west virginia department of environmental protection

Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Phone: (304) 926-0475

Austin Caperton, Cabinet Secretary
dep.wv.gov

ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2896F
Plant ID No.:	051-00142
Applicant:	Blue Racer Midstream, LLC
Facility Name:	Natrium Extraction and Fractionation Plant
Location:	Near Proctor, Marshall County
NAISC/SIC Code:	211130/1321
Application Type:	Modification
Received Date:	August 6, 2018
Engineer Assigned:	Joe R. Kessler
Fee Amount:	$4,500
Date Received:	August 7, 2018 (Original); January 16, 2019 (Revised)
Complete Date:	February 4, 2019
Due Date:	May 5, 2019
Applicant Ad Date:	August 7, 2018
Newspaper:	*Moundsville Daily Echo*
UTM's:	Easting: 512.1 km Northing: 4,400.8 km Zone: 17
Latitude/Longitude:	39.75996/-80.86101
Description:	Modification to primarily remove equipment/processes from the permit that were never constructed, to revise/clarify the configuration and emissions of existing equipment, and, most substantively, to add four (4) additional cryogenic processing plants and associated support equipment that will raise plant capacity to a maximum of 1,725 mmscf/day.

On December 19, 2011 Dominion Natrium, LLC (Dominion) was issued Permit Number R13-2896 for the construction of the 400 mmscf-natural gas/day Natrium Extraction and Fractionation Plant. The facility began operation on May 15, 2013. Since that time, the facility has been the subject of both permitting and compliance/enforcement actions. The following summarizes these actions:

- On June 10, 2013, permit application R13-2896A was submitted for the installation of two (2) heaters and a Vapor Recovery Unit (VRU). However, this application was withdrawn on July 23, 2013 due to its submission by Blue Racer Natrium, LLC, who had not previously transferred the permit into their name;

- On July 31, 2013, Dominion agreed to a Consent Order (CO-R13-E-2013-12) concerning (primarily) the operation of the original elevated flare. As part of the Orders for Compliance, Dominion was required to submit a permit application to "correct all deficiencies and violations with Permit R13-2896;"

- On September 24, 2013, Permit Number R13-2896 was transferred to "Blue Racer Natrium, LLC;"

- On December 26, 2013, Permit Number R13-2896B was issued to Blue Racer Natrium, LLC to replace the existing flare and make other changes pursuant to requirements of the Consent Order. Additionally, and unrelated to the Consent Order, the permit authorized installation of two (2) process heaters;

- On February 21, 2014 the permit was transferred to "Blue Racer Midstream, LLC." Formed in December 2012, Blue Racer Midstream, LLC (Blue Racer) is a joint venture between Caiman Energy II, LLC and Dominion;

- On February 26, 2014 Blue Racer submitted permit application R14-0031 to relax the Greenhouse Gases (GHGs) synthetic minor limits that were part of R13-2896. This required Blue Racer to undergo Prevention of Significant Deterioration (PSD) review under 45CSR14 for the requested changes. However, on June 23, 2014, in *Utility Air Regulatory Group v. Environmental Protection Agency*, the Supreme Court (SCOTUS) ruled that GHGs alone could no longer define a source as a "major stationary source" or a modification as a "major modification" for the purposes of PSD review. Therefore, consistence with EPA guidance and with the concurrence of the DAQ, on August 7, 2014, Blue Racer withdrew permit application R14-0031 and resubmitted a request for the changes under permit application R13-2896C as a minor modification;

- On November 6, 2014, Permit Number R13-2896C was issued to Blue Racer for the removal of the annual fuel usage limit on the 216.7 mmBtu/hr Hot Oil Heater (S001) and addition of the following: four (4) new 61.6 mmBtu/hr heaters, a second fractionation train consisting of two (2) de-ethanizer towers, an ethane amine treating unit, a depropanizer, and a debutanizer, and increasing various facility storage capacities. This modification increased the capacity of the plant to 460 million standard cubic feet per day (mmscfd);

- On January 16, 2015, Blue Racer agreed to a Consent Order (CO-R13-E-2015-3) to replace the existing elevated flare with a ground flare system to correct the on-going visible emissions problems with the existing flare. As part of the Orders for Compliance, Blue Racer was required to "submit a technically and administratively complete permit application (Rule 13 and/or Rule 14) for the construction, installation, and operation of a ground flare system within ninety (90) days of the effective date of this Order." This Consent Order allowed Blue Racer to begin construction of the new ground flare prior to issuance of a pre-construction permit;

- On November 2, 2015, pursuant to the requirements of Consent Order CO-R13-E-2015-3, Permit Number R13-2896D was issued to Blue Racer for the replacement of the existing elevated flare with a ground flare system; and

- On January 19, 2016, Permit Number R13-2896E was issued to Blue Racer to authorize the addition of one (1) Cryogenic Train which includes one (1) Regeneration Gas Heater, one (1) Cryogenic HMO Heater, and two (2) Glycol Dehydration Units (GDU). Additionally, to update the emissions from the previously installed GDU to be routed to a vapor combustor and the addition of piping and fugitive components. This modification increased the capacity of the plant to 690 mmscfd.

DESCRIPTION OF PROCESS/MODIFICATIONS

Existing Facility

The Natrium Extraction and Fractionation Processing Plant is an existing 690 million standard cubic feet per day (mmscfd) natural gas processing plant with natural gas liquids (NGL) processing capability (utilizing three (3) permitted cryogenic plants) located approximately four (4) miles northwest of Proctor, Marshall County, WV along the east bank of the Ohio River. The facility has the capability to both process large amounts of raw natural gas (by separating out the liquids, drying it, and removing impurities) and to fractionate NGLs into usable components. NGLs are generally defined to be the lighter liquid components entrained in the gas stream as opposed to "condensate" which is the heavier (and with a higher boiling point) organic compounds that are easily separated at the well-head and usually sent to a refinery. NGLs - both after separation from gas pipelined to the site, as well as NGLs sent to the site via pipeline, truck, railcar, or barge - are separated (or "fractionated") into their constituent organic compounds. The compounds ethane, propane, butane, i-butane, and natural gasoline are produced by the fractionation process.

Proposed Modifications

Blue Racer is now proposing to make the following substantive modifications at the Natrium facility:

- Installation of three (3) additional 230 mmscfd and one (1) 345 mmscfd natural gas cryogenic processing plants that will raise plant capacity to a maximum of 1,725 mmscfd;

- Installation of three (3) additional 9.7 mmBtu/hr and one (1) 19.28 mmBtu/hr natural gas-fired Regeneration Gas Heaters (S036, S044, S048, and S040, respectively);

- Installation of three (3) additional 26.3 mmBtu/hr and one (1) 54.67 mmBtu/hr natural gas-fired Cryogenic HMO Heaters (S037, S045, S049, and S041, respectively);

- Installation of two (2) 61.6 mmBtu/hr natural gas-fired Hot Oil Heaters (S052 and S053);

- Installation of one (1) natural gas-fired 10.09 MMBtu/hr stabilizer heater (S056);

- Installation of one (1) 230 mmscf/day Glycol Dehydration Unit (GDU) that includes a 3.0 mmBtu/hr natural gas-fired Glycol Reboiler (S032 and S029);

- Installation of one (1) 129 mmscf/day ethane amine treater (S054) and associated vapor recovery unit to control emissions from regenerator vent;

- Installation of one (1) 21,000 gallons slop storage tank (TK-2906), one (1) 63,000 gallons produced water storage tank (TK-2907), three (3) 1,260,000 gallons natural gasoline storage tanks (TK-2802, TK-4802, TK-6802), two (2) 714,000 gallons natural gasoline storage tanks (TK-3802, TK-5802), one (1) 4,200,000 gallons refrigerated propane storage tank (TK-7802), four (4) pressurized spherical NGL storage tanks (US-2800, US-2801, US-2804, US-2805), and four (4) pressurized butane bullet tanks (V-2905, V-2915, V-2925, V-2935);

- Installation of up to an aggregate 16,000 horsepower (hp) of one or more natural gas-fired emergency generators;

- Adding to the permit additional groupings of piping and fugitive components: FUG AREA 4, FUG AREA 5, FUG AREA 6 and FUG AREA 7;

- Many revisions/clarifications to emissions and configuration of existing equipment as detailed in the permit application (pages 4 and 5); and

- Removal of various equipment from the permit that were never constructed as detailed in the permit application (pages 4 and 5).

Post-Modification Process Description

The following is a description of the Natrium Extraction and Fractionation Processing Plant after the proposed modifications described above would be completed.

Inlet Gas/Liquids Separation and Liquids Handling

Natural gas from regional gas wells is, after removal of condensate and water close to the well-head, sent to the facility for processing. Inlet gas first passes through horizontal separators, or slug catchers, which separate entrained liquids from the inlet gas. The liquids are first treated in the stabilizer (application of heat provided by the hot oil heaters), where the lighter components are removed and combined with the separated inlet gas for processing. The remaining liquid components are then either routed to one of the two (2) 63,000 gallon Produced Water Tanks (TK-907, TK-2907), one of the six (6) Natural Gasoline Storage Tanks (TK-802, TK-2802, TK-3802,TK-4802, TK-5802, TK-6802), or routed back into the Debutanizer input stream.

Natural Gas Processing

After liquids separation, the inlet gas is diverted into one of six (6) 230 mmscf/day or one (1) 345 mmscf/day cryogenic gas processing trains that mirror each other (the following is an accurate description of each train). In each train, the gas is compressed by electric compressors (no combustion emissions). Each compressor is equipped with a blowdown vent through which a small amount of natural gas is emitted during shutdown (i.e., for decompression, which is required for safety purposes). These emissions are routed to the ground flare (C004A) for combustion.

After compression, the gas is fed into one of two (2) triethylene glycol (TEG) dehydration units (GDU). The glycol dehydration system (S006, S032) is used to remove any remaining water from the gas. Cryogenic Plant 1 and 2 share a single GDU (S006) with two contactors with a total capacity of 460 mmscf/day, while Cryogenic Plant 3 utilizes a 230 mmscf/day GDU (S032). The proposed Cryogenic Plants 4 through 7 will employ molecular sieve dehydration systems only. Glycol dehydration is a liquid desiccant system used for the removal of water from natural gas. In the GDU, lean, water-free glycol is fed to the top of an absorber (known as a "contactor") where it is contacted with the wet natural gas stream. The glycol removes water from the natural gas by physical absorption and is carried out the bottom of the column.

At the Natrium facility, in each GDU, the rich glycol (water saturated) solution is routed to a flash tank, where light-end VOCs flash-off from the solution.

