

Permit Writer	Edward S. Andrews, P.E.
Email Address	edward.s.andrews@wv.gov
Company Name	Columbia Gas Transmission, LLC
Company ID	051-00216
Facility Name	Lone Oak Compressor Station
Permit Number	R13-3254
County	Marshall
Newspaper	<i>Moundsville Daily</i> 304 845 2660
Company Contact & Email	Lacey Ivey livey@cpg.com kellytaylor@nisource.com
Consultant Email Address	Ehrhardt, Jennifer <Jennifer.Ehrhardt@aecom.com>
Regional Office (if applicable)	NPRO

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verbal approval
10/30 pm

INTERNAL PERMITTING DOCUMENT TRACKING MANIFEST

Company Name Columbia Gas Transmission - Lone Oak

Permitting Action Number R13-3254 Total Days 102 DAQ Days 5

Permitting Action:

- | | | |
|---|------------------------------------|--------------------------------------|
| <input type="radio"/> Permit Determination | <input type="radio"/> Temporary | <input type="radio"/> Modification |
| <input type="radio"/> General Permit | <input type="radio"/> Relocation | <input type="radio"/> PSD (Rule 14) |
| <input type="radio"/> Administrative Update | <input type="radio"/> Construction | <input type="radio"/> NNSR (Rule 19) |

Documents Attached:

- | | |
|--|--|
| <input type="radio"/> Engineering Evaluation/Memo | <input type="radio"/> Completed Database Sheet |
| <input type="radio"/> Draft Permit | <input type="radio"/> Withdrawal |
| <input type="radio"/> Notice | <input type="radio"/> Letter |
| <input type="radio"/> Denial | <input type="radio"/> Other (specify) _____ |
| <input type="radio"/> Final Permit/General Permit Registration | _____ |

Date	From	To	Action Requested
9/14	Ed	Bew	Review review for public comments.
10/28	Bew	Ed	See Comments - Address - Go to Notice

NOTE: Retain a copy of this manifest for your records when transmitting your document(s).



Permit / Application Information Sheet
Division of Environmental Protection
West Virginia Office of Air Quality

Company:	Columbia Gas Transmission, LLC	Facility:	Lone Oak Station
Region:	1	Plant ID:	051-00216
Engineer:	Andrews, Edward S.	Application #:	13-3254
Physical Address:	Waynesburg Pike Lone Oak WV	Category:	
County:	Marshall	SIC: [4922] ELECTRIC, GAS AND SANITARY SERVICES - NATURAL GAS TRANSMISSION NAICS: [486210] Pipeline Transportation of Natural Gas	
Other Parties:	OPER_MGR - Fyola, Glenn 724-825-9098 AIR_CO-OD - Alexander, Jim 219-647-5924		

Information Needed for Database and AIRS
1. Need valid physical West Virginia address with zip
2. Air Program
3. Inspection result
4. Pollutant and class

Regulated Pollutants		
CO	Carbon Monoxide	195.700 TPY
PM10	Particulate Matter < 10 um	15.900 TPY
SO2	Sulfur Dioxide	2.570 TPY
VOC	Volatile Organic Compounds (Reactive organic gases)	28.290 TPY
PM2.5	Particulate Matter < 2.5 um	15.900 TPY
THAP	Total HAP Pollutants	2.530 TPY
NOX	Nitrogen Oxides (including NO, NO2, NO3, N2O3, N2O4, and N2O5)	134.260 TPY
CO2E	Carbon Dioxide Equivalents	263926.490 TPY

Summary from this Permit 13-3254		
Air Programs	Applicable Regulations	
NSPS	02 02 A 60 A 63 ZZZZ	
Fee Program	Fee	Application Type
8D	\$2,000.00	CONSTRUCTION

Notes from Database
 Permit Note: This action is for the construction of a new compressor station near Lone Oak. 4 Mars 100 CT, one heater (1.0 MMBtu/hr), one Emergency Generator, one condensate tank.

Activity Dates	
APPLICATION RECEIVED	06/05/2015
APPLICATION FEE PAID	06/08/2015
ASSIGNED DATE	06/08/2015
APPLICANT PUBLISHED LEGAL AD	06/17/2015
APPLICATION DEEMED COMPLETE	09/10/2015

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Please note, this information sheet is not a substitute for file research and is limited to data entered into the AIRTRAX database.

Company ID: 051-00216
 Company: Columbia Gas Transmission, LLC
 Printed: 09/15/2015
 Engineer: Andrews, Edward S.



west virginia department of environmental protection

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Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
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ENGINEERING EVALUATION/FACT SHEET

B BACKGROUND INFORMATION

Application No.:	R13-3254
Plant ID No.:	051-00216
Applicant:	Columbia Gas Transmission LLC
Facility Name:	Lone Oak Station
Location:	Lone Oak
NAICS Code:	486210
Application Type:	Construction
Received Date:	June 5, 2015
Engineer Assigned:	Edward S. Andrews, P.E.
Fee Amount:	\$2,000.00
Fee Deposit Date:	June 8, 2015
Complete Date:	September 10, 2015
Due Date:	November 29, 2015
Applicant Ad Date:	June 17, 2015
Newspaper:	<i>Moundsville Daily</i>
UTM's:	Easting: 535.8 km Northing: 4,414.8 km Zone: 17
Description:	The application is for the construction of a new compressor station with four (4) Mars 100 combustion turbine/compressors, one process heater, one emergency generator and several small catalytic heaters.

Process Description

Pipeline transmission of natural gas requires that the gas be compressed. The proposed Lone Oak Compressor Station will install four Solar turbine-driven gas compressors. The project also includes the installation of one emergency generator, one process heater, up to forty catalytic space heaters, and numerous insignificant storage tanks.

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For the Lone Oak Station, Columbia is proposing to:

- Install four (4) new Solar Mars 100 turbines;
- Install one new 1,175-hp Waukesha emergency generator;
- Install one new 1.0-MMBtu/hr process heater;
- Install a pipeline pig launcher and receiving stations;
- Install 40 new catalytic space heaters (0.072 MMBtu/hr each); and
- Install various small insignificant storage tanks (condensate, waste liquid, lube oil).

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_x (DLN) combustion system (known as SoloNO_x) limits formation of NO_x, CO, and VOC by pre-mixing air and fuel prior to combustion. When operating a Solar Mars 100 turbine at ambient temperatures ~ 0 °F and at loads ~ 50%, this DLN system is able to limit the exhaust gas concentration of these pollutants (corrected to 15% O₂) to 15 ppm NO_x, 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 of 0 to -20° F, additional pilot fuel is required by the turbine to maintain flame stability, which increases estimated emission concentrations to 42 ppm NO_x, 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_x, 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 another turbine and move that volume to the turbine, or shift the turbine volume to another turbine and shut down the turbine).

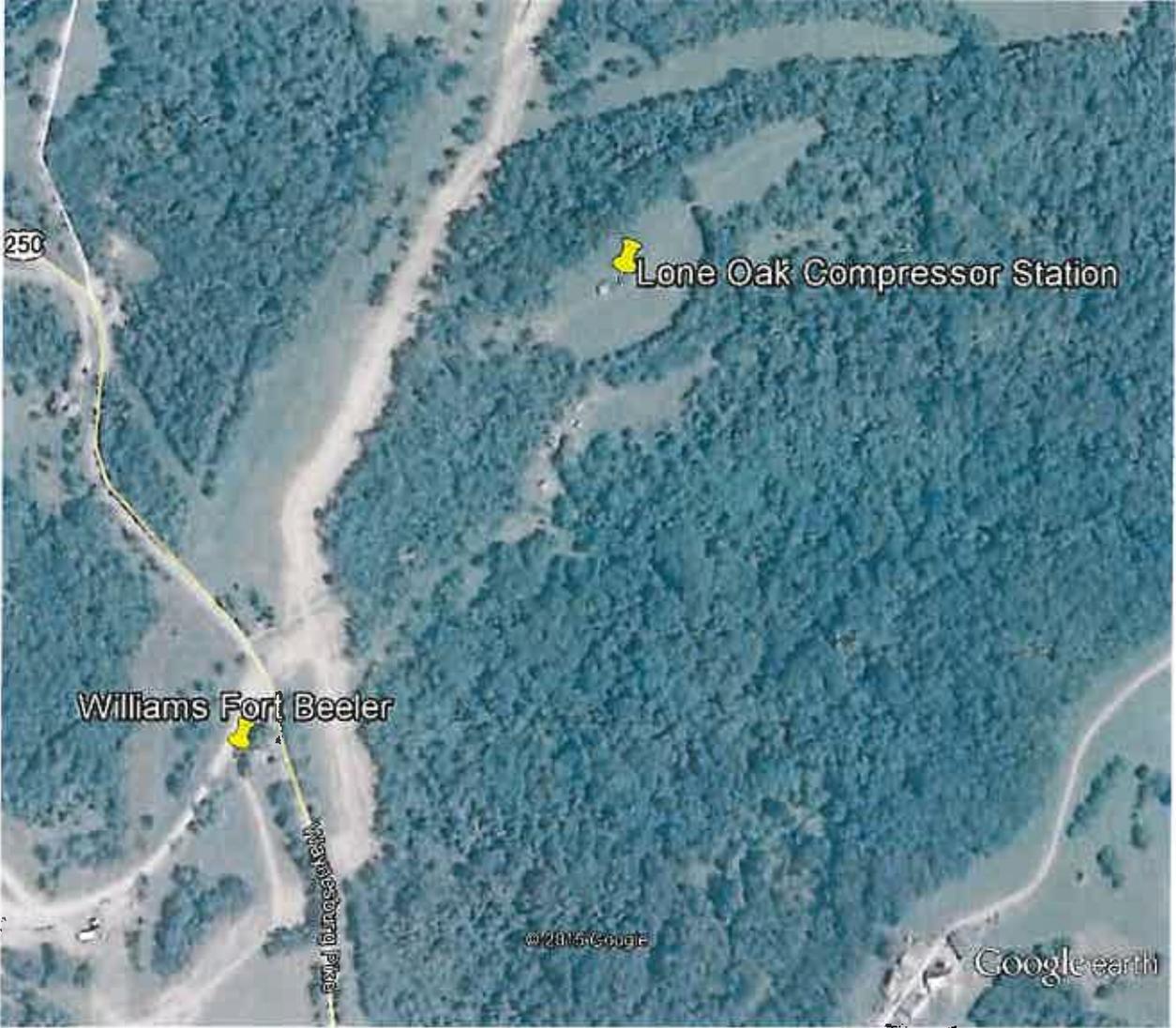
Other emissions sources includes an emergency generator set with a reciprocating engine that can generate 830 kilowatts (kW) of electricity. A small process heater is used to pre-heat the fuel gas. The station is supporting a new pipeline. A receiver and launcher will be installed to the pipeline pigging operation that will be conducted on an as-needed basis. The applicant notes up to 46 catalytic (natural gas-fired) heaters used for indoor heating during the heating season may be installed at the facility.

SITE INSPECTION

On August 21, 2015, Mr. Gene Coccari of Small Business Assistance Section of the DAQ, and this writer conducted a site visit of the proposed facility. The access road to the site from US 250 is unmarked and straight across from the entrance into William Ohio Valley

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Midstream's Fort Beeler Gas Plant. At the actual site, there were no signs of preconstruction. Other than the existing structures, no other structures were visible from the site. Using Google Earth, the writer located the nearest structure to be 30 degrees at a range of 1,250 feet from the site. The writer determined that this proposed site is acceptable for this particular type of source.



ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Solar Combustion Turbines

The applicant classified the operation of the turbine into five operating modes, which are normal operation, startup/shutdown, low-load, below zero, and extreme below zero. The emissions from the proposed turbine and the existing one can vary significantly between these different operating modes. Solar refers to these modes as non-SoLoNO_x modes except for normal operation, which is referred to as SoLoNO_x Mode.

Normal Operation: Normal operation is classified as loads above 50% of peak power output with ambient temperatures above zero degrees Fahrenheit. The Solar's SoLoNO_x, which is Solar's gas turbine dry low NO_x emission combustion system, works very well to minimize emissions generated from the combustion turbine. Typically, the system can maintain NO_x emissions at 15 ppm with the oxygen corrected to 15% in this mode. Carbon Dioxide (CO) and unburnt hydrocarbons (UHC) are maintained at 25 ppm with the oxygen level corrected to 15%. Pipeline quality natural gas has less than 10% of VOC; typically the VOC content is less than 1%. Columbia assumed that the unburnt hydrocarbons would only be 20%, which is a reasonable assumption. The VOC emission concentration is 5 ppmvd at 15% oxygen. Hourly emissions from a Mars-100 turbine under normal operating conditions are presented in the following table.

Pollutant	NO _x	CO	VOC	PM(total)	PM ₁₀	PM _{2.5}	SO ₂	Total HAPs	CO ₂ e
lb/hr	7.42	7.53	0.86	0.90	0.90	0.90	0.10	0.14	16,054

Startup/Shut Down: Startup and Shutdown events should take approximately 10 minutes per event (10 min. startup & 10 min. shutdown) or 20 minutes for a complete startup/shut down cycle. Solar has published Product Information Letter (PIL) 170 Revision 5 for customers to estimate emissions during startup/shut down events of their turbines. To determine the annual potential emissions, Columbia used 50 complete events per year to determine the annual potential to emit for the turbine. CO emissions are 272.7 pounds per complete cycle with NO_x being only 3.10 pounds per cycle. VOC emission are predicted to be 3.12 pounds per cycle.

