CONE Midstream Partners LP

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JUN 30 2015
WV DEP / DIV OF AIR QUALITY

June 29, 2015

Tracey Rothwell
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street
Charleston, WV 25304

RE: Cone Gathering, LLC
Moundsville, WV (Marshall County)
Slug Catcher Site
Request for Permit Determination

Mr. Rothwell:

Cone Gathering, LLC (Cone Gathering) is submitting this revised Permit Determination (PD) request to the West Virginia Department of Environmental Protection (WVDEP), seeking confirmation that proposed addition of a slug catcher site along an existing pipeline near Moundsville, West Virginia is exempt from permitting.

BACKGROUND

Cone Gathering is proposing to build a site which will act as a liquids collection and separation facility. The materials in the inlet pipeline consist of a mixture of natural gas, condensate and produced water. These streams will be separated into the three components via a slug catcher, 3-phase separator, and surge drum and the natural gas and condensate will flow into separate pipelines leaving the site. The produced water will be stored in storage tanks.

EMISSION CALCULATIONS

Emissions from the proposed operations at Moundsville will result from combustion of natural gas in two (2) small engines (associated with the vapor recovery units [VRUs]), flashing, working and breathing losses in the storage tanks, and fugitive emissions from piping components. One of the engines is used to compress natural gas from the separation process back into the pipeline while the other is used to control emissions from the produced water tanks.

The background of the calculations for the proposed emission sources is as follows:

Compressor Engines – Potential emissions of nitrogen oxides (NO_X), carbon monoxide (CO), volatile organic compounds (VOC), and Greenhouse Gases (GHG) are calculated using vendor specification sheets, where applicable. Emissions of all other criteria pollutants and Hazardous Air Pollutants (HAPs) are calculated using vendor specification sheets and U.S. EPA's AP-42 factors for 4-stroke, rich burn engines. Note that potential emissions are calculated using controlled emission estimates in accordance with 45 CSR 13 Subsection 2.19a:

> *Notwithstanding the provisions of subsection 2.19, any natural gas compressor which is equipped with a catalytic converter which is integral to the unit shall have its potential to emit determined taking into*

consideration reductions achieved by the catalytic converter. Said catalytic converter must be interlocked in such a way as to not allow operation of the engine without operation of the catalytic converter. The catalytic converter shall have the catalyst replaced every 45,000 hours of operation or every ten (10) years, whichever is earlier, as established by records kept by the source, unless the Secretary approves an alternative method of verifying catalyst effectiveness.

Cone Gathering meets all the criteria outlined in the paragraph. As such, potential emissions are calculated using after-catalyst specifications.

Produced Water Tanks – Potential emissions of VOC, HAPs and GHG are calculated using the American Petroleum Institute (API) E&P TANKS version 2.0 program. Controlled emission estimates were based on a conservative 5% annual downtime on the VRU operation and a maximum site throughput for liquids and estimated liquids composition. *However, for applicability purposes, no control is assumed.*

Fugitives – The equipment component leak emissions are calculated using emission factors obtained from Table 2-4 (Oil & Gas Production Operations) of Protocol for Equipment Leak Emission Estimates, EPA 453/R-95-017, November 1995, as well as 40 CFR 98 Subpart W.

REVIEW OF 45 CSR 13

WVDEP requires new stationary sources of air emissions to be permitted through its Rule 13 construction permitting program. The definition in Rule 13 states that a "stationary source" meets one of the following provisions:

45 CSR 13 2.24.a	*Is subject to any substantive requirement of an emission control rule promulgated by the Secretary;*
45 CSR 13 2.24.b	*Discharges or has the potential to discharge more than 6 pounds per hour and 10 tons per year, or has the potential to discharge more than 144 pounds per calendar day, of any regulated air pollutant;*
45 CSR 13 2.24.c	*Discharges or has the potential to discharge more than 2 pounds per hour or 5 tons per year of hazardous air pollutants considered on an aggregated basis;*
45 CSR 13 2.24.d	*Discharges or has the potential to discharge any air pollutant(s) listed in Table 45-13A in the amounts shown in Table 45-13A or greater; or*
45 CSR 13 2.24.e	*An owner or operator voluntarily chooses to be subject to a construction or modification permit pursuant to this rule, even though not otherwise required to do so.*

Equipment with potential emissions (calculated in accordance with subsection 2.19a for engines) below the stationary source thresholds listed above are not required to obtain an air permit. Additionally, Table 45-13B of Rule 13 contains a list of de minimus sources whose emissions are not required to be considered in a stationary source determination. Cone Gathering has evaluated the Rule 13 provisions and has determined that the proposed Moundsville Slug Catcher Site will not exceed the emission levels requiring an air permit, and is requesting WVDEP's concurrence that the site will be exempt from obtaining a construction or operating permit. *It is important to note even assuming no control of the produced water tanks, emissions from the tanks are both below the emissions thresholds for Rule 13 permitting as well as New Source Performance Standard (NSPS) Subpart OOOO.* Attachment E and F document the proposed facility will not exceed the emissions criteria in 45 CSR 13 2.2.4.b, 45 CSR 13 2.2.4.c and 45 CSR 13 2.2.4.d,). It is important to note that the engines are not subject to any emissions standards under NSPS Subpart JJJJ due to the original construction date of the units (i.e., pre-2006).

Thank you for your review of the enclosed information. As previously stated, Cone Gathering is requesting that WVDEP provide written concurrence that an air permit is not needed for the proposed operations. If you have any questions or comments about the information presented in this letter, please do not hesitate to contact me at (724) 485-3063 or by email at DavidMorris@consolenergy.com.

