certified mail
receipt ???
KEW

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NOTICE OF PERMIT

In the matter of an
Application for Permit by:

Mr. Carl D. Schulz, Vice President
Florida Gas Transmission Company
P. O. Box 1188
Houston, Texas 77251-1188

DER File No. **AC** 62-229319
Taylor County
PSD-FL-202

Enclosed is Permit Number **AC** 62-229319 to construct a 12,600 bhp natural gas fired turbine at the Florida Gas Transmission Company's facility located 6 miles N. of Perry on Pisgah Road, in Taylor County, Florida. This permit is issued pursuant to Section(s) 403, Florida Statutes.

Any party to this Order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

C. H. Fancy, P.E., Chief
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400
904-488-1344

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF PERMIT and all copies were mailed before the close of business on 9-28-93 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

(Clerk) 9-28-93 (Date)

Copies furnished to:
J. Cole, NE District
B. Andrews, P.E., ENSR
J. Harper, EPA
J. Bunyak, NPS

Final Determination

Florida Gas Transmission Company
Taylor County
Perry, Florida
Station No. 15

Natural Gas Compressor Engine
Permit No. AC 62-229319
PSD-FL-202

Department of Environmental Protection
Division of Air Resources Management
Bureau of Air Regulation

September 23, 1993

FINAL DETERMINATION

The Technical Evaluation and Preliminary Determination for the permit to construct a 12,600 bhp natural gas fired turbine at the Florida Gas Transmission Company located 6 miles N. of Perry on Pisgah Road in Perry, Florida, was distributed on June 28, 1993. The Notice of Intent was published in the Tallahassee Democrat on July 13, 1993. Copies of the evaluation were available for inspection at the Department's offices in Jacksonville and Tallahassee.

Florida Gas Transmission Company (FGTC's) application for a permit to construct a 12,600 bhp natural fired gas turbine in Perry, Florida, has been reviewed by the Bureau of Air Regulation in Tallahassee.

No adverse comments were submitted by EPA. Comments regarding the Permit Specific Conditions were submitted by Mr. V. Duane Pierce, Ph.D., Air Quality Supervisor for Florida Gas Transmission Company and Barry Andrews, P.E., representing FGTC as the professional engineer of record. The Bureau has considered Mr. Pierce's and Mr. Andrews' comments and agreed to the changes proposed to the draft specific conditions of the permit since these changes will not affect the air quality analysis considered during the evaluation of this project. The amendments to the Specific Conditions of this permit are as follows:

SPECIFIC CONDITION No. 5:

FROM:

The permitted operating parameters and utilization rates for this natural gas compressor engine shall not exceed the values stated in the application. The parameters include, but are not limited to:

Maximum natural gas consumption shall not exceed 0.1054 MMCF/hr.
Maximum heat input shall not exceed 109.66 MMBTU/hr.

TO:

The permitted operating parameters and utilization rates for this natural gas compressor engine shall not exceed the values stated in the application. The parameters include, but are not limited to:

Maximum natural gas consumption shall not exceed **0.1265 MMCF/hr (based on a fuel heating value of 1040 BTU/SCF).**
Maximum heat input shall not exceed **131.59 MMBTU/hr.**

SPECIFIC CONDITION No. 1:

FROM:

Emission Limits

1. The maximum allowable emissions from this source shall not exceed the emission rates as follows:

Pollutant	lbs/hr	tons/yr	Emission Factor
Nitrogen Oxides (a)	16.14	70.70	0.58 g/bhp-hr
Carbon Monoxide	11.71	51.30	0.42 g/bhp-hr
Volatile Organic Compounds (non-methane)	0.67	2.93	0.24 g/bhp-hr
Particulate Matter (TSP)	0.53	2.31	5 lbs/MMscf
Particulate Matter (PM_{10})	0.53	2.31	5 lbs/MMscf
Sulfur Dioxide	3.01	13.19	10 gr/100scf

(a) Initial NOx emissions for natural gas firing shall not exceed 42 ppmv at 15% oxygen on a dry basis. The permittee shall achieve NOx emissions of 25 ppmv at 15% oxygen on a dry basis at the earliest achievable date, but no later than 1/1/98.

TO:

Emission Limits

1. The maximum allowable emissions from this source shall not exceed the emission rates as follows:

Pollutant	lbs/hr	tons/yr	Emission Factor
Nitrogen Oxides (a)	16.14	70.70	0.58 g/bhp-hr
Carbon Monoxide	11.71	51.30	0.42 g/bhp-hr
Volatile Organic Compounds (non-methane)	0.67	2.93	0.24 g/bhp-hr
Particulate Matter (TSP)	**0.64**	**2.77**	5 lbs/MMscf
Particulate Matter (PM_{10})	**0.64**	**2.77**	5 lbs/MMscf
Sulfur Dioxide	**3.61**	**15.83**	10 gr S/100scf

Initial NOx emissions for natural gas firing shall not exceed 42 ppmv at 15% oxygen on a dry basis. The permittee will attempt to achieve a maximum NOx emissions level of 25 ppmvd at 15% O_2 by 1/1/98. Should this level of control not be achieved, when the compliance demonstration stack tests are performed, the permittee must provide the Department with expected compliance dates which will be updated annually.

After 1/1/98, the Department will revise the BACT determination and re-evaluate the economic analysis for this project if the compliance schedule and the NOx emission limit of 25 ppmvd at 15% O_2 has not been met.

The final action of the Department will be to issue construction permit **AC** 62-229319, PSD-FL-202 with the changes noted above.

Florida Department of
Environmental Protection

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

PERMITTEE:

Florida Gas Transmission Company
P. O. Box 1188
Houston, Texas 77251-1188

Permit Number: AC 62-229319
PSD-FL-202
Expiration Date: June 30, 1995
County: Taylor
Latitude/Longitude: 30°09'50"N
83°36'22"W
Project: Natural Gas Compressor Engine (ID 1507) Station No. 15

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-210, 212, 272, 275, 296, and 297; and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the construction of one natural gas fired engine to be located 6 miles north of Perry on Pisgah Road in Perry, Taylor County, Florida. The UTM coordinates are Zone 17, 249.02 km East and 3339.60 km North.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Application to Construct/Operate Air Pollution Sources DER Form 17-1.202(1).
2. Florida Gas Transmission's letter dated May 10, 1993.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

GENERAL CONDITIONS:

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

   a. Have access to and copy any records that must be kept under the conditions of the permit;

   b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

   c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

   a. a description of and cause of non-compliance; and

   b. the period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

GENERAL CONDITIONS:

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

(x) Determination of Best Available Control Technology (BACT)
(x) Determination of Prevention of Significant Deterioration (PSD)
(x) Compliance with New Source Performance Standards (NSPS)

14. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;

GENERAL CONDITIONS:

- the dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SPECIFIC CONDITIONS:

Emission Limits

1. The maximum allowable emissions from this source shall not exceed the emission rates as follows:

Pollutant	lbs/hr	tons/yr	Emission Factor
Nitrogen Oxides (a)	16.14	70.70	0.58 g/bhp-hr
Carbon Monoxide	11.71	51.30	0.42 g/bhp-hr
Volatile Organic Compounds (non-methane)	0.67	2.93	0.24 g/bhp-hr
Particulate Matter (TSP)	0.64	2.77	5 lbs/MMscf
Particulate Matter (PM_{10})	0.64	2.77	5 lbs/MMscf
Sulfur Dioxide	3.61	15.83	10 gr S/100scf

Initial NOx emissions for natural gas firing shall not exceed 42 ppmv at 15% oxygen on a dry basis. The permittee will attempt to achieve a maximum NOx emissions level of 25 ppmvd at 15% O_2 by 1/1/98. Should this level of control not be achieved, when the compliance demonstration stack tests are performed, the permittee must provide the Department with expected compliance dates which will be updated annually.

After 1/1/98, the Department will revise the BACT determination and re-evaluate the economic analysis for this project if the compliance schedule and the NOx emission limit of 25 ppmvd at 15% O_2 has not been met.

2. Visible emissions shall not exceed 10% opacity.

Operating Rates

3. This source is allowed to operate continuously (8760 hours per year).

4. This source is allowed to burn natural gas only.

SPECIFIC CONDITIONS:

5. The permitted operating parameters and utilization rates for this natural gas compressor engine shall not exceed the values stated in the application. The parameters include, but are not limited to:

- Maximum natural gas consumption shall not exceed 0.1265 MMCF/hr (based on a full heating value of 1040 BTU/CF.
- Maximum heat input shall not exceed 131.59 MMBtu/hr.

6. Any change in the method of operation, equipment or operating hours shall be submitted to the DEP's Bureau of Air Regulation and Northeast District offices.

7. Any other operating parameters established during compliance testing and/or inspection that will ensure the proper operation of this facility shall be included in the operating permit.

Compliance Determination

8. Compliance with the allowable emission limits shall be determined within 60 days after achieving the maximum production rate at which this facility will be operated, but not later than 180 days after initial start-up and annually thereafter except as provided in Specific Condition 10, below, by the following reference methods as described in 40 CFR 60, Appendix A (July 1992 version) and adopted by reference in Chapter 17-297, F.A.C.

- Method 1.	Sample and Velocity Traverses
- Method 2.	Volumetric Flow Rate
- Method 3 or 3A.	Gas Analysis
- Method 9.	Determination of the Opacity of the Emissions from Stationary Sources
- Method 10.	Determination of the Carbon Monoxide Emissions from Stationary Sources
- Method 20.	Determination of Nitrogen Oxides, Sulfur Dioxide and Diluent Emissions from Gas Turbines
- Method 18.	Measurements of Gaseous Organic Compound Emissions by Gas Chromatography
- Method 25A.	Determination of Total Gaseous Organic Concentrations Using a Flame Ionization Analyzer

9. Other DEP approved methods may be used for compliance testing after prior Department approval. Compliance with the SO_2 emission limit can be determined by calculations based on fuel analysis using ASTM D1072-80, D3031-81, D4084-82, or D3246-81 for sulfur content of gaseous fuels.

SPECIFIC CONDITIONS:

10. Initial compliance with the volatile organic compound (VOC) emissions limits will be demonstrated by EPA Method 25A or Method 18. Thereafter, except as provided in Rule 17-297.340(2), compliance with the VOC emission limits will be assumed, provided the CO allowable emission rate is achieved.

11. During performance tests, to determine compliance with the NO_x standard, measured NO_x emissions at 15 percent oxygen will be adjusted to ISO ambient atmospheric conditions by the following correction factor:

$$NO_x = (NO_{x\,obs}) \left(\frac{P_{ref}}{P_{obs}}\right)^{0.5} e^{19\,(H_{obs} - 0.00633)} \left(\frac{288°K}{T_{AMB}}\right)^{1.53}$$

where:

NO_x = Emissions of NO_x at 15 percent oxygen and ISO standard ambient conditions.

$NO_{x\,obs}$ = Measured NO_x emission at 15 percent oxygen, ppmv.

P_{ref} = Reference combustor inlet absolute pressure at 101.3 kilopascals (1 atmosphere) ambient pressure.

P_{obs} = Measured combustor inlet absolute pressure at test ambient pressure.

H_{obs} = Specific humidity of ambient air at test.

e = Transcendental constant (2.718).

T_{AMB} = Temperature of ambient air at test.

12. Stack sampling facilities shall be required and shall comply with the requirements of F.A.C. Rule 17-297.345. Test results will be the average of 3 valid runs. The Northeast District office will be notified at least 30 days in writing in advance of the compliance test(s). The source shall operate between 90% and 100% of maximum capacity for the ambient conditions experienced during compliance test(s). The turbine manufacturer's capacity vs temperature (ambient) curve shall be included with the compliance test. Compliance test results shall be submitted to the Northeast District office no later than 45 days after completion.

13. Continuous emission monitoring system to monitor and record fuel consumption shall be as specified in 40 CFR 60.334(a). Sulfur nitrogen content and the lower heating value of the fuel being fired in the combustion turbine shall be determined as specified in 40 CFR

SPECIFIC CONDITIONS:

60.334(b). Any request for a future custom monitoring schedule shall be made in writing and directed to the Northeast District office. Any custom schedule approved by DEP pursuant to 40 CFR 60.334(b) will be recognized as enforceable provisions of the permit, provided that the holder of this permit demonstrates that the provisions of the schedule will be adequate to assure continuous compliance.

14. The permittee shall annually perform a visual inspection of the turbine compressor engine, fitters, associated piping system for rust spots, cracks, leaks and odors. Also ensure that safety valves and the stack are in proper order and working properly. The permittee shall document the findings and corrective action taken.

15. When the Department, after investigation, has good reason (such as odor complaints, increased visible emissions, excess emissions, etc.), to conclude that any applicable emission standard contained in this permit is being violated, it may require the owner or operator of the facility to conduct compliance tests which identify the nature and quantity of air pollutant emissions from the facility and to provide a report of said tests to the Department (F.A.C. Rule 17-297.340(2)).

Rule Requirements

16. This source shall comply with all applicable provisions of Chapter 403, Florida Statutes, Chapters 17-210, 212, 275, 296, 297 and 17-4, Florida Administrative Code and 40 CFR 60 (July, 1992 version).

17. This source shall comply with all requirements of 40 CFR 60, Subpart GG, and F.A.C. Rule 17-296.800,(2)(a), Standards of Performance for Stationary Gas Turbines.

18. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements and regulations (F.A.C. Rule 17-210.300(1)).

19. No person shall cause, suffer, allow, or permit the discharge of air pollutants which cause or contribute to an objectionable odor pursuant to F.A.C. Rule 17-296.320(2). Objectionable odor is defined as any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonable interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance pursuant to F.A.C. Rule 17-296.200(123).

SPECIFIC CONDITIONS:

20. This source shall be in compliance with all applicable provisions of F.A.C. Rules 17-210.650: Circumvention; 17-210.700: Excess Emissions; 17-296.800: Standards of Performance for New Stationary Sources (NSPS); Chapter 17-297: Stationary Sources-Emissions Monitoring; Chapter 17-296: Stationary Source-Emission Standards and, 17-4.130: Plant Operation-Problems.

21. If construction does not commence within 18 months of issuance of this permit, then the permittee shall obtain from the Department a review and, if necessary, a modification of the control technology and allowable emissions for the unit(s) on which construction has not commenced (40 CFR 52.21(r)(2)).

22. Quarterly excess emission reports, in accordance with the July 1, 1992 version of 40 CFR 60.7 and 60.334 shall be submitted to the Department's Northeast District office.

23. Fugitive dust emissions, during the construction period, shall be minimized by covering or watering dust generation areas.

24. Pursuant to F.A.C. Rule 17-210.300(2), Air Operating Permits, the permittee is required to submit annual reports on the actual operating rates and emissions from this facility. These reports shall include, but are not limited to the following: sulfur content and the lower heating value of the fuel being fired, fuel usage, hours of operation, air emissions limits, etc. Annual reports shall be sent to the Department's Northeast District office by March 1 of each calendar year.

25. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

26. An application for an operation permit must be submitted to the Northeast District office at least 90 days prior to the expiration date of this construction permit. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction

SPECIFIC CONDITIONS:

permit, and compliance test reports as required by this permit (F.A.C. Rules 17-4.055 and 17-4.220).

Issued this 27 day

of September, 1993

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Virginia B. Wetherell

Virginia B. Wetherell, Secretary

Best Available Control Technology (BACT) Determination
Florida Gas Transmission Company
Taylor County-PSD-FL-202

The applicant proposes to expand an existing natural gas pipeline compressor station No. 15 near the town of Perry in Taylor County, Florida. The proposed expansion consists of adding one new 12,600 brake horsepower (BHP) natural-gas-fired, turbine engine.

The applicant has indicated the maximum total annual tonnage of regulated air pollutants emitted from the proposed turbine engine based on 8,760 hrs/year operation to be as follows:

Pollutant	Max. Net Increase in Emissions (TPY)	PSD Significant Emission Rate (TPY)
NOx	70.70	40
SO_2	13.18	40
PM/PM_{10}	2.32	25/15
CO	51.30	100
VOC	2.93	40

Rule 17-212.400(2)(f)(3) of the Florida Administrative Code (F.A.C.) requires a BACT review for all regulated pollutants emitted in an amount equal to or greater than the significant emission rates listed in the previous table. In this case, BACT is only required for nitrogen oxides (NOx).

BACT Determination Requested by the Applicant

The BACT Determination requested by the applicant is given below:

Pollutant	Proposed Limits
NOx	42 ppmvd at 5% O_2

Date of Receipt of a BACT Application

April 7, 1993

Review Group Members

This determination was based upon comments received from the applicant and the Permitting and Standards Section.

BACT DETERMINATION PROCEDURE

In accordance with F.A.C. Chapter 17-212, this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available control methods, systems and techniques.

In addition, the regulations require that in making the BACT determination the Department shall give consideration to:

(a) Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).

(b) All scientific, engineering and technical material and other information available to the Department.

(c) The emission limiting standards or BACT determinations of any other State.

(d) The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine for the emission source in question the most stringent control available for a similar or identical source or source category. If it is shown that this level of control is technically or economically infeasible for the source in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

BACT ANALYSIS FOR NITROGEN OXIDES (NOx)

CONTROL TECHNOLOGY REVIEW

The uncontrolled emissions of nitrogen oxides (245.4 TPY) represent a significant proportion of the total emissions generated by this project, and need to be controlled if deemed appropriate. As such, the applicant presented an extensive analysis of the different available technologies for NOx control.

The technologies that were evaluated in the application are:

- Selective catalytic reduction (SCR)
- Dry low-NOx combustion controls (Dry Low NOx)
- Wet (water/steam) injection
- Selective noncatalytic reduction (SNCR)
- Nonselective catalytic reduction (NSCR)

The applicant has indicated that only two of the above technologies (SCR & Dry Low-NOx) presented are technically feasible alternatives for control of NOx emissions from gas turbines in compressor service stations.

Dry Combustion Technology (Dry Low-NOx)

Dry combustion techniques are designed to alter the conditions in the combustion chamber to influence the temperature, residence time, and mixing of air and fuel so as to reduce the amount of NOx formed. The state-of-the-art concept in designing a low-NOx turbine involves raising the air-to-fuel ratio in the combustion primary zone and thoroughly premixing primary combustion air and fuel. This reduces NOx formation by lowering the average flame temperature in the combustor primary zone and avoiding localized hot spots.

Dry combustion controls will reduce NOx emissions for this turbine by 173.79 TPY. Annual NOx emissions are expected not to exceed 70.7 TPY (42 ppmvd at 15% O_2). Total annual cost for this technology is estimated to be $103,134. Therefore, NOx controls costs will be $593 per ton of NOx removed based on a 10 years operating life for the dry low control installation. This makes dry low-NOx combustion a technically and economically feasible control method for natural gas pipeline turbines.

The applicant has proposed that BACT for nitrogen oxides will be met by using dry low NOx combustor design to limit emissions to 42 ppmvd at 15% O_2 when burning natural gas.

A review of the EPA's BACT/LAER Clearinghouse indicates that the lowest NOx emission limit established to date for a gas turbine at a compressor station is 8.0 ppmvd at 15% oxygen. This level of control was accomplished through the use of a selective catalytic reduction (SCR) system.

Selective Catalytic Reduction (SCR)

Selective catalytic reduction is a post-combustion method for control of NOx emissions. The SCR process combines vaporized ammonia with NOx in the presence of a catalyst to form nitrogen and water. The vaporized ammonia is injected into the exhaust gases prior to passage through the catalyst bed. The SCR process can achieve up to 90% reduction of NOx with a new catalyst. As the catalyst ages, the maximum NOx reduction will decrease to approximately 86 percent.

The effect of exhaust gas temperature on NOx reduction depends on the specific catalyst formulation and reactor design. Most commercial SCR systems operate over a temperature range of about 600-750°F although recently developed zeolite-based catalysts are claimed to be capable of operating at temperatures as high as 950°. At levels above and below this window, the specific catalyst formulation will not be effective and NO_x reduction will decrease. Operating at high temperatures can permanently damage the catalyst through sintering of surfaces.

For this type of turbines, a significant design concern is the location of the catalyst bed within the flue gas duct work to ensure that the required SCR temperature "window" is met. A typical gas turbine in compressor service has an exhaust temperature near 1000°F (Solar, 1991), either water quench, dilution with ambient air, or heat recovery, would be required in order to bring the turbine exhaust temperature into the SCR window. All three temperature reduction methods have detrimental side effects.

Another major technical problem, identified by the applicant, is the reliability of the required automated control equipment. As engine power demand fluctuates, gas density, temperature, flow rate, and other system operational characteristics vary. As these factors change, engine exhaust flow rate, exhaust temperature, and other parameters important to maintaining catalytic NOx reduction efficiency also change. This limits the application of SCR at natural gas compressor stations, which are often designed to operate in an unattended mode.

In addition, flow variations in natural gas pipelines impose an additional design complication for the reliable high conversion operation of the SCR process. The systems must be designed to cope with the maximum and minimum flow and the maximum and minimum temperature without prohibitive additional reheat costs and multiple ammonia injection systems. The appropriate method to operate without excessive ammonia slip at the low temperature, low flow condition is to select an active catalyst that will allow high conversion of ammonia at low temperature with an ammonia/NOx ratio close to one. This will provide high conversion of NOx at low load and temperature and somewhat lower conversions at high load without excessively complex ammonia control technology. There are no complex ammonia controls on existing compressor stations that are capable of coping with the flow and temperature variations found in natural gas transmission service. Moreover, the sophisticated controls needed for a system this complex may require extensive operator attention and maintenance.

The 90% NOx removal specified in other BACT analyses is not technically feasible for Compressor Station No. 15 because the SCR system must be designed to satisfy both high and low load conditions. Tradeoffs in SCR system operation to limit ammonia slip decrease the amount of NOx removal possible. A maximum of approximately 80% NOx removal is deemed technically feasible for SCR over the entire operating range of the proposed turbines.

BACT EVALUATION BY THE DEPARTMENT

Although technically feasible, the applicant has rejected using SCR on this type of turbine because of economic, energy, and environmental impacts. The following limitations, identified by the applicant, has been evaluated by the Department.

Energy Impact

The energy impacts of SCR will increase electrical power generation by 0.6 MW hr/yr

Economic Impact

Given the applicant's proposed BACT level for nitrogen oxides, an evaluation was made of the cost and associated benefit of using SCR as follows:

The applicant has indicated that the total annual cost to install SCR at 100 percent capacity factor is $962,378. Taking into consideration the total annual cost, a cost/benefit analysis of using SCR was developed.

Based on the information supplied by the applicant, it is estimated that the maximum annual NOx emissions from the proposed compressor engine will be 245.40 tons/year. Assuming that SCR would reduce NOx emissions by 80%, the SCR would control approximately 195.6 tons of NOx annually. When this reduction (195.6 TPY NOx) is taken into consideration with the total annual cost of $962,378, the total cost per ton of controlling NOx is $4,920 per ton NOx removed. This cost is not representative of costs that have been previously justified as BACT for this type of turbine.

Environmental Impact

The use of SCR could result in accidental spills, emissions of ammonia, and the handling of spent catalyst which is sometimes classified as hazardous waste.

In addition to nitrogen oxides and ammonia, the impacts of toxic pollutants associated with the combustion of natural gas have been evaluated. These toxics (formaldehyde and polycyclic organic matter) common to the combustion of natural gas, are expected to be emitted in minimal amounts and will not have an impact on air quality or this BACT analysis.

BACT DETERMINATION BY THE DEPARTMENT

Based on the information presented by the applicant and the studies conducted, the Department believes that the NOx control emission technology proposed by the applicant satisfies the BACT requirement for this 12,600 HP gas turbine. A review of the latest BACT Clearinghouse determinations for NOx show limits of 25 ppmvd at 15% O_2 (natural gas) using dry low-NOx burn technology. Solar is currently developing dry low NOx programs to achieve emission control level of 25 ppmvd at 15% oxygen when firing natural gas. Therefore, since this technology will likely be available by 1997, the Department has accepted the proposed 42 ppmvd (natural gas) at 15% O_2 as a BACT for a limited time.

Although add-on control (SCR) could be used to provide additional control, the benefits that would be obtained do not warrant the cost. The emission limit for the 12,600 HP gas turbine is thereby established as follows:

Pollutant	Emission Limit
NOx	42 ppmvd at 15% O_2 25 ppmvd at 15% O_2, not later than 1/1/98

Note: Initial NOx emission rates for natural gas firing shall not exceed 42 ppmvd at 15% oxygen on a dry basis. The permittee shall achieve NOx emissions of 25 ppmvd at 15% oxygen at the earliest achievable date. After 1/1/98, the Department will revise the BACT determination and re-evaluate the economic analysis for this project if the compliance schedule and the NOx emission limit of 25 ppmvd at 15% O_2 has not been met.

Details of the Analysis May be Obtained by Contacting:

Doug Outlaw, P.E., BACT Coordinator
Department of Environmental Protection
Bureau of Air Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended by:

C. H. Fancy, P.E., Chief
Bureau of Air Regulation

September 23, 1993
Date

Approved by:

Virginia B. Wetherell
Virginia B. Wetherell, Secretary
Dept. of Environmental Protection

September 27 1993
Date

R. File

FLORIDA

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

May 30, 1995

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. V. Duane Pierce
Air Quality Supervisor
Phase III Expansion Project
Florida Gas Transmission Company
Post Office Box 1188
Houston, Texas 77251-1188

Dear Mr. Pierce:

Re: Request for Extensions to Air Construction Permits
AC 62-229319/PSD-FL-202-Taylor County
AC 05-229322-Brevard County
AC 56-230129/PSD-FL-203-St. Lucie County
AC 50-229440-Palm Beach County
AC 09-229441-Citrus County
AC 29-228821-Hillsborough

The Department is in receipt of your letter dated April 20, requesting to extend the expiration date of the above mentioned permits. The Bureau has evaluated your request and agrees to extend the expiration date of the permits as follows:

Expiration Date:

From: July 30, 1995
To: January 30, 1996

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes (F.S.). The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the applicant of the amendment request/application and the parties listed below must be filed within 14 days of receipt of this amendment. Petitions filed by other persons must be filed within 14 days of the amendment issuance or within 14 days of their receipt of this amendment, whichever occurs first. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, F.S.

The Petition shall contain the following information:

(a) The name, address and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;
(d) A statement of the material facts disputed by Petitioner, if any;
(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and,
(g) A statement of the relief sought by petitioner, stating precisely the action the petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this amendment. Persons whose substantial interests will be affected by any decision of the Department with regard to the amendment request/application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this amendment in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, Florida Administrative Code.

A copy of this letter shall be filed with the referenced permits and become a part of the permits.

Sincerely,

Howard L. Rhodes

Howard L. Rhodes, Director
Division of Air Resources
Management

HLR/th/t

Enclosure: Mr. V. Duane Pierce's letter of April 20, 1995

cc: Ed Middleswart, NWD
Robert Leetch, NED
Charles Collins, CD
Isidore Goldman, SED
Jerry Campbell, EPCHC
Alan Weatherford, FGTC
Barry Andrews, ENRS
Jim Stormer, PBCHU

BEST AVAILABLE COPY

Florida Gas Transmission Company

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

April 20, 1995

Mr. C. H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blairstone Road
Tallahassee, Florida 32399-2400

RE: Extension of Construction Permits

Air Permit No. AC 62-229319/PSD-FL-202
FGT Compressor Station No. 15, Taylor County

Air Permit No. AC 05-229322
FGT Compressor Station No. 19, Brevard County

Air Permit No. AC 56-230129/PSD-FL-203
FGT Compressor Station No. 20, St. Lucie County

Air Permit No. AC 50-229440
FGT Compressor Station No. 21, Palm Beach County

Air Permit No. AC 09-229441
FGT Compressor Station No. 26, Citrus County

Air Permit No. AC 29-228821
FGT Compressor Station No. 30, Hillsborough County

Dear Mr. Fancy:

Florida Gas Transmission Company (FGT) requests an extension for each of the above referenced air construction permits to a date 60 days after the due date for the Title V permit application for the facility. A non-Title V operating permit application for each of the facilities was submitted on 31 March 1995.

If you have any questions or need additional information, please call me at (713) 646-7323 or Mr. Allan Weatherford at (407) 875/5816.

Sincerely,

V. Duane Pierce

V. Duane Pierce, Ph.D.
Air Quality Supervisor
Phase III Expansion Project

Florida Gas Transmission Company

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

March 31, 1995

COPY

Ms. Rita Felton
Florida Department of Environmental Protection
Northeast District
7825 Baymeadows Way, Suite 200B
Jacksonville, Florida 32256-7590

RE: Air Permit No. AC 62-229319/PSD-FL-202
FGT Compressor Station No. 15, Taylor County
Operating Permit Application

Dear Ms. Felton:

Enclosed is one application for an air operating permit for the facilities constructed under the above referenced Air Construction Permit. This application is for a state operating permit only. It is not an application for a Title V permit. A Title V permit application for the entire facility will be submitted by the required submittal date for a Title V permit application.

The short form has been used for this application. This was chosen based on discussions with several Florida Department of Environmental Protection District offices and local program offices. There were differences of opinions as to which form was the appropriate form. The majority of opinions were for the short form. Our analysis of the regulations, the forms and the directions to the forms lead us to conclude that the short form is the most appropriate.

Emissions testing was performed on February 10, 1995, and the test report was submitted to your office on March 17, 1995. Prior to testing the ports were found to be in the wrong location. Also, there were only four when six were needed. The ports were moved to the proper location and two were added prior to testing. The sampling platform is being raised to the new height.

We understand that a fee is not required since we have paid an annual operating fee for this facility.

We will be requesting an extension for our construction permit to a date 60 days past the due date for our Title V permit application. This will be done through the Department of Environmental Protection in Tallahassee since they issued the Construction Permit. We will copy you on this request.

If you have any questions or need further information, please call me at (713) 646-7323 or Mr. Allan Weatherford at (407) 875-5816.

Sincerely,

V. Duane Pierce

V. Duane Pierce, Ph.D.
Air Quality Supervisor
Phase III Expansion Project

cc: Clair Fancy - FDEP - Tallahassee

William Rome - FGT - w/o attachments

Allan Weatherford - FGT

FGT Perry Compressor Station No. 15 File

FILE: 15opapp.doc

COPY

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR RESOURCES MANAGEMENT

APPLICATION FOR AIR PERMIT - SHORT FORM

I. APPLICATION INFORMATION

Identification of Facility Addressed in This Application

Compressor Station No. 15
Florida Gas Transmission Company
6 miles north of Perry on Pisgah Road
Taylor County, Florida

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official :

Name : William E. Rome
Title : Vice President, Operations

2. Owner or 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 : 7138536071 Fax :

4. Owner/Authorized Representative or Responsible Official Statement :

I, the undersigned, am the owner or authorized representative of the facility (non-Title V source) addressed in this Application for Air Permit or the responsible official, as defined in Chapter 62-213, F.A.C., 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. Further, I agree to operate and maintain the air pollutant emissions units and air pollution control equipment described in this application 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. If the purpose of this application is to obtain an air operation permit or operation permit revision for one or more emissions units which have undergone construction or modification, I 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. 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.*

William E. Rome
Signature

3/21/95
Date

Scope of Application

Emissions Unit ID	Description of Emissions Unit
03	Compressor Engine No. 1507
Unknown	2,000 Gallon New Lube Oil Tank
Unknown	Fugitive Emissions

Purpose of Application

Category I : All Air Operation Permit Applications Subject to Processing Under Chapter 62-213, F.A.C.

This Application for Air Permit is submitted to obtain :

[ ] Initial air operation permit for one or more existing, but previously unpermitted, emissions units.

[X] Initial air operation permit for one or more newly constructed or modified emissions units.

Current construction permit number :
AC 62-229319

[ ] Air operation permit revision to address one or more newly constructed or modified emissions units.

Current construction permit number :

Operation permit to be revised :

[ ] Air operation permit renewal.

Operation permit to be renewed :

Application Processing Fee

Attached - Amount : NA

Construction/Modification Information

1. Description of Alterations : No Alterations
2. Date of Commencement of Construction : 2/28/94

Professional Engineer Certification

1. Professional Engineer Name : Jimmy D. Harp

   Registration Number : 17362

2. Professional Engineer Mailing Address :

   Organization/Firm : Florida Gas Transmission Company
   Street Address : 1400 Smith Street
   City : Houston
   State : TX Zip Code : 77002-____

3. Professional Engineer Telephone Numbers :

   Telephone : 7138531619 Fax : 7138532723

4. Professional Engineer Statement :

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

   (1) To the best of my knowledge, there is reasonable assurance (a) that the air pollutant emissions unit(s) and the air pollutant 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 in the Florida Statues 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.

   Jimmy D. Harp
   Signature

   3/30/95
   Date

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

Application Contact

1. Name and Title of Application Contact : Name : Allan Weatherford Title : Division Environmental Specialist
2. Application Contact Mailing Address : Organization/Firm : Florida Gas Transmission Company Street Address : 601 South Lake Destiny Drive City : Maitland State : FL Zip Code : 31751-___
3. Application Contact Telephone Numbers : Telephone : 4078755816 Fax : 4078755896

Application Comment

This application is for a non-Title V operating permit for new sources. ATitle V application will be submitted for this facility by the appropriate due date.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Name, Location, and Type

1. Facility Owner or Operator :
   Florida Gas Transmission Company

2. Facility Name : Compressor Station No. 15

3. Facility Identification Number : 31GVL62003

4. Facility Location Information :

   Compressor Station No. 15
   Florida Gas Transmission Company
   6 miles north of Perry on Pisgah Road
   Taylor County, Florida

   Facility Street Address : Route 5, Box 486-10
   City : Perry
   County : Taylor
   Zip Code : 32347-9358

5. Facility UTM Coordinates :

   Zone : 17 East (km) : 249.02 North (km) : 3339.06

6. Facility Latitude/Longitude :

   Latitude (DD/MM/SS) : 30 9 50 Longitude (DD/MM/SS) : 83 36 22

7. Governmental Facility Code :	8. Facility Status Code :	9. Relocatable Facility ?	10. Facility Major Group SIC Code :
0	A		49

11. Facility Comment :

Facility Contact

1. Name and Title of Facility Contact : Name : Sonny Beets Title : Area Leader
2. Facility Contact Mailing Address : Organization/Firm : Florida Gas Transmission Company Street Address : P.O. Box 939 City : Perry State : FL   Zip Code : 32347-0939
3. Facility Contact Telephone Numbers : Telephone : 9045846183   Fax : 9044852723

Facility Regulatory Classifications

1. Small Business Stationary Source?	N
2. Title V Source?	
3. Synthetic Non-Title V Source by Virtue of Previous Air Construction Permit? Construction Permit Number/Issue Date : AC 62-229319 09/27/93	N
4. Facility Regulatory Classifications Comment : Facility is a Title V facility. This application is for a non-Title V operating permit.	

D. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements for All Applications

1. Area Map Showing Facility Location :	Attachment 1
2. Facility Plot Plan :	Attachment 2
3. Process Flow Diagram(s) :	Attachment 3
4. Precautions to Prevent Emissions of Unconfined Particulate Matter :	NA

III. EMISSIONS UNIT INFORMATION

A. GENERAL EMISSIONS UNIT INFORMATION

Emissions Unit Information Section 1

<u>Type of Emissions Unit Addressed in This Section</u>

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, an individually-regulated emission point (stack or vent) serving a single process or production unit, or activity, which also has other individually-regulated emission points.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a collectively-regulated 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 only.

[ ] 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.

Emissions Unit Information Section 1

Emissions Unit Description and Status

1. Description of Emissions Unit Addressed in This Section : Compressor Engine No. 1507	
2. ARMS Identification Number : 03	
3. Emissions Unit Status Code : A	4. Emissions Unit Major Group SIC Code : 49
5. Initial Startup Date : 10/14/94	
6. Long-term Reserve Shutdown Date :	
7. Package Unit : Manufacturer : Solar Model Number : Mars 90S	
8. Generator Nameplate Rating : MW	
9. Incinerator Information : Dwell Temperature : °F Dwell Time : seconds Incinerator Afterburner Temperature : °F	
10. Emissions Unit Comment : Engine was previously called model T-12000.	

Emissions Unit Information Section 1

Emissions Unit Control Equipment 1

1. Description : Dry, Low NOx Combuster	
2. Control Device or Method Code :	99

Emissions Unit Information Section 1

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate :	132 mmBtu/hr
2. Maximum Incinerator Rate :	lb/hr tons/day
3. Maximum Process or Throughput Rate : Units :	
4. Maximum Production Rate : Units :	
5. Operating Capacity Comment : Manufacturer rated for 12600 bhp at ISO conditions.	

Emissions Unit Information Section 1

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule :

24 hours/day	7 days/week
52 weeks/year	8760 hours/year

I. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Emissions Unit Information Section 1

Supplemental Requirements for All Applications

1. Process Flow Diagram :	Attachment 3
2. Fuel Analysis or Specification :	Attachment 4
3. Detailed Description of Control Equipment :	NA
4. Description of Stack Sampling Facilities :	Attachment 5
5. Compliance Test Report :	03/17/95
6. Procedures for Startup and Shutdown :	NA
7. Operation and Maintenance Plan :	NA
8. Other Information Required by Rule or Statue :	NA

III. EMISSIONS UNIT INFORMATION

A. GENERAL EMISSIONS UNIT INFORMATION

Emissions Unit Information Section 2

Type of Emissions Unit Addressed in This Section

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, an individually-regulated emission point (stack or vent) serving a single process or production unit, or activity, which also has other individually-regulated emission points.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a collectively-regulated 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 only.

[ ] 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.

Emissions Unit Information Section 2

Emissions Unit Description and Status

1. Description of Emissions Unit Addressed in This Section : 2,000 Gallon New Lube Oil Tank	
2. ARMS Identification Number : Unknown	
3. Emissions Unit Status Code : A	4. Emissions Unit Major Group SIC Code : 49
5. Initial Startup Date : 10/14/94	
6. Long-term Reserve Shutdown Date :	
7. Package Unit : Manufacturer : Model Number :	
8. Generator Nameplate Rating : MW	
9. Incinerator Information : Dwell Temperature : °F Dwell Time : seconds Incinerator Afterburner Temperature : °F	
10. Emissions Unit Comment :	

Emissions Unit Information Section 2

Emissions Unit Control Equipment 1

1. Description : Pressurized except when being loaded.
2. Control Device or Method Code :

Emissions Unit Information Section 2

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate :	mmBtu/hr	
2. Maximum Incinerator Rate :	lb/hr	tons/day
3. Maximum Process or Throughput Rate : 500 Units : gal/yr		
4. Maximum Production Rate : Units :		
5. Operating Capacity Comment :		

Emissions Unit Information Section 2

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule :			
24	hours/day	7	days/week
52	weeks/year	8760	hours/year

I. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Emissions Unit Information Section 2

Supplemental Requirements for All Applications

1. Process Flow Diagram :	Attachment 3
2. Fuel Analysis or Specification :	NA
3. Detailed Description of Control Equipment :	NA
4. Description of Stack Sampling Facilities :	NA
5. Compliance Test Report :	NA
6. Procedures for Startup and Shutdown :	NA
7. Operation and Maintenance Plan :	NA
8. Other Information Required by Rule or Statue :	NA

III. EMISSIONS UNIT INFORMATION

A. GENERAL EMISSIONS UNIT INFORMATION

Emissions Unit Information Section 3

Type of Emissions Unit Addressed in This Section

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, an individually-regulated emission point (stack or vent) serving a single process or production unit, or activity, which also has other individually-regulated emission points.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a collectively-regulated 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 only.

[X] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

Emissions Unit Information Section 3

Emissions Unit Description and Status

1. Description of Emissions Unit Addressed in This Section : Fugitive Emissions	
2. ARMS Identification Number : Unknown	
3. Emissions Unit Status Code : A	4. Emissions Unit Major Group SIC Code : 49
5. Initial Startup Date : 10/14/94	
6. Long-term Reserve Shutdown Date :	
7. Package Unit : Manufacturer : Various; Model Number : Various	
8. Generator Nameplate Rating : MW	
9. Incinerator Information : Dwell Temperature : °F; Dwell Time : seconds; Incinerator Afterburner Temperature : °F	
10. Emissions Unit Comment : Potential fugitive emissions from Compressor Station No. 15 include fugitive emissions from the new valves and flanges that are in gas service.	

Emissions Unit Information Section ________

Emissions Unit Control Equipment ______

1. Description :	
2. Control Device or Method Code :	

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate :	mmBtu/hr	
2. Maximum Incinerator Rate :	lb/hr	tons/day
3. Maximum Process or Throughput Rate : Units :		
4. Maximum Production Rate : Units :		
5. Operating Capacity Comment : This section is not applicable to fugitive emissions.		

Emissions Unit Information Section 3

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule :	
24 hours/day	7 days/week
52 weeks/year	8760 hours/year

I. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Emissions Unit Information Section 3

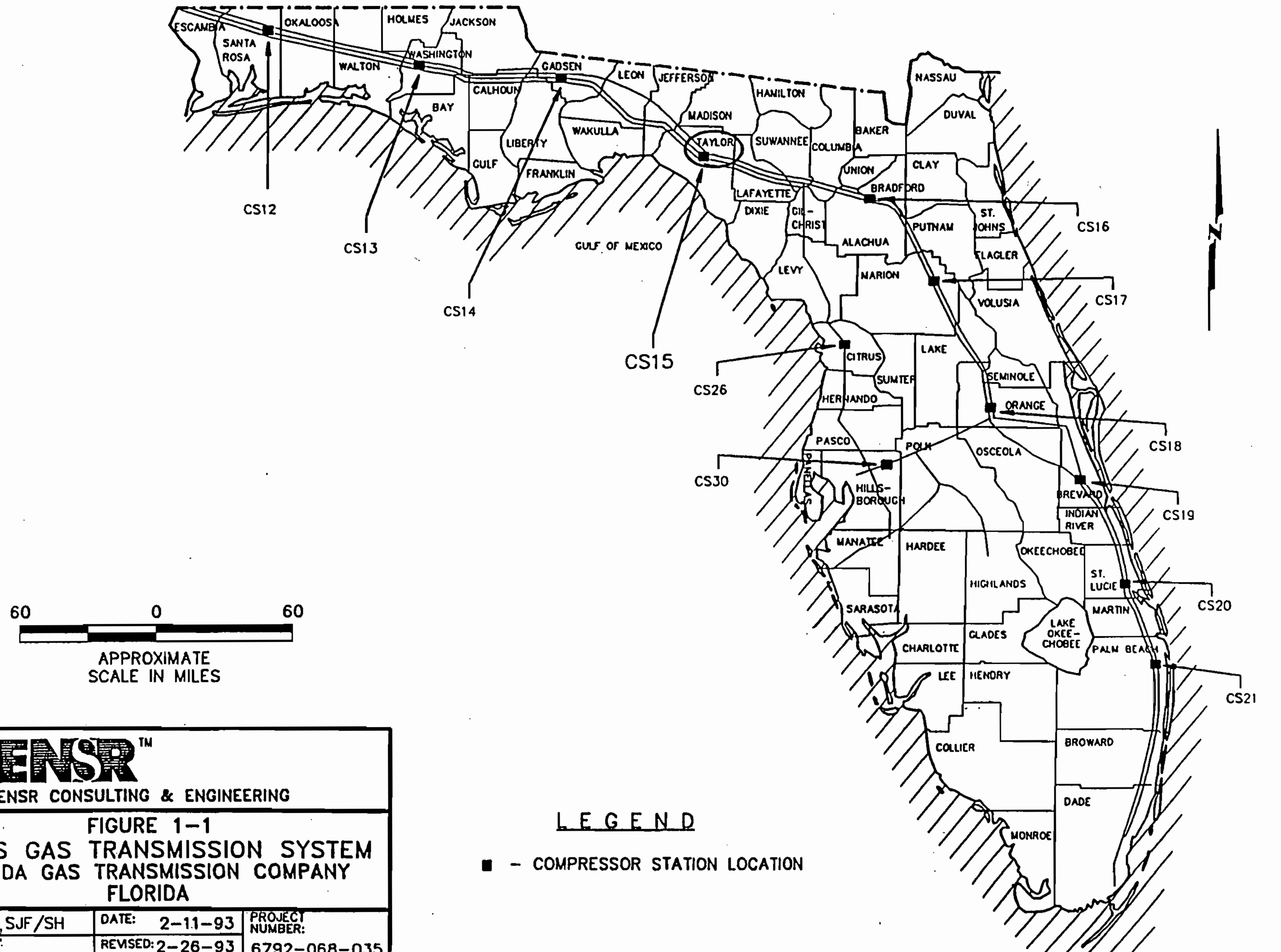
Supplemental Requirements for All Applications

1. Process Flow Diagram :	NA
2. Fuel Analysis or Specification :	NA
3. Detailed Description of Control Equipment :	NA
4. Description of Stack Sampling Facilities :	NA
5. Compliance Test Report :	NA
6. Procedures for Startup and Shutdown :	NA
7. Operation and Maintenance Plan :	NA
8. Other Information Required by Rule or Statue :	NA

ATTACHMENT 1

Area Map

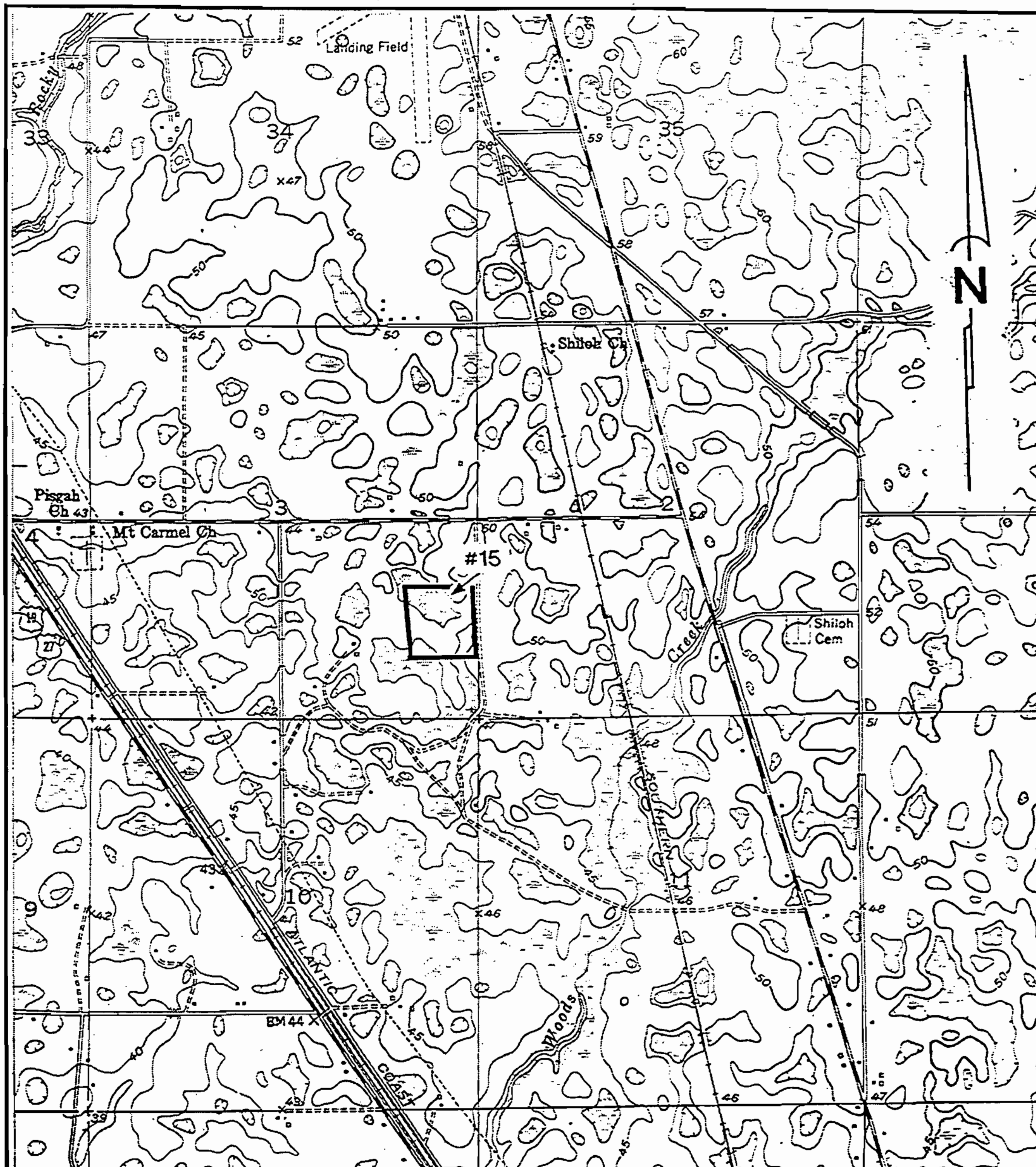
CE679261
12-15-92



ENSR™
ENSR CONSULTING & ENGINEERING

FIGURE 1-1
FGTC'S GAS TRANSMISSION SYSTEM
FLORIDA GAS TRANSMISSION COMPANY
FLORIDA

DRAWN: SJF/SH	DATE: 2-11-93	PROJECT NUMBER:
APPV'D:	REVISED: 2-26-93	6792-068-035



0 2000 4000

SCALE IN FEET

REFERENCE: U.S.G.S. Quadrangle Map for Boyd, Florida, 1954.