Low-Load Operations: Low-load operation would be considered to be non-startup/shutdown modes with the turbine operating below 50% load (as determined by ambient temperatures). Solar provided an estimate of NO_x, CO, and UHC emissions in PIL 167 Revision 4. For annual estimation purposes, Columbia anticipates operating the combustion turbines during this condition for 25 hours per year. CO emissions are 653.41 pounds per complete cycle with NO_x being only 16.10 pounds per cycle. VOC emissions are predicted to be 7.42 pounds per cycle.

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Below Zero Operations: Cold weather operations would be considered to be when the turbine is operating at loads above 50% when ambient conditions are below zero degrees Fahrenheit. Solar provided an estimate of NO_x CO and UHC emissions in PIL 167 Revision 4 for customers to estimate emissions during non-SoLoNO_x modes, which includes conditions below zero. For annual estimation purposes, Columbia used 50 hours per year. CO emissions are 30.91 pounds per hour with NO_x emissions being 21.33 pounds per hour for operating the turbines during these conditions. VOC emissions are predicted to be 1.77 pounds per hour.

Extreme Below Zero Operations: In addition to regular below zero operations, although very limited, there are times when the ambient temperatures fall below negative twenty degrees Fahrenheit. In PIL 167 Revision 4, Solar has additional guidelines for determining emissions of NO_x, CO, and UHC at these extreme conditions. For annual estimation purposes, Columbia did not anticipate operating these combustion turbines during this condition.

Compressor Venting

Columbia used a conservative assumption that one blowdown occurs per shutdown. It is not expected that a blowdown will occur after each shutdown. The Solar Mars 100 has pneumatic actuator vents with a vent rate of 3 standard cubic feet per hour per actuator. The proposed compressor will be equipped with 2 dry seals with an estimated leakage rate of 0.5 scf per minute per seal. Using the specific features of the compressor, Columbia estimated the blowdown emissions would be 103 pounds of VOCs per event (shutdown). These turbines will be using electric starters instead of pneumatic start, which has no potential for losses. Carbon dioxide equivalent was predicted to be 66,327 pounds per startup & shutdown cycle.

The pneumatic actuators and seals are contributing to fugitive leaks during continuous operations. The dry seals are losing 60 scf per hour and the actuators are losing 84 scf per hour. For annual estimates, it was assumed continuous operation. VOCs emissions were estimated to be 0.14 tpy from the actuators and 0.40 tpy from the seals.

Process Heater

The process heater is 1.00 MMBtu/hr natural gas fired heater. Columbia used emission factors from Tables 1.4.1-1 and 1.4.1-3 of AP-42 and Subpart C of Part 98 to estimate emissions from these heaters. Presented in the following table is the estimate of emissions from the heater.

Pollutant	Emission Factor	Hourly Rate (lb/hr)	Annual Rate (TPY)
PM/PM ₁₀ /PM _{2.5} Filterable	1.9 lb/MMcf	0.002	0.009
PM Condensable Fraction	5.7 lb/MMcf	0.006	0.026
Total PM	7.6 lb/MMcf	0.007	0.03
Sulfur Dioxide (SO ₂)	20 grain/100 scf	0.06	0.26

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Oxides of Nitrogen (NO _x)	100 lb/MMcf	0.10	0.44
Carbon Monoxide (CO)	84 lb/MMcf	0.05	0.22
Volatile Organic Compounds (VOCs)	5.5 lb/MMcf	0.005	0.02
Total Hazardous Air Pollutants (HAPs)	1.89 lb/MMscf	0.002	0.01
Carbon Dioxide Equivalent (CO _{2e})	116.98 lb/MMBtu	116.98	512.37

Equipment Leaks

Columbia has measured leaks throughout their pipeline systems and developed emission factors based on component leaks per compressor by type of component. The VOC emissions were estimated as a total for the compressors and other components to be 0.80 tpy. These fugitive leaks have the potential to release greenhouse gases, which are methane and carbon dioxide. The potential CO_{2e} from these leaks was estimated to be 517 tpy.

Emergency Generator

The applicant used several sources of data, which included manufacturer's data (engine and catalytic converter), to estimate emissions from the proposed engine. Presented in the following table is the estimate of emissions from the emergency generator.

Table #3 – Emissions from the Engine for the Emergency Generator Set		
	Waukesha Engine	
Engine Maximum Power Output (bhp)	1,175	
	Emissions	
Pollutant	(lb/hr)	(TPY)
Oxides of Nitrogen (NO _x)	5.18	1.30
Carbon Monoxide (CO)	3.36	0.84
Volatile Organic Compounds (VOCs)	0.10	0.03
Formaldehyde (HCOH)	0.48	0.12
Carbon Dioxide Equivalent (CO _{2e})	1,198.29	299.57

Emissions from the proposed new sources are indicated in the following table.

Table #4 – Potential Emissions from the Proposed New Emissions Units

Source	Operating Mode	Cycles	Hr/Yr	NO _x (tpy)	CO (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	VOC (tpy)	SO ₂ (tpy)	CO _{2e} (tpy)
T01 Solar Mars 100 CT #1	Normal Load @ 32 ^o F		8,668	32.16	32.64	3.90	3.90	3.73	0.37	62,681.66
	Low Temperature (< 0 ^o F)		50	0.53	0.77	0.02	0.02	0.04	0.002	361.57
	Very Low Temperature (< 20 ^o F)		0	0	0	0	0	0	0	0
	Low Load (< 50%)		25	0.05	8.17	0.01	0.01	0.09	0.001	100.34
	Startup/Shutdown	50	17	0.08	6.82	0.01	0.01	0.08	0.001	136.46
	Total			8,760	32.82	48.4	3.94	3.94	3.94	0.374
T02 Solar Mars 100 CT #2	Normal Load @ 32 ^o F		8,668	32.16	32.64	3.90	3.90	3.73	0.37	62,681.66
	Low Temperature (< 0 ^o F)		50	0.53	0.77	0.02	0.02	0.04	0.002	361.57
	Very Low Temperature (< 20 ^o F)		0	0	0	0	0	0	0	0
	Low Load (< 50%)		25	0.05	8.17	0.01	0.01	0.09	0.001	100.34
	Startup/Shutdown	50	17	0.08	6.82	0.01	0.01	0.08	0.001	136.46
	Total			8,760	32.82	48.4	3.94	3.94	3.94	0.374
T03 Solar Mars 100 CT #3	Normal Load @ 32 ^o F		8,668	32.16	32.64	3.90	3.90	3.73	0.37	62,681.66
	Low Temperature (< 0 ^o F)		50	0.53	0.77	0.02	0.02	0.04	0.002	361.57
	Very Low Temperature (< 20 ^o F)		0	0	0	0	0	0	0	0
	Low Load (< 50%)		25	0.05	8.17	0.01	0.01	0.09	0.001	100.34
	Startup/Shutdown	50	17	0.08	6.82	0.01	0.01	0.08	0.001	136.46
	Total			8,760	32.82	48.4	3.94	3.94	3.94	0.374
T04 Solar Mars 100 CT #4	Normal Load @ 32 ^o F		8,668	32.16	32.64	3.90	3.90	3.73	0.37	62,681.66
	Low Temperature (< 0 ^o F)		50	0.53	0.77	0.02	0.02	0.04	0.002	361.57
	Very Low Temperature (< 20 ^o F)		0	0	0	0	0	0	0	0
	Low Load (< 50%)		25	0.05	8.17	0.01	0.01	0.09	0.001	100.34
	Startup/Shutdown	50	17	0.08	6.82	0.01	0.01	0.08	0.001	136.46
	Total			8,760	32.82	48.4	3.94	3.94	3.94	0.374
Venting/Seals	Normal							12.41		8,034
Equip. Leaks	Fugitive								0.80	517
G1 – Em. Gen.	Normal		500	1.30	0.84	0.02	0.02	0.03	0.001	266
HT1 –Line Heater	Normal		8,760	0.44	0.22	0.03	0.03	0.02	0.26	512.37
SH1 – Catalytic Heaters	Normal		8,760	1.24	1.04	0.09	0.09	0.07	0.01	1,477
Pigging Ops.	Fugitive							0.014		24.53
Total				134.26	195.70	15.90	15.90	28.304	2.57	263,951.02
PSD major Source Threshold Values (45 CSR 14)				250	250	250	250	250	250	N/A
Major Source Title V (45 CSR 30)				100	100	100	100	100	100	N/A

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REGULATORY APPLICABILITY

Columbia Gas' proposed Lone Oak Compressor Station does not meet the definition of a Major Source under Prevention of Significant Deterioration (PSD), which is State Rule 45 CSR 14, and is classified as an area source for Hazardous Air Pollutants for applicability purposes under 40 CFR 63. The application as filed requires a construction permit issued under 45 CSR 13 (West Virginia's minor source permitting program). Potential NO_x and CO emissions are greater than 100 tpy, and therefore the station will be required to submit an application for a Title V Operating Permit under 45 CSR 30.

Rule 2 (45 CSR 2)

The process heater is only subject to the opacity requirement of 45 CSR §2-3.1. according to 45 CSR §2-11.1. Natural gas units are exempt for the visible emission monitoring plan requirements of this rule due to the nature of burning pipeline quality natural gas.

NSPS (40 CFR Part 60)

New Source Performance Standards (NSPS) apply to certain new, modified, or reconstructed sources meeting criteria established in 40 CFR 60.

The process heater is rated for 1.00 MMBtu/hr. The definition of affected source in Subpart Dc (Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units) is units between 10 MMBtu/hr and up to 100 MMBtu/hr. Thus, the proposed process heater is not an affected source and is not subject to the standards under Subpart Dc.

Subpart KKKK

U.S. EPA has promulgated NSPS for stationary combustion turbines constructed, modified, or reconstructed after February 18, 2005, in Subpart KKKK. Subpart KKKK applies to combustion turbines with a peak heat input of 10 MMBtu/hr and greater. The proposed Solar Taurus turbines are rated at 71.3 MMBtu/hr (at 0⁰ F). Therefore, the purposed turbines are affected sources under this subpart.

Sources subject to Subpart KKKK are exempt from the requirements of Subpart GG (NSPS for combustion turbines constructed/modified/reconstructed after October 3, 1977).

This subpart establishes emissions standards for NO_x and SO₂. These turbines would be limited to 0.060lb of SO₂ per MMBtu/hr of heat input. These turbines will be burning pipeline quality natural gas with a maximum sulfur content of 20 grains per 100 standard cubic feet of gas. Under 40 CFR §60.4365, a source is exempt from monitoring fuel sulfur content if the source burns natural gas that is covered by an transportation agreement (Federal Energy Regulatory Commission tariff limit) with a maximum of 20 grains of sulfur per 100 standard cubic feet of gas (40 CFR §60.4365(a)).

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40 CFR §60.4325 establishes NO_x standards for affected units as specified in Table 1 of Subpart KKKK. The proposed units are new turbines firing natural gas with a heat input of greater than 50 MMBtu/hr and less than 850 MMBtu/hr. In this subcategory, these turbines are limited to a NO_x standard of 25 ppm at 15 percent oxygen (O₂) content or 150 nana gram /Joule of useful output. The selected turbines are equipped with a dry low NO_x emission combustion system, known as SoLoNO_x[™], which has been developed to provide the lowest emissions possible during normal operating conditions. Solar Taurus (manufacturer) predicts that the NO_x emissions with the SoLoNO_x[™] combustion controls from the turbine to be 15 ppm when the ambient temperatures are at or above 0⁰ F.

There are alternative standards for units operating at less than 75 percent of peak load or when operating temperatures are less than 0⁰ F. The alternative limit is 150 ppm at 15% O₂ is listed in Table 1 to Subpart KKKK. The manufacturer predicts that the NO_x rate for the proposed turbines would increase up to 120 ppm for subzero operations. For low load operations, the manufacturer predicts the NO_x concentrations to increase slightly to 70 ppm for loads at or less than 50% of peak output and 50 ppm at idle conditions. The proposed turbines are capable of meeting the NO_x limitations under this subpart at normal and other than normal conditions.

This subpart requires sources to use one of two options in monitoring compliance with the standard, which are testing or a continuous emission monitoring system. Sources can conduct testing every year and reduce the subsequent testing to every two years if the NO_x results are at or less than 75% of the standard, which equates to 15 ppm for these two turbines. The applicant has elected to use the testing option at this time. The permit will be structured on the 15 ppm as the short term limit, which is 75% of the applicable limit, for the short term limit with initial testing and subsequent testing every two years. Under the subpart, sources electing to conduct testing are only required to submit test reports of the results in lieu of submitting excess emissions and monitor downtime in accordance with 40 CFR §60.7(c).

Subpart JJJJ

Subpart JJJJ (Standard of Performance for Stationary Spark Ignition Internal Combustion Engines) applies to stationary spark ignition engines manufactured after July 1, 2007. The replacement generator set will be equipped with a spark ignition engine manufactured after July 1, 2007. Thus, the engine would be subject the standards of this subpart and subject to the emission limitations of Table 1 to Subpart JJJJ of Part 60, which includes the following requirements for emergency engines greater than 130 bhp.

- For NO_x, the limit is 2.0 grams per horsepower-hour (g/hp-hr) or 160 ppmvd at 15 % O₂.
- For CO, the limit is 4.0 g/hp-hr or 500 ppmvd at 15 % O₂.
- For VOC, the limit is 1.0 g/hp-hr or 86 ppmvd at 15 % O₂.

