AIR PERMIT REVIEW

NORTH CAROLINA DIVISION OF AIR QUALITY Greenfield Application Review	**Region:** Mooresville Regional Office **County:** Cleveland **NC Facility ID:** 2300395 **Inspector's Name:** NA **Date of Last Inspection:** greenfield **Compliance Code:** NA
Facility Data **Applicant (Facility's Name):** PSNC - Kings Mountain Compressor Station **Facility Address:** PSNC - Kings Mountain Compressor Station 247 Battleground Road Kings Mountain, NC 28056 **SIC:** 4923 / Gas Transmission And Distribution **NAICS:** 48621 / Pipeline Transportation of Natural Gas **Facility Classification: Before:** NA **After:** Small **Fee Classification: Before:** N/A **After:** Small	**Permit Applicability (this application only)** **SIP: Yes** **NSPS:** Yes (Subpart JJJJ, KKKK, and OOOOa) **NESHAP:** Yes (Subpart ZZZZ) **PSD:** No **PSD Avoidance:** No **NC Toxics:** Yes (2D .1100 and 2Q .0711) **112(r):** No **Other:**

Contact Data			**Application Data**
Facility Contact	**Authorized Contact**	**Technical Contact**	
Russell Southworth Supervisor (828) 670-3523 15 Overland Industrial Blvd. Asheville, NC 28806	George Ratchford Vice President - Gas Operations (704) 810-3225 PO Box 1398 Gastonia, NC 28056	Craig Pearson Manager of Environmental Services (803) 217-9472 100 Scana Parkway Building C Cayce, SC 29033	**Application Number:** 2300395.17A **Date Received:** 12/05/2017 **Application Type:** Greenfield Facility **Application Schedule:** State **Existing Permit Data** **Existing Permit Number:** N/A **Existing Permit Issue Date:** N/A **Existing Permit Expiration Date:** N/A

Review Engineer: Denise Hayes **Review Engineer's Signature:** **Date:**	**Comments / Recommendations:** **Issue** 10561R00 **Permit Issue Date:** June 4, 2018 **Permit Expiration Date:** May 31, 2026

1. Purpose of Application:

PSNC – Kings Mountain Compressor Station has submitted an application for a greenfield facility. The facility will be a natural gas compressor station with sources consisting of four natural gas-fired compressor turbines, a natural gas-fired emergency generator (750 kW capacity), storage tanks, and associated equipment.

The compressor turbines (ID Nos. ES-1 through ES-4) will be rated at 51.52 million Btu per hour heat input and 6,091 horsepower output. They will each be equipped with SoLoNOx technology which utilizes lean-premixed combustion technology to ensure a more uniform air to fuel mixture to help control the combustion process to prevent NOx and CO emissions from forming. There are no add-on control devices being installed for these sources.

2. Application Chronology:

The application was received on December 5, 2017.

The acknowledgment letter was sent on December 11, 2017.

An additional information request was sent on January 11, 2018 requesting a modeling demonstration for benzene and an explanation of how the heaters would work throughout the facility.

The modeling was received on February 8, 2018 and was forwarded to RCO for review. An explanation of the heaters was also received on February 8, 2018.

An additional information request was sent by RCO and additional modeling was received on March 7, 2018.

Additional updates to the modeling were received on March 13, 2018

Additional information was requested concerning hexane emissions from blowdown operations and applicability of operating a CEM unit for NOx for NSPS Subpart KKKK on March 16, 2018. This request was through Patrick Ballard of the Asheville Regional Office.

A response from the facility was received March 20, 2018 with updated hexane emissions and details of showing compliance with NSPS Subpart KKKK.

An update to the modeling was also received on March 20, 2018.

An additional information request was sent on March 27, 2018 requesting the manufacturer's certification for emission factors of NOx and CO and clarification on compliance strategy for NSPS for the turbines.

An additional information request was sent on March 28, 2018 requesting the manufacturer's certification for emergency generator.

The manufacturer's data for the emergency generator was received on March 29, 2018.

The manufacturer's data and information concerning compliance with NSPS was received on March 30, 2018.

The modeling memo from AQAB was received on April 2, 2018.

Additional information concerning the manufacturer's emissions data for the emergency engine was received on April 2, 2018.

The manufacture date of the emergency engine was confirmed on April 4, 2018.

The stack orientation for toxics was confirmed on April 9, 2018.

The draft permit was posted for public comment on April 24, 2018.

The public comment period ended on May 24, 2018. MRO did not receive any comments from the public with concerns about this permit.

The facility submitted comments on the draft permit via email on May 24, 2018.