Still Vent and flash tank vapors generated in the S006 GDU are routed to the 216.7 mmBtu/hr hot oil heater (S001) as fuel (the combustion in the hot oil heater is conservatively estimated to have a VOC destruction and removal (DRE) of 98%). The rich glycol is then heated in the glycol regenerator to release water from the solution prior to being routed back into the dehydration process. Heat for the S006 GDU is provided by the hot oil heater (S001).

As stated above Cryogenic Plant 3 will utilize a 230 mmscf/day GDU, where emissions from the still vent and flash tank can be routed either to a dedicated vapor combustor (C009) or to the hot oil heater (S001) for combustion as fuel. Blue Racer is permitting the S032 GDU assuming that all waste gas is routed to the vapor combustor on a continuous basis, to be conservative, but would like to keep the flexibility to route the waste gas to the hot oil heater (S001) as fuel. Heat for the proposed GDU (S032) is provided by a 3.0 mmBtu/hr Reboiler (S029). Liquids removed in the post-dehydration process condenser are routed to the 21,000 gallon Slop Tanks (TK-906, TK-2906).

From the GDUs, the gas is routed to the molecular sieve dehydration unit, where the water content is reduced further. The 216.7 mmBtu/hr Hot Oil Heater (S001), five (5) 9.7 mmBtu/hr (S012, S024, S036, S044, S048) , and one (1) 19.28 mmBtu/hr (S040) natural gas-fired Mole Sieve Regenerator Heaters are used to heat a small amount of natural gas that is slip-streamed from the residue line as needed to regenerate the beds. The wet gas is then routed back into the inlet process stream. The molecular sieve unit does not have vents to atmosphere. The residue gas from the beds that are regenerated is routed back to the residue gas stream. Therefore, the only emissions from this unit are associated with fugitive piping/equipment leaks and combustion-related emissions from the heaters. Collected water is sent to the one of the Produced Water Tanks.

After the molecular sieve dehydration unit, the propane-cooled cryogenic units remove heavier components to produce NGLs by cooling the stream and reducing the stream pressure. Cryogenic Plant 1 utilizes heat from the Hot Oil Heater (S001), and the remaining cryogenic plants have a dedicated 26.3 mmBtu/hr (S013, S026, S037, S045, S049) or 54.67 mmBtu/hr (S041) natural gas-fired heat medium oil (HMO) heater. The natural gas leaving the cryogenic units is lean and dry (i.e., pipeline quality), and it is compressed via electric-driven residue gas compressors and shipped off site via pipeline. Collected NGLs can be transferred back to one of the Natural Gasoline Storage Tanks or directly into the deethanizers or depropanizers of the NGL fractionation plants. The only emissions from these cryogenic units are associated with fugitive piping/equipment leaks and the associated HMO heaters.

NGL Fractionation

NGL leaving the cryogenic units or received on-site as raw material feed is fed to a series of trayed columns for separation into constituent organic products identified above. The facility contains two (2) fractionation lines with a total of three (3) deethanizer towers, two (2) depropanizers, and (2) debutanizers, and a butane splitter. At the bottom of each column is a reboiler that is heated by the hot oil systems which consist of one (1) 216.7 mmBtu/hr (S001) and six (6) 61.58 mmBtu/hr (S016, S017, S018, S019, S052, S053) Hot Oil Heaters. As the NGL stream enters a column in the middle, the reboiler vaporizes a portion of the feed to produce stripping vapors rising inside the column. This stripping vapor rises up through the column contacting down-flowing liquids allowing for the fractionation of the liquids. Vapor leaving the top of the column enters a condenser where heat is removed by a cooling medium and the vapor condensed. Liquid is returned to the column as reflux to limit the loss of heavy components overhead. The product leaving the lower part of the column has the highest boiling point, whereas the hydrocarbon leaving the top of the column has the lowest boiling point. This basic system is used in all towers to separate lighter organic components from heavier ones.

Ethane product may be further treated in one of the two (2) 129 mmscf/day Ethane Amine Units (S011, S054) before being compressed and shipped off site via pipeline. In these units, amine contactors are used to remove CO_2 and the trace amounts of hydrogen sulfide (H_2S) from the ethane product stream. Small amounts of hydrocarbons may also be absorbed in this process as well. The saturated (rich) amine from the contactors enters a flash tank where gaseous vapors are flashed and routed to the ground flare (C004A). After the flash tank, the liquid stream (rich amine) is routed to an amine regenerator, where heat from the hot oil system vaporizes the remaining CO_2, H_2S and hydrocarbons from the rich amine stream. The lean amine is returned to the amine contactors for reuse. The waste gas from S011 is vented to the atmosphere, and the waste gas from S054 is captured by a vapor recovery unit (VRU) and routed to the Plant's discharge line. The amine unit vent streams are primarily (~97%) CO_2, with water and trace amounts (~0.5%) of hydrocarbons. The remaining separated streams (propane, butanes, and natural gasoline) are sent to appropriate product storage tanks.

Product Storage and Loadout

The facility will utilize the following product storage tanks:

Table 1: Product Storage Tanks

Emission Unit ID	Description	Material	Size (Gallons)	Control Device
TK-802	Natural Gasoline Storage Tank	Natural Gasoline	714,000	Natural Gas Blanket(1)
TK-2802	Natural Gasoline Storage Tank	Natural Gasoline	1,260,000	Natural Gas Blanket(1)
TK-3802	Natural Gasoline Storage Tank	Natural Gasoline	714,000	Natural Gas Blanket(1)
TK-4802	Natural Gasoline Storage Tank	Natural Gasoline	1,260,000	Natural Gas Blanket(1)
TK-5802	Natural Gasoline Storage Tank	Natural Gasoline	714,000	Natural Gas Blanket(1)
TK-6802	Natural Gasoline Storage Tank	Natural Gasoline	1,260,000	Natural Gas Blanket(1)
TK-7802	Refrigerated Propane Storage Tank	Propane	4,200,000	VRU
n/a	Spherical NGL Products Storage Tank (US-800)	NGL Products	2,142,000	None(2)
n/a	Spherical NGL Products Storage Tank (US-801)	NGL Products	865,200	None(2)
n/a	Spherical NGL Products Storage Tank (US-804)	NGL Products	865,200	None(2)
n/a	Spherical NGL Products Storage Tank (US-805)	NGL Products	865,200	None(2)
n/a	Spherical NGL Products Storage Tank (US-2800)	NGL Products	2,142,000	None(2)
n/a	Spherical NGL Products Storage Tank (US-2801)	NGL Products	865,200	None(2)
n/a	Spherical NGL Products Storage Tank (US-2804)	NGL Products	865,200	None(2)
n/a	Spherical NGL Products Storage Tank (US-2805)	NGL Products	865,200	None(2)
n/a	Eight (8) Pressurized Horizontal NGL Bullet Tanks (V-1905, V-1915, V-1925, V-1935, V-2905, V-2915, V-2925, V-2935)	NGL Products	90,000	None(2)

(1) Tank uses a natural gas blanket to prevent emissions of natural gasoline. Working/breathing losses of natural gas blanket are collected and sent to Hot Oil Heater as a supplemental fuel.

(2) These tanks are pressurized to prevent working/breathing losses and, therefore, have no emissions. However each is connected to the Ground Flare (C004A) in case the tank becomes depressurized due a malfunction.

To remove products from the facility, Blue Racer utilizes truck, railcar, and barge loadouts (S008, S033). The loadouts will employ vapor balance (closed system) to route all displaced vapors back to the tanks when loading propane, isobutane, butanes, natural gasoline, or NGLs to truck or railcar and when loading propane to barge. Natural Gasoline barge loading operations, and Slop Oil, Produced Water, and Gasoline Dispenser truck loading operations are not required to use vapor balance. The following table details the material loading/unloading operations:

Table 2: Material Loading/Unloading Operations(1)

Emission Unit ID	Material Loaded/Unloaded	Truck (gpm)	Rail (gpm)	Barge (gpm)
Material Loading				
S008	Propane	3,600 (vb)	4,000 (vb)	4,000 (vb)
	Isobutane			No
	Butane			No
	NGL			No
	Natural Gasoline	600 (vb)	2,000 (vb)	n/a
S033		n/a	n/a	4,000
S015	Slop Oil/Produced Water	150	No	No
L-1	Gasoline Dispenser	1	No	No
Material Unloading				
S055	Pressurized NGL/Condensate	3,600	n/a	No

(1) The permittee is not authorized to conduct the loading/unloading operations marked "No." Those operations marked with "(vb)" are required to use vapor balance.

Flaring

The facility will utilize two (2) flares: (1) a non-assisted 19,800,000 scf/hr Callidus CAL-MP staged, multi-point ground flare system (S004A:C004A), and (2) a 72,000 scf/hr non-assisted flare (S034A:C034) for control of potential propane emissions during all times of propane/butane pig trap operations. The ground flare shall be used to control of potential emissions from maintenance events, equipment blowdowns, pressure relief valves, and other controlled sources. The flares will each have a minimum permitted VOC DRE of 98.0% and will utilize a 1.629 mmBtu/hr natural gas-fired pilot light.

Diesel-Fired Emergency Fire-Pump Engines

The facility utilizes two (2) Caterpillar C18 700 horsepower (hp) emergency diesel-fired (S002, S003) water pumps in case of fire. These engines are operated in non-emergency situations less than 100 hr/yr for testing and maintenance to ensure reliability during emergency situations.

Emergency Generators

The facility is authorised to use up to an aggregate 16,000 horsepower (hp) of one or more natural gas-fired emergency generators.

Fugitive Emissions

Seven (7) areas of fugitive emissions (FUG AREA 1 through 7) consisting of VOC/HAP losses through piping and components vapor leaks will be designated for the facility. As of this writing, these areas are designated for the following sources:

Table 3: Fugitive Area Designations

Fugitive Area Designation	Plant Area
FUG AREA 1	Cryo 1 (excluding Demethanizer 1) Cryo 2
FUG AREA 2	Demethanizer 1 Frac 2
FUG AREA 3	Cryo 3
FUG AREA 4	Frac 1, Cryo 4
FUG AREA 5	Cryo 5
FUG AREA 6	Cryo 6
FUG AREA 7	Cryo 7

SITE INSPECTION

On September 17, 2014, the writer conducted an announced site inspection of the Natrium Extraction and Fractionation Plant. The primary contact at the facility was Mr. Sean Wilson, Director EHS for Caimen Energy. The facility has received multiple inspections from the Compliance/Enforcement Section since that time including the last "Full-on-Site" inspection by DAQ Inspector Mr. Jamie Jarrett on August 8, 2016. On December 19, 2018, the writer visited the facility for meetings with Blue Racer personnel but did not perform a full site inspection. An additional full site inspection by the writer for this modification was deemed as not necessary.