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The proposed engine for the generator set is manufactured by Waukesha. The manufacturer claims that the NO_x rate is predicted at 2 g/hp-hr; CO is 1.30 g/hp-hr; and VOC (Non-Methane Hydrocarbon) is 0.24 g/hp-hr. According to the manufacturer's data, this engine should be capable of meeting the emission standards of this subpart. However, the manufacturer did not certify the engine as specified under 40 CFR Part 90, 40 CFR Part 1048 or 40 CFR Part 1054. Therefore, the permit will require the applicant to conduct an initial performance test and either conduct subsequent performance testing every 8,760 hours of operation or once every 3 years, whichever is sooner.

Subpart OOOO

Turbines are driving compressors at a transmission station for a natural gas pipeline system. Subpart OOOO (Standards of Performance for Crude Oil and Natural Gas Production) establishes standards for certain process equipment at oil and natural gas production sites. This regulation defines sites from the wellhead and the point of custody transfer to the natural gas transmission and storage segment. The Lone Oak Compressor is downstream of the custody transfer point of Columbia's transmission system. Therefore, the proposed compressors are not affected sources and not subject to the performance standards of Subpart OOOO.

However, this subpart does include storage tanks that have a VOC potential of 6 tpy or greater that are located at natural gas transmission segments. 40 CFR §60.5365(e) is clear that the potential must be calculated using a generally accepted model or calculation methodology, based on the maximum average daily throughput determined for a 30-day period of production prior to the applicable emission determination deadline. For the replacement of the station condensate storage tank, this time period would be the first 30 days the vessel was placed into service. Thus, the draft permit will require the applicant to record the daily production of pipeline fluids from the station being stored in the new vessel for the first 30 days of being in service and determine if the potential VOC emissions from the vessel, which includes the flash, working, and breathing losses, are at or greater than 6 tpy. If the VOC emissions is at or greater than 6 tpy, the vessel is an affected Group 2 source under the Subpart OOOO, which requires these emissions to be controlled.

The writer used ProMax Version 3.2 to predict the amount of pipeline liquids that would be collected in the gas filter/separators. This simulation predicted the total VOC emissions from the condensate tank to be 0.001 tons per year, which includes working, breathing & flashing losses from the condensate entering into the storage vessel.

NESHAP (40 CFR Part 63)

With a potential to emit of 2.53 tpy of total HAPs, the station is classified as a area source of HAPs. Subpart YYYY, which is for combustion turbines, and Subpart DDDDD, which is for boilers and process heaters, are only applicable to affected units of the subparts operating at a major source of HAP. Thus, these regulations are not applicable to the station. The following will discuss the key applicable parts of each affected source with its corresponding subpart.

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Subpart ZZZZ

The internal combustion engine for the emergency generator set is classified as an affected source under the NESHAP for Stationary Reciprocating Internal Combustion Engines (Subpart ZZZZ). The proposed facility is classified as an area source and the engine will be required to comply with the requirement of Subpart JJJJ to Part 60. Thus, the criteria of 40 CFR §63.6590(c) and (c)(1) is satisfied, which means no further requirements of Subpart ZZZZ to Part 63 apply to this engine.

Subpart JJJJJ

This subpart covers boilers located at an area source of HAPs. The proposed heater is natural gas fired, which is not listed as a subcategory in 40 CFR §63.11200. Thus, this regulation is not applicable to the process heater.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The Lone Oak Compressor Station will only have the potential to emit of 2.53 tons per year of HAPs. Therefore, no information about the toxicity of these HAPs is presented in this evaluation.

AIR QUALITY IMPACT ANALYSIS

The proposed construction is not classified as a major source as defined by 45CSR14, so air quality modeling was not required.

MONITORING OF OPERATIONS

Columbia proposed to monitor the different operating modes (i.e. normal, low load, low temperature, etc.) in terms of hours per month. This monitoring will be used to determine actual emissions to show compliance with the annual limits. The applicable rules and regulations require tracking hours of operation for the generator set through the hour-meter, fuel used by the heater, testing, and maintenance records. The turbines and emergency engine are required to conduct periodic compliance testing by regulation. No further monitoring is warranted for this particular facility.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that the Lone Oak Station should meet all applicable requirements of state rules and federal regulations. It is recommended that Columbia Gas Transmission, LLC be granted a 45CSR13 modification permit for the proposed modification to Lone Oak Compressor Station.



Edward S. Andrews, P.E.
Engineer

October 29, 2015
Date

Engineering Evaluation of R13-3254
Columbia Gas Transmission, LLC
Lone Oak Compressor Station
Non-confidential

West Virginia Department of Environmental Protection
Earl Ray Tomblin
Governor

Division of Air Quality

Randy C. Huffman
Cabinet Secretary

Permit to Construct



R13-3254

This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§22-5-1 et seq.) and 45 C.S.R. 13 – Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation. The permittee identified at the above-referenced facility is authorized to construct the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.

Issued to:

**Columbia Gas Transmission LLC
Lone Oak Compressor Station
051-00216**

William F. Durham
Director

*Issued: **DRAFT***

Facility Location: 1.7 miles from Lone Oak, South on U.S. Route 250 (Waynesburg Pike)
Lone Oak, Marshall County, West Virginia
Mailing Address: 1700 MacCorkle Avenue, SE
Charleston, WV 25314
Facility Description: Transmission Compressor Station for a natural gas pipeline system
NAICS Codes: 486210
UTM Coordinates: 525.8 km Easting • 4,414.8 km Northing • Zone 17
Permit Type: Construction
Description of Change: This project is for the construction of a new compressor station, which includes 4 Mars 100 combustion turbine/compressors, one process heater, and one emergency generator.

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §§22-5-14.

As a result of the granting of this permit, the source is subject to 45CSR30. The Title V (45CSR30) application will be due within twelve (12) months after the date of the commencement of the operation or activity (activities) authorized by this permit, unless granted a deferral or exemption by the Director from such filing deadline pursuant to a request from the permittee.

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1.0. Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
T01	T01E	Solar Mars 100 Combustion Turbine /Compressor #1	2017	16,231 hp*	Combustion Controls
T02	T02E	Solar Mars 100 Combustion Turbine /Compressor #2	2017	16,231 hp*	Combustion Controls
T03	T03E	Solar Mars 100 Combustion Turbine /Compressor #3	2017	16,231 hp*	Combustion Controls
T04	T04E	Solar Mars 100 Combustion Turbine /Compressor #4	2017	16,231 hp*	Combustion Controls
HTR1	H1	Process Heater #1 (Natural Gas Fired Unit)	2017	1.0 MMBtu/hr	None
G1	G1	Waukesha VGF-P48GL reciprocating, SI, 4SLB engine/generator set (Emergency Generator #1)	2017	1,175 bhp	None
TK01	TK01	Condensate (Pipeline Fluids) Storage Tank	2017	1,000 gal	None

* Power output at 0°F.

SI – Spark-ignition.

4SLB – 4 stroke, lean burn.

2.0. General Conditions

2.1. Definitions

- 2.1.1. All references to the “West Virginia Air Pollution Control Act” or the “Air Pollution Control Act” mean those provisions contained in W.Va. Code §§ 22-5-1 to 22-5-18.
- 2.1.2. The “Clean Air Act” means those provisions contained in 42 U.S.C. §§ 7401 to 7671q, and regulations promulgated thereunder.
- 2.1.3. “Secretary” means the Secretary of the Department of Environmental Protection or such other person to whom the Secretary has delegated authority or duties pursuant to W.Va. Code §§ 22-1-6 or 22-1-8 (45CSR§30-2.12.). The Director of the Division of Air Quality is the Secretary’s designated representative for the purposes of this permit.

2.2. Acronyms

CAAA	Clean Air Act Amendments	NO_x	Nitrogen Oxides
CBI	Confidential Business Information	NSPS	New Source Performance Standards
CEM	Continuous Emission Monitor	PM	Particulate Matter
CES	Certified Emission Statement	PM_{2.5}	Particulate Matter less than 2.5 µm in diameter
C.F.R. or CFR	Code of Federal Regulations	PM₁₀	Particulate Matter less than 10µm in diameter
CO	Carbon Monoxide	Ppb	Pounds per Batch
C.S.R. or CSR	Codes of State Rules	Pph	Pounds per Hour
DAQ	Division of Air Quality	Ppm	Parts per Million
DEP	Department of Environmental Protection	Ppm_v or ppmv	Parts per Million by Volume
dscm	Dry Standard Cubic Meter	PSD	Prevention of Significant Deterioration
FOIA	Freedom of Information Act	Psi	Pounds per Square Inch
HAP	Hazardous Air Pollutant	SIC	Standard Industrial Classification
HON	Hazardous Organic NESHAP	SIP	State Implementation Plan
HP	Horsepower	SO₂	Sulfur Dioxide
lbs/hr	Pounds per Hour	TAP	Toxic Air Pollutant
LDAR	Leak Detection and Repair	TPY	Tons per Year
M	Thousand	TRS	Total Reduced Sulfur
MACT	Maximum Achievable Control Technology	TSP	Total Suspended Particulate
MDHI	Maximum Design Heat Input	USEPA	United States Environmental Protection Agency
MM	Million	UTM	Universal Transverse Mercator
MMBtu/hr or mmbtu/hr	Million British Thermal Units per Hour	VEE	Visual Emissions Evaluation
MMCF/hr or mmcf/hr	Million Cubic Feet per Hour	VOC	Volatile Organic Compounds
NA	Not Applicable	VOL	Volatile Organic Liquids
NAAQS	National Ambient Air Quality Standards		
NESHAPS	National Emissions Standards for Hazardous Air Pollutants		

2.3. Authority

This permit is issued in accordance with West Virginia Air Pollution Control Act W.Va. Code §§ 22-5-1. et seq. and the following Legislative Rules promulgated thereunder:

- 2.3.1. 45CSR13 – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation;*

2.4. Term and Renewal

- 2.4.1. This Permit shall remain valid, continuous and in effect unless it is revised, suspended, revoked or otherwise changed under an applicable provision of 45CSR13 or any other applicable legislative rule;

2.5. Duty to Comply

- 2.5.1. The permitted facility shall be constructed and operated in accordance with the plans and specifications filed in Permit Application R13-3254, and any modifications, administrative updates, or amendments thereto. The Secretary may suspend or revoke a permit if the plans and specifications upon which the approval was based are not adhered to;
[45CSR§§13-5.11 and 10.3.]
- 2.5.2. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the West Virginia Code and the Clean Air Act and is grounds for enforcement action by the Secretary or USEPA;
- 2.5.3. Violations of any of the conditions contained in this permit, or incorporated herein by reference, may subject the permittee to civil and/or criminal penalties for each violation and further action or remedies as provided by West Virginia Code 22-5-6 and 22-5-7;
- 2.5.4. Approval of this permit does not relieve the permittee herein of the responsibility to apply for and obtain all other permits, licenses, and/or approvals from other agencies; i.e., local, state, and federal, which may have jurisdiction over the construction and/or operation of the source(s) and/or facility herein permitted.

2.6. Duty to Provide Information

The permittee shall furnish to the Secretary within a reasonable time any information the Secretary may request in writing to determine whether cause exists for administratively updating, modifying, revoking, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records to be kept by the permittee. For information claimed to be confidential, the permittee shall furnish such records to the Secretary along with a claim of confidentiality in accordance with 45CSR31. If confidential information is to be sent to USEPA, the permittee shall directly provide such information to USEPA along with a claim of confidentiality in accordance with 40 C.F.R. Part 2.

2.7. Duty to Supplement and Correct Information

Upon becoming aware of a failure to submit any relevant facts or a submittal of incorrect information in any permit application, the permittee shall promptly submit to the Secretary such supplemental facts or corrected information.

2.8. Administrative Update

The permittee may request an administrative update to this permit as defined in and according to the procedures specified in 45CSR13.
[45CSR§13-4.]

2.9. Permit Modification

The permittee may request a minor modification to this permit as defined in and according to the procedures specified in 45CSR13.
[45CSR§13-5.4.]

2.10 Major Permit Modification

The permittee may request a major modification as defined in and according to the procedures specified in 45CSR14 or 45CSR19, as appropriate.
[45CSR§13-5.1]

2.11. Inspection and Entry

The permittee shall allow any authorized representative of the Secretary, upon the presentation of credentials and other documents as may be required by law, to perform the following:

- a. At all reasonable times (including all times in which the facility is in operation) enter upon the permittee's premises where a source is located or emissions related activity is conducted, or where records must be kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- c. Inspect at reasonable times (including all times in which the facility is in operation) any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit; and
- d. Sample or monitor at reasonable times substances or parameters to determine compliance with the permit or applicable requirements or ascertain the amounts and types of air pollutants discharged.

2.12. Emergency

- 2.12.1. An "emergency" means any situation arising from sudden and reasonable unforeseeable events beyond the control of the source, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under the permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by

improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.

- 2.12.2. Effect of any emergency. An emergency constitutes an affirmative defense to an action brought for noncompliance with such technology-based emission limitations if the conditions of Section 2.12.3 are met.
- 2.12.3. The affirmative defense of emergency shall be demonstrated through properly signed, contemporaneous operating logs, or other relevant evidence that:
- a. An emergency occurred and that the permittee can identify the cause(s) of the emergency;
 - b. The permitted facility was at the time being properly operated;
 - c. During the period of the emergency the permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards, or other requirements in the permit; and
 - d. The permittee submitted notice of the emergency to the Secretary within one (1) working day of the time when emission limitations were exceeded due to the emergency and made a request for variance, and as applicable rules provide. This notice must contain a detailed description of the emergency, any steps taken to mitigate emissions, and corrective actions taken.
- 2.12.4. In any enforcement proceeding, the permittee seeking to establish the occurrence of an emergency has the burden of proof.
- 2.12.5 The provisions of this section are in addition to any emergency or upset provision contained in any applicable requirement.