ENSR™

ENSR CONSULTING AND ENGINEERING

FIGURE 1-2
SITE LOCATION MAP
COMPRESSOR STATION #15
FLORIDA GAS TRANSMISSION COMPANY
PERRY, FLORIDA

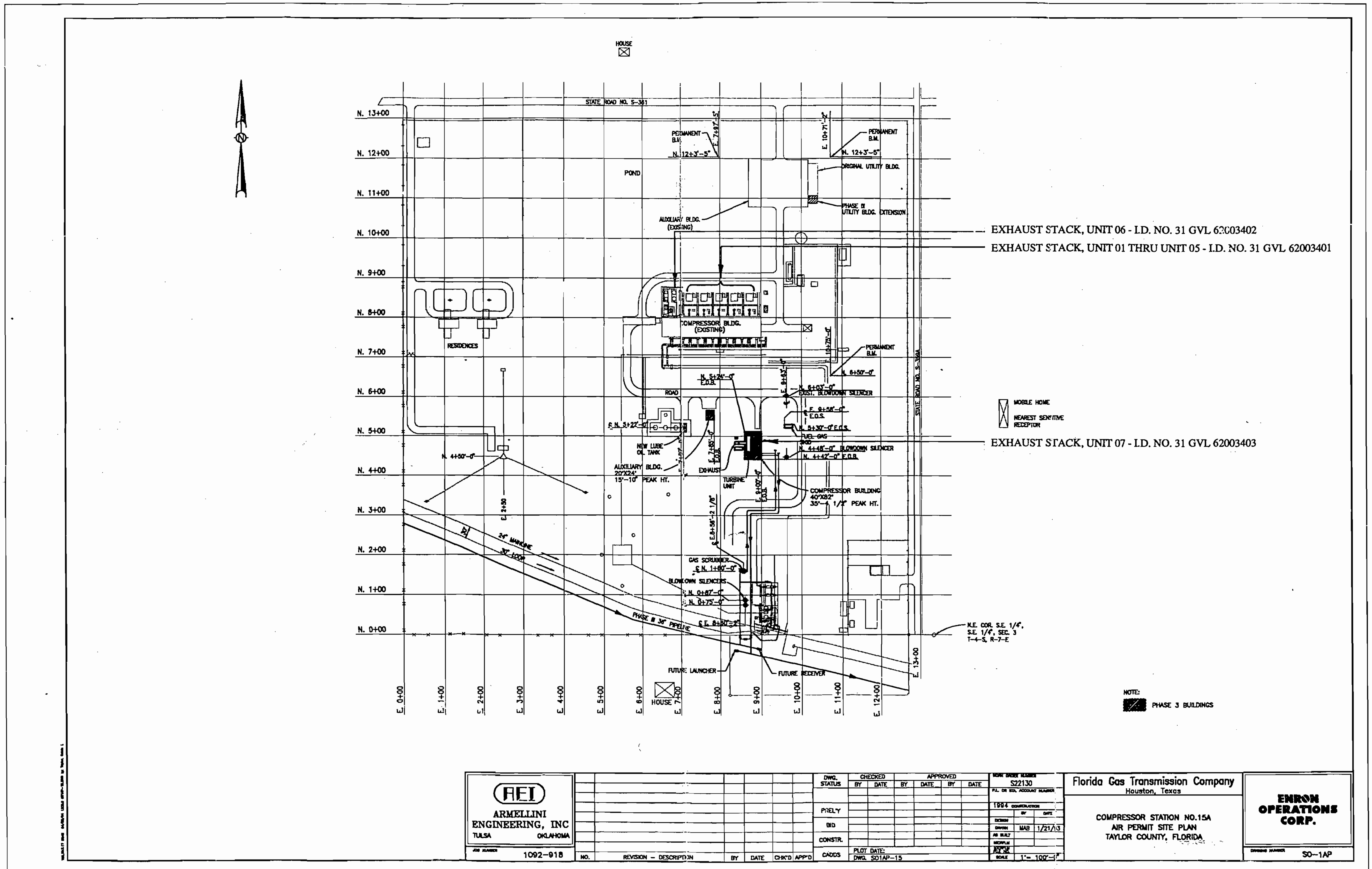
DRAWN BY: SJF/SH	DATE: 12-16-92	PROJECT NUMBER:
CHK'D.BY:	REVISED: 1-12-93	6792-068-035

TOPO

ATTACHMENT 2

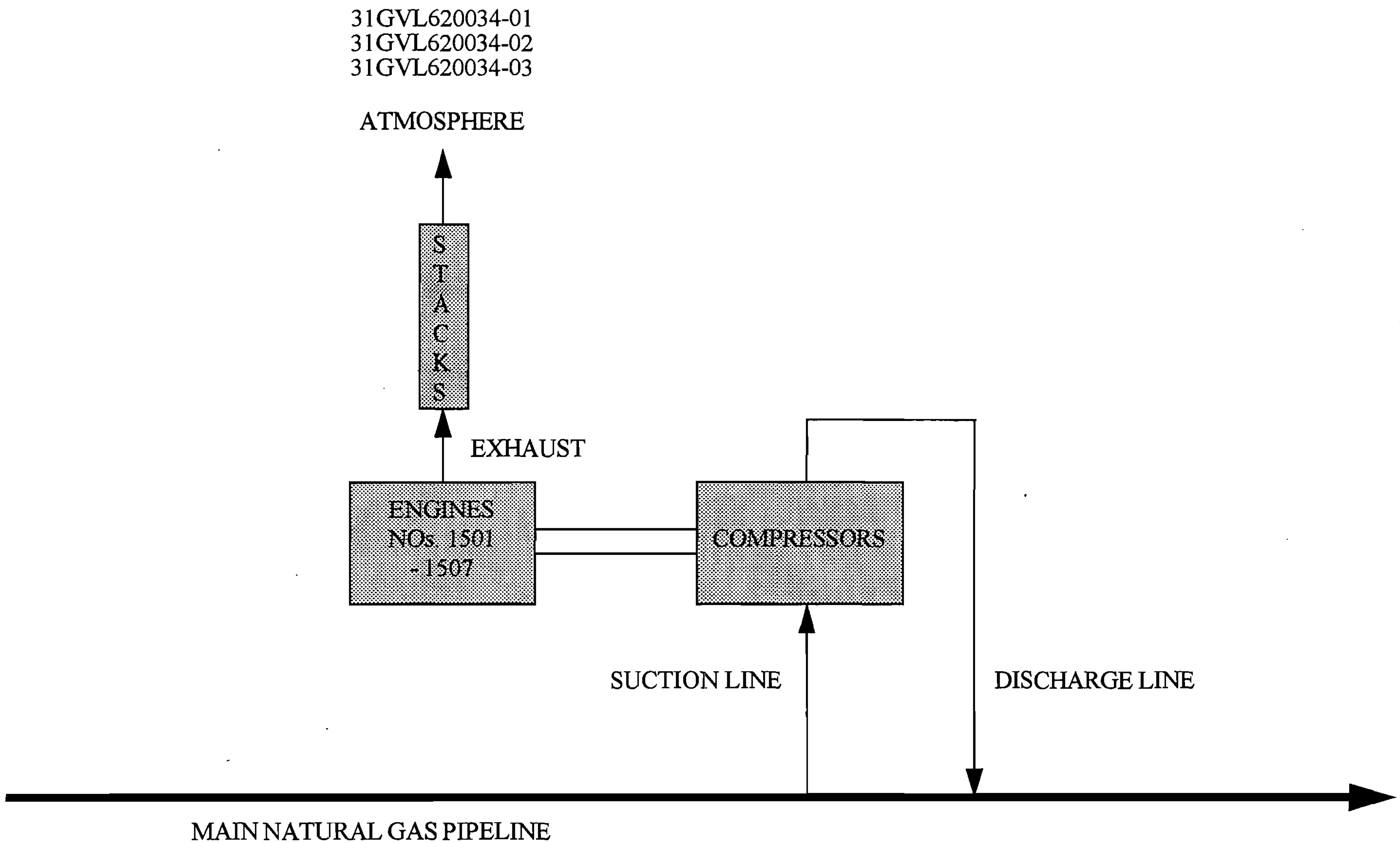
Plot Plan

AIR EMISSIONS PLOT PLAN C/S 15
Source I.D. No. 31GVL 62003401 through 62003403



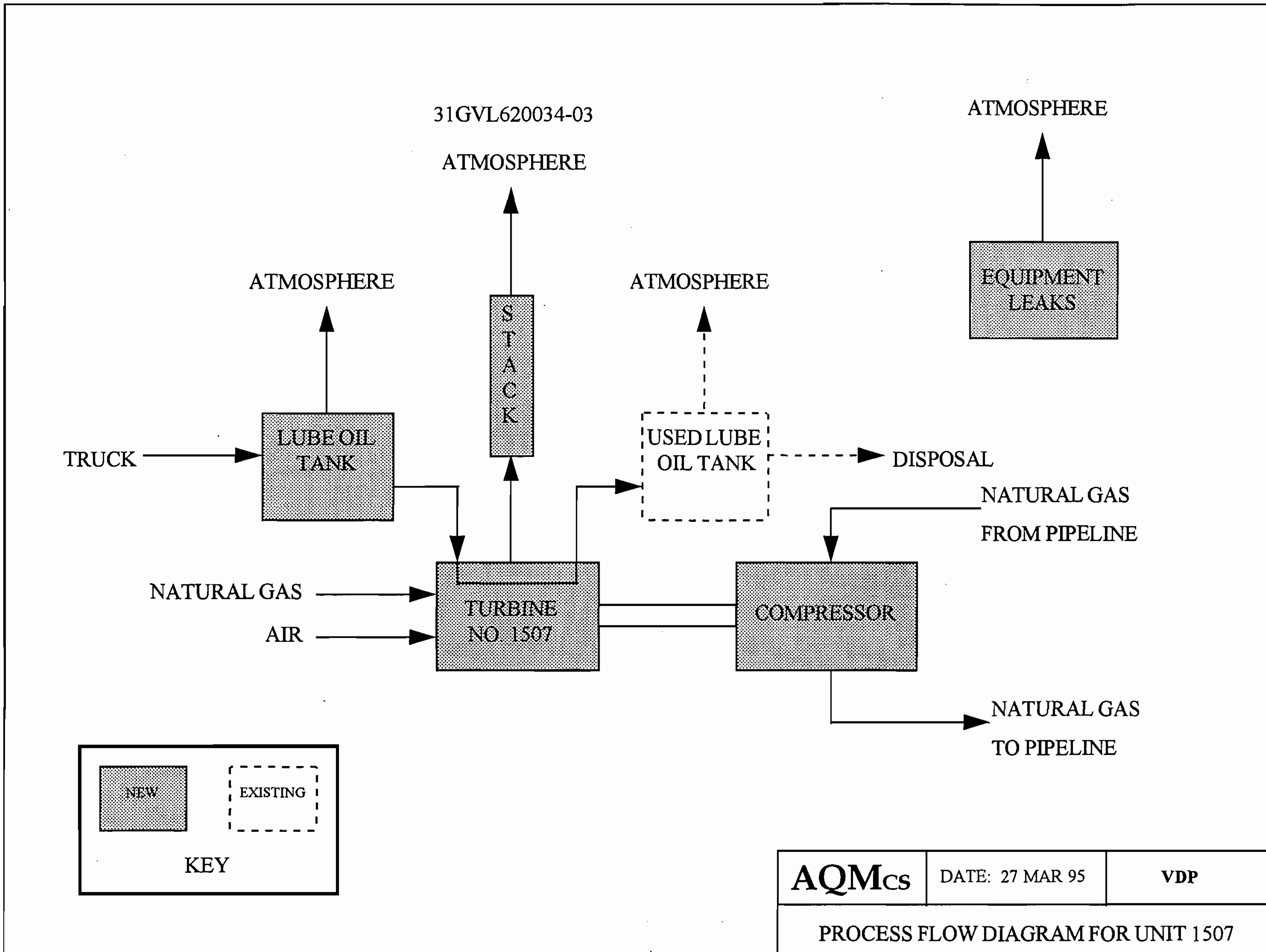
ATTACHMENT 3

Process Flow Diagrams



AQMcs	DATE: 29 MAR 95	VDP

PROCESS FLOW DIAGRAM FOR STATION 15


31GVL620034-03
ATMOSPHERE
ATMOSPHERE
ATMOSPHERE
ATMOSPHERE
EQUIPMENT LEAKS
STACK
TRUCK
LUBE OIL TANK
USED LUBE OIL TANK
DISPOSAL
NATURAL GAS FROM PIPELINE
NATURAL GAS
AIR
TURBINE NO. 1507
COMPRESSOR
NATURAL GAS TO PIPELINE
NEW
EXISTING
KEY
AQMcs
DATE: 27 MAR 95
VDP
PROCESS FLOW DIAGRAM FOR UNIT 1507

ATTACHMENT 4

Typical Fuel Analyses

ANALYSIS

DATE: 05/03/94		ANALYSIS TIME:	345	STREAM SEQUENCE: 1	
TIME: 11:07		CYCLE TIME:	360	STREAM#: 1	
ANALYZER#:	1	MODE:	RUN	CYCLE START TIME: 11:01	

COMP NAME	COMP CODE	MOLE %	GAL/MCF**	B.T.U.*	REL DEN*
HEXANE +	151	0.087	0.0381	4.49	0.0028
PROPANE	152	0.437	0.1204	11.02	0.0067
I-BUTANE	153	0.101	0.0331	3.30	0.0020
N-BUTANE	154	0.092	0.0291	3.02	0.0019
IPENTANE	155	0.040	0.0147	1.61	0.0010
NPENTANE	156	0.025	0.0091	1.01	0.0006
NITROGEN	157	0.385	0.0421	0.00	0.0037
METHANE	158	95.242	16.1435	964.13	0.5275
CO2	159	0.742	0.1265	0.00	0.0113
ETHANE	160	2.848	0.7619	50.52	0.0296
TOTALS		100.000	17.3185	1039.10	0.5871

* @ 14.730 PSIA & UNCORRECTED FOR COMPRESSIBILITY

** @ 14.730 & 60 DEG. F

COMPRESSIBILITY FACTOR (1/Z)	= 1.0022
DRY B.T.U. @ 14.730 PSIA & 60 DEG. F CORRECTED FOR (1/Z)	= 1041.4
REAL RELATIVE DENSITY	= 0.5881
UNNORMALIZED TOTAL	= 100.00
ANALOG INPUT CHANNEL 1 = H 2 S 140	= .15023
ANALOG INPUT CHANNEL 2 = WATER 144	= 3.7802

ACTIVE ALARMS

NONE

FLORIDA GAS TRANSMISSION CO.
BROOKER LAB- Main Line
STANDARD GAS 1041.8 / 0.5939
CERTIFIED VALUE BTU 1041.9 GRAV. 0.5939
TOTAL SULFUR 0.03 GR/CCF H_2S 0.02 GR/CCF
H_2O 3.6 #/MMCF BY Ron Stahler

ANALYSIS

DATE: 12/01/93 ANALYSIS TIME: 345 STREAM SEQUENCE: 12
TIME: 12:38 CYCLE TIME: 360 STREAM#: 1
ANALYZER#: 1 MODE: RUN CYCLE START TIME: 12:32

COMP NAME	COMP CODE	MOLE %	GAL/MCF**	B.T.U.*	REL DEN*
HEXANE +	151	0.076	0.0333	3.92	0.0025
PROPANE	152	0.580	0.1599	14.64	0.0088
I-BUTANE	153	0.119	0.0388	3.87	0.0024
N-BUTANE	154	0.126	0.0398	4.12	0.0025
IPENTANE	155	0.041	0.0150	1.64	0.0010
NPENTANE	156	0.026	0.0094	1.04	0.0006
NITROGEN	157	0.460	0.0504	0.00	0.0044
METHANE	158	94.190	15.9651	953.48	0.5217
CO2	159	0.747	0.1273	0.00	0.0114
ETHANE	160	3.635	0.9724	64.48	0.0377
TOTALS		100.000	17.4114	1047.20	0.5931

* @ 14.730 PSIA & UNCORRECTED FOR COMPRESSIBILITY

** @ 14.730 & 60 DEG. F

COMPRESSIBILITY FACTOR (1/Z) = 1.0023
DRY B.T.U. @ 14.730 PSIA & 60 DEG. F CORRECTED FOR (1/Z) = 1049.6
REAL RELATIVE DENSITY = 0.5942
UNNORMALIZED TOTAL = 99.97

ACTIVE ALARMS

NONE

FLORIDA GAS TRANSMISSION CO.
BROOKER LAB- WeT
STANDARD GAS 1041.9 0.5940
CERTIFIED VALUE BTU 1042.0 GRAV. 0.5940
TOTAL SULFUR 0.15 GR/CCF H^2S 0.08 GR/CCF
H^2O 2.8 #/MMCF BY [signature]

ANALYSIS.

DATE:	01/12/93	ANALYSIS TIME:	345	STREAM SEQUENCE:	12
TIME:	12:32	CYCLE TIME:	360	STREAM#:	1
ANALYZER#:	1	MODE:	RUN	CYCLE START TIME:	12:26

COMP NAME	COMP CODE	MOLE %	GAL/MCF**	B.T.U.*	SP. GR.*
HEXANE +	151	0.073	0.0319	3.76	0.0024
PROPANE	152	0.930	0.2561	23.44	0.0142
I-BUTANE	153	0.189	0.0618	6.16	0.0038
N-BUTANE	154	0.228	0.0718	7.45	0.0046
IPENTANE	155	0.057	0.0210	2.31	0.0014
NPENTANE	156	0.040	0.0144	1.60	0.0010
NITROGEN	157	0.810	0.0000	0.00	0.0078
METHANE	158	93.511	0.0000	946.61	0.5180
CO2	159	0.774	0.0000	0.00	0.0118
ETHANE	160	3.388	0.9064	60.10	0.0352
NAtc		4.905			
TOTALS		100.000	1.3634	1051.41	0.6000

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

** @ 14.730 & 60 DEG. F

COMPRESSIBILITY FACTOR (1/Z)	= 1.0023
DRY B.T.U. @ 14.730 PSIA & 60 DEG. F CORRECTED FOR (1/Z)	= 1053.8
SAT B.T.U. @ 14.730 PSIA & 60 DEG. F CORRECTED FOR (1/Z)	= 1035.5
REAL SPECIFIC GRAVITY	= 0.6011
UNNORMALIZED TOTAL	= 100.17

ACTIVE ALARMS

NONE

FLORIDA GAS TRANSMISSION CO.

BROOKER LAB- WET

STANDARD GAS 1041.9 / 0.5940

CERTIFIED VALUE BTU 1042.0 GRAV. 0.5940

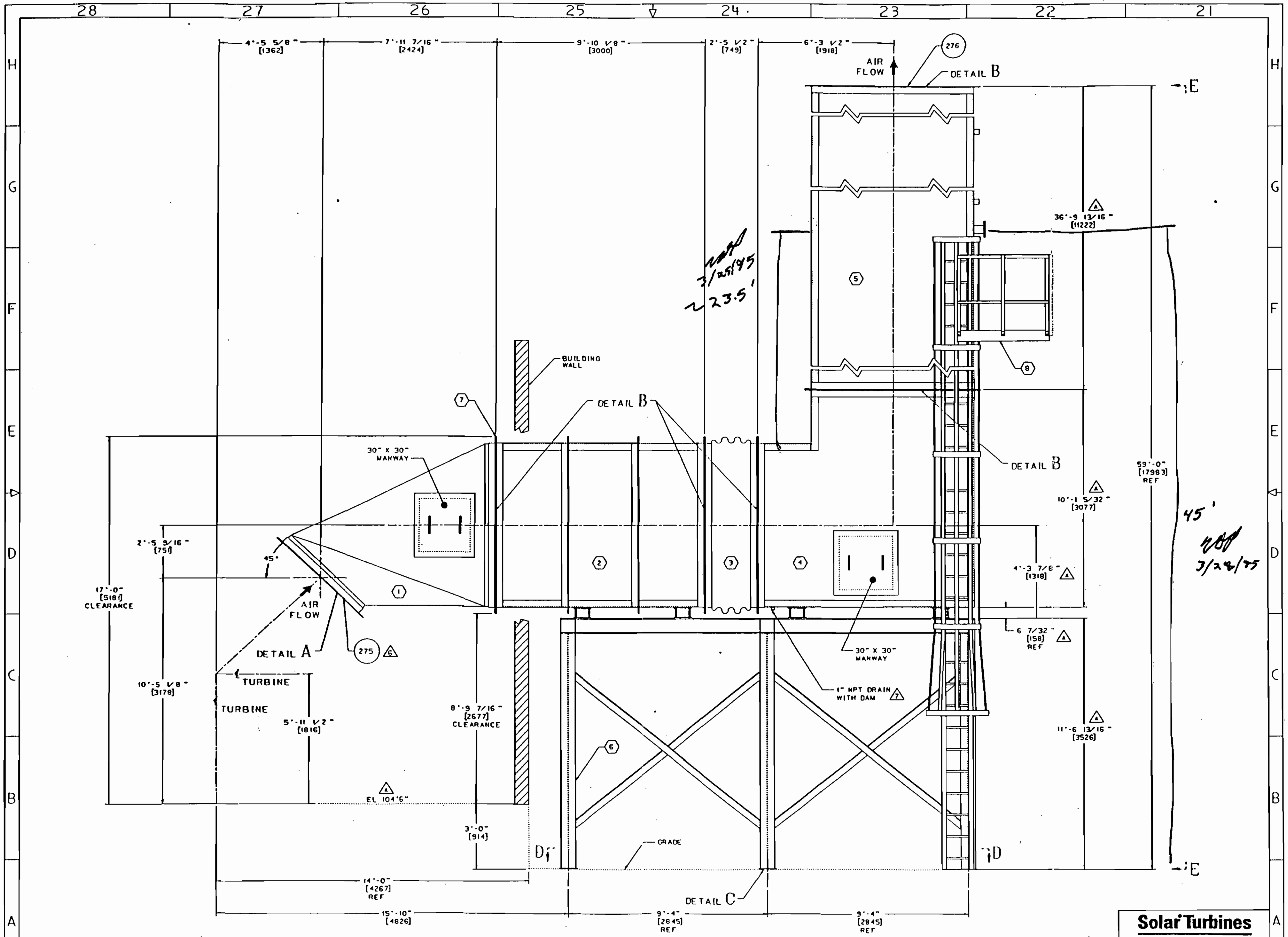
TOTAL SULFUR 0.48 GR/CCF H^2S 0.03 GR/CCF

H^2O 2.7 #/MMCF BY Bill Stinson

RECEIVED
JAN 14 1993
TECH OPERATIONS

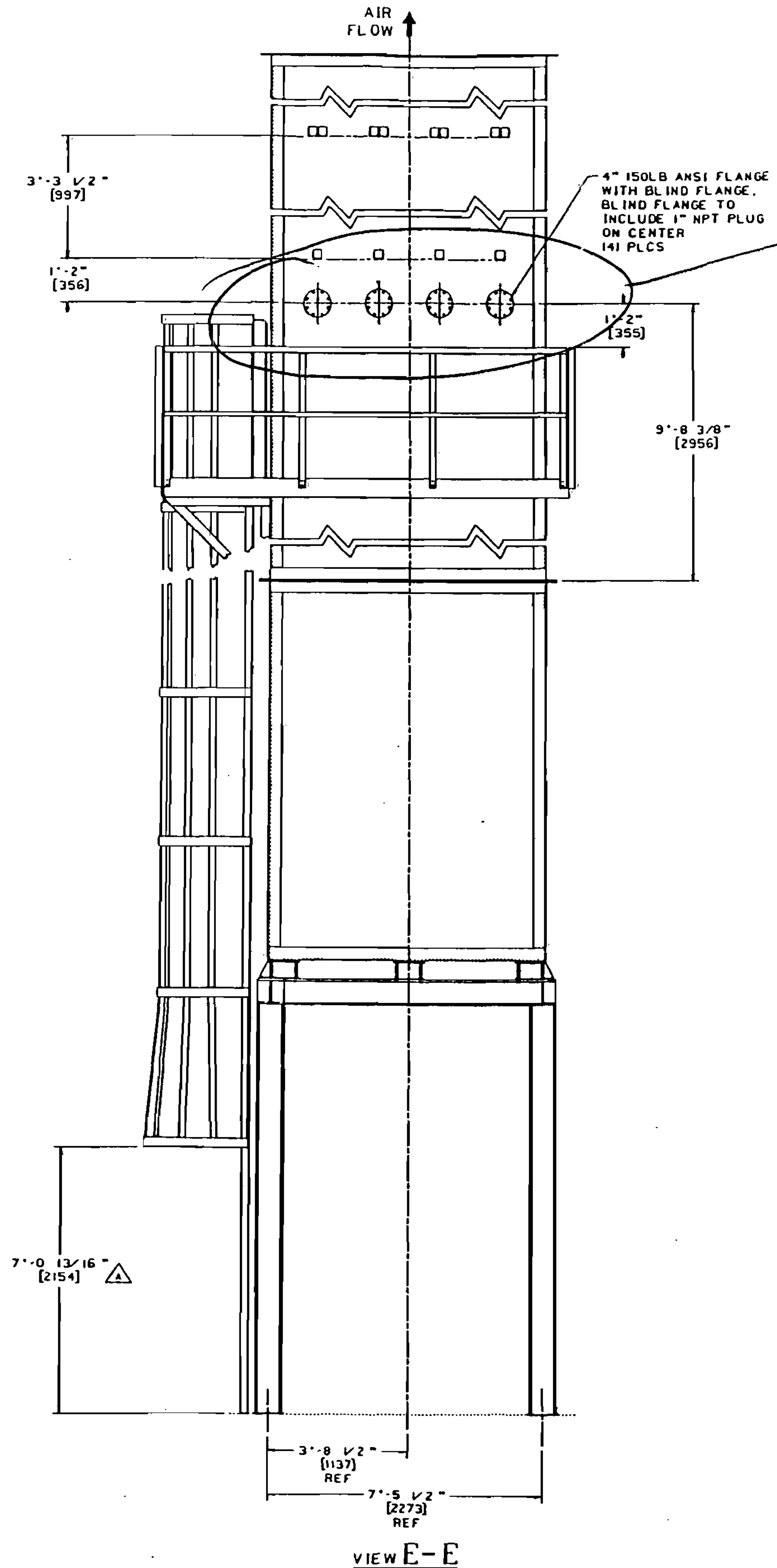
ATTACHMENT 5

Sampling Facility Drawings



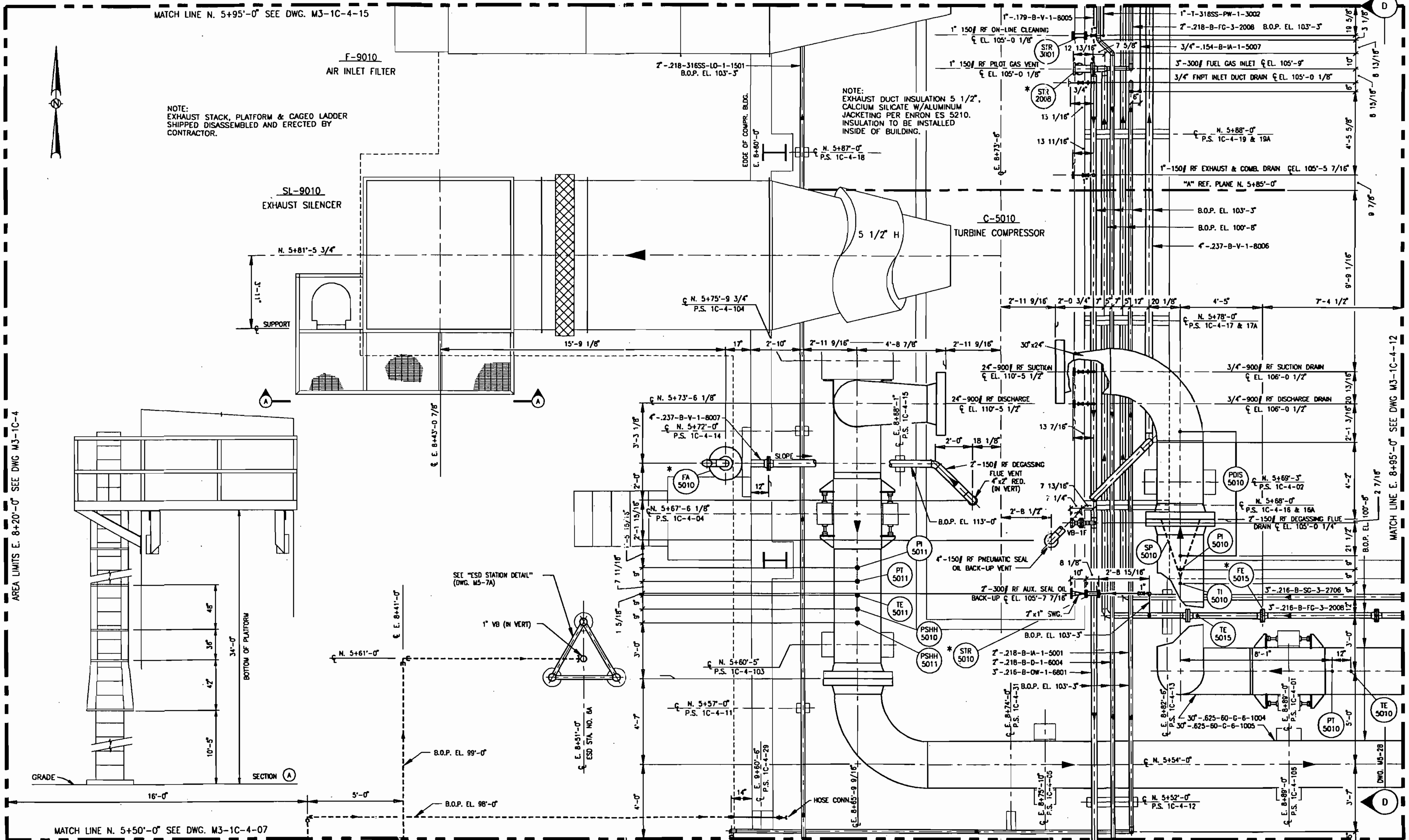
ELEVATION VIEW

Solar Turbines
A Caterpillar Company
47051-AN-0002
REV A
SHEET 2



6 ports evenly spaced
MWP
2/28/95

Solar Turbines
A Caterpillar Company
DRAWING NO. 47051-AN-0002
REV A



EL. 100'-0" = EL. 50'-0" MEAN SEA LEVEL

* INDICATES ITEMS FURNISHED W/ COMPR. PACKAGE

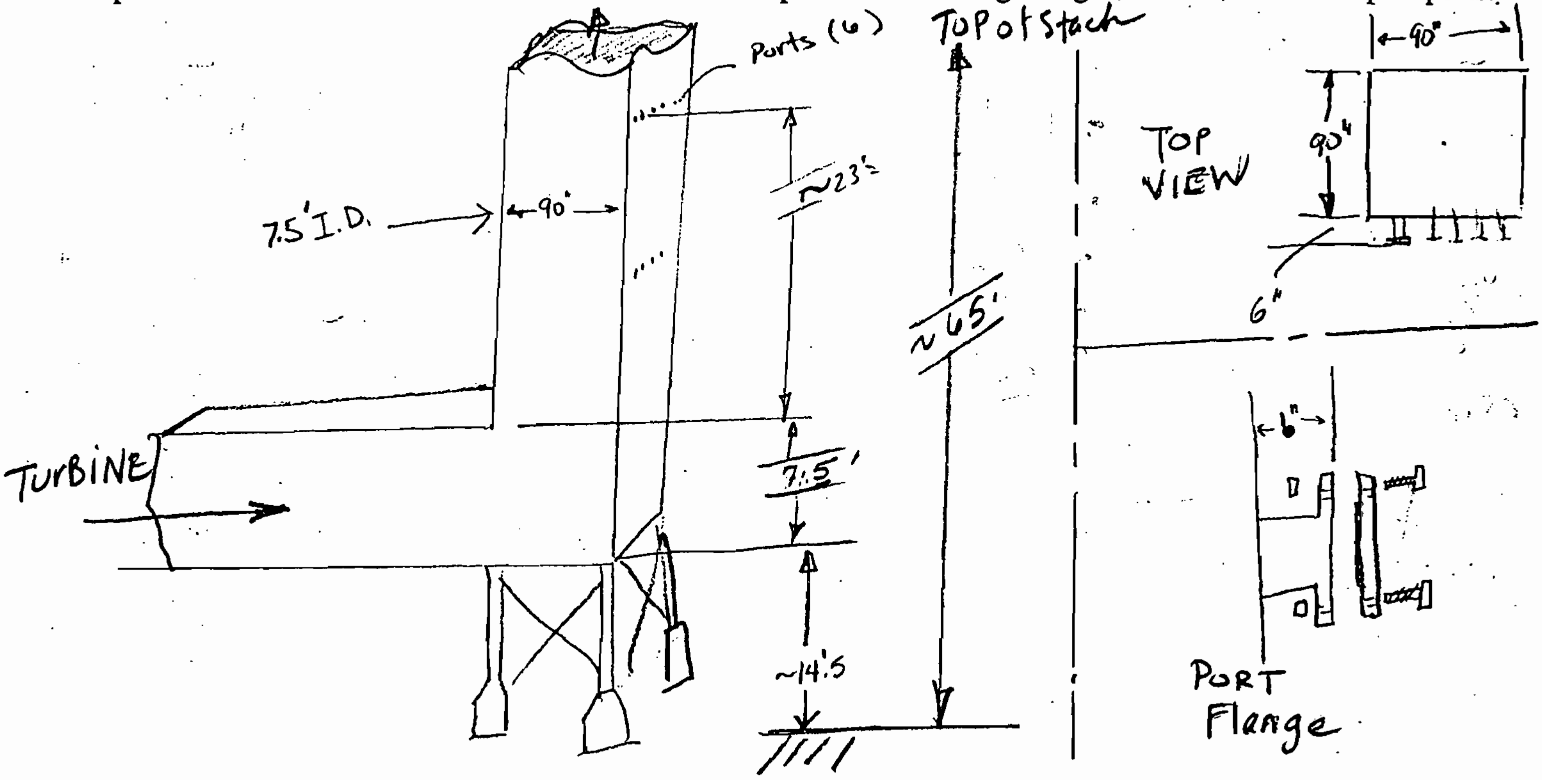
AEI ARMELLINI ENGINEERING, INC TULSA OKLAHOMA						DWG. STATUS	CHECKED BY	DATE	APPROVED BY	DATE	BY	DATE	WORK ORDER NUMBER S2213C	Florida Gas Transmission Company Houston, Texas	ENRON OPERATIONS CORP.
							KS	4/30/93	PA	4/30/93			P.L. OR STA. ACCOUNT NUMBER		
							KS	6/25/93	PA	6/25/93					
						PREL'Y							1994 CONSTRUCTION	COMPRESSOR STATION NO. 15A PIPING PLAN COMPRESSOR AREA TAYLOR COUNTY, FLORIDA	
						BID	KS	8/15/93	PA	8/15/93			DESIGN		
							KS	9/7/93	PA	9/7/93			DRAWN DAVID 4/22/93		
	1	ISSUED FOR CONSTRUCTION	NN	11/01/93	KS FWD	CONSTR.							AS BUILT		
	0	ISSUED FOR BID	SKNY	9/7/93	KS PA								MICROFILM		
JOB NUMBER 1092-918	NO.	REVISION - DESCRIPTION	BY	DATE	CHK'D APP'D	CADDS	PLOT DATE: AUG 27, 1993 TIME: 10:12 AM DWG. 1C411-15						SCALE 3/8"=1'-0"		DRAWING NUMBER M3-1C-4-11

Rectangular Stack Sampling Traverse Point Layout
(EPA Method 2A) O_2 TRAVERSE

Date: 2-10-95
Plant: STATION 15
Source: 1507
Technician(s) CC/JC/LB
Stack Length (L) 90 in.
Stack Width (W) 90 in.

Port + Stack ID: 96 in.
Port Extension (Ref. Pt.) 6 in.
Stack ID: 90 in.
Stack Area 56.25 ft^2
Total Req'd Trav. Pts (P). 36
No. of Traverse Pts. 6 /dimen.
No. of Traverse Pts. 6 /port

Stack Diagram (Side View showing major unit components, dimensions and nearest upstream & downstream flow disturbances. Top view showing length, width, and sample ports.)



Calculate the Equivalent Diameter of Rectangular Stack

$$De = \frac{2 \times L \times W}{(L + W)} \quad \underline{90} \text{ in.} = \frac{2 \times (90 \text{ in}) \times (90 \text{ in})}{((90 \text{ in}) + (90 \text{ in}))} \qquad \frac{16,200}{180}$$

Calculate Distance from Stack Wall to Traverse Points
(Example for Point No. 2)

Distance = L x 1.5 / Points Traverse   22.5 in. = (90 in) x 1.5 / 6

Point No.	Length Factor	Distance from Ref. Point (inches)	
1	0.5	7.5 + 6"	~~45" + port~~
2	1.5	22.5 + 6"	~~67.5" + port~~
3	2.5	37.5 + 6"	~~75" + port~~
4	3.5	52.5 + 6"	
5	4.5	67.5 + 6"	
6	5.5	82.5 + 6"	
7	6.5		
8	7.5		

CC

BEST AVAILABLE COPY

→ P 5/4

Check Sheet

Company Name: Fl. Gas Transmission
Permit Number: AC 62-229319
PSD Number:
County: PSD - 202
Permit Engineer:
Others involved:

Application:
- [x] Initial Application
- [ ] Incompleteness Letters
- [ ] Responses
- [ ] Final Application (if applicable)
- [ ] Waiver of Department Action
- [ ] Department Response
- [ ] Other

Intent:
- [x] Intent to Issue
- [x] Notice to Public
- [x] Technical Evaluation
- [x] BACT Determination
- [x] Unsigned Permit
- [ ] Correspondence with:
  - [x] EPA
  - [ ] Park Services
  - [ ] County
  - [ ] Other
- [x] Proof of Publication
- [ ] Petitions - (Related to extensions, hearings, etc.)
- [ ] Other

Final Determination:
- [x] Final Determination
- [x] Signed Permit
- [x] BACT Determination
- [ ] Other

Post Permit Correspondence:
- [x] Extensions
- [x] Amendments/Modifications
- [ ] Response from EPA
- [ ] Response from County
- [ ] Response from Park Services
- [ ] Other

In the folder labeled as follows there are documents, listed below, which were not reproduced in this electronic file. That folder can be found in the supplementary documents file drawer. Folders in that drawer are arranged alphabetically, then by permit number.

Folder Name: Florida Gas Transmission Company

Permit(s) Numbered:

AC 56 -229319

Documents: Period during which document was received	Detailed Description
Application 23 November 1993	1. 22" × 32" B&W Drawing: Map Pocket for Plot Plan COMPRESSOR STATION NO. 15 PLOT PLAN (Drawing Number: SO-1)
Post Permit 7 April 1993	2. 22" × 32" B&W Drawing: Attachment B, Revised Plot Plan COMPRESSOR STATION NO. 15A AIR PERMIT SITE PLAN (Drawing Number: SO-1AP)

File
sent 10/9/95 KKW

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

October 9, 1995

Mr. V. Duane Pierce, Ph.D.
Florida Gas Transmission Company
Post Office Box 1188
Houston, Texas 77251-1188

Re: Status of Construction Permits Numbered AC62-229319, AC05-229322, AC56-230129

Dear Mr. Pierce:

In response to your letter dated September 1, 1995 enclosed are the current rules regarding Operation Permits for Major Sources of Air Pollution. Rule 62-213.420 (1) (b) 2. and 62-213.420 (1) (b) 3. should answer your question. Also enclosed is a recent Guidance Memo about Extension of the Expiration Date of Construction Permits that may clarify the enclosed rules.

In summary, if a timely and complete application for a Title V Operation permit is submitted by the applicable due date, then you may continue to operate the source under any existing valid permit or Florida Electrical Power Plant Siting Certification until action has been taken by the permitting authority on the Title V operation permit application.

It is important to note that the proposed rule change automatically extending valid construction permits has not yet been finalized. If you have any further questions regarding this matter, please call me at (904)488-1344.

Sincerely,

A. A. Linero 10/9

A. A. Linero, P.E. Administrator,
New Source Review Section

AAL/kw

cc: T. Heron, DEP

Florida Gas Transmission Company

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

RECEIVED
SEP 13 1995
Bureau of Air Regulation

September 1, 1995

Mr. C. H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Air Permit No. AC 62-229319/PSD-FL-202
FGT Compressor Station No. 15, Taylor County

Air Permit No. AC 05-229322
FGT Compressor Station No. 19, Brevard County

Air Permit No. AC 56-230129/PSD-FL-203
FGT Compressor Station No. 20, St. Lucie County

Dear Mr. Fancy:

Subject: Expiration of Construction Permits

Florida Gas Transmission Company (FGT) respectfully requests clarification of the future status of the construction permits referenced above.

These permits were recently extended so that they expire after September 1, 1995. Changes are being made to F.A.C. 62-213.420(1)(a)4 that will extend the expiration date of these permits until September 1, 1996.

We have been informed by one of the District Offices that permit issuance for the Title V permits may take the full three years allowed. Please advise us as to what the status will be or what procedures need to be followed for construction permits that expire on September 1, 1996, but have not received a Title V Operating Permit by that date.

Your consideration and response to this question is greatly appreciated. If you need any clarification or require further information, please call me at (713) 373-5365 or Mr. Allan Weatherford at (407) 875-5816.

Sincerely,

V. Duane Pierce

V. Duane Pierce, Ph.D.

cc: Allan Weatherford - FGT

FILE: fdepvext.doc

Florida Gas Transmission Company

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

RECEIVED
OCT 27 1994
Bureau of
Air Regulation

October 24, 1994

Mr. C. H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Turbine Model Name Change
Permit No. AC 62-229319/PSD-FL-202
Florida Gas Transmission Company, Compressor Station No. 15, Taylor County
Permit No. AC 50-229440
Florida Gas Transmission Company, Compressor Station No. 21, Palm Beach County
Permit No. AC 09-229441
Florida Gas Transmission Company, Compressor Station No. 26, Citrus County

Dear Mr. Fancy:

The model names of the turbines installed under the above referenced permits have been changed.

Solar Turbines, Inc., has changed the name of its model "Centaur-Taurus T-6502" to "Taurus 60." The old name was used in the permit applications; however, the turbines installed at Compressor Stations 21 and 26 (Permit Nos. AC 50-229440 and AC 09-229441) have the new model name.

Solar Turbines, Inc., has also changed the name of its model "Mars T-12000" to "Mars 90." The old name was used in the permit application; however, the turbines installed at Compressor Station 15 (Permit No. AC 62-229319/PSD-FL-202) have the new model name.

These are model name changes only. There has been no changes in the designs of these turbines.

If you have any questions or need further information, please call me at (713) 646-7323 or Mr. Allan Weatherford at (407) 875-5816.

Sincerely,

V. Duane Pierce

V. Duane Pierce, Ph.D.
Air Quality Supervisor

cc: Jim Pennington, Bureau of Air Regulation, Florida Department of Environmental Protection, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400

Chris Kirts, Section Chief, Florida Department of Environmental Protection, Northeast District, 7825 Baymeadows Way, Suite 200B, Jacksonville, Florida 32256-7590

Jeff Koerner, Air Pollution Control Section, Palm Beach County Public Health Unit, P.O. Box 29, West Palm Beach, Florida 33402-0029

B. Thomas, Florida Department of Environmental Protection, Southwest District, 4520 Oak Fair Boulevard, Tampa, Florida 33610-7347

Carlon Nelson - Phase III
Bill Osborne - Phase III
Allan Weatherford - FGT
Phase III Files

FILE: FLNAME.ltr

Clair ~~Patty~~ Kanani[illegible] 11/28

You asked if we needed to amend the permits - I checked with Teresa & we both agree that in the past we have copied the district & filed these - Do you see any reason to do it any differently? NO

Patty

PALLY

Florida Gas Transmission Company

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

RECEIVED
OCT 26 1994
Bureau of Air Regulation

October 24, 1994

Mr. C. H. Fancy, P.E.
Chief
Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Notification of Initial Startup
Permit No. AC 62-229319/PSD-FL-202
Florida Gas Transmission Company, Compressor Station No. 15, Taylor County
Permit No. AC 50-229440
Florida Gas Transmission Company, Compressor Station No. 21, Palm Beach County
Permit No. AC 09-229441
Florida Gas Transmission Company, Compressor Station No. 26, Citrus County
Permit No. AC 29-228821
Florida Gas Transmission Company, Compressor Station No. 30, Hillsborough County

Dear Mr. Fancy:

As required by 40 CFR 60.7(a)(3), Florida Gas Transmission Company hereby makes notification of the initial startup of the new turbines at Compressor Stations Nos. 15, 21, 26 and 30 as authorized under the FDEP Permits referenced above.

Startup of the turbines at these sites was initiated on October 14, 1994.

If you have any questions or need further information, please call me at (713) 646-7323 or Mr. Allan Weatherford at (407) 875-5816.