AIR EMISSIONS AND CALCULATION METHODOLOGIES

Blue Racer, in Attachment N of the permit application, provided a revised post-modification facility-wide potential-to-emit (PTE) for the Natrium facility and calculations for all equipment and processes at the facility. The following section will summarize the air emissions and emissions calculation methodologies used by Blue Racer to calculate the potential-to-emit of new or modified emission units only. For a detailed review of the emissions calculations, see Attachment N of the permit application.

Hot Oil Heaters

Potential emissions from the proposed new Hot Oil Heaters (P052, P053) were based on emission factors provided by the unit's vendor (CO and NO_x), as given in AP-42, Section 1.4 - "Natural Gas Combustion" (AP-42 is a database of emission factors maintained by USEPA), and on material balance equations (SO_2). Hourly emissions were based on the maximum design heat input (MDHI) of each heater (61.58 mmBtu/hr). Individual unit annual emissions were based on 8,760 hours of operation per year. A fuel gas heat content of 1,020 Btu/scf was used in the calculations. Emissions of SO_2 were based on a maximum sulfur content of the fuel gas of 4 ppm.

Additionally, the NOx emission factor of the 216.7 mmBtu/hr Hot Oil Heater (P001) was revised from 0.026 lb/mmBtu to 0.045 lb/mmBtu to reflect real-time performance data collected by the required (by 40 CFR 60, Subpart Db) Continuous Emissions Monitoring System (CEMS).

Other Process Heaters

Potential emissions from the proposed new five (5) Regeneration Gas Heaters (P024, P036, P040, P044, P048), five (5) Cryogenic HMO Heaters (P026, P037, P041, P045, P049), the one (1) Glycol Reboilers (P029), and the one (1) Stabilizer Heater were based on emission factors as given in AP-42, Section 1.4 - "Natural Gas Combustion." Maximum hourly emissions were based on the maximum design heat input (MDHI) of each heater. Individual unit annual emissions were based on 8,760 hours of operation per year. A fuel gas heat content of 1,020 Btu/scf was used in the calculations.

Ethane Amine Regenerator Units

The uncontrolled emissions from the revised (P005) and proposed new ethane amine regenerator vent (P054) was calculated by using the ProMax Simulation Software. ProMax software is chemical process simulator for design and modeling of amine gas treating and glycol dehydration units. Based on a detailed input gas analysis and the components of the facility, the software can simulate and model the inputs and outputs of the system. The waste gas from Unit S011 is vented to the atmosphere, and the waste gas from Unit S054 is captured by a vapor recovery unit (VRU) and routed to the Plant's discharge line for a minimum of 95% of the time it is in operation. Blue Racer provided an Excel output file of the ProMax run on the amine regenerator vents that confirm the emissions from the new unit.

Glycol Dehydrator Unit Emissions

Uncontrolled VOC and HAP emissions from the proposed new and revised existing GDU Regenerator Still Vents/SDU Flash Tanks (P001, P032) were based on the emissions calculation program GRI-GLYCalc Version 4.0. GRI-GLYCalc is a well-known program for estimating air emissions from glycol dehydration units using TEG. Included in the application is a copy of the appropriate GLY-Calc analysis sheets. Input values to GLYCalc for the proposed new GDU (S032) are based on inlet contactor gas sampling done at Natrium on April 10, 2014 and April 19, 2017. For the proposed new GDU (S032), the per-pollutant worst-case uncontrolled emissions from each

run were used in determining the PTE. For the revised GDU (S006), only the emissions used with the more recent gas analysis was used. Also included in the application is a copy of each gas sampling tests.

The calculated uncontrolled emissions were adjusted with an applied 10% safety factor and then controlled emissions (as given in Attachment N) were based on a maximum 2% emissions pass-through in the Hot Oil Heater and the Vapor Combustor. It is important to note that the controlled emission rate given in the GLYCalc report factors in use of a BTEX condenser. However, that control device is not required to be used at the facility and is, therefore, not taken credit for in determining the PTE of the GDUs.

Each Glycol Dehydration Unit (S006, S032) shall be designed and operated to route both still vent and flash tank vapors from the flash tank and regeneration still vent to the Hot Oil Heater (S001) as fuel, or for S032, also to the unit's vapor combustor (V003: C009) for control. While only trace amounts of VOCs should pass through the Hot Oil Heater without being combusted, a DRE of 98% was used for both the Hot Oil Heater and the Vapor Combustor (this is the basis for calculating the PTE on a 2% pass-through).

Ground Flare Combustion Exhaust

Three (3) sources of air emissions occur at the Ground Flare (S004A): VOC/HAP emissions that pass-through the units uncombusted, the products of combusting the organic vapors sent to the units for destruction, and the products of combustion of the 1.629 mmBtu/hr natural gas-fired pilot lights. This section details the products of combustion generated at the units (the pass-through emissions are discussed above under the Waste Gas Venting and below in the Pigging Sections, respectively). Uncontrolled combustion exhaust emissions from both sources are based on emission factors (CO and NO_x) as given in Texas Commission on Environmental Quality's (TCEQ) "Flares and Vapor Oxidizers" Report (RG-109: pp. 19), on AP-42, Section 1.4 (particulate matter, formaldehyde, and total HAPs), and on material balance (SO_2).

Maximum hourly emissions are based on the estimated worst-case short-term plant-wide blowdown scenario. This scenario is estimated to result in a maximum flow rate of waste gases to the flare of 3,333,280.7 scf/hr (calculated to have a total heat content of 11,154.97 mmBtu/hr). Similarly, the annual emissions are based on an estimated worst-case annual waste-gas volume of 52.34 mmscf (calculated to have a total heat content of 83,207.60 mmBtu/hr). The potential sources of waste gas are: purge gas, pigging, blowdowns, purges from the closed vent system, irregular process vents, and the ethane treater (S011 and S054) flash tanks.

Vapor Combustor/ Pig Trap Flare Combustion Exhaust

Two (2) substantive sources of air emissions occur at the Vapor Combustor (V003) controlling emissions from the GDU (S032) and the proposed Pig Trap Flare (C034): VOC/HAP emissions that pass-through the units uncombusted and the products of combusting the organic vapors sent to the units for destruction. This section details only the products of combustion

generated at the units (the pass-through emissions are discussed above under the GDU Section and below in the Pigging Sections, respectively). The contribution of combustion emission from the small natural-gas pilot lights for each unit can be disregarded.

Vapor Combustor

Emissions (CO and NO_x) from the products of combustion at the Vapor Combustor (V003) are primarily based on emission factors as given in Texas Commission on Environmental Quality's (TCEQ) "Flares and Vapor Oxidizers" Report (RG-109: pp. 19). These emission factors are generally accepted for estimating products of combustion from flares/vapor combustors at oil and gas processing facilities when combusting high BTU gas streams. Additional emissions (particulate matter, formaldehyde, and total HAPs) were based on emission factors given under AP-42 Section 1.4. While Section 1.4 of AP-42 is used for estimating emissions from boilers combusting natural gas, in the absence of other factors, it can be used to conservatively estimate the nominal amounts of expected emissions from various pollutants from vapor combustors. Hourly emissions from the vapor combustor were based on an hourly heat input of 5.56 mmBtu/hr and annual emissions were based on the calculated maximum annual heat input of the gases sent to each unit of 48,671.82 mmBtu/yr.

Pig Trap Flare

Emissions from the products of combustion at the Pig Trap Flare (P034) were based on emission factors as given in AP-42, Section 1.5 - "Liquified Petroleum Gas Combustion." A normalized propane heat content of 91,500,000 Btu/10^3 gallons was used in the calculations. The amount of waste propane gas sent to the flare is based on the maximum of one (1) propane pigging event in an hour and up to a maximum of twelve (12) propane pigging events per year.

Waste Gas Venting

Waste gas vented from various areas of the plant due to regular operations or during planned and unplanned events (not malfunctions, however, that would qualify as an "Act of God" under Section 3.3 of the draft permit) are collected and sent to the ground flare for destruction. The ground flare has a minimum organic VOC/HAP DRE of 98.0%. Maximum hourly VOC/HAP emissions are based on the estimated worst-case short-term plant-wide blowdown scenario. This scenario is estimated to result in a maximum flow rate of waste gases to the flare of 3,333,280.7 scf/hr (calculated to have a total heat content of 11,154.97 mmBtu/hr). Similarly, the annual emissions are based on an estimated worst-case annual waste-gas volume of 52.34 mmscf (calculated to have a total heat content of 83,207.60 mmBtu/hr). The potential sources of waste gas are: purge gas, pigging, blowdowns, purges from the closed vent system, irregular process vents, and the ethane treater (S011 and S054) flash tanks.

Storage Tanks

Natural Gasoline Storage Tank

The new proposed natural gasoline storage tanks (TK-3802, TK-4802, TK-5802, and TK-6802) use a natural gas blanket to prevent loss of natural gasoline vapors to atmosphere.

Additionally, the fuel gas blanket prevents the potential ingress of atmospheric oxygen into the tank and mitigates the potential for a negative internal tank pressure to result in loss of tank integrity/tank collapse. The vapor recovery unit (VRU) installed on the tanks serves to allow breathing losses and working losses that result from tank loading and filling to return any potentially displaced vapors from the tank back to the Hot Oil Heater fuel system. The use of this natural gas blanket/VRU system will prevent any substantive VOC emissions from the new natural gasoline storage tank.

Pressurized Storage Tanks

The four (4) new pressurized NGL storage tanks (US-2800, US-2801, US-2804, US-2805) and the four (4) new 90,000 gallons pressurized NGL bullet tanks (V-2905, V-2915, V-2925, V-2935) will not, when correctly pressurized, have any emissions. In any scenario where the pressure is lost in the tanks, any vapors will be captured and sent to the ground flare for destruction. Any emissions associated with this scenario would be captured under the waste gas venting calculations.

Other Uncontrolled Storage Tanks

Uncontrolled emissions from other new or modified fixed roof storage tanks (TK-906, TK-2906, TK-2907) that are not pressurized or do not utilize a natural gas blanket are based on the equations found in EPA AP-42 Chapter 7. The total emissions from each fixed roof storage tank are the combination of the calculated "breathing loss" and "working loss." The breathing loss refers to the loss of vapors as a result of tank vapor space breathing (resulting from temperature and pressure differences) that occurs continuously when the tank is storing liquid. The working loss refers to the loss of vapors as a result of tank filling or emptying operations. Breathing losses are independent of storage tank throughput while working losses are dependent on throughput. Variables input into the equations are based on specific tank design and worst-case material properties where applicable. Maximum hourly and annual emissions are based on the maximum tank turnovers and annual throughput.

