



August 17, 2016

Division of Air Quality
601 57th Street, SE
Charleston, WV 25304



**RE: Application for Rule 13 Construction Permit
Ascent Resources - Marcellus, LLC
Hoyt 403
Facility ID: 103-00067**

Dear Sir/Madam,

Ascent Resources – Marcellus, LLC (Ascent) owns and operates the Hoyt 403 facility (Facility), which is located in Wetzel County, West Virginia. The Facility is currently permitted under G70-A191, issued December 31, 2015.

Ascent is updating the combustor and requesting a conversion to a Rule 13 permit. To authorize the installation and operation of equipment at the Facility, Ascent is submitting this application for a Rule 13 Construction Permit. The purpose of this application is to obtain authorization to install and operate the identified emissions units at the Facility. The Facility consists of six (6) production unit heaters, two (2) condensate heaters, two (2) gunbarrel tanks, four (4) condensate storage tanks, four (4) produced water storage tanks, one (1) combustor, and various support operations.

This Application has been prepared in accordance with the requirements set forth in 45CSR6, 45CSR13, and applicable guidance documents. Ascent will operate the Facility in compliance with applicable federal and state air quality regulations. The required attachments are included in addition to the application forms.

Enclosed is the original and two (2) copies of the application, along with the fee in the amount of \$1,000. If you have any questions or need additional information, please feel free to contact me at 405-252-7753.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Evan Foster Pearson'.

Evan Foster Pearson
EH&S Air Compliance Specialist

Enclosures

*Ascent Resources -
Marcellus, LLC
Hoyt 403
103-00067
R13-3091A
Steve P*

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WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

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

PLEASE CHECK ALL THAT APPLY TO NSR (45CSR13) (IF KNOWN):

- CONSTRUCTION MODIFICATION RELOCATION
 CLASS I ADMINISTRATIVE UPDATE TEMPORARY
 CLASS II ADMINISTRATIVE UPDATE AFTER-THE-FACT

PLEASE CHECK TYPE OF 45CSR30 (TITLE V) REVISION (IF ANY):

- ADMINISTRATIVE AMENDMENT MINOR MODIFICATION
 SIGNIFICANT MODIFICATION

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS ATTACHMENT S TO THIS APPLICATION

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

Section I. General

1. Name of applicant (as registered with the WV Secretary of State's Office): Ascent Resources – Marcellus, LLC		2. Federal Employer ID No. (FEIN): 46-5580354	
3. Name of facility (if different from above): Hoyt 403		4. The applicant is the: <input type="checkbox"/> OWNER <input type="checkbox"/> OPERATOR <input checked="" type="checkbox"/> BOTH	
5A. Applicant's mailing address: PO Box 13678 Oklahoma City, OK 73113		5B. Facility's present physical address: 39.5932°N, 80.6578°W Wileyville, WV 26581	
6. West Virginia Business Registration. Is the applicant a resident of the State of West Virginia? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO – If YES, provide a copy of the Certificate of Incorporation/Organization/Limited Partnership (one page) including any name change amendments or other Business Registration Certificate as Attachment A . – If NO, provide a copy of the Certificate of Authority/Authority of L.L.C./Registration (one page) including any name change amendments or other Business Certificate as Attachment A .			
7. If applicant is a subsidiary corporation, please provide the name of parent corporation:			
8. Does the applicant own, lease, have an option to buy or otherwise have control of the <i>proposed site</i> ? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO – If YES, please explain: Lease – If NO, you are not eligible for a permit for this source.			
9. Type of plant or facility (stationary source) to be constructed, modified, relocated, administratively updated or temporarily permitted (e.g., coal preparation plant, primary crusher, etc.): Natural gas production		10. North American Industry Classification System (NAICS) code for the facility: 211111	
11A. DAQ Plant ID No. (for existing facilities only): 103-00067		11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only): G70-A191	

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



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

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

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

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

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

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

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

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

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

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

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

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

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

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

YES NO

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

Section III. Certification of Information

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

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

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

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

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

Certification of Truth, Accuracy, and Completeness

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

Compliance Certification

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

SIGNATURE _____

(Please use blue ink)

DATE: _____

(Please use blue ink)

35B. Printed name of signer: Tim Cummings

35C. Title: VP-Operations

35D. E-mail: N/A

36E. Phone: N/A

36F. FAX: N/A

36A. Printed name of contact person (if different from above): Evan Foster Pearson

36B. Title: EH&S Air Compliance Specialist

36C. E-mail:
evan.pearson@ascentresources.com

36D. Phone: 405-252-7753

36E. FAX: N/A

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

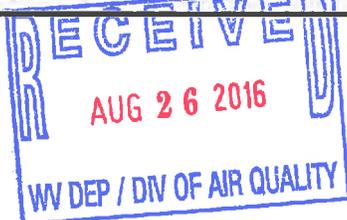
- | | |
|--|--|
| <input checked="" type="checkbox"/> Attachment A: Business Certificate | <input checked="" type="checkbox"/> Attachment K: Fugitive Emissions Data Summary Sheet |
| <input checked="" type="checkbox"/> Attachment B: Map(s) | <input checked="" type="checkbox"/> Attachment L: Emissions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

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

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

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

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



Source Aggregation Analysis

All equipment at the Hoyt 403 facility (Facility) is owned and operated by Ascent Resources – Marcellus, LLC and has been included in this application.

Traditionally, source aggregation has been determined based on a “three-prong” approach, including:

1. SIC Code: Surrounding or associated sources belong to the same 2-digit industrial grouping (2-digit SIC code) as this facility, OR surrounding or associated sources that belong to different 2-digit SIC codes are support facilities for this source.
2. Common Ownership or Control: Surrounding or associated sources are under common ownership or control as this source.
3. Contiguous or Adjacent: Surrounding or associated sources are contiguous or adjacent with this source.

On June 3, 2016, the United States Environmental Protection Agency (US EPA) finalized a rule clarifying oil and gas source aggregation at major sources. The final rule states that sources shall be aggregated if they are:

1. Under Common Control,
2. Located within ¼ mile of one another (measured from the center of the equipment on the surface site), and
3. Share Equipment (including, but not limited to, produced fluids storage tanks, phase separators, natural gas dehydrators or emissions control devices)

While states are not required to implement this definition, it provides additional reference in determining source aggregation.

Ascent has determined that there are currently no additional sources under the same SIC, under common control, contiguous or adjacent to this Facility, within a quarter (¼) mile of the Facility, or that share equipment; therefore any additional source aggregation analysis is not required.

Attachment A: Business Certificate

State of West Virginia



Certificate

*I, Natalie E. Tennant, Secretary of State of the
State of West Virginia, hereby certify that*

the attached true and exact copy of the Articles of Amendment to the Articles of Organization of

AMERICAN ENERGY-MARCELLUS, LLC

are filed in my office, signed and verified, as required by the provisions of West Virginia Code
§31B-2-204 and conform to law. Therefore, I issue this

CERTIFICATE OF AMENDMENT TO THE CERTIFICATE OF AUTHORITY

changing the name of the limited liability company to

ASCENT RESOURCES - MARCELLUS, LLC

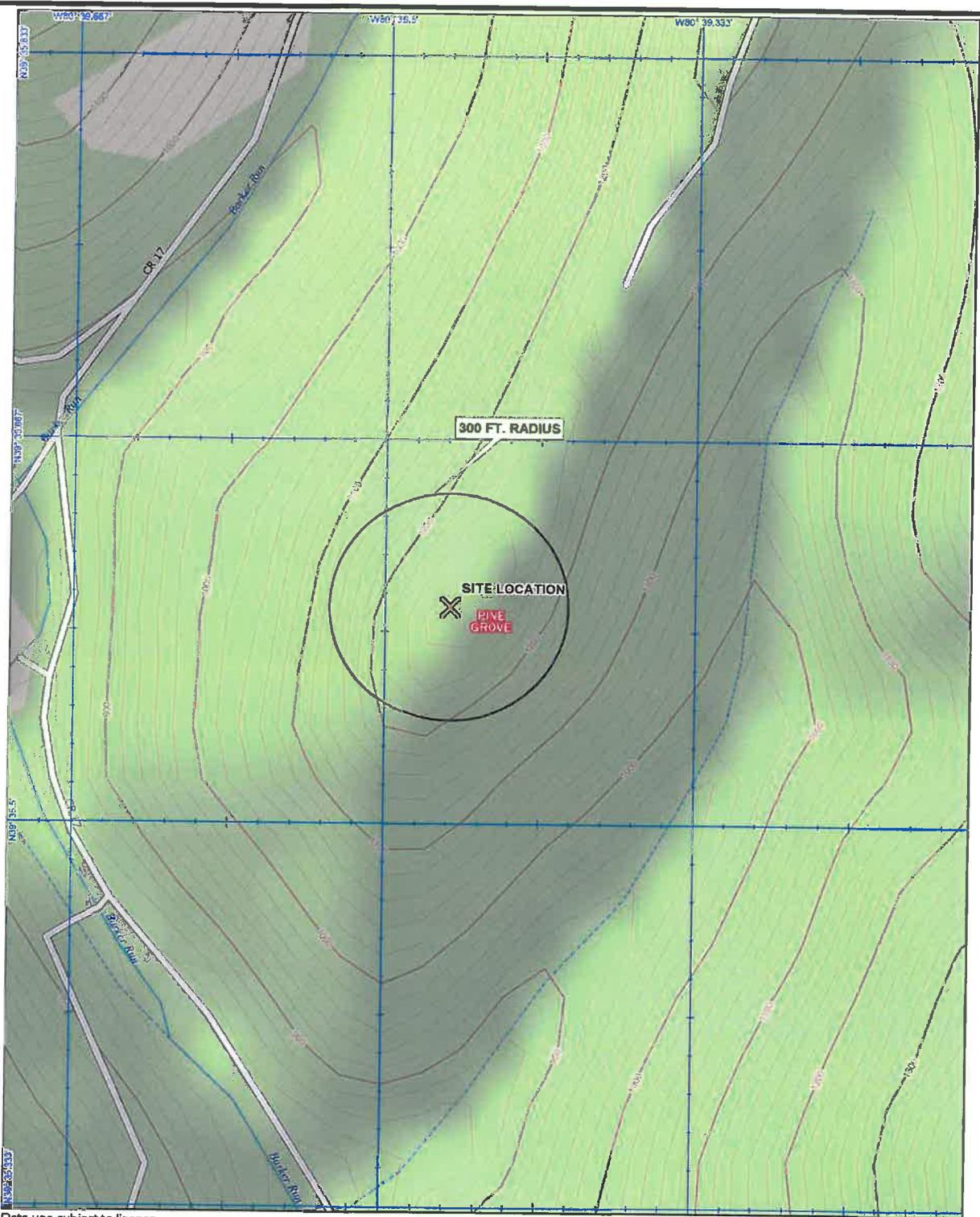


*Given under my hand and the
Great Seal of the State of
West Virginia on this day of
July 9, 2015*