3. Permitted Equipment List:

The following air emission sources will be listed in the permit:

Emission Source ID	Emission Source Description	Control System ID	Control System Description
ES-1 (**NSPS**) ES-2 (**NSPS**) ES-3 (**NSPS**) ES-4 (**NSPS**)	four (4) natural gas-fired compressor turbines (51.52 million Btu per hour heat input and 6,091 horsepower output, each) equipped with SoLoNOx technology	N/A	N/A
ES-S2	sixteen (16) natural gas-fired catalytic heaters (0.06 million Btu per hour maximum heat input, each)	N/A	N/A
ES-S3	two (2) natural gas-fired fuel heaters (0.77 million Btu per hour maximum heat input, each)	N/A	N/A
ES-S7	condensate tank (1,000 gallon capacity)	N/A	N/A

4. Specific Conditions and Limitations:

The Permittee shall comply with the following Environmental Management Commission Regulations, including Title 15A North Carolina Administrative Code (NCAC).

- 2D .0516, “Sulfur Dioxide Emissions from Combustion Sources”
- 2D .0521, “Control of Visible Emissions”
- 2D .0524, “New Source Performance Standards” (40 CFR Part 60 Subpart GG)*
- 2D .0524, “New Source Performance Standards” (40 CFR Part 60 Subpart JJJJ)
- 2D .0524, “New Source Performance Standards” (40 CFR Part 60 Subpart KKKK)
- 2D .0524, “New Source Performance Standards” (40 CFR Part 60 Subpart OOOOa)
- 2D .0535, “Excess Emissions Reporting and Malfunctions”
- 2D .0540, “Particulates from Fugitive Non-Process Dust Emission Sources”
- 2D .0605, “General Recordkeeping and Reporting Requirements”
- 2D .0611, “Monitoring Emissions from Other Sources”
- 2D .1100, “Control of Toxic Air Pollutants”
- 2D .1111, “NESHAP” (40 CFR Part 63 Subpart ZZZZ)
- 2D .1400, “Nitrogen Oxides”*
- 2D .1806, “Control and Prohibition of Odorous Emissions”
- 2Q .0711, “Emission Rates Requiring a Permit”
- Environmental Justice Review*

*Please note the facility is not subject to these regulations. They are shown in this list because they are discussed below.

a. 2D .0516, "Sulfur Dioxide Emissions from Combustion Sources"

Catalytic heaters (ID No. ES-S2) and Fuel gas heaters (ID No. ES-S3)

Per MRO memo "2D .0516 analysis" dated 04/10/97, compliance is indicated for No. 1 fuel oil, No. 2 fuel oil (diesel), natural gas, butane, propane, and wood fuel.

All of these combustion sources are fired with natural gas, which is an inherently low sulfur content fuel.

Therefore, the facility is expected to be in compliance with 2D .0516.

Turbines (ID Nos. ES-1 through ES-4)

In accordance with 2D .0516(b), a source subject to an emission standard for sulfur dioxide in Rule 2D .0524 shall meet the standard in that rule instead of 2D .0516. Rule 2D .0524 as promulgated in 40 CFR 60 Subpart KKKK contains an emission standard for sulfur dioxide (see Item 4.e. below).

Therefore, the turbines are not subject to 2D .0516.

b. 2D .0521, "Control of Visible Emissions"

In order to comply with 2D .0521, the visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute periods averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period.

The sources at this facility are natural gas-fired sources. Visible emissions are inherently low with natural gas combustion. Based on past inspections of similar sources, visible emissions are expected to be minimal. Compliance will be determined during the first inspection.

Therefore, the facility is expected to be in compliance with 2D .0521.

c. 2D .0524, "New Source Performance Standards" (40 CFR Part 60 Subpart GG)

The turbines (ID Nos. ES-1 through ES-4) are stationary units, are rated at greater than 10 million Btu per hour and will commence construction after October 3, 1997. Therefore, they appear to be subject to NSPS Subpart GG. However, the turbines are also subject to the requirements of NSPS Subpart KKKK. Section 60.4305(b) of Subpart KKKK states that "stationary combustion turbines regulated under this subpart are exempt from the requirements of subpart GG."

Therefore, the turbines are exempt from the requirements of Subpart GG and will show compliance with NSPS through Subpart KKKK.

d. 2D .0524, "New Source Performance Standards" (40 CFR Part 60 Subpart JJJJ)

The proposed natural gas-fired emergency generator (ID No. I-ES-S1) will be subject to NSPS Subpart JJJJ. It will be an emergency spark ignition internal combustion engine (SI ICE) that will commence construction after June 12, 2006 and will be manufactured after January 1, 2009 [40 CFR 60.4230(a)(4)(iv)]. The Permittee is choosing to purchase a certified engine.

In accordance with 60.4233(e), the generator (ID No. I-ES-S1) has a maximum engine power greater than 75 kW and must comply with the emissions standards in Table 1 of this Subpart as follows:

Pollutant	Emission Limit (g/hp-hr)	Manufacturer's Data[1] (g/hp-hr)
NOx	2.0	2.0
CO	4.0	2.48
VOC[2]	1.0	0.35

1. The manufacturer's data shows NOx, CO, and VOC have the highest emission rate at 50% load.
2. For purposes of this subpart, when calculating emissions of volatile organic compounds, emissions of formaldehyde should not be included.

