COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

SOUTH CENTRAL REGIONAL OFFICE
7705 Timberlake Road, Lynchburg, Virginia 24502
(434) 582-5120 Fax (434) 582-5125
www.deq.virginia.gov

Preston Bryant
Secretary of Natural Resources

David K. Paylor
Director

Thomas L. Henderson
Regional Director

STATIONARY SOURCE PERMIT TO OPERATE
This permit implements the control measures required for the NOx SIP Call Phase II.

In compliance with the Federal Clean Air Act and the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution,

Transcontinental Gas Pipe Line Corporation
P.O. Box 1396
Houston, Texas 77251-1396

Natural Gas Compressor Station #165
Registration No.: 30864
State-County-Plant ID No.: 51-143-0120

is authorized to operate

a natural gas compressor station

located at

945 Transco Road
in Pittsylvania County, VA

in accordance with the Conditions of this permit.

Approved on January 24, 2007

David K. Paylor
Director, Department of Environmental Quality

Permit consists of 10 pages.
Source Testing Report Format

I. PURPOSE:

This permit is for the purpose of:

A. Addressing the interstate transport of ozone and implementing ozone season emission reduction measures that will address the significant contribution to downwind ozone nonattainment by imposing certain federally enforceable conditions; and

B. Establishing requirements for the reduction of nitrogen oxide (NOx) emissions during the ozone season from the Transcontinental Gas Pipe Line Corporation – Compressor Station Number 165 located in Pittsylvania County. These requirements shall be the legal and regulatory basis for control of NOx emissions from this facility.

II. DEFINITIONS:

A. **Affected Engine** means any stationary IC engine that is a Large NOx SIP Call Engine, or other stationary IC engine that is subject to NOx emission reduction requirements under this permit.

B. **Board** or **SAPCB** means the State Air Pollution Control Board, a citizen board of the Commonwealth of Virginia described in § 10.1-1301 of the Code.

C. **Clean Air Act (CAA)** means 42 USC 7401 et seq.

D. **Code** means the Code of Virginia.

E. **DEQ** means the Department of Environmental Quality, an agency of the Commonwealth described in § 10.1-1183 of the Code.

F. **EPA** or **the administrator** means the United States Environmental Protection Agency.

G. **Large NO_x SIP Call Engine** means a stationary IC engine identified and designated as "large" in the NOx SIP Call Engine Inventory as emitting more than one ton of NOx per average ozone season day in 1995.

H. **New source review (NSR) program** means a preconstruction review and permit program (i) for new stationary sources or modifications (physical changes or changes in the method of operation) to existing ones, (ii) established to implement the requirements of §§ 110 (a)(2)(C), 112 (relating to permits for hazardous air pollutants), 165 (relating to permits in prevention of significant deterioration areas), and 173 (relating to permits in nonattainment areas) of the federal Clean Air Act and associated regulations, and (iii) promulgated as Article 6 (9 VAC 5-80-1100 et seq.), Article 7 (9 VAC 5-80-1400 et seq.), Article 8 (9 VAC 5-80-1605 et seq.) and Article 9 (9 VAC 5-80-2000 et seq.) of Part II of 9 VAC 5 Chapter 80 of the SAPCB Regulations.

I. **NO_x** means nitrogen oxides as defined by 9 VAC 5-10-20 of the SAPCB Regulations.

J. **Ozone season** means the period of time from May 1 to September 30 of any calendar year.

K. **Past NOx Emission Rate** means the emission rate of an affected engine in pounds per hour (lb/hr) as determined by performance testing consistent with the requirements of 40 CFR Part 60, Appendix A. Where such performance test data are not available, the Past NOx Emission Rate may be determined by the State on a case-by-case basis using, for example, appropriate emission factors or data from the NOx SIP Call Engine Inventory. For any affected unit subject to the NOx SIP Call, the Past NOx Emission Rate is the uncontrolled emission rate.

L. **Allowable Operating Hours** means the allowable number of hours of operation per ozone season for an affected engine or group of engines.

M. **Allowable NOx Emission Rate** means the allowable NOx emission rate in pounds per hour (lb/hr) during the ozone season for an affected engine or group of engines.

N. **State Air Pollution Control Board (SAPCB) Regulations** means 9 VAC 5 Chapters 10 through 80 and 9 VAC 5 Chapter 170.

