

January 15, 2016

Mr. William F. Durham, Director  
WVDEP - Division of Air Quality  
601 57th Street SE  
Charleston, West Virginia 25304



RE: Columbia Gas Transmission, LLC  
Construction/Modification Application (45CSR13) and  
Significant Modification Application (Revision to Title V)  
Seneca Compressor Station (Facility ID#071-00008)  
Permit Number: R30-07100008-2012

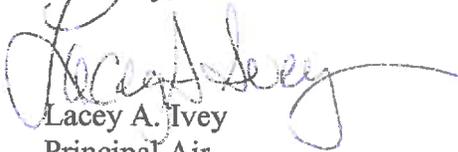
Dear Mr. Durham,

Columbia Gas Transmission, LLC owns and operates the Seneca Compressor Station, located in Pendleton County, West Virginia. This facility is operating under Permit Number R30-07100008-2012 and Columbia is requesting a modification to install one new natural gas-fired Solar Taurus 70 turbine (10,613 hp), one fuel gas heater (0.25 MMbtu/hr), twenty-three catalytic space heaters, and (3) 2000 gallon pipeline liquids tanks.

Based on these changes, the Station will continue to be classified as a major source under Title V regulations (annual potential emissions of NO<sub>x</sub> and CO are more than 100 tons per year). The potential to emit from the proposed modification is less than Prevention of Significant Deterioration (PSD) significant emission levels, therefore PSD permitting procedures are not required. This application package includes a description of changes, and any new specific applicable requirements, certification for the use of significant modification procedures, and a check in the amount of \$2,000 for application fees.

If you have any questions or need additional information, please feel free to contact me at (337) 241-0686 or via email at livey@cpg.com.

Sincerely,



Lacey A. Ivey  
Principal Air  
Columbia Pipeline Group

Attachments

APPLICATION FOR 45 CSR 13  
CONSTRUCTION PERMIT  
AND  
TITLE V PERMIT MODIFICATION

Columbia Gas Transmission LLC  
Seneca Compressor Station  
Pendleton County, West Virginia  
Title V Permit No. R30-07100008-2012

January 2016

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WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION  
**DIVISION OF AIR QUALITY**  
 601 57<sup>th</sup> Street, SE  
 Charleston, WV 25304  
 (304) 926-0475  
[www.dep.wv.gov/daq](http://www.dep.wv.gov/daq)

**APPLICATION FOR NSR PERMIT  
 AND  
 TITLE V PERMIT REVISION  
 (OPTIONAL)**

PLEASE CHECK ALL THAT APPLY TO NSR (45CSR13) (IF KNOWN):  
 CONSTRUCTION     MODIFICATION     RELOCATION  
 CLASS I ADMINISTRATIVE UPDATE     TEMPORARY  
 CLASS II ADMINISTRATIVE UPDATE     AFTER-THE-FACT

PLEASE CHECK TYPE OF 45CSR30 (TITLE V) REVISION (IF ANY):  
 ADMINISTRATIVE AMENDMENT     MINOR MODIFICATION  
 SIGNIFICANT MODIFICATION  
 IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS ATTACHMENT S TO THIS APPLICATION

**FOR TITLE V FACILITIES ONLY:** Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

**Section I. General**

1. Name of applicant (as registered with the WV Secretary of State's Office): Columbia Gas		2. Federal Employer ID No. (FEIN): 3 1 0 8 0 2 4 3 5	
3. Name of facility (if different from above): Seneca Compressor Station		4. The applicant is the: <input type="checkbox"/> OWNER <input type="checkbox"/> OPERATOR <input checked="" type="checkbox"/> BOTH	
5A. Applicant's mailing address: Columbia Gas Transmission LLC 1700 MacCorkle Ave, SE Charleston, WV 25314		5B. Facility's present physical address: Route 28 North Seneca Rocks, WV 26884	
6. West Virginia Business Registration. Is the applicant a resident of the State of West Virginia? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO - If YES, provide a copy of the <b>Certificate of Incorporation/Organization/Limited Partnership</b> (one page) including any name change amendments or other Business Registration Certificate as <b>Attachment A</b> . - If NO, provide a copy of the <b>Certificate of Authority/Authority of L.L.C./Registration</b> (one page) including any name change amendments or other Business Certificate as <b>Attachment A</b> .			
7. If applicant is a subsidiary corporation, please provide the name of parent corporation: Columbia Pipeline Group, Inc.			
8. Does the applicant own, lease, have an option to buy or otherwise have control of the proposed site? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO - If YES, please explain: Application is for construction of equipment at an existing natural gas compressor station which Columbia Gas owns and operates. - If NO, you are not eligible for a permit for this source.			
9. Type of plant or facility (stationary source) to be constructed, modified, relocated, administratively updated or temporarily permitted (e.g., coal preparation plant, primary crusher, etc.): Natural gas compressor station		10. North American Industry Classification System (NAICS) code for the facility: 486210	
11A. DAQ Plant ID No. (for existing facilities only): 071-00008		11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only): R13-2715E, R30-07100008-2012	
<b>All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.</b>			

<p>12A.</p> <ul style="list-style-type: none"> <li>For <b>Modifications, Administrative Updates or Temporary permits</b> at an existing facility, please provide directions to the <i>present location</i> of the facility from the nearest state road;</li> <li>For <b>Construction or Relocation permits</b>, please provide directions to the <i>proposed new site location</i> from the nearest state road. Include a <b>MAP as Attachment B</b>. Travel east on US Route 33 from Elkins. Turn left at Seneca Rocks onto State Route 28. Proceed north on Route 28 for approximately 1.1 miles to the station on the left.</li> </ul>		
12.B. New site address (if applicable):	12C. Nearest city or town: Seneca Rocks	12D. County: Pendleton
12.E. UTM Northing (KM): 4301.2	12F. UTM Easting (KM): 640.9	12G. UTM Zone: 17
<p>13. Briefly describe the proposed change(s) at the facility: Installation of one Solar Taurus 70 turbine, one process heater, and 23 catalytic heaters.</p>		
14A. Provide the date of anticipated installation or change: 2/1/2017	14B. Date of anticipated Start-Up if a permit is granted:	
<ul style="list-style-type: none"> <li>If this is an <b>After-The-Fact</b> permit application, provide the date upon which the proposed change did happen:</li> </ul>	10/1/2017	
<p>14C. Provide a <b>Schedule</b> of the planned <b>Installation of/Change to and Start-Up</b> of each of the units proposed in this permit application as <b>Attachment C</b> (if more than one unit is involved).</p>		
<p>15. Provide maximum projected <b>Operating Schedule</b> of activity/activities outlined in this application:</p> <p>Hours Per Day 24      Days Per Week 7      Weeks Per Year 52</p>		
<p>16. Is demolition or physical renovation at an existing facility involved?    <input checked="" type="checkbox"/> <b>YES</b>      <input type="checkbox"/> <b>NO</b></p>		
<p>17. <b>Risk Management Plans.</b> If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see <a href="http://www.epa.gov/ceppo">www.epa.gov/ceppo</a>), submit your <b>Risk Management Plan (RMP)</b> to U. S. EPA Region III.</p>		
<p>18. <b>Regulatory Discussion.</b> List all Federal and State air pollution control regulations that you believe are applicable to the proposed process (<i>if known</i>). A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance (<i>if known</i>). Provide this information as <b>Attachment D</b>.</p>		

### **Section II. Additional attachments and supporting documents.**

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate <b>application fee</b> (per 45CSR22 and 45CSR13).
20. Include a <b>Table of Contents</b> as the first page of your application package.
<p>21. Provide a <b>Plot Plan</b>, e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as <b>Attachment E</b> (Refer to <b>Plot Plan Guidance</b>).</p> <ul style="list-style-type: none"> <li>Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).</li> </ul>
22. Provide a <b>Detailed Process Flow Diagram(s)</b> showing each proposed or modified emissions unit, emission point and control device as <b>Attachment F</b> .
<p>23. Provide a <b>Process Description</b> as <b>Attachment G</b>.</p> <ul style="list-style-type: none"> <li>Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).</li> </ul>
<p><b>All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.</b></p>

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H**.  
 – For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I**.

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J**.

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K**.

28. Check all applicable **Emissions Unit Data Sheets** listed below:

<input type="checkbox"/> Bulk Liquid Transfer Operations	<input type="checkbox"/> Haul Road Emissions	<input type="checkbox"/> Quarry
<input type="checkbox"/> Chemical Processes	<input type="checkbox"/> Hot Mix Asphalt Plant	<input type="checkbox"/> Solid Materials Sizing, Handling and Storage Facilities
<input type="checkbox"/> Concrete Batch Plant	<input type="checkbox"/> Incinerator	<input type="checkbox"/> Storage Tanks
<input type="checkbox"/> Grey Iron and Steel Foundry	<input type="checkbox"/> Indirect Heat Exchanger	

General Emission Unit, specify: One (1) natural gas-fired turbine, one (1) heater, 23 catalytic heaters

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L**.

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

<input type="checkbox"/> Absorption Systems	<input type="checkbox"/> Baghouse	<input type="checkbox"/> Flare
<input type="checkbox"/> Adsorption Systems	<input type="checkbox"/> Condenser	<input type="checkbox"/> Mechanical Collector
<input type="checkbox"/> Afterburner	<input type="checkbox"/> Electrostatic Precipitator	<input type="checkbox"/> Wet Collecting System
<input type="checkbox"/> Other Collectors, specify		

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M**.

30. Provide all **Supporting Emissions Calculations** as **Attachment N**, or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O**.

➤ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and **Example Legal Advertisement** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?  
 YES     NO

➤ If **YES**, identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's "**Precautionary Notice – Claims of Confidentiality**" guidance found in the **General Instructions** as **Attachment Q**.

### Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below: Delegation of Authority Letter provided in lieu of Authority Form

<input type="checkbox"/> Authority of Corporation or Other Business Entity	<input type="checkbox"/> Authority of Partnership
<input type="checkbox"/> Authority of Governmental Agency	<input type="checkbox"/> Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R**.

*All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.*

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

**Certification of Truth, Accuracy, and Completeness**

I, the undersigned  Responsible Official /  Authorized Representative, hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

**Compliance Certification**

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE  DATE: 1-15-2016  
(Please use blue ink) (Please use blue ink)

35B. Printed name of signee: Steven A. Nelson		35C. Title: Manager of Operations
35D. E-mail: snelson@cpg.com	36E. Phone: 304-548-1630	36F. FAX:
36A. Printed name of contact person (if different from above): Lacey Ivey		36B. Title: Principal Air
36C. E-mail: livey@cpg.com	36D. Phone: 337-241-0686	36E. FAX:

**PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:**

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Attachment A: Business Certificate<br><input checked="" type="checkbox"/> Attachment B: Map(s)<br><input checked="" type="checkbox"/> Attachment C: Installation and Start Up Schedule<br><input checked="" type="checkbox"/> Attachment D: Regulatory Discussion<br><input checked="" type="checkbox"/> Attachment E: Plot Plan<br><input checked="" type="checkbox"/> Attachment F: Detailed Process Flow Diagram(s)<br><input checked="" type="checkbox"/> Attachment G: Process Description<br><input checked="" type="checkbox"/> Attachment H: Material Safety Data Sheets (MSDS)<br><input checked="" type="checkbox"/> Attachment I: Emission Units Table<br><input checked="" type="checkbox"/> Attachment J: Emission Points Data Summary Sheet | <input checked="" type="checkbox"/> Attachment K: Fugitive Emissions Data Summary Sheet<br><input checked="" type="checkbox"/> Attachment L: Emissions Unit Data Sheet(s)<br><input type="checkbox"/> Attachment M: Air Pollution Control Device Sheet(s)<br><input checked="" type="checkbox"/> Attachment N: Supporting Emissions Calculations<br><input checked="" type="checkbox"/> Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans<br><input type="checkbox"/> Attachment P: Public Notice<br><input type="checkbox"/> Attachment Q: Business Confidential Claims<br><input checked="" type="checkbox"/> Attachment R: Authority Forms<br><input checked="" type="checkbox"/> Attachment S: Title V Permit Revision Information<br><input checked="" type="checkbox"/> Application Fee |
|---|--|

*Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.*

**FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:**

- Forward 1 copy of the application to the Title V Permitting Group and:
- For Title V Administrative Amendments:
  - NSR permit writer should notify Title V permit writer of draft permit,
- For Title V Minor Modifications:
  - Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,
  - NSR permit writer should notify Title V permit writer of draft permit.
- For Title V Significant Modifications processed in parallel with NSR Permit revision:
  - NSR permit writer should notify a Title V permit writer of draft permit,
  - Public notice should reference both 45CSR13 and Title V permits,
  - EPA has 45 day review period of a draft permit.

*All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.*

# Attachment A

## **Business Certificate**

**WEST VIRGINIA  
STATE TAX DEPARTMENT  
BUSINESS REGISTRATION  
CERTIFICATE**

ISSUED TO:  
**COLUMBIA GAS TRANSMISSION LLC  
5151 SAN FELIPE ST 2500  
HOUSTON, TX 77056-3639**

BUSINESS REGISTRATION ACCOUNT NUMBER: **1025-1555**

This certificate is issued on: **07/1/2011**

*This certificate is issued by  
the West Virginia State Tax Commissioner  
in accordance with Chapter 11, Article 12, of the West Virginia Code*

*The person or organization identified on this certificate is registered  
to conduct business in the State of West Virginia at the location above.*

**This certificate is not transferrable and must be displayed at the location for which issued.**

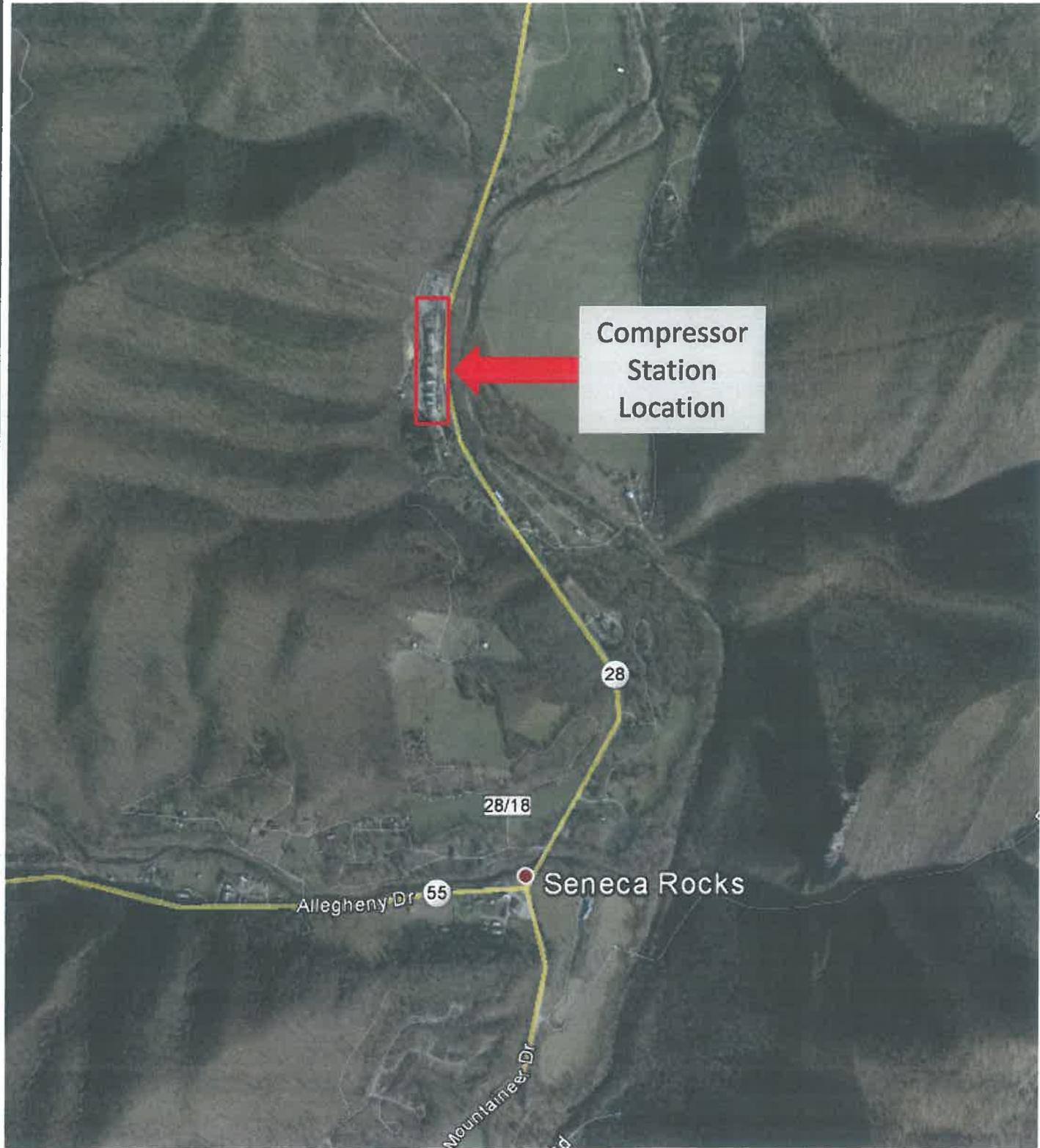
This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them.  
CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

# Attachment B

## Map



Travel east on US Route 33 from Elkins. Turn left at Seneca Rocks onto State Route 28. Proceed north on Route 28 for approximately 1.1 miles to the station on the left.