Natalie E. Tennant

Secretary of State

Attachment B: Map(s)



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 www.delorme.com



1015 N. Broadway, Suite 300
 Oklahoma City, OK 73102
 (405) 842-1066

www.envirocleanps.com

FIGURE TITLE	AREA MAP
DOCUMENT TITLE	RULE 13 CONSTRUCTION APPLICATION
CLIENT	ASCENT RESOURCES – MARCELLUS, LLC
LOCATION	HOYT 403 FACILITY WETZEL COUNTY, WEST VIRGINA

DATE	8/4/2016
SCALE	AS SHOWN
DESIGNED BY	PH
APPROVED BY	LWL
DRAWN BY	PH
PROJECT NUMBER	ARMAWV0001
ATTACHMENT	B

Attachment C: Installation and Start-Up Schedule

Installation and Start-up Schedule

Equipment	Unit ID	Installation Date	Startup Date
Sitewide Fugitive	23E	2012	2012
Production Unit Heater (1.5 MMBtu/hr)	1E	2012	2012
Production Unit Heater (1.5 MMBtu/hr)	2E	2012	2012
Production Unit Heater (1.5 MMBtu/hr)	3E	2012	2012
Production Unit Heater (1.5 MMBtu/hr)	4E	2012	2012
Production Unit Heater (1.5 MMBtu/hr)	5E	2012	2012
Production Unit Heater (1.5 MMBtu/hr)	6E	2012	2012
Condensate Heater (0.75 MMBtu/hr)	7E	2013	2013
Condensate Heater (0.75 MMBtu/hr)	8E	2013	2013
Tank 1 – Gunbarrel Tank (178-bbl)	9E	2012	2012
Tank 2 – Gunbarrel Tank (178-bbl)	10E	2012	2012
Tank 3 – Condensate Tank (210-bbl)	11E	2012	2012
Tank 4 – Condensate Tank (210-bbl)	12E	2012	2012
Tank 5 – Condensate Tank (210-bbl)	13E	2012	2012
Tank 6 – Condensate Tank (210-bbl)	14E	2012	2012
Tank 7 – Produced Water Tank (210-bbl)	15E	2012	2012
Tank 8 – Produced Water Tank (210-bbl)	16E	2012	2012
Tank 9 – Produced Water Tank (210-bbl)	17E	2012	2012
Tank 10 – Produced Water Tank (210-bbl)	18E	2012	2012
Combustor (2.5 MMBtu/hr)	19E	2016	2016
Condensate Truck Loading	20E	2013	2013
Produced Water Truck Loading	21E	2013	2013
Unpaved Road Sources	22E	2013	2013

Attachment D: Regulatory Discussion

Applicable State Requirements

45CSR6 CONTROL OF AIR POLLUTION FROM COMBUSTION OF REFUSE

Ascent is applying for a permit to authorize the installation and operation of the combustor that will be used on site to control the storage tanks. Ascent will comply with all requirements of this rule.

45CSR13 PERMITS FOR CONSTRUCTION, MODIFICATION, RELOCATION AND OPERATION OF STATIONARY SOURCES OF AIR POLLUTANTS, NOTIFICATION REQUIREMENTS, ADMINISTRATIVE UPDATES, TEMPORARY PERMITS, GENERAL PERMITS, PERMISSION TO COMMENCE CONSTRUCTION, AND PROCEDURES FOR EVALUATION

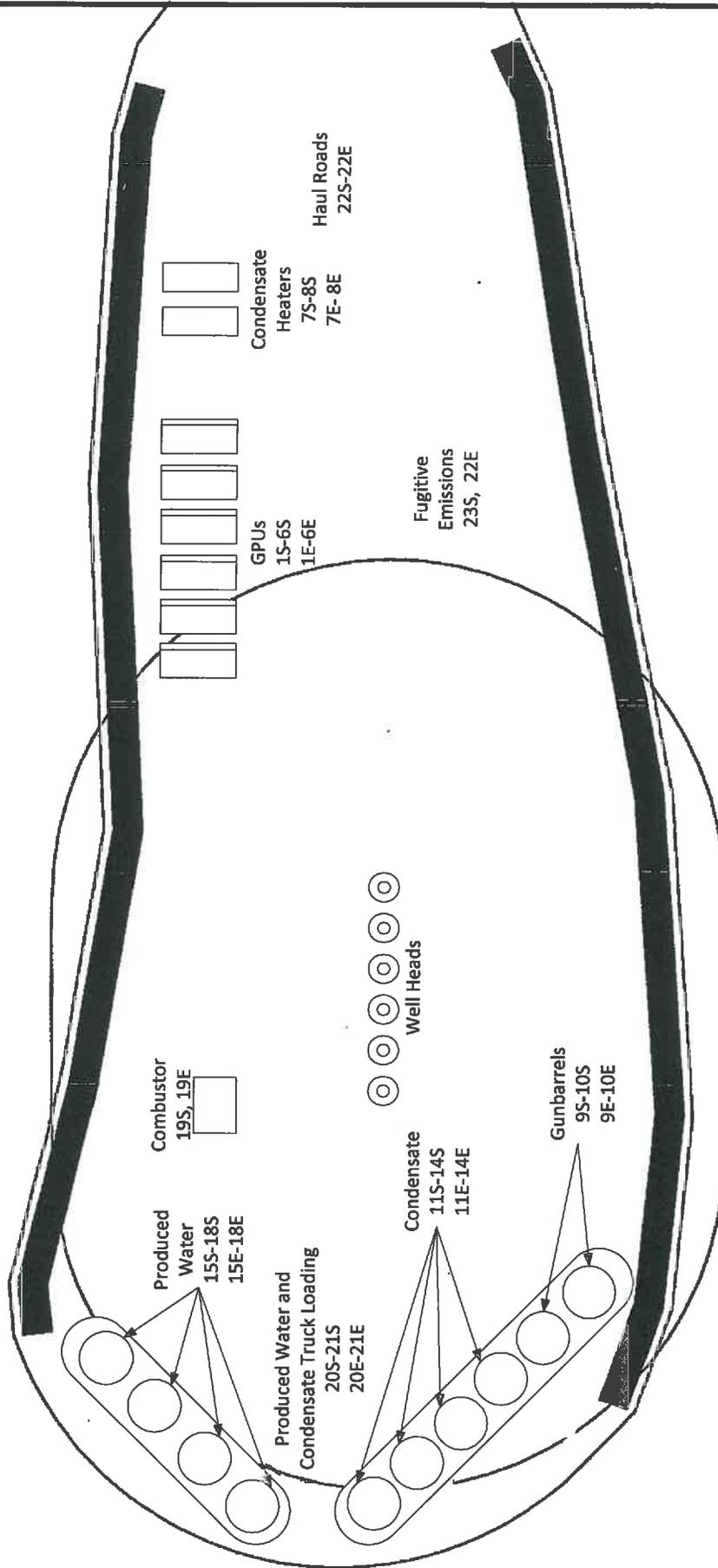
Ascent is submitting this application in accordance with this rule. Ascent will comply will all requirements of this rule.

Applicable Federal Requirements

40CFR NEW SOURCE PERFORMANCE STANDARDS (NSPS) SUBPART OOOO

The storage tanks were constructed after August 23, 2011, however a federally enforceable limit of less than six (6) tons per year (TPY) was requested in the previous permits. Therefore, there are no affected equipment under this subpart for the facility.