2.13. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it should have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. However, nothing in this paragraph shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in determining penalties for noncompliance if the health, safety, or environmental impacts of halting or reducing operations would be more serious than the impacts of continued operations.

2.14. Suspension of Activities

In the event the permittee should deem it necessary to suspend, for a period in excess of sixty (60) consecutive calendar days, the operations authorized by this permit, the permittee shall notify the Secretary, in writing, within two (2) calendar weeks of the passing of the sixtieth (60) day of the suspension period.

2.15. Property Rights

This permit does not convey any property rights of any sort or any exclusive privilege.

2.16. Severability

The provisions of this permit are severable and should any provision(s) be declared by a court of competent jurisdiction to be invalid or unenforceable, all other provisions shall remain in full force and effect.

2.17. Transferability

This permit is transferable in accordance with the requirements outlined in Section 10.1 of 45CSR13. [45CSR§13-10.1.]

2.18. Notification Requirements

The permittee shall notify the Secretary, in writing, no later than thirty (30) calendar days after the actual startup of the operations authorized under this permit.

2.19. Credible Evidence

Nothing in this permit shall alter or affect the ability of any person to establish compliance with, or a violation of, any applicable requirement through the use of credible evidence to the extent authorized by law. Nothing in this permit shall be construed to waive any defense otherwise available to the permittee including, but not limited to, any challenge to the credible evidence rule in the context of any future proceeding.

3.0. Facility-Wide Requirements

3.1. Limitations and Standards

- 3.1.1. **Open burning.** The open burning of refuse by any person, firm, corporation, association or public agency is prohibited except as noted in 45CSR§6-3.1.
[45CSR§6-3.1.]
- 3.1.2. **Open burning exemptions.** The exemptions listed in 45CSR§6-3.1 are subject to the following stipulation: Upon notification by the Secretary, no person shall cause, suffer, allow or permit any form of open burning during existing or predicted periods of atmospheric stagnation. Notification shall be made by such means as the Secretary may deem necessary and feasible.
[45CSR§6-3.2.]
- 3.1.3. **Asbestos.** The permittee is responsible for thoroughly inspecting the facility, or part of the facility, prior to commencement of demolition or renovation for the presence of asbestos and complying with 40 C.F.R. § 61.145, 40 C.F.R. § 61.148, and 40 C.F.R. § 61.150. The permittee, owner, or operator must notify the Secretary at least ten (10) working days prior to the commencement of any asbestos removal on the forms prescribed by the Secretary if the permittee is subject to the notification requirements of 40 C.F.R. § 61.145(b)(3)(i). The USEPA, the Division of Waste Management, and the Bureau for Public Health - Environmental Health require a copy of this notice to be sent to them.
[40CFR§61.145(b) and 45CSR§34]
- 3.1.4. **Odor.** No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.
[45CSR§4-3.1] *[State Enforceable Only]*
- 3.1.5. **Permanent shutdown.** A source which has not operated at least 500 hours in one 12-month period within the previous five (5) year time period may be considered permanently shutdown, unless such source can provide to the Secretary, with reasonable specificity, information to the contrary. All permits may be modified or revoked and/or reapplication or application for new permits may be required for any source determined to be permanently shutdown.
[45CSR§13-10.5.]
- 3.1.6. **Standby plan for reducing emissions.** When requested by the Secretary, the permittee shall prepare standby plans for reducing the emissions of air pollutants in accordance with the objectives set forth in Tables I, II, and III of 45CSR11.
[45CSR§11-5.2.]

3.2. Monitoring Requirements

[Reserved]

3.3. Testing Requirements

- 3.3.1. **Stack testing.** As per provisions set forth in this permit or as otherwise required by the Secretary, in accordance with the West Virginia Code, underlying regulations, permits and orders, the permittee shall conduct test(s) to determine compliance with the emission limitations set forth in this permit and/or established or set forth in underlying documents. The Secretary, or his duly

authorized representative, may at his option witness or conduct such test(s). Should the Secretary exercise his option to conduct such test(s), the operator shall provide all necessary sampling connections and sampling ports to be located in such manner as the Secretary may require, power for test equipment and the required safety equipment, such as scaffolding, railings and ladders, to comply with generally accepted good safety practices. Such tests shall be conducted in accordance with the methods and procedures set forth in this permit or as otherwise approved or specified by the Secretary in accordance with the following:

- a. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with 40 C.F.R. Parts 60, 61, and 63 in accordance with the Secretary's delegated authority and any established equivalency determination methods which are applicable. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4. or 45CSR§13-5.4 as applicable.
- b. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with applicable requirements which do not involve federal delegation. In specifying or approving such alternative testing to the test methods, the Secretary, to the extent possible, shall utilize the same equivalency criteria as would be used in approving such changes under Section 3.3.1.a. of this permit. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4. or 45CSR§13-5.4 as applicable.
- c. All periodic tests to determine mass emission limits from or air pollutant concentrations in discharge stacks and such other tests as specified in this permit shall be conducted in accordance with an approved test protocol. Unless previously approved, such protocols shall be submitted to the Secretary in writing at least thirty (30) days prior to any testing and shall contain the information set forth by the Secretary. In addition, the permittee shall notify the Secretary at least fifteen (15) days prior to any testing so the Secretary may have the opportunity to observe such tests. This notification shall include the actual date and time during which the test will be conducted and, if appropriate, verification that the tests will fully conform to a referenced protocol previously approved by the Secretary.
- d. The permittee shall submit a report of the results of the stack test within sixty (60) days of completion of the test. The test report shall provide the information necessary to document the objectives of the test and to determine whether proper procedures were used to accomplish these objectives. The report shall include the following: the certification described in paragraph 3.5.1.; a statement of compliance status, also signed by a responsible official; and, a summary of conditions which form the basis for the compliance status evaluation. The summary of conditions shall include the following:
 1. The permit or rule evaluated, with the citation number and language;
 2. The result of the test for each permit or rule condition; and,
 3. A statement of compliance or noncompliance with each permit or rule condition.

[WV Code § 22-5-4(a)(14-15) and 45CSR13]

3.4. Recordkeeping Requirements

- 3.4.1. **Retention of records.** The permittee shall maintain records of all information (including monitoring data, support information, reports, and notifications) required by this permit recorded in a form suitable and readily available for expeditious inspection and review. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation. The files shall be maintained for at least five (5) years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. At a minimum, the most recent two (2) years of data shall be maintained on site. The remaining three (3) years of data may be maintained off site, but must remain accessible within a reasonable time. Where appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.
- 3.4.2. **Odors.** For the purposes of 45CSR4, the permittee shall maintain a record of all odor complaints received, any investigation performed in response to such a complaint, and any responsive action(s) taken.
[45CSR§4. State Enforceable Only.]

3.5. Reporting Requirements

- 3.5.1. **Responsible official.** Any application form, report, or compliance certification required by this permit to be submitted to the DAQ and/or USEPA shall contain a certification by the responsible official that states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.
- 3.5.2. **Confidential information.** A permittee may request confidential treatment for the submission of reporting required by this permit pursuant to the limitations and procedures of W.Va. Code § 22-5-10 and 45CSR31.
- 3.5.3. **Correspondence.** All notices, requests, demands, submissions and other communications required or permitted to be made to the Secretary of DEP and/or USEPA shall be made in writing and shall be deemed to have been duly given when delivered by hand, or mailed first class with postage prepaid to the address(es) set forth below or to such other person or address as the Secretary of the Department of Environmental Protection may designate:

If to the DAQ:
Director
WVDEP
Division of Air Quality
601 57th Street
Charleston, WV 25304-2345

If to the US EPA:
Associate Director
Office of Air Enforcement and Compliance Assistance
(3AP20)
U.S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

3.5.4. Operating Fee

- 3.5.4.1. In accordance with 45CSR30 – Operating Permit Program, the permittee shall submit a certified emissions statement and pay fees on an annual basis in accordance with the submittal requirements of the Division of Air Quality. A receipt for the appropriate fee shall be maintained on the premises for which the receipt has been issued, and shall be made

immediately available for inspection by the Secretary or his/her duly authorized representative.

- 3.5.4.2. In accordance with 45CSR30 – Operating Permit Program, enclosed with this permit is a Certified Emissions Statement (CES) Invoice, from the date of initial startup through the following June 30. Said invoice and the appropriate fee shall be submitted to this office no later than 30 days prior to the date of initial startup. For any startup date other than July 1, the permittee shall pay a fee or prorated fee in accordance with Section 4.5 of 45CSR22. A copy of this schedule may be found attached to the Certified Emissions Statement (CES) Invoice.
- 3.5.5. **Emission inventory.** At such time(s) as the Secretary may designate, the permittee herein shall prepare and submit an emission inventory for the previous year, addressing the emissions from the facility and/or process(es) authorized herein, in accordance with the emission inventory submittal requirements of the Division of Air Quality. After the initial submittal, the Secretary may, based upon the type and quantity of the pollutants emitted, establish a frequency other than on an annual basis.

4.0. Source-Specific Requirements

4.1. Limitations and Standards

4.1.1. The following conditions and requirements are specific to Combustion Turbines #1 through #4 (ID T01, T02, T03, and T04):

a. Emissions from each combustion turbine shall not exceed the following:

- i. Emissions of nitrogen oxides (NO_x) shall be controlled with combustion controls. Each turbine shall not discharge nitrogen oxides (NO_x) emissions in excess of 25 ppm at 15 percent O₂ when operating at load conditions at or above 75 percent of peak load and/or when operating temperatures are at or above 0^oF. For when the operating loads of the turbine are less than 75% of peak load and/or operating temperatures are less than 0^oF, NO_x emissions rate from the turbine shall not exceed 150 ppm at 15 percent O₂. Annual NO_x emissions from each turbine shall not exceed 32.82 tpy on a 12-month rolling total. This limit applies at all times, including periods of startup, shutdown, or malfunction. **[40CFR§§60.4320(a), Table 1 to Subpart KKKK of Part 60 – Nitrogen Oxides Emission Limits for New Stationary Combustion Turbines]**
- ii. Emissions of CO shall not exceed 48.4 tons per year, on a rolling 12 month total basis.
- iii. Emissions of SO₂ shall not exceed 0.060 lb of SO₂/MMBtu heat input. For purpose of demonstrating compliance with this limit, the permittee shall maintain the Federal Energy Regulatory Commission (FERC) tariff limit on total sulfur content of 20 grains of sulfur per 100 standard cubic feet of natural gas combusted in the turbines. **[40 CFR §§60.4330(a)(2) & 60.4365(a)]**
- iv. Emissions of VOC shall not exceed 3.73 tons per year, on a rolling 12 month total basis.

b. Each turbine shall only be fired with pipeline-quality natural gas.

c. The permittee must operate and maintain each turbine, air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction. **[40 CFR §60.4333(a)]**

4.1.2. The following conditions and requirements are specific to Process Heater #1 (ID HTR1):

- a. NO_x emissions emitted to the atmosphere from each heater shall not exceed 0.44 tons per year on a rolling yearly total basis.
- b. CO emissions emitted to the atmosphere from each heater shall not exceed 0.22 tons per year on a rolling yearly total basis.
- c. The heater shall not be designed or constructed with a maximum design heat input in excess of 1.00 MMBtu/hr. The condition satisfies compliance with the limitation of 45 CSR §2-3.1 **[45 CSR 2A-3.1.a.]**
- d. The heater shall only be fired with pipeline quality natural gas

- 4.1.3. The following conditions and requirements are specific to the internal combustion engine for the Emergency Generator #1 (ID G1):
- a. Emissions from emergency generator shall not exceed the following:
 - i. NO_x emissions from the engine shall not exceed 2.0 grams of NO_x per horsepower-hour (g/hp-hr) or 160 ppmvd at 15 percent O₂;
 - ii. CO emissions from engine shall not exceed 4.0 g/hp-hr or 540 ppmvd at 15 percent O₂;
 - iii. VOC emissions from the engine shall not exceed 1.0 g/hp-hr or 86 ppmvd at 15 percent O₂. Emission of formaldehyde shall be excluded when determining compliance with this VOC limit.
[40 CFR §60.4233(e), Table 1 to Subpart JJJJ of Part 60 - NO_x, CO, and VOC Emission Standards for Stationary Non-Emergency SI Engines ≥ 100 HP, Stationary SI Landfill/Digester Gas Engines, and Stationary Emergency Engines > 25 HP]
 - b. Compliance with the limits in Item a. shall be determined using the appropriate equations listed in 40 CFR §60.4244.
 - c. There is no time limit on the use of the engine in emergency situations. The engine can operate for combined non-emergency purposes, which include emergency demand response, maintenance and testing, and other non-emergency use for a maximum of 100 hours per year. Within the 100 hours per year, the engine can only operate:
 - i. Up to 15 hours per year for emergency demand response. Emergency demand response is determined by the Reliability Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP-002-3 or other authorized entity as determined by the Reliability Coordinator; and
 - ii. 50 hours per year for non-emergency use. The non-emergency situations cannot be used for peak shaving or to generate income for the facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

The operating limits imposed in this condition are on a calendar year basis.
[40 CFR §60.4243(d)]
 - d. The engine shall be equipped with a non-resettable hour-meter prior to start-up.
[40 CFR §60.4237(a)]
 - e. The permittee shall keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engines in a manner consistent with good air pollution control practice for minimizing emissions.
[40 CFR §60.4243(b)(2)(ii)]
 - f. The engine shall only be fired with pipeline quality natural gas.
- 4.1.4. **Operation and Maintenance of Air Pollution Control Equipment.** The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.
[45CSR§13-5.11.]