**Attachment B**

Date: December 2015

Facility Map  
Seneca Compressor Station

# Attachment C

## Installation and Start Up Schedule

## Installation and Start Up Schedule

Emission Point	Change	Effective Date of Change	Start Up Date
E09 – Solar Taurus 70 Turbine	Installation	March 2017	November 2017
H3 – Process Heater	Installation	March 2017	November 2017
SH2 – 23 Catalytic Heaters	Installation	March 2017	November 2017
Insignificant tanks (3) 2000 gallon Pipeline Liquids Tanks	Installation	March 2017	November 2017

# **Attachment D**

## **Regulatory Discussion**

## 1.0 INTRODUCTION

### 1.1 Summary and Conclusions

Columbia Gas Transmission, LLC (Columbia) operates the Seneca Compressor Station (the "Station") under Title V Permit No. R30-07100008-2012. The modifications in this application are scheduled to occur in 2017. This includes:

- Add one (1) new Solar Taurus 70 turbine (10,613 horsepower [hp] at 32 °F);
- Add one (1) fuel gas heater (0.25 million British thermal units per hour [MMBtu/hr]);
- Add twenty-three (23) catalytic heaters (8 x 0.005 MMBtu/hr and 15 x 0.072 MMBtu/hr);
- Add (3) 2000 gallon Pipeline Liquids Tanks, and
- Modify the Station's Title V permit to reflect these changes.

An analysis of federal and state regulations was performed to identify applicable air quality regulations. Federal and state regulations potentially applying to the proposed modifications are summarized in Section 3.

### 1.2 Report Organization

The existing Station and proposed Project are described in Section 2.0. An analysis of applicable regulations and proposed compliance procedures is presented in Section 3.0. Completed permit application forms, including emissions estimating basis, emission calculations, and supporting data are contained within this application package.

## 2.0 PROJECT DESCRIPTION

### 2.1 Description of Existing Facility

Columbia's Seneca Compressor Station is located in Pendleton County, West Virginia, near the town of Seneca Rocks. The Station receives natural gas via pipeline from an upstream compressor station, compresses it using natural gas-fired turbines, and then transmits it via pipeline to a downstream station. The Station is covered by Standard Industrial Classification (SIC) 4922 and operates under Title V Permit No. R30-07100008-2012. The Station has the potential to operate seven (7) days per week, twenty-four (24) hours per day.

The Station currently operates five (5) natural gas-fired turbines including:

- One (1) General Electric 3132R Frame 3 turbine rated at 13,750 hp (22,000 hp maximum) that was originally purchased in 1971 and relocated to the Seneca Compressor Station in 1981 (E04);
- Two (2) Solar Taurus 60-7800S turbines rated at 7,491 hp each that were installed in 2008 (E05 and E06);
- One (1) Solar Saturn 10-1400 turbine rated at 1,557 hp that was installed in 2013 (E07); and
- One (1) Solar Mars 100-15000S turbine rated at 15,432 hp that was installed in 2013 (E08).

Auxiliary equipment at the Station includes a natural gas-fired emergency generator, fuel gas heaters, catalytic space heaters, and numerous storage tanks for lubricating oils, glycol, and pipeline liquids. A plot plan of the Station is provided as Attachment E.

Based on the current annual potential to emit (PTE) oxides of nitrogen (NO<sub>x</sub>) and carbon monoxide (CO) as presented in Table N-1 of Attachment N, the existing Station is classified as a major source under New Source Review (NSR) regulations. Also provided in Table N-1 are the current potential emissions of volatile organic compounds (VOC), greenhouse gases as carbon dioxide equivalents (CO<sub>2</sub>e), sulfur dioxide (SO<sub>2</sub>), respirable particulate matter with an aerodynamic diameter of less than or equal to 10 microns (PM<sub>10</sub>), fine particulate matter with an aerodynamic diameter of less than or equal to 2.5 microns (PM<sub>2.5</sub>), formaldehyde [CH<sub>2</sub>O, the primary hazardous air pollutant (HAP)], and total HAPs. The existing Station is a minor source HAPs.

Pendleton County and all of its bordering counties are classified as attainment or unclassifiable for all National Ambient Air Quality Standards (NAAQS). Nearby Class I Areas include the following:

- Dolly Sods Wilderness Area located approximately 8 miles (12 kilometers) north of the Station in Randolph and Tucker Counties, West Virginia;
- Otter Creek Wilderness Area located approximately 15 miles (25 kilometers) west-northwest of the Station in Randolph and Tucker Counties, West Virginia; and
- Shenandoah National Park located approximately 60 miles (90 kilometers) east and southeast of the Station in Warren, Page, Rockingham, and Augusta Counties, Virginia.

## 2.2 Proposed Modification

The proposed Solar Taurus 70 turbine will have an output of 10,613 hp at 32 °F, and it will be designated Emission Point ID E09. Attachment F includes a process flow diagram showing the existing and Project equipment. The U.S. Environmental Protection Agency (USEPA) Source Classification Code (SCC) for the proposed turbine is 2-02-002-01.

The new turbine will be equipped with advanced dry-low-NO<sub>x</sub> combustion controls, known by the manufacturer as SoLoNO<sub>x</sub>. These controls reduce nitrogen oxides and peak combustion temperatures through the use of a lean, premixed air/fuel mixture and advanced combustion controls. The SoLoNO<sub>x</sub> system is operational at turbine loads from approximately 50% to 100% of full load. During operation at low turbine loads (<50% of full load), low ambient temperatures (<0 °F), and during turbine startup and shutdown, supplemental pilot fuel is fired for flame stability and results in NO<sub>x</sub>, CO, and VOC concentrations that are higher than during SoLoNO<sub>x</sub> operation. Estimated emissions during each of the operating modes are summarized in Table N-3 of Attachment N. Additional turbine emission data and calculations are presented in Attachment N.

The new Solar Taurus 70 turbine is expected to operate essentially the entire year, and emission estimates are based on 8,760 operating hours per year. Because the SoLoNO<sub>x</sub> controls cannot operate properly at low ambient temperatures or below 50% of peak load, the potential emission estimates presented in Table N-3 include separate lines for operating hours at: (1) ambient temperatures less than or equal to 0 °F, (2) low load (less than 50% load), and (3) startup/shutdown cycles. Operation at low ambient temperatures is based on 240 hours per year, while operation at low load is based on 180 hours per year. Startup/shutdown cycles are limited to 200 cycles per year. Annual emissions from the proposed turbine during the rest of the year are conservatively based on an ambient temperature of 32 °F. Combustion turbine power varies with atmospheric conditions such that maximum heat input, maximum fuel consumption, and associated emissions generally increase as ambient temperature decreases. For the purpose of this application, turbine emissions have been characterized based on an ambient temperature of 32 °F. The annual average ambient temperature is approximately 50 °F.

The Project will include installation of one (1) 0.25-MMBtu/hr fuel gas heater and 23 catalytic heaters with various heat inputs. Potential emissions from these units are based on AP-42 emission factors.

Potential annual emissions from all sources associated with the Project are provided in Table N-1 of Attachment N, and source-specific emissions calculations are also provided in Attachment N.

No other changes in station equipment are currently being proposed. The target date for starting construction is February 2017. Initial commercial operation is scheduled for October 2017.

## 2.3 Contemporaneous Equipment Changes

In 2008, two Solar Taurus 60-7800S turbines were installed, and two Allison 501-K13C turbines were retired. These changes were prior to the contemporaneous period for the Project. In 2013, two existing boilers and two emergency generators were retired. A new emergency generator, a refurbished Solar Saturn turbine, a new Solar Mars turbine, and a fuel gas heater for the Solar Mars turbine were installed in 2013. In tabular form, the contemporaneous equipment changes are shown below in Table 2-1.

**Table 2-1 Contemporaneous Equipment Changes**

<b>Equipment</b>	<b>Emission Point ID</b>	<b>Action</b>	<b>Date</b>
Waukesha L5990GU Emergency Generator	G1	Retired	2013
Waukesha VGF-L36GL Emergency Generator	G3	Installed	2013
Solar Saturn 10-1400	E07	Installed	2013
Solar Mars 100-15000	E08	Installed	2013
Fuel Gas Heater	H2	Installed	2013
36 Catalytic Heaters	SH1	Installed	2013
Peerless Heating System Boiler	BL1	Retired	2013
Peerless Heating System Boiler	BL2	Retired	2013
Ingersoll Rand PVG 4 Emergency Generator	G2	Retired	2013
Solar Taurus 70 Turbine	E09	To be installed	2017
Fuel Gas Heater	H3	To be installed	2017
23 Catalytic Heaters	SH2	To be installed	2017

### 3.0 REGULATORY ANALYSIS AND COMPLIANCE METHODS

This section reviews the applicability of state and federal regulations potentially affecting the new emission units and proposed compliance procedures. Supporting calculations are included in Attachment N.

#### 3.1 Prevention of Significant Deterioration

West Virginia implements the Prevention of Significant Deterioration (PSD) permitting program pursuant to the USEPA-approved West Virginia State Implementation Plan and in accordance with Regulation 14 (a.k.a., Series 14) of Title 45 of the Code of State Rules (45 CSR 14). Regulation 14 closely mirrors federal PSD regulations at 40 CFR §52.21. The Station is a major source under PSD rules per §45-14-2.43. For a major stationary source such as the existing Station, PSD requirements apply to projects that have the potential to increase annual emissions beyond defined significance levels. This potential is evaluated as a two-step process. First, any emissions increase associated with the project itself is evaluated. If the project will result in a significant emissions increase (as defined at §45-14-2.74 and -2.75), then the net emissions increase, considering all contemporaneous equipment changes must be evaluated based on the definition of net emissions increase at §45-14-2.46.

Per §45-14-2.80.e.1, beginning July 1, 2011, new major stationary sources with the potential to emit greater than or equal to 100,000 tpy of CO<sub>2</sub>e were required to meet the requirements set forth in the PSD program. The provisions of §45-14-2.80.f, however, clarify that this portion of the rule ceases to be effective under certain circumstances, including a federal court decision invalidating provisions of the rule. On June 23, 2014, the U.S. Supreme Court issued a decision that greenhouse gas emissions could not be a basis for PSD or Title V applicability, and this decision was followed by a July 24, 2014 memorandum from the USEPA that stated that the USEPA will comply with the Court's decision and will not apply or enforce regulations that would require a PSD permit where PSD would be applicable solely because of GHG emissions. Therefore, CO<sub>2</sub>e emissions are no longer considered for PSD applicability.

Emissions calculations for the PSD applicability analysis are provided in Attachment N, and potential annual emissions associated with the Project are summarized in Table N-1. For all PSD-regulated pollutants, the potential Project emissions are below the significant emissions increase thresholds; therefore, PSD is not applicable to emissions increases at Step 1 of the PSD applicability procedure.

To ensure that future emissions remain below the PSD significance levels, the Station will accept requirements to monitor turbine operating mode (e.g., low temperature, low load, startup/shutdown) and to monitor fuel usage to ensure that actual emissions, accounting for these non-SoLoNOx conditions, do not exceed the proposed potential annual emission rates.

#### 3.2 New Source Performance Standards

New Source Performance Standards (NSPS) apply to new, modified, or reconstructed stationary sources meeting criteria established in 40 CFR Part 60. This section describes requirements that apply to the proposed units at the Seneca Compressor Station.

Subpart Dc (Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units) applies to steam generating units with a maximum design heat input capacity of greater than or equal to 10 MMBtu/hr, but less than or equal to 100 MMBtu/hr, which are constructed, modified or reconstructed after June 9, 1989 (per 40 CFR §60.40c(a)). Steam generating units are defined in 40 CFR §60.41c as devices that combust fuel and heat water or any heat transfer medium. Since the proposed

heater will be rated at 0.25 MMBtu/hr, this NSPS is not applicable. The proposed catalytic heaters are not steam generating units.

Subpart OOOO (Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution) is not applicable to the proposed new equipment (no affected facilities proposed) per 40 CFR §60.5365.

Columbia requests a permit shield for NSPS Subpart Dec and Subpart OOOO.

The USEPA has promulgated NSPS for stationary combustion turbines in 40 CFR 60 Subpart KKKK. New combustion turbines, such as the proposed Solar Taurus 70 turbine, that have a peak heat input of 10 MMBtu/hr and greater, will be subject to the requirements of Subpart KKKK per 40 CFR §60.4305(a). Sources covered by Subpart KKKK are exempt from the requirements in Subpart GG (the previous combustion turbine NSPS) per 40 CFR §60.4305(b). The subcategory and corresponding NO<sub>x</sub> emission standard as established in Table 1 to Subpart KKKK for the proposed turbine is presented in Table 3-1.

**Table 3-1 Proposed Turbine and Corresponding Category and Emission Standard**

Unit	Table 1 subcategory	Heat input	NO <sub>x</sub> Emission Standard	Manufacturer's Warranty
Solar Taurus 70 (E09)	New turbine firing natural gas	> 50 MMBtu/hr and ≤ 850 MMBtu/hr	25 ppm at 15 percent O <sub>2</sub> or 150 ng/J of useful output (1.2 lb/MWh)	15 ppm at 15% O <sub>2</sub>

Table 1 to Subpart KKKK also establishes a NO<sub>x</sub> emission limit of 150 ppm at 15% O<sub>2</sub> or 1,100 ng/J of useful output (8.7 lb/MWh) for turbines with a peak capacity equal to or less than 30 MW output which are operating at less than 75% of peak load or at temperatures less than 0 °F.

The fuel sulfur limit in Subpart KKKK is 0.060 lb SO<sub>2</sub>/MMBtu. Under 40 CFR §60.4365, a source is exempt from monitoring fuel sulfur content if the source burns natural gas that is covered by a purchase or transportation agreement with maximum sulfur content of 20 grains per 100 scf, which is the case for the proposed turbine fuel.