Attachment E: Plot Plan



DATE	8/4/2016
SCALE	NOT TO SCALE
DESIGNED BY	SB
APPROVED BY	LWL
DRAWN BY	PH
PROJECT NUMBER	ARMAWV0001
ATTACHMENT	E

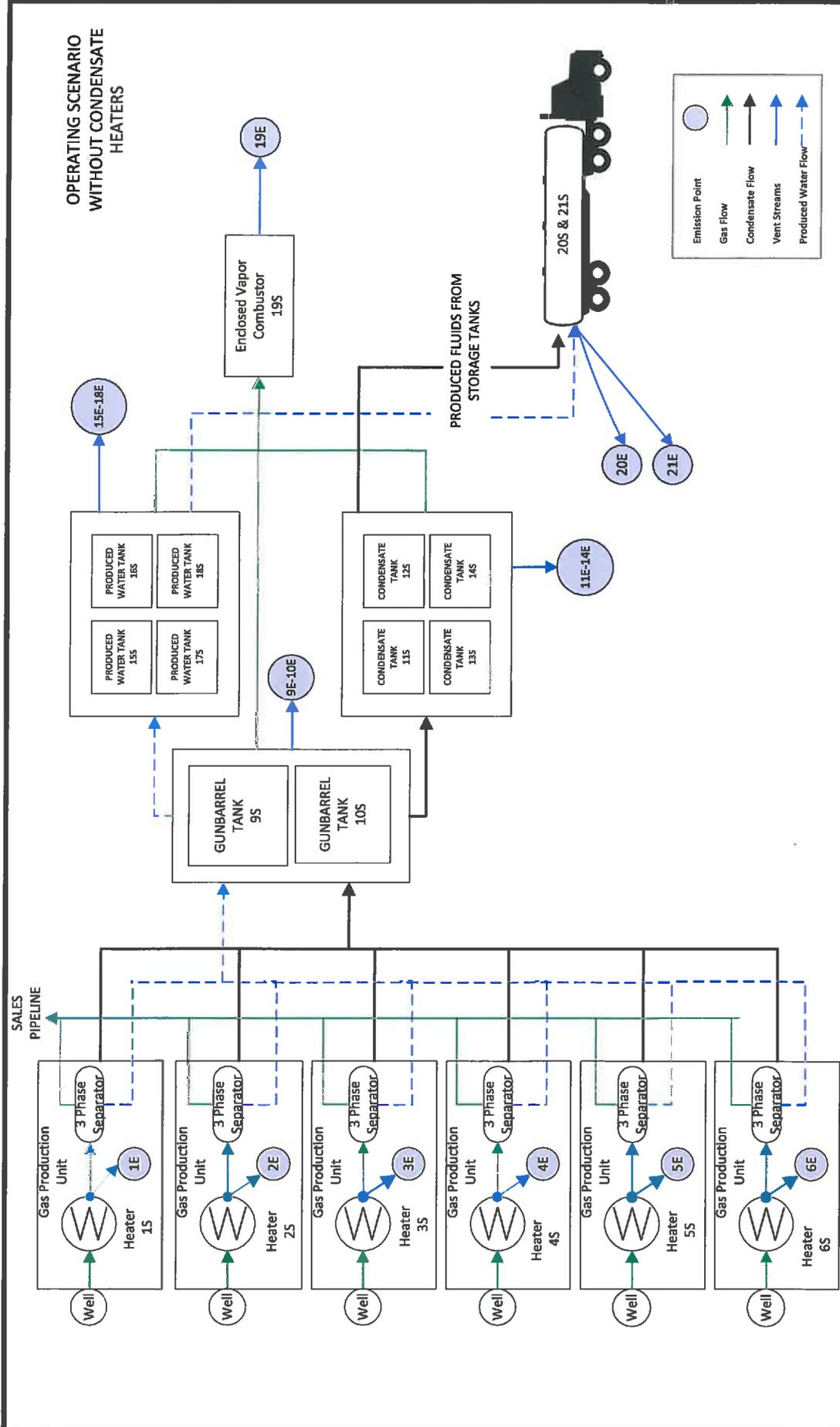
FIGURE TITLE	PLOT PLAN
DOCUMENT TITLE	RULE 13 CONSTRUCTION APPLICATION
CLIENT	ASCENT RESOURCES – MARCELLUS, LLC
LOCATION	HOYT 403 FACILITY WETZEL COUNTRY, WEST VIRGINIA



**ENVIRO CLEAN
CARDINAL**

 1250 E. COPELAND RD
 SUITE 240
 ARLINGTON, TX 76011
www.envirocleanps.com

Attachment F: Detailed Process Flow Diagram(s)



DATE	8/4/2016
SCALE	NOT TO SCALE
DESIGNED BY	AD
APPROVED BY	LWL
DRAWN BY	AD
PROJECT NUMBER	ARMAWV0001
ATTACHMENT	F

FIGURE TITLE	PROCESS FLOW DIAGRAM (PAGE 1 OF 2)
DOCUMENT TITLE	RULE 13 CONSTRUCTION APPLICATION
CLIENT	ASCENT RESOURCES, LLC
LOCATION	HOYT 403 FACILITY WEITZEL COUNTY, WEST VIRGINA

ENVIRO CLEAN CARDINAL
 1015 N. BROADWAY
 SUITE 300
 OKLAHOMA CITY, OK 73102
 www.envirocleanps.com

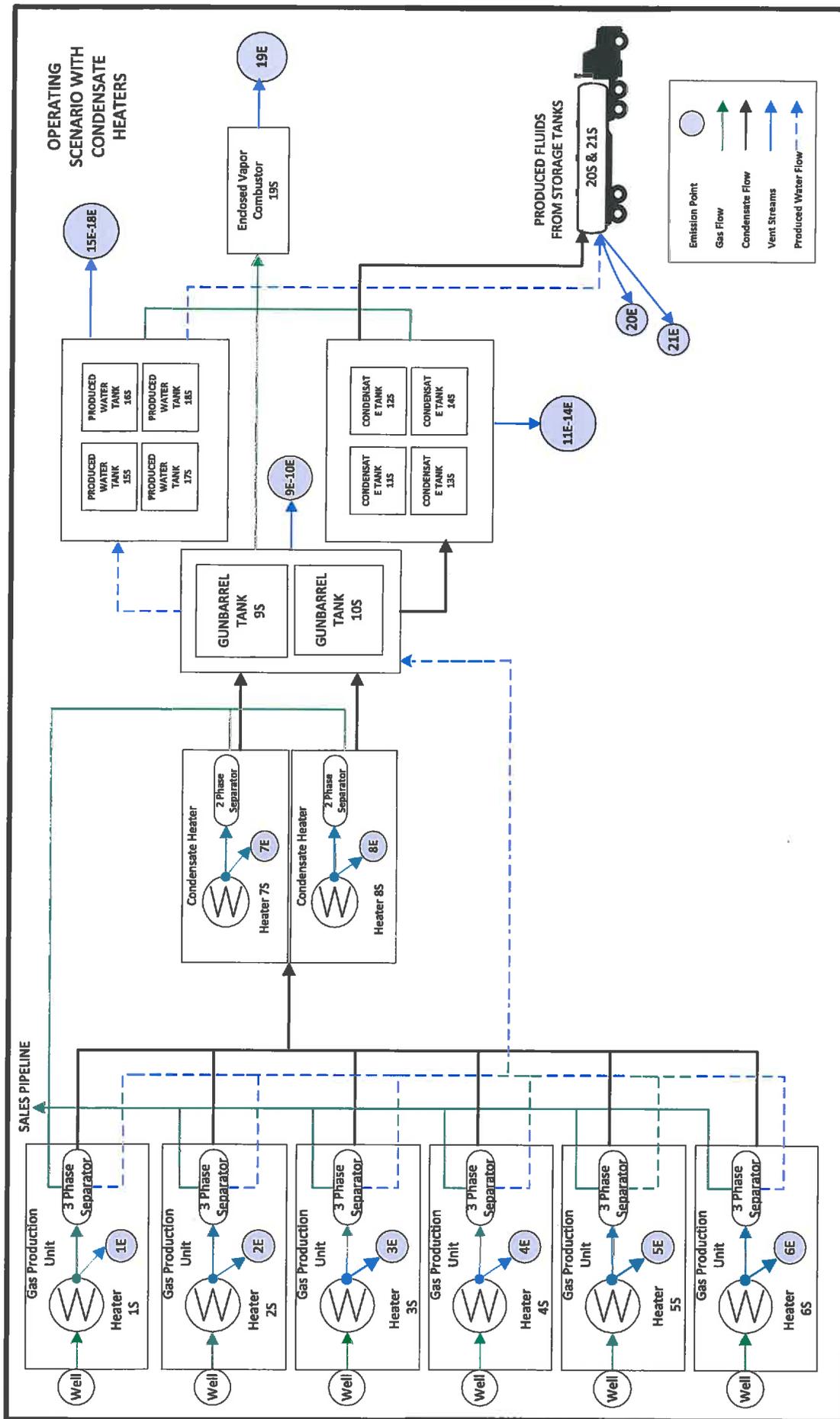


FIGURE TITLE	PROCESS FLOW DIAGRAM (PAGE 2 of 2)	DATE	8/4/2016
DOCUMENT TITLE	RULE 13 CONSTRUCTION APPLICATION	SCALE	NOT TO SCALE
CLIENT	ASCENT RESOURCES, LLC	DESIGNED BY	AD
LOCATION	HOYT 403 FACILITY WETZEL COUNTY, WEST VIRGINA	APPROVED BY	LWL
		DRAWN BY	AD
		PROJECT NUMBER	ARMAWV0001
		FIGURE NUMBER	E

ENVIRO CLEAN CARDINAL
 1015 N. BROADWAY
 SUITE 300
 OKLAHOMA CITY, OK 73102
 www.envirocleansps.com

Attachment G: Process Description

Process Description

Natural gas, condensate, and produced water flow from the six (6) wellheads located on the Hoyt 403 site. The gas and liquids are first routed through the six (6) 1.5 MMBtu/hr gas production units (GPUs) where the first stage of fluid separation occurs. The GPUs separate the well stream into a high pressure natural gas stream, a condensate liquid stream, and a produced water liquid stream.

Ascent may operate two (2) 0.75 MMBtu/hr condensate heaters at the Facility. When the heaters are in operation, the liquids will pass from the GPUs to the condensate heaters. Gas recovered from the heaters is routed to the low pressure sales line and liquids are sent to the gunbarrels. To be conservative, emissions are calculated with the burners in operation but the storage tanks are calculated with all flash occurring at the storage tanks.

The liquids are then sent to the two (2) gunbarrel tanks. Produced water from the gunbarrels is sent to four (4) 210-bbl produced water storage tanks. The condensate from the gunbarrels is sent to the four (4) 210-bbl condensate storage tanks.

The natural gas stream exits the facility via pipeline. Condensate and produced water are transported offsite via truck. Working, breathing, and flashing emissions from the gunbarrels and working and breathing losses from the storage tanks are routed to the onsite enclosed combustor.