Sincerely,

V. Duane Pierce

V. Duane Pierce, Ph.D.
Air Quality Supervisor

An **ENRON/SONAT** Affiliate

cc: Jim Pennington, Bureau of Air Regulation, Florida Department of Environmental Protection, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400

Chris Kirts, Section Chief, Florida Department of Environmental Protection, Northeast District, 7825 Baymeadows Way, Suite 200B, Jacksonville, Florida 32256-7590

Jeff Koerner, Air Pollution Control Section, Palm Beach County Public Health Unit, P.O. Box 29, West Palm Beach, Florida 33402-0029

B. Thomas, Florida Department of Environmental Protection, Southwest District, 4520 Oak Fair Boulevard, Tampa, Florida 33610-7347

Sterlin Woodard, Section Chief, Environmental Protection Commission of Hillsborough County, 1410 N. 21st Street, Tampa, Florida 33605

ORIGINAL FILED IN AC ~~29~~ 62-228821

KKW

Florida Gas Transmission Company

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

RECEIVED

JUN 15 1994

Bureau of
Air Regulation

June 13, 1994

Mr. C. H. Fancy, P.E.
Chief
Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Permit No. AC 62-229319/PSD-FL-202
Florida Gas Transmission Company, Compressor Station No. 15, Taylor County
Notification of Commencement of Construction

Dear Mr. Fancy:

As required by 40 CFR 60, Florida Gas Transmission Company hereby makes notification of the anticipated startup of the new turbine at Compressor Station No. 15 as authorized under FDEP Permit No. AC 62-229319/PSD-FL-202. The startup of this turbine is now anticipated for July 14, 1994.

Notification will be made of actual startup as required.

If you have any questions or need further information, please call me at (713) 646-7323 or Mr. Bill Osborne at (713) 853-3294.

Sincerely,

V. Duane Pierce

V. Duane Pierce, Ph.D.
Air Quality Supervisor

cc: Jim Pennington, Bureau of Air Regulation, Florida Department of Environmental Protection, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400

Chris Kirts, Section Chief, Florida Department of Environmental Protection, Northeast District, 7825 Baymeadows Way, Suite 200B, Jacksonville, Florida 32256-7590

3/25 John Brown

Patty Copy and file GRC

Florida Gas Transmission Company

PL Place in files please

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

RECEIVED

MAR 25 1994

Bureau of
Air Regulation

March 21, 1994

Mr. C. H. Fancy, P.E.
Chief
Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Permit No. AC 62-229319/PSD-FL-202
Florida Gas Transmission Company, Compressor Station No. 15, Taylor County
Notification of Commencement of Construction

Dear Mr. Fancy:

As required by 40 CFR 60.7(a)(1), Florida Gas Transmission Company hereby makes notification of the commencement of construction for the new turbine at Compressor Station No. 15 as authorized under FDEP Permit No. AC 62-229319/PSD-FL-202. Construction began on February 28, 1994.

If you have any questions or need further information, please call me at (713) 646-7323 or Mr. Bill Osborne at (713) 853-3294.

Sincerely,

V Duane Pierce

V. Duane Pierce, Ph.D.
Air Quality Supervisor

CC: Jim Pennington, Bureau of Air Regulation, Florida Department of Environmental Protection, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400

Chris Kirts, Florida Department of Environmental Protection, Northeast District, 7825 Baymeadows Way, Suite 200B, Jacksonville, Florida 32256-7577

Florida Department of
Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

December 16, 1993

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Duane Pierce, Ph.D.
Air Quality Supervisor
Phase III Expansion Project
Florida Gas Transmission Company
P.O. Box 1188
Houston, Texas 77251-1188

Dear Mr. Pierce:

RE: Request for Permit Amendments
AC 09-229441 Natural Gas Compressor Station No. 26, Citrus County
AC 50-229440 Natural Gas Compressor Station No. 21, Palm Beach County
AC 62-229319/PSD-FL-202 Compressor Station No. 15, Taylor County
AC 56-230129/PSD-FL-203 Compressor Station No. 20, St. Lucie County

The Department has reviewed your November 24, 1993, letter requesting some minor changes from the design submitted in the original application. As stated in your letter, these proposed changes do not involve increases of any air emissions from the turbines covered by these permits. Air dispersion modeling of NO_x emissions has been performed using the U.S. EPA's ISCLT2 model to evaluate the relative effect on air quality impacts of these proposed changes. No adverse air quality impacts will occur with these. The Department has evaluated these requests and has agreed to the changes as proposed.

Attachment to be Incorporated:

Mr. Duane Pierce's letter dated November 23, 1993.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the applicant of the amendment request/application and the parties listed below must be filed within 14 days of receipt of this amendment. Petitions filed by other persons must be filed within 14 days of the amendment issuance or within 14 days of their receipt of this amendment, whichever occurs first. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

(a) The name, address and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;
(d) A statement of the material facts disputed by Petitioner, if any;
(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action;
(g) A statement of the relief sought by petitioner, stating precisely the action the petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this amendment. Persons whose substantial interests will be affected by any decision of the Department with regard to the request/application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this amendment in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

This letter amendment must be attached to construction Permit No. AC 09-229441 and AC 50-229440 and shall become a part of each permit.

Sincerely,

Howard L Rhodes

Howard L. Rhodes
Director
Division of Air Resources
Management

HLR/TH/bjb

<u>Attachment to be Incorporated</u>:

Mr. Duane Pierce's letter of November 23, 1993.

cc: Isidore Goldman - SED
Bill Thomas - SWD

<u>CERTIFICATE OF SERVICE</u>

The undersigned duly designated deputy clerk hereby certifies that this AMENDMENT and all copies were mailed by certified mail before the close of business on 12/22/93 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Barbara J. Boutwell 12/22/93
Clerk Date

Memorandum

Florida Department of
Environmental Protection

TO: Howard L. Rhodes

FROM: Clair Fancy

DATE: December 16, 1993

SUBJ: Request for Permit Amendments
AC 09-229441 Natural Gas Compressor Station No. 26, Citrus County
AC 50-229440 Natural Gas Compressor Station No. 21, Palm Beach County
AC 62-229319/PSD-FL-202 Compressor Station No. 15, Taylor County
AC 56-230129/PSD-FL-203 Compressor Station No. 20, St. Lucie County

Attached for your approval and signature is an amendment to the above construction permits prepared by the Bureau of Air Regulation for the above referenced company. The purpose of the amendment is to allow Florida Gas Transmission Company to modify some of the application's original designs. These changes will not change any permitted emissions or violate any air quality standards.

I recommend your approval and signature.

CF/TH/bjb

Attachment

Florida Gas Transmission Company

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

RECEIVED
NOV 22 1993
Division of Air Resources Management

November 18, 1993

Mr. Clair Fancy, Chief
Bureau of Air Regulation
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Air Permit AC 62-229319 / PSD-FL-202
Natural Gas Compressor Station No. 15, Taylor County

Dear Mr. Fancy:

As discussed in a telephone conversation with Ms. Teresa Heron of your staff on November 17, Florida Gas Transmission Company's (FGT) Phase III Expansion Engineering Group has refined the design of the Phase III expansion for Compressor Station No. 15 and FGT proposes to make some desirable minor changes from the original design submitted in the original air permit application. FGT understands that these changes are minor and of an administrative nature and that they do not require public notice or a lengthy review period.

<u>It is extremely important to FGT that the start of construction not be delayed</u>. If the FDEP should decide that either a public notice or lengthy review is required for these proposed changes, then FGT will not make them.

These proposed changes do <u>not</u> involve increases in any air emissions or air quality impacts from the turbine covered by this permit. Additionally, air dispersion modeling of NO_x emissions has been performed using the U.S. EPA's ISCLT2 model to evaluate the relative effect on air quality impacts of these proposed changes. The modeling demonstrates that these proposed changes will result in an improvement in the already minimal air quality impacts of this project.

CHANGES

The proposed changes are described below.

1. The new Compressor Building will have an increased height and length. The original and new dimensions are given in the table below.

New Compressor Building Dimension Changes

BUILDING DIMENSION	ORIGINAL	NEW
HEIGHT	32' (9.75 m)	35.375' (10.78 m)
LENGTH	70' (21.33 m)	82' (24.99 m)
WIDTH	40' (12.19 m)	NO CHANGE

2. Since the increased Compressor Building dimensions could potentially change air quality impacts, we are also increasing the height of the new turbine stack from 55 feet (16.76 m) to 60 feet (18.29 m).

3. The storage requirements for used lube oil and oily water have increased. This requires the addition of two new small tanks that will be used to store the used lube oil and oily water. Emissions of VOCs were calculated using USEPA's AP-42 equations. Calculation data sheets are provided in Attachment A. The tank parameters are summarized below.

New Tank Parameters

PARAMETER	TANK #2	TANK #3
Content	used lube oil	oily water
Vapor Pressure (psia)	0.0019	0.0019
Molecular Weight	190	190
Volume (gal)	1300	300
Height (ft)	2.5	2.5
Dimensions (ft)	4 x 17.5	4 x 4
Effective Diameter (ft)	9.4	4.5
Throughput (gal/yr)	1350	3600
Max. Fill Rate (gal/hr)	1800	600
Short-term Maximum VOC Emission Rate (lb/hr)	0.01	0.01
Annual VOC Emission Rate (TPY)	0.00	0.00

4. Minor changes have been made to the original plot plan. A new one is provided in Attachment B.

DISPERSION MODELING

Air dispersion modeling was performed using ISCLT2 to compare the relative effects on air quality impacts of these changes. The same meteorology used in the original application (Tallahassee, upper and surface data, 1982-1986) was used for this dispersion modeling. The model input files used in the original application were modified to reflect the proposed changes as follows:

1) Downwash parameters were changed to reflect the new building and stack dimensions and the new configuration shown in the plot plan. The same input file and downwash program (Bowman Engineering's GEP Program) that were used in the original application were used to generate downwash parameters for the modeling of these proposed changes.

2) Stack coordinates and stack height were changed to reflect the new height and location.

3) The receptor grids were revised to meet the limitations of the ISCLT2 version used. This version limits the number of receptors to 500. Since the original modeling used receptor grids larger than 500, the grid sizes had to be reduced. The reduced grids were located so that they included the receptors with the highest impacts in the original application modeling.

The maximum concentration resulting from the ISCLT2 modeling decreased from 0.0765 ug/m^3 with our permitted stack and building heights to 0.0740 ug/m^3 with the new values. As stated above, this indicates that the proposed changes should result in even lower ambient air quality impacts than the already predicted low impacts. The output from the modeling runs and the downwash program and a computer disk with both input and output files have been sent to Mr. Cleveland Holladay of the FDEP under separate cover.

NO_x Air Dispersion Modeling Results

PARAMETERS	MAXIMUM OFFSITE CONCENTRATION (ug/m^3)	YEAR	RECEPTOR LOCATION	
			East meters	North meters
Original	0.0765	1986	0	-2500
Proposed	0.0740	1986	0	-2500

In summary, the changes in the compressor engine stack parameters and Compressor Building dimensions should result in improved air quality impacts compared to what was proposed in FGT's original application.

Again, FGT would like to restate that it is extremely important that these proposed changes do not delay start of construction for this project and that FGT will not make these changes if that is the case.

Should you have any questions concerning these changes or need additional information, please do not hesitate to call me at (713) 853-3569.

Sincerely,

V Duane Pierce

V. Duane Pierce, Ph.D.
Air Quality Supervisor
Phase III Expansion Project
Florida Gas Transmission Company

cc: Carlon Nelson
William Osborne
Allan Weatherford
Files

FILE: 15FDER04.LTR

ATTACHMENT A

TANK EMISSION CALCULATIONS
SUMMARY TABLES

FIXED ROOF TANK CALCULATIONS
AP-42 – Fourth Edition – 1990

Symbol	Description	Units	Value	References
	Tank Identification	C. S. 15 - Tank 6		
	Contents	Oily Water		
Mv	Vapor Molecular Weight	(lb/lb mol)	190	(See AP-42, Table 4.3-2)
	Liquid Temp.	degrees F		
	Max		91.4	
	Avg		57.0	
	Constants for Calc of True Vapor Press			
	A			(See EPA, 1990)
	B			(See EPA, 1990)
	C			(See EPA, 1990)
P	True Vapor Pressure	(psia)		
	@ Max Temp		0.0019	(See Note)
	@ Avg Temp		0.0019	
Wl	Density	(lb/gal)		(See EPA, 1990)
	Tank Height	(feet)	2.5	
D	Tank Diameter	(feet)	4.5	
V	Tank Volume	(gallons)	300	
	Tank Throughput	(gal/yr)	3,600	
Kc	Product Factor		1	
FRm	Maximum Fill Rate	(gal/hr)	600	
Pa	Avg. Atm. Pressure	(psia)	14.7	
T	Avg. Diurnal Delta T	degrees F	21	
H	Avg. Vapor Space Ht.	(feet)	2	(1/2 Tank Hgt. if Unknown)
Fp	Paint Factor		1.4	(See AP-42, Table 4.3-1)
C	Adj. for Small Tanks		0.16	(See AP-42, Fig. 4.3-4)
N	Turnovers	#/yr	12.00	(Annual throughput/V)
Kn	Turnover Factor		1	(See AP-42, Fig. 4.3-7)

Equations:

Lb	Breathing Loss	(lb/yr)	0.0226*Mv*(P/(14.7-P))^0.68*D^1.73*H^0.51* T^0.5*Fp*C*Kc
Lw	Working Loss	(lb/yr)	2.4*10^-5*Mv*P*V*N*Kn*Kc
	Annual Loss	(tons/yr)	(Lb+Lw)/2000
	Max. Short-term Loss	(lb/hr)	(Lw, lb/yr * FRm)/(N * V) (TACB, 1992)

		@Max Temp	@Avg Temp
Breathing Loss (Lb)	(lb/yr)	0.19	0.19
Working Loss (Lw)	(lb/yr)	0.06	0.06
Max. Short-term Loss	(lb/hr)	0.01	0.01
Annual Loss	(tons/year)	0.00	0.00

Note: Vendor information indicates a vapor pressure of <0.1 mm Hg.

FIXED ROOF TANK CALCULATIONS
AP-42 - Fourth Edition - 1990

Symbol	Description	Units	Value	References
	Tank Identification	C. S. 15 - Tank 5		
	Contents	Used Lube Oil		
Mv	Vapor Molecular Weight	(lb/lb mol)	190	(See AP-42, Table 4.3-2)
	Liquid Temp.	degrees F		
	Max		91.4	
	Avg		57.0	
	Constants for Calc of True Vapor Press			
	A			(See EPA, 1990)
	B			(See EPA, 1990)
	C			(See EPA, 1990)
P	True Vapor Pressure	(psia)		
	@ Max Temp		0.0019	(See Note)
	@ Avg Temp		0.0019	
Wl	Density	(lb/gal)		(See EPA, 1990)
	Tank Height	(feet)	2.5	
D	Tank Diameter	(feet)	9.4	
V	Tank Volume	(gallons)	1300	
	Tank Throughput	(gal/yr)	1350	
Kc	Product Factor		1	
FRm	Maximum Fill Rate	(gal/hr)	1,800	
Pa	Avg. Atm. Pressure	(psia)	14.7	
T	Avg. Diurnal Delta T	degrees F	21	
H	Avg. Vapor Space Ht.	(feet)	4	(1/2 Tank Hgt. if Unknown)
Fp	Paint Factor		1.4	(See AP-42, Table 4.3-1)
C	Adj. for Small Tanks		0.5	(See AP-42, Fig. 4.3-4)
N	Turnovers	#/yr	1.04	(Annual throughput/V)
Kn	Turnover Factor		1	(See AP-42, Fig. 4.3-7)

Equations:

Lb	Breathing Loss	(lb/yr)	0.0226*Mv*(P/(14.7-P))^0.68*D^1.73*H^0.51* T^0.5*Fp*C*Kc
Lw	Working Loss	(lb/yr)	2.4*10^-5*Mv*P*V*N*Kn*Kc
	Annual Loss	(tons/yr)	(Lb+Lw)/2000
	Max. Short-term Loss	(lb/hr)	(Lw, lb/yr * FRm)/(N * V) (TACB, 1992)

		@Max Temp	@Avg Temp
Breathing Loss (Lb)	(lb/yr)	3.06	3.06
Working Loss (Lw)	(lb/yr)	0.01	0.01
Max. Short-term Loss	(lb/hr)	0.01	0.01
Annual Loss	(tons/year)	0.00	0.00

Note: Vendor information indicates a vapor pressure of <0.1 mm Hg.

ATTACHMENT B

REVISED PLOT PLAN

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

OCT 8 1993

4APT-AEB

DEPARTMENT OF ENVIRONMENTAL PROTECTION

OCT 15 1993

OFFICE OF THE SECRETARY

Mr. Clair H. Fancy, P.E., Chief
Air Resources Management Division
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Florida Gas Transmission Company, Compressor Station Number 15, Taylor County (PSD-FL-202)

Dear Mr. Fancy:

This is to acknowledge receipt of the final determination and Prevention of Significant Deterioration (PSD) permit for the above referenced facility. The proposed expansion to the existing Florida Gas Transmission facility will be the addition of one Solar Mars Model T-12000 natural gas fired turbine engine, equipped with dry low-NO_x combustion technology. The proposed turbine is rated at 12,600 brake horsepower and will be used to drive gas compressors as part of a new natural gas transmission line. The proposed modification is subject to PSD review on the basis of significant NO_x emissions.

Your determination proposes to limit NO_x emissions from the turbine through dry low-NO_x combustion technology.

We have reviewed the package as submitted and have no adverse comments. Thank you for the opportunity to review and comment on the package. If you have any questions or comments, please contact Mr. Scott Davis of my staff at (404) 347-5014.

Sincerely yours,

Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides, and Toxics
Management Division

cc: J. Heron
K. Zhang
J. Cole, NE Dist.
J. Bunyak, NPS
B. Andrews, ENSR
CHF/JB/GPL

10-14-93

Florida Gas Transmission Company

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

July 30, 1993

RECEIVED

AUG 2 1993

Division of Air Resources Management

Mr. Clair Fancy, P.E.
Chief, Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Mr. Fancy:

Upon reviewing the Technical Evaluations and Preliminary Determinations for the proposed natural gas compressor engines located in Palm Beach County (Station No. 21) and Citrus County (Station No. 26), it was discovered that our draft permits contained the nominal lb/hr emission rates rather than the maximum emission rates which were presented in the Applications to Operate/Construct Air Pollution Sources. Further review indicates that this error also holds true for draft permits which have been received for proposed natural gas compressor engines located in Taylor County (Station No. 20).

Florida Gas Transmission Company (FGTC) requests that the permits be amended to include the maximum lb/hr emission levels for the natural gas compressor engines addressed above as follows:

	Pollutant (lb/hr)					
Station	No_x	CO	VOC	TSP	PM_{10}	SO_2
No. 15 - Taylor County (AC 62-229319)	18.66	13.49	0.76	0.53	0.53	3.01
No. 19 - Brevard County (AC 05-229322)	79.38	45.20	16.57	0.19	0.19	1.05
No. 20 - St. Lucie County (AC 56-230129)	52.92	26.46	12.35	0.15	0.15	0.84
No. 21 - Palm Beach County (AC 50-229440)	9.15	6.64	0.38	0.29	0.29	1.64
No. 26 -Citrus County (AC 09-229441)	9.15	6.64	0.38	0.29	0.29	1.64

These changes do not affect the TPY limits which are based on the nominal lb/hr emission rates. FGTC also discovered that for Station 21, the nominal lb/hr emission rates presented in Table 2-2 of our application were inadvertently transferred to the maximum lb/hr column on page 4A of the Application to Operate/Construct Air Pollution Sources. To resolve this error, FGTC has included a corrected page 4A and has had this transmittal letter signed and sealed by Barry Andrews (ENSR Consulting and Engineering) who is representing FGTC as the professional engineer of record. This procedure is consistent with instructions given by Mr. Preston Lewis of your bureau.

Please note that this letter is not intended to address all of FGTC's comments for Stations 20, 21 and 26. FGTC is presently reviewing the Technical Evaluations and Preliminary Determinations for each of these Stations and will be providing additional comments in the near future.

FGTC appreciates the opportunity to provide the Bureau of Air Regulation with these comments. Should you have any questions, please contact Duane Pierce at (713) 853-3569.

Sincerely,

V. Duane Pierce

V. Duane Pierce, Ph.D.
Air Quality Supervisor
Phase III Expansion Project
Florida Gas Transmission Company

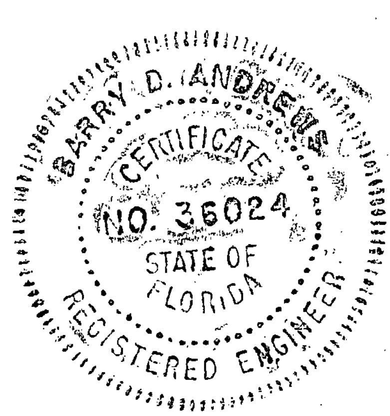
Barry D. Andrews

Barry Andrews, P.E.
ENSR Consulting and Engineering

Enclosures

cc: Carlon Nelson EB0463
William R. Osborne EB0365
Files

VDP:meb
pierce\corres\073093



SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants Type	Contaminants % Wt	Utilization Rate - lbs/hr	Relate to Flow Diagram

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): ______

2. Product Weight (lbs/hr): ______

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Emission Point 2101

Name of Contaminant	Emission[1] Maximum lbs/hr	Emission[1] Actual T/yr	Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission lbs/yr	Potential[4] Emission T/yr	Relate to Flow Diagram
NO_x	9.15	39.05			9.15	39.05	
CO	6.64	28.29			6.64	28.29	
NMHC	.38	1.62			.38	1.62	
SO_2	1.64	7.18			1.64	7.18	
PM	.29	1.26			.29	1.26	

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

Florida Gas Transmission Company
P. O. Box 945100 Maitland, Florida 32794-5100 (407) 875-5800

July 17, 1993

Certified Mail

Mr. Clair Fancy, P.E.
Chief, Bureau of Air Regulation
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florid 32399-2400

Dear Mr. Fancy:

**RE: Proof of Publication
Intent to Issue Permit
Florida Gas Transmission Company - Station 15
Taylor County, Perry, Florida**

An affidavit is attached as proof of public notice publication for the above-referenced permit.

Sincerely,

Allan Weatherford

Allan Weatherford, REM
Compliance Environmentalist

bc
aw0719cf
attach

cc: Raymond Young
Levon Carroll
Sonny Beets
Duane Pierce
J. Heron
K. Zhang
J. Cole, NE Dist
J. Harper, EPA
J. Bunyak, NPS
B Andrews, ENSR

BEST AVAILABLE COPY

RECEIVED JUL 19 1993

TALLAHASSEE DEMOCRAT
PUBLISHED DAILY
TALLAHASSEE - LEON - FLORIDA

STATE OF FLORIDA COUNTY OF LEON:
Before the undersigned authority personally appeared Phyllis Drapp who on oath says that she is Legal Advertising Representative of the Tallahassee Democrat, a daily newspaper published at Tallahassee in Leon County, Florida; that the attached copy of advertising being a Legal Ad in the matter of

THE STATE OF FLORIDA

in the Second Judicial Circuit Court was published in said newspaper in the issues of:

JULY 12, 1993

Affiant further says that the said Tallahassee Democrat is a newspaper published at Tallahassee, in the said Leon County, Florida, and that the said newspaper has heretofore been continuously published in said Leon County, Florida, each day and has been entered as second class mail matter at the post office in Tallahassee, in said Leon County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that she has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this publication in the said newspaper.

Phyllis Drapp

PHYLLIS DRAPP
LEGAL ADVERTISING REPRESENTATIVE

Sworn To And Subscribed Before Me

13 Day of July

A.D., 1993

(SEAL)

Lee Pierce
Notary Public
LEE PIERCE

Notary Public, State of Florida
My Commission Expires April 27, 1995
Bonded Thru Troy Fain - Insurance Inc.

NOTARY PUBLIC STATE OF FLORIDA

THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF INTENT TO ISSUE PERMIT

The Department of Environmental Regulation gives notice of its intent to issue a permit to Florida Gas Transmission Company, Post Office Box 1188, Houston, Texas 77251-1188, to install one natural gas fired turbine. The Company's facility is located 6 miles north of Perry on Pisgah Road in Perry, Taylor County, Florida. Modeling results show that increases in ground-level concentrations are less than Prevention of Significant Deterioration (PSD) significant impact levels for the appropriate pollutant (NOx). These emissions will not cause or contribute to a violation of any ambient air quality standard or PSD increment. A determination of Best Available Control Technology (BACT) was required. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, F.S.

The Petition shall contain the following information; (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed; (b) A statement of how and when each petitioner received notice of the Department's action or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by Petitioner, if any; (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action; (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed; and (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The amendment application is available for public inspection during business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Regulation
Bureau of Air Regulation Office
111 S. Magnolia Park Courtyard
Tallahassee, Florida

Department of Environmental Regulation
Northeast District Office
7825 Baymeadows Way-Suite 200B
Jacksonville, Florida 32256-7577

Any person may send written comments on the proposed action to Mr. Preston Lewis at the Department's Tallahassee address. All comments received within 30 days of the publication of this notice will be considered in the Department's final actions.

Further, a public hearing can be requested by any person(s). Such requests must be submitted within 30 days of this notice.

JULY 12, 1993 AD AD.79640020

AIR RES

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

4APT-AEB

JUL 14 1993

RECEIVED

JUL 20 1993

Division of Air Resources Management

RECEIVED

JUL 19 1993

DNR
Executive Director's Office

Mr. Clair H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Florida Gas Transmission Company, Compressor Station Number 15, Taylor County (PSD-FL-202)

Dear Mr. Fancy:

This is to acknowledge receipt of the preliminary determination and draft Prevention of Significant Deterioration (PSD) permit for the above referenced facility. The proposed expansion to the existing Florida Gas Transmission facility will be the addition of one Solar Mars Model T-12000 natural gas fired turbine engine, equipped with dry low-NO_x combustion technology. The proposed turbine is rated at 12,600 brake horsepower and will be used to drive gas compressors as part of a new natural gas transmission line. The proposed modification is subject to PSD review on the basis of significant NO_x emissions.

Your determination proposes to limit NO_x emissions from the turbine through dry low-NO_x combustion technology.

We have reviewed the package as submitted and have no adverse comments. Thank you for the opportunity to review and comment on the package. If you have any questions or comments, please contact Mr. Scott Davis of my staff at (404) 347-5014.

Sincerely yours,

Brian L. Beals, Chief
Source Evaluation Unit
Air Enforcement Branch
Air, Pesticides, and Toxics
Management Division

cc: D. Heron
K. Zhang
J. Cole, NED
J. Bunyak, NPS
B. Andrews, ENSR

Florida Gas Transmission Company

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

RECEIVED
JUL 19 1993
Division of Air
Resources Management

July 16, 1993

Ms. Teresa Heron
Air Permitting and Standards
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Draft Air Permit AC 62-229319 / PSD-FL-202
Natural Gas Compressor Station No. 15, Taylor County

Dear Ms. Heron:

We have one additional comment to make on the specific conditions proposed for our Compressor Station No. 15 located in Taylor County. We respectfully propose the following additional modification to the specific permit conditions.

SPECIFIC CONDITION:

5. The permitted operating parameters and utilization rates for this natural gas compressor engine shall not exceed the values stated in the application. The parameters include, but are not limited to:

   ~~- Maximum natural gas consumption shall not exceed 0.1054 MMCF/hr~~
   - Maximum heat input shall not exceed 109.66 MMBtu/hr

   OR

   - Maximum natural gas consumption shall not exceed 0.1054 MMSCF/hr (based on a fuel heating value of 1040 Btu/SCF)

Rationale: The maximum natural gas consumption value will vary depending on what is used as the heating value of the natural gas. The maximum natural gas consumption value in MMSCF/hr is calculated from the maximum heat input value in Btu/SCF. The value calculated for the maximum natural gas consumption is dependent on the number used for the actual heating value of the gas which can vary. In the application a value of 1040 Btu/SCF was used in this calculation; however, at any point in time the actual heating value of the natural gas may differ from 1040 Btu/SCF.

Since the maximum natural gas consumption is dependent on the maximum heat input, it is not necessary to specify the maximum natural gas consumption value in the permit condition. If the maximum natural gas consumption value is specified in the permit condition, then the basis for the value should be stated.

FGT appreciates this opportunity to comment on these permit conditions and your consideration of our proposed changes. If you have any questions or need additional information, please do not hesitate to call me at (713) 853-3569.

Sincerely,

V. Duane Pierce

V. Duane Pierce, Ph.D.
Air Quality Supervisor
Phase III Expansion Project
Florida Gas Transmission Company

cc: William Osborne - FGT
Carlon Nelson - FGT
File Phase III Air CS 15

FILE: 15FDER03.LTR

Florida Gas Transmission Company

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

RECEIVED

JUN 29 1993

Division of Air
Resources Management

June 25, 1993

Ms. Teresa Heron
Air Permitting and Standards
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Draft Air Permit AC 62-229319 / PSD-FL-202
Natural Gas Compressor Station No. 15, Taylor County

Dear Ms. Heron:

We have reviewed the draft permit provisions for the proposed new turbine at our Compressor Station No. 15. We respectfully propose the following modifications to these specific permit conditions.

1.(a) Initial NO_x emissions for natural gas firing shall not exceed 42 ppmv at 15% oxygen on a dry basis. The permittee shall achieve NO_x emissions of 25 ppmv at 15% oxygen on a dry basis at the time of the first major overhaul provided that the retrofit is cost effective. A major overhaul is defined as removing the turbine from the compressor station and transporting it to the manufacturer's facility for major component inspection and replacement. The retrofit will be considered cost effective only in the case that the cost per ton of providing additional (incremental) NO_x control does not exceed $4,000. The cost of such control will be defined as the capital cost plus the direct and indirect cost to install the replacement components. The cost benefit analysis will follow the standard methods as contained in the BACT cost effectiveness section of the New Source Review Workshop Manual (USEPA, October 1990) and the USEPA's OAQPS Cost Control Manual (USEPA 1990).
~~The permittee shall achieve NO_x emissions of 25 ppmv at 15% oxygen on a dry basis at the earliest achievable date, but no later than 1/1/98.~~

Rationale: Although 25 ppmv is expected to be achievable by 1/1/98, it is not known for certain that 25 ppmv will be achievable on these machines by that date. FGT cannot commit to installing a technology by a particular date when there is no guarantee that the technology will exist and when failure to install such technology would then result in a non-compliance situation for FGT. Also, a retrofit of the turbine, whenever the technology becomes available, would entail considerable costs for FGT and would have a significant impact on operations by decreasing the station's compression capability for a significant period of time. Finally, BACT is to be based upon current technology and economics and should not be based upon a potential future technology. The proposed change would not require the technology if it was not available and would provide for retrofitting at a planned maintenance time that would be cost efficient and would not create any additional impact on the facility's operations. The proposed alternative also allows for a cost benefit analysis and potential rejection of the retrofit if it is uneconomical which is consistent with BACT rules and procedures.

8. Compliance with the allowable emission limits shall be determined within 60 days after achieving the maximum production rate at which this facility will be operated, but not later than 180 days after initial start-up and annually thereafter, by the following reference methods as described in 40 CFR 60, Appendix A (July 1992 version) and adopted by reference in Chapter 17-297, F.A.C.

- Method 1.	Sample and Velocity Traverse
- Method 2.	Volumetric Flow Rate
- Method 3.	Gas Analysis
or Method 3a	
- Method 9.	Determination of the Opacity of the Emissions from Stationary Sources
- Method 10.	Determination of the Carbon Monoxide Emissions from Stationary Sources
- Method 20.	Determination of the Nitrogen Oxides, Sulfur Dioxide and diluent Emissions from Gas Turbines
- Method 25A	Determination of Total Gaseous Organic Concentrations Using a Flame Ionization Analyzer

Rationale: Method 3A is an acceptable method and provides better data at lower costs.

10. Initial compliance with the volatile organic compound (VOC) emissions limits will be demonstrated by EPA Method 25A to determine total hydrocarbons and Method 18 and gas chromatography to determine methane. VOC emissions will be total hydrocarbon emissions minus methane emissions. Thereafter, ~~Initial compliance with the volatile organic compound (VOC) emissions limits will be demonstrated by EPA Method 25, thereafter,~~ compliance with the VOC emission limits will be assumed, provided the CO allowable emission rate is achieved.

Rationale: EPA Method 25A is a better, appropriate and acceptable method to measure total hydrocarbons from this source and Method 18 with gas chromatography is also appropriate and acceptable for measuring methane. The difference between the two measurements would provide an accurate measurement of total non-methane VOCs.

11. During performance tests, to determine compliance with the NO_x standard, measured NO_x emissions at 15 percent oxygen will be adjusted to ISO ambient atmospheric conditions by the following correction factor:

$$NO_x = (NO_{x\ obs}) \quad (P_{ref}/P_{obs})^{0.5} \quad e^{19\ (Hobs\ -\ 0.00633)} \quad (288^{o}K/T_{AMB})^{1.53}$$

where:

NO_x = Emissions of NO_x at 15 percent oxygen and ISO standard ambient conditions.

$NO_{x\ obs}$ = Measured NO_x emission at 15 percent oxygen, ppmv.

P_{ref} = Reference ambient absolute pressure, 101.3 kilopascals (1 atmosphere) pressure.

P_{obs} = Measured ambient absolute pressure at test ambient pressure in kilopascals.

~~P_{ref} = Reference combustor inlet absolute pressure at 101.3 kilopascals (1 atmosphere) ambient pressure.~~

~~P_{obs} = Measured combustor inlet absolute pressure at test ambient pressure.~~

H_{obs} = Specific humidity of ambient air at test.

e = Transcendental constant (2.718).

T_{amb} = Temperature of ambient air at test.

Rationale: This equation was empirically developed by the USEPA based on turbine manufacturer data. The measurement uncertainty of NO_x emissions from gas turbines in field tests can be 20 percent and a typical ambient correction from test to ISO conditions is less than 20 percent. Use of the combustor inlet pressure is scientifically correct; however, in practice there is a high uncertainty in measuring this correctly. Measurement of the ambient absolute pressure is a more practical approach. Additionally, this eliminates the need to obtain the reference combustor inlet pressure from the manufacturer which can be difficult to do since manufacturers are generally reluctant to supply this value that they consider to be proprietary. This substitute had been accepted by the USEPA and California's South Coast Air Quality Management District has adopted it in their Rule 1134.

12. The test results will be the average of 3 valid runs. The northeast District office will be notified at least 30 days in writing in advance of the compliance test(s). The source shall operate between 95% and 100% of maximum capacity of the gas producer for the ambient conditions experienced during compliance test(s). ~~The source shall operate between 95% and 100% of maximum capacity for the ambient conditions experienced during compliance test(s). The turbine manufacturer's capacity vs temperature (ambient) curve shall be included with the compliance test.~~ Compliance test results shall be submitted to the northeast District office no later than 45 days after completion.

Rationale: The operation and load on the turbine is actually controlled and limited by the compressor unit; therefore, it is more appropriate to define maximum capacity in terms of the gas producer. The manufacturer's capacity vs. temperature (ambient) curve would normally be used to predict kilowatt production on larger turbines in electric power production and does not provide data relative to emission rates; therefore, it should not be required.

13. The permittee shall maintain records of turbine inlet and outlet temperatures, ambient temperature, RPM, fuel consumption, hours of operation and preventative maintenance activities.

~~The permittee shall install, calibrate, maintain, and operate a continuous emission monitor in the stack to measure and record the nitrogen oxides emissions from this source. The continuous emission monitor must comply with 40 CFR 60, Appendix B, Performance Specification 2 (July 1, 1992).~~

Rationale: The installation, calibration, maintenance and operation of a continuous emission monitor (CEM) to measure NO_x is not necessary to ensure that this source will operate within its permitted emission limits. Installation of a CEM would require excessive and unnecessary capital and operation and maintenance costs for FGT. Compliance with NO_x emission limits can be determined just as effectively through annual emissions testing in conjunction with monitoring of the turbine operating parameters that determine emissions. Additionally, we are unaware of any existing Solar Mars turbine being required to have a CEM.

FGT appreciates this opportunity to comment on these permit conditions and your consideration of our proposed changes. If you have any questions or need additional information, please do not hesitate to call me at (713) 853-3569.

Sincerely,

V. Duane Pierce

V. Duane Pierce, Ph.D.
Air Quality Supervisor
Phase III Expansion Project
Florida Gas Transmission Company

cc: William Osborne - FGT
Carlon Nelson - FGT
File Phase III Air CS 15
R. Zhang } 6/30/93
file }

FILE: PIERCE/CORRES/15FDER02.LTR

BEST AVAILABLE COPY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

RECEIVED

MAY 05 1997

APR 29 1997

To: all NSR Engineers
Note new ACE rule. Consider this when issuing permits. Whether CEMS is given as compliance method or not, we can use it.
Ce

ASSISTANT ADMINISTRATOR
FOR ENFORCEMENT AND
COMPLIANCE ASSURANCE

MEMORANDUM

SUBJECT: INTERIM POLICY AND GUIDANCE ON THE USE OF "CREDIBLE EVIDENCE" IN AIR ENFORCEMENT ACTIVITIES

FROM: STEVEN A. HERMAN
ASSISTANT ADMINISTRATOR

TO: Regional Administrator (EPA Regions I-X)
Regional Counsel (EPA Regions I-X)
Regional Enforcement Division Directors (EPA Regions I, VI and III)
Air Division Directors (EPA Regions I-X)

The Agency recently revised its regulations and reaffirmed its authority to use any credible evidence to enforce continuing compliance with applicable requirements under the Clean Air Act, as amended. 62 Fed. Reg. 8314 (February 24,1997) (commonly and hereinafter referred to as the "credible evidence rule"). For clarity of policy, consistency in application and guidance on the use of "credible evidence" in the Agency's clean air enforcement program[1], the following will serve as interim implementing measures:

- Withdrawal of Prior Agency Policy and Guidance - Previous policy guidance concerning the use of continuous emission monitoring (CEM) data indicated that this data would be used for direct enforcement of applicable emissions limitations only when specified as the compliance test method in Agency rules, state implementation plans (SIPs), source permits, orders or consent decrees. These policies, along with any other Agency-imposed restrictions on its longstanding statutory authority to use "credible evidence", were superseded by the 1990 amendments to the Clean Air Act. Since enactment of those

[1] In every enforcement action taken by the Agency we rely on credible evidence of the violation. As used in this Policy and Guidance, however, the term "credible evidence" refers specifically to the kinds of evidence discussed in the credible evidence rule (e.g., non-reference test method data and other information that are relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test procedures or methods had been performed). *See* 62 Fed. Reg. 8314 (Feb. 24, 1997).

amendments, there has been no limit on EPA's pre-existing statutory authority to use credible evidence to establish violations. With the credible evidence rule, however, the Agency has formally confirmed and acknowledged its authority, ability and intention to continue to rely upon any credible evidence, including CEM data (as appropriate), to establish a violation and seek appropriate relief. Accordingly, credible evidence can be used to establish any violation, regardless of whether the violation occurred before or after promulgation of that rule.

Certain Agency policy and other memoranda have in the past suggested a distinction between information sufficient to support issuing a notice of violation and information necessary to prove a violation or determine compliance. The 1990 amendments to the Clean Air Act and the credible evidence rule eliminated any perceived need or basis for recognizing such an artificial distinction. To avoid possible confusion in the future by those required to comply with emissions limitations and misapplication by those involved in enforcing such limitations, all such prior Agency policy and guidance are hereby expressly withdrawn to the extent they imply any limitation on the use of CEM data (or any other data generated/developed by methods not specified by regulation) in the Agency's enforcement activities[2]. Moreover and to the extent that prior statements of policy or position may be affected by or inconsistent with the credible evidence rule, the credible evidence rule and this policy/guidance control.

Interim Enforcement Response Policy - The credible evidence rule does not affect prior Agency guidance on the "Timely and Appropriate Enforcement Response to Significant Air Pollution Violators", issued by John S. Seitz, Director, Office of Air Quality Planning & Standards, and Robert Van Heuvelen, Director of Civil Enforcement, under memorandum dated February 7, 1992, as subsequently clarified and amended, or other

---

[2] The following guidance is expressly included in this withdrawal:

Memorandum, Guidance Concerning EPA's Use of Continuous Emission Monitoring Data, from Kathleen M. Bennett, Assistant Administrator for Air, Noise and Radiation, August 12, 1982.

Memorandum, Guidance: Enforcement Applications of Continuous Emission Monitoring System Data, Edward E. Reich, Director, Station Source Compliance Division, and Michael S. Alushin, Associate Enforcement Counsel, Air Enforcement Division, April 22, 1986.

Policy Statement, CEMS Policy, Gerald A. Emison, Director, Office of Air Quality Planning and Standards (OAQPS), March 31, 1988 (reissued). *See also* Policy Statement, CEMS Policy and FY 1988 Guidance, Gerald A. Emison, Director, OAQPS, July 28, 1987.

Memorandum, Transmittal of SO2 Continuous Compliance Strategy, John S. Seitz, Director, Stationary Source Compliance Division (OAQPS), July 5, 1988.

guidance of general applicability. Agency enforcement resources and activities should continue to focus on addressing significant violations and in causing sources to return to continuous compliance with applicable requirements. Enforcement activities (particularly judicial enforcement proceedings) should generally be directed at violations that (1) may threaten or result in harm to public health or the environment, (2) are of significant duration or magnitude, (3) represent a pattern of noncompliance, (4) involve a refusal to provide specifically requested compliance information, (5) involve criminal conduct, or (6) allow a source to reap an economic benefit. *See* Credible Evidence White Paper, "The Use of Information other Than Reference Test Results for Determining Compliance with the Clean Air Act", March 21, 1996.

Minor violations generally should continue to be a lower judicial enforcement priority because other tools can typically be used to address these violations without resort to federal court (e.g., occasional exceedences of short duration that are quickly and adequately resolved can typically be handled administratively without the use of more formal, judicial enforcement proceedings). Agency enforcement personnel should look at all the facts and circumstances of a case (e.g., extent and duration of noncompliance, environmental consequences and economic benefits of noncompliance), including consideration of the full range of types of violations and all available enforcement tools, in deciding whether and, if so, what enforcement response is warranted to address sporadic, infrequent violations identified or determined through the use of credible evidence.

The Agency has and should maintain a balanced enforcement program that seeks to assure compliance through using a mix of the compliance and enforcement tools available to it. Common sense and reasoned enforcement discretion must continue to guide the Agency in assessing and determining whether available information should be proffered or otherwise used as credible evidence of a violation[3].

<u>SIP Revisions Concerning Credible Evidence</u> - Numerous states have submitted or will soon submit revisions to their SIPs to expressly permit the use of "credible evidence" to enforce applicable requirements. *See* 40 CFR 51.212(c), as recently promulgated. Some revisions have been approved, but many others are still pending (due in part to the pendency of the now concluded credible evidence rule) or are yet to be submitted. As reflected in the credible evidence rule, EPA (and the states) have had the authority and ability to use credible evidence to enforce Clean Air Act requirements. Nonetheless and to ensure clarity at the earliest practicable date, action on these SIP revisions should be expedited, consistent with necessary legal requirements and in consideration of other pending policy matters (e.g., state audit immunity policies).

---

[3] For example, the Clean Air Act Stationary Source Civil Penalty Policy (October 25, 1991) recommends that recoupment of economic benefit due to delayed and avoided compliance costs be calculated from the "first provable date of violation." Agency enforcement personnel should utilize their common sense and experience to assess and evaluate <u>all</u> available information in determining what constitutes a "provable" date of violation under that policy.

Proceedings Involving the Use of Credible Evidence in FY 97 are "Nationally Significant" - In redelegating concurrence authority for the settlement of enforcement actions to Regional Counsel, an exception was made for cases raising issues of national significance. Memorandum, Redelegation of the Assistant Administrator for OECA's Concurrence Authority in Settlement of Certain Civil Judicial and Administrative Enforcement Actions, Steven A. Herman, Assistant Administrator, July 8, 1994. Guidelines for identifying nationally significant cases/issues were contemporaneously issued, with subsequent guidance further clarifying the matter. Memorandum, OECA/Regional Procedures for Civil Judicial and Administrative Enforcement Case Redelegation, Robert Van Heuvelen, Director, Office of Regulatory Enforcement, November 8, 1994. Consistent with such redelegation, guidelines and guidance, the initiation, litigation and resolution of civil proceedings involving the use or anticipated use of non-reference test data to establish/refute the existence or duration of a violation under SIPs, NSPS, or NESHAPs are to be identified and treated as cases involving "nationally significant issues" for at least the next year.

Regional Counsel should review their current cases (regardless of redelegated authority) to determine whether credible evidence issues have been or are likely to be raised. In all future referrals and enforcement actions, Regional Counsel, Enforcement Division Directors and Air Division Directors should consider whether non-reference test method data and/or other information are available and can be used to enforce compliance with applicable Clean Air Act requirements.

Future Guidance/Work Group Formation - Since the evaluation and use of credible evidence plays an important part in ensuring continuous compliance with emission limitations and requirements, the Regions are encouraged to use non-reference test data where appropriate. Such use could be aided, and consistency enhanced, by the issuance of additional guidance and direction on the evaluation and use of all forms of non-reference test data as credible evidence.

With this memorandum I am also announcing the creation of a Credible Evidence Work Group, to be chaired by ORE's Air Enforcement Division. This work group is charged with developing additional guidance on the use of credible evidence and other, related materials. This activity will undoubtedly benefit greatly from the perspectives and expertise resident in the Agency's regions, offices and program activities. Please submit nominations of persons with both legal and technical experience in clean air enforcement matters to Bruce Buckheit, Director, Air Enforcement Division, Office of Regulatory Enforcement, not later than June 1, 1997.

The measures identified and described in this document are intended solely for the guidance of government personnel (e.g., the Interim Enforcement Response Policy). They are not intended and cannot be relied upon to create rights, substantive or procedural, enforceable by any party in litigation with the United States or the Environmental Protection Agency. EPA reserves the right to act at variance with these measures and to change them at any time without public notice.

HOPPING GREEN SAMS & SMITH
PROFESSIONAL ASSOCIATION
ATTORNEYS AND COUNSELORS
123 SOUTH CALHOUN STREET
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500
FAX (904) 224-8551
FAX (904) 425-3415

May 9, 1997

"ANY CREDIBLE EVIDENCE" RULE

On February 24, 1997, the U.S. Environmental Protection Agency (EPA) published its long-awaited "Any Credible Evidence" (ACE) rule. 62 Fed. Reg. 8314. EPA also released on its TTN Electronic Bulletin Board (CAAA page) a "Response to Comments" document on this rule. The ACE rule is comprised of amendments to the federal regulations covering State Implementation Plans (SIPs), New Source Performance Standards (NSPS), and National Emission Standards for Hazardous Air Pollutants (NESHAP) -- 40 CFR Parts 51, 52, 60 and 61. This rule became "effective" on April 25, 1997, although certain states may have to amend their SIPs before the amendments will have an effect on the state level for non-NSPS/NESHAP standards. These amendments are designed to clarify that nothing in a SIP or a federal regulation shall preclude the use of "any credible evidence" for purposes of determining compliance with requirements under the Clean Air Act (CAA). EPA also stated in the preamble that the ACE rule primarily represents confirmation of its "long-standing" authority under the CAA to bring enforcement actions based on any information available. According to EPA, the ACE rule simply "removes what some have construed to be a regulatory bar to the admission of non-reference test data to prove a violation of an emission standard, no matter how credible and probative those data are that a violation has occurred." 62 Fed. Reg. 8315.