Respectfully,

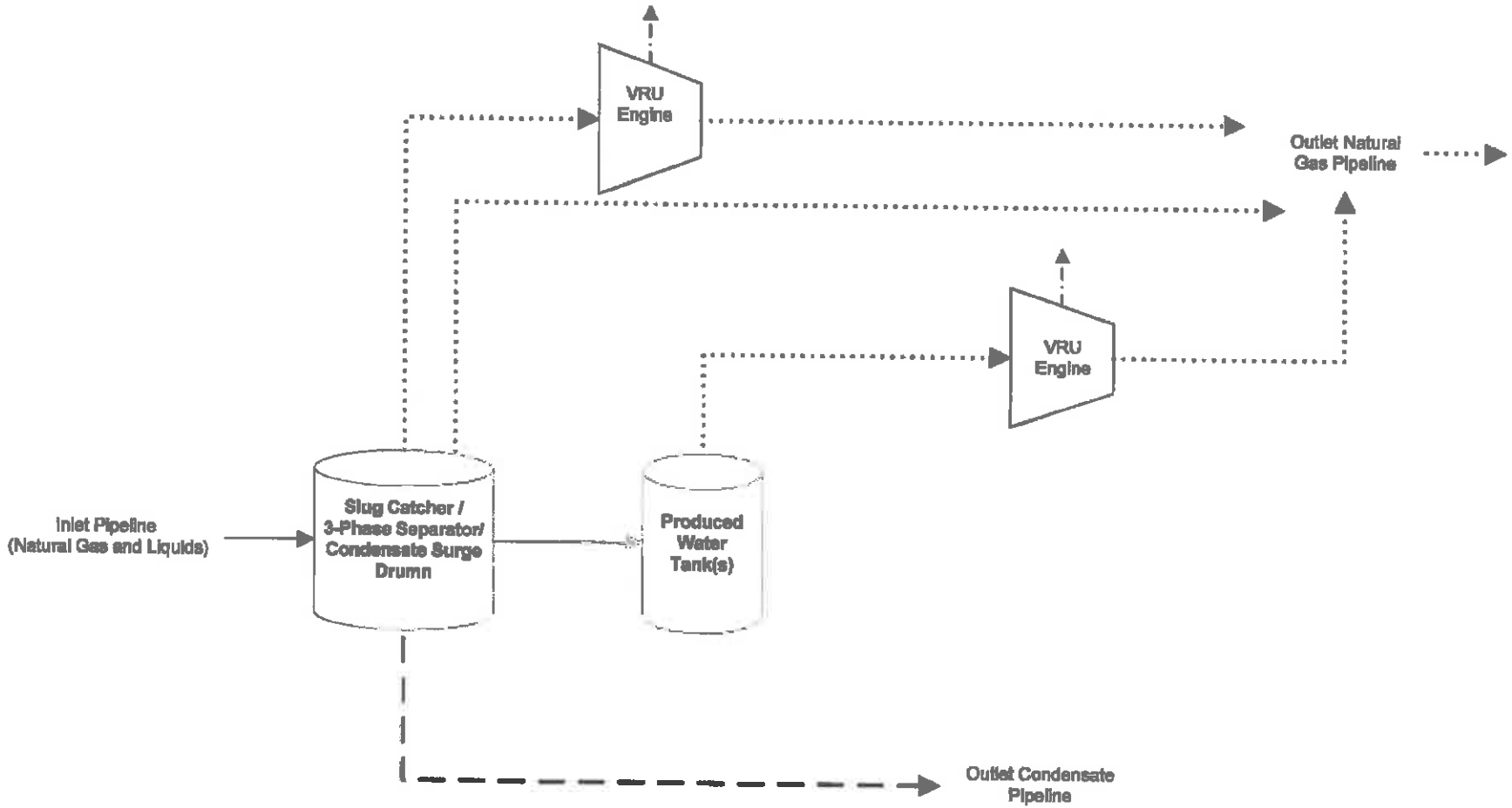
David Morris, EIT
Air Quality Manager

Attachment A
Map

ATTACHMENT A

Figure 1 - Map of Moundsville Slug Catcher Site

Attachment B
Process Flow Diagram (PFD)



Flow Legend

- Gas/Water/Condensate Flow
- Gas Flow
- Condensate Flow
- Produced Water Flow
- Stack Emissions

Cone Gathering, LLC

Process Flow Diagram
Moundsville Slug Catcher Site

Trinity Consultants

May 2014
143901.0035

Attachment C
Process Description

The Moundsville Slug Catcher Site is a liquids gathering and separation site. The influent stream consists of natural gas, condensate and produced water, and first enters the Slug Catcher/3-Phase Separator. The Slug Catcher can be visualized as a wide spot along the pipeline, which allows for the separation of gas from liquids. The separation results in three streams – gas, condensate and water. The gas is sent further down a natural gas pipeline, the condensate is sent further down a condensate pipeline, and the produced water is stored on-site in tanks. The engines on-site power the compressors associated with the Vapor Recovery Units (VRUs), which compress gas from the respective tanks (Produced Water Tanks and Condensate Surge Drum) into the outlet natural gas pipeline.