Attachment H: Material Safety Data Sheets (MSDS)

Section 1: Identification of the substance or mixture and of the supplier

Product Name:	Natural Gas Liquids
SDS Number:	786340
Synonyms/Other Means of Identification:	Natural Gas Liquids, Raw Natural Gas Liquids, Ethane Free Plant Condensate Raw NGL EPBC Mix PBC Mix Y-Grade Gas Liquids
MARPOL Annex I Category: Intended Use:	Naphthas and Condensates Feedstock
Manufacturer:	Ascent Resources 3501 N.W. 63rd Oklahoma City, OK 73116
Emergency Health and Safety Number:	Chemtrec: 800-424-9300 (24 Hours)
SDS Information:	Phone: 800-642-3074 URL: www.ascentresources.com

Section 2: Hazard(s) Identification

Classification

H224 – Flammable liquids – Category 1
H315 – Skin corrosion/irritation – Category 2
H304 – Aspiration Hazard – Category 1
H336 – Specific target organ toxicity (single exposure) – Category 3
H350 – Carcinogenicity – Category 1B
H411 – Hazardous to the aquatic environment, chronic toxicity – Category 2

Hazards not Otherwise Classified

May contain or release poisonous hydrogen sulfide gas

Label Elements



DANGER

Extremely flammable liquid and vapor. (H224)*
Causes skin irritation. (H315)*
May contain or release poisonous hydrogen sulfide gas
May be fatal if swallowed and enters airways. (H304)*
May cause drowsiness or dizziness. (H336)*
May cause cancer. (H350)*
Toxic to aquatic life with long lasting effects. (H411)*

Precautionary Statement(s):

- Obtain special instructions before use. (P201)*
- Do not handle until all safety precautions have been read and understood. (P202)*
- Keep away from heat/sparks/open flames/hot surfaces. - No smoking. (P210)*
- Keep container tightly closed. (P233)*
- Ground/bond container and receiving equipment. (P240)*
- Use with explosion-proof equipment. (P241)*
- Use only non-sparking tools. (P242)*
- Take precautionary measures against static discharge. (P243)*
- Avoid breathing dust/fume/gas/mist/vapours/spray. (P261)*
- Wash thoroughly after handling. (P264)*
- Use only outdoors or in a well-ventilated area. (P271)*
- Wear protective gloves / protective clothing / eye protection / face protection. (P280)*
- IF ON SKIN: Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. (P303+P361+P353)*
- In case of fire: Use dry chemical, carbon dioxide, or foam for extinction. (P370+P378)*
- If skin irritation occurs: Get medical advice/attention. (P313)*
- Take off contaminated clothing and wash before reuse. (P362)*
- IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. (P301+P310)*
- Do NOT induce vomiting. (P331)*
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. (P304+P340)*
- Call a POISON CENTER or doctor/physician if you feel unwell. (P312)*
- In case of fire: Use dry chemical, carbon dioxide, or foam for extinction. (P370+P378)*
- Store in a well-ventilated place. Keep cool. (P403+P235)*
- Store locked up. (P405)*
- Dispose of contents/container to approved disposal facility. (P501)*

* (Applicable GHS hazard code.)

Section 3: Composition / Information on Ingredients

Component	CASRN	Concentration ¹
Natural gas (petroleum), raw liq. mix		
n-Hexane	64741-48-6	100
Benzene	110-54-3	5-25
Hydrogen Sulfide	71-43-2	0.1-5
Total Sulfur: > 0.5 wt%	7783-06-4	<1

¹ All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Section 4: First Aid Measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek medical attention. Wash contaminated clothing before reuse.

Inhalation (Breathing): If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If symptoms persist, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion (Swallowing): Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Hydrogen sulfide and oxides of nitrogen and sulfur may also be formed.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

Section 6: Accidental Release Measures

Personal Precautions: Extremely flammable. Spillages of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. May contain or release poisonous hydrogen sulfide gas. If the presence of dangerous amounts of H₂S around the spilled product is suspected, additional or special actions may be warranted, including access restrictions and use of protective equipment. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

Methods for Containment and Clean-Up: Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken.

Section 7: Handling and Storage

Precautions for safe handling: Keep away from ignition sources such as heat/sparks/open flame – No smoking. Take precautionary measures against static discharge. Nonsparking tools should be used. May contain or release dangerous levels of hydrogen sulfide. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing vapors or mists. Use only outdoors or in well-ventilated area. Wear protective gloves/clothing and eye/face protection. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8).

Extremely Flammable. May vaporize easily at ambient temperatures. The vapor is heavier than air and may create an explosive mixture of vapor and air. Beware of accumulation in confined spaces and low lying areas. Open container slowly to relieve any pressure. Electrostatic charge may accumulate and create a hazardous condition when handling or processing this material. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-70 and/or API RP 2003 for specific bonding/grounding requirements. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

Static Accumulation Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding of tanks, transfer piping, and storage tank level floats are necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. Special care should be given to ensure that special slow load procedures for "switch loading" are followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil or diesel) is loaded into tanks previously containing low flash point products (such as gasoline or naphtha). For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA) 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.

Conditions for safe storage: This material may contain or release poisonous hydrogen sulfide gas. In a tank, barge, or other closed container, the vapor space above this material may accumulate hazardous concentrations of hydrogen sulfide. Check atmosphere for oxygen content, H₂S, and flammability prior to entry. Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

Section 8: Exposure Controls / Personal Protection

Component	ACGIH	OSHA	Other
Natural gas (petroleum), raw liq. mix	TWA: 300 ppm (as Gasoline)	TWA: 400 mg/m ³ TWA: 100 ppm	0.5 ppm TWA8hr (as benzene) 0.25 ppm TWA12hr (as benzene) 2.5 ppm STEL (as benzene) (American Energy Guidelines)
n-Hexane	TWA: 50 ppm Skin	TWA: 500 ppm TWA: 1800 mg/m ³	--
Benzene	STEL: 2.5 ppm TWA: 0.5 ppm Skin	Ceiling: 25 ppm STEL: 5 ppm TWA: 10 ppm TWA: 1 ppm	--
Hydrogen Sulfide	STEL: 5 ppm TWA: 1 ppm	Ceiling: 20 ppm	TWA: 5 ppm 8hr TWA: 2.5 ppm 12hr STEL: 15 ppm (American Energy Guidelines)

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Depending on exposure and use conditions, additional protection may be necessary to prevent skin contact including use of items such as chemical resistant boots, aprons, arm covers, hoods, coveralls, or encapsulated suits. Suggested protective materials: Nitrile

Respiratory Protection: A NIOSH approved, self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode should be used in situations of oxygen deficiency (oxygen content less than 19.5 percent), unknown exposure concentrations, or situations that are immediately dangerous to life or health (IDLH).

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use.

If benzene concentrations equal or exceed applicable exposure limits, OSHA requirements for personal protective equipment, exposure monitoring, and training may apply (29CFR1910.1028 - Benzene).

Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

Section 9: Physical and Chemical Properties

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance:	Colorless
Physical Form:	Liquid
Odor:	Gasoline; Rotten egg / sulfurous
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	150 - 200 psia (Reid VP) @ 100°F / 37.8°C
Vapor Density (air=1):	>1
Initial Boiling Point/Range:	No data
Melting/Freezing Point:	No data
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity (water=1):	(estimated) 0.5 - 0.7 @ 68°F / 20°C
Percent Volatile:	100%
Evaporation Rate (nBuAc=1):	No data
Flash Point:	< -99 °F / < -73 °C
Test Method:	(estimate)
Lower Explosive Limits (vol % in air):	No data
Upper Explosive Limits (vol % in air):	No data
Auto-ignition Temperature:	No data

Section 10: Stability and Reactivity

Stability: Stable under normal ambient and anticipated conditions of use.

Conditions to Avoid: Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizing agents and strong reducing agents.

Hazardous Decomposition Products: Not anticipated under normal conditions of use.

Hazardous Polymerization: Not known to occur.

Section 11: Toxicological Information

Information on Toxicological Effects of Substance/Mixture

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Expected to have a low degree of toxicity by inhalation	May contain or release poisonous hydrogen sulfide gas - see Other Comments.	> 5.2 mg/L (vapor)
Skin Absorption	Unlikely to be harmful		> 2 g/kg
Ingestion (Swallowing)	Unlikely to be harmful		> 5 g/kg

Aspiration Hazard: May be fatal if swallowed and enters airways.

Skin Corrosion/Irritation: Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious Eye Damage/Irritation: Causes mild eye irritation.

Signs and Symptoms: Effects of overexposure can include slight irritation of the respiratory tract, nausea, vomiting, and signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue). Continued exposure to high concentrations can result in vomiting, cardiac irregularities and sudden loss of consciousness.

Skin Sensitization: Not expected to be a skin sensitizer.

Respiratory Sensitization: No information available.

Specific Target Organ Toxicity (Single Exposure): May cause drowsiness and dizziness.

Specific Target Organ Toxicity (Repeated Exposure): Not expected to cause organ effects from repeated exposure.

Carcinogenicity: May cause cancer Based on component information.

Germ Cell Mutagenicity: Not expected to cause heritable genetic effects.

Reproductive Toxicity: Not expected to cause reproductive toxicity.

Other Comments: This material may contain or liberate hydrogen sulfide, a poisonous gas with the smell of rotten eggs. The smell disappears rapidly because of olfactory fatigue so odor may not be a reliable indicator of exposure. Effects of overexposure include irritation of the eyes, nose, throat and respiratory tract, blurred vision, photophobia (sensitivity to light), and pulmonary edema (fluid accumulation in the lungs). Severe exposures can result in nausea, vomiting, muscle weakness or cramps, headache, disorientation and other signs of nervous system depression, irregular heartbeats, convulsions, respiratory failure, and death.