O. **SIP or State Implementation Plan** means the portion or portions of the plan, or the most recent revision thereof, which has been approved under § 110 of the federal Clean Air Act, or promulgated under § 110(c) of the federal Clean Air Act, or promulgated or approved pursuant to regulations promulgated under § 301(d) of the federal Clean Air Act and which implements the relevant requirements of the federal Clean Air Act.

P. **Stationary internal combustion engine (IC engine)** means any internal combustion engine of the reciprocating type that is either attached to a foundation at a facility or is designed to be capable of being carried or moved from one location to another and remains at a single site at a building, structure, facility, or installation for more than 12 consecutive months. Any engine (or engines) that replaces an engine at a site that is intended to perform the same or similar function as the engine replaced is included in calculating the consecutive time period.

Q. **VAC or 9 VAC** means Title 9 of the Virginia Administrative Code. This title comprises the environmental regulations for the Commonwealth of Virginia, including the State Air Pollution Control Board Regulations.

III. CONDITIONS:

A. **Application:**

1. Beginning on May 1, 2007, the owner or operator of any affected engine identified in Condition III.B.1 shall not operate that affected engine during the ozone season unless the owner or operator complies with the operating and emission limitation requirements set forth in this permit.
(9 VAC 5-80-850)

2. The facility shall be operated in accordance with the terms and conditions of this permit. Any changes in the facilities subject to this permit or any existing facilities which alter the impact of the permitted facility on air quality may require a permit or a permit revision.
(9 VAC 5-80-830)

B. **Process Requirements:**

1. **Equipment List:**

The affected engine subject to emission reductions of the NOx SIP Call to be operated at this facility consists of the following:

Ref. ID	Manufacturer	Model Number	Horsepower
M/L 11	Clark	TCV-10	3,400 HP

(9 VAC 5-80-830)

2. **Emission Reductions:** The NOx SIP Call Phase II emissions reduction requirements for the affected engine shall be met through engine combustion modifications (high pressure fuel injection) or through operational limitations. (9 VAC 5-80-850)

C. **Monitoring**

1. A Parametric Monitoring Systems (PMS) shall be installed on the affected engine (Ref. M/L 11) to measure and record the operating performance indicators as analytical monitoring for NOx emissions prior to the start of the 2007 Ozone Season. The PMS shall be installed, maintained, calibrated, and operated in accordance with approved procedures which shall include, as a minimum, the manufacturer's written requirements or recommendations. Each monitoring device shall be provided with adequate access for inspection and shall be in operation when the affected engine (Ref. M/L 11) is operating. During each ozone season, beginning in 2007, the PMS shall collect and record at a minimum four or more data points equally spaced over each hour the following parameters at the following frequencies:

   - Fuel flow (FF_{SCFM}) in standard cubic feet per minute (SCFM) on an hourly average basis
   - Engine speed (RPM) on an hourly average basis
   - Air manifold temperature (AMT) in degrees F on an hourly average basis
   - Critical trapped equivalence ratio (TER_C) on an hourly average basis
   - Engine trapped volume (V_{TRAP}) in cubic feet (ft^3) on an hourly average basis
   - Actual air manifold pressure (AMP_{ACT}) in inches of mercury (in Hg) on an hourly average basis
   - Critical air manifold pressure (AMP_C) in inches of mercury (in Hg) on an hourly average basis

2. If the one (1) hour average actual air manifold pressure (AMP_{ACT}) of the affected engine (Ref. M/L 11) is less than the calculated critical air manifold pressure (AMP_C) for that affected engine (Ref. M/L 1-11) for a one-hour period, the permittee shall report a deviation from normal operation.

3. If any three (3) hour average of AMP_{ACT} of the affected engine (Ref. M/L 11) is less than the calculated AMP_C for that affected engine, the source shall take timely corrective action such that the affected engine resumes normal operation.

4. If the three (3) hour average of AMP_{ACT} of the affected engine (Ref. M/L 11) is less than the calculated AMP_C for that engine for three (3) times during any ozone season, the permittee shall repeat the testing required in Condition III.F to re-establish the correlation between parameter levels that indicate proper operation of the affected engine (Ref. M/L 11) and assure compliance with the NOx limit. Testing shall be completed and the results submitted to the South Central Regional Office within ninety (90) days of the third occurrence.
(9 VAC 5-80-890)