Attachment D
MSDS Sheets (Not Applicable)

Attachment E
Emission Calculations

Moundsville Slug Catcher Site
Facility-Wide Emissions Summary

	Moundsville Equipment[1]				Site TOTAL	
	VRU Engine	VRU Engine	Produced Water Tanks	Station Fugitives - Component Leaks, Loading		
Equipment Status	New	New	New	New		
Fuel Type	Natural Gas	Natural Gas	NA	NA		
Capacity	145	84	400 bbl (each)			
Unit	bhp	bhp	bbl			
# of Emission Units	1	1	4	ALL		
Hours per Year	8,760	8,760	8,760	8,760		
Pollutant	tpy	tpy	tpy	tpy	lb/hr	tpy
PM_{10}	0.11	0.06	---	---	0.04	0.17
$PM_{2.5}$	0.11	0.06	---	---	0.04	0.17
SO_X	0.00	0.00	---	---	0.00	0.01
CO	2.80	1.62	---	---	1.01	4.42
NO_X	2.80	0.81	---	---	0.82	3.61
VOC (incl. HCHO)	0.90	0.2	5.05	3.05	2.11	9.24
CO_2	756	364	0.01	0.03	256	1,120
CH_4	1.46	1.02	1.24	5.87	2.19	9.59
N_2O	0.00	0.00	---	---	0.00	0.00
CO_2e	793	390	31.01	147	311	1,361
Formaldehyde (HCHO)	0.38	0.07	---	---	0.10	0.44
Total HAPs (incl. HCHO)	0.45	0.10	0.00	0.20	0.17	0.75

1. For potential emission calculations, no control is assumed except for the engines, which have an interlocked catalyst.

Individual TAPs (as specified in 45 CSR 27):						
Benzene	0.009	0.005			0.003	0.014
1,3-Butadiene	0.004	0.002			0.001	0.006
Carbon Tetrachloride	0.000	0.000			0.000	0.000
Chloroform	0.000	0.000			0.000	0.000
Methylene Chloride	0.000	0.000			0.000	0.000
Vinyl Chloride	0.000	0.000			0.000	0.000

Moundsville Slug Catcher Site
VRU Engine - 145 hp

Engine Information:

Manufacturer:	Caterpillar
Model No.:	G3306
Stroke Cycle:	4-stroke
Type of Burn:	Rich
Rated Horsepower (bhp):	145
Control Device:	NSCR

Engine Fuel Information:

Fuel Type:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,189
Specific Fuel Consumption (Btu/bhp-hr):	8,940
Maximum Fuel Consumption at 100% Load (scf/hr):	1,091
Heat Input (MMBtu/hr):	1.30
Potential Fuel Consumption (MMBtu/yr):	11,356
Max. Fuel Consumption at 100%(MMscf/hr):	0.0011
Max. Fuel Consumption (MMscf/yr):	9.6
Max. Annual Hours of Operation (hr/yr):	8,760

Engine Emissions Data:

Pollutant	Emission Factor	Units	Maximum Potential Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO_X	2.00	g/bhp-hr	0.64	2.80	Vendor Spec Sheet
NMNEHC (excludes HCHO)	0.37	g/bhp-hr	0.12	0.52	Vendor Spec Sheet
CO	2.00	g/bhp-hr	0.64	2.80	Vendor Spec Sheet
SO_X	0.001	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
PM_{10}	0.02	lb/MMBtu	0.03	0.11	AP-42, Table 3.2-3 (Aug-2000)
$PM_{2.5}$	0.02	lb/MMBtu	0.03	0.11	AP-42, Table 3.2-3 (Aug-2000)
Formaldehyde (HCHO)	0.27	g/bhp-hr	0.09	0.38	Vendor Spec Sheet
GHG (CO_2e)	See Table Below		181	793	Vendor Specs & 40 CFR 98
Other (Total HAP)	See Table Below		0.10	0.45	AP-42, Table 3.2-3 (Aug-2000)

Notes:

1. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
2. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).
3. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this source type.
4. Potential emissions include catalyst control in accrodance with Subsection 2.19a. As Cone meets all the the applicability criteria.

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Maximum Potential Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
GHGs:					
CO_2	540	g/bhp-hr	173	756	Vendor Spec Sheet
CH_4	1.04	g/bhp-hr	0.33	1.46	Vendor Spec Sheet
N_2O	0.0001	kg/MMBtu	0.00	0.00	40 CFR 98, Table C-2
GHG (CO_2e)			**181**	**793**	
Organic HAPs:					
1,1,2,2-Tetrachloroethane	2.53E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
1,1,2-Trichloroethane	1.53E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
1,3-Butadiene	6.63E-04	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
1,3-Dichloropropene	1.27E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Acetaldehyde	2.79E-03	lb/MMBtu	0.00	0.02	AP-42, Table 3.2-3 (Aug-2000)
Acrolein	2.63E-03	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-3 (Aug-2000)
Benzene	1.58E-03	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-3 (Aug-2000)
Carbon Tetrachloride	1.77E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Chlorobenzene	1.29E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Chloroform	1.37E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Ethylbenzene	2.48E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Ethylene Dibromide	2.13E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Methanol	3.06E-03	lb/MMBtu	0.00	0.02	AP-42, Table 3.2-3 (Aug-2000)
Methylene Chloride	4.12E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Naphthalene	9.71E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
PAH	1.41E-04	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Styrene	1.19E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Toluene	5.58E-04	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Vinyl Chloride	7.18E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Xylene	1.95E-04	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)

Total HAP (Includes HCHO)	**0.10**	**0.45**

Moundsville Slug Catcher Site
VRU Engine - 84 hp

Engine Information:

Manufacturer:	Cummins
Model No.:	G 5.9
Stroke Cycle:	4-stroke
Type of Burn:	Rich
Rated Horsepower (bhp):	84
Control Device:	3-Way (NSCR)

Engine Fuel Information:

Fuel Type:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,189
Specific Fuel Consumption (Btu/bhp-hr):	8,793
Maximum Fuel Consumption at 100% Load (scf/hr	621
Heat Input (MMBtu/hr):	0.74
Potential Fuel Consumption (MMBtu/yr):	6,470
Max. Fuel Consumption at 100%(MMscf/hr):	0.0006
Max. Fuel Consumption (MMscf/yr):	5.4
Max. Annual Hours of Operation (hr/yr):	8,760