Information on Toxicological Effects of Components

Natural gas (petroleum), raw liq. mix

Carcinogenicity: Two year inhalation studies of vaporized unleaded gasoline produced an increased incidence of kidney tumors in male rats and liver tumors in female mice. Repeated skin application of various petroleum naphthas in mice for two years resulted in an increased incidence of skin tumors but only in the presence of severe skin irritation. Follow-up mechanistic studies suggest that the occurrence of these tumors may be the consequence of promotional processes and not relevant to human risk assessment. Epidemiology data collected from a study of more than 18,000 petroleum marketing and distribution workers showed no increased risk of leukemia, multiple myeloma, or kidney cancer from gasoline exposure. Unleaded gasoline has been identified as a possible carcinogen by the International Agency for Research on Cancer.

Target Organs: Two year inhalation studies of wholly vaporized unleaded gasoline, and 90 days studies of various petroleum naphthas, did not produce significant target organ toxicity in laboratory animals. Nephropathy in male rats, characterized by the accumulation of alpha-2-u- globulin in epithelial cells of the proximal tubules was observed, however follow-up studies suggest that these changes are unique to the male rat.

Reproductive Toxicity: No evidence of developmental toxicity was found in pregnant laboratory animals (rats and mice) exposed to high vapor concentrations of unleaded gasoline and petroleum naphthas via inhalation. A two-generation reproductive toxicity study of vapor recovery gasoline did not adversely affect reproductive function or offspring survival and development.

n-Hexane

Target Organs: Excessive exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesias of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone.

Reproductive Toxicity: Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

Benzene

Carcinogenicity: Benzene is an animal carcinogen and is known to produce acute myelogenous leukemia (a form of cancer) in humans. Benzene has been identified as a human carcinogen by IARC, the US National Toxicology Program and the US-Occupational Safety and Health Administration.

Target Organs: Prolonged or repeated exposures to benzene vapors can cause damage to the blood and blood forming organs, including disorders like leukopenia, thrombocytopenia, and aplastic anemia.

Reproductive Toxicity: Some studies in occupationally exposed women have suggested benzene exposure increased risk of miscarriage and stillbirth and decreased birth weight and gestational age. The size of the effects detected in these studies was small, and ascertainment of exposure and outcome in some cases relied on self-reports, which may limit the reliability of these results.

Germ Cell Mutagenicity: Benzene exposure has resulted in chromosomal aberrations in human lymphocytes and animal bone marrow cells. Exposure has also been associated with chromosomal aberrations in sperm cells in human and animal studies.

Toluene

Carcinogenicity: Exposure of rats and mice to toluene at concentrations ranging from 120-1200 ppm for two years did not demonstrate evidence of carcinogenicity. Toluene has not been listed as a carcinogen by IARC.

Target Organs: Epidemiology studies suggest that chronic occupational overexposure to toluene may damage color vision. Subchronic and chronic inhalation studies with toluene produced kidney and liver damage, hearing loss and central nervous system (brain) damage in laboratory animals. Intentional misuse by deliberate inhalation of high concentrations of toluene has been shown to cause liver, kidney, and central nervous system damage, including hearing loss and visual disturbances.

Reproductive Toxicity: Exposure to toluene during pregnancy has demonstrated limited evidence of developmental toxicity in laboratory animals. Decreased fetal body weight and increased skeletal variations in both inhalation and oral studies, but only at doses that were maternally toxic. No fetal toxicity was seen at doses that were not maternally toxic. Decreased sperm counts have been observed in male rats in the absence of a reduction in fertility. Toluene has been reported to cause mental or growth retardation in the children of solvent abusers who directly inhale toluene during pregnancy.

Cyclohexane

Reproductive Toxicity: Two-generation reproduction and developmental toxicity studies using rats and rabbits exposed (whole-body) to atmospheric concentrations up to 7000 ppm cyclohexane did not detect evidence of developmental toxicity in either species.

Section 12: Ecological Information

Toxicity: Acute aquatic toxicity studies on samples of gasoline and naphtha streams show acute toxicity values greater than 1 mg/L and mostly in the range 1-100 mg/L. These tests were carried out on water accommodated fractions, in closed systems to prevent evaporative loss. Results are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon composition. These substances should be regarded as toxic to aquatic organisms, with the potential to cause long term adverse effects in the aquatic environment. Classification: H411; Chronic Cat 2.

Persistence and Degradability: The hydrocarbons in this material are not readily biodegradable but are regarded as inherently biodegradable since their hydrocarbon components can be degraded by microorganisms.

Persistence per IOPC Fund definition: Non-Persistent

Bioaccumulative Potential: Log Kow values measured for the hydrocarbon components of this material range from 3 to greater than 6 and therefore are regarded as having the potential to bioaccumulate. In practice, metabolic processes or physical properties may prevent this effect or limit bioavailability.

Mobility in Soil: On release to water, hydrocarbons will float on the surface and since they are sparingly soluble, the only significant loss is volatilization to air. In air, these hydrocarbons are photodegraded by reaction with hydroxyl radicals with half lives varying from 6.5 days for benzene to 0.5 days for n-dodecane.

Other Adverse Effects: None anticipated.

Section 13: Disposal Considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)

- D001 - Ignitability characteristic
- D018 - Toxicity characteristic (Benzene)

Section 14: Transport Information

U.S. Department of Transportation (DOT)

Shipping Description:	<i>If vapor pressure is > 300 kPa (43.5 psia) at 50° C (122° F) shipping description is:</i> UN1965, Hydrocarbon gas mixture, liquefied, n.o.s., 2.1; , <i>If vapor pressure is <= 300 kPa (43.5 psia) at 50° C (122° F) shipping description is:</i> UN3295, Hydrocarbons, liquid, n.o.s., 3, I or II [I if BP < 95° F (35° C); II if BP > 95° F]
Non-Bulk Package Marking:	<i>Must be consistent with shipping description, either:</i> Hydrocarbon gas mixture, liquefied, n.o.s., UN1965 <i>or</i> Hydrocarbons, liquid, n.o.s., UN3295
Non-Bulk Package Labeling:	<i>For UN1965:</i> Flammable gas <i>For UN3295:</i> Flammable liquid
Bulk Package/Placard Marking:	<i>For UN1965:</i> Flammable gas / 1965 <i>For UN3295:</i> Flammable / 3295
Packaging - References:	<i>For UN1965:</i> 49 CFR: 173.306; 173.304; 173.314 & .315 <i>For UN3295:</i> 49 CFR 173.150; 173.201; 173.243 [PG I] <i>-or-</i> 49 CFR 173.150; 173.202; 173.242 [PG II] <i>(Exceptions; Non-bulk; Bulk)</i>
Hazardous Substance: Emergency Response Guide: Note:	See Section 15 for RQ's <i>UN1965 - 115; UN3295 - 128;</i> <i>The following alternate shipping description order may be used until January 1, 2013:</i> Proper Shipping name, Hazard Class or Division, (Subsidiary Hazard if any), UN or NA number, Packing Group <i>Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable</i> <i>Other shipping description elements may be required for DOT compliance.</i>

International Maritime Dangerous Goods (IMDG)

Shipping Description:	<i>If boiling point is < 20° C shipping description is:</i> UN1965, Hydrocarbon gas mixture, liquefied, n.o.s., (Propane , Butane), 2.1 <i>If vapor pressure is <= 300 kPa (43.5 psia) at 50° C (122° F) shipping description is:</i> UN3295, Hydrocarbons, liquid, n.o.s., 3, I or II (FP° C cc), [where FP is the material's flash point in degrees C cc.] [I if BP < 95° F (35° C); II if BP > 95° F];
Non-Bulk Package Marking:	<i>Must be consistent with shipping description, either:</i> Hydrocarbon gas mixture, liquefied, n.o.s., (Propane, Butane), UN1965 <i>or</i> Hydrocarbons, liquid, n.o.s., UN3295
Labels:	<i>For UN1965:</i> Flammable gas <i>For UN3295:</i> Flammable liquid
Placards/Marking (Bulk):	<i>For UN1965:</i> Flammable gas / 1965 <i>For UN3295:</i> Flammable / 3295
Packaging - Non-Bulk:	<i>For UN1965:</i> P200 <i>For UN3295:</i> P001
EMS:	<i>For UN1965:</i> F-D, S-U <i>For UN3295:</i> F-E, S-D
Note:	<i>If transported in bulk by marine vessel in international waters, product is being carried under the scope of MARPOL Annex I.</i>

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)

UN/ID #: UN1965 or UN3295

Proper Shipping Name: *For UN1965:* Hydrocarbon gas mixture, liquefied, n.o.s. (Propane, Butane)
For UN3295: Hydrocarbons, liquid, n.o.s.

Hazard Class/Division: *For UN1965:* 2.1
For UN3295: 3

Subsidiary risk: None
Packing Group: *For UN1965:* None
For UN3295: I or II [*Determined by IATA 3.3.2*]

Non-Bulk Package Marking: *For UN1965:* Hydrocarbon gas mixture, liquefied, n.o.s. (Propane, Butane), UN1965
For UN3295: Hydrocarbons, liquid, n.o.s., UN3295

Labels: *For UN1965:* Flammable gas , Cargo Aircraft Only
For UN3295: Flammable liquid

ERG Code: *For UN1965:* 10L or *For UN3295:* 3H

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	UN1965 - Forbidden UN3295 - Forbidden - [PG I] Y341 - [PG II]	UN1965 - Forbidden UN3295 - 351 - [PG I] 353 - [PG II]	UN1965 - 200 UN3295 - 361 - [PG I] 364 - [PG II]
Max. Net Qty. Per Package:	UN3295 - Forbidden - [PG I] 1L - [PG II]	UN3295 - 1L - [PG I] 5 L - [PG II]	UN1965 - 150 kg UN3295 - 30 L - [PG I] 60 L - [PG II]

Section 15: Regulatory Information

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):

This material contains the following chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372:

Component	TPQ	EPCRA RQ
Hydrogen Sulfide	500 lb	100 lb

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health: Yes
Chronic Health: Yes
Fire Hazard: Yes
Pressure Hazard: No
Reactive Hazard: No

CERCLA/SARA - Section 313 and 40 CFR 372:

This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration ¹	de minimis
n-Hexane	5-25	1.0%
Toluene	1-5	1.0%
Benzene	0.1-5	0.1%
Cyclohexane	0-3	1.0%

EPA (CERCLA) Reportable Quantity (in pounds):

EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

California Proposition 65:

Warning: This material may contain detectable quantities of the following chemicals, known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the warning requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Component	Type of Toxicity
Toluene	Developmental Toxicant Female Reproductive Toxicant
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant

International Hazard Classification

Canada:

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the Regulations.