The proposed NO<sub>x</sub> emission rate and fuel sulfur level comply with NSPS limits. To demonstrate compliance with Subpart KKKK, 40 CFR §60.4400 requires an initial NO<sub>x</sub> performance test using EPA reference methods. The initial compliance test must be conducted within 60 days after achieving full-load operation or within 180 days of startup if the turbine is not operated at full load. Unless continuous parameter monitoring is implemented, annual performance testing using EPA reference methods must be conducted within 14 calendar months following the previous performance test. The test frequency can be reduced to biennial if measured NO<sub>x</sub> emissions are less than 75% of the limit. Columbia requests that portable emissions analyzers be approved for annual turbine testing. In addition, Columbia will continuously monitor the turbine to document any operating periods during which the SoLoNO<sub>x</sub> system is not in service (e.g., during startup, shutdown, low-load, or a system malfunction). Records of turbine startup, shutdown, SoLoNO<sub>x</sub> malfunction, and/or SoLoNO<sub>x</sub> monitoring system malfunction will be recorded per Subpart KKKK and NSPS General Provisions in 40 CFR §60.7(b)&(c).

Compliance with the SO<sub>2</sub> and fuel sulfur limits can be demonstrated by monitoring natural gas sulfur content annually. However, per 40 CFR §60.4365(a), the turbine will be exempt from periodic monitoring by demonstrating compliance with the FERC tariff limit on total sulfur content of 20 grains of sulfur or less per 100 standard cubic feet.

### 3.3 National Emission Standards for Hazardous Air Pollutants

National Emission Standards for Hazardous Air Pollutants (NESHAP) are promulgated under 40 CFR Part 63 for specific processes and HAP emissions. The Station is classified as an area source of HAP emissions and will remain so after the Project.<sup>1</sup>

40 CFR 63 Subpart YYYY for stationary combustion turbines is only applicable to major sources of HAPs per 40 CFR §63.6085; therefore, the turbine is not subject to this regulation.

There are two NESHAPs which regulate emissions from industrial, commercial and institutional boilers – 40 CFR 63 Subpart DDDDD (major sources of HAPs) and 40 CFR 63 Subpart JJJJJ (area sources of HAPs). The proposed Station will be an area source of HAPs; Subpart JJJJJ is the applicable NESHAP for the Station. Per 40 CFR §63.11195(e), natural gas-fired sources are exempt from the requirements of this Subpart.

### 3.4 Compliance Assurance Monitoring (40 CFR 64)

Compliance Assurance Monitoring (CAM) requirements in 40 CFR Part 64 are intended to assure that emission control equipment is properly operated and maintained. CAM applies to emissions units that:

1. have an emission limitation,
2. use a control device to comply with the emissions limit, and
3. have sufficient emissions to be classified as a major emission source under 40 CFR Part 70.

As defined in 40 CFR §64.1, "control device" means add-on control equipment other than inherent process equipment that is used to destroy or remove air pollutant(s) prior to discharge to the atmosphere. The definition also states that "a control device does not include use of combustion or other process design features or characteristics."

Exemptions specified in 40 CFR §64.2(b) include units complying with an emission limitation or standard proposed by the USEPA after November 15, 1990 pursuant to Section 111 or 112 of the Clean Air Act (NSPS or NESHAP).

Potential emissions from the turbine are less than the Part 70 major source threshold specified in 40 CFR §70.2. Additionally, the proposed turbine will not use any add-on emission controls and will be subject to a federal NSPS promulgated after 1990. As such, the turbine is exempt from CAM requirements.

### 3.5 Prevention and Control of Emission of Smoke and Particulate Matter (45 CSR 2)

West Virginia Regulation 45 CSR 2 requires that smoke and particulate matter emissions from any fuel-burning unit (providing heat or power by indirect heat transfer) not exceed opacity levels of 10 percent based on a six-minute block average (per §45-2-3.1). The proposed equipment (e.g., fuel gas heater), is inherently compliant with this requirement by combusting only pipeline quality natural gas.

### 3.6 Prevention and Control of Emission of Sulfur Dioxide (45 CSR 10)

West Virginia Regulation 45 CSR 10 limits SO<sub>2</sub> emissions from fuel-burning units, manufacturing processes, and combustion of refinery or process gas streams. The turbine is not considered a fuel-burning unit per the definition in §45-10-2. Additionally, the Station is not defined as a manufacturing process and does not combust refinery or process gas streams. Additionally, fuel burning units less than

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<sup>1</sup> Per 40 CFR §63.2, an area source of HAPs is defined as a stationary source or group of sources with the potential to emit less than 10 tpy of any HAP and less than 25 tpy of any combination of HAPs.

10 MMBtu/hr, including the proposed heater, are exempt from section 3 and sections 6 through 8 of this regulation. Therefore, 45 CSR 10 does not apply to the Project.

### **3.7 Pre-construction Permitting under West Virginia Air Regulation 13 (45 CSR 13)**

Because the potential increase in emissions from the proposed Project does not exceed PSD significance levels, the Project is classified as a minor modification to the existing station for PSD purposes and is subject to the permitting requirements in 45 CSR 13. This document contains the information required by this permitting program.

### **3.8 Requirements for Operating Permits (45 CSR 30)**

After this Project, the Seneca Compressor Station will continue to be classified as a major source under Title V regulations. A significant modification application to revise the Station's Title V permit is being submitted to WVDAQ as part of the application package.

# Attachment E

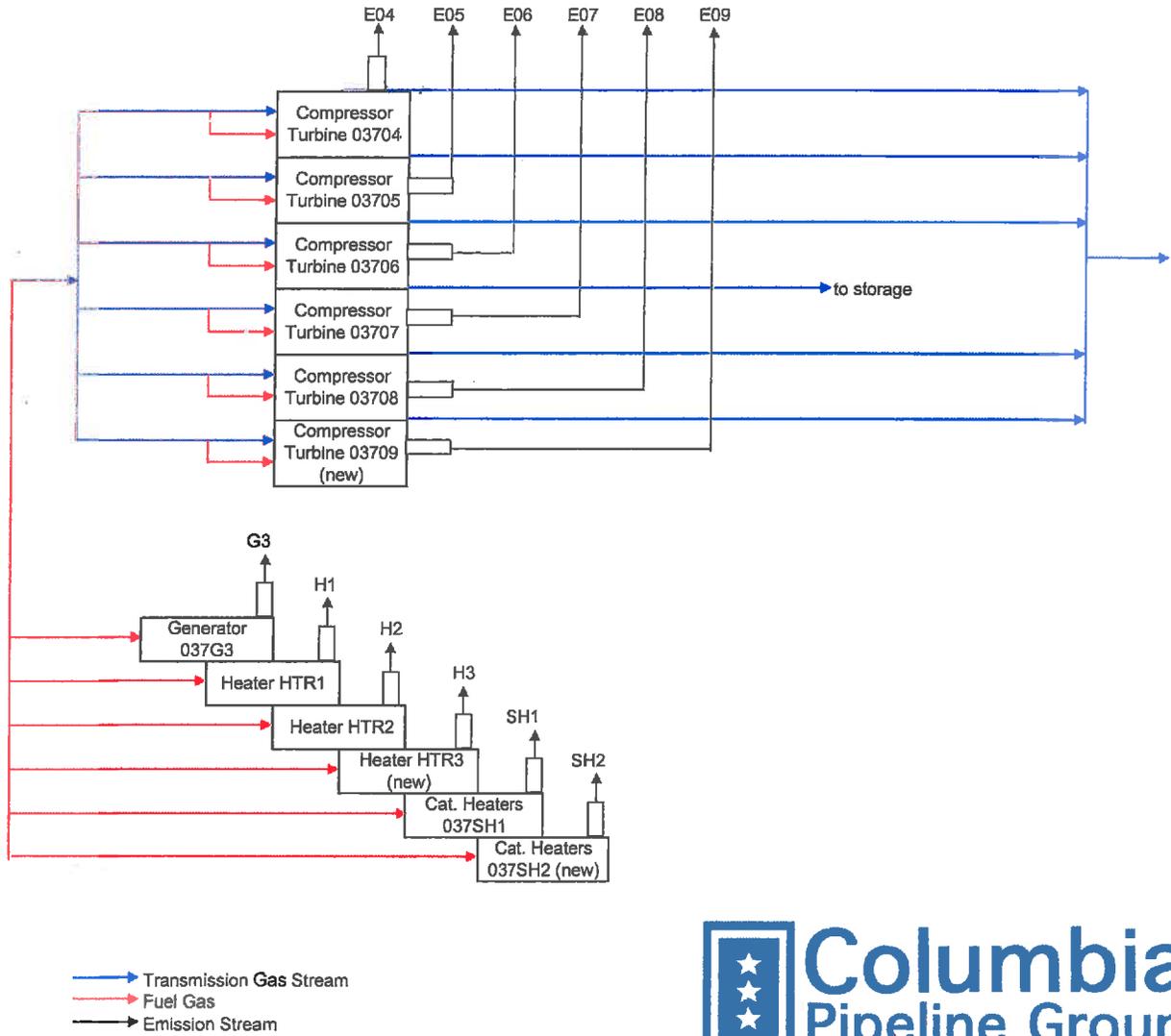
## Plot Plan



# Attachment F

## **Detailed Process Flow Diagram**

**ATTACHMENT F  
SENECA COMPRESSOR STATION PROCESS FLOW DIAGRAM**



# Attachment G

## Process Description

## Process Description

Pipeline transmission of natural gas requires that the gas be compressed. At the Seneca Compressor Station, natural gas-fired turbines are used to drive centrifugal gas compressors. This Project includes the installation of one Solar Taurus 70 turbine-driven compressor, one fuel gas heater, and twenty-three catalytic space heaters. The remainder of this discussion is specific to the turbine technology.

The power output from a natural gas-fired turbine is directly related to the fuel input rate and to the ratio of combustion air to fuel. As ambient temperatures decrease, a turbine's maximum power output will increase due to the increased density of inlet air. The Solar dry-low-NO<sub>x</sub> (DLN) combustion system (known as SoLoNO<sub>x</sub>) limits formation of NO<sub>x</sub>, CO, and VOC by pre-mixing air and fuel prior to combustion. When operating a Solar Taurus 70 turbine at ambient temperatures  $\geq 0$  °F and at loads  $\geq 50\%$ , this DLN system is able to limit the exhaust gas concentration of these pollutants (corrected to 15% O<sub>2</sub>) to 15 ppm NO<sub>x</sub>, 25 ppm CO, and 25 ppm unburned hydrocarbons (UHC, containing at least 80% non-VOC methane and ethane; therefore, 5 ppm VOC). At ambient temperatures less than or equal to 0 °F, additional pilot fuel is required by the turbine to maintain flame stability, which increases estimated emission concentrations to 42 ppm NO<sub>x</sub>, 100 ppm CO, and 50 ppm UHC (10 ppm VOC). At turbine loads  $< 50\%$ , additional pilot fuel and air flow are required to maintain flame stability and turbine responsiveness. These changes increase estimated emission concentrations to 66 ppm NO<sub>x</sub>, 4,400 ppm CO, and 440 ppm UHC (88 ppm VOC). Should loads drop below 50%, Columbia will make every effort to either bring the load back above 50% or shut a turbine down (e.g., shut down other units and move that volume to the turbine, or shift the turbine volume to other units and shut down the turbine).

In addition, there are changes in NO<sub>x</sub>, CO, and VOC emissions during the initial fuel light-off, turbine loading, and flame stabilization steps associated with turbine startup. There are also changes in emissions during the normal turbine shutdown sequence. The turbine will be limited to 200 startup/shutdown cycles per year. For a Solar Taurus 70 turbine, the startup sequence takes less than 10 minutes to complete prior to engaging the DLN system. The shutdown sequence for a Solar Taurus 70 turbine requires approximately 10 minutes. Emissions during each startup/shutdown cycle are estimated by Solar as provided in Attachment N.

Based on the manufacturer's estimated emission concentrations (ppm) and exhaust flow rates (scf), mass emissions rates (lb/hr) during the above operating modes are presented in Table N-3 within Attachment N. Additional information on turbine operating characteristics and emissions is provided in Attachment N to this application.

# Attachment H

## **SDSs**

No new processes or chemicals will be added to the compressor station as a result of this project. Therefore, the Department can continue to rely on the SDS package submitted with the prior application.

# Attachment I

## Emission Units Table

## Attachment I

### Emission Units Table

(includes all emission units and air pollution control devices  
that will be part of this permit application review, regardless of permitting status)

Emission Unit ID <sup>1</sup>	Emission Point ID <sup>2</sup>	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type <sup>3</sup> and Date of Change	Control Device <sup>4</sup>
HTR1	H1	Heater #1	2008	0.50 MMBTU/hr	Existing	-
HTR2	H2	Heater #2	2013	0.85 MMBTU/hr	Existing	-
03704	E04	GE Frame 3 Turbine	1981	13,750 HP 22,000 HP (max)	Existing	-
03705	E05	Solar Taurus 60-7800S Turbine #1	2008	7,491 HP	Existing	-
03706	E06	Solar Taurus 60-7800S Turbine #2	2008	7,491 HP	Existing	-
03707	E07	Solar Saturn 10-1400 Turbine	2013	1,557 HP	Existing	-
03708	E08	Solar Mars 100-15000S Turbine	2013	15,432 HP	Existing	-
037G3	G3	Dresser-Waukesha VGF-L36GL Emergency Generator	2013	880 HP	Existing	-
037SH1	SH1	Catalytic Space Heaters (36)	2013	36 x 0.072 MMBTU/hr	Existing	-
03709	E09	Solar Taurus 70 Turbine	2017	10,613 HP @ 32°F	New, 2017	
HTR3	H3	Heater #3	2017	0.25 MMBtu/hr	New, 2017	
037SH2	SH2	Catalytic Space Heaters (23)	2017	8 x 0.005, 15 x 0.072 MMBTU/hr	New, 2017	

<sup>1</sup> For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S,... or other appropriate designation.

<sup>2</sup> For Emission Points use the following numbering system: 1E, 2E, 3E, ... or other appropriate designation.