4.2. Monitoring Requirements

- 4.2.1. For the purpose of determining compliance with the annual limits for each combustion turbine (T01, T02, T03, and T04), the permittee shall monitor and record the following for each calendar month:
- a. Hours the turbine operated at normal conditions, which is when the turbine is at or above 50% load, and the ambient temperature is above 0^oF.
 - b. Hours the turbine operated at low-load conditions, which is when the turbine load is less than 50% load.
 - c. Hours the turbine operated at low temperature conditions, which is when the ambient temperature is less than 0^oF but at or above -20^oF.
 - d. Hours the turbine operated at very-low temperature conditions, which is when the ambient temperature is less than -20^oF.
 - e. The number of startup and shutdown cycles that occurred during the month.

Such records shall be maintained in accordance with Condition 3.4.1. of this permit.

- 4.2.2. The permittee shall keep records of the hours of operation for the engine identified as G1. The records must document how many hours are spent for emergency operation, including what classified the operation as an emergency, and how many hours spent for non-emergency operation with corresponding reason for the non-operation. Such records shall be maintained in accordance with Condition 3.4.1. and must be in a manner to demonstrate compliance with the operating limits of Condition 4.1.3.c.
[40 CFR §60.4245(b)]
- 4.2.3. The permittee shall keep records of the amount of fuel consumed by the process heater (HTR1) on a monthly basis. Such records shall be maintained in accordance with Condition 3.4.1. and must be in a manner to demonstrate compliance with the emission limits of Condition 4.1.2.
- 4.2.4. The permittee shall collect production data of condensate collected from the pipeline segment that the permitted facility support for the first 30 days that TK01 was placed into service. The permittee must calculate the potential VOC emissions from TK01, which includes flash emissions, breathing losses, and working losses from the vessel, using a generally accepted model or calculation methodology, based on the maximum average daily throughput determined for a 30-day period of production. If the potential VOC emissions from TK01 are at or greater than 6 tpy, TK01 is an affect source subject to Subpart OOOO of 40 CFR 60 and the permittee shall comply with the following:
- a. Determine the potential VOC emission rate as specified in 40 CFR §60.5365(e).
 - b. Reduce the VOC emissions in accordance with 40 CFR §60.5395(d).
 - c. Submit the information required for TK01 as specified in 40 CFR §60.5420(b) to the Director within 60 days from placing TK01 within service.
 - d. Maintain records in accordance with Condition 3.4.1.
[40 CFR §60.5410(h)]

4.3. Testing Requirements

- 4.3.1. For the purposes of demonstrating compliance with the NO_x emission standards in Condition 4.1.1.(a)(i) and 40 CFR §60.4320(a), the permittee shall conduct an initial performance test within 60 days after achieving maximum output of each turbine, but no later than 180 days after initial startup. After the initial test, subsequent performance testing shall be conducted annually (no more than 14 months following the previous test) unless the previous results demonstrate that the affected units achieved compliance of less than or equal to 75 percent of the NO_x emission limit, then the permittee may reduce the frequency of subsequent tests to once every two years (no more than 26 calendar months following the previous test) as allowed under 40 CFR §60.4340(a). If the results of any subsequent performance test exceed 75 percent of the NO_x emission limit, then the permittee must resume annual performance tests. Such testing shall be conducted in accordance with Condition 3.3.1. and 40 CFR §60.4400. Records of such testing shall be maintained in accordance with Condition 3.4.1.
[40 CFR §60.8(a), §60.4340(a), §60.4375(b), and §60.4400]
- 4.3.2. For the purposes of demonstrating compliance with the emission standards in Condition 4.1.3. and 40 CFR §60.4233(e), the permittee shall conduct an initial performance test within one year after initial startup. After the initial test, subsequent performance testing shall be conducted every 8,760 hours of operation or 3 years, whichever comes first. If the engine is not operational, the permittee must conduct the performance test immediately upon startup of the engine. These tests must be conducted within 10 percent of 100 percent of peak (or the highest achievable) load and according to the requirements of §60.8, under the specific conditions that are specified by Table 2 to Subpart JJJJ of Part 60 – Requirements for Performance Test, and in accordance with Condition 3.3.1. of this permit. Records of such testing shall be maintained in accordance with Condition 3.4.1. of this permit.
[40 CFR §60.8(a), 60.4243(b)(2)(ii), and 60.4244]

4.4. Recordkeeping Requirements

- 4.4.1. **Record of Monitoring.** The permittee shall keep records of monitoring information that include the following:
- a. The date, place as defined in this permit, and time of sampling or measurements;
 - b. The date(s) analyses were performed;
 - c. The company or entity that performed the analyses;
 - d. The analytical techniques or methods used;
 - e. The results of the analyses; and
 - f. The operating conditions existing at the time of sampling or measurement.
- 4.4.2. **Record of Maintenance of Air Pollution Control Equipment.** For all pollution control equipment listed in Section 1.0, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.
- 4.4.3. **Record of Malfunctions of Air Pollution Control Equipment.** For all air pollution control equipment listed in Section 1.0, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:

- a. The equipment involved.
- b. Steps taken to minimize emissions during the event.
- c. The duration of the event.
- d. The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

- e. The cause of the malfunction.
 - f. Steps taken to correct the malfunction.
 - g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.
- 4.4.4. Compliance with the annual emission limits in 4.1.1 for NO_x, CO and VOC for the turbines #2 & #3 shall be based on a rolling 12 month total. The emissions from each turbine shall be determined monthly using the following equation:

$$ME_{Px} = DLN_{Px} * DLN \text{ hours} + LL_{Px} * LL \text{ hours} + LT_{Px} * LT \text{ hours} + VLT_{Px} * VLT \text{ hours} + SS_{Px} * SS \text{ cycles}$$

Where:

- ME_{Px} = Monthly emissions of Pollutant X
- DLN_{Px} = Hourly emission rate of Pollutant X during normal operation
- DLN = Number of hours of normal operation in said month
- LL_{Px} = Hourly emission rate of Pollutant X during low load (<50%) operation
- LL = Number of hours of low load operation in said month
- LT_{Px} = Hourly emission rate of Pollutant X during low temperatures (<0°F)
- LT = Number of hours of low temperature operation in said month
- VLT_{Px} = Hourly emission rate of Pollutant X during very low temperatures (<-20°F)
- VLT = Number of hours of very low temperature operation in said month
- SS_{Px} = Unit emission rate (lb/cycle) for Pollutant X during startup/shutdown cycles
- SS = Number of startup/shutdown cycles for said month

Hourly emission rates used in the above calculation shall be based on best available data which is data collected during source specific testing or the data for specific model turbine provide or published by the manufacturer. This determination shall be performed within 30 days after the end of the calendar month and the monthly emissions shall be summed with the preceding 11

months to determine compliance with the annual limits in Condition 4.1.1.(a). Records of the monthly total and 12 month totals shall be maintained in accordance with Condition 3.4.1.

- 4.4.5. The permittee shall maintain current and valid documentation that the natural gas consumed by the combustion turbines specifying that the maximum total sulfur content is 20 grains of sulfur or less per 100 cubic feet of natural gas. Said documentation can be purchase contracts, tariff sheets, or transportation contracts. Such records shall be maintained in accordance with Condition 3.4.1., except that these records can be maintained off-site but must be made available for inspection within 15 days of the request. By satisfying this requirement the permittee is exempted from the total sulfur monitoring requirement of §60.4370. These records satisfy Conditions 4.1.1.b., 4.1.2.c., 4.1.3.f.
[40 CFR §60.4365(a)]

4.5. Reporting Requirements

- 4.5.1. The permittee shall submit a notification to the Director of the initial start-up of turbines. Such notice must be submitted within 15 days after the actual date of start-up for the affected source. This notification supersedes the notification requirements of Condition 2.18.
[40CFR§60.7(a)(3)]

CERTIFICATION OF DATA ACCURACY

I, the undersigned, hereby certify that, based on information and belief formed after reasonable inquiry, all information contained in the attached _____, representing the period beginning _____ and ending _____, and any supporting documents appended hereto, is true, accurate, and complete.

Signature¹ _____
(please use blue ink) Responsible Official or Authorized Representative Date

Name & Title _____
(please print or type) Name Title

Telephone No. _____ Fax No. _____

¹ This form shall be signed by a "Responsible Official." "Responsible Official" means one of the following:

- a. For a corporation: The president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:
 - (i) the facilities employ more than 250 persons or have a gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars), or
 - (ii) the delegation of authority to such representative is approved in advance by the Director;
- b. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;
- c. For a municipality, State, Federal, or other public entity: either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of U.S. EPA); or
- d. The designated representative delegated with such authority and approved in advance by the Director.

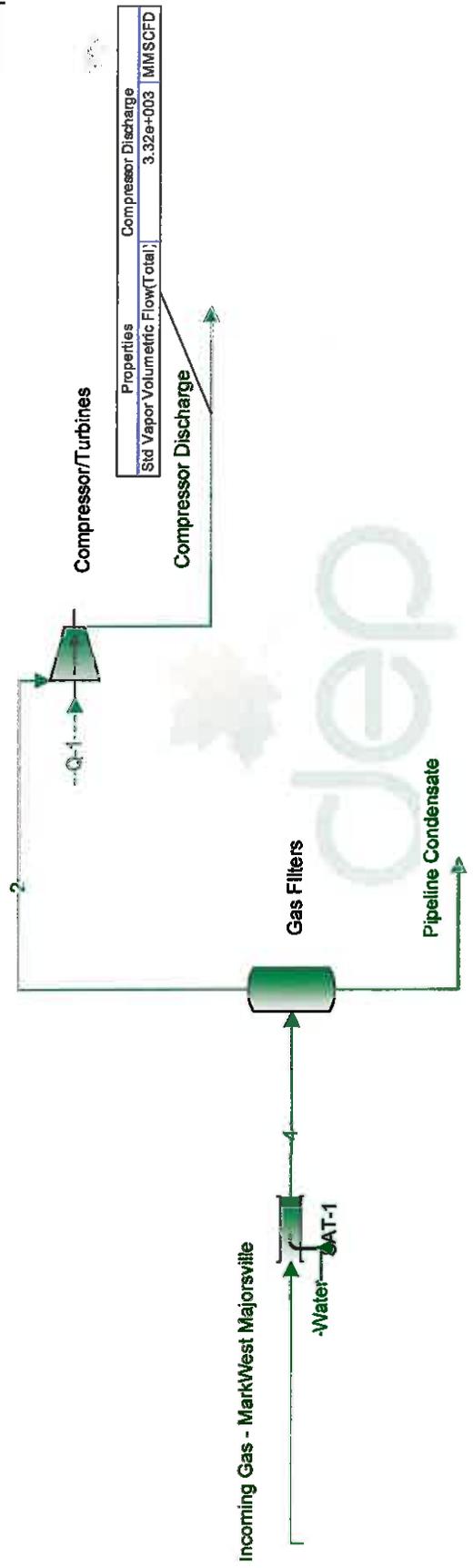
Columbia Gas – Lone Oak C.S.

ID # 51-216
 Reg RR-22511

Company Columbia Gas
 Facility Lone Oak Initials JK

The proposed station will have three gas filter/separators in parallel for the four Mars-100 CT/Comp.

Total Power from the 4 turbines at 60 F 5.736E+04 hp



Tank loss calculations for "Pipeline Condensate".
 Total working and breathing losses from the Vertical Cylinder are 0.0001888 ton/yr.
 Flashing losses are 0.001063 ton/yr.
 Loading losses are 9.659E-05 ton/yr of loaded liquid.
 Warning, expansion coefficient is negative. Verify vapor pressure of stored fluid

Tank-1

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Andrews, Edward S

From: livey@cpg.com
Sent: Thursday, September 10, 2015 3:09 PM
To: Andrews, Edward S
Subject: RE: Lone Oak Station R13-3251

Ed,

Here are the calculations for pigging for Lone Oak CS. Please let me know if you need any additional information.

Columbia Gas Transmission, LLC
 Leach Xpress

Fugitive Emissions from Pigging

Facility	Pressure psia	Volume cubic feet	Emissions					
			CH4		CO2		CO2e	VOC
			scf/year	ton/year	scf/year	ton/year	ton/year	ton/year
Lone Oak Receiver	1072.7	324.82	23,238	0.43	31.71	1.84E-03	10.71	5.96E-03
Lone Oak Launcher	1384.7	324.82	26,124	0.55	40.94	2.37E-03	13.82	7.69E-03
Lone Oak Total:			46,361	0.98	72.65	4.21E-03	24.53	1.36E-02

Thank you,

Lacey A. Ivey
 Principal Air
 Columbia Pipeline Group
 337-241-0686



ID # 51-216
 Reg R13-3251
 Company Columbia Gas
 Facility Lone Oak CS Initials SLI

From: "Andrews, Edward S" <Edward.S.Andrews@wv.gov>
 To: "livey@cpg.com" <livey@cpg.com>
 Date: 08/18/2015 12:28 PM
 Subject: RE: Lone Oak Station R13-3251

Lacey: Would it be a launching and receiving station?