WHMIS Hazard Class:

B2 - Flammable Liquids
D2A
D2B

National Chemical Inventories

All components are either listed on the US TSCA Inventory, or are not regulated under TSCA
All components are either on the DSL, or are exempt from DSL listing requirements

U.S. Export Control Classification Number: EAR99

Section 16: Other Information

Date of Issue:	1-Sep-2015
Status:	FINAL
Previous Issue Date:	1-Sep-2015
Revised Sections or Basis for Revision:	Identified Hazards (Section 2) Precautionary Statement(s) (Section 2) First Aid (Section 4)Exposure limits (Section 8) Shipping information (Section 14) Regulatory information (Section 15)
SDS Number:	786340

Guide to Abbreviations:

ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; GHS = Globally Harmonized System; IARC = International Agency for Research on Cancer; INSHT = National Institute for Health and Safety at Work; IOPC = International Oil Pollution Compensation; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

Disclaimer of Expressed and Implied Warranties:

The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.



Crude Condensate

Safety Data Sheet

Section 1: Identification of the substance or mixture and of the supplier

Product Name:	Crude Condensate
SDS Number:	730370
Synonyms/Other Means of Identification:	Natural Gas Condensates, Petroleum Crude Oil Condensate Gas Drips
MARPOL Annex I Category: Intended Use:	Naphthas and Condensates Feedstock
Manufacturer:	Ascent Resources 3501 N.W. 63rd Oklahoma City, OK 73116
Emergency Health and Safety Number:	Chemtrec: 800-424-9300 (24 Hours)
SDS Information:	Phone: 800-642-3074 URL: www.ascentresources.com

Section 2: Hazard(s) Identification

Classification

H224 -- Flammable liquids -- Category 1
H304 -- Aspiration Hazard -- Category 1
H315 -- Skin corrosion/irritation -- Category 2
H332 -- Acute toxicity, Inhalation -- Category 4
H336 -- Specific target organ toxicity (single exposure) -- Category 3
H350 -- Carcinogenicity -- Category 1B
H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2

Hazards not Otherwise Classified

May contain or release poisonous hydrogen sulfide gas

Label Elements



DANGER

Extremely flammable liquid and vapor. (H224)*
Causes skin irritation. (H315)*
May be fatal if swallowed and enters airways. (H304)*
Contains poisonous hydrogen sulfide gas
Harmful if inhaled. (H332)*
May cause drowsiness or dizziness. (H336)*
May cause cancer. (H350)*
Toxic to aquatic life with long lasting effects. (H411)*

Precautionary Statement(s):

Obtain special instructions before use. (P201)*
Do not handle until all safety precautions have been read and understood. (P202)*
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. (P210)*
Keep container tightly closed. (P233)*
Keep cool. (P235)*
Ground/bond container and receiving equipment. (P240)*
Use with explosion-proof equipment. (P241)*
Use only non-sparking tools. (P242)*
Take precautionary measures against static discharge. (P243)*
Avoid breathing dust/fume/gas/mist/vapours/spray. (P261)*
Wash thoroughly after handling. (P264)*
Use only outdoors or in a well-ventilated area. (P271)*
Avoid release to the environment. (P273)*
Wear protective gloves / protective clothing / eye protection / face protection. (P280)*
IF ON SKIN: Remove/Take off immediately all contaminated clothing. (P361)* Wash with plenty of soap and water. (P352)*
If skin irritation occurs: Get medical advice/attention. (P313)*
Take off contaminated clothing and wash before reuse. (P362)*
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. (P340)*
Call a POISON CENTER or doctor/physician if you feel unwell. (P312)*
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. (P301+P310)*
Do NOT induce vomiting. (P331)*
In case of fire: Use dry chemical, carbon dioxide, or foam for extinction.(P370+P378)*
Collect spillage. (P391)*
Store locked up. (P405)*
Store in a well-ventilated place. Keep container tightly closed. (P403+P233)*
Dispose of contents/container to approved disposal facility. (P501)*

* (Applicable GHS hazard code.)

Section 3: Composition / Information on Ingredients

Component	CASRN	Concentration ¹
Natural Gas Condensate ..C2-20	64741-47-5	100
Toluene	108-88-3	1-7
Hydrogen Sulfide	7783-06-4	0.1-5
Benzene	71-43-2	<5

¹ All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Crude oil, natural gas and natural gas condensate can contain minor amounts of sulfur, nitrogen and oxygen containing organic compounds as well as trace amounts of heavy metals like mercury, arsenic, nickel, and vanadium. Composition can vary depending on the source of crude.

Section 4: First Aid Measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek medical attention. Wash contaminated clothing before reuse.

Inhalation (Breathing): Immediately move victim away from exposure and into fresh air in a position comfortable for breathing. If respiratory symptoms or other symptoms of exposure develop, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion (Swallowing): Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

Most important symptoms and effects

Acute: Headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue.

Delayed: Dry skin and possible irritation with repeated or prolonged exposure.

Notes to Physician: At high concentrations hydrogen sulfide may produce pulmonary edema, respiratory depression, and/or respiratory paralysis. The first priority in treatment should be the establishment of adequate ventilation and the administration of 100% oxygen. Animal studies suggest that nitrites are a useful antidote, however, documentation of the efficacy of nitrites in humans is lacking. If the diagnosis of hydrogen sulfide poisoning is confirmed and if the patient does not respond rapidly to supportive care, the use of nitrites may be an effective antidote if delivered within the first few minutes of exposure. For adults the dose is 10 mL of a 3% NaNO₂ solution (0.5 gm NaNO₂ in 15 mL water) I.V. over 2-4 minutes. The dosage should be adjusted in children or in the presence of anemia, and methemoglobin levels, arterial blood gases, and electrolytes should be monitored closely.

Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of hydrocarbon solvents (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for the development of cardiac arrhythmias.

Federal regulations (29 CFR 1910.1028) specify medical surveillance programs for certain exposures to benzene above the action level or PEL (specified in Section (i)(1)(i) of the Standard). In addition, employees exposed in an emergency situation shall, as described in Section (i)(4)(i), provide a urine sample at the end of the shift for measurement of urine phenol.

Other Comments: Before attempting rescue, first responders should be alert to the possible presence of hydrogen sulfide, a poisonous gas with the smell of rotten eggs, and should consider the need for respiratory protection (see Section 8). Remove casualty to fresh air as quickly as possible. Immediately begin artificial respiration if breathing has ceased. Consider whether oxygen administration is needed. Obtain medical advice for further treatment.

Section 5: Fire-Fighting Measures



NFPA 704 Hazard Class

Health: 2 Flammability: 4 Instability: 0 (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

Unusual Fire & Explosion Hazards: Extremely flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. This product will float and can be reignited on surface water. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire. Hazardous combustion/decomposition products, including hydrogen sulfide, may be released by this material when exposed to heat or fire. Use caution and wear protective clothing, including respiratory protection.

Extinguishing Media: Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

Fire Fighting Instructions: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Hydrogen sulfide and oxides of nitrogen and sulfur may also be formed.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

Section 6: Accidental Release Measures

Personal Precautions: Extremely flammable. Spillages of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. Contains poisonous hydrogen sulfide gas. If the presence of dangerous amounts of H₂S around the spilled product is suspected, additional or special actions may be warranted, including access restrictions and use of protective equipment. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

Methods for Containment and Clean-Up: Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken.

Section 7: Handling and Storage

Precautions for safe handling: Keep away from ignition sources such as heat/sparks/open flame – No smoking. Take precautionary measures against static discharge. Nonsparking tools should be used. Do not handle until all safety precautions have been read and understood. Obtain special instructions before use. Wear protective gloves/clothing and eye/face protection. May contain or release dangerous levels of hydrogen sulfide. Use only outdoors or in well-ventilated area. Avoid breathing vapors or mists. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8).

Extremely Flammable. May vaporize easily at ambient temperatures. The vapor is heavier than air and may create an explosive mixture of vapor and air. Beware of accumulation in confined spaces and low lying areas. Open container slowly to relieve any pressure. Electrostatic charge may accumulate and create a hazardous condition when handling or processing this material. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-70 and/or API RP 2003 for specific bonding/grounding requirements. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

Mercury and other heavy metals may be present in trace quantities in crude oil, raw natural gas, and condensates. Production and processing of these materials can lead to "drop-out" of elemental mercury in enclosed vessels and pipe work, typically at the low point of any process equipment because of its density. Mercury may also occur in other process system deposits such as sludges, sands, scales, waxes, and filter media. Personnel engaged in work with equipment where mercury deposits might occur (confined space entry, sampling, opening drain valves, draining process lines, etc), may be exposed to a mercury hazard (see sections 3 and 8).

Static Accumulation Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding of tanks, transfer piping, and storage tank level floats are necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. Special care should be given to ensure that special slow load procedures for "switch loading" are followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil or diesel) is loaded into tanks previously containing low flash point products (such as gasoline or naphtha). For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.