In accordance with 40 CFR 60.4234, the emergency engine must be operated and maintained to meet the emissions standards over the entire life of the engine.

In accordance with 40 CFR 60.4236, the Permittee may not install an emergency engine that does not meet the applicable emissions standards of 60.4233.

In accordance with 40 CFR 60.4237(a), the Permittee is required to install a non-resettable hour meter if the emergency engine does not meet the standards applicable to non-emergency engines.

In accordance with 40 CFR 60.4243(b)(1), the Permittee has chosen to demonstrate compliance by purchasing a certified engine for the same model year and will demonstrate compliance via 40 CFR 60.4243(a)(1).

In accordance with 40 CFR 60.4243(a)(1), the Permittee has chosen to operate the certified engine according to the manufacturer's emission-related instructions. The Permittee will be required to keep records of conducted maintenance. No testing will be required for the certified engine.

In accordance with 40 CFR 60.4243(d), the Permittee will be allowed to operate the emergency generators for the purposes of maintenance checks and readiness testing for no more than 100 hours per year. Any operation of the emergency generators other than for emergency operation, maintenance, and readiness testing will be prohibited.

In accordance with 40 CFR 60.4245(a), the Permittee must maintain records of maintenance performed on the engine and documentation from the manufacturer that the engine is certified to meet the emission standards.

According to the application and subsequent additional information received on April 4, 2018, the engine that is to be purchased will be a certified engine. The manufacturer has guaranteed the emissions to the standards of the subpart. The Permittee will be required to perform maintenance on the engine per the manufacturer and will be required to maintain records of those activities. An initial notification will not be required. An initial performance test and subsequent test thereafter will not be required. The Permittee will operate and maintain the engine according to manufacturer's specifications to show compliance.

Therefore, the facility is expected to be in compliance with 2D .0524.

e. 2D .0524, "New Source Performance Standards" (40 CFR Part 60 Subpart KKKK)

The proposed natural gas-fired compressor turbines (ID Nos. ES-1 through ES-4) will be subject to NSPS Subpart KKKK. They will be stationary combustion turbines with heat input ratings of greater than 10 million Btu per hour and will commence construction after February 18, 2005 [40 CFR 60.4305(a)]. The turbines will not be subject to the requirements of Subpart GG (40 CFR 60.4305(b)].

In accordance with 60.4320(a), the turbines (ID Nos. ES-1 through ES-4) must comply with the emissions standards in Table 1 of this Subpart for NOx emissions. In accordance with 60.4330(a)(2), the turbines (ID Nos. ES-1 through ES-4) must comply with the emissions standards for SO2.

Pollutant	Emission Limit	Estimated Emissions
NOx	25 ppm @15% O_2 (1.2 lb/MW-hr)[1]	15 ppm @15% O_2 (0.68 lb/MW-hr)[3]
SO2	0.060 lb/mmBtu[2]	0.0006 lb/mmBtu[4]

1. The emissions limit is in the units of pounds of pollutant per Megawatt-hour of useful output.
2. The emissions limit is in the units of pounds of pollutant per million Btu heat input.
3. Estimated emissions taken from the manufacturer's data.
4. Estimated emissions taken from EPA Publication AP-42 Table 3.1-2a.

In accordance with 40 CFR 60.4333(a), the turbines must be operated and maintained in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction.

In accordance with 40 CFR 60.4340(b)(2)(ii), to demonstrate compliance and as an alternative to annual testing, the Permittee has elected to operate continuous parameter monitoring for temperature and pilot fuel level to determine whether the turbine is operating in low-NOx mode.

In accordance with 40 CFR 60.4345(a), the Permittee is required to provide engineering analyses, design specifications, manufacturer's recommendations and other relevant information to define the acceptable parametric ranges. The Permittee is required to develop and keep on-site a parameter monitoring plan that explains the procedures used to document proper operation in low-NOx mode [40 CFR 60.4355]. The plan must indicate the parameters to be monitored, pick operating ranges for the parameters, give an explanation of the process to be used to make certain the data that is obtained are representative of the emissions or parameters being monitored, give a description of

any quality assurance and control practices, give a description of the frequency of monitoring, and it must submit justification for the proposed elements of the monitoring.

In accordance with 40 CFR 60.4365(a), the Permittee has elected not to monitor the sulfur content of the fuel and will be required to demonstrate that the fuel does not exceed 0.060 pounds of sulfur dioxide per million Btu heat input. The Permittee must provide information showing that the fuel quality characteristics in a current, valid purchase contract, tariff sheet or transportation contract for the fuel specify that the maximum total sulfur content for natural gas use is 20 grains of sulfur or less per 100 standard cubic feet and has potential sulfur emissions of less than less than 0.060 lb SO_2/MMBtu heat input.