EPA is pushing on us to account for the emissions from pigging.

$$E = P * V / 14.7 * n * f$$

Where

E = methane emissions (cubic feet)

P = Gathering line pressure (psia)

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V = Launcher and receiver volume (cubic feet)

n = % methane

f = number of piggings per year

Jim has provided the several gas analysis. I would need the rest of the unknowns.

Plus, I need the operating pressure of the pipeline and daily volume to predict the condensate (produce fluids) which will be used to predict the flash, working & breathing losing in the storage tank.

Should you have any questions please contact me.

Sincerely,

Edward S. Andrews, P.E.

Engineer

West Virginia Department of Environmental Protection

Division of Air Quality

601 57th Street, SE

Charleston, WV 25304

304.926.0499 ext. 1214

From: livey@cpq.com [<mailto:livey@cpq.com>]

Sent: Tuesday, August 18, 2015 12:16 PM

To: Andrews, Edward S

Subject: Fw: Lone Oak Station R13-3251

Ed,

Sorry about the delay in getting an answer to your question. I am new and I am still catching up on all of my projects.

There will be pigging at Lone Oak.

Thank you,

Lacey A. Ivey

Principal Air

Columbia Pipeline Group

337-241-0686



— Forwarded by Lacey Ivey/NCS/Enterprise on 08/18/2015 11:15 AM —

From: James Alexander/NCS/Enterprise

To: "Andrews, Edward S" <Edward.S.Andrews@wv.gov> ,

Cc: "livey@cpq.com" <livey@cpq.com>

Date: 08/12/2015 02:00 PM

Subject: RE: Lone Oak Station R13-3251

same to you Ed

Jim Alexander

NiSource ES&S
219.647.5924

From: "Andrews, Edward S" <Edward.S.Andrews@wv.gov>
To: "jamesalexander@nsource.com" <jamesalexander@nsource.com>,
Cc: "lvey@cpq.com" <lvey@cpq.com>
Date: 08/12/2015 01:57 PM
Subject: RE: Lone Oak Station R13-3251

Thanks Jim.

Good Luck
Ed

From: jamesalexander@nsource.com [<mailto:jamesalexander@nsource.com>]
Sent: Wednesday, August 12, 2015 2:49 PM
To: Andrews, Edward S
Cc: lvey@cpq.com
Subject: RE: Lone Oak Station R13-3251

Hi Ed!

As you may or may not know, NiSource and Columbia Pipeline Group are two separate companies.
The permitting person for Columbia Pipeline Group is Lacey Ivey and I have copied her on this email.
Been nice working with you

Jim

Jim Alexander
NiSource ES&S
219.647.5924

From: "Andrews, Edward S" <Edward.S.Andrews@wv.gov>
To: "jamesalexander@nsource.com" <jamesalexander@nsource.com>,
Date: 08/12/2015 01:31 PM
Subject: RE: Lone Oak Station R13-3251

Jim: I am still new the flow rate and operating pressure of the pipeline to predict the flash emissions from the condensate tank. Are there going to be any pigging operations at this station?

Thanks,
Ed

Edward S. Andrews, P.E.
Engineer
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
304.926.0499 ext. 1214

From: jamesalexander@nisource.com [<mailto:jamesalexander@nisource.com>]
Sent: Tuesday, June 16, 2015 1:23 PM
To: Andrews, Edward S
Subject: RE: Lone Oak Station R13-3251

Okay Ed. Most of the gas will come from Majorsville which is only 7 miles away so they expect very little condensate.

I will send you the natural gas flowrate and pressure soon

Jim Alexander
NiSource ES&S
219.647.5924

From: "Andrews, Edward S" <Edward.S.Andrews@wv.gov>
To: "jamesalexander@nisource.com" <jamesalexander@nisource.com>,
Date: 06/16/2015 12:19 PM
Subject: RE: Lone Oak Station R13-3251

Jim: Thanks for the information. I'll be using ProMax to predict the flash emissions from the proposed new tank. However, I'll need the flowrate and pressure of the natural gas to predict the amount of condensate produced in the filter/separator which will be drained to the new tank. Since you provide three different gas analyses, I set of four different run, one using each of the gas analysis and four one with the three blended together. I am expecting very low VOC emissions but they want us to make sure that we don't miss one for Subpart OOOO.

Regarding to the previous owner, I notice there was a note for an existing fence line. I was just making sure there was not an existing source there that I might need to address in our files.

Thanks
Ed

Edward S. Andrews, P.E.
Engineer
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
304.926.0499 ext. 1214

From: jamesalexander@nisource.com [<mailto:jamesalexander@nisource.com>]
Sent: Tuesday, June 16, 2015 10:45 AM
To: Andrews, Edward S
Subject: Re: Lone Oak Station R13-3251

Hi Ed! Answers to your other questions:

Do you know what was located here before or who owned the site before Columbia? There is an existing fence noted in the plot plan.

Robert & Rosemary Conner used to own this property until April 21, 2015 when CPG purchased these three parcels from them for the Lone Oak CS. Attached you can find the Lone Oak Plat.

Where is the gas coming from that this station will be transmitting?

The gas to the Lone Oak CS is coming from two sources. The Columbia's existing 10100 Pipeline and the MarkWest Plant located approximately 7 miles northeast close to the Pennsylvania West Virginia border.

For Subpart OOOO applicability, we need determine the potential emissions from the condensate tank since it will be a new tank at this site. The emission from the tank needs to include working, breathing, flashing losses and loadout emissions. I need the following:

Tank dimensions, 1000 gal; Dia=12ft, H=9ft

- Tank Inlet gas temperature, This tank is required to collect all condensate from the drain lines. Engineering is assuming an inlet temperature of 60 F.
- Tank Suction/discharge pressures, This is an atmospheric tank. The vacuum truck will suck out the condensate. The tank will be protected by pressure relief vents.
- Tank Maximum pipeline flow rate, The tank is for the drain lines and will only see flow when the equipment drains the liquids to it (filter seps, compressor skids, blowdown stacks). We estimate that there will be one tank turnover each year.

Extended gas analysis (this could be an analysis that would be representative of the gas) See attached compositions; 3 cases are for Line 10100 and the other for MarkWest.

Pressure drop across the filter/separators (I am assuming that there is one filter/separator for incoming gas and one outgoing gas). 5 psi max drop across a filter sep. There are 3 incoming filter seps. There are no filter seps for the outgoing gas.

Please note if they are in series. They will run parallel.

Hope this helps

Jim

Jim Alexander
NiSource ES&S
219.647.5924

From: "Andrews, Edward S" <Edward.S.Andrews@wv.gov>
To: "jamesalexander@nisource.com" <jamesalexander@nisource.com>,
Date: 06/09/2015 07:26 AM
Subject: Lone Oak Station R13-3251

Jim: I need some additional information for my review of your application.

Do you know what was located here before or who owned the site before Columbia? There is an existing fence noted in the plot plan.

Where is the gas coming from that this station will be transmitting?

Could you send me a color version of Attachment B?

Could you send me a pdf of the plot plan?

For Subpart OOOO applicability, we need determine the potential emissions from the condensate tank since it will be a new tank at this site. The emission from the tank needs to include working, breathing, flashing losses and loadout emissions. I need the following:

Tank dimensions,
Inlet gas temperature,
Suction/discharge pressures,
Maximum pipeline flow rate,
Extended gas analysis (this could be an analysis that would be representative of the gas)
Pressure drop across the filter/separators (I am assuming that there is one filter/separator for incoming gas and one outgoing gas).
Please note if they are in series.

Should you have any questions about this request or your application, please contact me.

Sincerely,

Edward S. Andrews, P.E.
Engineer
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
304.926.0499 ext. 1214

Cc: John Grimm/TCO/Enterprise@NiSource, Jacob Ritenour/NCS/Enterprise@NiSource
Date: 05/14/2014 12:07 PM
Subject: Re: Leach Express - Gas chromatography

Do you just need Btu and specific gravity, or do you need the full C5+ or C6+ analysis, if it is even available?

Dewitt

Daniel Betancourt Thanks for your email, Dewitt. At this moment, w... 05/14/2014 01:03:02 PM

From: Daniel Betancourt/NCS/Enterprise
To: Dewitt Miller/TCO/Enterprise@NiSource
Cc: John Grimm/TCO/Enterprise@NiSource, Jacob Ritenour/NCS/Enterprise@NiSource
Date: 05/14/2014 01:03 PM
Subject: Re: Leach Express - Gas chromatography

Thanks for your email, Dewitt.

At this moment, we don't need a projection for the gas chromatography, just a reference chromatography (gas coming out of the existing MarkWest processing plant at Majorsville, for example). The compressor supplier is asking for this info. Jason and I tried to find one yesterday in Processnet but we couldn't get anything.

Regards,
Daniel Betancourt
Columbia Pipeline Group
Lead Engineer - Project Delivery
(O) 713-386-3788
(C) 832-415-7811
Dbetancourt@nisource.com

Dewitt Miller Daniel: I have thus far not been given any inform... 05/14/2014 11:51:53 AM

From: Dewitt Miller/TCO/Enterprise
To: Daniel Betancourt/NCS/Enterprise@NISOURCE
Cc: John Grimm/TCO/Enterprise@NiSource, Jacob Ritenour/NCS/Enterprise@NiSource
Date: 05/14/2014 11:51 AM
Subject: Re: Leach Express - Gas chromatography

Daniel:

I have thus far not been given any information on the anticipated chromatography of the new gas that will be developed and transported through the new Leach Xpress facilities. As a point of reference, the Btu content of the gas coming out of the existing MarkWest processing plant at Majorsville has generally been in the 1100 - 1150 range over the last year, but I don't know what the gas quality will be for all of the new Marcellus and Utica processed supplies that will be developed for the Leach Xpress project. So, I have based all studies thus far on an assumption of 1100 Btu and 0.70 specific gravity. As we rarely ever flow gas south from Crawford to Ceredo historically, a swing in flow direction to the south will likely not occur until new Leach Xpress production is developed, whether that be very quickly after project facilities are in place, or over a more extended ramp-up period. Either way, the gas physically moving south to Ceredo should primarily be new production, and thus reflect the chromatography of that new supply.

We could perhaps ask Josh Gibbon whether he thinks it's possible to obtain projections of gas quality from the producers who are part of the project.

Dewitt

Daniel Betancourt [Hi Dewitt. Can you please send me a gas chrom...](#)

05/14/2014 11:51:18 AM

From: Daniel Betancourt/NCS/Enterprise
To: Dewitt Miller/TCO/Enterprise@NiSource
Date: 05/14/2014 11:51 AM
Subject: Re: Leach Express - Gas chromatography

Hi Dewitt.

Can you please send me a gas chromatography as reference for the suction on the new compressors at Ceredo? I have to send it to the gas compressor supplier and prepare an estimate (\$) for us.

Regards,
Daniel Betancourt
Columbia Pipeline Group
Lead Engineer - Project Delivery
(O) 713-386-3788
(C) 832-415-7811
Dbetancourt@nisource.com

Dewitt Miller

[Daniel: I met yesterday with Operations Plannin...](#)

05/13/2014 09:52:20 AM

From: Dewitt Miller/TCO/Enterprise
To: Daniel Betancourt/NCS/Enterprise@NISOURCE
Cc: Jason Hamil/NCS/Enterprise@NiSource, Jacob Ritenour/NCS/Enterprise@NiSource, John Grimm/TCO/Enterprise@NiSource, Charles Harrison/TCO/Enterprise@NiSource, Jennifer Nelson/TCO/Enterprise@NiSource
Date: 05/13/2014 09:52 AM
Subject: Leach Express - Design/Operating Parameters for New Compressor and Regulator Stations

Daniel:

I met yesterday with Operations Planning and Gas Control to go over the preliminary design/operating parameters that you and I worked on in Houston a couple of weeks ago. The attached spreadsheet has been updated to incorporate some tweaks based on that discussion, as well as some additional information that Charlie Harrison developed for the compression. With regards to the compression, I believe we still need to go further in thinking through and developing the complete envelopes of desired operations for each station before finalizing any unit selections, but I wanted to go ahead and pass along this updated information as we have it right now.

One thing I will point out is that I have renamed the relay compressor station on the new header we were previously referring to as "Seneca", now calling it "Summerfield". The folks yesterday reminded me we already have an existing Seneca CS on the east side of the TCO system, and obviously do not want to create confusion by naming another station Seneca as well. I believe the routing of the new header is intended to place this relay compressor station somewhere near the town of Summerfield, Ohio, so I renamed it that. But if someone else ultimately comes up with a new official name for this new station, then we can adopt that name at that time.

During the discussion yesterday, it was again noted that we should strongly consider multiple units within each compressor station, rather than single large units. Doing so would potentially provide more operating flexibility, and also greater system operating reliability for times of planned or unplanned outages of individual units.

Thanks,
Dewitt

[attachment "Leach Xpress Prelim Design Conditions for Comp and Reg Stations 12May2014.xlsx"
deleted by Daniel Betancourt/NCS/Enterprise]



Re: Leach Express - Gas chromatography 
Dewitt Miller to: Daniel Betancourt
Cc: John Grimm, Jacob Ritenour

05/14/2014 02:00 PM

History: This message has been replied to.

Daniel - if I have pulled the data correctly, below is the 24-hr average component analysis for gas coming out of the MarkWest Majorsville plant for yesterday, 5/13/14. This data was available via PI Historian for energy device #851, which is the gas chromatograph stream assigned to the MarkWest plant outlet MS 642452.