<sup>3</sup> New, modification, removal

<sup>4</sup> For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

# Attachment J

## **Emission Points Data Summary Sheet**

**Attachment J**  
**EMISSION POINTS DATA SUMMARY SHEET**

**Table 1: Emissions Data**

Emission Point ID No. (Must match Emission Units Table & Plot Plan)	Emission Point Type <sup>1</sup>	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot Plan)		Air Pollution Control Device (Must match Emission Units Table & Plot Plan)		Vent Time for Emission Unit (chemical processes only)		All Regulated Pollutants - Chemical Name/CAS <sup>3</sup> (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions <sup>4</sup>		Maximum Potential Controlled Emissions <sup>5</sup>		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used <sup>6</sup>	Emission Concentration <sup>7</sup> (ppmv or mg/m <sup>3</sup> )
		ID No.	Source	ID No.	Device Type	Short Term <sup>2</sup>	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
H1		HTR1						NO <sub>x</sub>	0.05	0.21			Gas	EE	
								CO	0.04	0.18			Gas	EE	
								VOC	0.003	0.01			Gas	EE	
								SO <sub>2</sub>	0.03	0.002		-	Gas	EE	
								PM	0.004	0.02			Solid	EE	
								CH <sub>2</sub> O	0.00004	0.0002			Gas	EE	
H2		HTR2						NO <sub>x</sub>	0.08	0.37			Gas	EE	
								CO	0.07	0.31			Gas	EE	
								VOC	0.005	0.02			Gas	EE	
								SO <sub>2</sub>	0.05	0.003		-	Gas	EE	
								PM	0.006	0.03			Solid	EE	
								CH <sub>2</sub> O	0.0001	0.0003			Gas	EE	
E04		03704						NO <sub>x</sub>	64.77	177.30			Gas	EE	
								CO	16.60	45.43			Gas	EE	
								VOC	0.43	1.16			Gas	EE	
								SO <sub>2</sub>	11.56	0.40		-	Gas	EE	
								PM	1.34	3.66			Solid	EE	
								CH <sub>2</sub> O	0.14	0.39			Gas	EE	
E05		03705						NO <sub>x</sub>	3.8	18.79			Gas	EE	
								CO	3.9	50.60			Gas	EE	
								VOC	0.2	14.15			Gas	EE	
								SO <sub>2</sub>	0.05	0.21		-	Gas	EE	
								PM	0.5	1.96			Solid	EE	
								CH <sub>2</sub> O	0.05	0.21			Gas	EE	

**Attachment J  
EMISSION POINTS DATA SUMMARY SHEET**

**Table 1: Emissions Data**

Emission Point ID No. (Must match Emission Units Table & Plot Plan)	Emission Point Type <sup>1</sup>	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot Plan)		Air Pollution Control Device (Must match Emission Units Table & Plot Plan)		Vent Time for Emission Unit (chemical processes only)		All Regulated Pollutants - Chemical Name/CAS <sup>3</sup> (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions <sup>4</sup>		Maximum Potential Controlled Emissions <sup>5</sup>		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used <sup>6</sup>	Emission Concentration <sup>7</sup> (ppmv or mg/m <sup>3</sup> )								
		ID No.	Source	ID No.	Device Type	Short Term <sup>2</sup>	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr											
E06		03706						NO <sub>x</sub>	3.8	18.79			Gas	EE									
								CO	3.9	50.60			Gas	EE									
								VOC	0.2	14.15			Gas	EE									
								SO <sub>2</sub>	0.05	0.21			Gas	EE									
								PM	0.5	1.96			Solid	EE									
								CH <sub>2</sub> O	0.05	0.21			Gas	EE									
E07		03707						NO <sub>x</sub>	9.48	41.51			Gas	EE									
								CO	15.39	67.63			Gas	EE									
								VOC	0.44	1.94			Gas	EE									
								SO <sub>2</sub>	1.00	0.05			Gas	EE									
								PM	0.32	1.32			Solid	EE									
								CH <sub>2</sub> O	0.01	0.05			Gas	EE									
								NO <sub>x</sub>	6.76	31.83			Gas	EE									
								CO	6.85	63.02			Gas	EE									
								VOC	0.79	3.88			Gas	EE									
								SO <sub>2</sub>	7.14	0.37			Gas	EE									
E08		03708						PM	2.25	9.42			Solid	EE									
								CH <sub>2</sub> O	0.09	0.37			Gas	EE									
								NO <sub>x</sub>	3.88	0.97			Gas	EE									
								CO	2.52	0.63			Gas	EE									
								VOC	0.08	0.02			Gas	EE									
								SO <sub>2</sub>	0.39	0.001			Gas	EE									
								PM	0.07	0.02			Solid	EE									
								CH <sub>2</sub> O	0.36	0.09			Gas	EE									
								G3		037G3						NO <sub>x</sub>					Gas	EE	
																CO					Gas	EE	
VOC					Gas	EE																	
SO <sub>2</sub>					Gas	EE																	
PM					Solid	EE																	
CH <sub>2</sub> O					Gas	EE																	

**Attachment J  
EMISSION POINTS DATA SUMMARY SHEET**

**Table 1: Emissions Data**

Emission Point ID No. (Must match Emission Units Table & Plot Plan)	Emission Point Type <sup>1</sup>	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot Plan)		Air Pollution Control Device (Must match Emission Units Table & Plot Plan)		Vent Time for Emission Unit (chemical processes only)		All Regulated Pollutants - Chemical Name/CAS <sup>3</sup> (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions <sup>4</sup>		Maximum Potential Controlled Emissions <sup>5</sup>		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used <sup>6</sup>	Emission Concentration <sup>7</sup> (ppmv or mg/m <sup>3</sup> )
		ID No.	Source	ID No.	Device Type	Short Term <sup>2</sup>	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
SH1		037SH1						NO <sub>x</sub>	0.25	1.11			Gas	EE	
								CO	0.21	0.93			Gas	EE	
								VOC	0.014	0.06			Gas	EE	
								SO <sub>2</sub>	0.15	0.008		-	Gas	EE	
								PM	0.02	0.08			Solid	EE	
								CH <sub>2</sub> O	0.0002	0.0008			Gas	EE	
E09	Upward vertical stack	03709						NO <sub>x</sub>	4.74	22.80			Gas	EE	
								CO	4.81	91.80			Gas	EE	
								VOC	0.55	3.22			Gas	EE	
								SO <sub>2</sub>	5.01	0.27		-	Gas	EE	
								PM	0.58	2.53			Solid	EE	
								CH <sub>2</sub> O	0.06	0.27			Gas	EE	
H3	Upward vertical stack	HTR3						NO <sub>x</sub>	0.02	0.11			Gas	EE	
								CO	0.02	0.09			Gas	EE	
								VOC	0.001	0.01			Gas	EE	
								SO <sub>2</sub>	0.01	0.001		-	Gas	EE	
								PM	0.002	0.01			Solid	EE	
								CH <sub>2</sub> O	0.00002	0.0001			Gas	EE	

**Attachment J  
EMISSION POINTS DATA SUMMARY SHEET**

**Table 1: Emissions Data**

Emission Point ID No. (Must match Emission Units Table & Plot Plan)	Emission Point Type <sup>1</sup>	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot Plan)		Air Pollution Control Device (Must match Emission Units Table & Plot Plan)		Vent Time for Emission Unit (chemical processes only)		All Regulated Pollutants - Chemical Name/CAS <sup>3</sup> (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions <sup>4</sup>		Maximum Potential Controlled Emissions <sup>5</sup>		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used <sup>6</sup>	Emission Concentration <sup>7</sup> (ppmv or mg/m <sup>3</sup> )
		ID No.	Source	ID No.	Device Type	Short Term <sup>2</sup>	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
SH2		037SH2						NO <sub>x</sub>	0.11	0.48			Gas	EE	
								CO	0.09	0.40			Gas	EE	
								VOC	0.01	0.03			Gas	EE	
								SO <sub>2</sub>	0.06	0.004			Gas	EE	
								PM	0.01	0.04			Solid	EE	
								CH <sub>2</sub> O	0.0001	0.0004			Gas	EE	

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

- Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.
- Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).
- List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS<sub>2</sub>, VOCs, H<sub>2</sub>S, Inorganics, Lead, Organics, O<sub>3</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, SO<sub>3</sub>, all applicable Greenhouse Gases (including CO<sub>2</sub> and methane), etc. DO NOT LIST H<sub>2</sub>, H<sub>2</sub>O, N<sub>2</sub>, O<sub>2</sub>, and Noble Gases.
- Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).
- Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).
- Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).
- Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m<sup>3</sup>) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO<sub>x</sub>, use units of ppmv (See 45CSR10).

**Attachment J  
EMISSION POINTS DATA SUMMARY SHEET**

**Table 2: Release Parameter Data**

Emission Point ID No. (Must match Emission Units Table)	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow <sup>1</sup> (acfm) at operating conditions	Velocity (fps)	Ground Level (Height above mean sea level)	Stack Height <sup>2</sup> (Release height of emissions above ground level)	Northing	Easting
E04	10.0	850			1,575	54	4301.2	640.9
E05	5.0	950	100,000	85	1,575	40	4301.2	640.9
E06	5.0	950	100,000	85	1,575	40	4301.2	640.9
E07	2.0	917	32,261	171.1	1,575	15.33	4301.2	640.9
E08		859	200,964		1,575		4301.2	640.9
G3		841	4,643		1,575		4301.2	640.9
H1					1,575		4301.2	640.9
H2					1,575		4301.2	640.9
SH1					1,575		4301.2	640.9
E09	8.84 <sup>3</sup>	910	128,630	34.9	1,575	75.7	4301.2	640.9
H3					1,575		4301.2	640.9
SH2					1,575		4301.2	640.9

<sup>1</sup> Give at operating conditions. Include inerts.

<sup>2</sup> Release height of emissions above ground level.

<sup>3</sup> Effective diameter based on 7'-10" square duct.

# Attachment K

## **Fugitive Emissions Data Summary Sheet**

## Attachment K

### FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS	
1.)	Will there be haul road activities? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.)	Will there be Storage Piles? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.)	Will there be Liquid Loading/Unloading Operations? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No      The emissions are de minimus. <input type="checkbox"/> If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.)	Will there be emissions of air pollutants from Wastewater Treatment Evaporation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.)	Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.
6.)	Will there be General Clean-up VOC Operations? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.)	Will there be any other activities that generate fugitive emissions? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If you answered "NO" to all of the items above, it is not necessary to complete the following table, "Fugitive Emissions Summary."	

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS <sup>1</sup>	Maximum Potential Uncontrolled Emissions <sup>2</sup>		Maximum Potential Controlled Emissions <sup>3</sup>		Est. Method Used <sup>4</sup>
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads						
Unpaved Haul Roads						
Storage Pile Emissions						
Loading/Unloading Operations	(Existing Sources Only)					
Wastewater Treatment Evaporation & Operations						
Equipment Leaks	Methane CO <sub>2</sub> GHG (CO <sub>2</sub> e)	Does not apply	5.16 0.15 129.14	Does not apply	5.16 0.15 129.14	EE EE EE
General Clean-up VOC Emissions						
Other						

<sup>1</sup> List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS<sub>2</sub>, VOCs, H<sub>2</sub>S, Inorganics, Lead, Organics, O<sub>3</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, SO<sub>3</sub>, all applicable Greenhouse Gases (including CO<sub>2</sub> and methane), etc. DO NOT LIST H<sub>2</sub>, H<sub>2</sub>O, N<sub>2</sub>, O<sub>2</sub>, and Noble Gases.

<sup>2</sup> Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

<sup>3</sup> Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

<sup>4</sup> Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

## LEAK SOURCE DATA SHEET

Source Category	Pollutant	Number of Source Components <sup>1</sup>	Number of Components Monitored by Frequency <sup>2</sup>	Average Time to Repair (days) <sup>3</sup>	Estimated Annual Emission Rate (lb/yr) <sup>4</sup>
Pumps <sup>5</sup>	light liquid VOC <sup>6,7</sup>				
	heavy liquid VOC <sup>8</sup>				
	Non-VOC <sup>9</sup>				
Valves <sup>10</sup>	Gas VOC	N/A - less than 10% VOC			
	Light Liquid VOC				
	Heavy Liquid VOC				
Safety Relief Valves <sup>11</sup>	Non-VOC	36	0	N/A	4,154 lb CH4/yr
	Gas VOC	N/A - less than 10% VOC			
	Non VOC	16	0	N/A	83 lb CH4/yr
Open-ended Lines <sup>12</sup>	VOC	N/A - less than 10% VOC			
	Non-VOC	77	0	N/A	3,255 lb CH4/yr
	VOC	N/A - less than 10% VOC			
Sampling Connections <sup>13</sup>	Non-VOC	6	0	N/A	53 lb CH4/yr
	VOC	N/A - less than 10% VOC			
	Non-VOC	1	0	N/A	N/A - emissions included in other component estimates
Flanges	VOC	N/A - less than 10% VOC			
	Non-VOC	314	0	N/A	2,765 lb CH4/yr
	VOC	N/A - less than 10% VOC			
Other	Non-VOC	1 meter	0	N/A	10 lb CH4/yr

1 - 13 See notes on the following page.

# Attachment L

## **Emissions Unit Data Sheets**

**Attachment L**  
**EMISSIONS UNIT DATA SHEET**  
**GENERAL**

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 03709

<p>1. Name or type and model of proposed affected source:</p> <p>Solar Taurus Model 70 turbine. Proposed emission point ID E09.</p>
<p>2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.</p>
<p>3. Name(s) and maximum amount of proposed process material(s) charged per hour:</p> <p>N/A</p>
<p>4. Name(s) and maximum amount of proposed material(s) produced per hour:</p> <p>N/A</p>
<p>5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:</p> <p>Natural gas combustion products.</p>

\* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):			
(a) Type and amount in appropriate units of fuel(s) to be burned:			
753.1 million cubic feet per year (equivalent to 768,164 MMBtu/yr) for Turbine E09.			
(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:			
methane	93.25	All values in volume percent.	
ethane	3.68		
propane	0.88		
I-Butane	0.07		
N-Butane	0.19		
I-Pentane	0.03		
N-Pentane	0.003		
Hexane	0.012		
Carbon Dioxide	0.99	Nitrogen	0.89 Sulfur Dioxide 0.0001 ash - nil
(c) Theoretical combustion air requirement (ACF/unit of fuel):			
	@	°F and	psia.
(d) Percent excess air:			
(e) Type and BTU/hr of burners and all other firing equipment planned to be used:			
87.69 MMBtu/hr at 32 °F			
(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:			
N/A			
(g) Proposed maximum design heat input:		87.69	× 10 <sup>6</sup> BTU/hr.
7. Projected operating schedule:			
Hours/Day	24	Days/Week	7
		Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@	32	°F and	Full Load	psia
a. NO <sub>x</sub>	4.74	lb/hr		grains/ACF
b. SO <sub>2</sub>	5.01	lb/hr		grains/ACF
c. CO	4.81	lb/hr		grains/ACF
d. PM <sub>10</sub>	0.58	lb/hr		grains/ACF
e. Hydrocarbons	2.76	lb/hr		grains/ACF
f. VOCs	0.55	lb/hr		grains/ACF
g. Pb	0	lb/hr		grains/ACF
h. Specify other(s)				
CO <sub>2e</sub>	10,268	lb/hr		grains/ACF
Formaldehyde	0.06	lb/hr		grains/ACF
		lb/hr		grains/ACF
		lb/hr		grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing  
 Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

**MONITORING**

To demonstrate compliance with the turbine annual emission rates in the permit, Columbia proposes to maintain the following records:

- 1) Monthly operating hours
- 2) Monthly operating hours at less than 50% load,
- 3) Monthly operating hours at less than or equal to 0 °F ambient temperature, and
- 4) Monthly number of startup and shutdown cycles.

**RECORDKEEPING**

Maintain records of monitored parameters.

**REPORTING**

Notification of start-up date will be submitted within 15 days of start-up. Facility will follow same reporting requirements as currently being conducted. Performance test report will be submitted before the close of business on the 60<sup>th</sup> day following the completion of testing.

**TESTING**

Columbia will conduct an initial compliance test within 60 days after achieving full-load operation or within 180 days of startup if the turbines are not operated at full load. Unless continuous parameter monitoring is implemented by Columbia, annual performance testing using EPA reference methods will be conducted within 14 calendar months following the previous performance test. Columbia will reduce the test frequency to biennial if measured NOx emissions are less than 75% of limit. Columbia requests that portable emissions analyzers be allowed for annual turbine testing.

**MONITORING.** PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

**RECORDKEEPING.** PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

**REPORTING.** PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

**TESTING.** PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

Emissions warranted above ambient temperatures of -20° F and at loads between 50 and 100% of design. Solar provides guidance on estimating emission outside those conditions but does not warrant the rates. A complete maintenance manual is beyond the scope of this form but can be provided upon request.