In accordance with 40 CFR 60.4370(b), the Permittee will be required to determine and record the sulfur content once per operating day. In accordance with 40 CFR 60.4370(c), the Permittee is allowed to develop a custom schedule for determination of sulfur content. If the Permittee chooses this option, they must follow the procedures of 40 CFR 60.4370(c)(1) or (c)(2).

In accordance with 40 CFR 60.4375(a), the Permittee will be required to submit semi-annual reports of excess emissions and monitor downtime in accordance with 40 CFR 60.7(c).

In accordance with 40 CFR 60.4400, the permittee is required to conduct an initial performance test for NOx and establish acceptable operating ranges for purposes of the parameter monitoring plan in accordance with 40 CFR 60.4410.

According to the application and additional information received March 30, 2018, the Permittee will show compliance by monitoring the "T5" combustion flame temperature and the pilot fuel level. The "T5" combustion flame temperature schedule is developed at the factory and continuously monitored during operation. It is regulated by controlling the amount of air entering the combustor. The pilot fuel level is the ratio of fuel flow between the main and pilot fuel feed circuits. The main fuel feed is lean pre-mixed and burns with a clean emissions signature. The balance of fuel feed is delivered from the pilot and provides flame stability. During SoLoNOx operation, pilot fuel flow is reduced to a minimum. The pilot fuel level is continuously monitored during turbine operation. SoLoNOx operation will be determined during the compliance inspection.

Therefore, the facility is expected to be in compliance with 2D .0524.

f. <u>2D .0524, "New Source Performance Standards" (40 CFR Part 60 Subpart OOOOa)</u>

This facility will be subject to NSPS Subpart OOOOa since it will commence construction after September 18, 2015. In accordance with 40 CFR 60.5365a(j), the affected source will be the collection of fugitive emissions components at the compressor station. The other facilities listed in 40 CFR 60.5365a(a) through (i) are not affected sources as follows:

(a) Well affected facility. This site does not have wells.
(b) Each centrifugal compressor using wet seals. The sources at this site will use dry seals.
(c) Each reciprocating compressor. The sources at this site are not reciprocating compressors.
(d) Each pneumatic controller. There are no pneumatic controllers.

(e) Each storage vessel with potential VOC emissions equal to or greater than 6 tons per year. There are no storage vessels with potential VOC emissions greater than this threshold.
(f) The group of equipment within a process unit, where a process unit is defined as components assembled for the extraction of natural gas liquids from field gas. This process will not take place at this site.
(g) Sweetening units. This facility will not have any sweetening units.
(h) Each natural gas-driven diaphragm pneumatic pump. The pumps used at this site will be compressed air driven pumps.
(i) The collection of fugitive emissions components at a well site. This facility will not have any well sites.

In accordance with 40 CFR 60.5370a(a), the facility must be in compliance upon startup.

In accordance with 40 CFR 60.5370a(b), the Permittee must maintain and operate the affected sources in a manner consistent with good air pollution control practice for minimizing emissions at all times, including periods of startup, shutdown, and malfunction.

In accordance with 60.5397a, the Permittee must reduce GHG (as methane) and VOC as follows:

- 60.5397a(a) defines fugitive emissions as: Any visible emission from a fugitive emissions component observed using optical gas imaging or an instrument reading of 500 ppm or greater using Method 21.
- 60.5397a(b) requires development of an air emissions monitoring plan
- 60.5397a(c) specifies the 8 elements of a fugitive emissions monitoring plan
- 60.5397a(d) specifies the 4 more elements of a fugitive emissions monitoring plan
- 60.5397a(e) requires each monitoring survey observe each fugitive emissions component for fugitive emissions.
- 60.5397a(f)(2) requires an initial monitoring survey be conducted within 60 days of startup of a compressor station.
- 60.5397a(g)(2) requires a monitoring survey of the collection of fugitive emissions at a compressor station be conducted at least quarterly after the initial survey. Consecutive quarterly surveys must be conducted at least 60 days apart. 60.5397a(g)(3) and (4) describe how to handle “difficult-to-monitor” and “unsafe-to-monitor” emissions, respectively.
- 60.5397a(h)(1) requires each identified source of fugitive emissions be repaired or replaced no later than 30 days after discovery unless the repair qualifies under 60.5397a(h)(2) as either technically infeasible, would require a vent blowdown or compressor station shutdown, or would be unsafe to repair during operation of the unit. In these cases the repair must be made during the next compressor station shutdown or within 2 years, whichever is earlier. 60.5397a(h)(3) requires each repaired component be resurveyed for fugitive emissions within 30 days after being repaired. Subparagraphs (i) through (iii) require a resurvey within 30 days of discovery of the fugitive emission using either Method 21 or optical gas imaging, and digital documentation of any fugitive emission that can’t be repaired during the monitoring survey when discovered.
- 60.5397a(i) requires records of each monitoring survey be maintained as specified in 60.5420a(c)(15).
- 60.5397a(j) requires an annual report to include information specified in 60.5420a(b)(7).