EPA initially proposed the ACE rule in October of 1993, as part of its "Enhanced Monitoring" proposal (now referred to as "Compliance Assurance Monitoring" or "CAM"). 58 Fed. Reg. 54648. Because of the significant adverse reaction to many aspects of the 1993 proposal, EPA decided to proceed with the credible evidence revisions separately from CAM. EPA conducted numerous discussions with industry, environmental groups, and enforcement authorities, and then finalized an ACE rule having substantially the same effect as originally proposed. According to recent periodicals, at least 70 separate petitions have been filed challenging the validity of the ACE rule, as well as other federal regulations that petitioners claim are amended by the ACE rule. The rule will remain in effect, however, pending these challenges. Although the comment period for the February 24 ACE rule officially ended on April 25, 1997, EPA stated in the context of a recently published notice regarding the CAM rule that it would accept comments focused on the relationship between the CAM rule and the ACE rule until May 27, 1997. 62 Fed. Reg. 20147 (April 25, 1997).

EPA included a "SIP Call" in its ACE rule, meaning that, if necessary, states must amend their SIPs, to conform with the ACE revisions. The amendments relating to NSPS and NESHAPs, however, are effective now.

The ACE rule essentially authorizes sources, EPA, states, local programs, and citizens to use "any credible evidence" to show compliance or non-compliance with emission limits and standards contained in a SIP, NSPS, or NESHAP. Prior to the new ACE rule, industry's position typically has been that CAA violations could only be proven with evidence obtained from specified "reference test" methods as set forth in agency permits or rules; all other data could be used only as an "indicator," not as direct evidence of a violation. EPA's position is that the 1990 CAA Amendments and the new ACE rule clarify that such an argument is no longer available. The ACE rule's intended purpose is to eliminate any remaining argument that only selected test methods can be relied on to establish noncompliance. EPA also stated that unless expressly allowed otherwise, permit conditions are always meant to be complied with continuously, not just during the moment of a compliance test.

EPA believes that the ACE rule will provide numerous benefits. Primarily, EPA, states, and citizens would be able to use "any credible evidence" for compliance and enforcement purposes. Industry would also be able to rely on this same information for purposes of determining and certifying compliance with applicable requirements.

Significantly, if a particular test method is required by rule or permit (i.e., the reference test), it remains the benchmark upon which compliance will be assessed. In other words, any credible evidence can be used to prove what the reference test would have shown, if the reference test had been conducted. All applicable averaging times contained in the standards and corresponding reference tests also remain intact. EPA apparently crafted the amendments in this manner to counter the industry argument that the ACE rule would increase the stringency of certain existing requirements. EPA's position is that as long as the focus for compliance determinations remains on the appropriate reference test, the stringency of the underlying requirement is not affected.

Further, the party wishing to utilize non-reference test data has the burden of showing its credible relation to the reference test. EPA did not include any lists of "presumptively credible" types of data in this final rule, as were included in the prior proposals. EPA expressly stated that it is *not* predetermining the credibility of different types of non-reference data; rather, such determinations are left to the judicial and administrative tribunals in specific enforcement cases. Notwithstanding these declarations, EPA vouched for the credibility of certain types of data as follows: (1) the types of data and monitoring methods contained in EPA's October 1993 lists of "presumptively credible evidence and monitoring methods" (omitted in final version) "are indeed credible;" (2) data generated in accordance with EPA's pending CAM rule should be credible; (3) continuous emissions monitoring data, and well-chosen parametric monitoring data "generally provide accurate data . . . and are more representative of a source's ongoing compliance status than sporadic performance testing;" and (4) continuous opacity monitoring data is "arguably-more-accurate" than Method 9 data. Also, any data that is relied on or certified by the source as accurate (e.g., data submitted in an Acid Rain quarterly report) should reasonably be expected to be attributed with a high degree of credibility.

As mentioned above, EPA maintains that the principles contained in the ACE rule are not new, but rather clarify existing law. For example, EPA referred to a recent Colorado case, *Sierra Club v. Public Service Commission of Colorado*, 894 F. Supp. 1455 (D. Colo. 1995), in the preamble and Response to Comments document. In *Sierra Club*, a citizen suit prevailed in holding a utility liable for violating its opacity limit based on data obtained from a non-reference Continuous Opacity Monitor (COM). The specified reference test for determining compliance with the source's opacity limit was Method 9, yet the court found the COM data to be credible evidence of numerous violations.

EPA also spent considerable time in the preamble responding to concerns raised by industry regarding the implementation of the ACE rule. First, industry expressed concern that the ACE rule would violate sources' constitutional due process rights because there would be no "fair warning" of the types of data that could be used against them. EPA countered that "fair warning" need only be given regarding the standards that must be met, and not necessarily on the particular types of evidence that could be used to support an enforcement action. Second, industry expressed concern that sources would be more susceptible to suits based on "minor" violations because of the voluminous amount of data that might be available. EPA stated that there is no evidence that citizens suits would increase, and emphasized that EPA, and citizens as well, focus their judicial resources on more significant violations that have a greater potential of harm. Third, as discussed above, industry expressed concern that the ACE rule would increase the stringency of certain requirements without going through adequate public notice and comment periods to revise each rule. In other words, if a standard were established based on a specified test method, the use of a more stringent test method would effectively increase the stringency of the standard. EPA countered that sources have always been required to be in continual compliance with federal standards (unless explicitly stated otherwise) and that by focusing compliance determinations on the specified reference test, the stringency was not being increased. EPA used the analogy that just because the police can use radar guns to detect speeding automobiles does not mean that the speed limit was lowered, it just means that motorists must continually comply with the existing limit. Apparently, several of the industry petitions challenging the ACE rule are based on this concept that the stringency of the underlying requirements have been increased. Fourth, industry argued that the ACE rule would create uncertainty when certifying compliance because of non-reference test data may indicate noncompliance when the reference test data indicates compliance. EPA stated that a source could generally rely on the reference test data, but that it could not ignore obviously relevant information. If a source becomes aware of non-reference test data indicating noncompliance, it must consider this information, address it in the compliance certification, and certify accordingly.

Dated: February 13, 1997.

Carol M. Browner,

Administrator, U.S. Environmental Protection Agency.

For the reasons set out in the preamble, 40 CFR Chapter I is amended as follows:

PART 51—REQUIREMENTS FOR PREPARATION, ADOPTION, AND SUBMITTAL OF IMPLEMENTATION PLANS

1. The authority citation for part 51 is revised to read as follows:

Authority: 42 U.S.C. 7401, 7411, 7412, 7413, 7414, 7470–7479, 7501–7508, 7601, and 7602.

2. Section 51.212 is amended by revising paragraph (c) to read as follows:

§ 51.212 Testing, inspection, enforcement, and complaints.

* * * * *

(c) Enforceable test methods for each emission limit specified in the plan. For the purpose of submitting compliance certifications or establishing whether or not a person has violated or is in violation of any standard in this part, the plan must not preclude the use, including the exclusive use, of any credible evidence or information, relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed. As an enforceable method, States may use:

(1) Any of the appropriate methods in appendix M to this part, Recommended Test Methods for State Implementation Plans; or

(2) An alternative method following review and approval of that method by the Administrator; or

(3) Any appropriate method in appendix A to 40 CFR part 60.

PART 52—APPROVAL AND PROMULGATION OF IMPLEMENTATION PLANS

1. The authority citation for part 52 is revised to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

2. Section 52.12 is amended by revising paragraph (c) to read as follows:

§ 52.12 Source surveillance.

* * * * *

(c) For purposes of Federal enforcement, the following test procedures and methods shall be used, provided that for the purpose of establishing whether or not a person has violated or is in violation of any provision of the plan, nothing in this part shall preclude the use, including the exclusive use, of any credible evidence or information, relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test procedures or methods had been performed:

(1) Sources subject to plan provisions which do not specify a test procedure and sources subject to provisions promulgated by the Administrator will be tested by means of the appropriate procedures and methods prescribed in part 60 of this chapter unless otherwise specified in this part.

(2) Sources subject to approved provisions of a plan wherein a test procedure is specified will be tested by the specified procedure.

3. Subpart A is amended by adding a new § 52.33 to read as follows:

§ 52.33 Compliance certifications.

(a) For the purpose of submitting compliance certifications, nothing in this part or in a plan promulgated by the Administrator shall preclude the use, including the exclusive use, of any credible evidence or information, relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test had been performed.

(b) For all federal implementation plans, paragraph (a) of this section is incorporated into the plan.

PART 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

1. The authority citation for part 60 is revised to read as follows:

Authority: 42 U.S.C. 7401, 7411, 7413, 7414, 7416, 7601 and 7602.

2. Section 60.11 is amended by revising paragraphs (a) and (f) and by adding paragraph (g) to read as follows:

§ 60.11 Compliance with standards and maintenance requirements.

(a) Compliance with standards in this part, other than opacity standards, shall be determined in accordance with performance tests established by § 60.8, unless otherwise specified in the applicable standard.

* * * * *

(f) Special provisions set forth under an applicable subpart shall supersede any conflicting provisions in paragraphs (a) through (e) of this section.

(g) For the purpose of submitting compliance certifications or establishing whether or not a person has violated or is in violation of any standard in this part, nothing in this part shall preclude the use, including the exclusive use, of any credible evidence or information, relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed.

PART 61—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

1. The authority citation for part 61 is revised to read as follows:

Authority: 42 U.S.C. 7401, 7412, 7413, 7414, 7416, 7601 and 7602.

2. Section 61.12 is amended by revising paragraph (a) and adding paragraph (e) to read as follows:

§ 61.12 Compliance with standards and maintenance requirements.

(a) Compliance with numerical emission limits shall be determined in accordance with emission tests established in § 61.13 or as otherwise specified in an individual subpart.

* * * * *

(e) For the purpose of submitting compliance certifications or establishing whether or not a person has violated or is in violation of any standard in this part, nothing in this part shall preclude the use, including the exclusive use, of any credible evidence or information, relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test had been performed.

[FR Doc. 97–4196 Filed 2–21–97; 8:45 am]

BILLING CODE 6560–50–P

P 230 524 365

Receipt for Certified Mail

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

Sent to Carl Schulz	
Street and No. Fla GAS Trans.	
P.O., State and ZIP Code Houston, TX	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 6-28-93 AC 62-229319 PSD-FI-202	

PS Form 3800, June 1991

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Carl D Schulz, VP
Project Mgmt Servi
Fla GAS Transmission
PO BOX 1188
Houston, TX 77251-1188

4a. Article Number
P 230 524 365

4b. Service Type
☐ Registered ☐ Insured
☑ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery JUL 1 - 1993

5. Signature (Addressee)

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, December 1991 ☆U.S. GPO: 1992—323-402 **DOMESTIC RETURN RECEIPT**

is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

Florida Department of Environmental Regulation
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400
Lawton Chiles, Governor
Virginia B. Wetherell, Secretary

June 23, 1993

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Carl D. Schulz, Vice President
Project Management Services
Florida Gas Transmission Company
Post Office Box 1188
Houston, Texas 77251-1188

Dear Mr Schulz:

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit to install one natural gas fired turbine in Perry, Taylor County, Florida.

Please submit any written comments you wish to have considered concerning the Department's proposed action to Mr. Preston Lewis of the Bureau of Air Regulation.

Sincerely,

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/TH/kt

Attachments

cc: J. Cole, NE District
B. Andrews, P.E., ENSR
J. Bunyak, NPS
J. Harper, EPA

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

CERTIFIED MAIL

In the Matter of an
Application for Permit by:

DER File No. AC 62-229319
PSD-FL-202

Florida Gas Transmission Company
Post Office Box 1188
Houston, Texas 77251-1188

_______________________________/

INTENT TO ISSUE

The Department of Environmental Regulation gives notice of its intent to issue an air construction permit (copy attached) for the proposed project as detailed in the application specified above, for the reasons stated in the attached Technical Evaluation and Preliminary Determination.

The applicant, Florida Gas Transmission, applied on April 7, 1993, to the Department of Environmental Regulation for a permit to construct one natural gas fired turbine. The proposed source will be located at the applicant's existing facility in Perry, Taylor County, Florida.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes and Florida Administrative Code (F.A.C.) Chapters 17-212 and 17-4. The project is not exempt from permitting procedures. The Department has determined that a construction permit is required for the proposed work.

Pursuant to Section 403.815, Florida Statutes and Rule 17-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit. The notice shall be published one time only within 30 days in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within seven days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

The Department will issue the permit with the attached conditions unless a petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant and the parties listed below must be filed within 14 days of receipt of this intent. Petitions filed by other persons must be filed within 14 days of publication of the public notice or within 14 days of their receipt of this intent, whichever first occurs. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information;

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;
(d) A statement of the material facts disputed by Petitioner, if any;
(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and
(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this intent. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this intent in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

C. H. Fancy, P.E., Chief
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399
904-488-1344

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this INTENT TO ISSUE and all copies were mailed by certified mail before the close of business on 6-28-93 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGMENT
FILED, on this date, pursuant to §120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Clerk 6-28-93
Date

Copies furnished to:

J. Cole, NE District
B. Andrews, P.E., ENSR
J. Bunyak, NPS
J. Harper, EPA

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF INTENT TO ISSUE PERMIT

The Department of Environmental Regulation gives notice of its intent to issue a permit to Florida Gas Transmission Company, Post Office Box 1188, Houston, Texas 77251-1188, to install one natural gas fired turbine. The Company's facility is located 6 miles north of Perry on Pisgah Road in Perry, Taylor County, Florida. Modeling results show that increases in ground-level concentrations are less than Prevention of Significant Deterioration (PSD) significant impact levels for the appropriate pollutant (NOx). These emissions will not cause or contribute to a violation of any ambient air quality standard or PSD increment. A determination of Best Available Control Technology (BACT) was required. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within 14 days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information; (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed; (b) A statement of how and when each petitioner received notice of the Department's action or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by Petitioner, if any; (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action; (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Regulation
Bureau of Air Regulation
111 S. Magnolia Park Courtyard
Tallahassee, Florida

Department of Environmental Regulation
Northeast District Office
7825 Baymeadows Way-Suite 200B
Jacksonville, Florida 32256-7577

Any person may send written comments on the proposed action to Mr. Preston Lewis at the Department's Tallahassee address. All comments received within 30 days of the publication of this notice will be considered in the Department's final determination.

Further, a public hearing can be requested by any person(s). Such requests must be submitted within 30 days of this notice.

TECHNICAL EVALUATION
AND
PRELIMINARY DETERMINATION

FLORIDA GAS TRANSMISSION COMPANY

Taylor County
Perry, Florida
Station No. 15

Natural Gas Compressor Engine
Permit No. AC 62-229319
PSD-FL-202

Department of Environmental Regulation
Division of Air Resources Management
Bureau of Air Regulation

June 23, 1993

I. SYNOPSIS OF APPLICATION

I.1 APPLICANT NAME AND ADDRESS

Florida Gas Transmission Company
P.O. Box 1188
Houston, Texas 77251-1188

I.2 REVIEWING AND PROCESS SCHEDULE

Date of Receipt of Application: April 7, 1993

Application Completeness Date: April 7, 1993

II. FACILITY INFORMATION

II.1 FACILITY LOCATION

Florida Gas Transmission Company's (FGTC) facility is located 6 miles north of Perry on Pisgah Road in Perry, Taylor County, Florida. The UTM coordinates are Zone 17, 249.02 Km E and 3339.60 Km N.

II.2 STANDARD INDUSTRIAL CLASSIFICATION CODE

This facility is classified as follows:

Major Group No. 49 - Electric and Sanitary Services

Group No. 492- Gas Production and Distribution

Industry No. 4922- Natural Gas Transmission

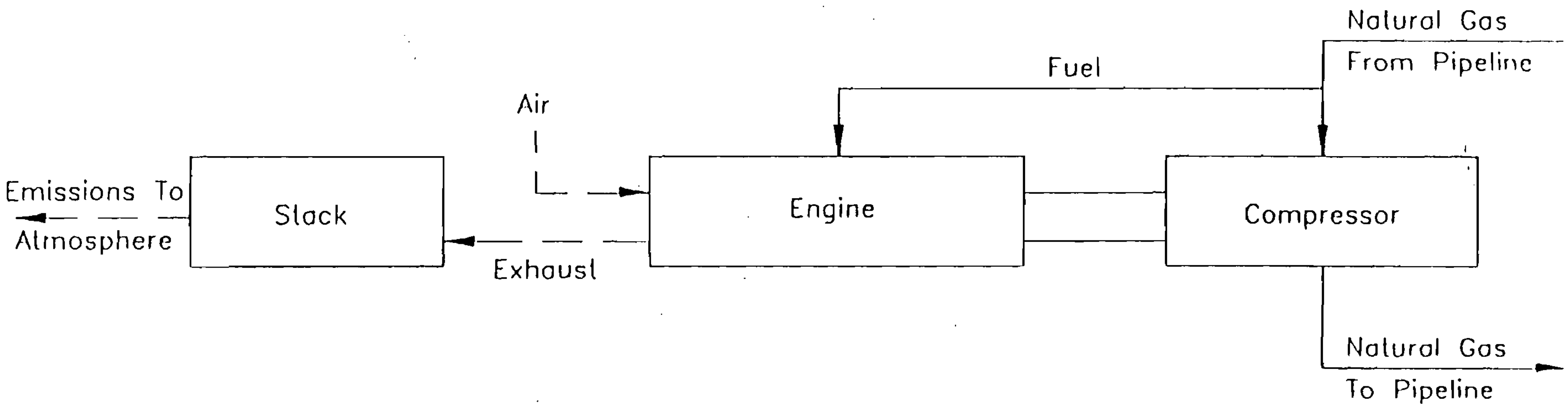
II.3 FACILITY CATEGORY

The FGTC site, in Perry, is classified as a major emitting facility for nitrogen oxides (NOx) and carbon monoxide (CO). The proposed project will increase NOx emissions by 70.7 tons per year and CO emissions by 51.3 tons per year. The total permitted emissions for this facility shall not exceed 1212 tons NOx per year and 286 tons CO per year.

III. PROJECT DESCRIPTION

The FGTC proposes to install one natural gas fired turbine. The turbine engine will be a Solar Mars T-1200 engine compressor unit ISO rated at 12,600 bhp at 8,800 revolutions per minute (rpm). The proposed unit will be used to drive a gas compressor that is a part of a new gas transmission line that will transport natural gas from source wells in Texas and Louisiana for delivery throughout Florida. The proposed turbine will incorporate dry, low NOx combustion technology. A flow diagram of a typical compressor unit is presented in Figure 2-1.

CE679259
(DALLAS/HPCL21)



ENSR CONSULTING & ENGINEERING

FIGURE 2-1
PROCESS FLOW DIAGRAM
OF AN
ENGINE-COMPRESSOR UNIT

DRAWN: DC/SH	DATE: 11-6-92	PROJECT NUMBER:

III. 1 Background Information

The FGTC existing compressor station consist of five 2,000 bhp and one (1) 4000 bhp natural gas fired reciprocating IC engines. Five of the engines are Worthington Model SEHG-8 engine compressor units and one is a Copper Bessemer. Some of these engines were installed before the CAA amendment of 1977: three were installed in 1962; a fourth engine installed in 1966; a fifth installed in 1968 and the sixth engine was installed in 1991. These existing engines are not being modified as part of this Phase III expansion project.

In general, the FGTC Phase III expansion project will be increasing the natural gas transport capacity of the existing Florida gas pipeline system. The scope of the work for Phase III includes expansions by the addition of state-of-the art compressor engines at four existing compressor stations and two new proposed compressor stations. The proposed engines would be used solely for the purpose of transporting natural gas in the pipeline for distribution in Florida. The main gas pipeline and the approximate locations of the existing and proposed compressor stations along the main pipeline are shown in Figure 1-1.

IV. **RULE APPLICABILITY**

The proposed project is subject to preconstruction review under the provisions of Chapter 403, Florida Statutes, and Florida Administrative (F.A.C.) Chapters 17-209 through 17-297.

This plant is located in an area (Taylor County) designated attainment for all criteria pollutant as in accordance with Rule 17-275.400.

The proposed project will be reviewed in accordance with F.A.C Rule 17-212.400, Prevention of Significant Deterioration, because it will be a major modification to a major facility. This review consists of a determination of Best Available Control Technology (BACT) and unless otherwise exempted, an air quality impact of the increased emissions. The review also includes a review of the project's impacts on soils, vegetation, visibility and air quality impact resulting from residential and industrial growth.

The proposed facility shall comply with applicable provisions of F.A.C. Chapter 17-297, Stationary Sources-Emissions Monitoring; F.A.C. 17-296, Stationary Sources-Emissions Standards; F.A.C. Rule 17-296.300 Best Available Control Technology; and F.A.C. Rule, 17-212.400, Prevention of Significant Deterioration.

V. **SOURCE IMPACT ANALYSIS**

V.1 CONTROL TECHNOLOGY REVIEW

A complete BACT evaluation was submitted with the application. This evaluation included analyzing technologies involving engine modification technologies involving exhaust gas treatment. Furthermore, the evaluation also included the feasibility of the different NOx control methods and a comparison of the technical environmental, energy and economic impacts. Based on this approach, dry low-NOx combustion was determined to represent BACT.

The proposed engine will incorporate dry low-NOx combustion technology. Dry combustion techniques are designed to alter the conditions in the combustion chamber to influence the temperature, residence time, and mixing of air and fuel so as to reduce the amount of NOx formed. The state-of-the-art concept in designing a low-NOx turbine involves raising the air-to-fuel ratio in the combustion primary zone and thoroughly premixing primary combustion air and fuel. This reduces NOx formation by lowering the average flame temperature in the combustor primary zone and avoiding localized hot spots. NOx combustion is a technically feasible control method for natural gas pipeline turbines.

V.2 EMISSION LIMITATIONS

The operation of this source will produce emissions of nitrogen oxide (NOx), carbon monoxide (CO), volatile organic compounds (VOC), particulate matter (PM), and sulfur dioxide (SO_2) from the burning of natural gas. Potential new VOC emissions from the station include fugitive emissions from new valves and flanges that will be in gas service. Table I summarizes the proposed emissions from this source and Table II summarizes the proposed and existing emissions from this facility.

Table I
Summary of Emissions
(Source ID No. 1506)

	Max. Potential Emissions From Proposed Turbine Engine		Significant Emission Rate
Pollutant	(lbs/hr)	(TPY)	(TPY)
Nitrogen Oxides	16.14	70.70	40
Carbon Monoxide	11.71	51.30	100
Volatile Organic Compounds (non-methane)	0.67	2.93	40
Particulate Matter (TSP)		2.32	25
Particulate Matter (PM_{10})	0.53	2.32	15
Sulfur Dioxide	3.01	13.18	40
Fugitive (VOC Emissions)	0.15	0.68	--

V.3. AIR QUALITY ANALYSIS

a. Introduction

The proposed Florida Gas Transmission pipeline compressor station No. 15 will emit one pollutant which is PSD significant

TABLE II

Annual (TPY) Emission Levels
FGTC, Phase III
Compressor Station No. 15

SOURCE ID	DESCRIPTION	NO_x	CO	VOC (NM/NEHC)	SO_2	PM
EXISTING FACILITY						
	COMPRESSOR ENGINES:					
1501	2000 bhp Recip. Engine	212.47	27.04	8.50	1.79	0.31
1502	2000 bhp Recip. Engine	212.47	27.04	8.50	1.79	0.31
1503	2000 bhp Recip. Engine	212.47	27.04	8.50	1.79	0.31
1504	2000 bhp Recip. Engine	212.47	27.04	8.50	1.79	0.31
1505	2000 bhp Recip. Engine	212.47	27.04	8.50	1.79	0.31
1506	4000 bhp Recip. Engine	77.26	96.58	38.63	3.48	0.68
	OTHER SOURCES: *	1.65	2.45	2.62	0.02	<0.01
EXISTING TOTAL		1141.26	234.23	83.75	12.45	2.23
PROJECT RELATED						
	COMPRESSOR ENGINE:					
1507	12,600 bhp Turbine Engine	70.70	51.30	2.93	13.18	2.32
	TANKS:					
Tank #1	New Lube Oil	—	—	0.00**	—	—
	FUGITIVE	—	—	0.15	—	—
PROJECT TOTAL		70.70	51.30	3.08	13.18	2.32
STATION TOTAL ***		1211.96	285.53	86.83	25.63	4.55

* - Other Sources includes; Ancillary equipment, storage tanks and equipment leaks.
** - actual emissions are insignificant at 0.00033 TPY
*** - STATION TOTAL = EXISTING + PROJECT

nitrogen oxides (NOx). (Table III)

The air quality impact analysis required by the PSD regulations for this pollutant includes:

* An analysis of existing air quality;
* A PSD increment analysis;
* An Ambient Air Quality Standards (AAQS) analysis;
* An analysis of impacts on soils, vegetation, and visibility and of growth-related air quality modeling impacts; and
* A "Good Engineering Practice" (GEP) stack height determination.

The analysis of existing air quality generally relies on preconstruction monitoring data collected with EPA-approved methods. The PSD increment and AAQS analysis depends on the air quality dispersion modeling carried out in accordance with EPA guidelines.

Based on the required analysis, the Department has reasonable assurance that the proposed Florida Gas Transmission pipeline compressor station No.15, as described in this report and subject to the approval proposed herein, will not cause or contribute to a violation of any ambient air quality standard or PSD increment. A discussion of the modeling methodology and required analysis follows.

b. Analysis of Existing Air Quality

Preconstruction ambient air quality monitoring is required for all pollutants subject to PSD review. An exemption to the monitoring requirement can be obtained if the maximum air quality impact, as determined by air quality modeling, is less than a pollutant-specific "de minimus" concentration.

The predicted impact of the proposed project for NOx, the only pollutant subject to PSD review for this project, is listed in Table IV. The annual average NOx concentration due to the proposed project is predicted to be 0.077 ug/m^3. The annual average de minimus concentration level for NOx is 14 ug/m^3. Therefore, the ambient monitoring analysis is not required.

c. Modeling Methodology

The EPA-approved Industrial Source Complex long-term (ISCLT2) dispersion model was used to evaluate the pollutant emissions from the proposed facility. All recommended EPA default options were used. Direction-specific downwash parameters were used because the stacks were less then the good engineering practice (GEP) stack height.

Meteorological data used in the modeling consisted of five years (1982-1986) of hourly surface data taken at Tallahassee, Florida and twice-daily upper air data taken at Waycross, Georgia.

These data were used in the National Climate Data Center (NCDC) stability array (STAR) preprocessor program for the ISCLT2 model. The STAR program converts the hourly data into the joint frequency of occurrence of wind direction, wind speed, and atmospheric stability.

Dispersion modeling was performed with receptors placed both near and far field. A 100-meter spaced, 25 x 25 receptor grid, centered on the facility, and extending out 1.2 km in all directions was used to check for "close in" NOx maximum. A 500-spaced, 25 x 25 receptor grid, extending 6 km in all directions, was used to identify the maximum NOx concentrations which occurred outside the initial 100-meter grid. A 2-km spaced, 31 x 31 receptor grid extending out 30 km was used to show compliance with the Class I threshold levels for NOx.

The highest predicted yearly impact from the proposed NOx emissions was compared with the standards.

d. Modeling Results

The maximum air quality impact from the proposed facility is presented in Table IV. As shown, the facility's maximum annual NOx concentrations is 0.077 ug/m^3, which is below the respective PSD significant impact levels of 1.0 ug/m^3 for NOx. Therefore, further dispersion modeling for comparison with AAQS and PSD Class II increment consumption was not required.

There are three Class I areas within 150 km of the site:

* St. Marks NWR - located about 36 km west of Compressor Station No.15
* Bradwell Bay - 50 km west northwest of the site.
* Okefenokee Swamp - 130 km northeast of the site.

For potential impacts to these Class I areas, modeling analysis was performed for NOx to calculate concentrations out to 30 km from the facility (considering the closest Class I area). The results showed that potential NOx annual concentrations (0.01 ug/m^3) in the direction (west and northeast) of the three Class I areas, were well below the Parks Class I screening level of 0.025 ug/m^3. Since the closest Class I area (St. Marks) is 36 km west of the site, impacts there and at two other, more distant Class I areas, will be below the limits for NOx.

e. Additional Impacts Analysis

The applicant did the air quality related values analysis. Since the maximum project impacts for NOx is predicted to be 0.077 ug/m^3, the project is not expected to have a harmful impact on soils and vegetation.

Table III: Siginificant and Net Emission Increase Rates (Tons per Year)

Pollutant	Significant Emission Rate	Proposed Net Emissions Increases	Applicable Pollutant (Yes/No)
CO	100	51.30	No
NO_X	40	70.70	Yes
SO_2	40	13.18	No
PM	25	2.32	No
O_3 (VOC)	40	2.93	No

Table IV. Maximum Air Quality Impacts for Comparison to the Significant and De Minimus Ambient Levels.

Pollutant	Avg. Time	Predicted Impact (ug/m_3)	Significant Imapct Level (ug/m_3)	De Minimus Level (ug/m_3)
NO_2	Annual	0.077	1.0	14.0

Visual Impact Screening and Analysis, known as VISCREEN, the EPA-approved Level I visibility computer model was used to estimate the impact of proposed facility's emissions upon visibility in Class I area. The results indicated the maximum visibility impacts caused by the facility do not exceed the screening criteria inside or outside the Class I area. As a result, there is no significant impact upon visibility predicted for the Class I area.

There will be a small number of temporary construction workers constructing the additional facilities at Compressor Station No. 15. However, there will be no increase in the permanent regional work force. As a result there will be no permanent impacts on air quality due to associated population growth.

VII. **CONCLUSION**

Based on the information provided by Florida Gas Transmission Company, the Department has reasonable assurance that the proposed project, as described in this evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-209 through 17-297 of the Florida Administrative Code.

#41755

Florida Department of Environmental Regulation
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400
Lawton Chiles, Governor
Virginia B. Wetherell, Secretary

PERMITTEE:

Florida Gas Transmission Company
P. O. Box 1188
Houston, Texas 77251-1188

Permit Number: AC 62-229319
PSD-FL-202
Expiration Date: June 30, 1995
County: Taylor
Latitude/Longitude: 30°09'50"N
83°36'22"W
Project: Natural Gas Compressor Engine (ID 1507) Station No. 15

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-210, 212, 272, 275, 296, and 297; and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the construction of one natural gas fired engine to be located 6 miles north of Perry on Pisgah Road in Perry, Taylor County, Florida. The UTM coordinates are Zone 17, 249.02 km East and 3339.60 km North.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Application to Construct/Operate Air Pollution Sources DER Form 17-1.202(1).
2. Florida Gas Transmission's letter dated May 10, 1993.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

GENERAL CONDITIONS:

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

a. Have access to and copy any records that must be kept under the conditions of the permit;

b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

GENERAL CONDITIONS:

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

   (x) Determination of Best Available Control Technology (BACT)
   (x) Determination of Prevention of Significant Deterioration (PSD)
   (x) Compliance with New Source Performance Standards (NSPS)

14. The permittee shall comply with the following:

   a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

   b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

   c. Records of monitoring information shall include:

      - the date, exact place, and time of sampling or measurements;
      - the person responsible for performing the sampling or measurements;

GENERAL CONDITIONS:

- the dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SPECIFIC CONDITIONS:

Emission Limits

1. The maximum allowable emissions from this source shall not exceed the emission rates as follows:

Pollutant	lbs/hr	tons/yr	Emission Factor
Nitrogen Oxides (a)	16.14	70.70	0.58 g/bhp-hr
Carbon Monoxide	11.71	51.30	0.42 g/bhp-hr
Volatile Organic Compounds (non-methane)	0.67	2.93	0.24 g/bhp-hr
Particulate Matter (TSP)	0.53	2.31	5 lbs/MMscf
Particulate Matter (PM_{10})	0.53	2.31	5 lbs/MMscf
Sulfur Dioxide	3.01	13.19	10 gr/100scf

(a) Initial NOx emissions for natural gas firing shall not exceed 42 ppmv at 15% oxygen on a dry basis. The permittee shall achieve NOx emissions of 25 ppmv at 15% oxygen on a dry basis at the earliest achievable date, but no later than 1/1/98.

2. Visible emissions shall not exceed 10% opacity.

Operating Rates

3. This source is allowed to operate continuously (8760 hours per year).

4. This source is allowed to burn natural gas only.

5. The permitted operating parameters and utilization rates for this natural gas compressor engine shall not exceed the values stated in the application. The parameters include, but are not limited to:

- Maximum natural gas consumption shall not exceed 0.1054 MMSCF/hr.
- Maximum heat input shall not exceed 109.66 MMBtu/hr.

SPECIFIC CONDITIONS:

6. Any change in the method of operation, equipment or operating hours shall be submitted to the DER's Bureau of Air Regulation and Northeast District offices.

7. Any other operating parameters established during compliance testing and/or inspection that will ensure the proper operation of this facility shall be included in the operating permit.

Compliance Determination

8. Compliance with the allowable emission limits shall be determined within 60 days after achieving the maximum production rate at which this facility will be operated, but not later than 180 days after initial start-up and annually thereafter, by the following reference methods as described in 40 CFR 60, Appendix A (July 1992 version) and adopted by reference in Chapter 17-297, F.A.C.

- Method 1. Sample and Velocity Traverses
- Method 2. Volumetric Flow Rate
- Method 3. Gas Analysis
- Method 9. Determination of the Opacity of the Emissions from Stationary Sources
- Method 10. Determination of the Carbon Monoxide Emissions from Stationary Sources
- Method 20. Determination of Nitrogen Oxides, Sulfur Dioxide and Diluent Emissions from Gas Turbines
- Method 25A. Determination of Total Gaseous Organic Concentrations Using a Flame Ionization Analyzer

9. Other DER approved methods may be used for compliance testing after prior Department approval. Compliance with the SO_2 emission limit can be determined by calculations based on fuel analysis using ASTM D1072-80, D3031-81, D4084-82, or D3246-81 for sulfur content of gaseous fuels.

10. Initial compliance with the volatile organic compound (VOC) emissions limits will be demonstrated by EPA Method 25A, thereafter, except as provided in Rule 17-297.340(2), compliance with the VOC emission limits will be assumed, provided the CO allowable emission rate is achieved.

11. During performance tests, to determine compliance with the NO_x standard, measured NO_x emissions at 15 percent oxygen will be adjusted to ISO ambient atmospheric conditions by the following correction factor:

SPECIFIC CONDITIONS:

$$NO_x = (NO_x\ obs) \left(\frac{P_{ref}}{P_{obs}}\right)^{0.5} e^{19\ (H_{obs} - 0.00633)} \left(\frac{288°K}{T_{AMB}}\right)^{1.53}$$

where:

NO_x = Emissions of NO_x at 15 percent oxygen and ISO standard ambient conditions.

$NO_x\ obs$ = Measured NO_x emission at 15 percent oxygen, ppmv.

P_{ref} = Reference combustor inlet absolute pressure at 101.3 kilopascals (1 atmosphere) ambient pressure.

P_{obs} = Measured combustor inlet absolute pressure at test ambient pressure.

H_{obs} = Specific humidity of ambient air at test.

e = Transcendental constant (2.718).

T_{AMB} = Temperature of ambient air at test.

12. Stack sampling facilities shall be required and shall comply with the requirements of F.A.C. Rule 17-297.345. Test results will be the average of 3 valid runs. The Northeast District office will be notified at least 30 days in writing in advance of the compliance test(s). The source shall operate between 95% and 100% of maximum capacity for the ambient conditions experienced during compliance test(s). The turbine manufacturer's capacity vs temperature (ambient) curve shall be included with the compliance test. Compliance test results shall be submitted to the Northeast District office no later than 45 days after completion.

13. The permittee shall install, calibrate, maintain, and operate a continuous emission monitor in the stack to measure and record the nitrogen oxides emissions from this source. The continuous emission monitor must comply with 40 CFR 60, Appendix B, Performance Specification 2 and 40 CFR 60, Appendix F, Quality Assurance Procedures (July 1, 1992 version). Pursuant to F.A.C. Rule 17-4.160(14), the permittee shall retain all monitoring records related to the requirements of this permit for a period of three (3) years.

14. Continuous emission monitoring system to monitor and record fuel consumption shall be as specified in 40 CFR 60.334(a). Sulfur and nitrogen content and lower heating value of the fuel being fired in the combustion turbine shall be determined as specified in 40 CFR 60.334(b). Any request for a future custom monitoring schedule shall be made in writing and directed to the Northeast District

SPECIFIC CONDITIONS:

office. Any custom schedule approved by DER pursuant to 40 CFR 60.334(b) will be recognized as enforceable provisions of the permit, provided that the holder of this permit demonstrates that the provisions of the schedule will be adequate to assure continuous compliance.

15. The permittee shall annually perform a visual inspection of the turbine compressor engine, fitters, associated piping system for rust spots, cracks, leaks and odors. Also ensure that safety valves and the control device/stack are in proper order and working properly. The permittee shall document the findings and corrective action taken.

16. When the Department, after investigation, has good reason (such as odor complaints, increased visible emissions, excess emissions, etc.), to conclude that any applicable emission standard contained in this permit is being violated, it may require the owner or operator of the facility to conduct compliance tests which identify the nature and quantity of air pollutant emissions from the facility and to provide a report of said tests to the Department (F.A.C. Rule 17-297.340(2)).

Rule Requirements

17. This source shall comply with all applicable provisions of Chapter 403, Florida Statutes, Chapters 17-210, 212, 275, 296, 297 and 17-4, Florida Administrative Code and 40 CFR 60 (July, 1992 version).

18. This source shall comply with all requirements of 40 CFR 60, Subpart GG, and F.A.C. Rule 17-296.800,(2)(a), Standards of Performance for Stationary Gas Turbines.

19. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements and regulations (F.A.C. Rule 17-210.300(1)).

20. No person shall cause, suffer, allow, or permit the discharge of air pollutants which cause or contribute to an objectionable odor pursuant to F.A.C. Rule 17-296.320(2). Objectionable odor is defined as any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonable interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance pursuant to F.A.C. Rule 17-296.200(123).

21. This source shall be in compliance with all applicable provisions of F.A.C. Rules 17-210.650: Circumvention; 17-210.700: Excess Emissions; 17-296.800: Standards of Performance for New

SPECIFIC CONDITIONS:

Stationary Sources (NSPS); Chapter 17-297: Stationary Sources-Emissions Monitoring; Chapter 17-296: Stationary Source-Emission Standards and, 17-4.130: Plant Operation-Problems.

22. If construction does not commence within 18 months of issuance of this permit, then the permittee shall obtain from the Department a review and, if necessary, a modification of the control technology and allowable emissions for the unit(s) on which construction has not commenced (40 CFR 52.21(r)(2)).

23. Quarterly excess emission reports, in accordance with the July 1, 1992 version of 40 CFR 60.7 and 60.334 shall be submitted to the Department's Northeast District office.

24. Fugitive dust emissions, during the construction period, shall be minimized by covering or watering dust generation areas.

25. Pursuant to F.A.C. Rule 17-210.300(2), Air Operating Permits, the permittee is required to submit annual reports on the actual operating rates and emissions from this facility. These reports shall include, but are not limited to the following: sulfur content and the lower heating value of the fuel being fired, fuel usage, hours of operation, air emissions limits, etc. Annual reports shall be sent to the Department's Northeast District office by March 1 of each calendar year.

26. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

27. An application for an operation permit must be submitted to the Northeast District office at least 90 days prior to the expiration date of this construction permit. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rules 17-4.055 and 17-4.220).

Issued this ______ day

of _______________, 1993

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

____
Virginia B. Wetherell, Secretary

Best Available Control Technology (BACT) Determination
Florida Gas Transmission Company
Taylor County-PSD-FL-202

The applicant proposes to expand an existing natural gas pipeline compressor station No. 15 near the town of Perry in Taylor County, Florida. The proposed expansion consists of adding one new 12,600 brake horsepower (BHP) natural-gas-fired, turbine engine.

The applicant has indicated the maximum total annual tonnage of regulated air pollutants emitted from the proposed turbine engine based on 8,760 hrs/year operation to be as follows:

Pollutant	Max. Net Increase in Emissions (TPY)	PSD Significant Emission Rate (TPY)
NOx	70.70	40
SO_2	13.18	40
PM/PM_{10}	2.32	25/15
CO	51.30	100
VOC	2.93	40

Rule 17-212.400(2)(f)(3) of the Florida Administrative Code (F.A.C.) requires a BACT review for all regulated pollutants emitted in an amount equal to or greater than the significant emission rates listed in the previous table. In this case, BACT is only required for nitrogen oxides (NOx).

BACT Determination Requested by the Applicant

The BACT Determination requested by the applicant is given below:

Pollutant	Proposed Limits
NOx	42 ppmvd at 5% O_2

Date of Receipt of a BACT Application

April 7, 1993

Review Group Members

This determination was based upon comments received from the applicant and the Permitting and Standards Section.

BACT DETERMINATION PROCEDURE

In accordance with F.A.C. Chapter 17-212, this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available control methods, systems and techniques.

In addition, the regulations require that in making the BACT determination the Department shall give consideration to:

(a) Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).

(b) All scientific, engineering and technical material and other information available to the Department.

(c) The emission limiting standards or BACT determinations of any other State.

(d) The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine for the emission source in question the most stringent control available for a similar or identical source or source category. If it is shown that this level of control is technically or economically infeasible for the source in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

BACT ANALYSIS FOR NITROGEN OXIDES (NOx)

CONTROL TECHNOLOGY REVIEW

The uncontrolled emissions of nitrogen oxides (245.4 TPY) represent a significant proportion of the total emissions generated by this project, and need to be controlled if deemed appropriate. As such, the applicant presented an extensive analysis of the different available technologies for NOx control.

The technologies that were evaluated in the application are:

- Selective catalytic reduction (SCR)
- Dry low-NOx combustion controls (Dry Low NOx)
- Wet (water/steam) injection
- Selective noncatalytic reduction (SNCR)
- Nonselective catalytic reduction (NSCR)

The applicant has indicated that only two of the above technologies (SCR & Dry Low-NOx) presented are technically feasible alternatives for control of NOx emissions from gas turbines in compressor service stations.

Dry Combustion Technology (Dry Low-NOx)

Dry combustion techniques are designed to alter the conditions in the combustion chamber to influence the temperature, residence time, and mixing of air and fuel so as to reduce the amount of NOx formed. The state-of-the-art concept in designing a low-NOx turbine involves raising the air-to-fuel ratio in the combustion primary zone and thoroughly premixing primary combustion air and fuel. This reduces NOx formation by lowering the average flame temperature in the combustor primary zone and avoiding localized hot spots.

Dry combustion controls will reduce NOx emissions for this turbine by 173.79 TPY. Annual NOx emissions are expected not to exceed 70.7 TPY (42 ppmvd at 15% O_2). Total annual cost for this technology is estimated to be $103,134. Therefore, NOx controls costs will be $593 per ton of NOx removed based on a 10 years operating life for the dry low control installation. This makes dry low-NOx combustion a technically and economically feasible control method for natural gas pipeline turbines.

The applicant has proposed that BACT for nitrogen oxides will be met by using dry low NOx combustor design to limit emissions to 42 ppmvd at 15% O_2 when burning natural gas.

A review of the EPA's BACT/LAER Clearinghouse indicates that the lowest NOx emission limit established to date for a gas turbine at a compressor station is 8.0 ppmvd at 15% oxygen. This level of control was accomplished through the use of a selective catalytic reduction (SCR) system.

Selective Catalytic Reduction (SCR)

Selective catalytic reduction is a post-combustion method for control of NOx emissions. The SCR process combines vaporized ammonia with NOx in the presence of a catalyst to form nitrogen and water. The vaporized ammonia is injected into the exhaust gases prior to passage through the catalyst bed. The SCR process can achieve up to 90% reduction of NOx with a new catalyst. As the catalyst ages, the maximum NOx reduction will decrease to approximately 86 percent.

The effect of exhaust gas temperature on NOx reduction depends on the specific catalyst formulation and reactor design. Most commercial SCR systems operate over a temperature range of about 600-750°F although recently developed zeolite-based catalysts are claimed to be capable of operating at temperatures as high as 950°. At levels above and below this window, the specific catalyst formulation will not be effective and NO_x reduction will decrease. Operating at high temperatures can permanently damage the catalyst through sintering of surfaces.

For this type of turbines, a significant design concern is the location of the catalyst bed within the flue gas duct work to ensure that the required SCR temperature "window" is met. A typical gas turbine in compressor service has an exhaust temperature near 1000°F (Solar, 1991), either water quench, dilution with ambient air, or heat recovery, would be required in order to bring the turbine exhaust temperature into the SCR window. All three temperature reduction methods have detrimental side effects.

Another major technical problem, identified by the applicant, is the reliability of the required automated control equipment. As engine power demand fluctuates, gas density, temperature, flow rate, and other system operational characteristics vary. As these factors change, engine exhaust flow rate, exhaust temperature, and other parameters important to maintaining catalytic NOx reduction efficiency also change. This limits the application of SCR at natural gas compressor stations, which are often designed to operate in an unattended mode.

In addition, flow variations in natural gas pipelines impose an additional design complication for the reliable high conversion operation of the SCR process. The systems must be designed to cope with the maximum and minimum flow and the maximum and minimum temperature without prohibitive additional reheat costs and multiple ammonia injection systems. The appropriate method to operate without excessive ammonia slip at the low temperature, low flow condition is to select an active catalyst that will allow high conversion of ammonia at low temperature with an ammonia/NOx ratio close to one. This will provide high conversion of NOx at low load and temperature and somewhat lower conversions at high load without excessively complex ammonia control technology. There are no complex ammonia controls on existing compressor stations that are capable of coping with the flow and temperature variations found in natural gas transmission service. Moreover, the sophisticated controls needed for a system this complex may require extensive operator attention and maintenance.

The 90% NOx removal specified in other BACT analyses is not technically feasible for Compressor Station No. 15 because the SCR system must be designed to satisfy both high and low load conditions. Tradeoffs in SCR system operation to limit ammonia slip decrease the amount of NOx removal possible. A maximum of approximately 80% NOx removal is deemed technically feasible for SCR over the entire operating range of the proposed turbines.

BACT EVALUATION BY THE DEPARTMENT

Although technically feasible, the applicant has rejected using SCR on this type of turbine because of economic, energy, and environmental impacts. The following limitations, identified by the applicant, has been evaluated by the Department.

Energy Impact

The energy impacts of SCR will increase electrical power generation by 0.6 MW hr/yr

Economic Impact

Given the applicant's proposed BACT level for nitrogen oxides, an evaluation was made of the cost and associated benefit of using SCR as follows:

The applicant has indicated that the total annual cost to install SCR at 100 percent capacity factor is $962,378. Taking into consideration the total annual cost, a cost/benefit analysis of using SCR was developed.

Based on the information supplied by the applicant, it is estimated that the maximum annual NOx emissions from the proposed compressor engine will be 245.40 tons/year. Assuming that SCR would reduce NOx emissions by 80%, the SCR would control approximately 195.6 tons of NOx annually. When this reduction (195.6 TPY NOx) is taken into consideration with the total annual cost of $962,378, the total cost per ton of controlling NOx is $4,920 per ton NOx removed. This cost is not representative of costs that have been previously justified as BACT for this type of turbine.