Engine Emissions Data:

Pollutant	Emission Factor	Units	Maximum Potential Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO_X	1.0	g/bhp-hr	0.19	0.81	Vendor Spec Sheet
VOC (NMHC)	0.22	g/bhp-hr	0.04	0.18	Vendor Spec Sheet
CO	2.0	g/bhp-hr	0.37	1.62	Vendor Spec Sheet
SO_X	0.001	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
PM_{10}	0.019	lb/MMBtu	0.01	0.06	AP-42, Table 3.2-3 (Aug-2000)
$PM_{2.5}$	0.019	lb/MMBtu	0.01	0.06	AP-42, Table 3.2-3 (Aug-2000)
Formaldehyde (HCHO)	0.021	lb/MMBtu	0.02	0.07	AP-42, Table 3.2-3 (Aug-2000)
GHG (CO_2e)	See Table Below		89	390	Vendor Specs & 40 CFR 98
Other (Total HAP)	See Table Below		0.02	0.10	AP-42, Table 3.2-3 (Aug-2000)

Notes:

1. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
2. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).
3. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this source type.
4. Note that VOC is expressed as NMHC (non-methane hydrocarbons) - this is conservative as it includes ethane.
5. Potential emissions include catalyst control in accrodance with Subsection 2.19a. As Cone meets all the the applicability criteria.

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Maximum Potential Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
GHGs:					
CO_2	449	g/bhp-hr	83	364	Vendor Spec Sheet
CH_4	1.26	g/bhp-hr	0.23	1.02	Vendor Spec Sheet (THC-NMHC)
N_2O	0.0001	kg/MMBtu	0.00	0.00	40 CFR 98, Table C-2
GHG (CO_2e)			**89**	**390**	
Organic HAPs:					
1,1,2,2-Tetrachloroethane	2.53E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
1,1,2-Trichloroethane	1.53E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
1,3-Butadiene	6.63E-04	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
1,3-Dichloropropene	1.27E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Acetaldehyde	2.79E-03	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-3 (Aug-2000)
Acrolein	2.63E-03	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-3 (Aug-2000)
Benzene	1.58E-03	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-3 (Aug-2000)
Carbon Tetrachloride	1.77E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Chlorobenzene	1.29E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Chloroform	1.37E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Ethylbenzene	2.48E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Ethylene Dibromide	2.13E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Methanol	3.06E-03	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-3 (Aug-2000)
Methylene Chloride	4.12E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Naphthalene	9.71E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
PAH	1.41E-04	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Styrene	1.19E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Toluene	5.58E-04	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Vinyl Chloride	7.18E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)
Xylene	1.95E-04	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-3 (Aug-2000)

Total HAP (includes HCHO)	**0.02**	**0.10**	

Moundsville Slug Catcher Site
Produced Water Tanks

Storage Tank Information:

Source ID:	**Produced Water Tanks**
Tank Contents:	Produced Water
Total Site Throughput (bbls/day):	230
Assumed Percent Condensate (%):	0.25%
Total Condensate Throughput (bbl/day):	0.6
Control Type:	VRU
Control Efficiency:	95%
Max. Annual Hours of Operation (hr/yr):	8,760

1. Control efficiency is included for information purposes, for applicability purposes, no control is assumed.

Tank Emissions Data:

Pollutant	Uncontrolled Emissions		Controlled Emissions		Emissions Estimation Method
	lbs/hr	tpy	lbs/hr	tpy	
VOC	1.15	5.05	0.06	0.25	E&P TANKS 2.0
HAPs	0.00	0.00	0.00	0.00	E&P TANKS 2.0
GHG (CO_2e)	7.08	31.01	0.35	1.55	E&P TANKS 2.0

Notes:

1. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).

E&P TANKS Emissions Data:

Pollutant	Total Uncontrolled Emissions (Working + Breathing + Flashing)	
	lbs/hr	tpy
VOC	1.152	5.046
HAPs	0.000	0.000
CO_2	0.003	0.013
CH_4	0.283	1.240

Notes:

1. E&P TANKS 2.0 software estimates working, breathing, and flashing losses and reports as one total.
2. This tank does contain hydrocarbons that could be flashed off at tank operating conditions.

Moundsville Slug Catcher Site
Fugitive Components

Fugitive Component Information:

Component Type	Estimated Component Count	Gas Leak Emission Factor (lb/hr/component)	Gas Leak Emission Factor Factor Source	Average Gas Leak Rate (lb/hr)	Max Gas Leak Rate (tpy)	Potential VOC Emissions (tpy)	Potential HAP Emissions (tpy)
Connectors	200	4.41E-04	EPA Protocol, Table 2-4	0.09	0.46	0.06	0.00
Flanges	50	8.60E-04	EPA Protocol, Table 2-4	0.04	0.23	0.03	0.00
Open-Ended Lines	1	4.41E-03	EPA Protocol, Table 2-4	0.00	0.02	0.00	0.00
Pump Seals	0	5.29E-03	EPA Protocol, Table 2-4	0.00	0.00	0.00	0.00
Valves	250	9.92E-03	EPA Protocol, Table 2-4	2.48	13.04	1.68	0.04
Other	25	1.94E-02	EPA Protocol, Table 2-4	0.49	2.55	0.33	0.01
Total				**3.10**	**16.30**	**2.09**	**0.05**

Notes:
1. "Other" equipment types include compressor seals, relief valves, diaphragms, drains, meters, etc.
2. The component count is conservatively estimated based on the design of the facility.
3. Conservatively assumed that maximum leak rate is 20% greater than measured average leak rate for the purposes of establishing PTE.
4. VOC and HAP emissions are based on fractions of these pollutants in the site-specific gas analysis.