In accordance with 40 CFR 60.5398a, alternative means of emission limitation may be allowed with approval by the Administrator.

In accordance with 40 CFR 60.5410a(j), to achieve initial compliance, the Permittee must develop a fugitive emissions monitoring plan, conduct an initial monitoring survey, maintain records, repair each source of fugitive emission, and submit the initial annual report.

In accordance with 40 CFR 60.5415a(h), the Permittee must demonstrate continuous compliance by conducting quarterly periodic monitoring surveys, repairing or replacing identified sources of fugitive emissions, maintaining records, and submitting annual reports.

In accordance with 40 CFR 60.5420a, the Permittee must comply with the notification, reporting and recordkeeping requirements. It also states that 60.7(a)(1), (2), and (3) do not apply.

According to the application, the facility will develop a monitoring plan and will conduct the required monitoring surveys. Compliance will be determined during the initial inspection.

Therefore, the facility is expected to be in compliance with 2D .0524.

g. 2D .0540, "Particulates from Fugitive Non-Process Dust Emission Sources"

This rule states in part that the facility must not cause or allow fugitive dust emissions from activities such as: unloading and loading areas, process areas stockpiles, stock pile working, plant parking lots, and plant roads (including access roads and haul roads) to cause or contribute to substantive complaints.

No substantive complaints have been received from facility's operating similar sources. Compliance will be determined during the initial inspection.

Therefore, the facility is expected to be in compliance with 2D .0540.

h. 2D .0605, "General Recordkeeping and Reporting Requirements"

During a public information session held on May 23, 2018 for the PSNC – Mill Spring Compressor Station, a comment was made to require additional monitoring of emissions beyond what is required by the NSPS. The Asheville Regional Office suggested that a subsequent test would be helpful in fulfilling this request.

Therefore, with the agreement of the Director and to be consistent with the sister facility, a condition will be added to this permit requiring a subsequent test for NOx emissions half way through the permit cycle. The subsequent test will be required to be performed after June 30, 2022 and the test results submitted by December 31, 2022.

i. 2D .0611, "Monitoring Emissions from Other Sources"

During a public information session held on May 23, 2018 for the PSNC – Mill Spring Compressor Station, a comment was made to require additional monitoring for the turbines. The Asheville Regional Office suggested adding a condition that would require operating and maintaining the SoLoNOx reduction technology in a manner consistent with the manufacturer's

recommendations. The facility will be required to perform inspection and maintenance as required by the manufacturer and record those activities in a logbook.

Compliance will be determined during the initial compliance inspection.

j. 2D .1100, "Control of Toxic Air Pollutants"

The original permit application indicated that the facility could be exempt from the air toxics rules under 2Q .0702(a)(25) since the reported facility-wide benzene emissions all come from natural gas-fired equipment with a total heat input less than 450 million Btu per hour. Based on the permit review for the Northampton Compressor Station (Facility ID No. 6600169, Air Permit No. 10466R00), a concern arose from the public hearing for that permit that questioned the applicability of this exemption since the facility will operate a pipeline liquids storage tank (I-TK-1) that listed benzene as one of the constituents of the stored liquids. The DAQ requested PSNC – Kings Mountain evaluate the condensate tank for any benzene. PSNC used the E & P TANKS program and found that the condensate tank would have emissions of benzene. Therefore, the facility cannot be exempt from toxics since there are other sources of benzene besides the combustion sources.

During the facility's toxics evaluation, it was found that emissions of acrolein, benzene, formaldehyde, and 1,3-butadiene all exceeded their respective TPER limits. Therefore, the facility performed a model to demonstrate compliance with 2D .1100. The modeling was submitted February 9, 2018 with updates being submitted on March 20, 2018. The memo dated March 27, 2018 from Ms. Nancy Jones with AQAB, indicates the modeling adequately demonstrates compliance on a source-by-source basis for all toxics that were modeled as follows:

TAP	Averaging Period	Max. Conc. ($\mu g/m^3$)	AAL ($\mu g/m^3$)	% of AAL
Benzene	Annual	0.018	0.12	15%
Formaldehyde	1-hour	7.1	150	5%
1,3-Butadiene*	Annual	0.00006	0.44	<1%
Acrolein	1-hour	0.69	80	1%

* The emissions of 1,3-butadiene do not exceed the TPER limit as shown below in Item 4.l. The facility miscalculated the emissions from the emergency generator by using 8760 hours of operation instead of 500 hours of operation. This pollutant will only be listed in the condition for 2Q .0711 for toxic pollutant emissions not exceeding the TPER limits.