D. **Periodic Monitoring**

At least once per ozone season, beginning with the 2008 Ozone Season, the permittee shall test the affected engine (Ref. M/L 11) with a portable analyzer to demonstrate the validity of the PMS and compliance to the ozone season NOx emission limit in Condition III.E.1. The engine shall be tested in the "as found" condition. The engine may not be adjusted or tuned prior to any test for the purpose of lowering emissions, then returned to previous setting or operating conditions after the test is completed. The permittee shall submit the testing protocol for approval to the South Central Regional Office at least 30 days prior to the scheduled testing. The portable analyzer shall be capable of measuring NOx emissions over the full range of expected engine operating conditions. The permittee shall calibrate the portable analyzer in accordance to the provisions of 40 CFR Part 60 Appendix A, Method 7E or alternative as approved by the Administrator and record the results in a logbook.
(9 VAC 5-80-850)

E. **Operating/Emission Limitations**

1. **Emission Limits** – Beginning on May 1, 2007, NOx emissions from the operation of the affected engine shall not exceed the projected emission rates specified below during the ozone season:

Unit ID	Past Ozone Season NO_x Emission Rate (1995) (lb/hr)	Past Ozone Period NO_x Emission Rate (1995) (tons/ozone season)	Ozone Season Projected NO_x Emission Rate (lb/hr)	Ozone Season Projected NO_x Emission Rate (ton/ozone season)
M/L 11	120.14	201.8	19.20	35.25
TOTAL	[redacted]	201.8	[redacted]	32.25

(9 VAC 5-80-850)

2. **Fuel** - The approved fuel for the affected engine is natural gas. A change in the fuel may require a NSR program permit.
(9 VAC 5-80-850)

F. **Testing**

1. **Initial Emissions Test** – Prior to May 1, 2007 the permittee shall conduct an initial emissions test consistent with 40 CFR Part 60, Appendix A for NOx from the affected engine (Ref. M/L 11) using reference method 7(E) to determine compliance with the ozone season allowable NOx emission limits contained in Condition III.E.1. The permittee shall submit the testing protocol for approval to the South Central Regional Office at least 30 days prior to the scheduled testing. One copy of the test results shall be submitted to the South Central Regional Office within 45 days after test completion and shall conform to the test report format enclosed with this permit.
(9 VAC 5-80-880)

2. **PMS Relative Accuracy Test** - The permittee shall perform a minimum of nine (9) emissions tests runs to establish a correlation between the engine operating parameters in Condition III.C.1 and NOx emissions in Condition III.E.1 from the affected engine (Ref. M/L 11) using the following equation and constants A, B, and C referenced below:

$$AMP_C = \left[\frac{\{AF_{ST} \times (0.0765 \times FSG) \times \frac{FF_{SCFM}}{RPM} \times (AMT + 460)\}}{(2.699 \times TER_C \times V_{TRAP})}\right] - 14.73] \times 2.036$$

Where:

AF_{ST} = stoichiometric air/fuel ratio
FSG = fuel gas specific gravity
FF_{SCFM} = unit fuel flow rate in standard cubic feet per minute (SCFM)
RPM = unit speed in revolutions per minute
AMT = air manifold temperature in °F
TER_C = critical trapped equivalence ratio
V_{TRAP} = engine trapped volume in cubic feet (ft^3)
AMP_C = critical air manifold pressure in inches of mercury (in Hg)

And:

$$TER_c = A \times \frac{(FF_{SCFM})^2}{(RPM)^2} + B \times \frac{(FF_{SCFM})}{(RPM)} + C$$

Where:

A, B, and C = constants determined based upon initial performance testing of affected unit.

3. **Test Protocol** - Tests shall be conducted and reported and data reduced as set forth in 9 VAC 5-50-30 and the test methods and procedures contained in each applicable section listed in 40 CFR Part 60, Appendix A or alternative as approved by the Administrator. The details of the tests are to be arranged with the South Central Regional Office. The permittee shall submit a test protocol at least 30 days prior to scheduled testing. One copy of the test results shall be submitted to the South Central Regional Office within 45 days after test completion and shall conform to the test report format enclosed with this permit.
(9 VAC 5-80-880)

4. **Future Testing** - If any affected engine is changed in a manner that results in significant changes in the parameters established in Condition III.F.2, the permittee shall repeat the testing required in Condition III.F.2 to re-establish the correlation between parameter levels that indicate proper operation of the affected engine (Ref. M/L 11) and assure compliance with the NOx limit. Testing shall be completed and the results submitted to the South Central Regional Office within ninety (90) days of the engine change.
(9 VAC 5-80-880)