Environmental Impact

The use of SCR could result in accidental spills, emissions of ammonia, and the handling of spent catalyst which is sometimes classified as hazardous waste.

In addition to nitrogen oxides and ammonia, the impacts of toxic pollutants associated with the combustion of natural gas have been evaluated. These toxics (formaldehyde and polycyclic organic matter) common to the combustion of natural gas, are expected to be emitted in minimal amounts and will not have an impact on air quality or this BACT analysis.

BACT DETERMINATION BY THE DEPARTMENT

Based on the information presented by the applicant and the studies conducted, the Department believes that the NOx control emission technology proposed by the applicant satisfies the BACT requirement for this 12,600 HP gas turbine. A review of the latest BACT Clearinghouse determinations for NOx show limits of 25 ppmvd at 15% O_2 (natural gas) using dry low-NOx burn technology. Solar is currently developing dry low NOx programs to achieve emission control level of 25 ppmvd at 15% oxygen when firing natural gas. Therefore, since this technology will likely be available by 1997, the Department has accepted the proposed 42 ppmvd (natural gas) at 15% O_2 as a BACT for a limited time.

Although add-on control (SCR) could be used to provide additional control, the benefits that would be obtained do not warrant the cost. The emission limit for the 12,600 HP gas turbine is thereby established as follows:

Pollutant	Emission Limit
NOx	42 ppmvd at 15% O_2 25 ppmvd at 15% O_2, not later than 1/1/98

Note: Initial NOx emission rates for natural gas firing shall not exceed 42 ppmvd at 15% oxygen on a dry basis. The permittee shall achieve NOx emissions of 25 ppmvd at 15% oxygen at the earliest achievable date, but not later than 1/1/98.

Details of the Analysis May be Obtained by Contacting:

Doug Outlaw, P.E., BACT Coordinator
Department of Environmental Regulation
Bureau of Air Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended by:

C. H. Fancy, P.E., Chief
Bureau of Air Regulation

________________________1993
Date

Approved by:

Virginia B. Wetherell, Secretary
Dept. of Environmental Regulation

________________________1993
Date

BEST AVAILABLE COPY

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

DISTRICT ROUTING SLIP

TO: Johnny Cole DATE: 4-9-93

			CC TO
	PENSACOLA	**Northwest District**	
	PANAMA CITY	Northwest District Branch Office	
	TALLAHASSEE	Northwest District Branch Office	
	TAMPA	**Southwest District**	
	ORLANDO	**Central Florida District**	
	MELBOURNE	Central Florida District Branch Office	
X	**JACKSONVILLE**	**Northeast District**	
	GAINESVILLE	Northeast District Branch Office	
	FORT MYERS	**South Florida District**	
	PUNTA GORDA	South Florida District Branch Office	
	MARATHON	South Florida District Branch Office	
	WEST PALM BEACH	**Southeast Florida District**	
	PORT ST. LUCIE	Southeast Florida District Branch Office	

Reply Optional ☐ Reply Required ☐ Info Only ☐

Date Due: Date Due:

COMMENTS: AC 62-229319
PSD-FL-202

Please submit comments by 5-5-93.

FROM: C. H. Fancy

TEL: SC/278-1344

Flo
Tran
Co

April 1993

File Copy

Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Virginia B. Wetherell, Secretary

April 9, 1993

Ms. Jewell A. Harper, Chief
Air Enforcement Branch
U.S. EPA, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30308

Dear Ms. Harper:

RE: FL Gas Transmission Company
Compressor Station #15
Taylor County, PSD-FL-202

The Department has received the above referenced PSD application package. Please review this package and forward your comments to the Department's Bureau of Air Regulation by May 5, 1993. The Bureau's FAX number is (904)922-6979.

If you have any questions, please contact Teresa Heron or Katherine Zhang at (904)488-1344 or write to me at the above address.

Sincerely,

R Bruce Mitchell
for C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/pa

Enclosures

Reading File
Teresa Heron
Katherine Zhang
4-9-93 RR

File Copy

Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Virginia B. Wetherell, Secretary

April 9, 1993

Mr. John Bunyak, Chief
Policy, Planning and Permit Review Branch
National Park Service-Air Quality Division
P. O. Box 25287
Denver, CO 80225

Dear Mr. Bunyak:

RE: FL Gas Transmission Company
Compressor Station #15
Taylor County, PSD-FL-202

The Department has received the above referenced PSD application package. Please review this package and forward your comments to the Department's Bureau of Air Regulation by May 5, 1993. The Bureau's FAX number is (904)922-6979.

If you have any questions, please contact Teresa Heron or Katherine Zhang at (904)488-1344 or write to me at the above address.

Sincerely,

R. Bruce Mitchell

for C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/pa

Enclosures

Reading File
Teresa Heron
Katherine Zhang
4-9-93 RR

Florida Gas Transmission Company

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

May 5, 1993

RECEIVED
MAY 07 1993
Division of Air
Resources Management

Ms. Teresa Heron
Air Permitting and Standards
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Air Permit Application
Natural Gas Compressor Station No. 15, Taylor County

Dear Ms. Heron:

Thank you for providing me with some of your time last week to discuss the air permit applications that we have submitted as part of our Phase III Project. I know you have a very busy schedule.

During our discussion of the BACT portion of the PSD Application for Compressor Station No. 15, I indicated that we had added a summary table with later PSD applications and that I would provide you with one for Compressor Station No. 15. I have attached six copies of Table 6-4 to be added to the PSD Application for Compressor Station No. 15. This table, titled "Summary of Top-Down BACT Impact Analysis Results for NO_x for a Stationary Gas Turbine Compressor Engine," summarizes the results of the BACT Analysis for Compressor Station No. 15.

I hope you find this table useful for your evaluation of this application. Should you have any questions concerning this or about any of our other applications, please do not hesitate to call me at (713) 853-3569.

Sincerely,

V. Duane Pierce

V. Duane Pierce, Ph.D.
Air Quality Supervisor
Phase III Expansion
Florida Gas Transmission Company

Ms. Teresa Heron
May 5, 1993
Page 2

cc: William Osborne - FGTC
File Phase III Air CS 15

FILE: PIERCE/CORRES/15FDER01.LTR

cc: K. Zhang
g. Cole, NE Dist.
g. Harper, EPA
g. Bunyak, NPS

Table 6–4
Summary of Top–Down BACT Impact Analysis Results for NOx for a Stationary Gas Turbine Compressor Engine

Control Alternative	Annual Emissions (TPY)*	Total Emission Reduction (TPY)*	Incremental Emission Reduction (TPY)*	Environmental Impacts: Potential Toxic Air Impact?	Environmental Impacts: Potential Adverse Environmental Impacts?	Energy Impacts Incremental Increase over baseline: Natural Gas (MMBtu/yr)	Energy Impacts Incremental Increase over baseline: Electricity (MW–hr/yr)	Total Annualized Cost ($/yr)	Economic Impacts: Incremental Annualized Cost ($/yr)	Economic Impacts: Total Cost Effectiveness ($/ton)	Economic Impacts: Incremental Cost Effectiveness ($/ton)
Turbine Plus SCR	48.9	195.6	21.8	No	No	0	0.6	$962,378	$859,244	$4,920	$39,415
Dry Low NOx Combustion	70.7	173.8	173.8	No	No	0	0	$103,134	$103,134	$593	$593
Baseline	244.5	-----	-----	---	---	-----	---	-----	-----	---	---

* Total emission reduction, total annualized cost effectiveness are calculated based on similar baseline parameter values.
** Incremental values are based on the next lower control technology's parameter values.

Table 6-4
Summary of Top-Down BACT Impact Analysis Results for NOx for a Stationary Gas Turbine Compressor Engine

Control Alternative	Annual Emissions (TPY)*	Total Emission Reduction (TPY)*	Incremental Emission Reduction (TPY)*	Environmental Impacts: Potential Toxic Air Impact?	Environmental Impacts: Potential Adverse Environmental Impacts?	Energy Impacts Incremental Increase over baseline: Natural Gas (MMBtu/yr)	Energy Impacts Incremental Increase over baseline: Electricity (MW-hr/yr)	Total Annualized Cost ($/yr)	Economic Impacts: Incremental Annualized Cost ($/yr)	Economic Impacts: Total Cost Effectiveness ($/ton)	Economic Impacts: Incremental Cost Effectiveness ($/ton)
Turbine Plus SCR	48.9	195.6	21.8	No	No	0	0.6	$962,378	$859,244	$4,920	$39,415
Dry Low NOx Combustion	70.7	173.8	173.8	No	No	0	0	$103,134	$103,134	$593	$593
Baseline	244.5	-----	-----	---	---	-----	---	-----	-----	---	---

* Total emission reduction, total annualized cost effectiveness are calculated based on similar baseline parameter values.
** Incremental values are based on the next lower control technology's parameter values.

Table 6-4

Summary of Top-Down BACT Impact Analysis Results for NOx for a Stationary Gas Turbine Compressor Engine

Control Alternative	Annual Emissions (TPY)*	Total Emission Reduction (TPY)*	Incremental Emission Reduction (TPY)*	Environmental Impacts: Potential Toxic Air Impact?	Environmental Impacts: Potential Adverse Environmental Impacts?	Energy Impacts Incremental Increase over baseline: Natural Gas (MMBtu/yr)	Energy Impacts Incremental Increase over baseline: Electricity (MW-hr/yr)	Total Annualized Cost ($/yr)	Economic Impacts: Incremental Annualized Cost ($/yr)	Economic Impacts: Total Cost Effectiveness ($/ton)	Economic Impacts: Incremental Cost Effectiveness ($/ton)
Turbine Plus SCR	48.9	195.6	21.8	No	No	0	0.6	$962,378	$859,244	$4,920	$39,415
Dry Low NOx Combustion	70.7	173.8	173.8	No	No	0	0	$103,134	$103,134	$593	$593
Baseline	244.5	-----	-----	---	---	-----	---	-----	-----	---	---

* Total emission reduction, total annualized cost effectiveness are calculated based on similar baseline parameter values.

** Incremental values are based on the next lower control technology's parameter values.

Table 6–4
Summary of Top–Down BACT Impact Analysis Results for NOx for a Stationary Gas Turbine Compressor Engine

Control Alternative	Annual Emissions (TPY)*	Total Emission Reduction (TPY)*	Incremental Emission Reduction (TPY)*	Environmental Impacts: Potential Toxic Air Impact?	Environmental Impacts: Potential Adverse Environmental Impacts?	Energy Impacts Incremental Increase over baseline: Natural Gas (MMBtu/yr)	Energy Impacts Incremental Increase over baseline: Electricity (MW–hr/yr)	Total Annualized Cost ($/yr)	Economic Impacts: Incremental Annualized Cost ($/yr)	Economic Impacts: Total Cost Effectiveness ($/ton)	Economic Impacts: Incremental Cost Effectiveness ($/ton)
Turbine Plus SCR	48.9	195.6	21.8	No	No	0	0.6	$962,378	$859,244	$4,920	$39,415
Dry Low NOx Combustion	70.7	173.8	173.8	No	No	0	0	$103,134	$103,134	$593	$593
Baseline	244.5	-----	-----	---	---	-----	---	-----	-----	---	---

* Total emission reduction, total annualized cost effectiveness are calculated based on similar baseline parameter values.
** Incremental values are based on the next lower control technology's parameter values.

Table 6-4
Summary of Top-Down BACT Impact Analysis Results for NOx for a Stationary Gas Turbine Compressor Engine

Control Alternative	Annual Emissions (TPY)*	Total Emission Reduction (TPY)*	Incremental Emission Reduction (TPY)*	Environmental Impacts: Potential Toxic Air Impact?	Environmental Impacts: Potential Adverse Environmental Impacts?	Energy Impacts Incremental Increase over baseline: Natural Gas (MMBtu/yr)	Energy Impacts Incremental Increase over baseline: Electricity (MW-hr/yr)	Total Annualized Cost ($/yr)	Economic Impacts: Incremental Annualized Cost ($/yr)	Economic Impacts: Total Cost Effectiveness ($/ton)	Economic Impacts: Incremental Cost Effectiveness ($/ton)
Turbine Plus SCR	48.9	195.6	21.8	No	No	0	0.6	$962,378	$859,244	$4,920	$39,415
Dry Low NOx Combustion	70.7	173.8	173.8	No	No	0	0	$103,134	$103,134	$593	$593
Baseline	244.5	-----	-----	---	---	-----	---	-----	-----	---	---

* Total emission reduction, total annualized cost effectiveness are calculated based on similar baseline parameter values.
** Incremental values are based on the next lower control technology's parameter values.

Table 6-4
Summary of Top-Down BACT Impact Analysis Results for NOx for a Stationary Gas Turbine Compressor Engine

Control Alternative	Annual Emissions (TPY)*	Total Emission Reduction (TPY)*	Incremental Emission Reduction (TPY)*	Environmental Impacts		Energy Impacts Incremental increase over baseline		Total Annualized Cost ($/yr)	Economic Impacts		
				Potential Toxic Air Impact?	Potential Adverse Environmental Impacts?	Natural Gas (MMBtu/yr)	Electricity (MW-hr/yr)		Incremental Annualized Cost ($/yr)	Total Cost Effectiveness ($/ton)	Incremental Cost Effectiveness ($/ton)
Turbine Plus SCR	46.9	195.6	21.8	No	No	0	0.6	$962,378	$859,244	$4,920	$39,415
Dry Low NOx Combustion	70.7	173.8	173.8	No	No	0	0	$103,134	$103,134	$593	$593
Baseline	244.5	-----	-----	---	---	-----	---	-----	-----	---	---

* Total emission reduction, total annualized cost effectiveness are calculated based on similar baseline parameter values.
** Incremental values are based on the next lower control technology's parameter values.

Florida Gas Transmission Company

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

RECEIVED
DER - MAIL ROOM
1993 APR -7 AM 10: 52

April 6, 1993

Mr. Clair Fancy, Chief
Bureau of Air Regulation
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

Florida Gas Transmission Company, an ENRON/SONAT affiliate, is proposing to expand its existing pipeline system and has filed an application with the Federal Energy Regulatory Commission for a certificate of public convenience and necessity. This expansion will require the installation of three new compressor stations and the addition of new engines at eight existing stations. As discussed in a meeting on December 18, 1992, with you, Mr. Preston Lewis, and other members of your staff, two of the new stations and four of the existing stations requiring new engines are located in Florida. One of these is Compressor Station No. 15, located in Taylor County, near Perry, Florida.

Attached for your consideration is one original and three copies of an application for a PSD permit for the addition of one new 12,600 bhp Solar Mars turbine at Compressor Station No. 15. A check for the permit fee in the amount of $7,500.00 is also attached.

Should you have any questions concerning this application, please call Dr. V. Duane Pierce at (713) 853-3569.

Sincerely,

CP C. D. Schulz
Vice President Project Management Services
Florida Gas Transmission Company

CDS:DP
pierce\corres\acovfl15.ltr
cc: J. Bunyak, NPS
J. Harper, ECA
J. Cole, NED
} 4-9-93

An **ENRON/SONAT** Affiliate

CHECK NO.
0622084215

FLORIDA GAS TRANSMISSION COMPANY
P.O. BOX 1188
HOUSTON, TEXAS 77251-1188

DATE OF CHECK
04-01-93
Rcpt # 180844

ENRON CORP

This check is VOID unless printed on BLUE background

VOID

EXACTLY $*****7,500 DOLLARS 00 CENTS

AMOUNT OF CHECK
$*****7,500.00

PAY TO THE ORDER OF
STATE OF FLORIDA DEPT OF
ENVIRONMENTAL REGULATION
TWIN TOWERS OFFICE BUILDING
TALLAHASSEE, FL
32399-2400

BY ______________
"AUTHORIZED REPRESENTATIVE"

NORWEST BANK GRAND JUNCTION

[redacted]

REMITTANCE STATEMENT
FLORIDA GAS TRANSMISSION COMPANY

CHECK NO. 0622084215

PAGE 001 OF 001

VOUCHER NO.	INVOICE DATE	INVOICE NUMBER	PURCHASE ORDER	AMOUNT GROSS	AMOUNT DISCOUNT	AMOUNT NET
9304000089	040193	CKR04019301		7,500.00	0.00	7,500.00
AIR PERMIT APPLICATION FEE FOR COMPRESSOR STATION NO. 15 - PERRY, TAYLOR COUNTY, FLORIDA						
					TOTAL	7,500.00

Special Instructions
CALL MARCY BABB, X3295

P. O. BOX 1188, HOUSTON,TEXAS 77251-1188
DETACH STATEMENT BEFORE DEPOSITING. ENDORSEMENT OF CHECK ATTACHED ACKNOWLEDGES PAYMENT IN FULL OF ALL ITEMS SHOWN ABOVE. IN CASE OF ERROR OR OMISSION RETURN BOTH CHECK AND STATEMENT

AC 62-229319
PSD-FL-202
Rc'd 4-7-93
Rcpt # 180844
$7500.00

Florida Gas Transmission Company

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

April 6, 1993

RECEIVED

APR 7 1993

Division of Air
Resources Management

Mr. Clair Fancy, Chief
Bureau of Air Regulation
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

Florida Gas Transmission Company, an ENRON/SONAT affiliate, is proposing to expand its existing pipeline system and has filed an application with the Federal Energy Regulatory Commission for a certificate of public convenience and necessity. This expansion will require the installation of three new compressor stations and the addition of new engines at eight existing stations. As discussed in a meeting on December 18, 1992, with you, Mr. Preston Lewis, and other members of your staff, two of the new stations and four of the existing stations requiring new engines are located in Florida. One of these is Compressor Station No. 15, located in Taylor County, near Perry, Florida.

Attached for your consideration is one original and three copies of an application for a PSD permit for the addition of one new 12,600 bhp Solar Mars turbine at Compressor Station No. 15. A check for the permit fee in the amount of $7,500.00 is also attached.

Should you have any questions concerning this application, please call Dr. V. Duane Pierce at (713) 853-3569.

Sincerely,

Cf
C. D. Schulz
Vice President Project Management Services
Florida Gas Transmission Company

CDS:DP
pierce\corres\acovfl15.ltr

Florida Gas Transmission Company

PHASE III EXPANSION PROJECT

Compressor Station No. 15
Taylor County, Florida

Prevention of Significant Deterioration and Permit to Construct Application

April 1993

CONTENTS

CONTENTS
(Cont'd)

CONTENTS
(Cont'd)

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

Florida Gas Transmission Company (FGTC), a Delaware Corporation and ENRON/SONAT affiliate of Houston, Texas, is proposing to expand its existing natural gas pipeline facility in Taylor County, Florida (Compressor Station No.15). This proposed modification is part of FGTC's Phase III expansion project, aimed at increasing the supply capacity of FGTC's network servicing domestic, commercial, and industrial customers in Florida. The scope of work for the Phase III project includes expansion through the addition of state-of-the-art compressor engines at eight existing compressor stations and the development of three new compressor stations. The new pipeline will follow much of the right-of-way of the existing system. 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.

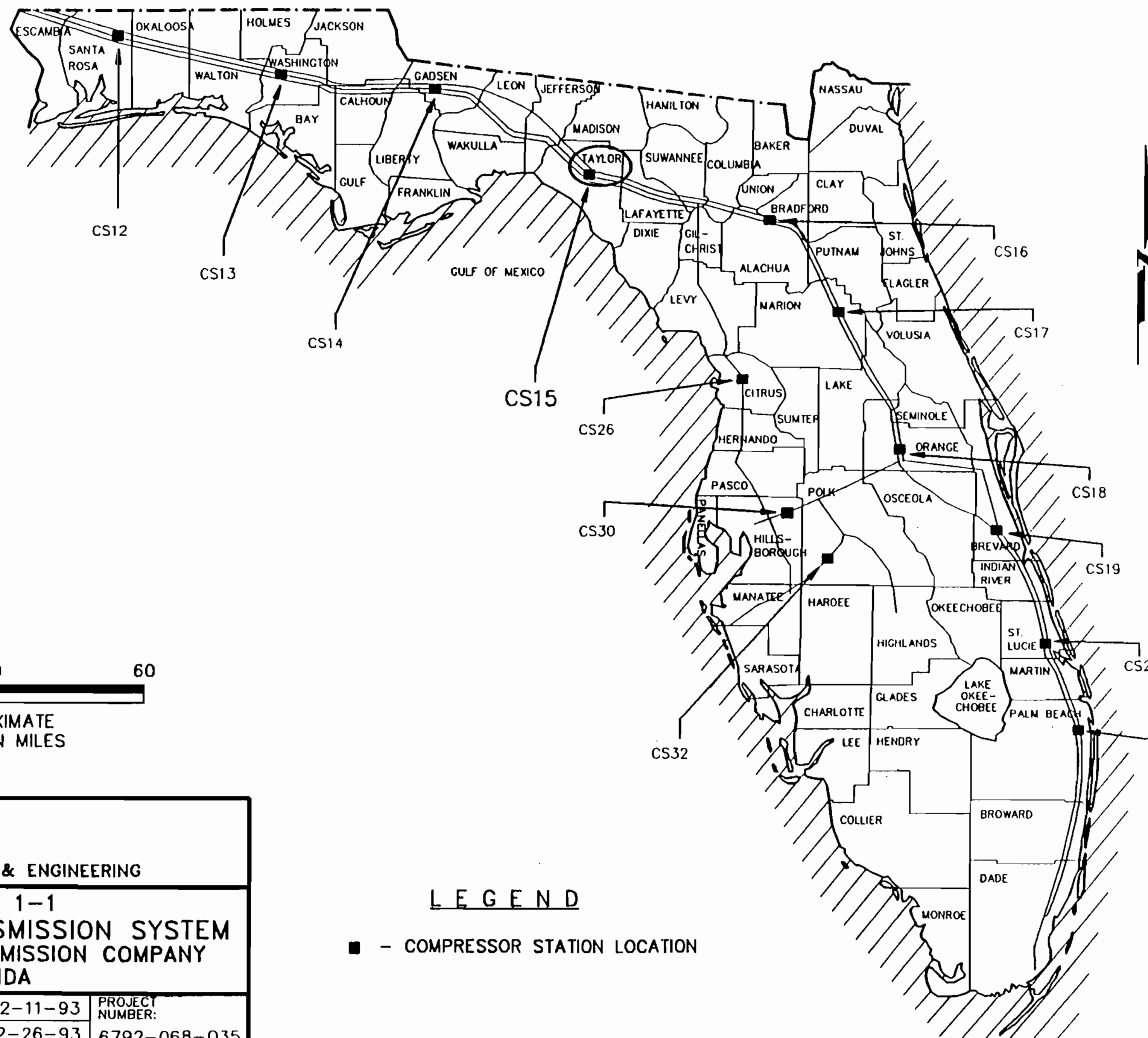
The route of the main gas pipeline and the approximate location of Compressor Station No. 15 along the main pipeline are shown in Figure 1-1.

Compressor Station No. 15 is located approximately 6 miles north of the town of Perry on Pisgah Road in Taylor County, Florida. Figure 1-2 shows the location of the existing compressor station.

The proposed expansion at this location consists of the installation of one (1) 12,600 (ISO) brake horsepower (bhp), natural-gas-fired, turbine engine. The proposed engine will be used solely for the purpose of transporting natural gas by pipeline for distribution to markets in Florida. The proposed engine is a Solar Mars T-12000 equipped with dry low NO_x combustion. Under current federal and state air quality regulations, the proposed engine will constitute a major modification at an existing major stationary source.

This report addresses the requirements of the Prevention of Significant Deterioration (PSD) review procedures pursuant to rules and regulations implementing the Clean Air Act (CAA) Amendments of 1977. The Florida Department of Environmental Regulations (FDER) has PSD review and approval authority in the State of Florida. Based on the projected maximum emission rates for the proposed 12,600 (ISO) bhp engine, there will be a PSD significant increase in only NO_x emissions.

CE679261
12-15-92



60 0 60

APPROXIMATE
SCALE IN MILES

ENSR™

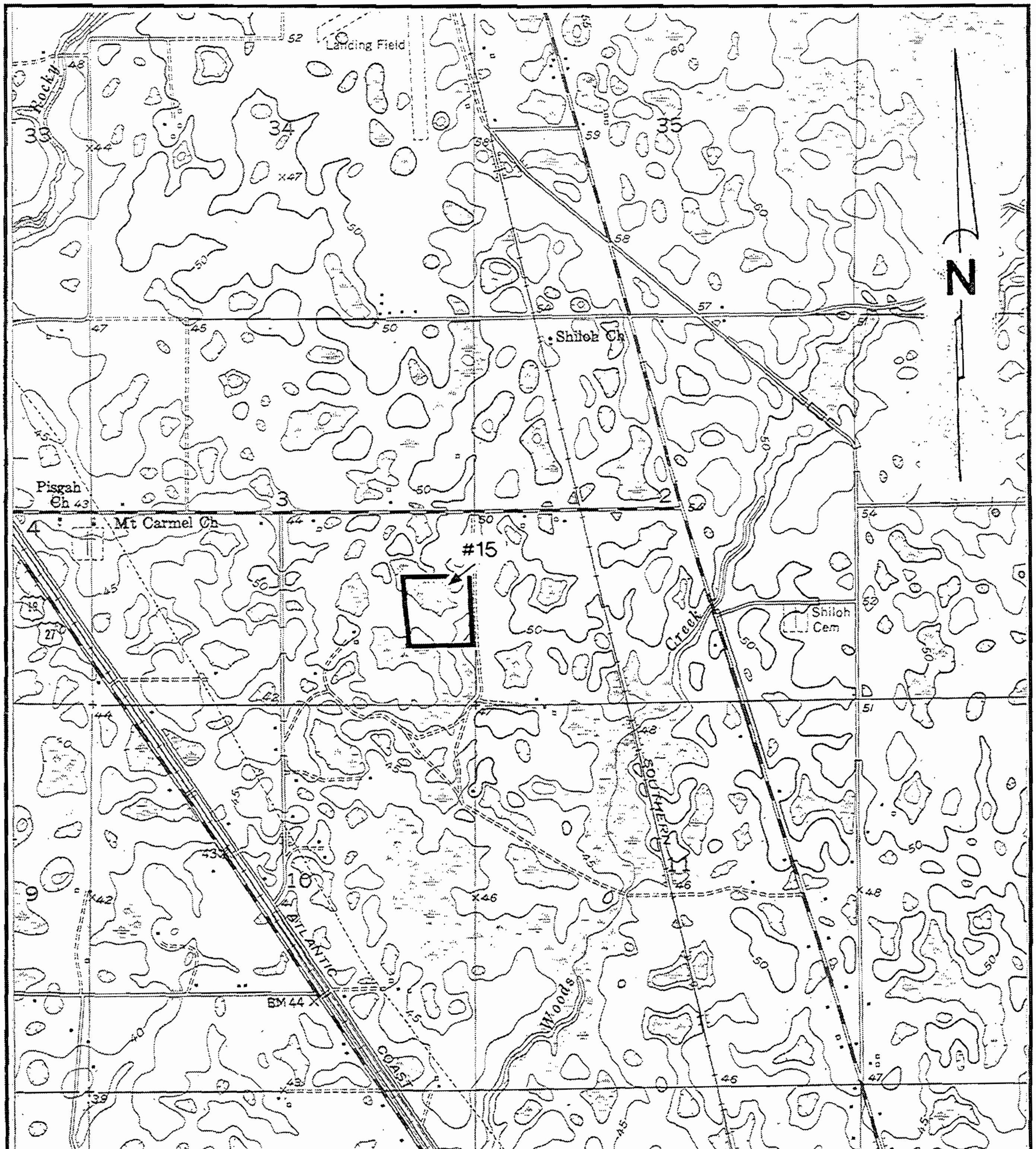
ENSR CONSULTING & ENGINEERING

FIGURE 1-1
FGTC'S GAS TRANSMISSION SYSTEM
FLORIDA GAS TRANSMISSION COMPANY
FLORIDA

DRAWN: SJF/SH	DATE: 2-11-93	PROJECT NUMBER:
APPV'D:	REVISED: 2-26-93	6792-068-035

LEGEND

■ - COMPRESSOR STATION LOCATION



0 2000 4000

SCALE IN FEET

REFERENCE: U.S.G.S. Quadrangle Map for Boyd, Florida, 1954.

ENSR CONSULTING AND ENGINEERING

FIGURE 1-2
SITE LOCATION MAP
COMPRESSOR STATION #15
FLORIDA GAS TRANSMISSION COMPANY
PERRY, FLORIDA

DRAWN BY: SJF/SH	DATE: 12-16-92	PROJECT NUMBER:
CHK'D.BY:	REVISED: 1-12-93	6792-068-035

TOPO

The increases in all other pollutants, when considered alone, are below the PSD significant emission rates.

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 represents Best Available Control Technology (BACT) for the proposed turbine engine.

This application contains six additional sections. Descriptions of the existing operation at FGTC's Compressor Station No.15 and the proposed 12,600 (ISO) bhp engine addition are presented in Section 2.0. The air quality review requirements and applicability of state and federal regulations are discussed in Section 3.0. The methodology and results of the air dispersion modeling and air quality impact analysis are presented in Section 4.0, and impacts on soil, vegetation, and visibility are summarized in Section 5.0. The BACT analysis required as part of the PSD permitting process is presented in Section 6.0. References are included in Section 7.0.

FDER permit application forms are presented in Appendix A. Additional appendices contain information which supports the representations made in this application.

2.0 PROJECT DESCRIPTION

A plot plan of FGTC's Compressor Station No. 15, showing the location of the plant boundaries, the existing emission sources, and the location of the proposed engine addition, is presented in Appendix 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

FGTC's existing Compressor Station No. 15 consists of five (5) 2,000 bhp and one (1) 4,000 bhp natural-gas-fired reciprocating internal combustion (IC) engines. Table 2-1 summarizes engine manufacturer, model, and dates of installation for each of the existing engines. The original installation was made in 1962 (Compressor Engines 1501 through 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. These existing engines are not being modified as part of this expansion project.

2.2 Proposed Compressor Station Addition

As part of the Phase III project, FGTC proposes to increase the horsepower capacity of Compressor Station No. 15. This will be achieved by adding one new gas turbine (Compressor Engine 1507). The proposed new engine will be used to drive a gas compressor that is a part of a new gas transmission line that will transport 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 Compressor Engine Addition

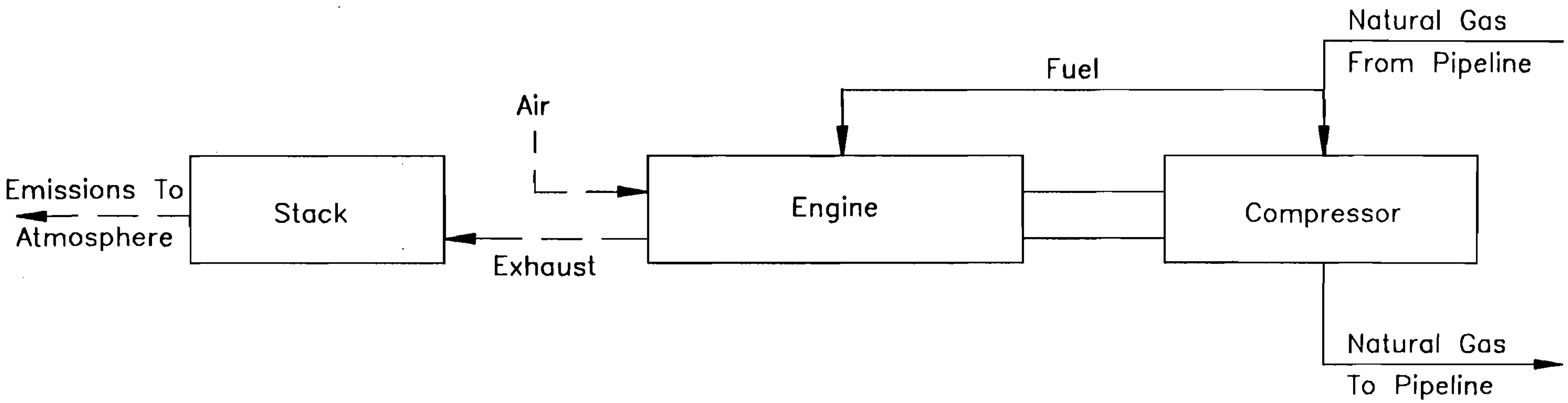
FGTC proposes to install one natural gas-fired turbine engine and associated support equipment at Compressor Station No. 15. The turbine engine will be a Solar Mars T-12000 engine compressor unit ISO rated at 12,600 bhp at 8,800 revolutions per minute (rpm). A flow diagram of a typical compressor unit is presented in Figure 2-1. Fuel will be exclusively natural gas from the FGTC's gas pipeline. Engine specifications and stack parameters for the proposed engine are presented in Table 2-2. The proposed engine will incorporate dry, low NO_x combustion technology.

TABLE 2-1

Summary of Existing Engine Information
Compressor Station No. 15

Engine #	Date of Installation	Type	Manufacturer	Model #	Brake Horse Power (bhp)
1501	1962	Reciprocating	Worthington	SEHG-8G	2000
1502	1962	Reciprocating	Worthington	SEHG-8G	2000
1503	1962	Reciprocating	Worthington	SEHG-8G	2000
1504	1966	Reciprocating	Worthington	SEHG-8G	2000
1505	1968	Reciprocating	Worthington	SEHG-8G	2000
1506	1991	Reciprocating	Cooper - Bessemer	GW-330-C2	4000

CE679259
(DALLAS/HPCL21)



ENSR CONSULTING & ENGINEERING

FIGURE 2-1
PROCESS FLOW DIAGRAM
OF AN
ENGINE-COMPRESSOR UNIT

DRAWN: DC/SH	DATE:	11-6-92	PROJECT NUMBER:	
APPV'D:	REVISED:	3-16-93	6792-068	

TABLE 2-2

Engine Specifications and Stack Parameters for the Proposed Project

Parameter	Design Specification
Compressor Engine	1507
Type	Gas Turbine
Manufacturer	Solar
Model	Mars T-12000
Unit Size	12,600 bhp ISO Rated
Specific Heat Input	8,703 Btu/bhp-hr
Maximum Fuel Consumption [a]	0.1054 MMscf/hr
Speed	8800 rpm
Stack Parameters	
Stack Height	55 ft
Stack Diameter	7.55 ft x 7.55 ft (square)
Exhaust Gas Flow	171,106 acfm
Exhaust Temperature	870 °F
Exhaust Gas Velocity	50.03 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.
lb/hr	=	pounds per hour.
MMscf/hr	=	million standard cubic feet per hour
rpm	=	revolutions per minute.

[a] Based on heating value for natural gas of 1,040 British thermal units per standard cubic foot (Btu/scf).

Hourly and annual emissions of regulated pollutants from the proposed engine under normal operating conditions, are presented in Table 2-3. The table also includes the maximum hourly emissions which can be expected from this proposed engine. These maximum values represent the highest emission rate the unit could produce under any operating condition. It should be noted that these highest emission rates would only occur under extreme load and weather conditions which are unlikely to be encountered at the compressor station. They have been included to ensure the facility is properly permitted. 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 Appendix C).

Typically, turbine vendors do not provide information on particulate or SO_2 emissions; therefore, particulate matter (PM) emissions are based upon USEPA publication AP-42 (USEPA, 1985) emission factors for natural gas combustion in boilers and emissions of sulfur dioxide (SO_2) are based on FGTC's natural gas contract limit of 10 grains sulfur per 100 cubic feet of gas.

2.2.2 Support Equipment Additions

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

- A new compressor building
- A new control building
- An extension to an existing utility building
- One - 2,000 gallon new lube oil storage tank.

The location of new on-site structures is shown on the facility plot plan contained in Appendix B. The new compressor building, housing the Solar Mars turbine, has approximate dimensions of 40 feet wide by 70 feet long by 32 feet high. The new control building will be located west of the new compressor building and the new utility building extension will be added to an existing structure to the northeast. The approximate dimensions of these buildings will be 20 feet wide by 20 feet long by 12 feet high for the control building and 20 feet wide by 24 feet long by 12 feet high for the utility building extension. Due to the size of these buildings and their distance from the new exhaust stack, they will not influence compressor engine emissions.

Proper lubrication is essential for optimal performance of compressor engines, which must be capable of 24-hour operation for extended periods. For this reason lube oil will be stored on-site. New lube oil required by the turbine will be stored in a new 2,000 gallon above ground tank. This will be a horizontal tank five feet in diameter, 13 feet 8 inches long and equipped with a relief valve and/or rupture disk to control emissions.

TABLE 2-3

Emissions from FGTC's Proposed Compressor Engine

Pollutant	Emission Factor	Reference	Compressor Emissions		
			Maximum lb/hr	Nominal lb/hr	TPY
Nitrogen Oxides	0.58 grams/bhp-hr	Manufacturer Data	18.66	16.14	70.70
Carbon Monoxide	0.42 grams/bhp-hr	Manufacturer Data	13.49	11.71	51.30
Volatile Organic Compounds (non-methane)	0.024 grams/bhp-hr	Manufacturer Data	0.76	0.67	2.93
Particulate Matter	0.019 grams/bhp-hr	AP-42 (factor of 5 lb/MMscf)	0.53	0.53	2.32
Sulfur Dioxide	0.11 grams/bhp-hr	10 grains/100 scf	3.01	3.01	13.18

NOTE:

Maximum natural gas consumption is 93,200 standard cubic feet per hour (scf/hr).

grams/bhp-hr = grams per brake horsepower per hour.
grains/100scf = grains per one hundred standard cubic feet.
lb/hr = pounds per hour.
lb/MMscf = pounds per million standard cubic feet.
scf = standard cubic feet
TPY = tons per year.

Annual emissions have been estimated using USEPA's AP-42 (USEPA, 1990) procedures and are not expected to exceed 0.00033 TPY.

2.2.3 Fugitive Emissions

Potential new emissions from Compressor Station No. 15 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. Table 2-4 lists the quantities of existing and new components to be added as part of the Phase III project and an estimate of the fugitive emissions from these sources.

2.2.4 Emissions summary

The total change in emissions resulting from the project are listed on Table 2-5. As can be seen from the table, the emission increases are significant under PSD for only NO_x. The calculations used to estimate these emissions are presented in Appendix D.

TABLE 2–4
FGTC's Compressor Station No. 15
Fugitive VOC Emission Calculation
and Summary

COMPONENT TYPE	SERVICE	COMPONENT COUNT	EMISSION FACTORS	NM/NE * FRACTION	EMISSIONS LBS/HR	LBS/DAY	TONS/YR
CURRENT:							
Valve	Gas	145	1.06 Lbs/Day (a)	0.005	0.032	0.77	0.14
Flange	Gas	323	0.57 Lbs/Day (a)	0.005	0.038	0.92	0.17
Compressor Seal	Gas	6	39.7 Lbs/Day (a)	0.005	0.050	1.19	0.22
				Total	0.120	2.88	0.53
PROJECT ADDED:							
Valve	Gas	61	1.06 Lbs/Day (a)	0.005	0.013	0.32	0.06
Flange	Gas	106	0.57 Lbs/Day (a)	0.005	0.013	0.30	0.06
Compressor Seal	Gas	1	39.7 Lbs/Day (a)	0.005	0.008	0.20	0.04
				Total	0.034	0.82	0.15
FUTURE: (b)							
Valve	Gas	206			0.045	1.09	0.20
Flange	Gas	429			0.051	1.22	0.22
Compressor Seal	Gas	7			0.058	1.39	0.25
				Total:	0.154	3.70	0.68

Notes: (a) – EPA–450/3–83–007, page 3–9
(b) – Future = current + project added
* – NM/NE = non–methane/non–ethane

TABLE 2-5

Annual (TPY) Emission Levels
FGTC, Phase III
Compressor Station No. 15

SOURCE ID	DESCRIPTION	NO_x	CO	VOC (NM/NEHC)	SO_2	PM
EXISTING FACILITY						
	COMPRESSOR ENGINES:					
1501	2000 bhp Recip. Engine	212.47	27.04	8.50	1.79	0.31
1502	2000 bhp Recip. Engine	212.47	27.04	8.50	1.79	0.31
1503	2000 bhp Recip. Engine	212.47	27.04	8.50	1.79	0.31
1504	2000 bhp Recip. Engine	212.47	27.04	8.50	1.79	0.31
1505	2000 bhp Recip. Engine	212.47	27.04	8.50	1.79	0.31
1506	4000 bhp Recip. Engine	77.26	96.58	38.63	3.48	0.68
	OTHER SOURCES: *	1.65	2.45	2.62	0.02	<0.01
EXISTING TOTAL		1141.26	234.23	83.75	12.45	2.23
PROJECT RELATED						
	COMPRESSOR ENGINE:					
1507	12,600 bhp Turbine Engine	70.70	51.30	2.93	13.18	2.32
	TANKS:					
Tank #1	New Lube Oil	—	—	0.00**	—	—
	FUGITIVE	—	—	0.15	—	—
PROJECT TOTAL		70.70	51.30	3.08	13.18	2.32
STATION TOTAL ***		1211.96	285.53	86.83	25.63	4.55

* - Other Sources Includes; Ancillary equipment, storage tanks and equipment leaks.
** - actual emissions are insignificant at 0.00033 TPY
*** - STATION TOTAL = EXISTING + PROJECT

3.0 REGULATORY ANALYSIS

This section presents a review of federal and Florida state air quality regulations which govern the operations to be conducted at Compressor Station No. 15.

3.1 Federal Regulatory 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 key elements of the federal regulatory program and the impact they have on operations at Compressor Station No. 15. Special attention will be placed on National Ambient Air Quality Standards (AAQS) (40 CFR 50), New Source Performance Standards (NSPS) (40 CFR 60), National Emission Standards for Hazardous Air Pollutants (NESHAPS) (40 CFR 61), and Prevention of Significant Deterioration (PSD) (40 CFR 52.21).

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 which 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 which 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 prior to initiation of construction. Similar sources located in areas designated as non-attainment or that adversely impact such areas undergo more stringent New Source Review (NSR). In either case it is necessary, as a first step, to determine the air quality classification of a project site.

The 1990 CAA Amendments called for a review of the ambient air quality of all regions of the United States. States were required to file with the USEPA by March 15, 1991, designations of all areas as either attainment, non-attainment or unclassifiable. The current classification of

TABLE 3-1

NATIONAL AND STATE AMBIENT AIR QUALITY STANDARDS
($\mu g/m^3$)

	AVERAGING PERIOD	EPA STANDARDS		FLORIDA STANDARDS
		PRIMARY	SECONDARY	
PM_{10}	24-hour(1)	150	150	150(1)
	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
O3	1-hour(3)	235	235	235

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

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

Taylor County is listed on Table 3-2, for each criteria pollutant. Taylor County in designated as unclassifiable on attainment for all criteria pollutants. These designations were obtained from 40 CFR 81, as updated in the November 6, 1991, Federal Register (FR56694).

The designation of Unclassifiable/Attainment 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 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). While the portion of the Florida State Implementation Plan (SIP) related to PSD regulations has been approved by the USEPA, and authority for the PSD program has been transferred to the state, the applicability of the program to Compressor Station No. 15 will be reviewed in this section, as it remains primarily a federal program.

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 a Class II - 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 (see Table 3-3) and 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" has a special meaning here as it is determined on an annual basis after the application of air pollution control equipment, or any other federally enforceable restriction.

TABLE 3-2

Classification of Taylor County For Each Criteria Pollutant

Carbon Monoxide	Cannot be Classified or Better than National Standards
Oxides of Nitrogen	Cannot be Classified or Better than National Standards
Sulfur Dioxide	Better than Standards
Particulate Matter (PM_{10})	Not Designated
Total Suspended Particulate	Better than Standards
Ozone	Cannot be Classified or Better than National Standards

Source: 40 CFR 81.300, 1991
56FR56694

TABLE 3-3

Major Stationary Sources

Fossil Fuel-Fired Steam Electric Plants of More Than 250,000,000 British Thermal Units Per Hour Heat Input
Coal Cleaning Plants (with thermal dryers)
Kraft Pulp Mills
Portland Cement Plants
Primary Zinc Smelters
Iron and Steel Mill Plants
Primary Aluminum Ore Reduction Plants
Primary Copper Smelters
Municipal Incinerators Capable of Charging More Than 250 Tons of Refuse Per Day
Hydrofluoric, Sulfuric or Nitric Acid Plants
Petroleum Refineries
Lime Plants
Phosphate Rock Processing Plants
Coke Oven Batteries
Sulfur Recovery Plants
Carbon Black Plants
Primary Lead Smelters
Fuel Conversion Plants
Sintering Plants
Secondary Metal Production Plants
Chemical Processing Plants
Fossil-Fuel Boilers (or combination thereof) Totaling of More Than 250,000,000 British Thermal Units Per Hour Heat Input
Petroleum Storage and Transfer Units With a Total Storage Capacity Exceeding 300,000 Barrels
Taconite Ore Processing Plants
Glass Fiber Processing Plants
Charcoal Production Plants
Source: 40 CFR 51.165(a)(iv)(2)(c)

According to the "PSD Workshop Manual, (USEPA, 1980)" 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 3-4.

By these definitions, and based on the emissions presented in Section 2.0, the action proposed to take place at Compressor Station No. 15 is a major modification of an existing major stationary source. While it is not one of the 28 named source categories, the existing facility does emit >250 TPY of at least one regulated pollutant (NO_x). The increase in NO_x resulting from the proposed action will exceed the PSD significant rate; therefore, the compressor station is subject to PSD preconstruction permitting review.

PSD review is used to determine whether significant air quality deterioration will result from the new or modified facility. Major new facilities and major modifications are required to undergo the following analyses and reviews related to PSD for each pollutant emitted in significant amounts:

- Increment/Classification
- Control Technology Review
- Air Quality Monitoring Analysis
- Source Impact Analysis
- Additional Impact Analyses
- Good Engineering Practice (GEP) Stack Height Analysis.

Discussions concerning each of these requirements are presented in the following sections.

TABLE 3-4

PSD Significant Emission Rates

POLLUTANT	EMISSION RATE TONS/YEAR
Carbon Monoxide	100
Nitrogen Oxides	40
Sulfur Dioxide	40
Total Suspended Particulates	25
Ozone (VOC)	40
Lead	0.6
Asbestos	0.007
Beryllium	0.0004
Mercury	0.1
Vinyl Chloride	1.0
Fluorides	3
Sulfuric Acid Mist	7
Total Reduced Sulfur	10
Reduced Sulfur	10
Hydrogen Sulfide	10

VOC = Volatile Organic Compounds

Sources: 40 CFR 52.21; F.A.C. Chapter 17-2.

3.1.2.1 Increment/Classifications

In 1977, USEPA promulgated PSD regulations related to the requirements for classifications, increments, and area designations as set forth by Congress. A PSD increment is the maximum allowable increase in concentration that is allowed to occur above a baseline concentration for a pollutant (USEPA, 1980).

PSD increments were initially set for only SO_2 and Total Suspended Solids (TSP). However, in 1988, USEPA promulgated final PSD regulations for nitrogen oxides (NO_x) and established PSD increments for nitrogen dioxide (NO_2). On October 15, 1989, USEPA proposed PSD increments for PM_{10}. The PM_{10} increments are somewhat lower in magnitude than the TSP increments. An area is designated as being Class I, II, or III depending on the criteria listed in Table 3-5.