GHG Fugitive Emissions from Component Leaks:

Component Type	Estimated Component Count	GHG Emission Factor (scf/hr/component)	GHG Emission Factor Factor Source	CH_4 Emissions (tpy)	CO_2 Emissions (tpy)	CO_2e Emissions (tpy)
Connectors	200	0.003	40 CFR 98, Table W-1A	0.09	0.00	2.28
Flanges	50	0.003	40 CFR 98, Table W-1A	0.02	0.00	0.57
Open-Ended Lines	1	0.061	40 CFR 98, Table W-1A	0.01	0.00	0.23
Pump Seals	0	13.3	40 CFR 98, Table W-1A	0.00	0.00	0.00
Valves	250	0.027	40 CFR 98, Table W-1A	1.03	0.01	25.70
Other	25	0.04	40 CFR 98, Table W-1A	0.15	0.00	3.81
Total				**1.30**	**0.01**	**32.60**

Notes:
1. The component count is conservatively estimated based on the design of the facility.
2. CH_4 and CO_2 emissions are based on fractions of these pollutants in the site-specific gas analysis.
3. Emissions are calculated in accordance with Equations W-31, W-35 and W-36 in Subpart W of 40 CFR 98.
4. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).

VOC/GHG Fugitive Emissions from Pneumatic Devices:

Component Type	Estimated Component Count	GHG Emission Factor (scf/hr/component)	VOC Emissions (tpy)	HAP Emissions (tpy)	CH_4 Emissions (tpy)	CO_2 Emissions (tpy)	CO_2e Emissions (tpy)
Pneumatic	5	6	0.27	0.00	4.57	0.02	114.24
Total			**0.27**	**0.00**	**4.57**	**0.02**	**114.24**

Notes:
1. The component count is conservatively estimated based on the design of the facility.
2. CH_4 and CO_2 emissions are based on fractions of these pollutants in the site-specific gas analysis.
3. Emissions are calculated in accordance with Equations W-31, W-35 and W-36 in Subpart W of 40 CFR 98.
4. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).
5. The GHG Emission Factor for Pneumatic Devices comes from 40 CFR 60, Subpart OOOO.

VOC/GHG Fugitive Emissions from Blowdowns:

Fugitive Component Emissions Data:

Pollutant	Atmospheric Emissions lbs/hr	Atmospheric Emissions tpy	Emissions Estimation Method
VOC	0.54	2.36	EPA Protocol, Table 2-4 & Site-Specific Gas Analysis
HAPs	0.01	0.06	EPA Protocol, Table 2-4 and Site-Specific Gas Analysis
GHG (CO_2e)	34	147	40 CFR 98, Table W-1A and Site-Specific Gas Analysis

Moundsville Slug Catcher Site
Produced Water Loading

Liquid Loading Losses:

Uncontrolled Loading Losses: L_L (lb/10^3 gal) = 12.46 (SPM)/T

Controlled Loading Losses: L_L (lb/10^3 gal) = 12.46 (SPM)/T * (1 - collection efficiency * control efficiency)

Parameter	Value	Description
S	1.45	saturation factor for splash loading (AP-42 Table 5.2-1)
Collection Efficiency	0%	Assume no collection
Control Efficiency	0%	Assume no control
P	0.10	max true vapor pressure of liquid loaded (psia) - assume 5% of organic VP (99%+ water)
M	105.53	molecular weight of vapors (lb/lb-mol) - conservatively assume flash liquid
T	511.0	temperature of liquids loaded (deg R)

Description	Loading Losses (lb/10^3 gal)	Maximum Throughput[1] (gal)	VOC Emissions Uncontrolled (tpy)	VOC Emissions Controlled (tpy)
Liquids Hauling	0.4	3,525,900	0.69	0.69

[1] Total produced water

Speciated HAP Emission Potential:

Constituent	mol%[1]	True Vapor Pressure of Organic Compounds in liquid (psia)[2]	Partial Vapor Pressure (psia)	Mole Fraction	Molecular Weight	VOC Vapor Weight	Speciated Weight Fraction	Speciated Liquid Loading Emissions (tpy)[3]
Methane	0.006	---	---	---	---	---	---	---
Ethane	0.173	---	---	---	---	---	---	---
Propane	1.685	127.310	---	---	---	---	---	---
Isobutane	1.210	46.110	---	---	---	---	---	---
n-Butane	5.887	32.045	---	---	---	---	---	---
Isopentane	5.087	12.530	0.64	0.31	72.15	22.06	0.28	0.19
n-Pentane	9.924	8.433	0.84	0.40	72.15	28.96	0.37	0.26
n-Hexane	16.406	2.436	0.40	0.19	85.67	16.42	0.21	0.14
Other Hexanes	0.000	2.436	0.00	0.00	86.18	0.00	0.00	0.00
Heptanes	16.101	0.735	0.12	0.06	97.88	5.56	0.07	0.05
Benzene	0.000	1.508	0.00	0.00	78.11	0.00	0.00	0.00
Toluene	0.000	0.425	0.00	0.00	92.14	0.00	0.00	0.00
Ethylbenzene	0.000	0.151	0.00	0.00	106.17	0.00	0.00	0.00
Xylenes	0.000	0.180	0.00	0.00	106.17	0.00	0.00	0.00
2,2,4-Trimethylpentane	0.000	0.596	0.00	0.00	114.23	0.00	0.00	0.00
C8+ Heavies	43.521	0.213	0.09	0.04	107.73	4.79	0.06	0.04
	100.0		2.09			77.79	1.00	
Total Emissions:								0.69
Total HAP Emissions:								0.145

[1] An atmospheric analysis of flash liquid

[2] Emission factors from AP-42 Section 7.1 "Liquid Storage Tanks" Tables 7.1-2, 7.1-3 and 7.1-5 (at 70 deg F or ~21 deg C) and Handbook of Chemistry and Physics: 84th Edition (at 295 K)

[3] Speciated emissions (tpy) = Speciated Weight Fraction x Calculated Controlled Liquid Loading Emissions (tpy). As methane through n-butane will flash off prior to loading, the emissions from these constituents are not included in the speciation.