Methane	84.51015
Ethane	14.42243
Propane	0.39782
Butane	0.00629
iPentane	0.00000
nPentane	0.00000
Hexane	0.00097
CO2	0.14262
N2	0.51107
Btu	1130
SG	0.636

As alluded to previously, this is only a snapshot representation of the gas currently being processed through the MarkWest plant. I have no way of saying how this might change in the future under the Leach Xpress project as more gas is developed here and elsewhere into the new header.

Dewitt

Daniel Betancourt Dewitt, I need C5+ or C6+, the one available. If y... 05/14/2014 01:14:57 PM

From: Daniel Betancourt/NCS/Enterprise
To: Dewitt Miller/TCO/Enterprise@NiSource
Date: 05/14/2014 01:14 PM
Subject: Re: Leach Express - Gas chromatography

Dewitt,

I need C5+ or C6+, the one available. If you can easily find the SG and BTU also, great. If not, no problems cause the supplier can calculate them.

Regards,
Daniel Betancourt
Columbia Pipeline Group
Lead Engineer - Project Delivery
(O) 713-386-3788
(C) 832-415-7811
Dbetancourt@nisource.com

Dewitt Miller Do you just need Btu and specific gravity, or do... 05/14/2014 12:07:16 PM

From: Dewitt Miller/TCO/Enterprise
To: Daniel Betancourt/NCS/Enterprise@NISOURCE

A fld ANLY.TXT
Analysis

Date-Time: 04/14/15 07:16 Analysis Time: 225 Cycle Time: 240
 Stream: 1 A-FLD Mode: ANLY Cycle Start Time: 07:12
 Analyzer: 2350A_001 Strm Seq:1,2,3
 Company: Daniel Industries

Component Name	Mole Percent	BTU Gross	Relative Density
C6+ 57/28/14	0.0000	0.00	0.0000
PROPANE	0.3089	7.79	0.0047
i-BUTANE	37.7 PPM	0.12	0.0001
n-BUTANE	42.3 PPM	0.14	0.0001
NEOPENTANE	0.0000	0.00	0.0000
i-PENTANE	0.0000	0.00	0.0000
n-PENTANE	0.0000	0.00	0.0000
NITROGEN	0.5040	0.00	0.0049
METHANE	88.0474	891.34	0.4877
CARBON DIOXIDE	0.1635	0.00	0.0025
ETHANE	10.9683	194.55	0.1139
TOTALS	100.0000	1093.94	0.6138

'*' indicates user-defined components

Compressibility Factor (1/Z) @ 14.73000 PSIA & 60.0 DEG.F= 1.00250

Base Pressures 14.73000

 Gross Dry BTU = 1096.68 Corrected/Z
 Real Relative Density Gas = 0.6151
 Unnormalized Mole Percent = 95.232

ACTIVE ALARMS
None

B fld ANLY.TXT
Analysis

Date-Time: 04/14/15 07:08 Analysis Time: 225 Cycle Time: 240
 Stream: 2 B-FLD Mode: ANLY Cycle Start Time: 07:04
 Analyzer: 2350A_001 Strm Seq:1,2,3
 Company: Daniel Industries

Component Name	Mole Percent	BTU Gross	Relative Density
C6+ 57/28/14	0.0000	0.00	0.0000
PROPANE	0.3046	7.68	0.0046
i-BUTANE	37.3 PPM	0.12	0.0001
n-BUTANE	36.9 PPM	0.12	0.0001
NEOPENTANE	0.0000	0.00	0.0000
i-PENTANE	0.0000	0.00	0.0000
n-PENTANE	0.0000	0.00	0.0000
NITROGEN	0.4940	0.00	0.0048
METHANE	88.1844	892.73	0.4885
CARBON DIOXIDE	0.1615	0.00	0.0025
ETHANE	10.8480	192.42	0.1126
TOTALS	100.0000	1093.07	0.6131

'*' indicates user-defined components

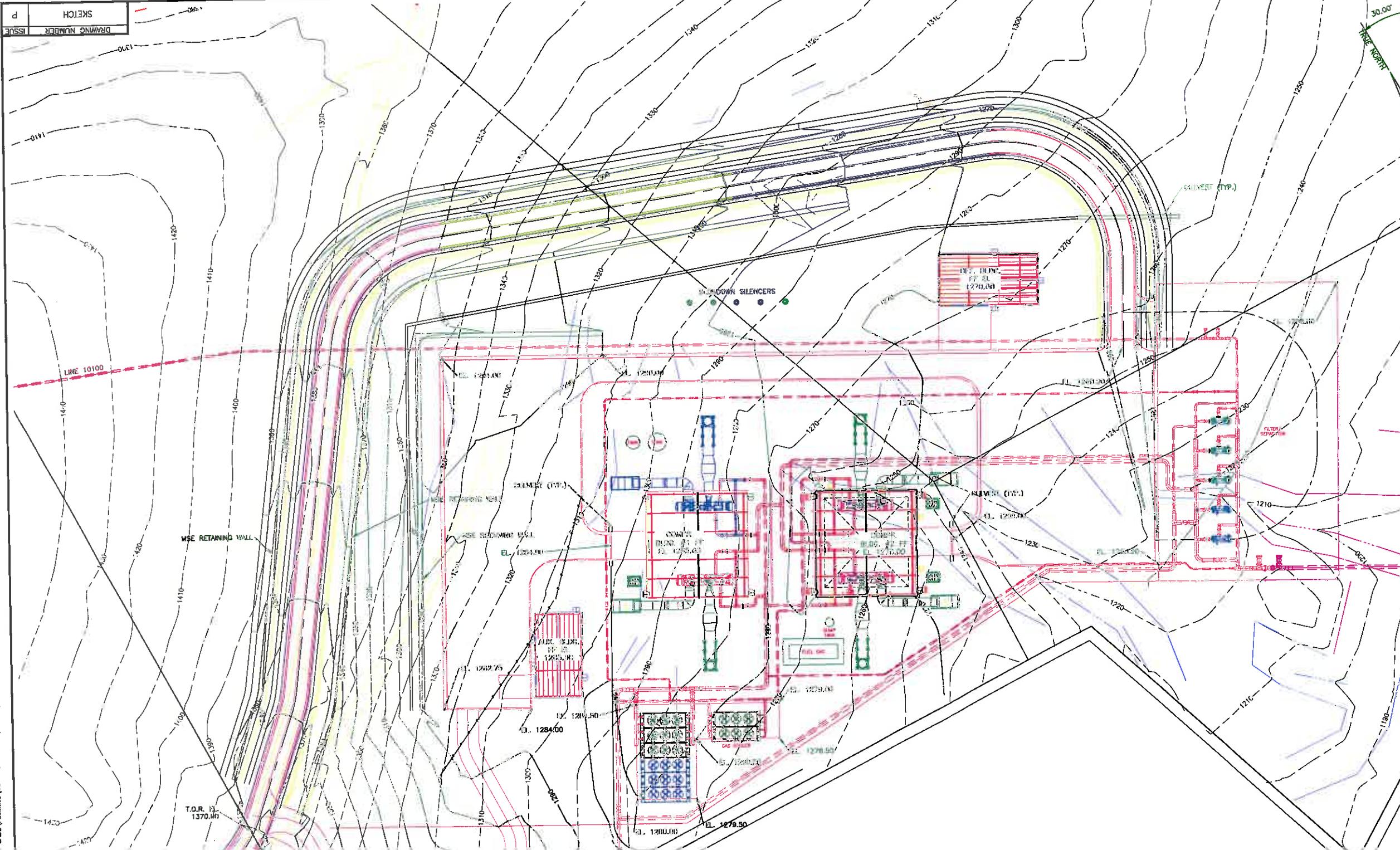
Compressibility Factor (1/Z) @ 14.73000 PSIA & 60.0 DEG.F= 1.00249

Base Pressures 14.73000

 Gross Dry BTU = 1095.80 Corrected/Z
 Real Relative Density Gas = 0.6144
 Unnormalized Mole Percent = 95.137

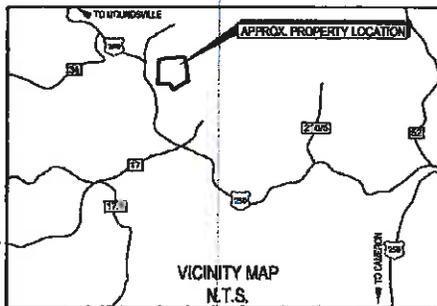
ACTIVE ALARMS
None

ISSUE	SKETCH
DRAWING NUMBER	
P	



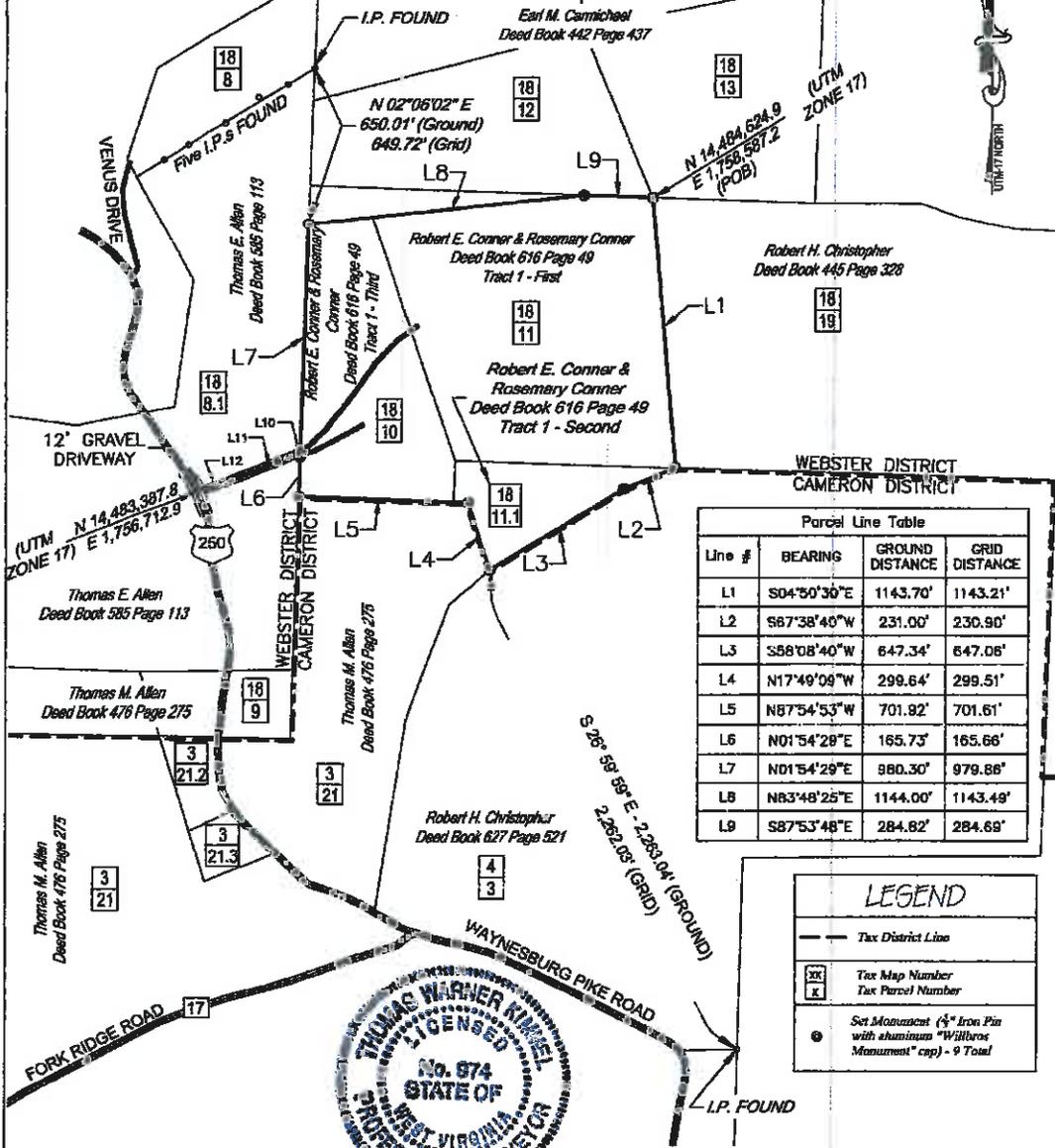
NOTES

1. ALL BEARINGS & DISTANCES SHOWN HEREON ARE BASED UPON UTM ZONE 17, DATUM OF 1983, US SURVEY FOOT, AS DERIVED FROM AN ON THE GROUND SURVEY PERFORMED BY WILLBROS ENGINEERS (U.S.) LLC IN SEPTEMBER, 2014 TO FEBRUARY 2015.
2. THIS PLAT WAS PREPARED WITHOUT THE BENEFIT OF A TITLE COMMITMENT OR ABSTRACT OF TITLE; THERE MAY BE ADDITIONAL EASEMENTS THAT ARE NOT SHOWN HEREON.
3. THE TOTAL TRACT AREA AS SURVEYED IS 1,906,183 SQUARE FEET FOR 43.7600 ACRES OF LAND.