Conditions for safe storage: This material may contain or release poisonous hydrogen sulfide gas. In a tank, barge, or other closed container, the vapor space above this material may accumulate hazardous concentrations of hydrogen sulfide. Check atmosphere for oxygen content, H₂S, and flammability prior to entry. Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

Section 8: Exposure Controls / Personal Protection

Component	ACGIH	OSHA	Other
Natural Gas Condensate ..C2-20	TWA: 300 ppm (as Gasoline)	TWA: 400 mg/m ³ TWA: 100 ppm	0.5 ppm TWA8hr (as benzene) 0.25 ppm TWA12hr (as benzene) 2.5 ppm STEL (as benzene) (American Energy Guidelines)
Toluene	TWA: 20 ppm	Ceiling: 300 ppm TWA: 200 ppm	---
Hydrogen Sulfide	STEL: 5 ppm TWA: 1 ppm	Ceiling: 20 ppm	TWA: 5 ppm 8hr TWA: 2.5 ppm 12hr STEL: 15 ppm (American Energy Guidelines)
Benzene	STEL: 2.5 ppm TWA: 0.5 ppm Skin	Ceiling: 25 ppm STEL: 5 ppm TWA: 10 ppm TWA: 1 ppm	---

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Depending on exposure and use conditions, additional protection may be necessary to prevent skin contact including use of items such as chemical resistant boots, aprons, arm covers, hoods, coveralls, or encapsulated suits. Suggested protective materials: Nitrile

Respiratory Protection: A NIOSH approved, self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode should be used in situations of oxygen deficiency (oxygen content less than 19.5 percent), unknown exposure concentrations, or situations that are immediately dangerous to life or health (IDLH).

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use.

If benzene concentrations equal or exceed applicable exposure limits, OSHA requirements for personal protective equipment, exposure monitoring, and training may apply (29CFR1910.1028 - Benzene).

Workplace monitoring plans should consider the possibility that heavy metals such as mercury may concentrate in processing vessels and equipment presenting the possibility of exposure during various sampling and maintenance operations. Implement appropriate respiratory protection and the use of other protective equipment as dictated by monitoring results (See Sections 2 and 7).

Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

Section 9: Physical and Chemical Properties

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance:	Amber to dark brown
Physical Form:	Liquid
Odor:	Rotten egg / sulfurous; Petroleum.
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	5-15 psia (Reid VP) @ 100°F / 37.8°C
Vapor Density (air=1):	1
Initial Boiling Point/Range:	-20 to 800 °F / -29 to 427 °C
Melting/Freezing Point:	No data
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity (water=1):	0.6 - 0.8 @ 60°F (15.6°C)
Bulk Density:	6.25 lbs/gal
VOC Content(%):	50
Evaporation Rate (nBuAc=1):	1
Flash Point:	-51 °F / -46 °C
Test Method:	Pensky-Martens Closed Cup (PMCC), ASTM D93, EPA 1010
Lower Explosive Limits (vol % in air):	1.1
Upper Explosive Limits (vol % in air):	6.0
Auto-ignition Temperature:	590 °F / 310 °C

Section 10: Stability and Reactivity

Stability: Stable under normal ambient and anticipated conditions of use.

Conditions to Avoid: Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizing agents and strong reducing agents.

Hazardous Decomposition Products: Not anticipated under normal conditions of use.

Hazardous Polymerization: Not known to occur.

Section 11: Toxicological Information

Information on Toxicological Effects of Substance/Mixture

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Harmful if inhaled	Contains poisonous hydrogen sulfide gas. See Signs and Symptoms.	10 mg/L (vapor, estimated)
Skin Absorption	Unlikely to be harmful		> 2 g/kg
Ingestion (Swallowing)	Unlikely to be harmful		> 5 g/kg

Aspiration Hazard: May be fatal if swallowed and enters airways.

Skin Corrosion/Irritation: Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious Eye Damage/Irritation: Causes mild eye irritation.

Signs and Symptoms: Effects of overexposure can include slight irritation of the respiratory tract, nausea, vomiting, and signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue). Continued exposure to high concentrations can result in vomiting, cardiac irregularities and sudden loss of consciousness.

This material contains hydrogen sulfide, a poisonous gas with the smell of rotten eggs. The smell disappears rapidly because of olfactory fatigue so odor may not be a reliable indicator of exposure. Effects of overexposure include irritation of the eyes, nose, throat and respiratory tract, blurred vision, photophobia (sensitivity to light), and pulmonary edema (fluid accumulation in the lungs). Severe exposures can result in nausea, vomiting, muscle weakness or cramps, headache, disorientation and other signs of nervous system depression, irregular heartbeats, convulsions, respiratory failure, and death.

Skin Sensitization: Not expected to be a skin sensitizer.

Respiratory Sensitization: No information available.

Specific Target Organ Toxicity (Single Exposure): May cause drowsiness and dizziness.

Specific Target Organ Toxicity (Repeated Exposure): Not expected to cause organ effects from repeated exposure.

Carcinogenicity: May cause cancer

Germ Cell Mutagenicity: Not expected to cause heritable genetic effects.

Reproductive Toxicity: Not expected to cause reproductive toxicity.

Information on Toxicological Effects of Components

Natural Gas Condensate ..C2-20

Carcinogenicity: Two year inhalation studies of vaporized unleaded gasoline produced an increased incidence of kidney tumors in male rats and liver tumors in female mice. Repeated skin application of various petroleum naphthas in mice for two years resulted in an increased incidence of skin tumors but only in the presence of severe skin irritation. Follow-up mechanistic studies suggest that the occurrence of these tumors may be the consequence of promotional processes and not relevant to human risk assessment. Epidemiology data collected from a study of more than 18,000 petroleum marketing and distribution workers showed no increased risk of leukemia, multiple myeloma, or kidney cancer from gasoline exposure. Unleaded gasoline has been identified as a possible carcinogen by the International Agency for Research on Cancer.

Target Organs: Two year inhalation studies of wholly vaporized unleaded gasoline, and 90 days studies of various petroleum naphthas, did not produce significant target organ toxicity in laboratory animals. Nephropathy in male rats, characterized by the accumulation of alpha-2-u- globulin in epithelial cells of the proximal tubules was observed, however follow-up studies suggest that these changes are unique to the male rat.

Reproductive Toxicity: No evidence of developmental toxicity was found in pregnant laboratory animals (rats and mice) exposed to high vapor concentrations of unleaded gasoline and petroleum naphthas via inhalation. A two-generation reproductive toxicity study of vapor recovery gasoline did not adversely affect reproductive function or offspring survival and development.

Xylenes

Target Organs: Rats exposed to xylenes at 800, 1000 or 1200 ppm 14 hours daily for 6 weeks demonstrated high frequency hearing loss. Another study in rats exposed to 1800 ppm 8 hours daily for 5 days demonstrated middle frequency hearing loss.

Reproductive Toxicity: Both mixed xylenes and the individual isomers produced limited evidence of developmental toxicity in laboratory animals. Inhalation and oral administration of xylene resulted in decreased fetal weight, increased incidences of delayed ossification, skeletal variations and resorptions, but no evidence of teratogenicity.

Toluene

Carcinogenicity: Exposure of rats and mice to toluene at concentrations ranging from 120-1200 ppm for two years did not demonstrate evidence of carcinogenicity. Toluene has not been listed as a carcinogen by IARC.

Target Organs: Epidemiology studies suggest that chronic occupational overexposure to toluene may damage color vision. Subchronic and chronic inhalation studies with toluene produced kidney and liver damage, hearing loss and central nervous system (brain) damage in laboratory animals. Intentional misuse by deliberate inhalation of high concentrations of toluene has been shown to cause liver, kidney, and central nervous system damage, including hearing loss and visual disturbances.

Reproductive Toxicity: Exposure to toluene during pregnancy has demonstrated limited evidence of developmental toxicity in laboratory animals. Decreased fetal body weight and increased skeletal variations in both inhalation and oral studies, but only at doses that were maternally toxic. No fetal toxicity was seen at doses that were not maternally toxic. Decreased sperm counts have been observed in male rats in the absence of a reduction in fertility. Toluene has been reported to cause mental or growth retardation in the children of solvent abusers who directly inhale toluene during pregnancy.

Cyclohexane

Reproductive Toxicity: Two-generation reproduction and developmental toxicity studies using rats and rabbits exposed (whole-body) to atmospheric concentrations up to 7000 ppm cyclohexane did not detect evidence of developmental toxicity in either species.

Benzene

Carcinogenicity: Benzene is an animal carcinogen and is known to produce acute myelogenous leukemia (a form of cancer) in humans. Benzene has been identified as a human carcinogen by IARC, the US National Toxicology Program and the US-Occupational Safety and Health Administration.

Target Organs: Prolonged or repeated exposures to benzene vapors can cause damage to the blood and blood forming organs, including disorders like leukopenia, thrombocytopenia, and aplastic anemia.

Reproductive Toxicity: Some studies in occupationally exposed women have suggested benzene exposure increased risk of miscarriage and stillbirth and decreased birth weight and gestational age. The size of the effects detected in these studies was small, and ascertainment of exposure and outcome in some cases relied on self-reports, which may limit the reliability of these results.

Germ Cell Mutagenicity: Benzene exposure has resulted in chromosomal aberrations in human lymphocytes and animal bone marrow cells. Exposure has also been associated with chromosomal aberrations in sperm cells in human and animal studies.

n-Hexane

Target Organs: Excessive exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesias of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone.

Reproductive Toxicity: Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

Ethyl Benzene

Carcinogenicity: Rats and mice exposed to 0, 75, 250, or 750 ppm ethyl benzene in a two year inhalation study demonstrated limited evidence of kidney, liver, and lung cancer. Ethyl benzene has been listed as a possible human carcinogen by IARC.

Target Organs: In rats and mice exposed to 0, 75, 250, or 750 ppm ethyl benzene in a two year inhalation study there was mild damage to the kidney (tubular hyperplasia), liver (eosinophilic foci, hypertrophy, necrosis), lung (alveolar epithelium metaplasia), thyroid (hyperplasia), thyroid (hyperplasia) and pituitary (hyperplasia). In animal models (particularly rats), ethyl benzene affects the auditory function mainly in the cochlear mid-frequency range and ototoxicity was observed after combined exposure to noise and ethyl benzene. There is no evidence of either ethyl benzene-induced hearing losses or ototoxicity with combined exposure to ethyl benzene and noise in workers.