Material Loading/Unloading

Many different materials are loaded and unloaded at the Natrium Facility using trucks, railcars, and barge. Refer to Table 2 above for a detailed presentation of the different types of loading and unloading operations. Emissions from displaced vapors will only occur during those loading operations that do not use vapor balance. When utilizing vapor balance, all displaced vapors are collected and returned back to the appropriate storage tanks and no emissions occur. Therefore, emissions from displaced vapors only occur during natural gasoline barge loading, and Slop Oil, Produced Water, and Gasoline Dispenser truck loading. Additionally, pressurized loading/unloading of trucks and railcars will result in emissions when disconnecting the hose allowing a small amount of vapors to “puff” and scape.

Uncontrolled VOC/HAP emissions from the barge loading of natural gasoline (P033) were based on an emission factor (0.41 lbs-vapor/10^3 gallons loaded) developed by Blue Racer during performance testing. Worst case hourly emission were based on the maximum design capacity of the barge loading pumps (4,000 gpm). Annual emissions were based on a total annual loading of 408,240,000 gallons per year. All vapors emitted are assumed to be VOCs and HAP emissions are estimated based on the speciated weight percentages of HAPs in natural gasoline.

Uncontrolled VOC emissions from truck loading of Slop Oil, Produced Water, and Gasoline Dispenser (P015 and L-1) occur as displacement of vapors while loading. The emission factors (0.258 lbs-vapor/10^3 gallons loaded) used to generate the emissions of Slop Oil/Produced Water are based on the equation given in AP-42 Section 5.2-4. In this equation, Blue Racer used variables specific to the liquids loaded and to the method of loading (submerged fill). Worst-case hourly emissions were based maximum design capacity of the Slop Oil/Produced Water loading pump (150 gpm) and annual emissions were based on a total annual loading of 2,007,070 gallons per year. All vapors emitted are assumed to be VOCs and HAP emissions are expected to be negligible from these liquids.

Uncontrolled VOC emissions from truck loading of Gasoline Dispenser were based on an emission factor (12 lbs-vapor/10^3 gallons loaded) given in Table 5.2-5 of AP-42. Worst-case hourly emissions were based maximum design capacity of the Gasoline Dispenser loading pump (1 gpm) and annual emissions were based on a total annual loading of 10 gallons per year. All vapors emitted are assumed to be VOCs and HAP emissions from the small amount Gasoline loaded are expected to be negligible from this source.

Uncontrolled VOC/HAP emissions generated from the disconnection of pressurized lines during unloading of NGL/condensate and the loading of propane, butanes, and natural gasoline (to truck and rail) were based on the expected number of disconnects per hour and year and the specific characteristic of the gas in question. The amount of gas released per connection was based on the volume of gas in the end of the hose connection: 0.698 ft^3. For NGL/condensate unloading, 85% of the released vapors were estimated to be VOCs and HAP emissions are estimated based on the speciated weight percentages of HAPs in NGL/condensate. For propane, butanes, and natural gasoline, all vapors emitted are assumed to be VOCs and HAP emissions are estimated based on the speciated weight percentages of HAPs in the materials.

Pigging Operations

As noted above vapors associated with some pigging operations are sent to the Ground Flare for control (see Waste Gas Venting above). However, vapors from Pig Trap operations (S034) and many other pigging operations (S035) are not sent to the Ground Flare. Vapors from the Pig Trap are sent to a dedicated Pig Trap flare (C034) and the other pigging operations vent to the atmosphere without control (P035). The combustion exhaust emissions from the Pig Trap Flare were discussed above. However, while the minimum DRE of this flare is 98%, some pass-through VOC emissions will occur. These emissions will occur at the Pig Trap Flare (P034) and were estimated by Blue Racer using the worst-case hourly and annual propane flow rate due to the pigging and using the minimum DRE of 98%.

The emissions associated with the other uncontrolled pigging operations were based on worst-case individual pigging operation material balances with the assumption that all vapors were released to the atmosphere. Worst-case emissions were based on the expected maximum number of hourly and annual pigging events for each type of pigging operation.

Fugitive Emissions

Equipment Leaks

Blue Racer based their updated (FUG AREA 1, 2, and 3) and proposed new (FUG AREA 4 through 7) uncontrolled VOC and HAP equipment leak calculations on emission factors taken from the document EPA-453/R-95-017 - "Protocol for Equipment Leak Emission Estimates." Emission factors were, with only one exception (no emission factor was available for Pump Seals in Heavy Liquid Service), taken from Table 2-4: "OIL AND GAS PRODUCTION OPERATIONS AVERAGE EMISSION FACTORS (kg/hr/source)." As stated in the document, the average emission factor approach is "one accepted approach for estimating emissions" from components in service with the oil and gas industry. This method is most effective when used, as Blue Racer is using them, "for estimating emissions from a population of equipment."

Component counts were based on actual existing component counts where available and proposed component counts for new and modified equipment. As the provided emission factors are for Total Organic Compounds (TOCs), VOC, and HAP contents of the serviced materials were used to determine specific pollutant emissions.

Controlled emission rates per component types, and as based on the applicable statutory leak definition (of 10,000 or 500 ppm), were based on reduction percentages taken from Table 5-2 of EPA-453/R-95-017. Closed vent system gas and light liquid components are vented to the Ground Flare S004A and, therefore, any leaks from these components are controlled at a DRE of 98%, and not to the atmosphere as fugitive emissions. Emissions of these vapors would be accounted for as pass-through emissions in the Waste Gas Venting (see above).

Unpaved Haulroads

Blue Racer included in their application a revised estimate of fugitive emissions created by truck traffic (NGLs, other liquids deliveries/loadouts, and other commercial vehicles) at the facility. As these trucks travel on unpaved roads, Blue Racer used the equation given in Section 13.2.2 of AP-42 and appropriate variables to estimate potential emissions. Worst-case emissions were based on the estimated worst-case number of hourly and annual truck trips and average truck weights.

Emissions Summary

Based on the above estimation methodology as submitted in Attachment N of the permit application, the revised post-modification facility-wide emissions of the Natrium Extraction and Fractionation Plant is given in Attachment A. The change in annual facility-wide emissions as a result of the modifications evaluated herein is given in the following table:

Table 4: Change In Facility-Wide Annual Emissions

Pollutant	R13-2896E[(1)]	R13-2896F[(1)]	Change[(2)]
	tons/year	tons/year	tons/year
CO	131.71	233.75	102.04
NO_X	100.52	210.46	109.94
$PM_{2.5}$	18.90	29.47	10.57
PM_{10}	22.54	39.99	17.45
PM	33.69	72.16	38.47
SO_2	1.82	2.66	0.84
VOCs	75.30	388.98	313.68
HAPs	6.27	20.16	13.89

(1) R13-2896E emissions taken from R13-2896E Fact Sheet and R13-2896F emissions taken from Tables N-1 and N-2 of resubmitted Permit Application R13-2896F.

(2) This column represents the facility-wide change in total emissions including fugitives which is not the change in emissions evaluated for PSD applicability purposes. See the Regulatory Applicability section for discussion of potential PSD applicability under 45CSR14.

REGULATORY APPLICABILITY

The Blue Racer Natrium Extraction and Fractionation Plant is subject to a variety of substantive state and federal air quality rules and regulations. Each applicable rule, and Blue Racer's proposed compliance thereto, will be discussed in detail below with respect only to those emission units added or modified as part of this permitting action. Additionally, those rules that have questionable applicability but have been determined to not apply will also be discussed.

45CSR2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers.

45CSR2 "establishes emission limitations for smoke and particulate matter which are discharged from fuel burning units." A fuel burning unit is defined under 45CSR2 as any "furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer." Additionally, the definition of "Indirect Heat Exchanger" specifically excludes process heaters, which are defined as "a device that is primarily used to heat a material to initiate or promote a chemical reaction in which the material participates as a reactant or catalyst." Based on these definitions, the proposed new Regeneration Gas Heaters (S024, S036, S040, S044, S048) and the Glycol Reboiler (S029) are not subject to 45CSR2 as they are properly defined as process heaters. The proposed new two (2) 61.6 mmBtu/hr natural gas-fired Hot Oil Heaters (S052 and S053), the three (3) new 26.3 mmBtu/hr and one (1) new 54.67 mmBtu/hr natural gas-fired Cryogenic HMO Heaters (S037, S045, S049, and S041, respectively), and the one (1) new natural gas-fired 10.09 MMBtu/hr stabilizer heater (S056) are each defined as a fuel burning unit and are subject to 45CSR2. Each substantive 45CSR2 requirement is discussed below.

45CSR2 Opacity Standard - Section 3.1

Pursuant to 45CSR2, Section 3.1, each of the fuel burning units noted above are subject to an opacity limit of 10%. Proper maintenance and operation of the units (and use of natural gas as fuel) should keep the opacity of the units well below 10% during normal operations.

45CSR2 Weight Emission Standard - Section 4.1.b

The facility-wide allowable particulate matter (PM) emission rate for all of the non-exempt natural gas-fired heaters, identified as Type "b" fuel burning units, per 45CSR2, Section 4.1(b), is the product of 0.09 and the total aggregate design heat input of all the applicable units in million Btu per hour. As shown in Table 5 below, the maximum aggregate design heat input (short-term) of all of the non-exempt units (S001, S013, S016-S019, S026, S037, S041, S045, S049, S052, S053, and S056) will be 782.44 mmBtu/Hr. Using the above equation, the 45CSR2 facility-wide PM emission limit of the units will be 70.42 lb/hr. This limit represents filterable PM only and does not include condensable PM. The exemption of condensable PM is located within the 45CSR2 Appendix - which establishes compliance test procedures - by not requiring measurement of the condensable PM. The maximum potential hourly PM emissions during normal operations from the units (*including* condensables) is estimated to be 5.85 lb/hr. This conservative emission rate is 8.31% of the 45CSR2 limit.

Table 5: 45CSR2 Compliance Demonstration

Emission Unit ID	Fuel Burning Unit Description	Design Capacity (mmBtu/hr)	Fuel Burning Unit PTE (lb/hr)
S001	Hot Oil Heater	216.7	1.61
S013	Cryogenic HMO Heater	26.3	0.19
S016	Hot Oil Heater	61.58	0.46
S017	Hot Oil Heater	61.58	0.46
S018	Hot Oil Heater	61.58	0.46
S019	Hot Oil Heater	61.58	0.46
S026	Cryogenic HMO Heater	26.3	0.20
S037	Cryogenic HMO Heater	26.3	0.20
S041	Cryogenic HMO Heater	54.67	0.41
S045	Cryogenic HMO Heater	26.3	0.20
S049	Cryogenic HMO Heater	26.3	0.20
S052	Hot Oil Heater	61.58	0.46
S053	Hot Oil Heater	61.58	0.46
S056	Stabilizer Heater	10.09	0.08
	Totals →	***782.44***	***5.85***

45CSR2 Testing, Monitoring, Record-keeping, & Reporting (TMR&R) - Section 8

Section 8 of 45CSR2 requires testing for initial compliance with the limits under Section 3 and 4, monitoring for continued compliance, and record-keeping of that compliance. The TMR&R requirements are clarified under 45CSR2A and discussed below.