**Attachment L**  
**EMISSIONS UNIT DATA SHEET**  
**GENERAL**

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 037SH2

<p>1. Name or type and model of proposed affected source:</p> <p>23 Catalytic heaters. Proposed emission point ID SH2.</p>
<p>2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.</p>
<p>3. Name(s) and maximum amount of proposed process material(s) charged per hour:</p> <p>N/A</p>
<p>4. Name(s) and maximum amount of proposed material(s) produced per hour:</p> <p>N/A</p>
<p>5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:</p> <p>Natural gas combustion products.</p>

\* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.



8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:			
@	°F and	14.7	psia
a. NO <sub>x</sub>	0.11	lb/hr	grains/ACF
b. SO <sub>2</sub>	0.06	lb/hr	grains/ACF
c. CO	0.09	lb/hr	grains/ACF
d. PM <sub>10</sub>	0.01	lb/hr	grains/ACF
e. Hydrocarbons		lb/hr	grains/ACF
f. VOCs	0.01	lb/hr	grains/ACF
g. Pb	0	lb/hr	grains/ACF
h. Specify other(s)			
CO <sub>2e</sub>	131	lb/hr	grains/ACF
Formaldehyde	0.0001	lb/hr	grains/ACF
		lb/hr	grains/ACF
		lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing  
 Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

**MONITORING**

Columbia assumes this unit will operate 8760 hours per year. No monitoring, recordkeeping, reporting, or testing is required for this unit.

**RECORDKEEPING**

**REPORTING**

**TESTING**

**MONITORING.** PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

**RECORDKEEPING.** PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

**REPORTING.** PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

**TESTING.** PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty  
 N/A

**Attachment L  
EMISSIONS UNIT DATA SHEET  
GENERAL**

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): HTR3

<p>1. Name or type and model of proposed affected source:</p> <p>Fuel Gas heater. Proposed emission point ID H3.</p>
<p>2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.</p>
<p>3. Name(s) and maximum amount of proposed process material(s) charged per hour:</p> <p>N/A</p>
<p>4. Name(s) and maximum amount of proposed material(s) produced per hour:</p> <p>N/A</p>
<p>5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:</p> <p>Natural gas combustion products.</p>

\* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):			
(a) Type and amount in appropriate units of fuel(s) to be burned:			
Natural gas at a designed fuel usage of 245 ft <sup>3</sup> /hr.			
(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:			
methane	93.25	All values in volume percent.	
ethane	3.68		
propane	0.88		
I-Butane	0.07		
N-Butane	0.19		
I-Pentane	0.03		
N-Pentane	0.003		
Hexane	0.012		
Carbon Dioxide	0.99	Nitrogen 0.89	Sulfur Dioxide 0.0001 ash - nil
(c) Theoretical combustion air requirement (ACF/unit of fuel):			
	@	°F and	psia.
(d) Percent excess air:			
(e) Type and BTU/hr of burners and all other firing equipment planned to be used:			
0.25 MMBtu/hr			
(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:			
N/A			
(g) Proposed maximum design heat input:		0.25	× 10 <sup>6</sup> BTU/hr.
7. Projected operating schedule:			
Hours/Day	24	Days/Week	7
		Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:			
@	°F and	14.7	psia
a. NO <sub>x</sub>	0.02	lb/hr	grains/ACF
b. SO <sub>2</sub>	0.01	lb/hr	grains/ACF
c. CO	0.02	lb/hr	grains/ACF
d. PM <sub>10</sub>	0.002	lb/hr	grains/ACF
e. Hydrocarbons		lb/hr	grains/ACF
f. VOCs	0.001	lb/hr	grains/ACF
g. Pb	0	lb/hr	grains/ACF
h. Specify other(s)			
CO <sub>2e</sub>	29	lb/hr	grains/ACF
Formaldehyde	0.00002	lb/hr	grains/ACF
		lb/hr	grains/ACF
		lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing  
 Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

**MONITORING**

Columbia assumes this unit will operate 8760 hours per year. No monitoring, recordkeeping, reporting, or testing is required for this unit.

**RECORDKEEPING**

**REPORTING**

**TESTING**

**MONITORING.** PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

**RECORDKEEPING.** PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

**REPORTING.** PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

**TESTING.** PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty  
 N/A

# Attachment P

## Public Notice

**(to be provided as a supplemental submittal)**

# Attachment N

## **Supporting Emissions Calculations**

Columbia Gas Transmission, LLC  
 Seneca Compressor Station  
 Jan 2016 Application  
 Table N-1 - Facility Total PTE

Source	Capacity	Annual Emissions (tpy)									
		NO <sub>x</sub>	CO	CO <sub>2</sub> e	PM <sub>10</sub> /PM <sub>2.5</sub>	VOC	SO <sub>2</sub>	CH <sub>2</sub> O	Total HAP		
<b>New Source PTE<sup>1</sup></b>		23.39	92.29	54,515	2.58	16.90	0.28	0.27	0.41		
E09 - Solar Taurus 70 Turbine	10,613 hp (32 °F)	22.80	91.80	44,975	2.53	3.22	0.27	0.27	0.39		
H3 - Process Heater	0.25 MMBtu/hr	0.11	0.09	128	0.01	0.01	7.82E-04	8.05E-05	2.03E-03		
SH2 - (23) Catalytic Heaters	Various	0.48	0.40	574	0.04	0.03	3.50E-03	3.61E-04	0.01		
Equipment Leaks (fugitive emissions) <sup>2</sup>				129		0.20					
Venting				8,838		13.65					
<b>Current PTE<sup>1</sup></b>		290.9	279.3	213,983	18.5	46.7	1.26	1.33	1.95		
E07 - Solar Saturn 10 Turbine	1,333 hp (50 °F)	41.5	67.6	8,576	1.32	1.94	0.05	0.05	0.08		
Venting				861		1.33					
E08 - Solar Mars Turbine	13,814 hp (50 °F)	31.8	63.0	61,264	9.42	3.88	0.37	0.37	0.54		
Venting				6,488		10.02					
G3 - Emergency Generator	880 hp	0.97	0.63	200	0.02	0.02	1.22E-03	0.09	0.12		
H2 - Heater	0.85 MMBtu/hr	0.37	0.31	436	0.03	0.02	2.66E-03	2.74E-04	6.89E-03		
SH1 - Catalytic Heaters	0.072 MMBtu/hr	1.11	0.93	1,329	0.08	0.06	8.11E-03	8.35E-04	0.02		
H1 - Heater	0.50 MMBtu/hr	0.21	0.18	256	0.02	0.01	1.56E-03	1.61E-04	4.05E-03		
E04 - GE Frame 3 Turbine	13,750 hp	177.3	45.4	64,880	3.66	1.16	0.40	0.39	0.57		
E05 & E06 - Solar Taurus 60 Turbines	7,915 hp (0 °F)	37.6	101.2	69,692	3.93	28.30	0.42	0.42	0.61		
Equipment Leaks (fugitive emissions) <sup>2</sup>				258		0.40					
<b>PSD Significance Threshold</b>		40	100	n/a <sup>3</sup>	15 / 10	40	40				
<b>Proposed PTE<sup>1</sup></b>		314.3	371.6	268,499	21.0	63.7	1.54	1.60	2.35		

1. Excludes fugitive emissions (compressor stations are not one of the named source categories that include fugitive emissions).

2. Fugitive emissions are not part of the PSD or Title V applicability analyses.

3. Per 6-23-2014 Supreme Court decisions, applicability of PSD permitting cannot be triggered by GHG emissions.

**Columbia Gas Transmission, LLC  
Seneca Compressor Station  
Jan 2016 Application  
Table N-2 - Solar Taurus 70 Turbine (E09)**

Horsepower 10,613 hp (32 °F)  
 Brake Specific Fuel Consumption 7444 Btu/Bhp-hr (LHV, 32 °F)  
 Total Heat Input 79.00 MMBtu/hr (LHV, 32 °F)  
 87.69 MMBtu/hr (HHV, 32 °F)<sup>3</sup>  
 Operating Hours 8760 hr/yr  
 Natural Gas Heat Content 1020 Btu/scf  
 Fuel Consumption 753.10 MMscf/yr  
 85,970.6 scf/hr (based on 32°F)

Pollutant	Emission Factor		Emission Rate lb/hr <sup>1</sup>	Emission Rate ton/yr <sup>2</sup>	Emission Factor Reference
	ppmvd@15%O <sub>2</sub>	lb/MMBtu			
NO <sub>x</sub>	15.00	0.060 LHV	4.74	22.80	Vendor Data
CO	25.00	0.061 LHV	4.81	91.80	Vendor Data
CO <sub>2e</sub>		117.1 HHV	10,268	44,975	40 CFR 98 Subpart C
PM <sub>10</sub>		0.0066 HHV	0.58	2.53	AP-42 Table 3.1-2a (4/00)
PM <sub>2.5</sub>		0.0066 HHV	0.58	2.53	AP-42 Table 3.1-2a (4/00)
VOC	5.00	0.007 LHV	0.55	3.22	Vendor Data (20% of UHC) <sup>4</sup>
SO <sub>2</sub> (Maximum Hourly)		0.0571 HHV	5.01		20 grains S / 100 scf
SO <sub>2</sub> (Average Annual)		0.000714 HHV		0.27	0.25 grains S / 100 scf
Formaldehyde		0.00071 HHV	0.06	0.27	AP-42 Table 3.1-3 (4/00)
Total HAPs		0.00103 HHV	0.09	0.39	AP-42 Table 3.1-3 (4/00)

- Maximum hourly emission rate based on normal operation at 32 °F. Heat input, fuel consumption, and emissions increase as temperature decrease and for the purpose of this application, hourly emissions are characterized by Solar emissions data for 32 °F.
- Annual emission rate based on combination of potential operating modes as provided on following page for NO<sub>x</sub>, CO, and VOC.  
All other pollutants based on horsepower and brake specific fuel consumption at 32 °F.
- HHV heat input based on HHV=1.11\*LHV
- VOC based on 20% of vendor data for unburned hydrocarbon (UHC).

Columbia Gas Transmission, LLC  
 Seneca Compressor Station  
 Jan 2016 Application

Table N-3 - Solar Taurus 70 (E09) - Emission Rates

Operating Mode	Units	NO <sub>x</sub>	CO	VOC
Normal Load @ 32 °F <sup>1</sup>	lb/hr	4.74	4.81	0.55
Low Temp (<0 °F) <sup>2</sup>	lb/hr	14.21	20.59	1.18
Low-Load (<50%) <sup>3</sup>	lb/hr	14.45	586.42	6.70
Startup/ Shutdown <sup>4</sup>	lb/event	1.90	166.50	1.90

1. Based on data from Solar Taurus 70 Compressor Set data sheet and the following concentrations:  
 15 ppm NO<sub>x</sub>; 25 ppm CO; 5 ppm VOC
2. Based on data from Solar Product Information Letter (PIL) 167
3. For the purpose of calculating potential annual emissions, non-startup/shutdown operation at <50% load is based on emissions data provided by Solar for 40% load.
4. Based on data from Solar PIL170

Potential Annual Emissions Per Turbine

Operating Mode	Operating Time		NO <sub>x</sub> ton/yr	CO ton/yr	VOC ton/yr
	Cycles	hr/yr			
Normal Load @ 32 °F		8273	19.61	19.90	2.28
Low Temp (<0 °F)		240	1.70	2.47	0.14
Low-Load (<50%)		180	1.30	52.78	0.60
Startup/ Shutdown	200	67	0.19	16.65	0.19
<b>Total</b>		<b>8,760</b>	<b>22.80</b>	<b>91.80</b>	<b>3.22</b>

Emission Rates During Normal Operation (g/hp-hr)<sup>1</sup>

Emission Point ID / Model	NO <sub>x</sub>	CO	VOC <sup>2</sup>	SO <sub>2</sub> <sup>3</sup>	PM <sub>10</sub> / PM <sub>2.5</sub>	CH <sub>2</sub> O
E09 / Solar Taurus 70	0.20	0.21	0.02	0.21	0.02	0.003

1. Based on vendor performance data; values in italics based on AP-42 emission factors.
2. VOC is based on 20 percent of unburned hydrocarbons per Solar Product Information Letter 168.
3. Conservatively based on 20 grains sulfur per 100 standard cubic feet of natural gas for maximum short-term emissions.

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**Table N-4 - Emissions from Venting - Solar Taurus 70 (E09)**

Number of Pneumatic Actuators: 15  
Pneumatic Actuator Vent Rate: 3 scf/hr/actuator

Number of Startup/Shutdown Cycles: 200 per year  
Electric Starter Emissions per Startup: 0 scf  
Blowdown Emissions per Shutdown: 84,856 scf

Number of Dry Seals: 2  
Dry Seal Vent Rate: 0.5 scf/min/seal

Annual Operating Hours: 8760

Component	Emission Rate									
	Total	CH <sub>4</sub> <sup>2</sup> scf/hr	CO <sub>2</sub> <sup>2</sup> scf/hr	CH <sub>4</sub> <sup>3</sup> lb/hr	CO <sub>2</sub> <sup>3</sup> lb/hr	CH <sub>4</sub> ton/yr	CO <sub>2</sub> ton/yr	CO <sub>2</sub> e <sup>4</sup> ton/yr	VOC <sup>6</sup> ton/yr	
<b>Continuous During Operation</b>	<b>scf/hr</b>	<b>45.00</b>	<b>0.45</b>	<b>1.78</b>	<b>0.05</b>	<b>7.78</b>	<b>0.23</b>	<b>194.72</b>	<b>0.30</b>	
Pneumatic Actuator										
Dry Seals	60.00	55.95	0.59	2.37	0.07	10.37	0.30	259.63	0.40	
<b>Intermittent During Startup/Shutdown</b>	<b>scf/event</b>	<b>scf/event</b>	<b>scf/event</b>	<b>lb/event</b>	<b>lb/event</b>	<b>ton/yr</b>	<b>ton/yr</b>	<b>ton/yr</b>	<b>ton/yr</b>	
Pneumatic Starter <sup>1</sup>	0	0	0	0	0	0	0	0	0.00	
Blowdowns <sup>1,5</sup>	84,856	79,128	840	3,349	97	335	10	8,383	12.95	
							<b>Total:</b>	<b>8,838</b>	<b>13.65</b>	

1. Emission rates per event instead of per hour
2. CH<sub>4</sub> and CO<sub>2</sub> emission rates based on 93.25 vol% CH<sub>4</sub> and 0.99 vol% CO<sub>2</sub> in natural gas
3. Conversion based on densities of GHG as provided in 40 CFR 98.233(v)
4. Based on 40 CFR 98 Subpart A Global Warming Potentials
5. Conservative estimate based on 1 blowdown per shutdown. It is not expected that a blowdown will occur after each shutdown.
6. Based on a 0.039 ratio of VOC to methane as calculated from gas composition

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 Table N-5 - Fugitive Emissions from Leaks - Taurus 70 (E09)

Number of Compressors: 1  
 Annual Operating Hours: 8760

Component	Average Number of Leaking Components <sup>1</sup> / compressor	Emission Factor <sup>2</sup> / component	Total Emission Rate (1 compressor)											
			Total	CH <sub>4</sub> <sup>3</sup>	CO <sub>2</sub> <sup>3</sup>	CH <sub>4</sub> <sup>4</sup>	CO <sub>2</sub> <sup>4</sup>	CH <sub>4</sub>	CO <sub>2</sub>	CO <sub>2</sub> e <sup>5</sup>	VOC <sup>6</sup>			
	scf/hr	scf/hr / component	scf/hr	scf/hr	scf/hr	lb/hr	lb/hr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr
Compressor Service														
Valve	0.55	14.84	8.16	7.61	0.08	0.32	0.01	1.41	0.04	35.32	5.46E-02			
Connector	0.62	5.59	3.47	3.23	0.03	0.14	0.00	0.60	0.02	15.00	2.32E-02			
Open-Ended Line	0.16	17.27	2.76	2.58	0.03	0.11	0.00	0.48	0.01	11.96	1.85E-02			
Pressure Relief	0.00	39.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00			
Meter	0.00	19.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00			
Non-Compressor Service														
Valve	0.60	6.42	3.85	3.59	0.04	0.15	0.00	0.67	0.02	16.67	2.57E-02			
Connector	0.82	5.71	4.68	4.37	0.05	0.18	0.01	0.81	0.02	20.26	3.13E-02			
Open-Ended Line	0.59	11.27	6.65	6.20	0.07	0.26	0.01	1.15	0.03	28.77	4.44E-02			
Pressure Relief	0.12	2.01	0.24	0.22	0.00	0.01	0.00	0.04	0.00	1.04	1.61E-03			
Meter	0.01	2.93	0.03	0.03	0.00	0.00	0.00	0.01	0.00	0.13	1.96E-04			
								<b>Total:</b>		<b>5.16</b>	<b>0.15</b>	<b>129.14</b>	<b>0.20</b>	

1. Estimated component leaks per compressor based on average measurements throughout the Columbia pipeline system
2. Emission factors from 40 CFR 98 Subpart W Table W-3
3. CH<sub>4</sub> and CO<sub>2</sub> emission rates based on 93.25 vol% CH<sub>4</sub> and 0.99 vol% CO<sub>2</sub> in natural gas
4. Conversion based on densities of GHG as provided in 40 CFR 98.233(v)
5. Based on 40 CFR 98 Subpart A Global Warming Potentials
6. Based on a 0.039 ratio of VOC to methane as calculated from gas composition.