Moundsville Slug Catcher Site
Gas Analysis

HHV (Btu/scf): 1,189

Constituent	Natural Gas Stream Speciation (Vol. %)	Natural Gas Stream Speciation (wt. %)
Carbon Dioxide	0.160%	0.36
Nitrogen	0.702%	0.00
Methane	82.144%	68.13
Ethane	12.001%	18.66
Propane	3.221%	7.34
Isobutane	0.411%	1.23
n-Butane	0.712%	2.14
Isopentane	0.193%	0.72
n-Pentane	0.167%	0.62
Cyclopentane	0.000%	0.00
n-Hexane	0.057%	0.25
Cyclohexane	0.007%	0.03
Other Hexanes	0.039%	0.17
Heptanes	0.020%	0.10
Methylcyclohexane	0.013%	0.07
2,2,4-Trimethylpentane	0.000%	0.00
Benzene	0.002%	0.01
Toluene	0.004%	0.02
Ethylbenzene	0.000%	0.00
Xylenes	0.006%	0.03
C8 + Heavies	0.017%	0.10
Total	100%	

TOC (Total)	99.014%	99.64
VOC (Total)	4.868%	12.85
HAP (Total)	0.069%	0.31

Separator Liquid Composition

PENCOR ID No. 39414-04

Flash Summary (1,800 psia and 76 °F to atmospheric pressure and 60 °F)

Gas-Liquid Ratio	1,130	Scf/Stb	Color	Clear		
Vapor Gravity	1.337	(Air = 1.00)	API Gravity (water free)	66.8	°API at 60 °F	
Shrinkage	0.572	Vstd / Vsat	Water content by Karl Fisher	0.04	Weight %	
Separator Liquid Density	0.598	g/cc at 550 psia and 76 °F				

Component (Symbol / Name)		Flash Vapor (mole %)	Flash Liquid (mole %)	Flash Liquid (weight %)	Molecular Weight	Specific Gravity (water = 1.0)	Separator Liquid (mole %)	Separator Liquid (weight %)
N_2	Nitrogen	0.124	0.000	0.000	28.01	0.809	0.069	0.028
CO_2	Carbon Dioxide	0.099	0.000	0.000	44.01	0.818	0.055	0.036
H_2S	Hydrogen Sulfide	0.000	0.000	0.000	34.08	0.801	0.000	0.000
C1	Methane	26.771	0.006	0.001	16.04	0.300	14.921	3.518
C2	Ethane	25.495	0.173	0.049	30.07	0.356	14.284	6.312
C3	Propane	23.264	1.685	0.704	44.10	0.507	13.710	8.884
IC4	I-Butane	3.944	1.210	0.667	58.12	0.563	2.734	2.335
nC4	n-Butane	11.040	5.887	3.243	58.12	0.584	8.759	7.481
iC5	i-Pentane	2.999	5.087	3.478	72.15	0.624	3.923	4.160
nC5	n-Pentane	3.282	9.924	6.785	72.15	0.631	6.223	6.597
C6	Hexanes	1.958	16.406	13.399	86.18	0.664	8.355	10.580
C7	Heptanes	0.692	16.101	14.849	97.27	0.700	7.514	10.740
C8	Octanes	0.255	16.654	16.609	105.26	0.751	7.515	11.625
C9	Nonanes	0.043	8.141	9.684	125.23	0.736	3.628	6.877
C10	Decanes	0.034	5.732	7.279	134.31	0.779	2.557	5.046
C11	Undecanes		3.648	5.081	147.00	0.790	1.615	3.489
C12	Dodecanes		2.481	3.785	161.00	0.801	1.098	2.599
C13	Tridecanes		1.842	3.055	175.00	0.812	0.816	2.097
C14	Tetradecanes		1.243	2.239	190.00	0.823	0.550	1.536
C15	Pentadecanes		0.951	1.856	206.00	0.833	0.421	1.275
C16	Hexadecanes		0.659	1.387	222.00	0.840	0.292	0.952
C17	Heptadecanes		0.500	1.122	237.00	0.848	0.221	0.771
C18	Octadecanes		0.389	0.925	251.00	0.853	0.172	0.635
C19	Nonadecanes		0.289	0.720	263.00	0.858	0.128	0.494
C20	Eicosanes		0.216	0.563	275.00	0.863	0.096	0.386
C21	Heneicosanes		0.155	0.427	291.00	0.868	0.069	0.293
C22	Docosanes		0.125	0.361	305.00	0.873	0.055	0.248
C23	Tricosanes		0.101	0.304	318.00	0.878	0.045	0.209
C24	Tetracosanes		0.080	0.251	331.00	0.882	0.035	0.172
C25	Pentacosanes		0.051	0.167	345.00	0.886	0.023	0.114
C26	Hexacosanes		0.056	0.190	359.00	0.890	0.025	0.131
C27	Heptacosanes		0.039	0.139	374.00	0.894	0.017	0.095
C28	Octacosanes		0.034	0.124	388.00	0.897	0.015	0.086
C29	Nonacosanes		0.027	0.102	402.00	0.900	0.012	0.071
C30+	Triacontanes Plus		0.108	0.475	467.73	0.914	0.048	0.329
Total		100.000	100.000	100.000			100.000	100.000
Calculated Mole Weight		36.28	105.53				68.05	
Measured Mole Weight			113.17					

- Compositional groupings based on normal to normal carbon distribution.
- Pristane is included as C_{17} and Phytane is included as C_{18}.