45CSR2A Applicability - Section 3

Pursuant to 45CSR2, Section 3.1(b), the owner or operator of a "fuel burning unit(s) which combusts only natural gas shall be exempt from sections 5 and 6." Therefore, there is no substantive performance testing or monitoring requirements under 45CSR2 for the new fuel burning units.

45CSR2A Record-keeping and Reporting Requirements - Section 7

Section 7 sets out the record-keeping requirements that Blue Racer will have to meet under 45CSR2A for the fuel burning units. For units that combust only pipeline natural gas, the record-keeping requirements are limited to the date and time of start-up and shutdown, and the quantity of fuel consumed on a monthly basis.

45CSR6: To Prevent and Control Particulate Air Pollution from Combustion of Refuse

The existing (but modified) Ground Flare (S004A), the new Vapor Combustor (V003), and the new Pig Trap Flare (S034) each meet the definition of an "incinerator" under 45CSR6 and are, therefore, subject to the requirements therein.

Emission Standards for Incinerators - Section 4.1

Section 4.1 limits PM emissions from incinerators to a value determined by the following formula:

Emissions (lb/hr) = F x Incinerator Capacity (tons/hr)

Where, the factor, F, is as indicated in Table I below:

Table I: Factor, F, for Determining Maximum Allowable Particulate Emissions

Incinerator Capacity	Factor F
A. Less than 15,000 lbs/hr	5.43
B. 15,000 lbs/hr or greater	2.72

Based on information taken from the application, the following table shows the compliance determination for each flare:

Table 6: 45CSR6 PM Limitation Determination

Flare	Capacity[1] (tons/hr)	45CSR6 Emission Limit[2] (lb-PM/hr)	PTE (lb-PM/hr)
C004A	253.82	690.34	25.34
C009	0.05	0.14	0.03
C034	5.70	15.50	1.31

(1) The flare capacity is based on the estimated maximum amount of material sent to the flare for destruction as given under Attachment N of the permit application.

(2) The 45CSR6 Emission PM Emission Limit is based on the lower F Factor of 2.72 even if the calculated capacity is less than 15,000 lb/hr to be conservative and account for the fact the capacity may be larger than the amount of material sent to the flare.

Opacity Limits for Incinerators - Section 4.3, 4.4

Pursuant to Section 4.3, and subject to the exemptions under 4.4, each incinerator has a 20% limit on opacity during operation. Proper design and operation of the units should prevent any significant opacity.

45CSR10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides

The purpose of 45CSR10 is to "prevent and control air pollution from the emission of sulfur oxides." 45CSR10 has requirements limiting SO_2 emissions from "fuel burning units," limiting in-stack SO_2 concentrations of "manufacturing process source operations," and limiting H_2S concentrations in "process gas" streams that are combusted. Only the SO2 limitations on fuel burning units potentially apply at the facility. As noted under the discussion of 45CSR2 applicability, based on the same definitions therein, the new Regeneration Gas Heaters (S024, S036, S040, S044, S048) and the Glycol Reboiler (S029) are not subject to 45CSR10 as they are properly defined as process heaters. The new proposed two (2) 61.6 mmBtu/hr natural gas-fired Hot Oil Heaters (S052 and S053), the three (3) new 26.3 mmBtu/hr and one (1) new 54.67 mmBtu/hr natural gas-fired Cryogenic HMO Heaters (S037, S045, S049, and S041, respectively), and the one (1) new natural gas-fired 10.09 MMBtu/hr stabilizer heater (S056) are each defined as a fuel burning unit and are subject to 45CSR10. Each substantive 45CSR10 requirement is discussed below.

45CSR10 Fuel Burning Units - Section 3

The allowable sulfur dioxide (SO_2) emissions from the non-exempt gas-fired heaters, each identified as a Type "b" fuel burning unit in a Priority I Region (which includes Marshall County), per 45CSR10, Section 3.1.e, is the product of 3.1 and the total design heat input of each unit in million Btu per hour. As shown in Table 5 above, the total design heat input of the non-exempt units (S001, S013, S016-S019, S026, S037, S041, S045, S049, S052, S053, and S056) will be 782.44 mmBtu/Hr. Using the above equation results in a SO_2 limit of 2,425.56 pounds per hour. As all the non-exempt heaters are fueled by natural gas (with a small amount gaseous waste gas that contains no appreciable amount of sulfur), the aggregate PTE of these heaters will be far less than the emission limitation.

45CSR10 Testing, Monitoring, Record-keeping, & Reporting (TMR&R) - Section 8

Section 8 of 45CSR10 requires testing for initial compliance with the limits therein, monitoring for continued compliance, and record-keeping of that compliance. Interpretative Rule 45CSR10A provides guidance and clarification for complying with the testing, monitoring, recordkeeping and reporting requirements of 45CSR10.

Pursuant to §45-10-10.3 and §45-10-3.1(b), as all the gas-fired heaters "combust natural gas, wood or distillate oil, alone or in combination," they are not subject to the Testing and MRR Requirements under Section 8 of 45CSR10 or 45CSR10A.

45CSR13: Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

The proposed changes at Blue Racer's Natrium Extraction and Fractionation Plant have the potential to increase the PTE in excess of six (6) lbs/hour and ten (10) TPY of a regulated pollutant (see Table 4 above) and, therefore, pursuant to §45-13-2.17, the changes are defined as a "modification " under 45CSR13. Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the construction, modification, relocation and operation of any stationary source to be commenced without . . . obtaining a permit to construct." Therefore, Blue Racer is required to obtain a permit under 45CSR13 for the modification of the facility.

As required under §45-13-8.3 ("Notice Level A"), Blue Racer placed a Class I legal advertisement in a "newspaper of *general circulation* in the area where the source is . . . located." The ad ran on August 7, 2018 in *Moundsville Daily Echo* and the affidavit of publication for this legal advertisement was submitted on August 14, 2018.

45CSR14: Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration - (Not Applicable)

The Natrium Extraction and Fractionation Plant is located in Marshall County, WV. Marshall County is classified as "in attainment" with all National Ambient Air Quality Standards except for, in certain tax districts, SO_2. The Franklin Tax District, where the Natrium facility is located, is classified as "non-attainment" for SO_2. Therefore, applicability to major New Source Review (NSR) for all pollutants except for SO_2 is determined under 45CSR14.

Facility-Wide Applicability

As the facility type - a natural gas processing facility - is not a "listed source" under §45-14-2.43(a), the individual major source applicability threshold for each criteria pollutant is 250 TPY. As given in Attachment A, the facility-wide post-modification PTE of the Natrium Extraction and Fractionation Plant is only greater than 250 TPY for VOCs (388.98 TPY). All other pollutants are below the 250 TPY threshold. However, pursuant to §45-14-2.43(e), "the fugitive emissions of a stationary source shall not be included in determining whether it is a major stationary source, unless the source is listed in Table 1." Therefore, when fugitive VOC emissions - in this case the

fugitive VOC emissions from component leaks (176.27 TPY) - are removed from the facility-wide VOC emissions total, the VOC emissions are below 250 TPY (212.69 TPY). Therefore, *the facility* is not defined as a "major stationary source" under 45CSR14 and the rule does not apply to the changes evaluated herein.

Nested Source

The Prevention of Significant Deterioration (PSD) permitting program - as codified under 45CSR14 - includes an applicability test known as the "nested source principal" to prevent facilities not listed under §45-14-2.43(a) (with a corresponding major source threshold of 250 TPY) to mask sources that are listed under §45-14-2.43(a) (with a corresponding major source threshold of 100 TPY). Once a potential nested source is identified at a facility, it is reviewed, relevant to PSD applicability issues, completely independently of the larger source in which it is contained. For example, the major source applicability status of the nested source does not trigger the major source applicability status of the larger source. This is explicitly stated in a January 22, 1998 USEPA guidance memo sent to Ohio that states:

> *The USEPA has previously determined that the major source status of a nested activity does not dictate the major source status of the overall source independent of the total emission rate. In other words, if an entire source has the potential to emit of less than 250 tpy, then the existence of a major nested source does not make the entire source major for purposes of PSD applicability.*

If PSD is triggered for the nested source, the applicable requirements are only applied within the nested source itself. However, the nested source *does* also contribute emissions and is also considered part of the larger unlisted source as well.

One of the source-categories listed under §45-14-2.43(a) is: "*Fossil Fuel Boilers (or combinations thereof) Totaling More than 250 Million Btu/hour Heat Input.*" Generally, in the absence of explicit and formal EPA guidance on the issue (or any strict definition of "fossil fuel boiler" in 45CSR14), it has been accepted that units that are not subject to 40 CFR 60, Subpart Db, Dc, or are otherwise defined as "process heaters" under these Subparts and do not use a heat transfer medium are not included in this listed source definition. However, even excluding the units not subject to Subpart Db and Dc for these reasons (see the Subpart Db and Dc regulatory applicability sections below), the Natrium Extraction and Fractionation Plant has existing units that are subject to Subpart Db and Dc and are proposing to add additional units. Therefore, the following will review the potential PSD applicability of the nested source (only emissions of NO_x and CO will be considered as other emissions from natural gas combustion are much smaller and will not be substantive in considering PSD applicability).

The existing pre-modified facility contained the following emission units that are part of the nested source and their associated PTE:

Table 7: Nested Source PSD Applicability Analysis Existing PTE

Emission Unit ID	Unit Description	MDHI (mmBtu/hr)	NO_x PTE (TPY)[1]	CO PTE (TPY)[1]	NO_x PTE (TPY)[2]	CO PTE (TPY)[2]
S001	Hot Oil Heater	216.7	24.68	14.24	42.75	14.24
S013	Cryogenic HMO Heater	26.3	11.19	9.40	11.29	9.49
S016	Hot Oil Heater	61.58	6.47	15.91	6.47	15.91
S017	Hot Oil Heater	61.58	6.47	15.91	6.47	15.91
S018	Hot Oil Heater	61.58	6.47	15.91	6.47	15.91
S019	Hot Oil Heater	61.58	6.47	15.91	6.47	15.91
S026	Cryogenic HMO Heater	26.3	11.19	9.40	11.29	9.49
	Totals ➜	***515.62***	***72.94***	***96.68***	***91.21***	***96.86***

(1) As based on emissions limits in R13-2896E.
(2) Post-modification revised emissions as based on PTE given in Attachment N of permit application R13-2896F.