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 Table N-6 - Process Heater (HTR3)

Heat Input 0.25 MMBtu/hr  
 Operating Hours 8760 hr/yr  
 Natural Gas Heat Content 1020 Btu/scf  
 Fuel Consumption 2.15 MMscf/yr  
 245.1 scf/hr

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
	lb/MMscf	lb/MMBtu	lb/hr	ton/yr	
NO <sub>x</sub>	100	0.098	0.02	0.11	AP-42 Table 1.4-1 (7/98)
CO	84	0.082	0.02	0.09	AP-42 Table 1.4-1 (7/98)
CO <sub>2</sub> e		117.1	29	128	40 CFR 98 Subpart C
PM <sub>10</sub>	7.6	0.007	1.86E-03	0.01	AP-42 Table 1.4-2 (7/98)
PM <sub>2.5</sub>	7.6	0.007	1.86E-03	0.01	AP-42 Table 1.4-2 (7/98)
VOC	5.5	0.005	1.35E-03	0.01	AP-42 Table 1.4-2 (7/98)
SO <sub>2</sub> (Maximum Hourly)		0.0571	0.01		20 grains S / 100 scf
SO <sub>2</sub> (Average Annual)		0.000714		7.82E-04	0.25 grains S / 100 scf
Formaldehyde	0.075	0.00007	1.84E-05	8.05E-05	AP-42 Table 1.4-3 (7/98)
Total HAPs	1.89	0.00185	4.63E-04	2.03E-03	AP-42 Table 1.4-3 & 4 (7/98)

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Table N-7 - Catalytic Heaters (SH2 - 8 x 0.005 MMBtu/hr, 15 x 0.072 MMBtu/hr)

Total Heat Input 1.12 MMBtu/hr  
 Operating Hours 8760 hr/yr  
 Natural Gas Heat Content 1020 Btu/scf  
 Fuel Consumption 9.62 MMscf/yr  
 1098.0 scf/hr

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
	lb/MMscf	lb/MMBtu	lb/hr (23 heaters)	ton/yr	
NO <sub>x</sub>	100	0.098	0.11	0.48	AP-42 Table 1.4-1 (7/98)
CO	84	0.082	0.09	0.40	AP-42 Table 1.4-1 (7/98)
CO <sub>2</sub> e		117.1	131	574	40 CFR 98 Subpart C
PM <sub>10</sub>	7.6	0.007	0.01	0.04	AP-42 Table 1.4-2 (7/98)
PM <sub>2.5</sub>	7.6	0.007	0.01	0.04	AP-42 Table 1.4-2 (7/98)
VOC	5.5	0.005	0.01	0.03	AP-42 Table 1.4-2 (7/98)
SO <sub>2</sub> (Maximum Hourly)		0.0571	0.06		20 grains S / 100 scf
SO <sub>2</sub> (Average Annual)		0.000714		3.50E-03	0.25 grains S / 100 scf
Formaldehyde	0.075	0.00007	8.24E-05	3.61E-04	AP-42 Table 1.4-3 (7/98)
Total HAPs	1.89	0.00185	2.07E-03	9.08E-03	AP-42 Table 1.4-3 & 4 (7/98)

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Table N-8 - Solar Saturn Turbine (E07)**

Horsepower 1333 hp (based on 50 °F)  
 Brake Specific Fuel Consumption 11,301 Btu/Bhp-hr (LHV) (based on 50 °F)  
 Total Heat Input 15.06 MMBtu/hr (LHV) (based on 50 °F)  
 Maximum Heat Input (at 30 °F) 16.72 MMBtu/hr (HHV)<sup>3</sup> (based on 50 °F)  
 15.82 MMBtu/hr (LHV)  
 17.56 MMBtu/hr (HHV)<sup>3</sup>  
 8760 hr/yr  
 1020 Btu/scf  
 Operating Hours  
 Natural Gas Heat Content 143.61 MMscf/yr (based on 50 °F)  
 Fuel Consumption 17,215.9 scf/hr (based on 30 °F)

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
	ppmvd@15%O <sub>2</sub>	lb/MMBtu	lb/hr <sup>1</sup>	ton/yr	
NO <sub>x</sub>	150.00	0.600 LHV	9.48	41.51	Vendor Data
CO	400.00	0.973 LHV	15.39	67.63	Vendor Data
CO <sub>2</sub> e		117.1 HHV	2,056	8,576	40 CFR 98 Subpart C
PM <sub>10</sub>		0.018 HHV	0.32	1.32	Vendor Data (Solar PIL171)
PM <sub>2.5</sub>		0.018 HHV	0.32	1.32	Vendor Data (Solar PIL171)
VOC	20.00	0.028 LHV	0.44	1.94	Vendor Data (20% of UHC) <sup>4</sup>
SO <sub>2</sub> (Maximum Hourly)		0.0571 HHV	1.00		20 grains S / 100 scf
SO <sub>2</sub> (Average Annual)		0.000714 HHV		5.23E-02	0.25 grains S / 100 scf
Formaldehyde		0.00071 HHV	0.01	5.20E-02	AP-42 Table 3.1-3 (4/00)
Total HAPs		0.00103 HHV	0.02	0.08	AP-42 Table 3.1-3 (4/00)

1. Maximum hourly emission rate based on 30 °F.
2. Annual emission rate based on combination of potential operating modes as provided on following page for NO<sub>x</sub>, CO, and VOC.  
All other pollutants based on HP and BSFC at 50 °F (annual average temperature of nearest climatological center - Elkins Airport).
3. HHV heat input based on HHV=1.11\*LHV
4. VOC based on 20% of vendor data for unburned hydrocarbon (UHC).

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Table N-9 - Solar Mars Turbine (E08)**

Horsepower 13,814 hp (based on 50 °F)  
 Brake Specific Fuel Consumption 7790 Btu/Bhp-hr (LHV) (based on 50 °F)  
 Total Heat Input 107.61 MMBtu/hr (LHV) (based on 50 °F)  
 Maximum Heat Input (at 30 °F) 119.45 MMBtu/hr (HHV)<sup>3</sup> (based on 50 °F)  
 112.59 MMBtu/hr (LHV)  
 124.97 MMBtu/hr (HHV)<sup>3</sup>  
 Operating Hours 8760 hr/yr  
 Natural Gas Heat Content 1020 Btu/scf  
 Fuel Consumption 1025.86 MMscf/yr (based on 50 °F)  
 122,524.4 scf/hr (based on 30 °F)

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
	ppmvd@15%O <sub>2</sub>	lb/MMBtu	lb/hr <sup>1</sup>	ton/yr	
NO <sub>x</sub>	15.00	0.060 LHV	6.76	31.83	Vendor Data
CO	25.00	0.061 LHV	6.85	63.02	Vendor Data
CO <sub>2e</sub>		117.1 HHV	14,634	61,264	40 CFR 98 Subpart C
PM <sub>10</sub>		0.018 HHV	2.25	9.42	Vendor Data (Solar PIL171)
PM <sub>2.5</sub>		0.018 HHV	2.25	9.42	Vendor Data (Solar PIL171)
VOC	5.00	0.007 LHV	0.79	3.88	Vendor Data (20% of UHC) <sup>4</sup>
SO <sub>2</sub> (Maximum Hourly)		0.0571 HHV	7.14		20 grains S / 100 scf
SO <sub>2</sub> (Average Annual)		0.000714 HHV		0.37	0.25 grains S / 100 scf
Formaldehyde		0.00071 HHV	0.09	0.37	AP-42 Table 3.1-3 (4/00)
Total HAPs		0.00103 HHV	0.13	0.54	AP-42 Table 3.1-3 (4/00)

1. Maximum hourly emission rate based on 30 °F.
2. Annual emission rate based on combination of potential operating modes as provided on following page for NO<sub>x</sub>, CO, and VOC.  
All other pollutants based on HP and BSFC at 50 °F (annual average temperature of nearest climatological center - Elkins Airport).
3. HHV heat input based on HHV=1.11\*LHV
4. VOC based on 20% of vendor data for unburned hydrocarbon (UHC).

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Table N-10 - Emission Rates**

**Solar Saturn 10 (E07)**

Operating Mode	Units	NOx	CO	VOC
Normal Load @ 30 °F <sup>1</sup>	lb/hr	9.48	15.39	0.44
Low Temp (<0 °F) <sup>2</sup>	lb/hr	10.36	16.82	0.48
Low-Load (<50%) <sup>2</sup>	lb/hr	5.67	14.37	0.66
Very Low Temp (<-20 °F) <sup>2</sup>	lb/hr	10.36	16.82	0.48
Startup/Shutdown <sup>2</sup>	lb/cycle	1.44	4.44	0.23

1. Solar Predicted Emission Performance 22-Jan-14
2. E-mail from Solar 29-Jan-14

Operating Mode	Operating Time		NOx	CO	VOC
	Cycles	Hr/Yr	ton/yr	ton/yr	ton/yr
Normal Load @ 30 °F		8442	40.02	64.96	1.86
Low Temp (<0 °F)		240	1.24	2.02	5.76E-02
Low-Load (<50%)		30	0.09	0.22	9.87E-03
Very Low Temp (<-20 °F) <sup>2</sup>		12	0.06	0.10	2.88E-03
Startup/Shutdown	150	36	0.108	0.333	1.71E-02
Total		8760	41.51	67.63	1.94

**Solar Mars 100 (E08)**

Operating Mode	Units	NOx	CO	VOC
Normal Load @ 30 °F <sup>1</sup>	lb/hr	6.76	6.85	0.79
Low Temp (<0 °F) <sup>2</sup>	lb/hr	20.58	29.83	1.70
Low-Load (<50%) <sup>2</sup>	lb/hr	16.10	653.41	7.47
Very Low Temp (<-20 °F) <sup>2</sup>	lb/hr	58.80	44.74	1.70
Startup/Shutdown <sup>3</sup>	lb/event	3.10	272.7	3.12

1. Solar Predicted Emission Performance 22-Jan-14
2. Based on data from Solar Product Information Letter (PIL) 167
3. Solar PIL170

Operating Mode	Operating Time		NOx	CO	VOC
	Cycles	Hr/Yr	ton/yr	ton/yr	ton/yr
Normal Load @ 30 °F		8442	28.53	28.91	3.32
Low Temp (<0 °F)		240	2.47	3.58	0.20
Low-Load (<50%)		30	0.24	9.80	0.11
Very Low Temp (<-20 °F) <sup>2</sup>		12	0.35	0.27	0.01
Startup/Shutdown	150	36	0.23	20.45	0.23
Total		8760	31.83	63.02	3.88

**Solar Saturn 10 and Mars 100 Combined Emission Rates (E07 & E08)**

Totals	Units	NOx	CO	VOC
Normal Load @ 30 °F	ton/yr	68.55	93.88	5.17
Low Temp (<0 °F)	ton/yr	3.71	5.60	0.26
Low-Load (<50%)	ton/yr	0.33	10.02	0.12
Very Low Temp (<-20 °F) <sup>2</sup>	ton/yr	0.41	0.37	0.01
Startup/Shutdown	ton/yr	0.34	20.79	0.25
Total		73.34	130.64	5.82

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Table N-11 - Emissions from Venting - Solar Saturn 10 (E07)

Number of Pneumatic Actuators: 9  
 Pneumatic Actuator Vent Rate: 3 scf/hr/actuator

Number of Startup/Shutdown Cycles: 150  
 Pneumatic Starter Emissions per Startup: 1,575 scf  
 Blowdown Emissions per Shutdown: 4,967 scf

Number of Dry Seals: 2  
 Dry Seal Vent Rate: 0.5 scf/min/seal

Annual Operating Hours: 8760

Component	Emission Rate									
	Total	CH <sub>4</sub> <sup>2</sup>	CO <sub>2</sub> <sup>2</sup>	CH <sub>4</sub> <sup>3</sup>	CO <sub>2</sub> <sup>3</sup>	CH <sub>4</sub>	CO <sub>2</sub>	CO <sub>2</sub> e <sup>4</sup>	VOC <sup>5</sup>	
Continuous During Operation	scf/hr	scf/hr	scf/hr	lb/hr	lb/hr	ton/yr	ton/yr	ton/yr	ton/yr	
Pneumatic Actuator	27.00	25.18	0.27	1.07	0.03	4.67	0.14	116.83	0.18	
Dry Seals	60.00	55.95	0.59	2.37	0.07	10.37	0.30	259.63	0.40	
Intermittent During Startup/Shutdown	scf/event	scf/event	scf/event	lb/event	lb/event	ton/yr	ton/yr	ton/yr	ton/yr	
Pneumatic Starter <sup>1</sup>	1575.00	1,468.69	15.59	62.17	1.81	4.66	0.14	116.70	0.18	
Blowdowns <sup>1,5</sup>	4967.00	4,631.73	49.17	196.06	5.70	14.70	0.43	368.03	0.57	
							<b>Total:</b>	861.19	1.33	

1. Emission rates per event instead of per hour
2. CH<sub>4</sub> and CO<sub>2</sub> emission rates based on 93.25 vol% CH<sub>4</sub> and 0.99 vol% CO<sub>2</sub> in natural gas
3. Conversion based on densities of GHG as provided in 40 CFR 98.233(v)
4. Based on 40 CFR 98 Subpart A Global Warming Potentials
5. Conservative estimate based on 1 blowdown per shutdown. It is not expected that a blowdown will occur after each shutdown.
6. Based on a 0.039 ratio of VOC to methane as calculated from gas composition

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 Table N-12 - Emissions from Venting - Solar Mars 100 (E08)

Number of Pneumatic Actuators: 7  
 Pneumatic Actuator Vent Rate: 3 scf/hr/actuator