The current federal PSD increments are shown in Table 3-6. As shown, Class I increments are the most stringent, allowing the smallest amount of air quality deterioration, while the Class III increments allow the greatest amount of deterioration. Florida Department of Environmental Regulation (FDER) has adopted the USEPA class designations and allowable PSD increments for PM(TSP), SO_2, and NO_2.

The term "baseline concentration" evolved from federal and state PSD regulations and refers to a concentration level corresponding to a specified baseline date and certain additional baseline sources. By definition in the PSD regulations, baseline concentration means the ambient concentration level that exists in the baseline areas at the time of the applicable baseline date. A baseline concentration is determined for each pollutant for which a baseline date is established and includes:

- The actual emissions representative of sources in existence on the applicable baseline date; and

- The allowable emissions of major stationary sources that began construction before January 6, 1975, for SO_2 and TSP sources, or February 8, 1988, for NO_x sources; but were not in operation by the applicable baseline date.

The following emissions are not included in the baseline concentration and therefore affect PSD increment consumption:

- Actual emissions from any major stationary source on which construction began after January 6, 1975, for SO_2 and TSP sources, and after February 8, 1988, for NO_x sources; and

TABLE 3-5

PSD Area Class Definitions

CLASS I

All of the following areas which were in existence on August 7, 1977, shall be Class I and may not be redesignated:

- International parks
- National wilderness areas which exceed 5,000 acres in size
- National memorial parks which exceed 5,000 acres in size, and
- National parks which exceed 6,000 acres in size
- Areas which were redesignated as Class I under regulations promulgated before August 7, 1977, shall remain Class I, but may be redesignated

CLASS II

Any other area, unless otherwise specified in the legislation creating such area, is initially designated Class II, but may be redesignated.

CLASS III

Any area other than Class I areas for which a request for redesignation has been received may be designated as Class III.

The following areas may be redesignated only as Class I or II:

- An area as of August 7, 1977, exceeding 10,000 acres in size and which was a national monument, a national primitive area, a national preserve, a national recreation area, a national wild and scenic river, a national wildlife refuge, a national lakeshore or seashore; and
- A national park or national wilderness area established after August 7, 1977, which exceeds 10,000 acres in size.

Source: 40 CFR 52.21(e)

TABLE 3-6

ALLOWABLE PSD INCREMENTS AND IMPACT SIGNIFICANCE LEVELS ($\mu g/m^3$)

Pollutant	Averaging Time	PSD Increments*		Significant Impact Levels
		Class I	Class II	
Particulate Matter (TSP)	Annual Geometric Mean	5	19	1
	24-hour Maximum	10	37	5
Particulate Matter (PM_{10})	Annual Arithmetic Mean	4[a]	17[a]	1
	24-hour Maximum	8[a]	30[a]	5
Sulfur Dioxide	Annual Arithmetic Mean	2	20	1
	24-hour Maximum	5	91	5
	3-hour Maximum	25	512	25
Carbon Monoxide	8-hour Maximum	NA	NA	500
	1-hour Maximum	NA	NA	2,000
Nitrogen Dioxide	Annual Arithmetic Mean	2.5	25	1

* No Class III areas have been designated; therefore, there are no Class III increments.
[a] Proposed by EPA in the Federal Register on October 5, 1989.

Note: Particulate Matter (TSP) = total suspended particulate matter.
Particulate Matter (PM_{10}) = particulate matter with aerodynamic diameter $\leq$ 10 microns
$\mu g/m^3$ = micrograms per cubic meter
NA = Not applicable, i.e., no standard exists.

Source: Federal Register, Vol 43, No. 118, June 19, 1978; 40 CFR 50; 40 CFR 52.21; F.A.C. Chap. 17-2.400.

- Actual emission increases and decreases at any stationary source occurring after the baseline date.

If ambient air quality impacts of a project are less than the significant impact levels presented in Table 3-6, increment consumption is not considered. Due to the less than significant impacts resulting from this project (see Section 4.0) increment consumption is not an issue in permitting the turbine.

3.1.2.2 Control Technology Review

The control technology review requirements of the federal and state PSD regulations require that all applicable federal and state emission limiting standards be met and that BACT be applied to control emissions from the source [Chapter 17-2.500(5)(c), F.A.C.]. The BACT requirements are applicable to all regulated pollutants for which the increase in emissions from the facility or modification exceeds the significant emission rate (see Table 3-4).

Application of BACT may not result in emissions of any pollutant which would exceed the emissions allowed by applicable standards under CFR 60 or 61.

The requirements for BACT were promulgated within the framework of PSD in the 1977 amendments of the CAA. The primary purpose of BACT is to optimize consumption of PSD air quality increments and, thereby, enlarge the potential for future economic growth without significantly degrading air quality (USEPA, 1978; 1980). Guidelines for the evaluation of BACT can be found in USEPA's "Guidelines for Determining Best Available Control Technology (BACT)" (USEPA, 1978) and in the "PSD Workshop Manual" (USEPA, 1980). These guidelines were prepared by USEPA to provide a consistent approach to BACT and to ensure that the impacts of alternative emission control systems are measured by the same set of parameters. Through implementation of these guidelines, BACT in one area may not be identical to BACT in another area. Since BACT analyses must be conducted on a case-by-case basis (USEPA, 1980).

The BACT requirements are intended to ensure that the control systems incorporated in the design of a proposed facility reflect the latest in control technologies used in a particular industry in light of existing and future air quality in the vicinity of the proposed facility. BACT must, as a minimum, demonstrate compliance with New Source Performance Standards (NSPS) for a source (if applicable). An evaluation of the air pollution control techniques and systems is required. The evaluation is to include a cost-benefit analysis of alternative control technologies capable of achieving a higher degree of emission reduction than the proposed control technology. The cost-benefit analysis requires the documentation of the materials, energy, and economic penalties associated with the proposed and alternative control systems, as well as the environmental benefits derived from these systems. A decision on BACT is to be based on sound judgment, balancing environmental benefits with energy, economic, and other impacts (USEPA, 1978).

Historically, a "bottom-up" approach consistent with the BACT Guidelines and "PSD Workshop Manual" has been used. With this approach, an initial control level, which is usually NSPS, is evaluated against successively more stringent controls until a BACT level is selected. However, USEPA developed a concern that the bottom-up approach was not providing the level of BACT decisions originally intended. As a result, in December 1987, the USEPA Assistant Administrator for Air and Radiation mandated the adoption of a new "top-down" approach to BACT decision making.

The top-down BACT approach starts with the most stringent (or top) technology and emissions limit that has been applied elsewhere to the same or a similar source category. The applicant must next provide a basis for rejecting this technology in favor of the next most stringent technology or propose to use it. Rejection of control alternatives may be based on technical or economic infeasibility. Such decisions are made on the basis of physical differences (e.g., fuel type), locational differences (e.g., availability of water), or significant differences that may exist in the environmental, economic or energy impacts. The differences between the proposed facility and the facility on which the control technique was applied previously must be justified. Recently, USEPA issued a draft guidance document on the top-down approach entitled "Top-Down Best Available Control Technology Guidance Document" (USEPA, 1990a). A top-down BACT analysis is presented in Section 6.0, Best Available Control Technology Evaluation.

3.1.2.3 Air Quality Monitoring Analysis

In accordance with requirements of 40 CFR 52.21(m) and Chapter 17-2.500(f), F.A.C., any application for a PSD permit must contain an analysis of ambient air quality data in the area affected by any criteria pollutants emitted in significant rates from the proposed major stationary source or major modification. For a new major facility, the affected pollutants are those that the facility would potentially emit in significant amounts. For a major modification, the pollutants are those for which the net emissions increase exceeds the significant emission rate (see Table 3-5).

Existing data from the vicinity of the proposed source may be utilized if the data meet certain quality assurance requirements; otherwise, additional data may need to be gathered. Ambient air monitoring for a period of up to one year is generally appropriate to satisfy the PSD monitoring requirements. A minimum of four months of data is usually required. Guidance in designing a PSD monitoring network is provided in USEPA's "Ambient Monitoring Guidelines for Prevention of Significant Deterioration" (USEPA, 1987a).

Under the exemption rule, FDER may exempt a proposed PSD source from the monitoring requirements for a particular pollutant if the air quality impacts are less than the *de minimis* levels presented in Table 3-7 [Chapter 17-2.500(3)(e), F.A.C.]. Impacts from the proposed project presented in Section 4.0, indicate impacts will be well below the *de minimis* level and no monitoring is required.

3.1.2.4 Source Impact Analysis

A source impact analysis must be performed for a proposed major source subject to PSD for each pollutant for which the increase in emissions exceeds the significant emission rate (Table 3-5). The PSD regulations specifically provide for the use of atmospheric dispersion models in performing the impact analysis, estimating baseline and future air quality levels, and determining compliance with AAQS and allowable PSD increments. Designated USEPA models must normally be used in performing the impact analysis. Specific applications for other than USEPA-approved models require USEPA's consultation and prior approval. Guidance for the use and application of dispersion models is presented in the USEPA publication "Guideline on Air Quality Models" (USEPA, 1987b). The source impact analysis for criteria pollutants may be limited to only the new or modified source if the net increase in impact due to the new or modified source is below significance levels, as presented in Table 3-6.

Various lengths of record for meteorological data can be utilized for the impact analysis. A 5-year period can be used with corresponding evaluation of highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The term "highest, second-highest" (HSH) refers to the highest of the second-highest concentrations at all receptors (i.e., the highest concentration at each receptor is discarded). The second-highest concentration is significant because short-term AAQS specify that the standard should not be exceeded at any location more than once a year. If less than five years of meteorological data are used in the modeling analysis, the highest concentration at each receptor must normally be used for comparison to air quality standards. Impacts resulting from the proposed project are presented in Section 4.0 Air Quality Impact Analysis.

TABLE 3-7

De Minimis Monitoring Concentrations

POLLUTANT	De Minimis Monitoring Concentration ($\mu g/m^3$)
Carbon Monoxide	575, 8-hour
Nitrogen Oxides	14, annual
Sulfur Dioxide	13, 24-hour
Total Suspended Particulates	10, 24-hour
Ozone (VOC)	100 TPY[a]
Lead	0.1, 3-month
Asbestos	NM
Beryllium	0.001, 24-hour
Mercury	0.25, 24-hour
Vinyl Chloride	15, 24-hour
Fluorides	0.25, 24-hour
Sulfuric Acid Mist	NM
Total Reduced Sulfur	10, 1-hour
Reduced Sulfur	10, 1-hour
Hydrogen Sulfide	0.2, 1-hour

[a] No de minimis concentration; an increase in VOC emissions of 100 TPY or more will require monitoring analysis for ozone.
VOC = Volatile Organic Compound.
NM = no ambient measurement method.
$\mu g/m^3$ = micrograms per cubic meter.
Sources: 40 CFR 52.21; F.A.C. Chapter 17-2.

3.1.2.5 Additional Impact Analysis

In addition to an air quality impact analysis, federal and Florida PSD regulations require analysis of the impairment to visibility and the impacts on soils and vegetation that would occur as a result of the proposed source [40 CFR 52.21; Chapter 17-2.500(5)(e), F.A.C.]. These analyses are to be conducted primarily for PSD Class I areas. Impacts due to general commercial, residential, industrial, and other growth associated with the source must also be addressed. These analyses are required for each pollutant emitted in significant amounts (Table 3-5). Results of additional impact analyses are presented in Section 5.0, Soils, Vegetation, Visibility and Associated Population Growth Impacts.

3.1.2.6 Good Engineering Practice (GEP) Stack Height Analysis

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

- 65 meters; or
- a height established by applying the formula

  $H_{GEP} = H + 1.5 L$

  Where; H_{GEP} = 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 which exceeds the height calculated by the GEP stack height formula. Because terrain in the vicinity of the project site is generally flat, plume impaction was not considered in determining the GEP stack height.

The proposed stack at Compressor Station No. 15 will be 55 feet (16.76 meters) tall. Based on the proposed building dimensions, the calculated GEP stack height is less than 65 meters; therefore, GEP stack height is 65 meters. Since the stack is less than GEP stack height, it complies with the regulatory requirement.

3.1.3 Non-Attainment New Source Review (NSR) Applicability

Based on the current non-attainment provisions, all new major stationary sources, or 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. Based on Chapter 17-2.510(2)(a)2.a, Florida Administrative Code (F.A.C.), all volatile organic compound sources which are located within an area of influence are exempt from the provisions of new source review for non-attainment areas.

Compressor Station No. 15 is located in an area classified as either attainment or cannot be classified for all criteria pollutants. 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 prepare and publish, a list of stationary source categories which, in the Administrator judgement, cause or contribute significantly to air pollution and which may reasonably be anticipated to endanger public health. Further, the Administrator was to publish a proposed regulation establishing a Standard of Performance for any new source which fell into that category. The significant feature of the Section was that it would apply to all sources within a given category, regardless of its geographic location or the ambient air quality at that location. The standards, in essence defined emission limitations that would be applicable to a particular source group.

A portion of Section 111 of the Act requires states to develop their own set of performance standards. State standards apply to existing sources and only to those pollutants for which air quality criteria had not been developed or were not covered by either Section 108 or 112 of the Act. Additionally, states could regulate any source whether it was covered by a federally designated source category or not. It is clear that Congress wanted to give the states specific authority to regulate existing sources which would, otherwise, only be subject to the provisions of Section 111 if they were new. New source performance standards promulgated by the state of Florida are discussed in Section 3.2 and Appendix E.

Currently, there are 66 separate performance standards published in 40 CFR 60. The new turbine to be installed at Compressor Station No. 15 is subject to Subpart GG, Stationary Gas Turbines, because it will have a maximum heat input at peak load of >10.7 gigajoules/hour (10 MMBtu/hr) based on the lower heating value of the natural gas fuel.

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

$$STD = 0.0150\ \frac{14.4}{Y} + F$$

STD = *Allowable* NO_x *emissions*

Y = *Heat rate at peak load not to exceed* 14.4 *Kj/watt-hour*

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.

$$Y = Btu/bhp\text{-}hr \times 1.055\ Kj/Btu \times hp\text{-}hr/745.7\ watt\text{-}hour$$

$$= 8{,}703\ Btu/bhp\text{-}hr \times 1.055\ Kj/Btu \times hp\text{-}hr/745.7\ watt\text{-}hour$$

$$= 12.3$$

$$STD = 0.0150\ \frac{14.4}{12.3} + F$$

$$= 0.0176$$

$$= 176 ppm_v$$

Table 3-8 summarizes the NSPS applicability for the proposed gas engines.

The turbine at this facility will meet the NSPS for NO_x of 176 ppm_v (i.e., manufacturer's guarantee of 42 ppm_v), and for SO_2 of 150 ppm_v (estimated for this turbine to be 4 ppm_v).

3.1.5 Applicability of National Emission Standards for Hazardous Air Pollutants (NESHAP)

Realizing that there were numerous pollutants that did not meet the specific criteria for development of a National AAQS, Congress included Section 112 in the 1970 CAA Amendments which specifically addressed this problem. Section 112 provides the USEPA with a vehicle for developing standards for potentially hazardous pollutants.

During the development of the 1970 CAA Amendments the Senate prepared a report identifying many such compounds which were to be considered for regulation under the new section. The 1990 CAA Amendments significantly expanded the number of compounds to be regulated under Section 112. Under the current provisions of the Act, 189 compounds or classes of compounds are to be regulated under Section 112 by November 15, 2000.

The regulations which were developed to implement Section 112 are presented in 40 CFR, Part 61. This part contains a listing of those pollutants that have been designated as being hazardous (Part 61.01) as defined in Section 112, and standards applicable to specific industries. Unlike the New Source Performance Standards, this Section is applicable to both new and existing sources that emit pollutants regulated by this Section.

3.2 Florida State Air Quality Regulations

Title 17, F.A.C., contains the environmental rules and regulations for the State of Florida. The primary federal regulations which affect Compressor Station No. 15 have been incorporated, for the most part in whole, into the Florida state regulations. Specific air quality regulations of the state of Florida are contained in Title 17 F.A.C. and are too numerous to discuss in detail in this section, however, an applicability review was performed during the preparation of this document. The results of this review are presented in Appendix E. Compressor Station No. 15 will operate in compliance with all applicable Florida state air quality regulations as documented in Appendix E.

TABLE 3-8

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	109.7 MMBtu/hr	176 ppm_v	42 ppm_v
GG	60.333(a)	Engine No. 1507 Gas Turbine	Gas	SO_2	>10 MMBtu/hr	109.7 MMBtu/hr	150 ppm_v	4 ppm_v

* Design maximum based on vendor data.

4.0 AIR QUALITY IMPACT ANALYSIS

The Florida Department of Environmental Regulation (FDER), Air Quality Division, requires that an ambient air quality impact analysis be performed for a proposed project's emissions. For State Authority to Construct permits, this involves comparison of the proposed project's impacts to the State and National AAQS, discussed in Section 3.0 of this report. For PSD, additional assessments of increment consumption and for evaluation of impacts on Class I areas within 150 kilometers of the compressor station were also performed. The following section outlines the general approach used for this analysis. This approach was developed in consultation with the FDER and conforms with the recommendations presented in the Guideline on Air Quality Models (USEPA, 1987b).

4.1 Modeling Methodology and Assumption

This section outlines the approach used in the air dispersion modeling analysis. Model selection, meteorological data used, structure downwash considerations and predicted air quality impacts from modification of the Perry County compressor station No. 15 are discussed.

4.1.1 General Modeling Methodology

The modeling approach follows USEPA and FDER guidelines for determining compliance with State and National Ambient Air Quality (AAQS). Air dispersion modeling was used to determine compliance with federal and/or state AAQS and PSD.

The following procedure was followed for determining compliance with state and national standards and the PSD significance level:

- Model predictions for annual average NO_x concentrations, based on the net emission increases from the project were obtained using the Industrial Source Complex long-term (ISCLT2) model (version 92062). A brief description of the Industrial Source Complex (ISC) model is given in Section 4.1.2.

- For comparison to short term AAQS (CO) the ISCST2 model was run with 1982-1986 data from FDER. Since all off-site concentrations were less than significance, no additional modeling was conducted for CO.

- For comparison to annual National AAQS, the ISCLT2 was run using each of the latest five years (1982-1986) of available meteorological data processed into the Stability Array (STAR) format. The maximum off-site impact from all 5 years was then compared to the PSD significance level for each pollutant. All NO_x off-site impacts were less than the 1 $\mu g/m^3$ significance level; therefore, no additional modeling was performed for NO_x.

- For determining impacts at the three (3) Class I areas within 150 kilometers of the site, a 15 x 15, 2 kilometer spaced receptor grid was used, as discussed with FDER, to determine potential NO_x impacts out to a distance of 30 kilometers from the Compressor Station No. 15.

- A Level 1 screening analysis, using the USEPA model VISCREEN, was run as required by the Florida Parks and Wildlife Department, to determine impact on visibility due to the proposed project. The results of the visibility analysis are included in Appendix F.

4.1.2 Model Selection

The ISC dispersion model was used to evaluate emissions from the proposed facility. The ISC model was selected primarily for the following reasons:

- USEPA and FDER have approved the general use of the model for air quality dispersion analysis because the model assumptions and methods are consistent with those in the Guideline on Air Quality Models (USEPA, 1987b);

- The ISC model is capable of predicting the impacts from stack, area, and volume sources that are spatially distributed over large areas and located in flat or gently rolling terrain; and

- The results from the ISC model are appropriate for addressing compliance with AAQS and PSD increments.

Major features of the ISC model are presented in Table 4-1. Concentrations due to point, area and volume sources are calculated by the model using the steady-state Gaussian plume equation for a continuous source.

TABLE 4-1
Major Features of the ISC Model

ISC Model Features
• Polar or Cartesian coordinate systems for receptor locations
• Rural or urban option that affect windspeed profile exponent, dispersion rates, and mixing height calculations
• Plume rise as a result of momentum and buoyancy as a function of downwind distance for stack emissions (Briggs)
• Procedures suggested by Huber and Snyder (1976), Huber (1977), Schulman and Hanna (1986), and Schulman and Scire (1980) for evaluating building downwash and wake effects
• Procedures suggested by Briggs for evaluating stack-tip downwash
• Separation of multiple point sources
• Consideration of the effects of gravitational settling and dry deposition on ambient particulate concentrations
• Capability of simulating point, line, volume, and area sources
• Capability to calculate dry deposition
• Variation of windspeed with height (windspeed-profile exponent law)
• Concentration estimates for annual average
• Terrain-adjustment procedures for elevated terrain including a terrain truncation algorithm
• Receptors located above local terrain (i.e., "flagpole" receptors)
• Consideration of time-dependent exponential decay of pollutants
• The method of Pasquill (1976) to account for buoyancy-induced dispersion
• A regulatory default option to set various model options and parameters to EPA recommended values (see text for regulatory options used)
SOURCE: User's Guide for the Industrial Source Complex (ISC2) Dispersion Model, Volume I, Draft, EPA-450/4-92-2a

4.1.3 Modeling Options

For modeling analyses that will undergo regulatory review, the following model options are recommended in the USEPA Guideline on Air Quality Models (USEPA, 1987b), and are referred to as the regulatory default options in the ISC model:

- Final plume rise at all receptor locations,
- Stack-tip downwash,
- Buoyancy-induced dispersion,
- Default wind speed profile coefficients for rural or urban option,
- Default vertical potential temperature gradients, and
- Reducing calculated SO_2 concentrations in urban areas by using a decay half-life of 4 hours (i.e., reduce the SO_2 concentration by 50 percent for every 4 hours of plume travel time).

In this analysis, the USEPA Regulatory Default Options were used to address maximum impacts.

4.1.4 Selection of Dispersion Coefficients

The ISC model has rural and urban options which affect the wind speed profile, dispersion rates, and mixing-height formulations used in calculating ground level concentrations. The criteria used to determine when the rural or urban mode is appropriate are based on land use near the proposed plant's surroundings (Auer, 1978). If the land use is classified as heavy industrial, light-moderate industrial, commercial, or compact residential for more than 50 percent of the area within a 3 kilometers radius around the proposed source, the urban option is selected. Otherwise, the rural option is used. Based on a USGS topographical map of the land within a 3 kilometer radius around the site, the rural mode was selected.

4.1.5 Meteorological Data

The EPA Guideline on Air Quality Models (USEPA, 1987b) recommends the use of 5 years of representative meteorological data in air quality modeling. The most recent, readily available 5-year period is preferred. The meteorological data may be collected either on-site or at the nearest National Weather Service (NWS) station.

The NWS station in Tallahassee, Florida, located approximately 40 miles northwest of the site, is the most representative weather station that routinely records the hourly surface data required by the air dispersion models. Because of the proximity of this NWS station to the site, the meteorological data are considered to be representative of weather conditions occurring at the Taylor compressor station.

Meteorological data used in the analysis were obtained from the FDER. The data consisted of a 5-year record of surface weather observations (1982-1986). Surface data were collected by the NWS at Tallahassee. The data base consists of hourly surface data (i.e., wind speed, wind direction), and twice daily mixing heights. The five years of surface data were processed using the USEPA Stability Array (STAR) program, to generate the data required by ISCLT2 model.

4.1.6 Source Data

The model parameters for Compressor Station No. 15 are given in Table 4-2. The location of the proposed stack is shown on the facility plot plan (see Appendix B). The emission point listed on Table 4-2 as source 7 (1507) corresponds to the new compressor engine. Table 4-3 lists the emission rates modeled for NO_x and CO. The maximum CO pound per hour emission rates shown in the table were input to the ISCST model to determine concentrations for short-term averaging periods. Vendor guaranteed emission rates, in grams/bhp, converted to a tons per year value was used to determine NO_x annual average concentrations.

4.1.7 Receptor Grids Modeled

For ISCST2 and ISCLT2, the following grids were used in the modeling analysis:

- A 100-meter spaced, 25 x 25 receptor grid, centered on the facility, and extending out 1.2 kilometers out in all directions was used to check for "close in" NO_x and CO maximums.

- A 500-meter spaced, 25 x 25 receptor grid, centered on the facility, extending 6 kilometers in all directions, was used to identify the maximum NO_x concentrations, which occurred outside the initial 100-m grid.

- A 2-kilometer spaced, 31 x 31 receptor grid extending out 30 kilometers was used to show compliance with the Class I threshold levels for NO_x.

These grids were used, per guidance from FDER and the <u>Guideline on Air Quality Models</u> (USEPA, 1987b).

TABLE 4-2

FGTC Phase III
Compressor Station No. 15
Summary of Source Parameters Used in the Modeling Analysis

ISC Model Source Number	Stack Location		Stack Dimensions		Operating Parameters	
	X (m)	Y (m)	Height (m)	Diameter* (m)	Temperature (K)	Velocity (m/s)
1507	0	0	16.76	2.60	738.71	15.25

* Effective Diameter

TABLE 4-3

FGTC Phase III Expansion
Compressor Station No. 15
Modeled Emission Rates

SOURCE NO.	NO_x (TONS/YR)	CO (LBS/HR)
1507	70.70	11.71
SOURCE NO.	**NO_x (MAX GM/SEC)**	**CO (MAX GM/SEC)**
1507	2.03	1.48

4.1.8 Building Wake Effects and GEP Considerations

Based on the dimensions of the structures located at the compressor station, all stacks will be less than maximum allowable GEP height. Due to the location of emission points in relation to buildings and other solid structures, the stack emissions may be affected by building wakes from some of the structures. Therefore, the potential for building downwash must be considered in the modeling analysis.

The procedure used for addressing the effects of building downwash are those recommended in the User's Guide for Industrial Source Complex (ISC2) Models (USEPA, 1992). In the ISC model, the building heights and widths are input into the model for each direction. If the Huber-Snyder building downwash routine is used, the model picks the worst case dimension from all values. The effective width used by the program is the diameter of a circle of equal area to the square of the width input to the model.

If a specific width is to be modeled, then the value input to the model must be calculated according to the following formula:

$$M_w = \sqrt{\pi \times \left(\frac{H_w}{2}\right)^2}$$

$$= 0.886 H_w$$

where: M_w = building width input to the model to produce a building width of H_w used in the dispersion calculation.

H_w = the actual building width for dispersion calculations are desired.

If the Schulman-Scire wake effects method is used, the user inputs the building height and projected width associated with each wind sector. The actual inputs to the ISC model were generated using the Bowman Environmental Engineering Automated Downwash Program. Plant coordinates of all building corners, tier corners, and emission points are input into the downwash program. The program provides direction-specific building dimensions for either the ISC long or short-term model, which are then directly input into the ISC source file. The program was run using a rectangular building wake area and a wind direction angle increment of 1 degree.

A summary of actual building dimensions for structures considered is presented in Table 4-4. Only structures within about 500 feet of the stacks were input into the GEP model, as those at greater distances would have no effect on stack plume emissions.

4.2 Model Results

Modeling was only performed for the increases in net emissions of NO_x and CO from Compressor Station No. 15, even though NO_x is the only criteria pollutant which had an emissions increase greater than PSD significance threshold. A summary of the maximum predicted annual NO_x and CO off-site concentration, a comparison to the AAQS, and the significance level, is shown in Table 4-5. Table 4-6 provides the maximum concentration for each meteorological data year modeled. The maximum predicted (0.077 $\mu g/m^3$) off-site NO_x impact was about 3 kilometers south of the compressor station. Maximum CO concentrations occurred west and north of the site.

Area concentration maps for the maximum year are included for NO_x and CO in Appendix F for receptor grids with spacing of 100-meter, 500-meter and 2 kilometers. These show maximum impacts in $\mu g/m^3$ for each modeled receptor and pollutant and also show the facility property boundary.

As shown, the maximum predicted off-site NO_x and CO concentrations were much lower than the applicable AAQS and significance levels. The results of this air dispersion modeling show that the proposed modification to the Taylor compressor station should have no adverse effects on the surrounding area.

There are 3 PSD Class I areas within 150 kilometers of the site:

- St. Marks NWR - located about 36 kilometers west of Compressor Station No. 15.
- Bradwell Bay - 50 kilometers west northwest of the site.
- Okefenokee Swamp - 130 kilometers northeast of the site.

For potential impacts to these Class I areas, one year of additional NO_x modeling analysis was performed (for 1986, the worst case year), to calculate concentrations out to 30 kilometers from the facility. The results showed that potential NO_x annual concentrations (0.01 $\mu g/m^3$) in the direction (west and northeast) of the three Class I areas, were well below the Florida Parks and Wildlife Class I screening level of 0.025 $\mu g/m^3$. Since the closest Class I area (St. Marks) is 36 kilometers west of the site, impacts there and at the two other, more distant Class I areas will be well below the limits for NO_x.

TABLE 4-4

FGTC Phase III
Compressor Station No. 15
Building Dimensions

Building	Actual Building Dimensions		
	Height (ft)	Length (ft)	Width (ft)
Control Building	12	20	20
Compressor Building #1	12	245	55
Compressor Building #2	32	70	40

TABLE 4-5

FGTC PHASE III PROJECT, COMPRESSOR STATION NO. 15
NO_x MODELING RESULTS
MAXIMUM PREDICTED AVERAGE CONCENTRATION OF MODELED POLLUTANTS AND COMPARISON TO SIGNIFICANT IMPACT LEVEL

POLLUTANT	AVG TIME	MAX OFF-SITE ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	SIGNIFICANT IMPACT ($\mu g/m^3$)
NO_x				
SOURCE 1507	Annual	0.077	100	1
CO				
SOURCE 1507	1-hr	8	40,000	2,000
	8-hr	3	10,000	500

TABLE 4-6

FGTC PHASE III Project - Compressor Station No. 15
Maximum Predicted Impact by Year

Pollutant	Pollutant/ Averaging Period	Year of Meteorological Data				
		1982	1983	1984	1985	1986
NOx	Annual	0.054	0.053	0.061	0.046	0.077
CO	1-hour	4	6	8	7	5
	8-hour	1	3	2	3	1

NOTE:
All values are in $\mu g/m^3$ unless otherwise indicated.

A visual effects screening level model (VISCREEN) showed that impacts on visibility from the facility would not exceed the criteria inside or outside the closest Class I area (St. Mark National Wildlife Refuge). The maximum predicted plume contrast against both sky and terrain (0.001) is well below the Class I criteria for visibility (0.05). The delta E color difference parameter (0.128) is much less than the 2.00 criteria. Output from the VISCREEN model can be found in Appendix F.

5.0 SOILS, VEGETATION, VISIBILITY AND ASSOCIATED POPULATION GROWTH IMPACTS

PSD regulations require that proposed actions be reviewed for potential effects to soils, vegetation, and,visibility and that they be evaluated for possible secondary air quality impacts associated with population growth induced by the project. The section which follows reviews these issues for the proposed expansion of Compressor Station No. 15.

5.1 Impacts Upon Soils and Vegetation

The EPA has suggested screening level concentrations for determining the potential for impacts to vegetation from exposure to NO_x, SO_2 and CO. Since NO_x is the only pollutant which will be emitted in significant quantities, it will be the only pollutant reviewed.

The EPA screening threshold is 94 $\mu g/m^3$ for NO_x on an annual basis. Maximum project impact for NO_x is predicted to be 0.077 $\mu g/m^3$, therefore no impact to vegetation is likely and no additional investigation is warranted.

The amounts of nitrogen and/or sulfur which could be deposited on local soils by the project are minimal. Therefore, although not quantified, the impacts are not expected to be measurable.

5.2 Impacts Upon Visibility

Analysis of impacts to visibility, as required under PSD regulations is directed toward preserving the "integral vista" of Class I areas. In Florida, this analysis is restricted to those sources within 150 kilometers of a Class I area due to the limited ability of current models to accurately define impacts for areas outside this zone.

There are three Class I areas within 150 kilometers of Compressor Station No. 15 which must be reviewed. These areas include the:

- St. Marks National Wildlife Refuge
- Bradwell Bay
- Okefenokee Swamp

Based on the results of the USEPA VISCREEN model (USEPA, 1988) (see Section 4.0) no adverse impact is expected at any of the Class I areas.

5.3 Impacts Due to Associated Population Growth

There will be a small increase in temporary construction workers during the construction of the additional facilities at Compressor Station No. 15. However, there will be no increase in the permanent regional work force. As a result there will be no permanent impacts on air quality due to associated population growth.

6.0 BEST AVAILABLE CONTROL TECHNOLOGY EVALUATION

The prime movers in the natural gas industry are generally heavy-duty natural gas-fired stationary internal combustion (IC) engines. These engines are applied to power compressors used for pipeline transmission, field collection of gas from wells, underground storage, and gas processing plant activities. Stationary IC engines used include both gas turbines and reciprocating engines.

Originally natural gas pipeline compressors were almost always driven by reciprocating engines. However, technological advances have made it advantageous to utilize combustion turbines (CTs) in some pipeline transmission applications. The number of CTs in natural gas pipeline service has grown substantially in recent years for a variety of reasons, particularly on higher horsepower (hp) applications. One of their primary benefits is that gas turbines typically emit fewer pollutants than reciprocating engines on a g/bhp-hr basis. Based on current and future compressor power requirements, a gas turbine was selected for Compressor Station No. 15.

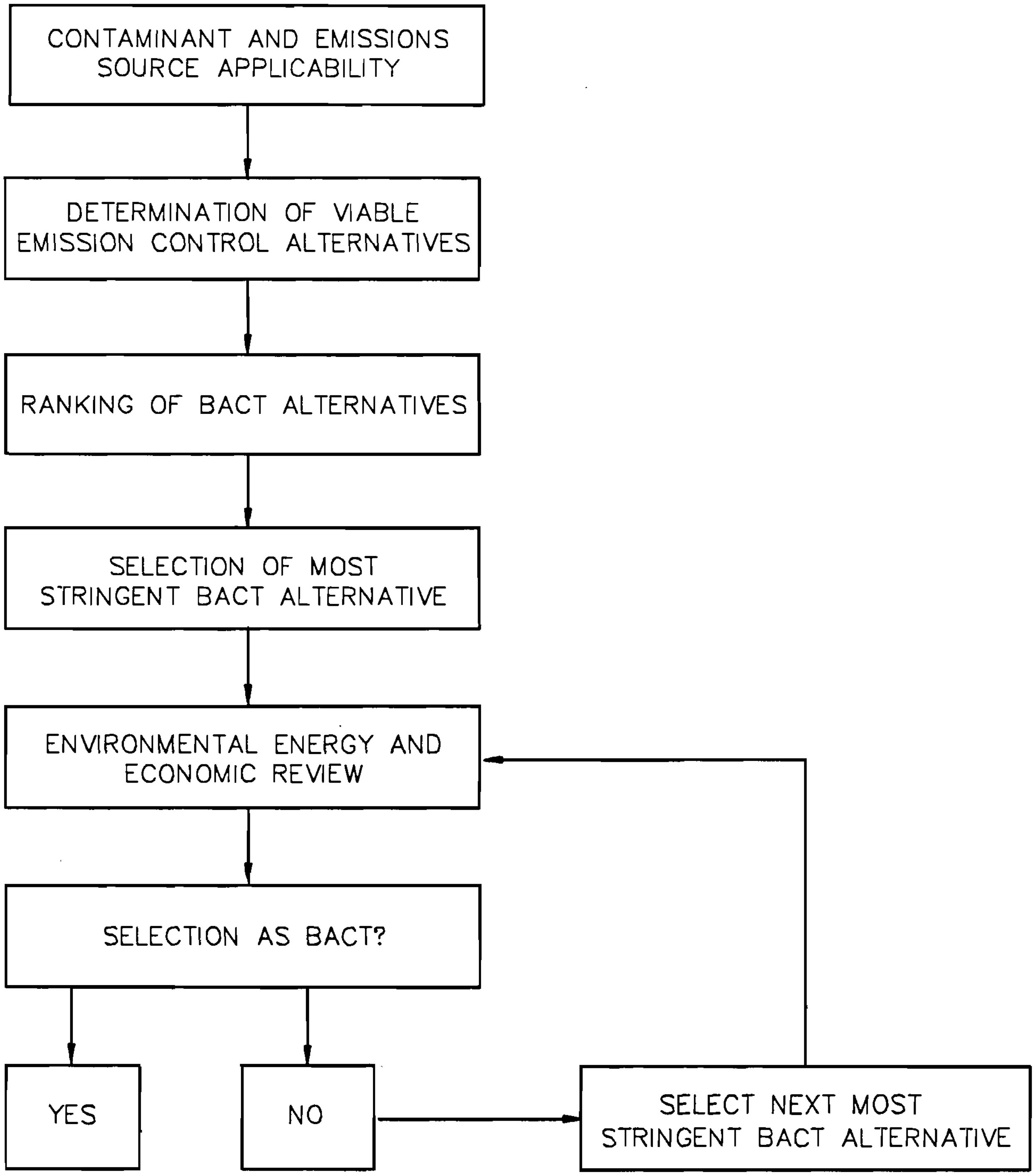
The total potential emissions increase in NO_x emissions, 70.70 TPY, resulting from the addition of the new compressor engine exceeds the PSD significant emission rates of 40 TPY. Therefore, a BACT review for NO_x must be performed. This section describes the BACT assessment for the proposed turbine installation at FGTC's Compressor Station No. 15.

6.1 The BACT Process

The structure of the BACT analysis is shown in Figure 6-1. This approach reflects the most recent "top-down" BACT guidance (USEPA, 1990a) by USEPA for PSD permit determinations as discussed in Section 3.1.2.2 of this report application.

The first step in the "top-down" BACT approach is to determine, for the emission source in question, the most stringent control available for a similar or identical source or source category. If it can be shown that this level of control is technically or economically infeasible for the source in question, then the next most stringent level of control is determined and similarly evaluated.

In selecting emission control technologies for evaluation as BACT, no technically feasible alternative should be ruled out. The review should be broad enough to take into account controls applied to similar source categories and even to consider innovative control technology where energy, environmental, or economic impacts so warrant.



ENSR CONSULTING & ENGINEERING

FIGURE 6-1
"TOP DOWN" BACT DECISION-MAKING PROCESS
FLORIDA GAS TRANSMISSION COMPANY
FLORIDA

DRAWN: SH	DATE: 01-19-93	PROJECT NUMBER:
APPV'D:	REVISED:	6792-068

The environmental analysis should estimate the net impact associated with each control alternative. Both beneficial, as well as, adverse impacts should be discussed and, where possible, quantified. When weighing environmental impacts, the analysis should consider all pollutants affected by the control alternative. This includes pollutants that are not currently regulated under the CAA (such as air toxics), but may cause a significant environmental impact. In addition, the environmental analysis should consider appropriate non-air effects, such as water pollution or solid/hazardous waste impacts.

The energy impact analysis should estimate the direct energy effects of the control alternatives in units of energy consumption (Btu's, kWh, barrels of oil, tons of coal, etc.). Where possible, the energy requirements of the control options should be shown in terms of total and incremental (units of energy per ton of reduction) energy costs.

The economic analysis involves assessing the costs associated with installation and operation of the various BACT alternatives. Examples of costs to be included are:

- capital and interest charges,
- engineering and installation costs,
- operating and maintenance labor and materials,
- energy costs,
- water disposal costs, and
- lost revenue due to equipment downtime.

Credit for tax incentives should also be included along with credits for product recovery costs and by-product sales generated from the use of control systems.

As a guide in determining when control costs become excessive, this review follows the standard annual control cost per unit of pollution removed, traditionally used for BACT economic evaluations. The total annual operating cost, in dollars, for alternative controls are divided by the total emission reductions in tons, to produce easily compared dollars per ton ratios. Incremental cost ratios (in dollars per ton) of one control method over another are also calculated for comparison purposes based on incremental annual cost and incremental emission reduction. Additional details of this cost estimating procedure are contained in Appendix G.

6.2 NO_x Control Review

This section provides the NO_x BACT assessment for the proposed Compressor Station No. 15 turbine.

6.2.1 Applicable NSPS

The minimum control requirements of BACT are those imposed by the New Source Performance Standards (NSPS). NSPS for stationary gas turbines (40 CFR Part 60, Subpart GG) (USEPA, 1992) were promulgated by USEPA on September 10, 1979, and amended on January 27, 1982. These standards limit potential emissions of nitrogen oxides (NO_x) from certain classes of stationary gas turbines. NSPS rules affect sources constructed or modified after the proposal date of the standards. Thus the units to be installed as part of the Phase III project are subject to this NSPS. The NSPS for NO_x emissions from stationary gas turbines are discussed in Section 3.1.4.

The NSPS limit on NO_x emissions for this turbine is 176 ppm_v corrected to 15 percent oxygen. Therefore, 176 ppm_v is the minimum control which can be considered as BACT. Since Solar guarantees the MARS T-12000 can achieve a 145 ppm_v NO_x level, the baseline NO_x emissions were calculated using the uncontrolled NO_x emissions.

6.2.2 Previous BACT Limits

Another important consideration in reviewing potential BACT emission limits is past BACT determinations for similar sources. The USEPA BACT/LAER Clearinghouse (USEPA, 1988-1993) contains extensive data on past BACT regulatory determinations for gas turbines across the country. However, most of the turbines listed in the Clearinghouse are those in electric utility and cogeneration use. A search of Clearinghouse records located only eight permit entries for turbines in natural gas pipeline compression service over the last five years.

It is important to recognize that there are basic differences between turbines in electric utility/cogeneration service and those in natural gas compression service. Such differences affect the appropriateness of certain emission control technologies as legitimate BACT choices. In setting the NSPS for gas turbines, USEPA recognized differences between turbines in varying kinds of service by setting more strict emission limits for turbines in electric utility service. This recognition is also appropriate for determining BACT.

Table 6-1 lists data from the USEPA BACT/LAER Clearinghouse for turbines in natural gas compression services permitted within the last five (5) calendar years. Both El Paso Natural Gas (ID Numbers AZ-0010 through AZ-0012) and Pacific Gas Transmission Company have installed dry low-NO_x controls to meet their BACT requirement (42 ppm_v corrected to 15 percent oxygen). This 42 ppm_v BACT limit is the lowest shown in USEPA files for turbines in natural gas pipeline service.

The only lower control limit for natural gas pipeline turbines is contained in Southern California Gas Permit No. 2046009-11. This Wheeler Ridge, California installation, being constructed in a non-attainment area, is required to meet the Lowest Achievable Emission Rate (LAER) standard which does not consider the economics of the control option. Therefore, it is representative of a past LAER and not a BACT determination.

USEPA BACT/LAER Clearinghouse data on turbines in natural gas pipeline service indicate the maximum BACT NO_x limit from previous determinations is 42 ppm_v corrected to 15 percent oxygen. A complete list of all turbines in the Clearinghouse, permitted during the past five (5) years, is shown in Appendix G.

6.2.3 Identification of NO_x Control Technologies for Turbines

In this section, the control technologies capable of reducing NOx emissions produced by gas turbines will be evaluated for their potential application as BACT for the proposed gas turbine. This BACT analysis follows USEPA's most recent draft guideline for the top-down approach (USEPA, 1990a).

All potentially applicable control technologies for turbines are reviewed. The technologies to be evaluated as possible NO_x controls on natural gas transmission turbines are:

- Selective catalytic reduction (SCR)
- Dry low-NO_x combustion controls
- Wet (water/steam) injection
- Selective non catalytic reduction (SNCR)
- Nonselective catalytic reduction (NSCR)

TABLE 6-1

BACT/LAER Clearinghouse for Turbines in Pipeline Compression Service

ID Number	Name	Size (hp)	Reviewing Agency	Date of Issuance	BACT/LAER for NO_x
CA-0463	Southern California Gas	5500	CA KC APCD	10/29/91	8 ppm_v, SCR
AZ-0010	El Paso Natural Gas	5500	EPA Region 9	10/25/91	42 ppm_v, dry controls
AZ-0011	El Paso Natural Gas	5500	EPA Region 9	10/25/91	42 ppm_v, dry controls
AZ-0012	El Paso Natural Gas	12000	EPA Region 9	10/18/91	42 ppm_v, dry controls
AK-0021	Arco Alaska, Inc.	5400	AK DEC	10/16/89	125 ppm_v, dry controls
OR-0007	Pacific Gas Transmission	14600	OR DEQ	11/03/89	42 ppm_v, dry controls
KY-0048	Texas Gas Transmission Turbine, gas	14300	KY DAQ	02/26/88	150 ppm_v, design
MI-0053	Great Lakes Gas Trans Turbine 1 Turbine 2 Turbine 3	 12500 12500 4000	MI DNR, AQD	02/16/88	 82.09 ppm_v, design 82.09 ppm_v, design 109 ppm_v, design

Source: USEPA BACT/LAER Clearinghouse, 1988-1993.

Dwight Genrese alabama
205-271-7861

Dpt of Env Mgmt

6.2.3.1 Selective Catalytic Reduction (SCR)

SCR is a post-combustion gas exhaust stream treatment technique for reduction of NO and NO_2 to molecular nitrogen, water, and oxygen. Ammonia (NH_3) is used as the reducing agent. The basic reactions are:

$$4\ NH_3 + 4\ NO + O_2 \rightarrow 4\ N_2 + 6\ H_2O$$
$$8\ NH_3 + 6\ NO_2 \rightarrow 7\ N_2 + 12\ H_2O$$

Typically, a fixed bed catalytic reactor is used in SCR process to effectively lower the activation energy of the NO_x decomposition reaction. Normally, the catalysts have platinum group metals as the active components on a honeycomb metal substrate.

Several types of reduction catalysts are available, each exhibiting advantages and disadvantages in terms of turbine exhaust temperature, NH_3/NO_x ratio, and optimum oxygen concentration. A disadvantage common to all catalyst types is the narrow "window" of acceptable system inlet temperature. Below the minimum temperature of about 500°F, the NO_x reduction reaction will not proceed, while operation above the maximum temperature (about 850°F) results in oxidation of NH_3 to nitrogen oxides (thereby actually increasing the NO_x emissions) or possibly the generation of explosive levels of ammonium nitrate and ammonium nitrite in the exhaust gas (Gas Research Institute, 1990). Commercial technology SCR is most effective across a narrow temperature range generally around 600 to 700°F.

A significant design concern is the location of the catalyst bed within the flue gas duct work to ensure that the required SCR temperature "window" is met. Since a typical turbine in compressor service has an exhaust temperature near 1000°F (Solar, 1991), either water quench, dilution with ambient air, or heat recovery, would be required in order to bring the turbine exhaust temperature into the SCR window. All three temperature reduction methods have detrimental side effects. Water quench would require large water volumes. Cold air addition to cool the gases would increase the SCR bed size, whereas a heat exchanger would need to be very large and carry a significant pressure drop. Maintaining the required reactor temperature during periods of reduced turbine load is also a problem for the SCR technology since fluctuating load conditions can occur for turbines in gas compression service.

Sulfur content of the fuel can be an additional concern. SCR systems can promote oxidation of sulfur dioxide (SO_2) to sulfur trioxide (SO_3), which combines with water to form sulfuric acid. Catalyst poisoning and corrosion of flue gas duct work and heat transfer surfaces are potential problems in this event. However, since clean natural gas will be the primary fuel this should not be a problem at Compressor Station No. 15.

The SCR process is also subject to loss of catalyst activity over time through two primary mechanisms: physical deactivation and chemical poisoning. The former is generally the result of either prolonged exposure to excessive temperatures or masking of the catalyst from deposition of particulate matter. Chemical poisoning is caused by the irreversible reaction of the catalyst with a contaminant in the gas stream and is a permanent condition.