Compositional Groupings of Separator Liquid

Group	Mole %	Weight %	MW	SG
Total Fluid	100.000	100.000	68.05	
C7+	26.987	50.070	126.35	0.761
C10+	8.310	21.028	172.21	0.812
C20+	0.439	2.134	330.72	0.882
C30+	0.048	0.329	467.73	0.914

Stock Tank Liquid Properties

Compositional Groupings of Flash Liquid (PENCOR ID No. 39414-04)

Group	Mole %	Weight %	MW	SG
Total Fluid	100.000	100.000	105.53	0.720
Heptanes plus (C7+)	59.622	71.674	126.87	0.762
Decanes plus (C10+)	18.726	30.552	172.21	0.812
Eicosanes plus (C20+)	0.992	3.103	330.72	0.882
Triacontanes plus (C30+)	0.108	0.475	467.73	0.914

Atmospheric Liquid Pipeline Package (PENCOR ID No. 39414-04)

Test	Method	Result	Units
Color	Visual	Clear	
API Gravity at 60 °F (water free)	ASTM D 5002	66.8	° API
Water Content	ASTM D 4377	0.04	wt%
Paraffin Content	UOP 46 modified	N/M	wt%
Asphaltene Content *	ASTM D 4055 modified	N/M	wt%
Wax Appearance Temperature	CPM	N/M	°F
Pour Point	ASTM D 97	N/M	°F
Reid Vapor Pressure	ASTM D 323	15.15	psi
Total Acid Number **	ASTM D 664	N/M	mg KOH/g
Total Sulfur **	ASTM D 4294	N/M	wt%
Viscosity at 80 °F	ASTM D 7042	N/M	cPoise
	ASTM D 7042	N/M	cStokes
Viscosity at 100 °F	ASTM D 7042	N/M	cPoise
	ASTM D 7042	N/M	cStokes
Viscosity at 120 °F	ASTM D 7042	N/M	cPoise
	ASTM D 7042	N/M	cStokes

* Asphaltenes defined as pentane insoluble

** Analysis performed by third party

Additional Testing in Mini Assay (performed by third party)

Test	Method	Result	Units
Carbon Residue - Conradson	ASTM D 189	N/M	wt %
Carbon Residue - Ramsbottom	ASTM D 524	N/M	wt %
Hydrogen Content	ASTM D 5291	N/M	wt %
Hydrogen Sulfide	UOP 163	N/M	ppm wt
Mercaptan Sulfur	ASTM D 3227	N/M	ppm wt
Nickel	ASTM D 5708	N/M	ppm wt
Vanadium	ASTM D 5708	N/M	ppm wt
Organically Bound Nitrogen	ASTM D 5762	N/M	ppm wt

Attachment F
Permit Determination Form

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION DIVISION OF AIR QUALITY 601 57th Street, SE Charleston, WV 25304 Phone: (304) 926-0475 www.dep.wv.gov/daq	**PERMIT DETERMINATION FORM (PDF)** FOR AGENCY USE ONLY: PLANT I.D. # _____ PDF # _____ PERMIT WRITER: _____

1. NAME OF APPLICANT (AS REGISTERED WITH THE WV SECRETARY OF STATE'S OFFICE):
Cone Gathering, LLC

2. NAME OF FACILITY (IF DIFFERENT FROM ABOVE):	3. NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODE:
Moundsville Slug Catcher Site	211111

4A. MAILING ADDRESS:	4B. PHYSICAL ADDRESS:
1000 Consol Energy Dr. Canonsburg, PA 15317	1100 Kansas Ridge Lane/County Hwy 88/8 Moundsville, WV 26041

5A. DIRECTIONS TO FACILITY (PLEASE PROVIDE **MAP** AS **ATTACHMENT A**):
From Moundsville, WV, follow WV-2 S/Lafayette Ave for 0.9 miles. Turn left onto State Rte 2 Alt and follow for approximately 200 feet. Turn left onto Roberts Ridge Rd and travel 2.8 miles. Continue onto Roberts Ridge St Joseph Rd and travel 1.0 mile. Make a slight right onto Kansas Ridge. After approximately 0.1 miles, make a slight right to stay on Kansas Ridge. Travel approximately 1.0 mile; the site road will be on the left.

5B. NEAREST ROAD:	5C. NEAREST CITY OR TOWN:	5D. COUNTY:
Kansas Ridge Lane/Co Hwy 88/8	Moundsville, WV	Marshall
5E. UTM NORTHING (KM):	**5F. UTM EASTING (KM):**	**5G. UTM ZONE:**
4412.0435	519.368	17

6A. INDIVIDUAL TO CONTACT IF MORE INFORMATION IS REQUIRED:		6B. TITLE:
David Morris		Air Quality Manager
6C. TELEPHONE:	6D. FAX:	6E. E-MAIL:
(724) 485-3063	n/a	DavidMorris@consolenergy.com

7A. DAQ PLANT I.D. NO. (FOR AN EXISTING FACILITY ONLY):	7B. PLEASE LIST ALL CURRENT 45CSR13, 45CSR14, 45CSR19 AND/OR TITLE V (45CSR30) PERMIT NUMBERS ASSOCIATED WITH **THIS** PROCESS (FOR AN EXISTING FACILITY ONLY):
n/a	n/a