Therefore, based on the above, and as noted in previous iterations of PSD determinations, while the MDHI of the above units (> 250 mmBtu/hr) define the aggregation of these units as a nested "listed" source under §45-14-2.43(a), the PTE of the existing sources (both as previously permitted and as revised in this changes evaluated herein) *is not* over 100 TPY for any criteria pollutant and, therefore, the existing nested source is not defined as "major."

As discussed above, Blue Racer is now proposing to add additional units that will also be a part of the nested source. These units and the associated PTE are given in the following table:

Table 8: Nested Source PSD Applicability Analysis New Units' PTE

Emission Unit ID	Unit Description	MDHI (mmBtu/hr)	NO_x PTE (TPY)[1]	CO PTE (TPY)[1]
S037	Cryogenic HMO Heater	26.3	11.29	9.49
S041	Cryogenic HMO Heater	54.67	23.48	19.72
S045	Cryogenic HMO Heater	26.3	11.29	9.49
S049	Cryogenic HMO Heater	26.3	11.29	9.49
S052	Hot Oil Heater	61.58	6.47	15.91
S053	Hot Oil Heater	61.58	6.47	15.91
S056	Stabilizer Heater	10.09	4.33	3.64
	Totals ➜	***266.82***	***74.62***	***83.65***

(1) Emissions as based on PTE given in Attachment N of permit application R13-2896F.

Pursuant to §45-14-2.40 and 2.43(c), proposed changes will be defined as "major" and subject to PSD review if one of two thresholds are crossed: (1) if the proposed changes will result in an increase defined as "significant" under §45-14-2.74 at an existing major source; or (2) if the proposed changes would by themselves constitute a major stationary source as defined under §45-14-2.43(a). As shown under Table 8, the existing nested source is not defined as major, so the threshold under (1) above is not triggered. And as shown in Table 9, the proposed new units will not exceed 100 TPY and, therefore, the threshold under (2) is also not triggered. Further, if we consider the revisions to the NO_x PTE of S001 and small revisions to the NO_x and CO PTE from the S013 and S026 as proposed actual changes and not be considered as part of the existing units (which in the view of the writer is more appropriate), the increase under Table 9 above becomes 92.89 TPY NO_x and 83.83 TPY CO, still below the 100 TPY threshold under §45-14-2.43(a). Therefore based on the above analysis 45CR14 does not apply to the changes proposed under this permitting action.

However, for future permitting purposes, the nested source will be defined as an existing major source as the new aggregated PTE associated with all the "fossil fuel fired boilers" will be in excess of 100 TPY for both CO and NO_x (see the following table).

Table 9: Nested Source PSD Applicability Analysis Post-Modification PTE

Emission Unit ID	Unit Description	MDHI (mmBtu/hr)	NO_x PTE (TPY)(1)	CO PTE (TPY)(1)
S001	Hot Oil Heater	216.7	42.75	14.24
S013	Cryogenic HMO Heater	26.3	11.29	9.49
S016	Hot Oil Heater	61.58	6.47	15.91
S017	Hot Oil Heater	61.58	6.47	15.91
S018	Hot Oil Heater	61.58	6.47	15.91
S019	Hot Oil Heater	61.58	6.47	15.91
S026	Cryogenic HMO Heater	26.3	11.29	9.49
S037	Cryogenic HMO Heater	26.3	11.29	9.49
S041	Cryogenic HMO Heater	54.67	23.48	19.72
S045	Cryogenic HMO Heater	26.3	11.29	9.49
S049	Cryogenic HMO Heater	26.3	11.29	9.49
S052	Hot Oil Heater	61.58	6.47	15.91
S053	Hot Oil Heater	61.58	6.47	15.91
S056	Stabilizer Heater	10.09	4.33	3.64
	Totals ➜	***782.44***	***165.83***	***180.51***

(1) Emissions as based on PTE given in Attachment N of permit application R13-2896F.

45CSR19: Requirements fo Pre-Construction Review, Determination of Emission Offsets for Proposed New or Modified Stationary Sources of Air Pollutants and Emission Trading for Intrasource Pollutants - (Not Applicable)

Pursuant to §45-19-3.1, 45CSR19 "applies to all major stationary sources and major modifications to major stationary sources proposing to construct anywhere in an area which is designated non-attainment." As noted above, the Natrium Extraction and Fractionation Plant is located in Marshall County, WV which is classified as in attainment with all NAAQS with the exception of SO_2 in the areas defined as the Clay, Washington, and Franklin (where the source is located) Tax Districts. Pursuant to §45-14-2.35, the individual major source applicability threshold for the specific non-attainment pollutant is 100 TPY. As given Attachment A, the facility-wide post-modification SO_2 PTE of the Natrium Extraction and Fractionation Plant is less than 100 TPY. Therefore, the facility is not defined as a "major stationary source" under 45CSR19.

45CSR27: To Prevent and Control the Emissions of Toxic Air Pollutants (Not Applicable)

Pursuant to §45-27-3.1, the "owner or operator of a plant that discharges or may discharge a toxic air pollutant into the open air in excess of the amount shown in the Table A [of 45CSR27] shall employ [Best Available Technology] at all chemical processing units emitting the toxic air pollutant." The facility-wide PTE of formaldehyde (1,140 lbs/yr) and benzene (1,360 lbs/yr) exceed the thresholds given under Table A. However, each existing and proposed emission unit at the facility that has the potential to emit formaldehyde is a combustion device and not defined as a chemical processing unit under 45CSR27. Therefore the BAT requirements therein do not apply to formaldehyde emissions.

Pursuant to §45-27-2.4, the definition of "Chemical Processing Unit" excludes "equipment used in the production and distribution of petroleum products providing that such equipment does not produce or contact materials containing more than 5% benzene by weight." With respect to benzene emissions, the primary emission contributors are the GDUs (536 lbs/yr) and natural gasoline barge loading operations (744 lbs/yr). The remaining sources (~80 lbs/yr) are either nominal or combustion units. "Petroleum products" are generally defined as "materials derived from petroleum, natural gas, or asphalt deposits." [McGraw-Hill © 1978: Dictionary of Scientific and Technical Terms: pp. 1194] The material streams processed at the facility are considered petroleum products that contain less than 5% benzene including the natural gasoline (0.45% benzene) loaded out in barges. Therefore, the facility is not subject to the requirements of 45CSR27.

45CSR30: Requirements for Operating Permits

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The Natrium Extraction and Fractionation Plant, as a result of the modifications made under R13-2896C, is defined under Title V as a "major source." A Title V permit application has not yet been submitted for this facility. Changes authorized by the modifications evaluated herein must also be incorporated into the facility's Title V permit application.

40 CFR 60, Subpart Db: Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units

Subpart Db of 40 CFR 60 is the federal NSPS for "steam generating units" that have MDHI of greater than 100 mmBtu/hr and greater than 100 mmBtu/hr and that were constructed, modified, or reconstructed after June 19, 1984. Subpart Db contains within it emission standards, compliance methods, monitoring requirements, and reporting and record-keeping procedures for affected facilities applicable to the rule. Subpart Db defines a "Steam Generating Unit" as "a device that combusts any fuel or byproduct/waste and produces steam or heats water or heats any heat transfer medium." The definition also states that "[t]his term does not include process heaters as they are defined in this subpart." The existing 216.7 mmBtu/hr Hot Oil Heater (with a revised NO_x emission factor), the unit at the facility over 100 mmBtu/hr, is defined as a steam generating unit and is subject to Subpart Db.

The following table outlines the criteria pollutant emission standards under Subpart Db applicable to the large Hot Oil Heater and the associated proposed emission rates:

Table 10: Subpart Db Emission Standards

Reference	Pollutant	Standard	S001 Emission Rate
§60.42b(k)	SO_2	Exempt from emission standard pursuant to §60.42b(k)(2)	0.001 lb/mmBtu
§60.43b	Particulate Matter	No emission standard given for natural gas.	0.00745 lb/mmBtu
§60.44b(a)(1)	NO_x	0.10 lb/MMBtu(1)	0.045 lb/mmBtu

(1) Low heat release < 70,000 Btu/hr-ft^3

Sections §60.45b and §60.46b outline the compliance and performance procedures for SO_2 and NO_x, respectively. Sections §60.47b and §60.48b outline the monitoring requirements that apply to steam generating units and §60.49b provides the reporting and record-keeping requirements. Blue Racer will be required to comply with all applicable requirements, including the requirement to use a NOx CEMS, to determine initial and continuing compliance with the emission standards pursuant to Subpart Db.

40 CFR 60, Subpart Dc: Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

Subpart Dc of 40 CFR 60 is the federal NSPS for "steam generating units" that have a Maximum Design Heat Input (MDHI) of less than 100 mmBtu/hr and greater than 10 mmBtu/hr and that were constructed, modified, or reconstructed after June 9, 1989. Subpart Dc contains within it emission standards, compliance methods, monitoring requirements, and reporting and record-keeping procedures for affected facilities applicable to the rule.

Pursuant to §60.40c(a), Subpart Dc applies to "each steam generating unit that commences construction . . . after June 9, 1989, and that has a maximum design heat input capacity of. . . 100 mmBtu/hr or less, but greater than or equal to 10 mmBtu/hr." Subpart Dc defines a "Steam

Generating Unit" as "a device that combusts any fuel and produces steam or heats water or heats any heat transfer medium." The definition also states that "[t]his term does not include process heaters as they are defined in this subpart." A "process heater" is defined as "a device that is primarily used to heat a material to initiate or promote a chemical reaction in which the material participates as a reactant or catalyst." Based on these definitions, the new Regeneration Gas Heaters (S024, S036, S040, S044, S048) and the Glycol Reboiler (S029) are not subject to Subpart Dc as they are properly defined as process heaters and do not employ a heat transfer medium (additionally, with the exception of S040, each of the heaters would be below the 10 mmBtu/hr applicability threshold) . The new proposed two (2) 61.6 mmBtu/hr natural gas-fired Hot Oil Heaters (S052 and S053), the three (3) new 26.3 mmBtu/hr and one (1) new 54.67 mmBtu/hr natural gas-fired Cryogenic HMO Heaters (S037, S045, S049, and S041, respectively), and the one (1) new natural gas-fired 10.09 MMBtu/hr stabilizer heater (S056) are each defined as a steam generating unit and are subject to Subpart Dc. Subpart Dc does not, however, have any emission standards for gas fired units. Therefore, the applicable heaters are only subject to the record-keeping and reporting requirements given under §60.48c.