The modeling was conducted at the worst case expected operations (8760 hours of operation for all sources except the emergency generator at 500 hours of operation). Therefore, no operational restrictions are necessary to demonstrate ongoing compliance with the AALs for the modeled mass emission rates. The modeled emissions rates for the permitted sources shown in the following table will be listed in a 2D .1100 permit condition:

Source	Benzene	Formaldehye	Acrolein
	(lb/yr)	(lb/hr)	(lb/hr)
Turbine ES-1	5.41	0.0365	0.00033
Turbine ES-2	5.41	0.0365	0.00033
Turbine ES-3	5.41	0.0365	0.00033
Turbine ES-4	5.41	0.0365	0.00033
Generator I-ES-S1*	0.099	0.416	0.0405
Cat Heaters ES-S2	0.017	0.0000707	0.00000169
fuel heaters ES-S3	0.028	0.000111	2.72E-08
condensate tank ES-S7	5.20	0	0
*The emergency generator is subject to NESHAP and is therefore exempt from toxics per 2Q .0702(a)(27). It will not be listed on the permitted equipment table but will be listed as an insignificant source.			

Therefore, the facility is expected to be in compliance with 2D .1100.

k. 2D .1111, "NESHAP" (40 CFR Part 63 Subpart ZZZZ)

The proposed natural gas-fired emergency generator (ID No. I-ES-S1) is considered a new spark ignition reciprocating internal combustion engine (SI RICE). The only requirement for new SI RICE located at area sources is that they comply with the requirements of NSPS Subpart JJJJ.

See section 4.d. for details regarding NSPS Subpart JJJJ. The facility provided an EPA certification in the application for the proposed engines.

Therefore, the facility is expected to be in compliance with 2D .1111.

l. 2D .1400, "Nitrogen Oxides"

This facility will operate natural gas-fired combustion turbines (ID Nos. ES-1 through ES-4) that will emit NOx.

Rule 2D .1408, "Stationary Combustion Turbines" states "(a) This Rule applies geographically according to Rule .1402 of this Section." Rule 2D .1402, "Applicability" states "(d) Rules .1407 through .1409(b) and .1413 of this Section apply to facilities with potential emissions of nitrogen oxides equal to or greater than 100 tons per year or 560 pounds per calendar day beginning May 1 through September 30 of any year in the following areas:

(1) Cabarrus County;
(2) Gaston County;
(3) Lincoln County;
(4) Mecklenburg County;
(5) Rowan County;
(6) Union County; and
(7) Davidson Township and Coddle Creek Township in Iredell County."

The facility will be located in Cleveland County, which is not one of the areas listed in the rule. Also, the potential emissions as shown below are estimated to be 56.46 tons per year.

Therefore, the facility will not be subject to 2D .1400 rules.

m. 2D .1806, "Control and Prohibition of Odorous Emissions"

In order to comply with 2D .1806, the facility must provide suitable measures for the control of nuisance odors such that the facility does not contribute to objectionable odors beyond the facility boundary.

Based on inspections of facilities with similar sources, minimal to no odors were detected beyond property boundaries. Furthermore, no odor complaints have been received regarding these facilities. Compliance will be determined during the initial inspection.

Therefore, the facility is expected to be in compliance with 2D .1806.

n. 2Q .0711, "Emission Rates Requiring a Permit"

The facility has triggered a toxics review as discussed in Item 4.j. above. The following toxic pollutants are triggered and are expected to be emitted below their respective TPER limits.

Pollutant	Actual Emissions (lb/yr)	TPER (lb/yr)	Actual Emissions (lb/day)	TPER (lb/day)	Actual Emissions (lb/hr)	TPER (lb/hr)	Model?
acetaldehyde	105.15				0.074	6.8	No
acrolein	**31.81**				**0.042**	**0.02**	**Yes**
ammonia	68.7				0.0078	0.68	No
benzene	**28.64**	**8.1**					**Yes**
benzo(a)pyrene	0.000026	2.2					No
1,3-butadiene	1.83	11					No
carbon tetrachloride*	0.14	460					No
chlorobenzene*	0.12		0.00033	46			No
chloroform*	0.11	290					No
ethylene dibromide*	0.17	27					No
formaldehyde	**1491.42**				**0.56**	**0.04**	**Yes**
n-hexane	115.31		7.68	23			No
methylene chloride*	0.079	1600			0.00016	0.39	No
phenol*	0.095				0.00019	0.24	No
sytrene*	0.093				0.00019	2.7	No
tetrachloroethane*	0.0098	430					No
toluene	244.26		0.67	98	0.031	14.4	No
vinyl chloride*	0.059	26					No
xylene	116.47		0.32	57	0.015	16.4	No

*These pollutants are only emitted from the emergency generator and will not be included in the condition for 2Q .0711 as noted below.

The facility has modeled for acrolein, benzene, and formaldehyde (see Item 4.h above). The facility also modeled for 1,3-butadiene with the assumption that the pollutant exceeded the TPER.

Upon further evaluation, the facility estimated emissions from the emergency generator at 8760 hours per year instead of 500 hours per year. The 1,3-butadiene emissions are not exceeded using the 500 hours per year. Therefore, that pollutant will be included in the 2Q .0711 condition and not the condition for 2D .1100.

The emissions of each pollutant are well below their respective TPER limits.