These problems can have a major impact on the operating life of the catalysts. Catalyst suppliers generally assign a 3-year lifetime to catalyst systems; thus an annualized loss of 33 percent per year is to be expected. It should be noted that the entire catalyst bed will not be lost at the same time. The portion of the bed furthest upstream will deteriorate the most rapidly, as it is exposed to the most extreme conditions encountered by the bed. Further into the bed conditions are more uniform and less degradation occurs. For this reason, the catalyst bed components are rotated over time, with new material being replaced at the downstream end. In addition to the cost and inconvenience of frequent catalyst replacement, some spent catalysts may require disposal as a hazardous waste.

Another major technical problem with SCR is the reliability of the required automated control equipment. As engine power demand fluctuates, gas density, temperature, flow rate, and other system operational characteristics vary. As these factors change, engine exhaust flow rate, exhaust temperature, and other parameters important to maintaining catalytic NO_x reduction efficiency also change. Completely automated control systems designed to react to the gas system operational changes have not been demonstrated in field testing or in operational situations to be reliable (Southwest Research, 1987). This limits the application of SCR at natural gas compressor stations, which are often designed to operate in an unattended mode. Almost all of the present applications of SCR are on turbines in electric utility/cogeneration service, with no demonstrated applications on turbines with wide load swings.

In the SCR process, ammonia is injected into the exhaust gas through a grid of pipes with closely spaced nozzles or holes to ensure good mixing with the exhaust gas. This ammonia injection grid is located upstream from the catalyst bed in an effort to ensure uniform ammonia distribution. Design of an ammonia injection grid must take into account natural variations in flow and NO_x concentration across the exhaust duct work. The NO_x and flow variations result in a fluctuation of ammonia/NO_x ratios localized across the duct cross-section.

When the conversion requirement is modest (i.e., 50-75%), a sufficient amount of excess catalyst, in addition to the ideal design volume, can overcome the variations of ammonia/NO_x ratio by reacting ammonia to completion in regions where there is a deficiency of ammonia, and converting NO_x to higher than design levels (approaching 100%) in regions where there is excess ammonia. The net effect on the average conversion is calculated to meet the design specification in this manner without generating excessive amounts of slip ammonia.

In large power plants with high conversion requirements (higher than 80%) elaborate flow distributors, flow guide vanes and adjustable ammonia grids are provided to ensure operability of the SCR system at high conversion levels without excessive ammonia slip. For smaller applications such as cogeneration turbines, the additional catalyst cannot compensate for the ammonia/flow variations without excessive pressure drop, or excessive cost. The smaller the exhaust flow the less feasible a complex flow distributor or ammonia control system becomes.

Flow variations in natural gas pipelines impose an additional design complication for the reliable high conversion operation of the SCR process. The systems must be designed to cope with the maximum and the minimum flow and the maximum and minimum temperature without prohibitive additional reheat costs and multiple ammonia injection systems. The appropriate method to operate without excessive slip ammonia at the low temperature, low flow condition is to select an active catalyst that will allow high conversion of ammonia at low temperature with an ammonia/NO_x ratio close to one. This will provide high conversion of NO_x at low load and temperature and somewhat lower conversions at high load without excessively complex ammonia control technology. There are no complex ammonia controls on existing compressor stations that are capable of coping with the flow and temperature variations found in natural gas transmission service. Moreover, the sophisticated controls needed for a system this complex may require extensive operator attention and maintenance.

The highly active SCR catalysts, especially the zeolite catalysts, have the characteristic of long equilibration times to reach steady-state, well in excess of the load fluctuation periods of the compressor. When the process response times are larger than the period of variation of the control variable, in this case flow or temperature, it is virtually impossible to control the process at high conversion with acceptable ammonia slip levels for the entire operating range. Therefore, the SCR system must be designed for maximum NO_x conversion at the high flow/high temperature condition and acceptable ammonia slip at the low flow/low temperature condition.

The 90% NO_x removal specified in other BACT analyses is not technically feasible for Compressor Station No. 15 because the SCR system must be designed to satisfy both high and low load conditions. Tradeoffs in SCR system operation to limit ammonia slip decrease the amount of NO_x removal possible. A maximum of approximately 80% NO_x removal is deemed technically feasible for SCR over the entire operating range of the proposed turbines.

6.2.3.2 Dry Low-NO_x Combustion

The two sources of NO_x emissions from gas-fired turbines are the predominant thermal fixation of atmospheric nitrogen and the conversion of fuel-bound nitrogen. Thermal NO_x generation is generally regarded as following the well-known Zeldovich (1946) mechanism. Its rate of generation is an exponential function of flame temperature and a linear function of the time the hot gas mixture is at the flame temperature. The NO_x generation rate also is a function of the ratio of actual fuel burned in a flame to stoichiometric fuel which can consume all available oxygen. The stoichiometric fuel flow rate results in the highest theoretical flame temperature. Both fuel rich and fuel lean operations result in lower flame temperatures and the rate of NO_x generation falls steeply as temperature decreases. Fuel rich mixtures are not energy efficient and also result in increased HC and CO emissions; therefore, fuel rich mixtures are not preferred. Fuel lean mixtures produce lower flame temperature and due to the exponential effect of the temperature on NO_x production, the rate of NO_x production falls steeply. Therefore, the introduction of a diluent into the reaction zone will decrease the rate of thermal NO_x production. This is the basic principle behind lean combustion. However, unlike steam or water injection, lean combustion using airflow splits has no impact on cycle efficiency.

Dry combustion techniques are designed to alter the conditions in the combustion chamber to influence the temperature, residence time, and mixing of air and fuel so as to reduce the amount of NO_x formed. The state-of-the-art concept in designing a low-NO_x turbine involves raising the air-to-fuel ratio in the combustion primary zone and thoroughly premixing primary combustion air and fuel. This reduces NO_x formation by lowering the average flame temperature in the combustor primary zone and avoiding localized hot spots. Vendors will guarantee NO_x reductions to at least 42 ppm_v corrected to 15% O_2 (Napierala, 1992). This makes dry low-NO_x combustion a technically feasible control method for natural gas pipeline turbines.

6.2.3.3 Water/Steam Injection

Water/steam injection works by introducing water into the combustion chamber. The injected fluid provides a heat sink which absorbs some of the heat of reaction, thereby reducing the peak flame temperature and the resultant NO_x formation.

Water/steam or "wet" injection has long been capable of reducing NO_x emissions to the established limit of 42 ppm_v, corrected to 15 percent oxygen. However, "wet" injection introduces many additional operational, environmental, and financial concerns not encountered with other competing control technologies.

The necessity to obtain a large supply of high quality water is one of these concerns. Water injected into the engine must be of extremely high purity so that no dissolved solids are left behind which may damage the turbine's internal components. This means that rigorous water treatment (including deionizing, demineralizing, softening, and polishing) of the water supply stream is required (Gas Research Institute, 1990).

The source of the water needed, if this BACT alternative were to be selected, has not yet been determined. This makes it difficult to provide an exact estimate of wet injection cost. Estimates from previous projects indicate capital costs to install a complete water treatment system to accommodate wet injection controls at Compressor Station No. 15 could total well over $2 million. It is possible that new water wells and other undetermined factors like water quality could add a considerable amount to this total.

Wet injection also increases operating costs by requiring about 8 percent more fuel. Additional energy is also required for pumping the water from the well, through the treatment unit and out to the evaporation ponds. The extra fuel requirement has been estimated at 67,924 million British terminal units (MMBtu) per year for the continuous operation of the proposed turbine. At $2.50 per MMBtu these additional fuel costs would be over $170,000 annually.

Potential environmental concerns include emissions, hazardous chemical storage and waste disposal problems. One unavoidable impact of wet injection control is increased CO emissions. Turbine vendors will guarantee a much lower CO limit for dry combustion control than water injection. Tests also indicate dry combustion controls may attain a significantly lower NO_x emission limit than the 42 ppm (corrected to 15% O_2) achieved by wet injection.

Another environmental area of concern involves the handling and disposal of hazardous material. Both the hydrochloric acid and the caustic needed to regenerate the deionizer beds in the water treatment system, are listed as hazardous substances under Section 102(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, known as CERCLA or "Superfund." The water treatment plant for reducing total dissolved solids would also create a waste stream requiring appropriate treatment and disposal.

Wet injection systems have increased operating problems associated with the changing flows which may occur for turbines in natural gas pipeline service. Flow changes characteristic of natural gas pipeline operation make it difficult to properly control water to fuel ratios, which can have definite adverse impacts on combustion system performance. High water to fuel ratios (above 1.0) can contribute to excessive equipment wear, maintenance, and downtime.

The previous discussion has illustrated the point that increased environmental problems, operating difficulties and financial requirements make wet injection much less desirable than competing technologies like dry low NO_x combustion controls for Compressor Station No. 15 turbines. Dry combustion controls can obtain the same (if not significantly better) emission reductions with lower environmental, energy, and economic impacts. Consequently wet controls will not receive any further consideration in this BACT review.

6.2.3.4 Selective Noncatalytic Reduction (SNCR)

SNCR was identified via technology transfer as a potential control option since there are no known applications of SNCR to combustion turbines. SNCR, a flue gas treatment technique, is infeasible because it requires flue gas temperatures in the range of 1300 to 2100°F, with an optimum temperature of 1600 to 1900°F (Fuel Tech, 1990,1991). The proposed combustion turbine exhaust temperature (approximately 1000°F) is considerably below the required SNCR temperature range. Therefore, additional fuel combustion or a similar energy supply would be needed to achieve exhaust temperatures compatible with SNCR operation. The temperature restriction and economic considerations make SNCR technically infeasible and inappropriate for Compressor Station No. 15, particularly in light of other available technologies.

6.2.3.5 Nonselective Catalytic Reduction (NSCR)

NSCR is also a post combustion flue gas treatment technique. It is the type of catalyst control used to reduce NO_x emissions from automobile exhaust and it typically utilizes a platinum catalyst. Nonselective catalytic reduction is effective only in fuel-rich combustion air. In other words, the combustion gas must be nearly depleted of oxygen (<4%) for an effective reaction. This condition does not exist for combustion turbines, which operate with high levels of excess air (typically 14 to 16% O_2 in the exhaust). Nonselective catalytic reduction is, therefore, not technically feasible for this application.

6.2.3.6 Summary of Technically Feasible NO_x Control Methods

In summary, there remains two technically feasible NO_x controls to be evaluated for turbines in natural gas transmission service. The technically feasible alternatives for control of NO_x emissions from gas turbines in compressor service include:

1) Selective catalytic reduction (SCR)
2) Dry combustion controls

6.2.4 Evaluation of Technically Feasible NO_x Control Methods

This section examines the technically feasible NO_x control methods identified in the previous discussion. First, the two remaining control alternatives are ranked according to their total removal effectiveness. Then each alternative is examined further in regards to technical issues, environmental effects, energy requirements and impacts, and economic impacts.

Before this can be done, a baseline condition must be established for BACT ranking and economic analysis purposes. The baseline is defined as the uncontrolled emission rate for the process being reviewed. Therefore, the baseline condition for the control technologies involving stationary turbine engines would be the emission factor for a heavy-duty, natural gas-fired pipeline compressor engine.

AP-42 (USEPA, 1988d) indicates the typical uncontrolled emission rate for this type of engine is 1.3 g/bhp-hr. However, the uncontrolled emission rate for the engine selected for Compressor Station No. 15 is indicated by the manufacturer to be 2.0 g/bhp-hr. This value will be used in the economic analysis.

6.2.4.1 Ranking of Feasible NO_x Control Technologies

The top-down BACT approach requires the ranking of the NO_x emission control alternatives in terms of achievable emission level. The two individual options, in order of removal effectiveness, are:

- SCR — 80% NO_x Reduction
- Dry Combustion Controls — 71% NO_x Reduction

The next section will examine technical issues, environmental impacts, energy requirements and impacts, and economic impacts for each remaining control technology, starting with SCR as specified by top down methodology. Only these two options will receive further consideration for BACT.

6.2.4.2 Analysis of SCR

Technical Issues

As the most effective NO_x abatement process in terms of removal efficiency, SCR is control technology often specified for state-of-the-art turbines to meet Lowest Achievable Emission Rate (LAER) standards in non-attainment areas. SCR systems generally operate effectively under steady flow conditions in the 600° F to 700° F region; however, technical problems occur under variable loads and at either higher or lower temperatures.

Temperatures common to natural gas pipeline compression service present formidable SCR system operational problems. Above 850° F ammonia injected upstream of the catalyst bed can be oxidized to form NO_x (or possibly explosive levels of ammonium nitrate and ammonium nitrite) actually increasing pollutant levels in the exhaust gas. Prolonged high temperature operation (above 850° F) can also cause the catalyst to physically deactivate.

Variations in load, faced in natural gas pipeline service, create significant challenges to limit "ammonia slip" (unreacted ammonia emitted to the atmosphere), in addition to the associated temperature problems they cause. The amount of ammonia injected for SCR operation is directly related to the amount of fuel burned. Fluctuations in fuel demand make it extremely difficult for controls to respond quickly as ammonia requirements increase or decrease. Excess ammonia injection above the requirement to effectively control NO_x passes directly into the atmosphere as emissions regulated under SARA Title III. Discussion of "ammonia slip" is continued in the following section of environmental effects.

Environmental Effects

For the purpose of this analysis, an SCR unit capable of reducing NO_x levels by 80 percent from the base case was assumed. This appears to be a reasonable upper limit for SCR systems in natural gas pipeline service because of the variable flow requirements. An 80 percent reduction would place NO_x levels from the proposed turbine at about 29 ppm. Total NO_x reductions from application of SCR would be about 195.6 TPY, leaving NO_x emissions of about 48.9 TPY.

Despite its effectiveness at controlling NO_x levels, SCR has some significant environmental drawbacks. Among these is the requirement for ammonia in the SCR system. Operation of SCR requires that excess ammonia be injected in the flue gas to maintain the desired NO_x reduction efficiency, creating the ammonia slip problem mentioned in the previous technical discussion.

Estimates of ammonia slip under constant load conditions place the level at approximately 10 ppm (Steiner, 1987; SCAQMD, 1988). This level is almost the same emission level as the control level obtained by some SCR applications. This is significant as ammonia is more acutely toxic than NO_x and is considered by USEPA to be an extremely hazardous substance [Section 302 of SARA Title III, Section 102(a) of CERCLA].

Specific problems have been associated with the design and operation of ammonia injection systems. A primary consideration affecting the "ammonia slip" is the control of the NH_3/NO_x

ratio for variable load conditions. The variable loads encountered with natural gas compressor engines makes this particularly important. In fact, the 10 ppm estimate for "ammonia slip" based on cogeneration turbines (which have constant loads) may be underestimated for this application.

In addition, there is a danger of spills and/or explosions during ammonia transportation, storage, and handling at the compressor station. These events, although rare, have potentially significant environmental consequences.

Another detrimental environmental effect of SCR results from disposal of the spent catalyst. Estimates (SCAQMD, 1988) are that most SCR catalysts contain around 5 percent vanadium pentoxide (V_2O_5). In its pure commercial-grade form, V_2O_5 is considered a hazardous material by USEPA.

Energy Requirements and Impacts

The use of SCR for the proposed turbine will have energy penalties in terms of electricity needed to operate the SCR unit and a decrease in the efficiency of the turbine when equipped with SCR. The electricity consumption of the SCR is estimated at about 63.75 KW. The efficiency loss at the turbine is caused by an estimated 3 inch (water) pressure drop across the catalyst beds.

Economic Analysis

The cost summary for the SCR BACT alternative is presented in Table 6-2. Detailed cost backup for the SCR economic analysis is provided in Appendix B. Capital costs for SCR are based on vendor quotations for a similarly sized SCR system. Total estimated capital costs for SCR come to $1,850,701. These costs are budget estimates only and predictably do no reflect necessary developmental costs for turbines to which SCR has not been previously applied.

Annualized costs for SCR include capital charges based on a 10 percent interest rate and 10-year project life, catalyst replacement at 3-year intervals, ammonia consumption, parts and maintenance, and labor costs for technicians to operate and monitor the SCR operating controls. Full-time staffing (24 hours/day, 365 days/year) dedicated to the operation and maintenance of the SCR unit was included since the station would run unattended without these controls. Annualized costs come to roughly $962,378.

The annualized cost effectiveness for SCR calculates to be $4,920 per ton. This figure is based on a single turbine in operation at full load for 8,760 hours per year. Since the actual turbine utilization and/or load may be less than this value, the cost effectiveness of SCR becomes

TABLE 6-2

Summary of Capital and Operating Costs for SCR NOx Controls

Operating Costs	$ 430,769
Overhead	156,472
Capital Charges at 16.27 percent of Capital Cost	301,109
G&A, Taxes, and Insurance at 4 percent	74,028
Interest on Working Capital	Neglected
Total Annual Costs	$ 962,378
NO_x Removed	195.6 tpy
Cost Effectiveness	$ 4,920 per ton

NOTE: See Appendix G for cost details.

worse. These costs are particularly high considering that there have been no previous applications of SCR on natural gas pipeline turbines. If necessary developmental costs are included, the costs for SCR would increase substantially above these levels.

6.2.4.3 Analysis of Dry Low-NO_x Combustion

Technical Issues

Gas turbine combustors are vessels for the mixing of large quantities of fuel and air and the burning of the resulting mixture. There are three important parameters which influence combustor design and performance:

- Air/fuel ratio - A flame burns best when there is just enough fuel to react with all of the available oxygen. At this ratio the flame temperature is hottest and chemical reaction fastest. Gas turbines cannot tolerate these high temperatures and consequently the air/fuel ratio is adjusted to 40% of stoichiometric. At this ratio the flame is too lean for stable and efficient combustion. Therefore the air is introduced in the combustor in two stages: A portion is introduced with the fuel to sustain a stable flame with the balance used to quench the flame before entering the turbine.

- The velocity at which the fuel and air are introduced to the reaction zone determines mixing and flame characteristics. Since the velocities required for adequate mixing are usually larger than the flame speed, mechanical devices are used to stabilize the flame by providing low velocity regions. Modern combustors combine the need for good mixing with low velocity into the aerodynamic design. This is the second important design variable.

- The third aspect of combustor design is the ability to ignite and operate over the load range of the application. This requires that the mechanical, aerodynamic design of the combustor be suitable for a range of flows with stable flame and operating characteristics.

Dry, low NO_x combustion technology was originally developed for heavy duty turbines in the 50 to 100 MW range. Recently, dry low NO_x combustors have been successfully designed to operate on much smaller turbines, like the one proposed for Compressor Station No. 15. All five BACT determinations on natural gas pipeline turbines listed in the USEPA Clearinghouse for the last four years have specified dry combustion controls.

Environmental Effects

The use of dry low NO_x combustors will result in an increase in both CO and non-methane hydrocarbon (NMHC) from levels achievable by completely ignoring NO_x control. Operating conditions which decrease NO_x emissions, generally increase CO and NMHC emissions. This precludes the possibility of obtaining the lowest possible emission rates for all pollutants simultaneously. CO and NMHC emissions could be reduced below dry combustion control levels if NO_x was not controlled. However, dry combustion controls are very effective in reducing NO_x emissions within the operating condition limitations.

Energy Requirements and Impacts

Dry, low-NO_x turbines do not require any more energy to operate than standard turbines; therefore, there are no additional energy requirements or impacts associated with this control technology.

Economic Analysis

A cost summary for dry low NO_x control is presented in Table 6-3. The additional capital cost to install dry low-NO_x control on the selected turbine is $508,800. This includes $480,000 (Solar, 1993) extra for the dry low NO_x modifications on the turbine and $28,800 to cover the additional 6 percent sales tax.

The only other annualized cost resulting from the dry low NO_x design are property taxes, insurance fees, administrative costs and the capital recovery cost (CRC) from the extra $508,800 investment. Taxes, insurance and administrative costs are expected to add $82,782 to the annualized cost. Based on a 10-year turbine operating life, the CRC is equivalent to the 10-year recovery factor (0.1627) times the NO_x control total capital investment of $508,800. This yields an annualized cost of $103,134 for dry low NO_x controls at Compressor Station No. 15.

Dry combustion controls will reduce NO_x emissions by 173.79 TPY. NO_x control costs are $593 per ton based on a 10 year operating life for the dry low-NO_x control installation.

6.2.5 NO_x Control Summary

This assessment concludes that application of dry combustion NO_x controls constitutes BACT for the proposed FGTC Compressor Station No. 15 turbine. SCR is the only other available NO_x control option to provide higher emission reductions. However, it has been shown to have extremely high capital and operating costs, resulting in a cost effectiveness exceeding what

TABLE 6-3

Summary of Capital and Operating Costs for Dry Low NO_x Controls

Operating Costs	$ 0
Overhead	0
Capital Charges at 16.27 percent of Capital Cost	82,782
G&A, Taxes, and Insurance at 4 percent	20,352
Interest on Working Capital	Neglected
Total Annual Costs	103,134
NO_x Removed	173.79 tpy
Cost Effectiveness	$ 593 per ton

NOTE: See Appendix G for cost details.

constitutes BACT. This option would reduce Compressor Station No. 15 NO_x emissions about 21.8 TPY below dry low NO_x control levels at an incremental cost ($962,378-$103,134 = $859,244) of $39,415 per ton.

SCR has not been applied in the past to turbines in natural gas compression service and may require research and development prior to application on these turbines. Turbines in natural gas compression service also routinely have fluctuating loads, and sufficiently sophisticated controllers for operating SCR under such conditions have not been proven in an operational setting. SCR also introduces environmental concerns with potential air toxic (e.g., ammonia) emissions and hazardous waste disposal problems. These factors make dry low-NO_x controls a much superior BACT alternative.

7.0 REFERENCES

Auer, A.H. 1978. Correlation of Land Use and Cover With Meteorological Anomalies. J. Appl. Meteor., Vol 17.

Bowman Environmental Engineering Automated Downwash Program (GEP). 1991. Bowman Environmental Engineering, Dallas, Texas.

Engelhard Corporation. 1993. Budgeting quotation for NO_x/CO Control System.

Fuel Tech. 1990. Standard Technical Sales Literature.

Fuel Tech. 1991. Does SNCR Fit in Current NO_x Reduction Strategies? (V.M. Albanese presented at New England AWMA, Fall Meeting, November 1991).

Gas Research Institute. 1990. Evaluation of NO_x Reduction Technology for Natural Gas Industry Prime Movers - Update to Special Report GRI-87/0257 (Compiled by Carlo Castaldini, Acurex Corporation, Mountain View, CA).

Jung, H.J. and E.R. Becker. 1987. Emission Control for Gas Turbines. Platinum Metals Review, October 1987, Volume 31 No. 4. Norton Chemical Process Products. 1993. Budgetary SCR Cost Estimate.

Napierala, J. 1992. Engineer, Solar Turbines Incorporated, San Diego, California. Personal Communication, December.

Norton Chemical Process Products Corporation. 1993. SCR and CO Catalyst Systems Price Quotation (Submitted by Stephen Turner, Akron, Ohio).

Smith, K.O. and P.B. Roberts. 1991. Development of a Low NO_x Industrial Gas Turbine Combustor (Presented at the Canadian Gas Association October 16-18, 1991 Symposium On Industrial Application of Gas Turbines).

Solar, 1993. Vendor supplied information.

Solar Turbines Incorporated. 1991. Performance Test Data, August.

South Coast Air Quality Management District (SCAQMD). 1988. Environmental Impact Report For Proposed Rule 1134: Control of Oxides of Nitrogen From Stationary Gas Turbines.

Southwest Research Institute. 1987. Evaluation of NO_x Reduction Technology for Natural Gas Industry Prime Movers (Prepared for the Gas Research Institute). NTIS PB-88-1127668.

Steiner, J. 1987. Thermal De-NO_x and SCR Operational Developments - Presented at the Second Annual International Enhanced Oil Recovery Conference, Anaheim, California.

U.S. Environmental Protection Agency (USEPA). 1978. Guidelines for Determining Best Available Control Technology (BACT). Research Triangle Park, NC.

U.S. Environmental Protection Agency (USEPA). 1980. PSD Workshop Manual. Research Triangle Park, NC.

U.S. Environmental Protection Agency (USEPA). 1983. Guideline Series: Control of Volatile Organic Compound Leaks from Natural Gas/Gasoline Processing Plants. USEPA-450/3-83-007. Research Triangle Park, NC.

U.S. Environmental Protection Agency (USEPA). 1987a. Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD). Research Triangle Park, NC. USEPA-450/4-87-007.

U.S. Environmental Protection Agency (USEPA). 1987b. Guideline on Air Quality Models, Supplement A (Revised). USEPA-450/2-78-027.

U.S. Environmental Protection Agency (USEPA). 1988. Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources (Supplement B, P. 3.1-2) AP-42. Research Triangle Park, NC.

U.S. Environmental Protection Agency (USEPA). 1990a. "Top-Down" Best Available Control Technology Guidance Document (Draft). Research Triangle Park, NC.

U.S. Environmental Protection Agency (USEPA). 1990b. OAQPS Control Cost Manual (rth Ed.) USEPA Publication: Research Triangle Park, NC. USEPA-450/3-90-006.

U.S. Environmental Protection Agency (USEPA). 1988 to 1993. BACT/LAER Clearinghouse--A Compilation of Control Technology Determinations. Research Triangle Park, NC.

U.S. Environmental Protection Agency (USEPA). 1992b. User's Guide for the Industrial Source Complex (ISC2) Dispersion Models. Vol. I (Draft). USEPA-450/4-92-2a.

U.S. Environmental Protection Agency (USEPA). (Revised, 1991). USEPA Regulations on National Primary and Secondary Ambient Air Quality Standards. 40CFR50; 36 FR22384; 43FR118. Research Triangle Park, NC.

U.S. Environmental Protection Agency (USEPA). (Revised 1991). USEPA Regulations on Preparation of Implementation Plans. 40CFR51; 36FR22398. Research Triangle Park, NC.

U.S. Environmental Protection Agency (USEPA). (Revised 1991). USEPA Regulations Designating Areas for Air Quality Planning. 40CF81; 35FR22421; 56FR56694. Research Triangle Park, NC.

U.S. Environmental Protection Agency (USEPA). (Amended 1992). USEPA Regulations on Approval and Promulgation of Implementation Plans. 40CFR52; 37FR10846. Research Triangle Park, NC.

U.S. Environmental Protection Agency (USEPA). (Amended 1992). USEPA Regulations on Standards of Performance for New Stationary Sources. 40CFR60; 36FR24876. Research Triangle Park, NC.

U.S. Environmental Protection Agency (USEPA). 1988. USEPA Workshop for Plume Visual Impact Screening and Analysis. USEPA-450/4-88.015. Research Triangle Park, N.C.

U.S. Environmental Protection Agency (USEPA). (Amended 1992). USEPA Regulations on National Emission Standards for Hazardous Air Pollutants. 40CFR61; 38FR8820. Research Triangle Park, NC.

Zeldovich, J. 1946. The Oxidation of Nitrogen in Combustion and Explosions. ACTA Physico Chimica, URSS Volume 21:4, pp 577-628.

APPENDIX A

FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION
PERMIT APPLICATION FORMS

AC62-229319
PSD-FL-202

BEST AVAILABLE COPY

Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor — Carol M. Browner, Secretary

Rec'd 4-7-93
Rpt #180844
$7500.00

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Natural Gas Compressor Engine [ ] New[1] [X] Existing[1]

APPLICATION TYPE: [X] Construction [ ] Operation [X] Modification

COMPANY NAME: Florida Gas Transmission Company COUNTY: Taylor

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Station 15, Unit No. 1507

SOURCE LOCATION: Street 6 miles north of Perry on Pisgah Road City Perry

UTM: East 248.49 km North 3339.22 km

Latitude 30 ° 09 ' 36 "N Longitude 83 ° 36 ' 41 "W

APPLICANT NAME AND TITLE: Carl D. Schulz, Vice President, Project Management Services Florida Gas Transmission Company (713) 853-3893

APPLICANT ADDRESS: P.O. Box 1198, Houston, TX 77251-1188

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Florida Gas Transmission

I certify that the statements made in this application for a construction permit are true, correct and complete to the best of my knowledge and belief. Further I agree to maintain and operate the pollution control source and pollution cont facilities in such a manner as to comply with the provision of Chapter 403, Flori Statutes, and all the rules and regulations of the department and revisions thereof. also understand that a permit, if granted by the department, will be non-transferab and I will promptly notify the department upon sale or legal transfer of the permitt establishment.

*Attach letter of authorization

Signed: [signature]

Carl D. Schulz, Vice President, Project Management Services
Name and Title (Please Type)

Date: ____________ Telephone No. (713) 853-3893

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project ha been [redacted]/examined by me and found to be in conformity with modern engineeri principles applicable to the treatment and disposal of pollutants characterized in t permit application. There is reasonable assurance, in my professional judgment, th

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed Barry D. Andrews

Name (Please Type)

Company Name (Please Type)

Mailing Address (Please Type)

Florida Registration No. 36024 Date: 3/24/93 Telephone No. (205) 740-8240

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

See PSD Report - Section 1.0 - Introduction

Section 2.0 - Project Description

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction February 1994 Completion of Construction 12/1/94

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

Not Applicable

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

Not Applicable

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52

if power plant, hrs/yr ____; if seasonal, describe: Not Applicable

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No

   a. If yes, has "offset" been applied? ____

   b. If yes, has "Lowest Achievable Emission Rate" been applied? ____

   c. If yes, list non-attainment pollutants. ____

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. Yes

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. Yes

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? Yes

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   a. If yes, for what pollutants? ____

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

BEST AVAILABLE COPY

SECTION I'I: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants Type	Contaminants % Wt	Utilization Rate - lbs/hr	Relate to Flow Diagram
Not Applicable				

Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): Not Applicable

2. Product Weight (lbs/hr): Not Applicable

Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Emission Point 1507

Name of Contaminant	Emission[1] Maximum lbs/hr	Emission[1] Actual T/yr	Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission lbs/yr	Potential[4] Emission T/yr	Relate to Flow Diagram
NO_x	18.66	70.7	BACT	BACT	18.66	70.7	
CO	13.49	51.3	N/A	N/A	13.49	51.3	
VOC	0.76	2.9	N/A	N/A	0.76	2.9	
SO_2	3.01	13.2	N/A	N/A	3.01	13.2	
PM	0.53	2.3	N/A	N/A	0.53	2.3	

See Section V, Item 2.

Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, :. (1) - 0.1 pounds per million BTU heat input)

Calculated from operating rate and applicable standard.

Emission, if source operated without control (See Section V, Item 3).

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): ______

2. Product Weight (lbs/hr): ______

. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Emission Point T-1

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
VOC	0.02	0.00	N/A	N/A	0.02	0.00	

See Section V, Item 2.

Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

Calculated from operating rate and applicable standard.

Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Not Applicable				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Natural Gas	0.1054	0.1054	109.66

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: 0.031 Percent Ash: N/A

Density: 0.0455 (lb/ft^3) lbs/gal Typical Percent Nitrogen: N/A

Heat Capacity: 22857 BTU/lb ______ BTU/gal

Other Fuel Contaminants (which may cause air pollution): ______

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average Not Applicable Maximum ______

G. Indicate liquid or solid wastes generated and method of disposal.

Not Applicable

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 55 ft. Stack Diameter: (square) 7.55 ft.

Gas Flow Rate: 171,106 ACFM 66,898 DSCFM Gas Exit Temperature: 870 °F.

Water Vapor Content: 8 % Velocity: 50.03 FPS

SECTION IV: INCINERATOR INFORMATION

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Patholog-ical)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Inciner-ated							
Uncon-trolled (lbs/hr)							

Description of Waste ______

Total Weight Incinerated (lbs/hr) ______ Design Capacity (lbs/hr) ______

Approximate Number of Hours of Operation per day ______ day/wk ______ wks/yr. ______

Manufacturer ______

Date Constructed ______ Model No. ______

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ______ ft. Stack Diamter: ______ Stack Temp. ______

Gas Flow Rate: ______ ACFM ______ DSCFM* Velocity: ______ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) ______

Brief description of operating characteristics of control devices: ______

______

______

______

______

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

______

______

______

______

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
   See Application Report, Section 2.0, Appendix D,E.
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made. See Application Report, Appendix D,E.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
   See Application Report, Appendix D,E.
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)
   Not Applicable
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
   Not Applicable
6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
   See Application Report, Figure 2-1.
7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
   See Application Report, Figure 1-1, Figure 2-1.
8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.
   See Application Report, Appendix C.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.
   Submitted separately.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit. Not Applicable.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source? See Application Report, Sections 3.0 and 6.0.

[ ] Yes [ ] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [ ] No

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life: 6. Operating Costs:

7. Energy: 8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: 55 ft. b. Diameter: (square) 7.55 ft.

c. Flow Rate: 171,106ACFM d. Temperature: 870 °F.

e. Velocity: 50.03 FPS

. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

Explain method of determining efficiency.
Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

Refer to Application Report

A. Company Monitored Data

1. ______ no. sites ______ TSP ______ ( ) SO^2* ______ Wind spd/dir

Period of Monitoring ____/____/____ to ____/____/____
month day year month day year

Other data recorded ______

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location) ______________________________

3. Upper air (mixing height) data obtained from (location) ______________________________

4. Stability wind rose (STAR) data obtained from (location) ______________________________

C. Computer Models Used

1. ______________________________ Modified? If yes, attach description.

2. ______________________________ Modified? If yes, attach description.

3. ______________________________ Modified? If yes, attach description.

4. ______________________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	______________________________	grams/sec
SO^2	______________________________	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

MAP POCKET FOR

PLOT PLAN

APPENDIX B

PLOT PLAN

APPENDIX C

SITE SUMMARY TABLE AND VENDOR DATA

BEST AVAILABLE COPY

22-Mar-93
CS15.WK1

Phase III Station Characteristics

Compressor Station:	Number 15
Name:	Perry
County:	Taylor
Nearest City:	Perry
Compressor Supervisor:	Jim Reed
Mailing Address:	P.O.Box 939 Perry, Florida 32347
Telephone:	904-584-6183
Latitude:	30-09-36
Longitude:	83-36-41
UTM Zone:	17
UTM Easting:	248.49 km
UTM Northing:	3,339.22 km
Elevation (ft):	50

ENGINE IDENTIFICATION	1507
Phase III Engine Characteristics	
Operating Time (hr/yr)	8,760
Hours/Day	24
Days/Week	7
Weeks/Year	52
Engine Type	Gas Turbine
Manufacturer	Solar
Model	Mars T-12000
Horsepower Rating (hp) ISO	12,600
Exhaust Temperature (F)	870
Mass Flow Rate (lbs/hr) (a)	305,561
Volumetric Flow Rate (acfm)	171,106
Volumetric Flow Rate (dscfm)	66,898
Ave. Fuel Consumption (MMCF/Hr) (b)	0.1054
Max. Fuel Consumption (MMCF/Hr) (b)	0.1054
Specific Fuel Consump. (BTU/bhp-hr)	8,703
Maximum Heat Input (MMBTU/Hr)	109.66
Phase III Stack Parameters	
Stack Height (ft)	55
Stack Dimension (Length) (ft)	7.55
Stack Dimension (Width) (ft)	7.55
Stack to Building Offset (ft)	19
Building Height (ft) (c)	32
Building Length (ft) (c)	70
Building Width (ft) (c)	40
Phase III Fuel Characteristics	
Fuel Type	N.G.
Heating Value (BTU/CF)	1040
Heat Capacity (BTU/lb)	22857
Density (lb/cubic ft)	0.0455
Percent Sulfur (%) (d)	0.031
Percent Ash (%)	N/A

ENGINE IDENTIFICATION 1507

Phase III Total Emissions Rates by Engine for Station 15

		Nominal	Maximum
Grams/BHP-Hour			
	NOX	0.58	0.67
	CO	0.42	0.49
	NMHC	0.024	0.028
	SO2 (e)	0.11	0.11
	PM (f)	0.019	0.019
Pounds/Hour			
	NOX	16.14	18.66
	CO	11.71	13.49
	NMHC	0.67	0.76
	SO2	3.01	3.01
	PM	0.53	0.53
Tons/Year			
	NOX	70.70	
	CO	51.30	
	NMHC	2.93	
	SO2	13.19	
	PM	2.31	

Notes:
(a) Wet mass flow (@ 60 F, 14.7 psi).
(b) Based on heating value of fuel gas.
(c) Engine 7 is enclosed in one building.
(d) Percent by weight.
(e) Based on 10 grains S/100 SCF n.g. (assume full conversion).
(f) Based AP-42 factor of 5 lbs/MMSCF.

CATERPILLAR

BEST AVAILABLE COPY

Solar Turbines Incorporated

13105 Northwest Freeway
Suite 980
Houston, TX 77040
(713) 895-2370
Fax: (713) 939-1042

January 8, 1993

Enron Corporation
P. O. Box 1188
Houston, Texas 77251-1188

Attention: Mr. C.K. Johansen

Subject: Enron / FGT
Phase III Expansion
HO-1-059

A.2. The guaranteed emissions levels for all SoLoNOx engines is 42 ppmv NOx and 50 ppmv CO at 15% O_2 at a load range of 50 to 100% and a temperature range of 0°F to 100°F.

For permitting purposes, maximum emission rates should be based on full load exhaust gas flow at the lowest expected site ambient temperature. Maximum annual emissions should be based on the site average annual temperature. Please contact Solar for assistance with permitting issues.

A.3. The emission table for standard engines at full load is attached.

A.4. Please refer to commercial section of proposal for pricing of SoLoNOx option (T-12000 $480,000; T-6502 $290,000). T-4500 $260,000 Avail 1st Qtr '94

BEST AVAILABLE COPY

NEW EQUIPMENT PREDICTED EMISSION PERFORMANCE
DATA FOR POINT NUMBER 1

Fuel: GAS Customer: ENRON/FLORIDA GAS TRANSMISSION
Water Injection: NO Inquiry Number: HO1-059
Number of Engines Tested: 15
Model: MARS T-12000 CS/MD 122 F MATCH

CRITICAL WARNINGS IN USE OF DATA FOR PERMITTING

1. It is recommended that permit values be based on full load gas turbine and ISO standard test conditions. ISO standard test condition should be referenced on the permit so that when site testing is performed, the necessary corrections can be made.

2. Nominal values are based on actual test results. The maximum expected values are obtained by applying the tolerance to the nominal values. Solar suggests using maximum expected values for permitting (for example, +200% multiply value submitted by 3 to use for permit value).

3. Upon written request, Solar will provide a single point guarantee for specific conditions submitted.

The following predicted emissions performance is based on the following specific single point: HP=12312., %Full Load=100.0, ALT=0.0', %RH= 60.0, TEMP= 59.0 F

$\frac{145}{42} : \frac{244}{X}$

NOx	(+)	CO	(+)	UHC	(+)	
145.25	20%	3.46	200%	2.68	400%	PPMvd at 15% O2
244.49	20%	3.55	200%	1.57	400%	TON/YR
0.58	20%	0.01	200%	0.00372	400%	LBm/MMBTU -(FUEL LHV)

X = 70.6

2X

145

OTHER IMPORTANT NOTES

1. If SoLoNOx is to be retrofitted in the future, use no less than 50 ppmV CO for permitting.

2. Ambient and load correction information will be submitted by Solar for CO prior to actual field test. NOx correction for ambient conditions will be based on US 40 CFR 60 subpart GG. Permit conditions should allow correction for load and ambient temperature.

3. Solar does not provide maximum values for water-to-fuel ratio, SOX, particulates, or conditions outside those above without separate written approval.

4. 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.

5. 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.

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

SOLAR TURBINES INCORPORATED DATE RUN: 12-JAN-93
ENGINE PERFORMANCE DATA REV. 1.5
EXHAUST GAS AND EMISSION DATA REV. 1.2
TEXT CHANGES REV. 1.1
JOB ID : ENRON

MARS
T-12000
CS/MD
122 F MATCH
GAS FUEL

PREDICTED NOMINAL PERFORMANCE

FUEL TYPE	SD NATURAL GAS
ELEVATION, FEET	0.
INLET LOSS, IN. H20	0.0
EXHAUST LOSS, IN. H20	0.0
AMB TEMP, DEG. F	59.0
REL HUMI, PCT	60.0
INLET LOSS HP	0.
EXHAUST LOSS HP	0.
COMP OR PUMP RPM	8496.
OPTIMUM RPM	8496.
100% RPM	8496.
NET OUTPUT POWER (HP)	12312.
FUEL FLOW, MMBTU/HR	96.60
HEAT RATE , BTU/HP-HR	7846.
INLET AIR FLOW, LB/HR	301867.
ENGINE EXH FLOW, LB/HR	305561.
PCD P.S.I.G.	220.0
P.T. INLET TEMP. DEG. F	1262.
COMPENSATED PTIT DEG. F	1319.
ENGINE EXH TEMP, DEG. F	868.

SOLAR TURBINES INCORPORATED DATE RUN: 19-FEB-93
ENGINE PERFORMANCE DATA REV. 1.6
EXHAUST GAS AND EMISSION DATA REV. 1.4
TEXT CHANGES REV. 1.1
JOB ID : 0

NEW EQUIPMENT PREDICTED EMISSION PERFORMANCE
DATA FOR POINT NUMBER 1

Fuel: GAS Customer: Enron
Water Injection: NO Inquiry Number:
Number of Engines Tested: 15
Model: MARS T-12000 CS/MD 59 F MATCH

CRITICAL WARNINGS IN USE OF DATA FOR PERMITTING

1. It is recommended that permit values be based on full load gas turbine and ISO standard test conditions. ISO standard test condition should be referenced on the permit so that when site testing is performed, the necessary corrections can be made.

2. Nominal values are based on actual test results. The maximum expected values are obtained by applying the tolerance to the nominal values. Solar suggests using maximum expected values for permitting (for example, +200% multiply value submitted by 3 to use for permit value).

3. Upon written request, Solar will provide a single point guarantee for specific conditions submitted.

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

HP=14846., %Full Load=100.0, ALTITUDE= 0.0 FEET, %RH= 60.0, TEMP= 10.0 F

NOx	(+)	CO	(+)	UHC	(+)	
148.57	50%	6.30	400%	2.16	600%	PPMvd at 15% O2
65.99	50%	1.70	400%	0.33	600%	LBm/Hr
2.02	50%	0.05	400%	0.01	600%	g/(HP-Hr) (GAS TURBINE SHAFT POWER)

OTHER IMPORTANT NOTES

1. If SoLoNOx is to be retrofitted in the future, use no less than 50 ppmV CO for permitting.

2. Ambient and load correction information will be submitted by Solar for CO prior to actual field test. NOx correction for ambient conditions will be based on US 40 CFR 60 subpart GG. Permit conditions should allow correction for load and ambient temperature.

3. Solar does not provide maximum values for water-to-fuel ratio, SOX, particulates, or conditions outside those above without separate written approval.

4. 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.

5. 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.

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

SOLAR TURBINES INCORPORATED DATE RUN: 19-FEB-93
ENGINE PERFORMANCE DATA REV. 1.6
EXHAUST GAS AND EMISSION DATA REV. 1.4
TEXT CHANGES REV. 1.1
JOB ID : 0

MARS
T-12000
CS/MD
59 F MATCH
GAS FUEL

DATA FOR NOMINAL PERFORMANCE

FUEL TYPE	SD NATURAL GAS
ELEVATION, FEET	0.
INLET LOSS, IN. H20	0.0
EXHAUST LOSS, IN. H20	0.0
AMB TEMP, DEG. F	10.0
REL HUMI, PCT	60.0
INLET LOSS HP	0.
EXHAUST LOSS HP	0.
COMP OR PUMP RPM	9106.
OPTIMUM RPM	9106.
NET OUTPUT POWER (HP)	14846.
FUEL FLOW, MMBTU/HR	110.99
HEAT RATE , BTU/HP-HR	7476.
INLET AIR FLOW, LB/HR	330060.
ENGINE EXH FLOW, LB/HR	334361.
PCD P.S.I.G.	239.8
P.T. INLET TEMP. DEG. F	1275.
COMPENSATED PTIT DEG. F	1330.
ENGINE EXH TEMP, DEG. F	842.

APPENDIX D

SUPPORTING CALCULATIONS

CALCULATION OF NORMAL POLLUTANT EMISSION FACTORS FOR SOLONOX TURBINE:

COMPRESSOR ENGINE (WITHOUT SOLONOX):

Engine No. 1507:

Engine Rating (ISO)	=	12,600 bhp
Brake Specific Fuel Consumption	=	8,703 Btu/bhp-hr
Maximum Fuel Consumption	=	0.1054 MMscf/hr

NORMAL OPERATION:

	PPM	TPY	
NO_x:	145.25	244.49	Manufacturer's Data
CO:	3.46	3.55	Manufacturer's Data
UHC:	2.68	1.57	Manufacturer's Data

COMPRESSOR ENGINE WITH SOLONOX:

Engine No. 1507:

CALCULATION OF NORMAL OPERATIONS EMISSIONS IN TONS/YR WITH SOLONOX

tons/yr = tons/yr (w/o SOLONOX) * PPM (with SOLONOX)/ PPM (without SOLONOX)

	PPM	TPY	
NO_x:	42.0	70.70	Manufacturer's Data
CO:	50.0	51.30	Manufacturer's Data
UHC:	50.0	29.29	Manufacturer's Data

CALCULATION OF NORMAL OPERATIONS GRAMS/BHP-HR

lbs/hr = (tons/yr) * (2000 lb/ton) * (1 yr/ 8760 hrs)

grams/bhp-hr = (lb/hr * (453.6 grams/1 lb))/ bhp

NO_x:	0.58 grams/bhp-hr	Manufacturer's Data
CO:	0.42 grams/bhp-hr	Manufacturer's Data
UHC:	0.24 grams/bhp-hr	Manufacturer's Data
SO_2:	10 grains/100 CF	Contract Limit on Sulfur Content

= 10 grains/100 CF * 1 lb/7000 grains * Btu/bhp-hr
  * bhp * 1 CF/1040 Btu * 64 lb SO_2/32 lb S

= 10 grains/100 CF * 1 lb/7000 grains * 8703 Btu/bhp-hr
  * 12,600 bhp * 1 CF/1040 Btu * 64 lb SO_2/32 lbs

= 3.01 lb SO_2/hr

= lb SO_2/hr * 453.6 g/1 lb * 1/bhp

= 3.01 lb SO_2/hr * 453.6 g/1 lb * 1/12,600 bhp

= 0.11 grams/bhp-hr

PM: 5 lb/10^6 CF Table 1.4-1, AP-42

= 5 lb PM/10^6 CF * MMCF/hr

= 5 lb PM/10^6 CF * 0.105 MMCF/hr

= 0.53 lb PM/hr

= lb PM/hr * 453.6 g/1 lb * 1/bhp

= 0.53 lb PM/hr * 453.6 g/1 lb * 1/12,600 bhp

= 0.019 grams/bhp-hr

CALCULATION OF WORST CASE POLLUTANT EMISSION FACTORS FOR SOLONOX TURBINE:

COMPRESSOR ENGINE (WITHOUT SOLONOX):

Engine No. 1507:

WORST CASE:

	PPM	lb/hr	
NO_x:	148.57	65.99	Manufacturer's Data
CO:	6.30	1.70	Manufacturer's Data
UHC:	2.16	0.33	Manufacturer's Data

COMPRESSOR ENGINE WITH SOLONOX:

Engine No. 1507:

CALCULATION OF WORST CASE SHORT TERM EMISSIONS IN LB/HR WITH SOLONOX

lb/hr = lb/hr (w/o SOLONOX) * PPM (with SOLONOX)/ PPM (without SOLONOX)

	PPM	lb/hr	
NO_x:	42.0	18.66	Manufacturer's Data
CO:	50.0	13.49	Manufacturer's Data
UHC:	50.0	7.64	Manufacturer's Data

CALCULATION OF WORST CASE GRAMS/BHP-HR

grams/bhp-hr = (lb/hr * (453.6 grams/1 lb))/ bhp

NO_x:	0.67 grams/bhp-hr	Manufacturer's Data
CO:	0.49 grams/bhp-hr	Manufacturer's Data
UHC:	0.28 grams/bhp-hr	Manufacturer's Data
SO_2:	10 grains/100 CF	Contract Limit on Sulfur Content
	0.11 grams/bhp-hr	
PM:	5 lbs/10^6 CF	Table 1.4-1, AP-42
	0.019 grams/bhp-hr	

CRITERIA POLLUTANT
EMISSION CALCULATIONS

MAXIMUM HEAT INPUT:

COMPRESSOR ENGINE:

Engine No. 1507:

Fuel Heating Value	=	1,040 Btu/scf
Engine Rating	=	12,600 bhp
Brake Specific Fuel Consumption	=	8703 Btu/bhp-hr
Maximum Heat Input = MMBtu/Hr	=	(Btu/bhp-hr * hp)/10^6
	=	(8703 * 12,600)/10^6
	=	109.66 MMBtu/hr
Gas Consumption = MMscf/hr	=	(59.60 MMBtu/hr/1040 Btu/CF)
	=	0.105 MMscfh

POLLUTANT EMISSION FACTORS FOR SOLONOX TURBINE:

COMPRESSOR ENGINES:

Engine No. 1507:

NORMAL OPERATIONS:

NO_x:	0.58 grams/bhp-hr	Manufacturer's Data
CO:	0.42 grams/bhp-hr	Manufacturer's Data
UHC:	0.24 grams/bhp-hr	Manufacturer's Data
NMHC:	0.024 grams/bhp-hr	(10% of UHC)
SO_2:	10 grains/100 CF	Contract Limit on Sulfur Content
	0.11 grams/bhp-hr	
PM:	5 lbs/10^6 CF	Table 1.4-1, AP-42
	0.019 grams/bhp-hr	

WORST CASE:

NO_x:	0.67 grams/bhp-hr	Manufacturer's Data
CO:	0.49 grams/bhp-hr	Manufacturer's Data
UHC:	0.28 grams/bhp-hr	Manufacturer's Data
NMHC:	0.028 grams/bhp-hr	(10% of UHC)
SO_2:	10 grains/100 CF	Contract Limit on Sulfur Content
	0.11 grams/bhp-hr	
PM:	5 lbs/10^6 CF	Table 1.4-1, AP-42
	0.019 grams/bhp-hr	

HOURS OF OPERATION:

The compressor engine is analyzed as if it has a potential to operate 8,760 hours per year.