40 CFR60, Subpart Kb: Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984

Subpart Kb of 40 CFR 60 is the NSPS for storage tanks containing Volatile Organic Liquids (VOLs) which construction commenced after July 23, 1984. The Subpart applies to storage vessels used to store volatile organic liquids with a capacity greater than or equal to 75 m^3 (19,813 gallons). However, storage tanks with a capacity greater than or equal to 151 m^3 (39,890 gallons) storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kPa) or with a capacity greater than or equal to 75 m^3 but less than 151 m^3 storing a liquid with a maximum true vapor pressure less than 15.0 kPa are exempt from Subpart Kb. Additionally, pursuant §60.110b(b)(2), "[p]ressure vessels designed to operate in excess of 204.9 kPa and without emissions to the atmosphere" are exempt from Subpart Kb.

Therefore, based on the above, the four (4) new pressurized NGL storage tanks (US-2800, US-2801, US-2804, US-2805) and the four (4) new pressurized NGL bullet tanks (V-2905, V-2915, V-2925, V-2935) are exempt from Subpart Kb. The proposed four (4) new natural gasoline storage tanks (TK-3802, TK-4802, TK-5802, and TK-6802) and the new Refrigerated Propane Tank (TK-7802), are however, subject to the applicable provisions therein. Pursuant to §60.112b(b)(1), the applicable storage tanks are required to be equipped with a "closed vent system and control device as specified in §60.112b(a)(3)." The use of a natural gas blanket and a closed vent VRU system meets the requirements of §60.112b(a)(3). Additionally, Blue Racer will be required to meet all applicable monitoring, recordkeeping, and reporting requirements in Subpart Kb.

The proposed new 21,000 gallons Slop Tank (TK-2906) and 63,000 gallons Produced Water (TK-2907) storage tanks are, pursuant to §60.110b(d)(4), exempt from the requirements of Subpart Kb as these tanks have "a design capacity less than or equal to 1,589.874 m^3 [and are] used for petroleum or condensate stored, processed, or treated prior to custody transfer."

40 CFR 60 Subpart JJJJ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

As discussed above, Blue Racer is authorized to install and operate one (1) or more natural gas-fired, 4-Stroke Lean Burn (4SLB) spark ignition reciprocating internal combustion engines (RICE) with an aggregate horsepower not to exceed 16,000 to act as emergency generators. While, specific make, model and hp of the individual units have not yet been specified, maximum emissions from each of the engines shall not exceed their individual limits as given in 40 CFR 60, Subpart JJJJ, specifically as limited under the following:

> *Owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except gasoline and rich burn engines that use LPG) must comply with the emission standards in Table 1 to this subpart for their stationary SI ICE. For owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 100 HP (except gasoline and rich burn engines that use LPG) manufactured prior to January 1, 2011 that were certified to the certification emission standards in 40 CFR part 1048 applicable to engines that are not severe duty engines, if such stationary SI ICE was certified to a carbon monoxide (CO) standard above the standard in Table 1 to this subpart, then the owners and operators may meet the CO certification (not field testing) standard for which the engine was certified.*
> **[40CFR§60.4233(e)]**

40 CFR 60, Subpart OOOOa: Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015

40 CFR 60, Subpart OOOOa establishes emission standards and compliance schedules for the control of greenhouse gases (GHG) and VOCs. The greenhouse gas standard in this subpart is in the form of a limitation on emissions of methane from affected facilities in the crude oil and natural gas source category that commence construction, modification or reconstruction after September 18, 2015. This subpart also establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO_2) emissions from affected facilities that commence construction, modification or reconstruction after September 18, 2015 (40 CFR 60, Subpart OOOO is applicable to those sources constructed prior to this date but after August 23, 2011). As the proposed new FUG AREA 4 through 7 will be constructed after September 18, 2015, the applicable requirements of Subpart OOOOa apply to these processes.

Fugitive Emissions Components

The fugitive emissions components located at FUG AREA 4 through 7 are subject to the LDAR requirements under §60.5400a. The requirements under §60.5400a essentially reference the LDAR requirements as given under 40 CFR 60, Subpart VVa. Substantively, Subpart VVa defines a leak definition of 500 ppm_v for valves and connectors in gas/light liquid service and 2,000 ppm_v (5,000 ppm_v for monomers) for pumps in light liquid service.

Storage Tanks (Not Applicable)

The proposed new 21,000 gallons Slop Tank (TK-2906) and 63,000 gallons Produced Water (TK-2907) storage tanks have potential emissions of VOC less than 6 tons/yr and are therefore not subject to Subpart OOOOa. The proposed four (4) new natural gasoline storage tanks (TK-3802, TK-4802, TK-5802, and TK-6802) and the new Refrigerated Propane Tank (TK-7802) are subject to the requirements of 40 CFR 60, Subpart Kb and are therefore, pursuant to §60.5395a(e), not subject to Subpart OOOOa.

40 CFR 63 Subpart HH: National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities

On June 1, 2013 the DAQ took delegation of the area source provisions of 40 CFR 63, Subpart HH. Pursuant to §63.760(a)(3), as the Natrium Extraction and Fractionation Plant - an area source of HAPs (see Attachment A) - "process[es], upgrade[s], or store[s] natural gas prior to the point at which natural gas enters the natural gas transmission and storage source category or is delivered to a final end user," it is defined as an area source subject to the applicable provisions under Subpart HH.

Pursuant to §63.760(b)(2), each TEG GDU located at an area source that meets the requirements under §63.760(a)(3) is defined as an affected facility under Subpart HH. The requirements for affected sources at area sources are given under §63.764(d). However, for a GDU, exemptions to these requirements are given under §63.764(e): if (1) "actual annual average flowrate of natural gas to the glycol dehydration unit is less than 85 thousand standard cubic meters [3 mmscf/day] per day" or (2) "actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere are less than 0.90 megagram [1 TPY] per year."

The proposed new GDU at Natrium will have potential emissions of benzene of less than 1 TPY. Therefore, these units are only subject to the applicable record-keeping requirements under §63.774.

40 CFR 63 Subpart ZZZZ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

On June 1, 2013 the DAQ took delegation of the area source provisions of 40 CFR 63, Subpart ZZZZ. As the Natrium Extraction and Fractionation Plant is defined as an area source of HAPs (see Attachment A), the facility is subject to applicable requirements of Subpart ZZZZ. Pursuant to §63.6590(c):

> An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part.

§63.6590(c)(1) specifies that "[a] new or reconstructed stationary RICE located at an area source" is defined as a RICE that shows compliance with the requirements of Subpart ZZZZ by "meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines." Pursuant to §63.6590(a)(2)(iii), a "stationary

RICE located at an area source of HAP emissions is new if [the applicant] commenced construction of the stationary RICE on or after June 12, 2006." The proposed new emergency generator(s) proposed for the Natrium Extraction and Fractionation Plant are defined as a new stationary RICE (manufacture date shall be after June 12, 2006) and, therefore, will show compliance with Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subparts JJJJ. Compliance with that rule is discussed above.

40 CFR 63 Subpart DDDDD: National Emission Standards for Hazardous Air Pollutants for Hazardous Air Pollutants Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters - (Not Applicable)

Subpart DDDDD of 40 CFR 63 establishes national emission limitations and work practice standards for HAPs emitted from industrial, commercial, and institutional boilers and process heaters located at major sources of HAP. Pursuant to §63.7485, a boiler or process heater is applicable to Subpart DDDDD "that is located at, or is part of, a major source of HAP[s]." A major source of HAPs is defined under §63.2 as a source that "has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants" The Natrium Extraction and Fractionation Plant will not have a potential to emit of HAPs at or above this threshold and is, therefore, not subject to Subpart DDDDD (see Attachment A).

40 CFR 63 Subpart JJJJJJ: National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources - (Not Applicable)

Subpart JJJJJJ of 40 CFR 63 establishes national emission limitations and work practice standards for HAPs emitted from industrial, commercial, and institutional boilers located at area sources of HAPs. An area sources of HAPs is defined as a facility that has a PTE, considering controls, in the aggregate, of less than 10 tons per year any HAP or less than 25 tons per year or more of any combination of HAPs. The Natrium Extraction and Fractionation Plant meets the definition of an area source of HAPs.

Pursuant to §63.11237, the definition of "boiler" covered under Subpart JJJJJJ is limited to "an enclosed device using controlled flame combustion in which water is heated to recover thermal energy in the form of steam or hot water." This would include only the proposed three (3) new 26.3 mmBtu/hr and one (1) new 54.67 mmBtu/hr natural gas-fired Cryogenic HMO Heaters (S037, S045, S049, and S041, respectively) and the one (1) new natural gas-fired 10.09 MMBtu/hr stabilizer heater (S056). However, pursuant to §63.11195(e), as all of these units are exclusively "gas-fired," they are exempt from Subpart JJJJJJ.

TOXICITY ANALYSIS OF NON-CRITERIA REGULATED POLLUTANTS

This section provides information on those regulated pollutants that may be emitted from the Natrium Extraction and Fractionation Plant and that are not classified as "criteria pollutants." Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO_x), Ozone, Particulate Matter (PM_{10} and $PM_{2.5}$), and Sulfur Dioxide (SO_2). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect the

public health and welfare. Other pollutants of concern, although designated as non-criteria *and without national concentration standards*, are regulated through various state and federal programs designed to limit their emissions and public exposure. These programs include federal source-specific HAP regulations promulgated under 40 CFR 61 and 40 CFR 63 (NESHAPS/MACT), and WV Legislative Rule 45CSR27 that regulates certain HAPs defined as Toxic Air Pollutants (TAPs). Any potential applicability to these programs were discussed above under REGULATORY APPLICABILITY.

The majority of non-criteria regulated pollutants fall under the definition of HAPs which are compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects *may* cause cancer or other serious human health effects. These adverse health affects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no applicable federal or state ambient air quality standards for these specific chemicals*. For a complete discussion of the known health effects of each compound listed in this section, refer to the IRIS database located at www.epa.gov/iris. It is important to note that the USEPA does not divide the various HAPs into further classifications based on toxicity or if the compound is a suspected carcinogen.

The following table lists each HAP currently identified by Blue Racer as potentially emitted in a substantive amount (greater than 10 lbs/year) from the Natrium facility. Additionally, information concerning the pollutant, and the associated carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)), and any potentially applicable MACT is provided.