Therefore, the facility is expected to be in compliance with 2Q .0711.

o. Environmental Justice Review

In accordance with the "Memorandum of Understanding on Environmental Justice and Executive Order 12898", the EPA is required to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

Based on the determination from Ms. Renee Kramer, Compliance Officer with the NC Division of Waste Management, Solid Waste Section, there does not appear to be a low-income community of concern within a 1-mile radius of the proposed facility and only 19% of the population within a 1-mile radius are minority.

Therefore, there does not appear to be any environmental justice concerns for this facility.

Emission summary for added equipment			
Pollutant	Projected Actual Emissions (tpy)	Potential Emissions After Controls/Limitations (tpy)	Potential Emissions Before Controls/Limitations (tpy)
TSP	5.98	5.98	5.98
PM10	5.98	5.98	5.98
SO_2	0.54	0.54	0.54
NO_X	56.46	56.46	56.46
VOC	4.43	4.43	4.43
CO	57.49	57.49	57.49
Highest HAP (formaldehyde)	0.74	0.74	0.74
Total HAP	1.13	1.13	1.13

Natural gas-fired turbines (ID Nos. ES-1 through ES-4)

Emissions from the turbines are estimated using manufacturer data and AP-42 Table 3.1-2a for criteria pollutants and AP-42 Table 3.1-3 for HAP. There are no add-on control devices so the before control and after control emissions are assumed to be the same. The SO2 emission factor is based on the sulfur content listed in the current gas tariff of the supply line. The email dated April 11, 2018 indicated the worst case sulfur content to be 0.4055 gr/100 scf.

EF from AP-42 = 0.94S lb/mmBtu where S is the percent sulfur in the fuel

S = (0.4055 gr/100 scf) x (15.7 ppm-100 scf/gr) x (%/10,000 ppm) = 0.000637%

Rating	6091	hp	
total hp	24364	bhp	
fuel rating @ 51.52 mmBtu//hr	206.08	mmBtu/hr	
Pollutant	AP-42 Factor	Man. Data Factor	Emissions
	lb/mmBtu	lb/mmBtu	(ton/yr)
PM	0.0066		5.96
PM10	0.0066		5.96
SO2	0.00060		0.54
Nox		0.06	54.16
CO		0.061	55.06
VOC	0.0021		1.90
1,3 butadiene	4.30E-07		3.88E-04
acetaldehyde	4.00E-05		3.61E-02
acrolein	6.40E-06		5.78E-03
benzene	1.20E-05		1.08E-02
ethylbenzene	3.20E-05		2.89E-02
formaldehyde	7.10E-04		6.41E-01
naphthalene	1.30E-06		1.17E-03
propylene oxide	2.90E-05		2.62E-02
toluene	1.30E-04		1.17E-01
xylene	6.40E-05		5.78E-02
Total HAP:			0.93
Highest HAP (formaldehyde):			0.64

Catalytic heaters (ID No. ES-S2) and Fuel heaters (ID No. ES-S3)

Emissions from the natural gas-fired heaters are shown in the attached spreadsheets A and B.

Emergency generator (ID No. I-ES-S1)

Emissions from the natural gas-fired emergency generator are shown in the attached spreadsheet C. Emissions are estimated using manufacturer data and AP-42 Table 3.2-2. Per DAQ policy, emissions are estimated using 500 hours of operation.

Fugitive equipment leaks (ID No. I-ES-FUG1)

Emissions from equipment leaks are calculated using information and factors from 40 CFR Part 98, Subpart W, Table W-1B.

Denisty of NG	0.01968	kg/scf
VOC content	0.05	%
HAP content	0.008	%
Equipment	Compressors	Heaters
Number of valves	12	14
Number of connectors	57	65
Number of open-ended lines		2
Number of pressure relief valves		1
Leak Rates		
Valves	0.027	kg/scf
Connectors	0.003	kg/scf
Open-ended lines	0.061	kg/scf
Pressure relief valves	0.04	kg/scf
Emissions	VOC	HAP
	(ton/yr)	(ton/yr)
Valves	0.0067	0.0011
Connectors	0.0035	0.00056
Open-ended lines	0.0012	0.00019
Pressure relief valves	0.0004	0.00006
Totals:	0.012	0.0019

Condensate Tank (ID No. ES-S7)

Emissions from the condensate tank are estimated using the E & P Tanks program. The emissions were calculated over 8760 hours per year.