NO_x EMISSIONS

COMPRESSOR ENGINES

Engine No. 1507:

NORMAL OPERATION:

lb NO_x/hr = (grams/bhp-hr) * (0.002205 lb/gram) * (bhp)

= (0.58 grams/bhp-hr) * (0.002205 lb/gram) * (12,600 bhp)

= 16.14 lb/hour

tons NO_x/yr = (lb NO_x/hr) * (8760 hr/yr) / (2000 lb/ton)

= (16.14 lb/hr) * (8760 hr/yr) / (2000 lb/ton)

= 70.70 tons/year

WORST CASE:

lb NO_x/hr = (grams/bhp-hr) * (0.002205 lb/gram) * (bhp)

= (0.67 grams/bhp-hr) * (0.002205 lb/gram) * (12,600 bhp)

= 18.66 lb/hour

CO EMISSIONS

COMPRESSOR ENGINES

Engine No. 1507:

NORMAL OPERATION:

lb CO/hr = (grams/bhp-hr) * (0.002205 lb/gram) * (bhp)

= (0.42 grams/bhp-hr) * (0.002205 lb/gram) * (12,600 bhp)

= 11.71 lb/hour

tons CO/yr = (lb CO/hr) * (8760 hr/yr) / (2000 lb/ton)

= (11.71 lb/hr) * (8760 hr/yr) / (2000 lb/ton)

= 51.30 tons/year

WORST CASE:

lb CO/hr = (grams/bhp-hr) * (0.002205 lb/gram) * (bhp)

= (0.49 grams/bhp-hr) * (0.002205 lb/gram) * (12,600 bhp)

= 13.49 lb/hour

NMHC EMISSIONS

COMPRESSOR ENGINES

Engine No. 1507:

NORMAL OPERATION:

lb NMHC/hr = (grams/bhp-hr) * (0.002205 lb/gram) * (bhp)

= (0.024 grams/bhp-hr) * (0.002205 lb/gram) * (12,600 bhp)

= 0.67 lb/hour

tons NMHC/yr = (lb NMHC/hr) * (8760 hr/yr) / (2000 lb/ton)

= (0.67 lb/hr) * (8760 hr/yr) / (2000 lb/ton)

= 2.93 tons/year

WORST CASE:

lb NMHC/hr = (grams/bhp-hr) * (0.002205 lb/gram) * (bhp)

= (0.028 grams/bhp-hr) * (0.002205 lb/gram) * (12,600 bhp)

= 0.76 lb/hour

SO_2 EMISSIONS

COMPRESSOR ENGINES

Engine No. 1507:

NORMAL OPERATION AND WORST CASE

lb SO_2/hr = (grams/bhp-hr) * (0.002205 lb/gram) * (bhp)

= (0.11 grams/bhp-hr) * (0.002205 lb/gram) * (12,600 bhp)

= 3.01 lb/hour

tons SO_2/yr = (lb SO_2/hr) * (8760 hr/yr) / (2000 lb/ton)

= (3.01 lb/hr) * (8760 hr/yr) / (2000 lb/ton)

= 13.18 tons/year

PM EMISSIONS

COMPRESSOR ENGINES

Engine No. 1507:

NORMAL OPERATION AND WORST CASE:

lb PM/hr = (grams/bhp-hr) * (0.002205 lb/gram) * (bhp)

= (0.019 grams/bhp-hr) * (0.002205 lbs/gram) * (12,600 bhp)

= 0.53 lb/hour

tons PM/yr = (lb PM/hr) * (8760 hr/yr) / (2000 lb/ton)

= (0.53 lb/hr) * (8760 hr/yr) / (2000 lb/ton)

= 2.32 tons/year

FIXED ROOF TANK CALCULATIONS
AP–42 – Fourth Edition – 1990

Symbol	Description	Units	Value	References
	Tank Identification	C.S. 15 – Tank 1		
	Contents	New Lube Oil		
Mv	Vapor Molecular Weight	(lb/lb mol)	190	(See AP–42, Table 4.3–2)
	Liquid Temp.	degrees F		
	Max			
	Avg			
	Constants for Calc of True Vapor Press			
	A			(See EPA, 1990)
	B			(See EPA, 1990)
	C			(See EPA, 1990)
P	True Vapor Pressure	(psia)		
	@ Max Temp		0.0019	(See EPA, 1990)
	@ Avg Temp		0.0019	
Wl	Density	(lb/gal)		(See EPA, 1990)
	Tank Height	(feet)	13.8	
D	Tank Diameter	(feet)	5	
V	Tank Volume	(gallons)	2,000	
	Tank Throughput	(gal/yr)	500	
Kc	Product Factor		1	
FRm	Maximum Fill Rate	(gal/hr)	2,000	
Pa	Avg. Atm. Pressure	(psia)	14.7	
T	Avg. Diurnal Delta T	degrees F	20	
H	Avg. Vapor Space Ht.	(feet)	6.9	(1/2 Tank Hgt. if Unknown)
Fp	Paint Factor		1.4	(See AP–42, Table 4.3–1)
C	Adj. for Small Tanks		0.25	(See AP–42, Fig. 4.3–4)
N	Turnovers	#/yr	0.25	(Annual throughput/V)
Kn	Turnover Factor		1	(See AP–42, Fig. 4.3–7)

Equations:

Lb	Breathing Loss	(lb/yr)	0.0226*Mv*(P/(14.7–P))^0.68*D^1.73*H^0.51* T^0.5*Fp*C*Kc	
Lw	Working Loss	(lb/yr)	2.4*10^–5*Mv*P*V*N*Kn*Kc	
	Annual Loss	(tons/yr)	(Lb+Lw)/2000	
	Max. Short–term Loss	(lb/hr)	(Lw, lb/yr * FRm)/(N * V)	(TACB, 1992)

		@Max Temp	@Avg Temp
Breathing Loss (Lb)	(lb/yr)	0.66	0.66
Working Loss (Lw)	(lb/yr)	0.00	0.00
Max. Short–term Loss	(lb/hr)	0.02	0.02
Annual Loss	(tons/year)	0.00	0.00

APPENDIX E

FDER REGULATORY REQUIREMENT SUMMARY

AIR QUALITY
REGULATORY REQUIREMENTS CHECKLIST
FLORIDA

Rules and Regulations	Applicability	Name	Comments
Title 17		Rules and Regulations of the State of Florida	Heading. No specific regulatory requirements.
• Chapter 17-2		Air Pollution	Heading. No specific regulatory requirements.
• Part I		Definitions	Heading. No specific regulatory requirements.
§17-2.100	Yes	Definitions	This subsection defines the terms used in Chapter 17-2. No specific regulatory requirements.
• Part II		General Provisions	Heading. No specific regulatory requirements.
§17-2.200	Yes	Statement of Intent	Chapter 17-2 is promulgated to eliminate, prevent, and control air pollution, except from outdoor burning and outdoor heating devices which are regulated under Chapter 17-5. It also furthers the Department of Environmental Regulation's (DER's) Prevention of Significant Deterioration (PSD) policy, and establishes ambient air quality standards and emission standards. No specific regulatory requirements.

Rules and Regulations	Applicability	Name	Comments
§17-2.210	Yes	Permits Required	Unless exempt, all sources at the compressor station which emit or can reasonably be expected to emit any air pollutant are required to be permitted prior to construction, modification, or initial or continued operation. FGTC must file a construction permit for new sources or those desiring to undergo modification. The permit term will be for a time period sufficient to allow determination of compliance. An operation permit is required of the source after the construction permit expires. The permit specifies the manner, nature, volume and frequency of emission permitted, applicable limiting standard (if any), proper operation and maintenance of pollution control equipment, and a term of 5 years. Requirements for sources which have shut down and desire to reactivate are specified. Exemptions to Chapter 17-2 are listed including emergency electrical generators operating $\leq$400 hrs/yr.
§17-2.215	No	Emission Estimates	Standards for making emissions estimates for all regulatory purposes including permitting and reporting purposes are established. Since standards have only been established for solid sulfur storage and handling facilities, this section is not applicable to the compressor station.

Rules and Regulations	Applicability	Name	Comments
§17-2.220	Yes	Public Notice and Comment	Public notice must be provided by FGTC for construction (including modifications) permit applications. There are additional public notice requirements for sources subject to New Source Review (NSR), i.e., sources located in non-attainment areas, or Prevention of Significant Deterioration (PSD), i.e., sources located in attainment areas. FGTC is required to publish the public notice after it has been prepared by DER. Procedures and specifications for public notice are detailed.
§17-2.240	Yes	Circumvention	Circumvention of pollution control devices and use of improperly operating devices is prohibited. No specific regulatory requirements.
§17-2.250	Yes	Excess Emissions	Excess emissions resulting from startup, shutdown, or malfunction are allowed for $\leq$2 hours in any 24-hour period provided best operational practices to minimize emissions are used and the activity did not result from poor maintenance or operations. Fossil fuel steam generators are presented as a special case. DER must be notified by FGTC of upset emissions followed by a written report on the malfunction(s), if requested.

Rules and Regulations	Applicability	Name	Comments
§17-2.260	Yes	Air Quality Models	FGTC's estimates of concentrations of ambient air pollutants are to be based on applicable air quality models, data bases, and other DER approved requirements specified in USEPA's "Guidelines On Air Quality Models" (1978). Alternative models may be allowed following public comment and as justified in USEPA's "Workbook for Comparison of Air Quality Models" (1978).
§17-2.270	Yes	Stack Height Policy	For the purpose of estimating ambient air concentrations through modeling, FGTC must use Good Engineering Practice (GEP). A required emission limitation shall not be affected by stack heights which exceed GEP or by other specified dispersion techniques. Actual stack heights are not restricted. GEP specifications and details regarding dispersion techniques are presented. The turbine stack at this facility meets GEP.
§17-2.280	Yes	Severability	If any part of this rule is invalidated, all other parts remain valid. No specific regulatory requirements.
§17-2.290	Yes	Effective Date	The effective date of this rule is 11/1/81. No specific regulatory requirements.
• Part III		Ambient Air Quality	Heading. No specific regulatory requirements.

Rules and Regulations	Applicability	Name	Comments
§17-2.300	Yes	Ambient Air Quality Standards	Standards are established to protect human health and welfare. Violations of ambient air quality standards (AAQS) are not allowed by any source.. Standards are established for SO_2 (maximum 3-hour concentration not to be exceeded more than once per year = 1,500 $\mu g/m^3$; 24-hour standard not to be exceeded more than once per year = 260 $\mu g/m^3$); for PM_{10} (24-hour average concentration not to be exceeded more than once per year = 150 $\mu g/m^3$); for CO (maximum 1-hour concentration not to be exceeded more than once per year = 40 $\mu g/m^3$); for O_3 (daily maximum 1-hour concentration not to be exceeded an average of more than one day per year = 100 $\mu g/m^3$); for NO_2 (annual arithmetic mean = 100 $\mu g/m^3$); and for lead (maximum quarterly arithmetic mean = 1.5 $\mu g/m^3$). Specific instructions for determining O_3 exceedances and compliance are presented. FGTC is required to maintain AAQS.
§17-2.310	Yes	Maximum Allowable Increases (Prevention of Significant Deterioration Increments	At each point within the baseline area, any increase in pollutant concentration by the compressor station over the baseline concentration shall be limited to the amounts specified in this section. Specifications regarding averaging periods and allowable increases are presented on a pollutant-by-pollutant basis for each area designation (i.e., Class I or II). One exceedance per year above the maximum allowable increase is permitted during one averaging period in the year. This

Rules and Regulations	Applicability	Name	Comments
			station is an existing major stationary source for at least one criteria pollutant. Therefore, the turbine is subject to pre-construction PSD review.
§17-2.320	Yes	Air Pollution Episodes	Air Pollution Episodes are defined and classified. DER is authorized to declare and terminate episodes and define affected areas. Preplanned abatement strategies prepared by FGTC may be requested by DER. Plan contents are established. Procedures for enforcing non-compliance are presented.
§17-2.330	Yes	Air Alert	Alert level criteria are defined. Actions required of specific sources upon declaration of an alert are given. FGTC is prohibited from any form of open burning.
§17-2.340	Yes	Air Warning	Warning level criteria are defined. Actions required of specific sources upon declaration of a warning are given. FGTC is prohibited from any form of open burning and unnecessary space heating and cooling.
§17-2.350	Yes	Air Emergency	Emergency level criteria are defined. Actions required of specific sources upon declaration of an emergency are given. FGTC is prohibited from any form of open burning, any construction other than in case of an emergency, and unnecessary lighting, heating, or cooling in unoccupied structures. FGTC is required to take any action that will result in the maximum reduction of air pollutants from the compressor station.

Rules and Regulations	Applicability	Name	Comments
• Part IV		Area Designation and Attainment Dates	Heading. No specific regulatory requirements.
§17-2.400	Yes	Procedures for Designation and Redesignation of Areas	All areas of the state are to be designated as non-attainment, attainment, or unclassifiable with respect to each pollutant for which an AAQS has been established. Area determinations determine emission limiting standards, new and modified source review requirements, and other air pollution control measures. All areas not designated as non-attainment are PSD areas which require establishment of a baseline date. PSD areas are further classified as Class I, II, or III areas for which maximum allowable increases in SO_2 and TSP shall apply after the baseline date. FGTC must comply with these maximum allowable increases. Air Quality Maintenance Areas are former non-attainment areas which have been redesignated to attainment or unclassifiable. These areas remain subject to the emission limiting standards and permit limitations imposed upon them as non-attainment areas. Procedures for redesignation of Class I, II, and III areas and PSD areas are established.
§17-2.410	Yes	Designation of Areas Not Meeting Ambient Air Quality Standards (Non-attainment Areas)	Ozone, TSP, and SO_2 non-attainment areas within the state are designated. No_x or PM_{10} non-attainment areas areas have been designated. No specific regulatory requirements.

Rules and Regulations	Applicability	Name	Comments
§17-2.420	Yes	Designation of Areas Meeting Ambient Air Quality Standards (Attainment Areas)	All areas not designated as non-attainment or unclassifiable are designated as attainment areas. This compressor station is located in an attainment area for SO_2 and PM, and unclassifiable for all other criteria pollutants. No specific regulatory requirements.
§17-2.430	Yes	Designation of Areas Which Cannot Be Classified Attainment or Non-attainment	Unclassifiable areas in the State are designated. These are all areas not designated as attainment or non-attainment. This compressor station is located in an area unclassifiable for NO_x, CO, and ozone. No specific regulatory requirements.
§17-2.440	Yes	Designation of Class I, Class II, and Class III Areas	Class I areas are specifically designated. All other areas are designated as Class II areas. No Class III areas are designated. No specific regulatory requirements.
§17-2.450	Yes	Designation of Prevention of Significant Deterioration (PSD) Areas	All of the State is a PSD area for TSP and SO_2 (except for designated non-attainment areas) and has a major source baseline date of 1/6/75; a minor source baseline date of 12/27/77; and a trigger date of 8/7/77. All of the state is a PSD area for NO_2 and has a major source baseline date of 2/28/88; a minor source baseline date of 3/28/88; and a trigger date of 2/8/88 No specific regulatory requirements.

Rules and Regulations	Applicability	Name	Comments
§17-2.460	Yes	Designation of Air Quality Maintenance Areas	Air Quality Maintenance Areas within the State are designated. Non-attainment areas which will automatically become air quality maintenance areas upon redesignation by USEPA as attainment are listed. No specific regulatory requirements.
• Part V		New and Modified Source Review Requirements	Heading. No specific regulatory requirements
§17-2.500	No	Prevention of Significant Deterioration	This rule applies to construction of new sources or modification of existing sources in attainment areas. Twenty-eight categories of major facilities (Table 500-1) subject to this section are established. The turbine at this station is not one of these listed sources. Specific construction and operation permit requirements are presented. Violations of AAQS are not allowed, nor are emissions increases above baseline concentrations which have been summed with the lesser of the allowable increases or AAQS. The criteria for determining whether or not the compressor station is subject to NSR are presented. Fugitive emissions cannot be used to subject a facility to NSR, and NSR does not apply to sources located in non-attainment areas. Although the turbine at this station is not one of the 28 listed sources, it has the potential to emit $\geq$250 TPY of at least one criteria pollutant for which the area is designated as attainment. Therefore, Compressor Station No. 15 is subject to PSD pre-construction

Rules and Regulations	Applicability	Name	Comments
			review. Source exemptions to New Source Review (NSR) are presented. Applicability of NSR to new or modified major and minor sources is established.
§17-2.510	Yes	New Source Review for Non-attainment Areas	This compressor station is located in an attainment area for all criteria pollutants.
§17-2.520	No	Sources Not Subject to Prevention of Significant Deterioration or Non-attainment Requirements	This rule applies to sources not subject to NSR but not exempt from general permitting requirements. This compressor station is subject to the PSD requirements presented in §17-2.500. Therefore, this section does not apply to the compressor station.
§17-2.530	Yes	Source Reclassification	A source whose operating permit has been revoked is deemed permanently shut down. A source whose permit has lapsed is deemed permanently shut down unless DER is notified within 20 days of the date of lapse and that the source intends to continue operation. The source must meet the additional requirements specified in this rule. This rule does not apply since the permit for this facility has never been revoked or has never lapsed.

Rules and Regulations	Applicability	Name	Comments
§17-2.540	No	Source Specific New Source Review Requirements	This rule applies only to sulfur storage and handling facilities.
• Part VI		Emission Limiting and Performance Standards	Heading. No specific regulatory requirement.
§17-2.600	No	Specific Source Emission Limiting Standards	Emission limiting standards for specified sources are presented. This compressor station is not one of the specified sources.
§17-2.610	Yes	General Particulate Emission Limiting Standard	This rule establishes a PM standard for sources not subject to any other PM or opacity standard. The compressor station is subject to this standard since it is not subject to any other PM limiting standard. A process rate standard and a 20% opacity standard is established. The rule mandates that reasonable practices be taken to prevent unconfined PM emissions.
§17-2.620	Yes	General Pollutant Emission Limiting Standard	Vapor emission control is required for storing, pumping handling, processing, loading, unloading, or using in any process or installation VOCs or organic solvents. FGTC's compressor station must not emit objectionable odors.

Rules and Regulations	Applicability	Name	Comments
§17-2.630	Yes	Best Available Control Technology (BACT)	Because this source is subject to PSD and because BACT is a requirement under PSD NSR, the turbine is subject to BACT.
§17-2.640	No	Lowest Achievable Emission Rate (LAER)	LAER is required for construction in non-attainment areas or areas of influence on non-attainment areas. Because this compressor station is located in an attainment area for all criteria pollutants, the turbine is not subject to LAER.
§17-2.650	No	Reasonably Available Control Technology (RACT)	RACT for VOC control is established for sources in non-attainment areas and air quality maintenance areas, and for PM in air quality maintenance areas and areas of influence on them. Because this compressor station is located in an attainment area for all criteria pollutants, this section does not apply.
§17-2.660	Yes	Standards of Performance for New Stationary Sources	Heading. No specific regulatory requirements.
• Subpart D	No	Standards of Performance for Fossil-Fuel Fired Steam Generators for which Construction is Commenced After August 17, 1991	This facility is not a fossil-fuel fired steam generator.

Rules and Regulations	Applicability	Name	Comments
• Subpart Da	No	Standards for Performance for Electric Utility Steam Generating Units for which Construction is Commenced after September 18, 1978	This facility is not an electric utility steam generating unit.
• Subpart Db	No	Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units	This facility is not a steam generating unit.
• Subpart E	No	Standards of Performance for Incinerators	This facility is not an incinerator.
• Subpart F	No	Standards of Performance for Portland Cement Plants	This facility is not a Portland Cement Plant.
• Subpart G	No	Standards of Performance for Nitric Acid Plants	This facility is not a nitric acid plant.
• Subpart H	No	Standards of Performance for Sulfuric Acid Plants	This facility is not a sulfuric acid plant.
• Subpart I	No	Standards of Performance for Asphalt Concrete Plants	This facility is not a hot mix asphalt facility.

Rules and Regulations	Applicability	Name	Comments
• Subpart J	No	Standards of Performance for Petroleum Refineries	This facility is not a petroleum refinery.
• Subpart K	No	Standards of Performance for Storage Vessels for Petroleum Liquids Constructed after June 11, 1973, and Prior to May 19, 1978	The storage vessels at this facility do not meet the minimum criteria specified (storage capacity $\geq$40,000 gallons).
• Subpart Ka	No	Standards of Performance for Storage Vessels for Petroleum Liquids Constructed after May 18, 1978.	The storage vessels at this facility do not meet the minimum criteria specified (storage capacity $\geq$40,000 gallons).
• Subpart Kb	No	Standards of Performance for Storage Vessels for Petroleum Liquids Constructed after July 23, 1978.	The storage vessels at this facility do not meet the minimum criteria specified (storage capacity $\geq$40 m^3).
• Subpart L	No	Standards of Performance for Secondary Lead Smelters	This facility is not a lead smelter.
• Subpart M	No	Standards of Performance for Secondary Brass and Bronze Ingot Production Plants	This facility does not produce brass or bronze.
• Subpart N	No	Standards of Performance for Iron and Steel Plants	This facility is not an iron or steel plant.

Rules and Regulations	Applicability	Name	Comments
• Subpart Na	No	Standards of Performance for Basic Oxygen Process Steel-making Facilities for which Construction is Commenced after January 20, 1983	This facility is not a steelmaking facility.
• Subpart O	No	Standards of Performance for Sewage Treatment Plants	This facility is not a sewage treatment plant.
• Subpart P	No	Standards of Performance for Primary Copper Smelters	This facility is not a copper smelter.
• Subpart Q	No	Standards of Performance for Primary Zinc Smelters	This facility is not a zinc smelter.
• Subpart R	No	Standards of Performance for Primary Lead Smelters	This facility is not a lead smelter.
• Subpart S	No	Standards of Performance for Primary Aluminum Reduction Plants	This facility is not an aluminum reduction plant.
• Subpart T	No	Standards of Performance for Phosphate Fertilizer Industry (P.F.I.)s: Wet Process Phosphoric Acid Plants	This facility is not part of the phosphate fertilizer industry.

Rules and Regulations	Applicability	Name	Comments
• Subpart U	No	Standards of Performance for P.F.I.s: Superphosphoric Acid Acid Plants	This facility is not part of the phosphate fertilizer industry.
• Subpart V	No	Standards of Performance for P.F.I.s: Diammonium Phosphate Plants	This facility is not part of the phosphate fertilizer industry.
• Subpart W	No	Standards of Performance for P.F.I.s: Triple Superphosphate Plants	This facility is not part of the phosphate fertilizer industry.
• Subpart X	No	Standards of Performance for P.F.I.s: Granular Triple Superphosphate Storage Facilities	This facility is not part of the phosphate fertilizer industry.
• Subpart Y	No	Standards of Performance for Coal Preparation Plants	This facility is not a coal preparation plant.
• Subpart Z	No	Standards of Performance for Ferroalloy Production Facilities	This facility is not a ferroalloy production facility.

Rules and Regulations	Applicability	Name	Comments
• Subpart AA	No	Standards of Performance for Steel Plants: Electric Arc Furnaces Constructed after October 21, 1974, and on or before August 17, 1983	This facility is not a steel plant.
• Subpart AAa	No	Standards of Performance for Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels Constructed after August 7, 1983	This facility is not a furnace.
• Subpart BB	No	Standards of Performance for Kraft Pulp Mills	This facility is not a Kraft pulp mill.
• Subpart CC	No	Standards of Performance for Glass Manufacturing Plants	This facility is not a glass manufacturing plant.
• Subpart DD	No	Standards of Performance for Grain Elevators	This facility is not a grain elevator.
• Subpart EE	No	Standards of Performance for Surface Coating: Metal Furniture	This facility is not involved in surface coating operations.
• Subpart GG	Yes	Standards of Performance for Stationary Gas Turbines	The stationary gas turbine to be installed at this facility is subject to this standard because it will exceed 10.7 gigajoules/hr (10MMBtu/hr) of heat input and is to be installed after 10/3/77.

Rules and Regulations	Applicability	Name	Comments
• Subpart HH	No	Standards of Performance for Lime Manufacturing Plants	This facility is not a lime manufacturing plant.
• Subpart KK	No	Standards of Performance for Lead-Acid Battery Manufacture Plants	This facility is not a lead-acid battery manufacturing plant.
• Subpart LL	No	Standards of Performance for Metallic-Mineral Processing Plants	This facility is not a metallic-mineral processing plant.
• Subpart MM	No	Standards of Performance for Automobile and Light Duty Truck Surface Coating Operations	This facility is not a surface coating facility.
• Subpart NN	No	Standards of Performance for Phosphate Rock Plants	This facility is not a phosphate rock plant.
• Subpart PP	No	Standards of Performance for Ammonium Sulfate Manufacturing	This facility is not involved in the manufacture of ammonium sulfate.
• Subpart QQ	No	Standards of Performance for Graphic Arts Industry: Publication Rotogravure Printing	This facility is not part of the graphic arts industry.

Rules and Regulations	Applicability	Name	Comments
• Subpart RR	No	Standards of Performance for Pressure Sensitive Tape and Label Surface Coating Operations	This facility is not involved in coating operations.
• Subpart SS	No	Standards of Performance for Industrial Surface Coating: Large Appliances	This facility is not involved in coating operations.
• Subpart TT	No	Standards of Performance for Metal Coil Surface Coating	This facility is not involved in coating operations.
• Subpart UU	No	Standards of Performance for Asphalt Processing and Asphalt Roofing Manufacture	This facility is not involved in asphalt processing or asphalt roofing manufacture.
• Subpart VV	No	Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry	This facility is not a SOCMI facility.
• Subpart WW	No	Standards of Performance for the Beverage Can Surface Coating Industry	This facility is not involved in coating operations.
• Subpart XX	No	Standards of Performance for Bulk Gasoline Terminals	This facility is not a bulk gasoline terminal.

Rules and Regulations	Applicability	Name	Comments
• Subpart AAA	No	Standards of Performance for New Residential Wood Heaters	This facility is not a residential wood heater.
• Subpart BBB	No	Standards of Performance for the Rubber Tire Manufacturing Industry	This facility is not involved in the manufacture of rubber tires.
• Subpart FFF	No	Standards of Performance for Flexible Vinyl and Urethane Coating and Printing	This facility is not involved in coating or printing.
• Subpart GGG	No	Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries	This facility is not a petroleum refinery.
• Subpart HHH	No	Standards of Performance for Synthetic Fiber Production Facilities	This facility is not a synthetic fiber production facility.
• Subpart III	No	Standards of Performance for Volatile Organic Compound (VOC) Emissions from the Synthetic Organic Chemical Manufacturing Industry (SOCMI) Air Oxidation Unit Processes	This facility is not a SOCMI facility.

Rules and Regulations	Applicability	Name	Comments
• Subpart JJJ	No	Standards of Performance for Petroleum Dry Cleaners	This facility is not a petroleum dry cleaner.
• Subpart KKK	No	Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants	This facility is not a natural gas processing plant.
• Subpart LLL	No	Standards of Performance for Onshore Natural Gas Processing: SO_2 Emissions	This facility is not a natural gas processing plant.
• Subpart NNN	No	Standards of Performance for Volatile Organic Compound (VOC) Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations	This facility is not a SOCMI facility.
• Subpart OOO	No	Standards of Performance for Nonmetallic Mineral Processing Plants	This facility is not a nonmetallic mineral processing plant.
• Subpart PPP	No	Standards of Performance for Wool Fiberglass Insulation Manufacturing Plants	This facility is not a wool fiberglass manufacturing plant.

Rules and Regulations	Applicability	Name	Comments
• Subpart QQQ	No	Standards of Performance for Petroleum Wastewater Systems	This facility is not a petroleum wastewater system.
• Subpart SSS	No	Standards of Performance for Magnetic Tape Manufacturing Industry	This facility is not involved in the manufacture or magnetic tape.
• Subpart TTT	No	Standards of Performance for Industrial Surface Coating: Surface Coating of Plastic Parts for Business Machines	This facility is not a surface coating facility.
• Subpart VVV	No	Standards of Performance for Polymeric Coating of Supporting Substrates Facilities	This facility is not involved in coating operations.
§17-2.670	No	National Emission Standards for Hazardous Air Pollutants	The federal NESHAPS are incorporated here by reference.
• Subpart B	No	Radon-222 Emission from Underground Uranium Mines	This facility is not an underground uranium mine.
• Subpart C	No	Beryllium	This facility is not a source of beryllium.
• Subpart D	No	Beryllium Rocket Motor Firing	This facility is not engaged in rocket motor firing.
• Subpart E	No	Mercury	There are no mercury emissions from this facility.

Rules and Regulations	Applicability	Name	Comments
• Subpart F	No	Vinyl Chloride	There are no vinyl chloride emissions from this facility.
• Subpart G	No		Reserved. No specific regulatory requirements.
• Subpart H	No		Reserved. No specific regulatory requirements.
• Subpart I	No		Reserved. No specific regulatory requirements.
• Subpart J	No	Benzene Equipment Leaks	There are no benzene emissions from this facility.
• Subpart K	No		Reserved. No specific regulatory requirements.
• Subpart L	No	Benzene Emissions from Coke By-Product Recovery Plants	This facility is not a coke by-product recovery plant.
• Subpart M	No	Asbestos	There are no asbestos emissions at this facility.
• Subpart N	No	Standard for Inorganic Arsenic Emissions from Glass Manufacturing Plants	This facility is not a glass manufacturing plant.
• Subpart O	No	Standard for Inorganic Arsenic Emissions from Primary Copper Smelters	This facility is not a primary copper smelter.

Rules and Regulations	Applicability	Name	Comments
• Subpart P	No	Standard for Inorganic Arsenic Emissions from Arsenic Trioxide and Metallic Arsenic Production Facilities	This facility is not an arsenic production facility.
• Subpart Q	No		Reserved. No specific regulatory requirements.
• Subpart R	No		Reserved. No specific regulatory requirements.
• Subpart S	No		Reserved. No specific regulatory requirements.
• Subpart T	No		Reserved. No specific regulatory requirements.
• Subpart U	No		Reserved. No Specific regulatory requirements.
• Subpart V	No	Equipment Leaks (Fugitive Emission Sources)	This facility will have no benzene or vinyl chloride emissions.
• Subpart W	No	Radon-222 Emissions from Licensed Uranium Mill Tailings	This facility does not handle uranium mill tailing.
• Subpart X	No		Reserved. No specific regulatory requirements.
• Subpart Y	No	Benzene Emissions from Benzene Storage Vessels	This facility does not have benzene storage vessels.
• Subpart Z	No		Reserved. No specific regulatory requirements.

Rules and Regulations	Applicability	Name	Comments
• Subpart AA	No		Reserved. No specific regulatory requirements.
• Subpart BB	No	Benzene Emissions from Benzene Transfer Operations	There are no benzene transfer operations at this facility.
• Subpart CC	No		Reserved. No specific regulatory requirements.
• Subpart DD	No		Reserved. No specific regulatory requirements.
• Subpart EE	No		Reserved. No specific regulatory requirements.
• Part VII	No	Source Sampling and Monitoring	Heading. No specific regulatory requirements.
§17-2.700	Yes	Stationary Point Source Emissions Test Procedures	The methods and procedures which FGTC must use to perform compliance test on stack emission are presented.
§17-2.710	No	Continuous Monitoring Requirements	These requirements apply only to certain specified sources. This facility is not one of those specified.
§17-2.753	No	DER Ambient Test Methods	These requirements apply only to certain specified sources. This facility is not one of those specified.
• Part VIII	Yes	Local Air Pollution Control Programs	This part establishes local air pollution control programs. in specified counties. This facility is not located in one of the counties with approved programs.

Rules and Regulations	Applicability	Name	Comments
• Part IX	No	Compliance Schedules	This part applies only to certain specified sources. This facility is not one of the sources specified.
• Chapter 17-4		Permits	Heading. No specific regulatory requirements.
§17-4.001	No	Scope of Part I	This section establishes that procedures for obtaining an FDER permit will be presented in Part I. No specific regulatory requirements.
§17-4.020	Yes	Definitions	Definitions of terms used in Part I to which FGTC is subject are presented.
§17-4.021	No	Transferability of Definitions	Terms defined in other Chapters retain their meaning here, unless otherwise defined. No specific regulatory requirements.
§17-4.022	No	Determination of the Landward Extent of Surface Waters of the State	Transferred to §17-3.022. No specific regulatory requirements.
§17-4.030	Yes	General Prohibition	All FGTC stationary sources must have a valid permit unless exempted, and must be constructed, maintained, and operated consistent with the terms of the permit.
§17-4.040	Yes	Exemptions	DER may exempt structural changes which will not change quality, nature, or quantity of emissions or will not cause pollution. DER may exempt sources which do not contribute significantly to pollution problems within the

Rules and Regulations	Applicability	Name	Comments
			state. FGTC may request an exemption for sources which meet the previously stated conditions.
§17-4.050	Yes	Procedure to Obtain Permit: Application	FGTC is to complete an application in quadruplicate on DER forms. The application must be certified by a Florida Registered Professional Engineer and must be accompanied by the appropriate processing fee. FGTC must submit a certification of construction and permit fee upon completion of construction in order to be granted an operation permit.
§17-4.055	Yes	Permit Processing	This section establishes the schedule which DER must follow in processing the permit application. DER may request additional information from FGTC. FGTC may request a hearing if it believes that the requested information if not legally authorized.
§17-4.060	Yes	Consultation	FGTC or their representatives are encouraged to consult with DER prior to submitting the permit application. No specific regulatory requirements.
§17-4.070	Yes	Standards for Issuing or Denying Permits; Issuance; Denial	The construction permit will be issued "for a period of time as necessary." The operation permit will have a 5 year term. FGTC's compliance history will be considered in issuing/denying the application. DER will stipulate permit conditions. No specific regulatory requirements.

Rules and Regulations	Applicability	Name	Comments
§17-4.080	Yes	Modification of Permit Conditions	DER may, after issuing the permit, modify or establish new permit conditions. FGTC may request a permit modification permit extension.
§17-4.090	Yes	Renewals	FGTC must apply for a permit renewal prior to 60 days before the expiration of the permit.
§17-4.100	Yes	Suspension and Revocation	FGTC's permit may be suspended or revoked for actions specified within the section.
§17-4.110	Yes	Financial Responsibility	DER may request FGTC to submit proof of financial responsibility, and may require a bond to guarantee compliance.
§17-4.120	Yes	Transfer of Permits	FGTC must submit an "Application for Transfer of Permit" within 30 days of selling/legally transferring a permitted facility.
§17-4.140	No	Reports	Repealed. No specific regulatory requirements.
§17-4.150	Yes	Review	After having received notice of a proposed or final DER action, FGTC waives its right to an administrative hearing if FGTC fails to respond to the notice with 14 days of receipt.

Rules and Regulations	Applicability	Name	Comments
§17-4.160	Yes	Permit Conditions	FGTC is required to properly operate and maintain the facility in order to maintain compliance. DER may access FGTC's records, inspect the facility, and collect samples. All FGTC data may be used in enforcement proceedings. FGTC must keep a copy of the permit at the facility. All monitoring information, reports, and data used to complete applications must be retained at the site or other location specified in the permit for 3 years. FGTC is required to keep specific information regarding monitoring data.
• Part II	No	Specific Permits: Requirements	Heading. No specific regulatory requirements.
§17-4.200	No	Scope of Part II	This section establishes that additional requirements for certain permits are established in the following sections. No specific regulatory requirements.
§17-4.210	Yes	Construction Permits	FGTC is required to apply on DER forms for a permit to construct.
§17-4.220	Yes	Operation Permit for New Sources	FGTC is required to submit the appropriate fee and certification that construction was completed.
§17-4.230	No	Operation Permits for Pollution Sources	Repealed. No specific regulation requirements.

Rules and Regulations	Applicability	Name	Comments
• Part III	No	Procedures for General Permits	This facility does not meet the requirements for being issued a general permit.
• Chapter 17-256	No	Open Burning and Frost Protection Fires	This facility will not engaged in open burning or use of frost protection fires.
• Chapter 17-8	Yes	Ad Valorem Tax Assessment Rules	A tax assessor may require FGTC to submit a detailed list of pollution control devices at the facility, and their cost and function, for the purpose of assessing ad valorem taxes.
• Chapter 17-242	No	Mobile Source - Motor Vehicle Emission Standards and Test Procedures	This facility is not involved with compliance and testing of mobile sources/motor vehicles.
• Chapter 17-243	No	Tampering With Motor Vehicle Air Pollution Control Equipment	This facility is not involved with checking motor vehicle pollution control devices for tampering.

APPENDIX F

AREA CONCENTRATION MAPS FROM ISC MODELING
GEP STRUCTURE DOWNWASH OUTPUT TABLE ISC MODEL OUTPUT
ISC MODEL OUTPUT
VISCREEN VISIBILITY SCREENING RESULTS
FLOPPY DISK WITH MODELING AND GEP INPUT FILES

MAXIMUM ANNUAL NO_x CONCENTRATION ($\mu G/m^3$)

100 METER GRID SPACING

FGTC Station 15 NOx ANNUAL max 100 M grid (ug/m3) 1986

UTM N (m) \ UTM E (m)	-1200	-1100	-1000	-900	-800	-700	-600	-500	-400	-300	-200	-100	0	100	200	300	400	500	600	700	800	900	1000	1100	1200
1200	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1100	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1000	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
900	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
800	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
700	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
600	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
500	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
400	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
300	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
200	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.00	0.01					0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
100	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.00	0.01					0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
0	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01					0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-100	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.00	0.00					0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
-200	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-300	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-400	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-500	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-600	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-700	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-800	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
-900	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.04	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01
-1000	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.05	0.06	0.05	0.04	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
-1100	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.05	0.06	0.05	0.04	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
-1200	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.05	0.05	0.06	0.05	0.04	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

PROPERTY BOUNDARY

POINT OF MAXIMUM

UTM N (m)

UTM E (m)

MAXIMUM ANNUAL NO_X CONCENTRATION ($\mu G/m^3$)

500 METER GRID SPACING

FGTC Station 15 NOx ANNUAL max 500 M grid (ug/m3) 1986

UTM N (m) \ UTM E (m)	-6000	-5500	-5000	-4500	-4000	-3500	-3000	-2500	-2000	-1500	-1000	-500	0	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000
6000	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
5500	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
5000	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
4500	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
4000	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
3500	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
3000	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.04	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
2500	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.04	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
2000	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.04	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1500	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1000	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
500	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.01	PROPERTY BOUNDARY	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-500	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-1000	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.06	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
-1500	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.04	0.07	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01
-2000	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.05	0.08	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01
-2500	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.05	0.08 (POINT OF MAXIMUM)	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01
-3000	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.04	0.06	0.08	0.05	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01
-3500	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.04	0.06	0.07	0.05	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01
-4000	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.04	0.06	0.07	0.06	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01
-4500	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.05	0.06	0.07	0.06	0.04	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01
-5000	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.03	0.04	0.05	0.06	0.07	0.06	0.04	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01
-5500	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.03	0.04	0.05	0.06	0.07	0.06	0.04	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01
-6000	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.04	0.05	0.06	0.07	0.06	0.05	0.04	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01

MAXIMUM ANNUAL NO_x CONCENTRATION ($\mu G/m^3$)

2 KILOMETER GRID OUT TO 30 KILOMETERS

FGTC Station 15 NOx annual max 2km grid out to 30 km 1986

UTM N (m) \ UTM E (m)	-30000	-28000	-26000	-24000	-22000	-20000	-18000	-16000	-14000	-12000	-10000	-8000	-6000	-4000	-2000	0	2000	4000	6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000
30000	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
28000	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
26000	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
24000	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
22000	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
20000	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
18000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
16000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
14000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
12000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
10000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
8000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
6000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
4000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
2000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.03	0.03		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-2000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.08	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-4000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.07	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-6000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.07	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-8000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.06	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-10000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.04	0.06	0.04	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-12000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.04	0.05	0.04	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-14000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.04	0.05	0.04	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-16000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.05	0.04	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-18000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.04	0.03	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-20000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.04	0.03	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-22000	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.04	0.03	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-24000	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-26000	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-28000	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-30000	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

PROPERTY BOUNDARY

POINT OF MAXIMUM

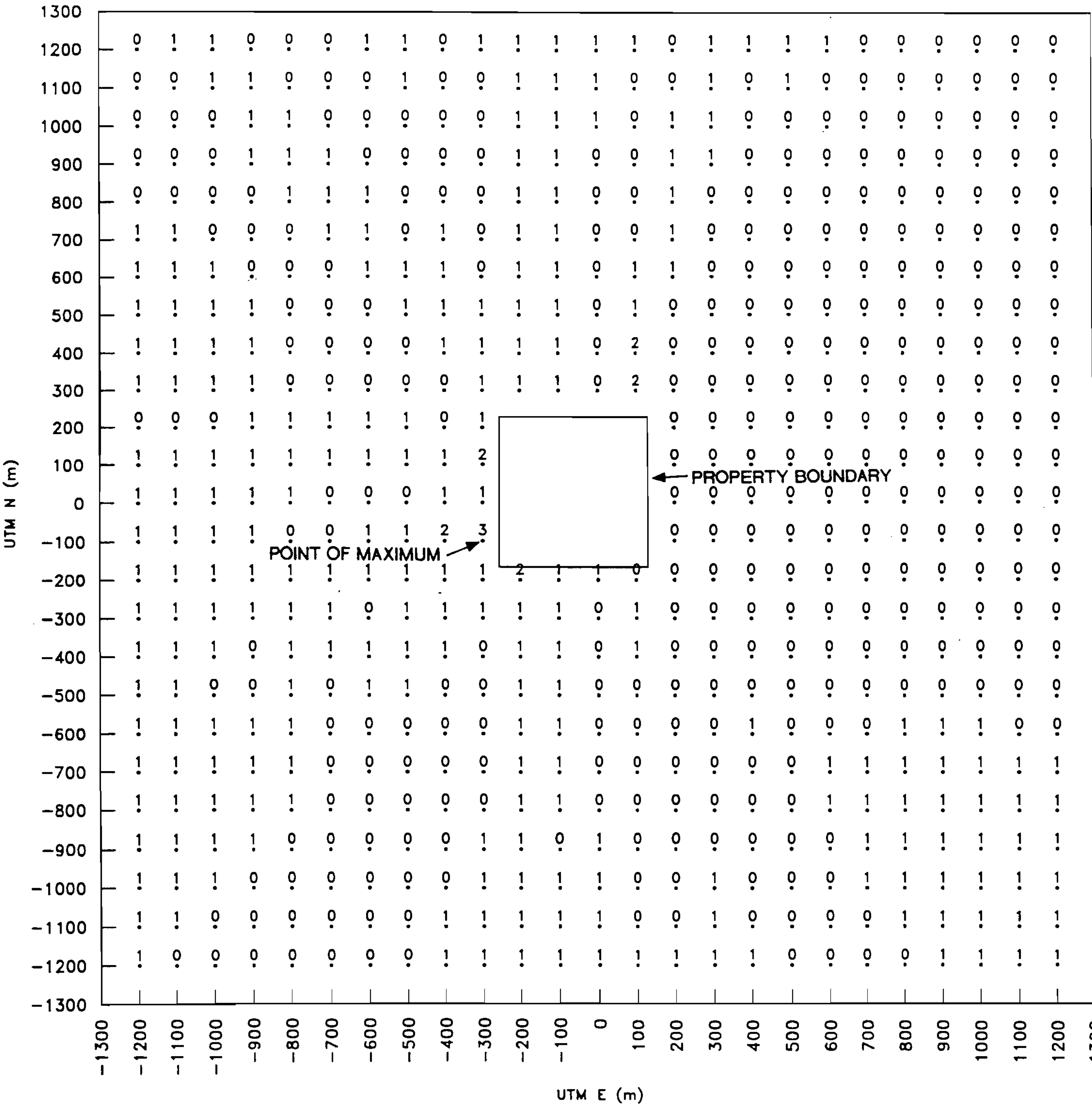
UTM N (m)

UTM E (m)

MAXIMUM 8-HOUR CO CONCENTRATION ($\mu G/m^3$)

100 METER GRID SPACING

FGTC Station 15 CO 8 HR max 100 M grid (ug/m3) 1985



MAXIMUM 1-HOUR CO CONCENTRATION ($\mu G/m^3$)

100 METER GRID SPACING

FGTC Station 15 CO 1 HR max 100 M grid (ug/m3) 1984