G. **Reporting**

Annual Ozone Season NOx Emissions Report –The permittee shall submit an annual summary report to the Director, South Central Regional Office documenting the total NOx emissions (in tons) from May 1 through September 30 of each year by October 31 from the affected engine. The report shall be submitted annually beginning in 2007. The report shall include the unit identification number for the affected engine, the manufacturer and model of the affected engine, and the name and address of the facility where the unit is located.
(9 VAC 5-80-900)

H. **Recordkeeping**

On Site Records - The permittee shall maintain records of emission data and operating parameters as necessary to demonstrate compliance with this permit for each affected engine. The content and format of such records shall be arranged with the Director, South Central Regional Office. For the affected engine (Ref. M/L 11), these records shall include, but are not limited to:

a. The number of hours the affected engine (Ref. M/L 11) is operated during the ozone season.

b. The type and quantity of fuel used during the ozone season for each affected engine.

c. Results of all emissions tests.

d. Periodic monitoring records necessary to demonstrate compliance with emission limits in Condition III.E.1.

e. Calculations demonstrating compliance with the NOx emissions limits listed in Condition III.E.1.

f. A summary of any corrective maintenance taken.

g. Records of the portable analyzer calibration.

These records shall be available for inspection by the DEQ and shall be current for at least the most recent five years. These records shall be made available to the State or EPA upon request.
(9 VAC 5-80-900)

I. **General Conditions**

1. **Right of Entry** - The permittee shall allow authorized local, state, and federal representatives, upon the presentation of credentials:

a. To enter upon the permittee's premises on which the facility is located or in which any records are required to be kept under the terms and conditions of this permit;

b. To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit or the State Air Pollution Control Board Regulations;

c. To inspect at reasonable times any facility, equipment, or process subject to the terms and conditions of this permit or the State Air Pollution Control Board Regulations; and

d. To sample or test at reasonable times.

For purposes of this condition, the time for inspection shall be deemed reasonable during regular business hours or whenever the facility is in operation. Nothing contained herein shall make an inspection time unreasonable during an emergency.
(9 VAC 5-170-130)

2. **Notification for Facility or Control Equipment Malfunction** - The permittee shall furnish notification to the South Central Regional Office of malfunctions of the affected facility or related air pollution control equipment that may cause excess emissions for more than one hour, by facsimile transmission, telephone or telegraph. Such notification shall be made as soon as practicable but no later than four daytime business hours after the malfunction is discovered. The permittee shall provide a written statement giving all pertinent facts, including the estimated duration of the breakdown, within two weeks of discovery of the malfunction. When the condition causing the failure or malfunction has been corrected and the equipment is again in operation, the permittee shall notify South Central Regional Office in writing.
(9 VAC 5-20-180 C)

3. **Violation of Ambient Air Quality Standard** - The permittee shall, upon request of the DEQ, reduce the level of operation or shut down a facility, as necessary to avoid violating any primary ambient air quality standard and shall not return to normal operation until such time as the ambient air quality standard will not be violated.
(9 VAC 5-20-180 I)

4. **Maintenance/Operating Procedures** - The permittee shall take the following measures in order to minimize the duration and frequency of excess emissions from process equipment which affect such emissions:

   a. Develop a maintenance schedule and maintain records of all scheduled and non-scheduled maintenance.

   b. Maintain an inventory of spare parts.

   c. Have available written operating procedures for equipment. These procedures shall be based on the manufacturer's recommendations, at a minimum.

   d. Train operators in the proper operation of all such equipment and familiarize the operators with the written operating procedures. The permittee shall maintain records of the training provided including the names of trainees, the date of training and the nature of the training.

   Records of maintenance and training shall be maintained on site for a period of five years and shall be made available to DEQ personnel upon request.
   (9 VAC 5-50-20 E)

5. **Permit Suspension/Revocation** - This permit may be suspended or revoked if the permittee:

   a. Knowingly makes material misstatements in the application for this permit or any amendments to it;

   b. Fails to comply with the terms or conditions of this permit;

   c. Fails to comply with any emission standards applicable to the equipment listed in Condition III.B.1;

   d. Causes emissions from this facility which result in violations of, or interferes with the attainment and maintenance of, any ambient air quality standard;

   e. Fails to operate this facility in conformance with any applicable control strategy, including any emission standards or emission limitations, in the State Implementation Plan in effect on the date that the application for this permit is submitted; or

   f. Fails to comply with the applicable provisions of the NSR program.