VOC = 0.67 ton/yr
Total HAP = 0.030 ton/yr
Highest HAP (hexane) = 0.045 ton/yr

Facility blowdown operations (ID No. I-ES-BD)

The application estimates that 1,218,658 cubic feet of natural gas will be processed during the blowdown operations. The following characteristics were presented in the application:

Density of VOC: 0.0235 kg/scf
VOC content: 5%
Density of HAP (n-hexane): 0.1004 kg/scf
HAP content: 0.008%

VOC: (1,218,658 scf/yr) x (0.0235 kg/scf) x (0.05) x (2.20462 lb/kg) x (ton/2000 lb) = 1.58 ton/yr
HAP: (1,218,658 scf/yr)x(0.1004 kg/scf)x(0.00008)x(2.20462 lb/kg)x(ton/2000 lb) = 0.011 ton/yr

Facility-wide								
Source	PM	PM10	SO2	NO x	CO	VOC	Highest HAP*	Total HAP
	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)
turbines	5.96	5.96	0.54	54.16	55.06	1.9	0.64	0.93
cat. Heaters	0	0	0	0.41	0.35	0.02	0.00031	0.0078
fuel heaters	0	0	0	0.66	0.56	0.04	0.00049	0.012
generator	0.02	0.02	0.0012	1.23	1.52	0.21	0.1	0.14
condesate tank						0.67	0	0.03
fugitive leaks						0.012	0	0.0019
blowdown						1.58	0	0.011
Totals:	5.98	5.98	0.54	56.46	57.49	4.43	0.74	1.13
*formaldehyde								

5. Facility-wide Applicability to the Following:

a. NSPS

The emergency generator (ID No. I-ES-S1) is subject to NSPS Subpart JJJJ.

The turbines (ID Nos. ES-1 through ES-4) are subject to NSPS Subpart KKKK.

The turbines (ID Nos. ES-1 through ES-4) are not subject to NSPS Subpart GG because they are subject to the requirements of Subpart KKKK.

The collection of fugitive emissions components at the compressor station are subject to NSPS Subpart OOOOa.

b. NESHAPS

The emergency generator (ID No. I-ES-S1) is subject to NESHAP Subpart ZZZZ.

c. PSD increment tracking

This facility will be a minor PSD source. For PSD increment tracking purposes, Cleveland County has been triggered for PM10 and sulfur dioxide. With this greenfield application, emissions of both pollutants will increase.

PM10: 0 lb/hr (heaters) + 0.079 lb/hr (generator) + 1.36 lb/hr (turbines) = 1.44 lb/hr

SO2: 0 lb/hr (heaters) + 0.0046 lb/hr (generator) + 0.12 lb/hr (turbines) = 0.12 lb/hr

The increase for PM10 is greater than 1 lb/hr and will be recorded.

d. Attainment status

This facility is located in an area that is either in attainment or unclassifiable for all pollutants.

e. 112(r)

This facility does not appear to be subject to this regulation.

6. Facility-Wide Air Toxics:

This facility is subject to toxics per 2D .1100 (Item 4.h.) and 2Q .0711 (Item 4.l.).

7. Facility Compliance Status:

This facility has not been inspected because this is the facility's first permit. Compliance will be determined during the initial inspection.

8. Facility Emissions Review:

Based on the potential emissions shown below, this facility is classified as a small facility.

Facility Emissions Summary

Pollutant	Potential Emissions After Controls/Limitations (tpy)	Potential Emissions Before Controls/Limitations (tpy)
TSP	5.98	5.98
PM10	5.98	5.98
SO_2	0.54	0.54
NO_x	56.46	56.46
VOC	4.43	4.43
CO	57.49	57.49
Highest HAP (formaldehyde)	0.74	0.74
Total HAP	1.13	1.13

9. Stipulation Changes to Permit:

Conditions for 2D .0516 (sulfur dioxide), 2D .0521 (visible emissions), 2D .0524 (NSPS Subpart KKKK, NOx and SO2), 2D .0535, 2D .0540 (non-process fugitive emissions), 2D .0605 (subsequent testing), 2D .0611 (SoLoNOx I&M), 2D .1100 (modeled toxics), 2D .1806 (odors), 2Q .0711 (triggered toxics), and a place holder for federal rules applicable to exempt sources for NSPS Subpart JJJJ, NSPS Subpart OOOOa and NESHAP Subpart ZZZZ will be added to the permit.

10. Exempt Source Review:

Source	Exemption Regulation	Source of TAPs?	Source of Title V Pollutants?
I-ES-S1 - natural gas-fired emergency generator (750 kilowatt capacity) subject to NESHAP Subpart ZZZZ and NSPS Subpart JJJJ	2Q .0102 (h)(5)	Yes	Yes
I-ES-FUG1 - equipment leaks subject to NSPS Subpart OOOOa	2Q .0102 (h)(5)	No	No
I-ES-BD - station blowdown operations	2Q .0102 (g)(14)(B)	Yes	Yes

The facility will also have three wash tanks that are exempt per 2Q .0102(g)(14)(A), sources that do not emit any regulated pollutants. However, sources with that exemption are not included in the exempt list of sources per DAQ policy.

11. Control Device Evaluation:

There are no control devices being added with this application.

12. Emission Inventory Review:

An emissions inventory is not required with this application.

13. Recommendations:

MRO will issue Air Permit No. 10561R00 to PSNC - Kings Mountain Compressor Station, Cleveland County, North Carolina.

DFH