Centerlines for 33' Wide Access Drive

Line #	BEARING	GROUND DISTANCE	GRID DISTANCE
L10	N01°54'29"E	18.10'	18.10'
L11	S67°35'49"W	326.75'	326.60'
L12	S72°04'34"W	125.20'	125.15'

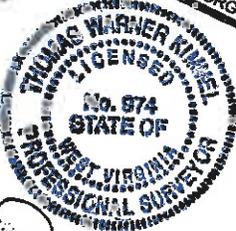


Parcel Line Table

Line #	BEARING	GROUND DISTANCE	GRID DISTANCE
L1	S04°50'30"E	1143.70'	1143.21'
L2	S87°38'40"W	231.00'	230.90'
L3	S58°08'40"W	647.34'	647.06'
L4	N17°49'09"W	299.64'	299.51'
L5	N87°54'53"W	701.92'	701.61'
L6	N01°54'28"E	165.73'	165.66'
L7	N01°54'29"E	980.30'	979.66'
L8	N83°48'25"E	1144.00'	1143.49'
L9	S87°53'48"E	284.82'	284.69'

LEGEND

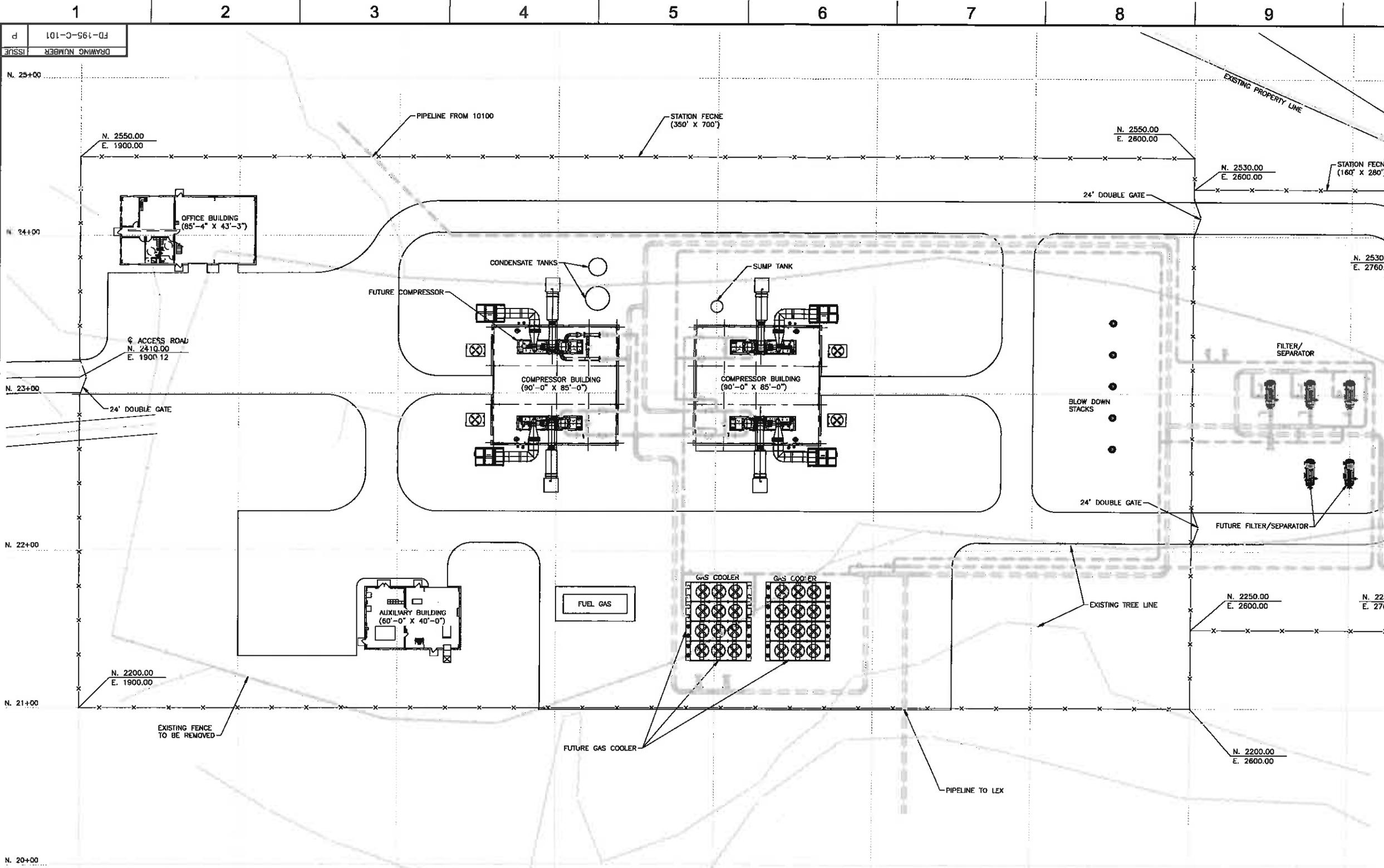
- Tax District Line
- XX Tax Map Number
- X Tax Parcel Number
- Set Monument (3" Iron Pin with aluminum "Willbros Monument" cap) - 9 Total



Thomas Warner Kimmel
 Thomas Warner Kimmel Date 2/26/15
 West Virginia Professional Surveyor No. 974

WILLBROS ENGINEERS (U.S.), LLC
 501 Technology Drive, 3rd Floor
 Canonsburg, PA 15317 COA # 15-5860

Plat of Survey of Lands of
Robert E. Conner & Rosemary Conner
 Webster District, Marshall County, WV



p FD-195-C-101
 DRAWING NUMBER
 ISSUE

N. 25+00

N. 2550.00
E. 1900.00

PIPELINE FROM 10100

STATION FENCE
(350' X 700')

N. 2550.00
E. 2600.00

EXISTING PROPERTY LINE

N. 2530.00
E. 2600.00

STATION FENCE
(160' X 280')

24' DOUBLE GATE

N. 24+00



CONDENSATE TANKS

SUMP TANK

FUTURE COMPRESSOR

ACCESS ROAD
N. 2410.00
E. 1900.12

N. 23+00

24' DOUBLE GATE

COMPRESSOR BUILDING
(90'-0" X 85'-0")

COMPRESSOR BUILDING
(90'-0" X 85'-0")

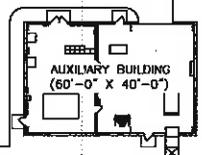
BLOW DOWN
STACKS

FILTER/
SEPARATOR

N. 22+00

24' DOUBLE GATE

FUTURE FILTER/SEPARATOR



FUEL GAS

Gas COOLER

Gas COOLER

EXISTING TREE LINE

N. 2250.00
E. 2600.00

N. 2250.00
E. 2760.00

N. 21+00

N. 2200.00
E. 1900.00

EXISTING FENCE
TO BE REMOVED

FUTURE GAS COOLER

PIPELINE TO LEX

N. 2200.00
E. 2600.00

N. 20+00

LONE OAK Drawings\Civil-Struct\VD-C195-101.dwg

39°53.037' -80°35.405'

39.88395° -80.59009° Heading: 013°

ID # 51-216
Reg R13-3254
Company Columbian Gas
Facility Gas Sub Initials SK



End of Document
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AECOM
125 Rock Road
Horsham, PA 19044

215.315.4150 tel
215.315.4151 fax

June 29, 2015

Ed Andrews

West Virginia DEP – Division of Air Quality
601 57th Street SE
Charleston, WV 25304



**RE: Construction Application (R13-3251)
Columbia Gas Transmission, LLC
Lone Oak Compressor Station (Facility ID#051-00216)**

ID # 051-216
Reg RB-3251
Company Columbia Gas
Facility Lone Oak Initials JNE

Dear Mr. Andrews:

On behalf of Columbia Gas Transmission, LLC, AECOM hereby submits the Affidavit of Publication for Attachment P of the permit application submitted on June 5, 2015 for the Lone Oak Compressor Station, located in Marshall County, West Virginia. The legal advertisement was published on June 17, 2015.

Should you have any questions regarding this application, please contact Jim Alexander, NiSource Air Permitting, at 219-647-5924.

Sincerely,

Jennifer Ehrhardt
Air Quality Engineer II
jennifer.ehrhardt@aecom.com

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(304) 845-2660
 P.O. BOX 369
 MOUNDSVILLE
 WEST VIRGINIA
 26041

AFFIDAVIT OF PUBLICATION

STATE OF WEST VIRGINIA,
 COUNTY OF MARSHALL, to wit

I, Melanie S. Murdock being first duly sworn upon my oath, do depose and say:

- that I am Legal Advertising Manager of the MOUNDSVILLE DAILY ECHO, a Republican newspaper;
- that I have been duly authorized to execute this affidavit;
- that such newspaper has been published for over 119 years, is regularly published afternoons daily except Saturdays and Sundays, for at least fifty weeks during the calendar year, in the municipality of Moundsville, Marshall County, West Virginia.
- that such newspaper is a newspaper of "general circulation" as defined in Art. 3, Chap. 59 of the Code of West Virginia 1931 as amended, within Moundsville and Marshall County;
- that such newspaper averages in length four or more pages, exclusive of any cover, per issue;
- that such newspaper is circulated to the general public at a definite price or consideration;
- that such newspaper is a newspaper to which the general public resorts for passing events of a political, religious, commercial and social nature and for current happenings, announcements, miscellaneous reading matters, advertisements and other notices;
- and that the annexed notice described as follows:

Legal Advertisement

PARTY(ies)

Air Quality Permit Notice / Waynesburg Pike

NATURE (and agency if heard before one)

CERTIF-BILL TO

AECOM
 Jennifer Ehrhardt
 125 Rock Road
 Horsham, PA 19044

WAS PUBLISHED IN-SAID NEWSPAPER AS FOLLOWS

Times	Dates
1	June 17, 2015
BY WORDS	PUBLICATION CHARGES
318	\$36.57

(signed) Melanie S. Murdock

NOTARIZATION

Taken, sworn and subscribed before me this 17th day of June, 2015.

OFFICIAL SEAL
 State of West Virginia
 STEPHANIE A. GRIFFITH
 Marshall County Circuit Clerk
 600 7th Street
 Moundsville, West Virginia 26041
 My Commission Expires June 21, 2022

Moundsville Daily Echo--PAGE THREE

**LEGAL ADVERTISEMENT
 AIR QUALITY PERMIT NOTICE**

Notice of Application

Notice is given that Columbia Gas Transmission LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a New Source Review (NSR) preconstruction permit for a proposed natural gas compression station located off Waynesburg Pike in Marshall County, West Virginia. The latitude and longitude coordinates are 39° 52' 56.53"N and 80° 34' 51.95"W.

The applicant estimates, if the preconstruction application is approved, the potential to discharge the following Regulated Air Pollutants will be: Carb Monoxide at 188.7 tons per year, Nitrogen Oxides at 127.9 tons per year, PM10 and PM2.5 at 15.2 tons per year, Sulfur Dioxide at 1.64 tons per year, Volatile Organic Compounds (VOC) at 27.5 tons per year, Carbon Dioxide Equivalents (CO2e) at 276.725 tons per year, Formaldehyde at 1.74 tons per year, and Total Hazardous Air Pollutants (HAPs) at 2.53 tons per year.

Startup of operation is planned to begin on or about the 1st day of November, 2017. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-1100, extension 1227, during normal business hours.

Dated this the 3rd day of June, 2015.

By: Columbia Gas Transmission LLC, Glenn Fyola, Manager of Operations, 950 Manifold Road, Washington, PA 15301.

PUBLISH: June 17, 2015

Andrews, Edward S

From: Null, Gregory L
Sent: Wednesday, June 10, 2015 9:49 AM
To: Andrews, Edward S
Subject: Columbia Gas Transmission LLC Lone Oak Station Permit Application Fee

This is the receipt for payment received from:

Columbia Gas Transmission LLC, check# 0351137812, dated 5/27/15, \$2,000
Columbia Gas Transmission LLC, R13-3251 id no 051-00216

OASIS Deposit CR 1500136205 June 9, 2015

Greg Null
Accounts Receivable Manager
West Virginia Department of Environmental Protection

Entire Document
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Andrews, Edward S

From: Adkins, Sandra K
Sent: Monday, June 08, 2015 3:23 PM
To: jamesalexander@nisource.com; gfyola@nisource.com
Cc: Andrews, Edward S
Subject: FW: WV DAQ Permit Application Status for Columbia Gas Transmission, LLC; Lone Oak Station

This is being re-sent due to an error in Mr. Fyola's email address.

From: Adkins, Sandra K
Sent: Monday, June 08, 2015 3:18 PM
To: 'jamesalexander@nisource.com'; 'gfyolar@nisource.com'
Cc: McKeone, Beverly D; Andrews, Edward S
Subject: WV DAQ Permit Application Status for Columbia Gas Transmission, LLC; Lone Oak Station

**RE: Application Status
Columbia Gas Transmission, LLC
Lone Oak Station
Plant ID No. 051-00216
Application No. R13-3251**

ID # 51-216
Reg R13-3251!
Company Columbia Gas
Facility Lone Oak Initials ED
C.S.

Mr. Fyola,

Your application for a construction permit for the Lone Oak Station was received by this Division on June 5, 2015, and was assigned to Ed Andrews. The following item was not included in the initial application submittal:

Original affidavit for Class I legal advertisement not submitted.

This item is necessary for the assigned permit writer to continue the 30-day completeness review.

Within 30 days, you should receive a letter from Ed Andrews stating the status of the permit application and, if complete, given an estimated time frame for the agency's final action on the permit.

Any determination of completeness shall not relieve the permit applicant of the requirement to subsequently submit, in a timely manner, any additional or corrected information deemed necessary for a final permit decision.

Should you have any questions, please contact the assigned engineer, Ed Andrews, at 304-926-0499, extension 1214.

Entire Document
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