7C. IS THIS PDF BEING SUBMITTED AS THE RESULT OF AN ENFORCEMENT ACTION? IF YES, PLEASE LIST:
NO

8A. TYPE OF EMISSION SOURCE (CHECK ONE):	8B. IF ADMINISTRATIVE UPDATE, DOES DAQ HAVE THE APPLICANT'S CONSENT TO UPDATE THE EXISTING PERMIT WITH THE INFORMATION CONTAINED HEREIN?
☒ **NEW SOURCE** ☐ **ADMINISTRATIVE UPDATE** ☐ **MODIFICATION** ☐ **OTHER** (PLEASE EXPLAIN IN 11B)	☐ **YES** ☐ **NO**

9. IS *DEMOLITION* OR PHYSICAL *RENOVATION* AT AN EXISTING FACILITY INVOLVED? ☐ **YES** ☒ **NO**

10A. DATE OF ANTICIPATED INSTALLATION OR CHANGE:	10B. DATE OF ANTICIPATED START-UP:
Upon Determination by WVDEP	TBD

11A. PLEASE PROVIDE A **DETAILED PROCESS FLOW DIAGRAM** SHOWING EACH PROPOSED OR MODIFIED PROCESS EMISSION POINT AS **ATTACHMENT B**.

11B. PLEASE PROVIDE A **DETAILED PROCESS DESCRIPTION** AS **ATTACHMENT C**.

12. PLEASE PROVIDE **MATERIAL SAFETY DATA SHEETS (MSDS)** FOR ALL MATERIALS PROCESSED, USED OR PRODUCED AS **ATTACHMENT D**. FOR CHEMICAL PROCESSE, PLEASE PROVIDE A MSDS FOR EACH COMPOUND EMITTED TO AIR.

13A. **REGULATED AIR POLLUTANT EMISSIONS:**

⇒ **FOR A NEW FACILITY,** PLEASE PROVIDE PLANT WIDE EMISSIONS BASED ON THE POTENTIAL TO EMIT (PTE) FOR THE FOLLOWING AIR POLLUTANTS INCLUDING ALL PROCESSES.

⇒ **FOR AN EXISTING FACILITY,** PLEASE PROVIDE THE PROPOSED CHANGE IN EMISSIONS BASED ON THE PTE OF ALL PROCESS CHANGES FOR THE FOLLOWING AIR POLLUTANTS.

PTE FOR A GIVEN POLLUTANT IS TYPICALLY BEFORE AIR POLLUTION CONTROL DEVICES AND IS COLLECTED BASED ON THE MAXIMUM DESIGN CAPACITY OF PROCESS EQUIPMENT.

POLLUTANT	HOURLY PTE (LB/HR)		YEARLY PTE (TON/YR) (HOURLY PTE MULTIPLIED BY 8760 HR/YR) DIVIDED BY 2000 LB/TON	
PM	0.04		0.17	
PM_{10}	0.04		0.17	
VOCs	2.11		9.24	
CO	1.01		4.42	
NO_X	0.82		3.61	
SO_2	0.00		0.01	
Pb	---		---	
HAPs (AGGREGATE AMOUNT)	0.17		0.75	
TAPs (INDIVIDUALLY)*	Benzene	0.003	Benzene	0.014
	1,3-Butadiene	0.001	1,3-Butadiene	0.006
OTHER (INDIVIDUALLY)*	---		---	

* ATTACH ADDITIONAL PAGES AS NEEDED

13B. PLEASE PROVIDE ALL **SUPPORTING CALCULATIONS** AS **ATTACHMENT E.**

CALCULATE AN HOURLY AND YEARLY PTE OF EACH PROCESS EMISSION POINT (SHOWN IN YOUR DETAILED PROCESS FLOW DIAGRAM) FOR ALL AIR POLLUTANTS LISTED ABOVE INCLUDING INDIVIDUAL HAP'S (LISTED IN SECTION 112[b] OF THE 1990 CAAA), TAP'S (LISTED IN 45CSR27), AND OTHER AIR POLLUTANTS (E.G. POLLUTANTS LISTED IN TABLE 45-13A OF 45CSR13, MINERAL ACIDS PER 45CSR7, ETC.).

14. **CERTIFICATION OF DATA**

I, DAVID MORRIS (*TYPE NAME*) ATTEST THAT ALL THE REPRESENTATIONS CONTAINED IN THIS APPLICATION, OR APPENDED HERETO, ARE TRUE, ACCURATE, AND COMPLETE TO THE BEST OF MY KNOWLEDGE BASED ON INFORMATION AND BELIEF AFTER REASONABLE INQUIRY, AND THAT I AM A ***RESPONSIBLE OFFICIAL*** ** (*PRESIDENT, VICE PRESIDENT, SECRETARY OR TREASURER, GENERAL PARTNER OR SOLE PROPRIETOR*) OF THE APPLICANT.

SIGNATURE OF RESPONSIBLE OFFICIAL: _____

TITLE: AIR QUALITY MANAGER DATE: 6 / 29 / 15

** THE DEFINITION OF THE PHRASE '***RESPONSIBLE OFFICIAL***' CAN BE FOUND AT 45CSR13, SECTION 2.23.

NOTE: PLEASE CHECK ENCLOSED ATTACHMENTS:

☒ **ATTACHMENT A** ☒ **ATTACHMENT B** ☒ **ATTACHMENT C** ☐ **ATTACHMENT D** ☒ **ATTACHMENT E**

RECORDS ON ALL CHANGES ARE REQUIRED TO BE KEPT AND MAINTAINED ON-SITE FOR TWO (2) YEARS.

THE PERMIT DETERMINATION FORM WITH THE INSTRUCTIONS CAN BE FOUND ON DAQ'S PERMITTING SECTION WEB SITE

www.dep.wv.gov/daq