Number of Startup/Shutdown Cycles: 150  
 Pneumatic Starter Emissions per Startup: 15,700 scf  
 Blowdown Emissions per Shutdown: 67,126 scf

Number of Dry Seals: 2  
 Dry Seal Vent Rate: 0.5 scf/min/seal

Annual Operating Hours: 8760

Component	Emission Rate									
	Total	CH <sub>4</sub> <sup>2</sup>	CO <sub>2</sub> <sup>2</sup>	CH <sub>4</sub> <sup>3</sup>	CO <sub>2</sub> <sup>3</sup>	CH <sub>4</sub>	CO <sub>2</sub>	CO <sub>2</sub> e <sup>4</sup>	VOC <sup>6</sup>	
<b>Continuous During Operation</b>	scf/hr	scf/hr	scf/hr	lb/hr	lb/hr	ton/yr	ton/yr	ton/yr	ton/yr	
Pneumatic Actuator	21.00	19.58	0.21	0.83	0.02	3.63	0.11	90.87	0.14	
Dry Seals	60.00	55.95	0.59	2.37	0.07	10.37	0.30	259.63	0.40	
<b>Intermittent During Startup/Shutdown</b>	scf/event	scf/event	scf/event	lb/event	lb/event	ton/yr	ton/yr	ton/yr	ton/yr	
Pneumatic Starter <sup>1</sup>	15,700	14,640	155	620	18	46	1	1,163	1.80	
Blowdowns <sup>1,5</sup>	67,126	62,595	665	2,650	77	199	6	4,974	7.68	
							<b>Total:</b>	<b>6,487.5</b>	<b>10.02</b>	

1. Emission rates per event instead of per hour
2. CH<sub>4</sub> and CO<sub>2</sub> emission rates based on 93.25 vol% CH<sub>4</sub> and 0.99 vol% CO<sub>2</sub> in natural gas
3. Conversion based on densities of GHG as provided in 40 CFR 98.233(v)
4. Based on 40 CFR 98 Subpart A Global Warming Potentials
5. Conservative estimate based on 1 blowdown per shutdown. It is not expected that a blowdown will occur after each shutdown.
6. Based on a 0.039 ratio of VOC to methane as calculated from gas composition

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Table N-13 - Fugitive Emissions from Leaks - Solar Saturn 10 & Mars 100 (E07 & E08)

Number of Compressors: 2  
 Annual Operating Hours: 8760

Component	Average Number of Leaking Components <sup>1</sup> / compressor	Emission Factor <sup>2</sup> / component	Total Emission Rate (2 compressors)											
			Total	CH <sub>4</sub> <sup>3</sup>	CO <sub>2</sub> <sup>3</sup>	CH <sub>4</sub> <sup>4</sup>	CO <sub>2</sub> <sup>4</sup>	CH <sub>4</sub>	CO <sub>2</sub>	CO <sub>2</sub> e <sup>5</sup>	VOC <sup>6</sup>			
		scf/hr / component	scf/hr	scf/hr	scf/hr	lb/hr	lb/hr	lb/hr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr
Compressor Service														
Valve	0.55	14.84	16.32	15.22	0.16	0.64	0.02	0.02	2.82	0.08	70.64	1.09E-01		
Connector	0.62	5.59	6.93	6.46	0.07	0.27	0.01	0.01	1.20	0.03	29.99	4.63E-02		
Open-Ended Line	0.16	17.27	5.53	5.15	0.05	0.22	0.01	0.01	0.96	0.03	23.91	3.69E-02		
Pressure Relief	0.00	39.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00		
Meter	0.00	19.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00		
Non-Compressor Service														
Valve	0.60	6.42	7.70	7.18	0.08	0.30	0.01	0.01	1.33	0.04	33.34	5.15E-02		
Connector	0.82	5.71	9.36	8.73	0.09	0.37	0.01	0.01	1.62	0.05	40.52	6.26E-02		
Open-Ended Line	0.59	11.27	13.30	12.40	0.13	0.52	0.02	0.02	2.30	0.07	57.55	8.89E-02		
Pressure Relief	0.12	2.01	0.48	0.45	0.00	0.02	0.00	0.00	0.08	0.00	2.09	3.22E-03		
Meter	0.01	2.93	0.06	0.05	0.00	0.00	0.00	0.00	0.01	0.00	0.25	3.92E-04		
			<b>Total:</b>						<b>10.32</b>	<b>0.30</b>	<b>258.29</b>	<b>0.40</b>		

1. Estimated component leaks per compressor based on average measurements throughout the Columbia pipeline system  
 2. Emission factors from 40 CFR 98 Subpart W Table W-3  
 3. CH<sub>4</sub> and CO<sub>2</sub> emission rates based on 93.25 vol% CH<sub>4</sub> and 0.99 vol% CO<sub>2</sub> in natural gas  
 4. Conversion based on densities of GHG as provided in 40 CFR 98.233(v)  
 5. Based on 40 CFR 98 Subpart A Global Warming Potentials  
 6. Based on a 0.039 ratio of VOC to methane as calculated from gas composition

Columbia Gas Transmission, LLC  
 Seneca Compressor Station  
 Jan 2016 Application  
 Table N-14 - Waukesha Emergency Generator (G3)

Horsepower 880 HP  
 Brake Specific Fuel Consumption 7757 Btu/Bhp-hr  
 Total Heat Input 6.83 MMBtu/hr  
 Operating Hours 500 hr/yr  
 Natural Gas Heat Content 1020 Btu/scf  
 Fuel Consumption 3.35 MMscf/yr  
 6692 scf/hr

Pollutant	Emission Factor		Emission Rate	Emission Factor Reference
	g/bhp-hr	lb/MMBtu		
NO <sub>x</sub>	2.00		3.88 0.97	Vendor Data
CO	1.30		2.52 0.63	Vendor Data
CO <sub>2</sub> e		117.1	799 200	40 CFR 98 Subpart C
PM <sub>10</sub>		0.010	0.07 0.02	AP-42 Table 3.2-2 (7/00) - 4SLB
PM <sub>2.5</sub>		0.010	0.07 0.02	AP-42 Table 3.2-2 (7/00) - 4SLB
VOC	0.04		0.08 0.02	Vendor Data
SO <sub>2</sub> (Maximum Hourly)		0.0571	0.39	20 grains S / 100 scf
SO <sub>2</sub> (Average Annual)		0.000714	1.22E-03	0.25 grains S / 100 scf
Formaldehyde		0.05280	0.36	AP-42 Table 3.2-2 (7/00) - 4SLB
Total HAPs		0.07220	0.49	AP-42 Table 3.2-2 (7/00) - 4SLB

Columbia Gas Transmission, LLC  
 Seneca Compressor Station  
 Jan 2016 Application  
 Table N-15 - Indirect-fired Heat Exchanger (HTR2)

Heat Input 0.85 MMBtu/hr  
 Operating Hours 8760 hr/yr  
 Natural Gas Heat Content 1020 Btu/scf  
 Fuel Consumption 7.30 MMscf/yr  
 833.3 scf/hr

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
	lb/MMscf	lb/MMBtu	lb/hr	ton/yr	
NO <sub>x</sub>	100	0.098	0.08	0.37	AP-42 Table 1.4-1 (7/98)
CO	84	0.082	0.07	0.31	AP-42 Table 1.4-1 (7/98)
CO <sub>2</sub> e		117.1	100	436	40 CFR 98 Subpart C
PM <sub>10</sub>	7.6	0.007	0.006	0.03	AP-42 Table 1.4-2 (7/98)
PM <sub>2.5</sub>	7.6	0.007	0.006	0.03	AP-42 Table 1.4-2 (7/98)
VOC	5.5	0.005	0.005	0.02	AP-42 Table 1.4-2 (7/98)
SO <sub>2</sub> (Maximum Hourly)		0.0571	0.05		20 grains S / 100 scf
SO <sub>2</sub> (Average Annual)		0.000714		2.66E-03	0.25 grains S / 100 scf
Formaldehyde	0.075	0.00007	6.25E-05	2.74E-04	AP-42 Table 1.4-3 (7/98)
Total HAPs	1.89	0.00185	1.57E-03	6.89E-03	AP-42 Table 1.4-3 & 4 (7/98)

Columbia Gas Transmission, LLC  
 Seneca Compressor Station  
 Jan 2016 Application  
 Table N-16 - Indirect-fired Catalytic Heaters (SH1)

Heat Input 2.592 MMBtu/hr  
 Operating Hours 8760 hr/yr  
 Natural Gas Heat Content 1020 Btu/scf  
 Fuel Consumption 22.26 MMscf/yr  
 2541.2 scf/hr

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
	lb/MMscf	lb/MMBtu	lb/hr	ton/yr	
NO <sub>x</sub>	100	0.098	0.25	1.11	AP-42 Table 1.4-1 (7/98)
CO	84	0.082	0.21	0.93	AP-42 Table 1.4-1 (7/98)
CO <sub>2</sub> e		117.1	304	1,329	40 CFR 98 Subpart C
PM <sub>10</sub>	7.6	0.007	0.019	0.08	AP-42 Table 1.4-2 (7/98)
PM <sub>2.5</sub>	7.6	0.007	0.019	0.08	AP-42 Table 1.4-2 (7/98)
VOC	5.5	0.005	0.014	0.06	AP-42 Table 1.4-2 (7/98)
SO <sub>2</sub> (Maximum Hourly)		0.0571	0.15		20 grains S / 100 scf
SO <sub>2</sub> (Average Annual)		0.000714			0.25 grains S / 100 scf
Formaldehyde	0.075	0.00007	1.91E-04	8.11E-03	AP-42 Table 1.4-3 (7/98)
Total HAPs	1.89	0.00185	4.80E-03	2.10E-02	AP-42 Table 1.4-3 & 4 (7/98)

Columbia Gas Transmission, LLC  
 Seneca Compressor Station  
 Jan 2016 Application

Table N-17 - Indirect-fired Heat Exchanger (HTR1)

Heat Input 0.5 MMBtu/hr  
 Operating Hours 8760 hr/yr  
 Natural Gas Heat Content 1020 Btu/scf  
 Fuel Consumption 4.29 MMscf/yr  
 490.2 scf/hr

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
	lb/MMscf	lb/MMBtu	lb/hr	ton/yr	
NO <sub>x</sub>	100	0.098	0.05	0.21	AP-42 Table 1.4-1 (7/98)
CO	84	0.082	0.04	0.18	AP-42 Table 1.4-1 (7/98)
CO <sub>2</sub> e		117.1	59	256	40 CFR 98 Subpart C
PM <sub>10</sub>	7.6	0.007	3.73E-03	0.02	AP-42 Table 1.4-2 (7/98)
PM <sub>2.5</sub>	7.6	0.007	3.73E-03	0.02	AP-42 Table 1.4-2 (7/98)
VOC	5.5	0.005	2.70E-03	0.01	AP-42 Table 1.4-2 (7/98)
SO <sub>2</sub> (Maximum Hourly)		0.0571	0.03		20 grains S / 100 scf
SO <sub>2</sub> (Average Annual)		0.000714	0.0004	0.002	0.25 grains S / 100 scf
Formaldehyde	0.075	0.00007	0.00004	0.0002	AP-42 Table 1.4-3 (7/98)
Total HAPs	1.89	0.00185	0.001	0.004	AP-42 Table 1.4-3 & 4 (7/98)

**Columbia Gas Transmission, LLC  
Seneca Compressor Station  
Jan 2016 Application  
Table N-18 - GE Frame 3 Turbine (E04)**

Horsepower 13,750 hp  
 Maximum Horsepower 22,000 hp  
 Brake Specific Fuel Consumption 9,200 Btu/Bhp-hr  
 Total Heat Input 126.50 MMBtu/hr  
 Operating Hours 8760 hr/yr  
 Natural Gas Heat Content 1020 Btu/scf  
 Fuel Consumption 1086.41 MMscf/yr  
 124,019.6 scf/hr

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
	lb/MMBtu	lb/hp-hr	lb/hr <sup>1</sup>	ton/yr	
NO <sub>x</sub>	0.32	2.94E-03	64.77	177.30	AP-42 Table 3.1-1 (4/00)
CO	0.082	7.54E-04	16.60	45.43	AP-42 Table 3.1-1 (4/00)
GHG (CO <sub>2</sub> e)	117.1	1.08	23,701	64,880	40 CFR 98 Subpart C
PM <sub>10</sub>	0.0066	6.07E-05	1.34	3.66	AP-42 Table 3.1-2a (4/00)
PM <sub>2.5</sub>	0.0066	6.07E-05	1.34	3.66	AP-42 Table 3.1-2a (4/00)
VOC	0.0021	1.93E-05	0.43	1.16	AP-42 Table 3.1-2a (4/00)
SO <sub>2</sub> (Maximum Hourly)	0.0571	5.25E-04	11.56		20 grains S / 100 scf
SO <sub>2</sub> (Average Annual)	0.000714	6.569E-06		0.40	0.25 grains S / 100 scf
Formaldehyde	0.00071	6.532E-06	0.14	0.39	AP-42 Table 3.1-3 (4/00)
Total HAPs	0.00103	9.45E-06	0.21	0.57	AP-42 Table 3.1-3 (4/00)

1. Maximum hourly emission rate based on maximum horsepower under optimum conditions.

Table N-19 - Solar Taurus 60 - Permitted Emission Rates (E05 & E06) - As provided in April 2007 Permit Application

Operating Mode	HP	Btu/hp-hr (LHV) <sup>6</sup>	MMBtu/hr (HHV) <sup>6</sup>	Emission Factor						Total HAP <sup>3</sup>	
				g/hp-hr NOx <sup>1</sup>	g/hp-hr CO <sup>1</sup>	g/hp-hr VOC <sup>1</sup>	lb/MMBtu CO <sub>2</sub> e <sup>2</sup>	lb/MMBtu PM <sub>10</sub> / PM <sub>2.5</sub> <sup>3</sup>	lb/MMBtu SO <sub>2</sub> <sup>4</sup>		lb/MMBtu CH <sub>2</sub> O <sup>3</sup>
Normal Load @ 0 °F	7915	7854	69.1	0.2	0.2	0.01	117.1	0.0066	0.00071	0.00071	0.00103
Low Temp (<0 °F)	8070	7929	71.1	0.6	0.9	0.03	117.1	0.0066	0.00071	0.00071	0.00103
Very Low Temp (<-20 °F)	8097	7950	71.5	1.8	1.3	0.04	117.1	0.0066	0.00071	0.00071	0.00103
Low-Load (<50%)	3957	9057	39.8	1.2	22.5	0.18	117.1	0.0066	0.00071	0.00071	0.00103
Startup/Shutdown <sup>6</sup>			39.8	0.9	16.8	165.9	117.1	0.0066	0.00071	0.00071	0.00103

1. Manufacturer Data provided by Solar
2. 40 CFR 98 Subpart C
3. AP-42 Chapter 3.1
4. Based on 0.25 gr S/100 scf
5. Emissions in lb/cycle for NOx, CO, and VOC.
6. LHV = 0.9\*HHV