   (9 VAC 5-80-1010)

6. **Change of Ownership** - In the case of a transfer of ownership of a stationary source, the new owner shall abide by any current permit issued to the previous owner. The new owner shall notify the South Central Regional Office of the change of ownership within 30 days of the transfer.
(9 VAC 5-80-940)

7. **Registration/Update** - Annual requirements to fulfill legal obligations to maintain current stationary source emissions data will necessitate a prompt response by the permittee to requests by the DEQ or the Board for information to include, as appropriate: process and production data; changes in control equipment; and operating schedules. Such requests for information from the DEQ will either be in writing or by personal contact. The availability of information submitted to the DEQ or the Board will be governed by applicable provisions of the Freedom of Information Act, §§ 2.2-3700 through 2.2-3714 of the Code of Virginia, § 10.1-1314 (addressing information provided to the Board) of the Code of Virginia, and 9 VAC 5-170-60 of the State Air Pollution Control Board Regulations. Information provided to federal officials is subject to appropriate federal law and regulations governing confidentiality of such information.
(9 VAC 5-80-900)

8. **Permit Copy** - The permittee shall keep a copy of this permit on the premises of the facility to which it applies.
(9 VAC 5-80-860 D)

9. **Relationship to Other Permit Requirements** - Except to the extent that conditions in this permit may be more stringent, this permit does not supersede or replace any other valid permit, regulatory or statutory requirement. Furthermore, this approval to operate shall not relieve Transcontinental Gas Pipe Line Corporation of the responsibility to comply with all other local, state and federal regulations, including permit regulations.
(9 VAC 5-80-800 D and 9 VAC 5-80-820 F)

10. **Federal Enforceability** - Once the permit is approved by the U.S. Environmental Protection Agency into the Commonwealth of Virginia State Implementation Plan, the permit is enforceable by EPA and citizens under the federal Clean Air Act.
(9 VAC 5-80-800 C and 9 VAC 5-80-820 F)

11. **Permit Modification** – The Board may revise (modify, rewrite, change or amend) or repeal this permit with the consent of Transcontinental Gas Pipe Line Corporation, for good cause shown by Transcontinental Gas Pipe Line Corporation, or on its own motion provided approval of the revision or repeal is accomplished in accordance with Regulations of the Board and the Administrative Process Act (§ 2.2-4000 et seq.). Such revision or repeal shall not be effective until the revision or repeal is approved by the U. S. Environmental Protection Agency following the requirements of 40 CFR Part 51 (Requirements for Preparation, Adoption, and Submittal of Implementation Plans).
(9 VAC 5-80-960 and 9 VAC 5-80-1000)

12. **Failure to Comply** - Failure by Transcontinental Gas Pipe Line Corporation to comply with any of the conditions of this permit shall constitute a violation of a Permit of the Board. Failure to comply may result in a Notice of Violation and civil penalty. Nothing herein shall waive the initiation of appropriate enforcement actions or the issuance of orders as appropriate by the Board as a result of such violations. Nothing herein shall affect appropriate enforcement actions by any other federal, state, or local regulatory authority.
(9 VAC 5-80-820 F, 9 VAC 5-80-910 and 9 VAC 5-80-1010)

SOURCE TESTING REPORT FORMAT

Cover
1. Plant name and location
2. Units tested at source (indicate Ref. No. used by source in permit or registration)
3. Tester; name, address and report date

Certification
1. Signed by team leader / certified observer (include certification date)
* 2. Signed by reviewer

Introduction
1. Test purpose
2. Test location, type of process
3. Test dates
* 4. Pollutants tested
5. Test methods used
6. Observers' names (industry and agency)
7. Any other important background information

Summary of Results
1. Pollutant emission results / visible emissions summary
2. Input during test vs. rated capacity
3. Allowable emissions
* 4. Description of collected samples, to include audits when applicable
5. Discussion of errors, both real and apparent

Source Operation
1. Description of process and control devices
2. Process and control equipment flow diagram
3. Process and control equipment data

* Sampling and Analysis Procedures
1. Sampling port location and dimensioned cross section
2. Sampling point description
3. Sampling train description
4. Brief description of sampling procedures with discussion of deviations from standard methods
5. Brief description of analytical procedures with discussion of deviation from standard methods

Appendix
* 1. Process data and emission results example calculations
2. Raw field data
* 3. Laboratory reports
4. Raw production data
* 5. Calibration procedures and results
6. Project participants and titles
7. Related correspondence
8. Standard procedures

_____* Not applicable to visible emission evaluations.