Table 11: Non-Criteria Regulated Pollutant Information

Pollutant	CAS #	Type	PTE[(1)] (tons/yr)	Known/Suspected Carcinogen	Classification	MACT[(1)]
Formaldehyde	50-00-0	VOC	0.57	Yes	B1 - Probable Human Carcinogen[(1)]	None
n-Hexane	110-54-3	VOC	3.40	No	Inadequate Data	None
Benzene	71-42-1	VOC	0.68	Yes	A - Known Human Carcinogen	HH
Toluene	108-88-3	VOC	1.42	No	Inadequate Data	None
Xylenes	1330-20-7	VOC	0.99	No	Inadequate Data	None
Methanol	67-56-1	VOC	8.41	No	Not Assessed	None

(1) Does a MACT apply to this specific HAP for any emission unit at the facility? See "Regulatory Applicability" section for discussion.

(2) From IRIS: "*Based on limited evidence in humans, and sufficient evidence in animals. Human data include nine studies that show statistically significant associations between site-specific respiratory neoplasms and exposure to formaldehyde or formaldehyde-containing products. An increased incidence of nasal squamous cell carcinomas was observed in long-term inhalation studies in rats and in mice. The classification is supported by in vitro genotoxicity data and formaldehyde's structural relationships to other carcinogenic aldehydes such as acetaldehyde.*"

AIR QUALITY IMPACT ANALYSIS

The estimated maximum emissions of the modified facility are less than applicability thresholds that would define the modification as "major" under 45CSR14 and, therefore, no air quality impacts modeling analysis was required pursuant to that rule.

MONITORING, COMPLIANCE DEMONSTRATIONS, REPORTING, AND RECORDING OF OPERATIONS

The monitoring, compliance demonstration, reporting, and recording requirements of the proposed new and modified equipment were integrated into the existing requirements in the draft permit. See the appropriate sections of the draft permit for specific requirements.

PERFORMANCE TESTING OF OPERATIONS

The performance testing requirements of the proposed new and modified equipment were integrated into the existing requirements in the draft permit. See the appropriate sections of the draft permit for specific requirements.

CHANGES TO PERMIT R13-2896E

Due to the size and complexity of the proposed modification, extensive revisions to the existing permit were made (too many to list here).

RECOMMENDATION TO DIRECTOR

The information provided in permit application R13-2896F indicates that compliance with all applicable federal and state air quality regulations will be achieved. Therefore, I recommend to the Director the issuance of a Permit Number R13-2896F to Blue Racer Midstream, LLC for the modifications discussed herein at the Natrium Extraction and Fractionation Plant located in Proctor, Marshall County, WV.

_____

Joe Kessler, PE
Engineer

_____

Date

Attachment A: Facility-Wide PTE

Blue Racer Midstream, LLC : Natrium Extraction and Fractionation Plant
Permit Number R13-2896F: Facility ID 051-00142

Emission Unit	EP ID	CO		NO_x		PM[1]		SO_x		VOC		Total HAPs	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Heaters													
Hot Oil Heater	P001	3.25	14.24	9.75	42.71	1.61	7.07	0.15	0.67	0.37	1.61	0.126	0.552
Regenerative Gas Heater	P012	0.80	3.50	0.95	4.17	0.07	0.32	0.01	0.03	0.05	0.23	0.018	0.078
Cryo HMO Heater	P013	2.17	9.49	2.58	11.29	0.20	0.86	0.02	0.08	0.14	0.62	0.049	0.213
Hot Oil Heater	P016	3.63	15.91	1.48	6.47	0.46	2.01	0.04	0.19	0.33	1.45	0.114	0.498
Hot Oil Heater	P017	3.63	15.91	1.48	6.47	0.46	2.01	0.04	0.19	0.33	1.45	0.114	0.498
Hot Oil Heater	P018	3.63	15.91	1.48	6.47	0.46	2.01	0.04	0.19	0.33	1.45	0.114	0.498
Hot Oil Heater	P019	3.63	15.91	1.48	6.47	0.46	2.01	0.04	0.19	0.33	1.45	0.114	0.498
Regenerative Gas Heater	P024	0.80	3.50	0.95	4.17	0.07	0.32	0.01	0.03	0.05	0.23	0.018	0.078
Cryo HMO Heater	P026	2.17	9.49	2.58	11.29	0.20	0.86	0.02	0.08	0.14	0.62	0.049	0.213
Regenerative Gas Heater	P036	0.80	3.50	0.95	4.17	0.07	0.32	0.01	0.03	0.05	0.23	0.018	0.078
Cryogenic HMO Heater	P037	2.17	9.49	2.58	11.29	0.20	0.86	0.02	0.08	0.14	0.62	0.049	0.213
Regenerative Gas Heater	P040	1.59	6.95	1.89	8.28	0.14	0.63	0.01	0.06	0.10	0.46	0.036	0.156
Cryogenic HMO Heater	P041	4.50	19.72	5.36	23.48	0.41	1.78	0.04	0.17	0.29	1.29	0.101	0.442
Regenerative Gas Heater	P044	0.80	3.50	0.95	4.17	0.07	0.32	0.01	0.03	0.05	0.23	0.018	0.078
Cryogenic HMO Heater	P045	2.17	9.49	2.58	11.29	0.20	0.86	0.02	0.08	0.14	0.62	0.049	0.213
Regenerative Gas Heater	P048	0.80	3.50	0.95	4.17	0.07	0.32	0.01	0.03	0.05	0.23	0.018	0.078
Cryogenic HMO Heater	P049	2.17	9.49	2.58	11.29	0.20	0.86	0.02	0.08	0.14	0.62	0.049	0.213
Hot Oil Heater	P052	3.63	15.91	1.48	6.47	0.46	2.01	0.04	0.19	0.33	1.45	0.114	0.498
Hot Oil Heater	P053	3.63	15.91	1.48	6.47	0.46	2.01	0.04	0.19	0.33	1.45	0.114	0.498
Stabilizer Heater	P056	0.83	3.64	0.99	4.33	0.08	0.33	0.01	0.03	0.05	0.24	0.019	0.082
Glycol Dehydration Units													
Glycol Dehydration System	P006[2]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.78	7.80	0.15	0.66
Glycol Dehydration Flash Tank													

Emission Unit	EP ID	CO		NO_x		PM[1]		SO_x		VOC		Total HAPs	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Glycol Dehydration System Glycol Dehydration Flash Tank	P032[2]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.17	9.50	0.33	1.45
GDU Reboiler	P029	0.25	1.08	0.29	1.29	0.02	0.10	0.00	0.01	0.02	0.07	0.01	0.02
GDU Vapor Combustor (C009)	V003[3]	1.54	6.74	0.77	3.38	0.03	0.11	0.002	0.01	0.00	0.00	0.00	0.00
Other Emission Units													
Ethane Amine Regenerator	P005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.98	8.67	1.82	7.99
Ethane Amine Regenerator	P054	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.98	0.43	1.82	0.40
Storage Tanks[4]	Various	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	87.39	0.51	0.00	0.00
Product Loading (Truck, Rail)	P008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.36	2.18	0.10	0.05
Slop Water Truck Loading	S015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.32	0.11	0.00	0.00
Product Loading (Barge)	P033	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	97.22	82.69	1.45	1.23
Pressurized NGL/Condensate Unloading	P055	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.05	19.83	0.46	1.02
Gasoline Dispenser Loading	L-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.001	0.00	0.00
Emergency Generator	P057	141.10	7.05	70.55	3.53	1.28	0.06	0.08	0.00	35.27	1.76	9.24	0.46
Fire Pump #1	P002	4.01	0.20	4.63	0.23	0.23	0.01	0.01	0.0004	4.63	0.23	0.008	0.0004
Fire Pump #2	P003	4.01	0.20	4.63	0.23	0.23	0.01	0.01	0.0004	4.63	0.23	0.008	0.0004
Propane Pig Trap Flare (C034)	P034	13.99	0.08	24.24	0.15	1.31	0.01	1.87	0.01	227.77	1.37	0.00	0.00
Other Pigging Operations	P035	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,391.24	47.86	15.90	0.55
Ground Flare (C004A)	P004A[5]	3,073.64	13.43	1,539.61	6.73	25.34	0.25	0.00	0.01	10,171.10	12.89	4.53	0.08
Fugitive Emissions													
Fugitive Area 1	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.03	70.21	0.046	0.203
Fugitive Area 2	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.92	34.70	0.023	0.103
Fugitive Area 3	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	13.56	0.010	0.043
Fugitive Area 4	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	17.12	0.016	0.068

Emission Unit	EP ID	CO		NO_x		PM[1]		SO_x		VOC		Total HAPs	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Fugitive Area 5	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	13.56	0.010	0.043
Fugitive Area 6	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	13.56	0.010	0.043
Fugitive Area 7	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	13.56	0.010	0.043
Unpaved Roads	n/a	0.00	0.00	0.00	0.00	n/a	43.86	0.00	0.00	0.00	0.00	0.00	0.00
Facility-Wide Total[6] ➜		***3,285.34***	***233.74***	***1,689.24***	***210.46***	***34.79***	***72.18***	***2.58***	***2.66***	***12,086.28***	***388.95***	***37.25***	***20.14***
Facility-Wide Non-Fugitive PTE[6] ➜		***3,285.34***	***233.74***	***1,689.24***	***210.46***	***34.79***	***28.32***	***2.58***	***2.66***	***12,046.83***	***212.68***	***37.12***	***19.59***

(1) With the exception of the unpaved haulroads, all particular matter emissions are assumed to be 2.5 microns or less. See Table N-1 in the permit application for the breakdown of $PM_{2.5}$ and PM_{10} emissions from the unpaved haulroads.

(2) Represents aggregate emissions from the regenerator still vent and the flash tank as controlled, at a minimum, by the Hot Oil Heater (S001) or GDU vapor combustor (C003) at a 98% DRE.

(3) Represents combustion exhaust emissions only, pass through hydrocarbon emission are given under P006 and P032.

(4) Consists of tanks TK-906, TK-907, TK-2906, TK-2907, and TK-L-1.

(5) Represents combustion exhaust emissions *and* pass-through VOC/HAP emissions from the waste gases sent to the ground flare.

(6) Emission totals in this table may be nominally different than those given in Tables N-1 and N-2 due to rounding differences. Non-Fugitive PTE does not include "fugitive" emissions and is used to determine major source status under 45CSR14 for non-listed sources. Additionally, as no individual HAP has a PTE over 10 TPY (methanol is the largest contributor, see Table N-2 of the permit application) and emissions of total HAPs is less than 25 TPY, the Natrium Extraction and Fractionation Plant is defined as a minor (area) source for purposes of 40 CFR 61 and 40CFR63.