Operating Mode	NOx		CO		VOC		CO <sub>2</sub> e		PM <sub>10</sub> / PM <sub>2.5</sub>		SO <sub>2</sub>		CH <sub>2</sub> O		Total HAP	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Normal Load @ 0 °F	3.8	15.56	3.9	15.79	0.2	0.90	8,088	32,966	0.5	1.86	0.05	0.20	0.05	0.20	0.07	0.29
Low Temp (<0 °F)	11.0	44.0	15.9	63.6	0.5	1.95	8,325	32,966	0.5	1.86	0.05	0.20	0.05	0.20	0.07	0.29
Very Low Temp (<-20 °F)	31.6	126.1	24.1	94.8	0.7	2.73	8,375	32,966	0.5	1.86	0.05	0.20	0.05	0.20	0.07	0.29
Low-Load (<50%)	10.3	39.1	196.5	747.1	1.5	5.58	4,663	18,252	0.3	1.08	0.03	0.12	0.03	0.12	0.04	0.15
Startup/Shutdown <sup>7</sup>	3.9	15.0	72.0	277.2	711.2	2,740.3	4,663	18,252	0.3	1.08	0.03	0.12	0.03	0.12	0.04	0.15

7. Based on 14 minute startup/shutdown cycle (9 minutes for startup, 5 minutes for shutdown)

Operating Mode	NOx		CO		VOC		CO <sub>2</sub> e		PM <sub>10</sub> / PM <sub>2.5</sub>		SO <sub>2</sub>		CH <sub>2</sub> O		Total HAP	
	ton/yr	Hr/Yr	ton/yr	Hr/Yr	ton/yr	Hr/Yr	ton/yr	Hr/Yr	ton/yr	Hr/Yr	ton/yr	Hr/Yr	ton/yr	Hr/Yr	ton/yr	Hr/Yr
Normal Load @ 0 °F	15.56	8152	15.79	8152	0.90	408	32,966	32,966	1.86	1.86	0.20	0.20	0.20	0.20	0.29	0.29
Low Temp (<0 °F)	1.32	240	1.91	240	0.05	12	999	999	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
Very Low Temp (<-20 °F)	1.19	12	0.14	12	0.00	320	50	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Load (<50%)	1.64	320	31.4	320	0.25	36	746	746	0.04	0.04	0.00	0.00	0.00	0.00	0.01	0.01
Startup/Shutdown	0.07	36	1.31	36	12.94	36	85	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	18.79	8760	50.60	8760	14.15	8760	34,846	34,846	1.96	1.96	0.21	0.21	0.21	0.21	0.31	0.31
Total (2 turbines)	37.58		101.20		28.30		69,692	69,692	3.93	3.93	0.42	0.42	0.42	0.42	0.61	0.61

# Attachment O

**Monitoring / Recordkeeping / Reporting /  
Testing Plans**

# Monitoring/Recordkeeping/Reporting/Testing Plans

## Turbine E09

To demonstrate compliance with the turbine annual emission rates in the permit, Columbia proposes to maintain the following records:

- 1) Monthly operating hours,
- 2) Monthly operating hours at less than 50% load,
- 3) Monthly operating hours at less than 0 °F ambient temperature, and
- 4) Monthly number of startup and shutdown cycles.

These monthly records will be used in conjunction with the emission factors in Attachment N to calculate monthly emissions and 12-month rolling sums. Monthly emission (ME) for each regulated pollutant ( $P_x$ ) will be calculated using the following equation:

$$ME_{P_x} = DLN_{P_x} * DLN \text{ hrs} + LL_{P_x} * LL \text{ hrs} + LT_{P_x} * LT \text{ hrs} + SS_{P_x} * SS \text{ cycles}$$

where:

$DLN_{P_x}$  is the unit emission rates (lb/hr) for pollutant X during normal (DLN) operation,  
 $LL_{P_x}$  is the unit emission rates (lb/hr) for pollutant X during low-load (LL) operation,  
 $LT_{P_x}$  is the unit emission rates (lb/hr) for pollutant X during low-temperature (LT) operation, and  
 $SS_{P_x}$  is the unit emission rates (lb/cycle) for pollutant X during startup/shutdown (SS) operation.

The unit emission rates for each pollutant during DLN, LL, LT, and SS operation are summarized in Table N-3 within Attachment N.

At the end of each month, the monthly emissions will be summed for the preceding 12 months to determine compliance with the proposed annual emission limits. The 12-month rolling emissions will be reported to the state as part of the Station's semi-annual monitoring report.

To demonstrate compliance with Subpart KKKK, 40 CFR §60.4400, an initial  $NO_x$  performance test using EPA reference methods is required. Therefore, Columbia will conduct an initial compliance test within 60 days after achieving full-load operation or within 180 days of startup if the turbines are not operated at full load. Unless continuous parameter monitoring is implemented by Columbia, annual performance testing using EPA reference methods will be conducted within 14 calendar months following the previous performance test. Columbia will reduce the test frequency to biennial if measured  $NO_x$  emissions are less than 75% of limit. Columbia requests that portable emissions analyzers be approved for annual turbine testing. In addition, the Station will continuously monitor the turbine to document any periods during which the SoLo $NO_x$  system is not in service (e.g., during startup, shutdown, low-load, or a system malfunction). Records of turbine startup, shutdown, SoLo $NO_x$  malfunction, and/or SoLo $NO_x$  monitoring system malfunction will be recorded per Subpart KKKK and NSPS General Provisions in 40 CFR 60.7(b)&(c). Compliance with the  $SO_2$  and fuel sulfur content limits can be demonstrated by monitoring natural gas sulfur content annually. However, per 40 CFR §60.4365(a), Columbia will exempt the proposed turbines from periodic monitoring by demonstrating compliance with the FERC tariff limit on total sulfur content of 20 grains of sulfur per 100 standard cubic feet.

# Attachment R

## **Delegation of Authority**



west virginia department of environmental protection

Division of Air Quality  
601 57<sup>th</sup> Street SE  
Charleston, WV 25304  
Phone: 304 926 0475 • FAX: 304 926 0479

Earl Ray Tomblin, Governor  
Randy C. Huffman, Cabinet Secretary  
www.dep.wv.gov

July 27, 2011

**CERTIFIED MAIL**  
91 7108 2133 3936 1583 6144

Mr. Victor M. Gaglio  
Senior Vice-President of Operations  
Columbia Gas Transmission  
1700 MacCorkle Avenue, S.E.  
Charleston, WV 25314

Re: Delegation of Authority Confirmation

Dear Mr. Gaglio:

Based on your letter, dated July 22, 2011, the Division of Air Quality (DAQ) hereby acknowledges the titles of Regional Director and Manager of Operations as delegated authorized representatives for the facilities listed below.

Company Name	Facility	Facility ID No.
Columbia Gas Transmission, LLC	Horse Creek Station	005-00039
Columbia Gas Transmission, LLC	Frametown Station	007-00100
Columbia Gas Transmission, LLC	Glenville Station	021-00001
Columbia Gas Transmission, LLC	Lost River Station	031-00002
Columbia Gas Transmission, LLC	Hardy Station	031-00031
Columbia Gas Transmission, LLC	Ripley Station	035-00003
Columbia Gas Transmission, LLC	Lanham Station	039-00047
Columbia Gas Transmission, LLC	Clendenin Station	039-00048
Columbia Gas Transmission, LLC	Coco Station	039-00049
Columbia Gas Transmission Corporation	Walgrove Station	039-00074
Columbia Gas Transmission Corporation	Cobb Station	039-00100
Columbia Gas Transmission Corporation	Hunt Station	039-00101
Columbia Gas Transmission Corporation	Charleston Office	039-00154
Columbia Gas Transmission Corporation	Clendenin Office	039-00546
Columbia Gas Transmission, LLC	Hubball Station	043-00002
Columbia Gas Transmission Corporation	Nye Station	043-00011
Columbia Gas Transmission, LLC	Hamlin Station	043-00027
Columbia Gas Transmission, LLC	Majorsville Station	051-00025
Columbia Gas Transmission, LLC	Adaline Station	051-00100

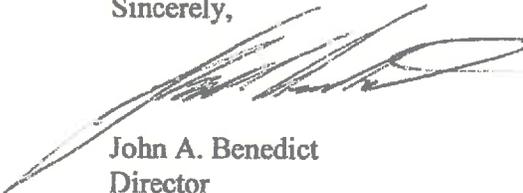
Promoting a healthy environment.

Letter to Victor M. Gaglio  
July 27, 2011  
Page 2

<b>Company Name</b>	<b>Facility</b>	<b>Facility ID No.</b>
<b>Columbia Gas Transmission, L.L.C.</b>	<b>Seneca Station</b>	<b>071-00008</b>
Columbia Gas Transmission, LLC	Terra Alta Station	077-00017
Columbia Gas Transmission, LLC	Glady Station	083-00017
Columbia Gas Transmission, LLC	Files Creek Station	083-00019
Columbia Gas Transmission, LLC	Flat Top Station	089-00004
Columbia Gas Transmission, LLC	Cleveland Station	097-00009
Columbia Gas Transmission, LLC	Ceredo Station	099-00013
Columbia Gas Transmission, LLC	Kenova Station	099-00014
Columbia Gas Transmission, LLC	Smithfield Station	103-00010
Columbia Gas Transmission, LLC	Rockport Station	107-00100
Columbia Gas Transmission, LLC	Huff Creek Station	109-00021

Should you have any questions or comments, please feel free to contact our office at the address or telephone number listed above.

Sincerely,



John A. Benedict  
Director

JAB/seh

c: **Joe Morgan**  
Megan Murphy  
File Room

# Attachment S

## **Title V Permit Revision Information**

**Attachment S**

**Title V Permit Revision Information**

<b>1. New Applicable Requirements Summary</b>	
Mark all applicable requirements associated with the changes involved with this permit revision:	
<input type="checkbox"/> SIP	<input type="checkbox"/> FIP
<input checked="" type="checkbox"/> Minor source NSR (45CSR13)	<input type="checkbox"/> PSD (45CSR14)
<input type="checkbox"/> NESHAP (45CSR15)	<input type="checkbox"/> Nonattainment NSR (45CSR19)
<input checked="" type="checkbox"/> Section 111 NSPS (Subpart(s) <u>KKKK</u> )	<input type="checkbox"/> Section 112(d) MACT standards (Subpart(s) _____)
<input type="checkbox"/> Section 112(g) Case-by-case MACT	<input type="checkbox"/> 112(r) RMP
<input type="checkbox"/> Section 112(i) Early reduction of HAP	<input type="checkbox"/> Consumer/commercial prod. reqts., section 183(e)
<input type="checkbox"/> Section 129 Standards/Reqts.	<input type="checkbox"/> Stratospheric ozone (Title VI)
<input type="checkbox"/> Tank vessel reqt., section 183(f)	<input type="checkbox"/> Emissions cap 45CSR§30-2.6.1
<input type="checkbox"/> NAAQS, increments or visibility (temp. sources)	<input type="checkbox"/> 45CSR27 State enforceable only rule
<input type="checkbox"/> 45CSR4 State enforceable only rule	<input type="checkbox"/> Acid Rain (Title IV, 45CSR33)
<input type="checkbox"/> Emissions Trading and Banking (45CSR28)	<input type="checkbox"/> Compliance Assurance Monitoring (40CFR64) <sup>(1)</sup>
<input type="checkbox"/> NO <sub>x</sub> Budget Trading Program Non-EGUs (45CSR1)	<input type="checkbox"/> NO <sub>x</sub> Budget Trading Program EGUs (45CSR26)
<p><sup>(1)</sup> If this box is checked, please include <b>Compliance Assurance Monitoring (CAM) Form(s)</b> for each Pollutants Specific Emission Unit (PSEU) (See Attachment H to Title V Application). If this box is not checked, please explain why <b>Compliance Assurance Monitoring</b> is not applicable:</p> <p style="padding-left: 40px;">This regulation does not apply because none of the proposed equipment use add-on emission controls.</p>	

<b>2. Non Applicability Determinations</b>
<p>List all requirements, which the source has determined not applicable to this permit revision and for which a permit shield is requested. The listing shall also include the rule citation and a rationale for the determination.</p> <p>40 CFR 60 Subpart Dc – The proposed heaters are less than the 10 MMBtu/hr applicability threshold in 40 CFR §60.40c(a)</p> <p>40 CFR 60 Subpart OOOO – The proposed units are not affected facilities listed under 40 CFR §60.5365.</p>
<input checked="" type="checkbox"/> <b>Permit Shield Requested</b> (not applicable to Minor Modifications)

*All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.*

**3. Suggested Title V Draft Permit Language**

Are there any changes involved with this Title V Permit revision outside of the scope of the NSR Permit revision?  Yes  No If Yes, describe the changes below.

Also, please provide **Suggested Title V Draft Permit language** for the proposed Title V Permit revision (including all applicable requirements associated with the permit revision and any associated monitoring /recordkeeping/ reporting requirements), OR attach a marked up pages of current Title V Permit. Please include appropriate citations (Permit or Consent Order number, condition number and/or rule citation (e.g. 45CSR§7-4.1)) for those requirements being added / revised.

**4. Active NSR Permits/Permit Determinations/Consent Orders Associated With This Permit Revision**

Permit or Consent Order Number	Date of Issuance	Permit/Consent Order Condition Number
	MM/DD/YYYY	
	/ /	
	/ /	

**5. Inactive NSR Permits/Obsolete Permit or Consent Orders Conditions Associated With This Revision**

Permit or Consent Order Number	Date of Issuance	Permit/Consent Order Condition Number
	MM/DD/YYYY	
	/ /	
	/ /	

**6. Change in Potential Emissions**

Pollutant	Change in Potential Emissions (+ or -), TPY
CO	+92.29
NO <sub>x</sub>	+23.39
PM <sub>10</sub>	+2.58
SO <sub>2</sub>	+0.28
VOC	+16.90
Formaldehyde	+0.27

*All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.*

**7. Certification For Use Of Minor Modification Procedures (Required Only for Minor Modification Requests)**

**Note:** This certification must be signed by a responsible official. Applications without a signed certification will be returned as incomplete. The criteria for allowing the use of Minor Modification Procedures are as follows:

- i. Proposed changes do not violate any applicable requirement;
- ii. Proposed changes do not involve significant changes to existing monitoring, reporting, or recordkeeping requirements in the permit;
- iii. Proposed changes do not require or change a case-by-case determination of an emission limitation or other standard, or a source-specific determination for temporary sources of ambient air quality impacts, or a visibility increment analysis;
- iv. Proposed changes do not seek to establish or change a permit term or condition for which there is no underlying applicable requirement and which permit or condition has been used to avoid an applicable requirement to which the source would otherwise be subject (synthetic minor). Such terms and conditions include, but are not limited to a federally enforceable emissions cap used to avoid classification as a modification under any provision of Title I or any alternative emissions limit approved pursuant to regulations promulgated under § 112(j)(5) of the Clean Air Act;
- v. Proposed changes do not involve preconstruction review under Title I of the Clean Air Act or 45CSR14 and 45CSR19;
- vi. Proposed changes are not required under any rule of the Director to be processed as a significant modification;

Notwithstanding subparagraph 45CSR§30-6.5.a.1.A. (items i through vi above), minor permit modification procedures may be used for permit modifications involving the use of economic incentives, marketable permits, emissions trading, and other similar approaches, to the extent that such minor permit modification procedures are explicitly provided for in rules of the Director which are approved by the U.S. EPA as a part of the State Implementation Plan under the Clean Air Act, or which may be otherwise provided for in the Title V operating permit issued under 45CSR30.

Pursuant to 45CSR§30-6.5.a.2.C., the proposed modification contained herein meets the criteria for use of Minor permit modification procedures as set forth in Section 45CSR§30-6.5.a.1.A. The use of Minor permit modification procedures are hereby requested for processing of this application.

(Signed): \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_  
 (Please use blue ink) (Please use blue ink)

Named (typed): **Steven A. Nelson** Title: **Manager of Operations**

**Note: Please check if the following included (if applicable):**

- Compliance Assurance Monitoring Form(s)
- Suggested Title V Draft Permit Language

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.