Section 12: Ecological Information

Toxicity: Acute aquatic toxicity studies on samples of gasoline and naphtha streams show acute toxicity values greater than 1 mg/L and mostly in the range 1-100 mg/L. These tests were carried out on water accommodated fractions, in closed systems to prevent evaporative loss. Results are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon composition. These substances should be regarded as toxic to aquatic organisms, with the potential to cause long term adverse effects in the aquatic environment. Classification: H411; Chronic Cat 2.

Persistence and Degradability: The hydrocarbons in this material are not readily biodegradable but are regarded as inherently biodegradable since their hydrocarbon components can be degraded by microorganisms.

Bioaccumulative Potential: Log Kow values measured for the hydrocarbon components of this material range from 3 to greater than 6 and therefore are regarded as having the potential to bioaccumulate. In practice, metabolic processes or physical properties may prevent this effect or limit bioavailability.

Mobility in Soil: On release to water, hydrocarbons will float on the surface and since they are sparingly soluble, the only significant loss is volatilization to air. In air, these hydrocarbons are photodegraded by reaction with hydroxyl radicals with half lives varying from 6.5 days for benzene to 0.5 days for n-dodecane.

Other Adverse Effects: None anticipated.

Section 13: Disposal Considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)

- D001 - Ignitability characteristic
- D018 - Toxicity characteristic (Benzene)

Section 14: Transport Information

U.S. Department of Transportation (DOT)

Shipping Description:	<p><i>If vapor pressure is > 300 kPa (43.5 psia) at 50° C (122° F) and H2S is > 8.8 molar % shipping description is:</i> UN3160, Liquefied gas, toxic, flammable, n.o.s., (Hydrogen sulfide; ; Liquefied Petroleum Gas), 2.3,; , (2.1), Inhalation Hazard Zone X <i>If vapor pressure is > 300 kPa (43.5 psia) at 50° C (122° F) and H2S is < 8.8 molar % shipping description is:</i> UN1965, Hydrocarbon gas mixture, liquefied, n.o.s., 2.1 <i>If vapor pressure is <= 300 kPa (43.5 psia) at 50° C (122° F) and H2S is < 8.8 molar % shipping description is:</i> UN1267, Petroleum crude oil, 3, I or II [I if BP < 35° C (95° F); II if BP > 35° C]</p>
Non-Bulk Package Marking:	<p><i>Must be consistent with shipping description, either:</i> Liquefied gas, toxic, flammable, n.o.s., (Hydrogen sulfide, Liquefied petroleum gas), UN3160 <i>or</i> Hydrocarbon gas mixture, liquefied, n.o.s., UN1965 <i>or</i> Petroleum crude oil, UN1267</p>
Non-Bulk Package Labeling:	<p><i>For UN3160:</i> Poison gas and Flammable gas <i>For UN1965:</i> Flammable gas <i>For UN1267:</i> Flammable liquid</p>
Bulk Package/Placard Marking:	<p><i>For UN3160:</i> Poison gas / 3160 and Flammable gas <i>For UN1965:</i> Flammable gas / 1965 <i>For UN1267:</i> Flammable / 1267</p>
Packaging - References:	<p><i>For UN3160:</i> None; 49 CFR 173.304; 173.314 & .315 <i>For UN1965:</i> 49 CFR: 173.306; 173.304; 173.314 & .315 <i>For UN1267:</i> 49 CFR 173.150; 173.201; 173.243 [PG I] <i>-or-</i> 49 CFR 173.150; 173.202; 173.242 [PG II] <i>(Exceptions; Non-bulk; Bulk)</i></p>
Hazardous Substance:	<p>The EPA's Petroleum Exclusion applies to Section 2 and/or 15 components which are listed in 49 CFR 172.101, Table 1 to Appendix A.</p>
Emergency Response Guide: Note:	<p>UN3160 - 119; UN1965 - 115; UN1267 - 128; Replace X in shipping description with: D if Molar % H2S is from 8.8% to 14.8% C if Molar % H2S is from 14.9% to 44.4% B if Molar % H2S is from 44.5% to 100.0% Container(s) greater than 5 liters (liquids) or 5 kilograms (solids), shipped by water mode and ALL bulk shipments may require the shipping description to contain the "Marine Pollutant" notation [49 CFR 172.203(l)] and the container(s) to display the [Marine Pollutant Mark] [49 CFR 172.322].</p> <p>The following alternate shipping description order may be used until January 1, 2013: Proper Shipping name, Hazard Class or Division, (Subsidiary Hazard if any), UN or NA number, Packing Group Other shipping description elements may be required for DOT compliance. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable</p>

International Maritime Dangerous Goods (IMDG)

Shipping Description: *If vapor pressure is > 300 kPa (43.5 psia) at 50° C (122° F) and H2S is > 8.8 molar % shipping description is:*
UN3160, Liquefied gas, toxic, flammable, n.o.s (Hydrogen sulphide , Liquefied Petroleum Gas), 2.3,; , (2.1)
If vapor pressure is > 300 kPa (43.5 psia) at 50° C (122° F) and H2S is < 8.8 molar % shipping description is:
UN1965, Hydrocarbon gas mixture, liquefied, n.o.s., (Hydrogen sulphide, Liquefied petroleum gas), 2.1;
If vapor pressure is <= 300 kPa (43.5 psia) at 50° C (122° F) and H2S is < 8.8 molar % shipping description is:
UN1267, Petroleum crude oil, 3, I or II [I if IBP < 35° C (95° F); II if IBP > 35° C] (-46° C);

Non-Bulk Package Marking: *Must be consistent with shipping description, either:*
Liquefied gas, toxic, flammable, n.o.s., (Hydrogen sulphide, Liquefied petroleum gas), UN3160
or
Hydrocarbon gas mixture, liquefied, n.o.s., (Hydrogen sulphide, Liquefied petroleum gas), UN1965
or
Petroleum crude oil, UN1267

Labels: *For UN3160:* Toxic gas and Flammable gas
For UN1965: Flammable gas
For UN1267: Flammable liquid

Placards/Marking (Bulk): *For UN3160:* Toxic gas / 3160 and Flammable gas
For UN1965: Flammable gas / 1965
For UN1267: Flammable / 1267

Packaging - Non-Bulk: *For UN3160 & UN1965:* P200
For UN1267: P001

EMS: *For UN3160 & UN1965:* F-D, S-U
For UN1267: F-E, S-E

Note: *If container(s) is greater than 5 liters (liquids) or 5 kilograms (solids), shipment may require the shipping description to contain the "Marine Pollutant" description [IMDG 5.4.1.4.3.5] and the container(s) to display the Marine Pollutant mark [IMDG 5.2.1.6]. U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 25. If transported in bulk by marine vessel in international waters, product is being carried under the scope of MARPOL Annex I.*

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)

UN/ID #: UN3160 - *Forbidden*
UN1965 *or* UN1267

Proper Shipping Name: *For UN1965:* Hydrocarbon gas mixture, liquefied, n.o.s. (Liquefied petroleum gas, Hydrogen sulphide)
For UN1267: Petroleum crude oil

Hazard Class/Division: *For UN1965:* 2.1
For UN1267: 3

Subsidiary risk: None
Packing Group: *For UN1965:* None
For UN1267: I or II [*Determined by IATA 3.3.2*]

Non-Bulk Package Marking: *For UN1965:* Hydrocarbon gas mixture, liquefied, n.o.s. (Liquefied petroleum gas, Hydrogen sulphide), UN1965
For UN1267: Petroleum crude oil, UN1267

Labels: *For UN1965:* Flammable gas , Cargo Aircraft Only
For UN1267: Flammable liquid

ERG Code: *For UN1965:* 10L *or* *For UN1267:* 3L
LTD. QTY Passenger Aircraft Cargo Aircraft Only

Packaging Instruction #:	<i>UN1965 - Forbidden</i> <i>UN1267 - Forbidden - [PG I]</i> <i>Y341 - [PG II]</i>	<i>UN1965 - Forbidden</i> <i>UN1267 - 351 - [PG I]</i> <i>353 - [PG II]</i>	<i>UN1965 - 200</i> <i>UN1267 - 361 - [PG I]</i> <i>364 - [PG II]</i>
Max. Net Qty. Per Package:	<i>UN1267 - None (PG I);</i> <i>1L (PG II)</i>	<i>UN1267 - 1L - [PG I]</i> <i>5 L - [PG II]</i>	<i>UN1965 - 150 kg</i> <i>UN1267 - 30 L - [PG I]</i> <i>60 L - [PG II]</i>

Section 15: Regulatory Information

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):

This material contains the following chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372:

Component	TPQ	EPCRA RQ
Hydrogen Sulfide	500 lb	100 lb

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health: Yes
Chronic Health: Yes
Fire Hazard: Yes
Pressure Hazard: No
Reactive Hazard: No

CERCLA/SARA - Section 313 and 40 CFR 372:

This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration ¹	de minimis
Xylenes	1-8	1.0%
Toluene	1-7	1.0%
Cyclohexane	1-5	1.0%
Benzene	<5	0.1%
n-Hexane	2-4	1.0%
Ethyl Benzene	1-3	0.1%

EPA (CERCLA) Reportable Quantity (in pounds):

EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

California Proposition 65:

Warning: This material may contain detectable quantities of the following chemicals, known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the warning requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Component	Type of Toxicity
Toluene	Developmental Toxicant Female Reproductive Toxicant
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant
Ethyl Benzene	Cancer

International Hazard Classification

Canada:

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the Regulations.

WHMIS Hazard Class:

B2 - Flammable Liquids
D2A
D2B

National Chemical Inventories

All components are either listed on the US TSCA Inventory, or are not regulated under TSCA
All components are either on the DSL, or are exempt from DSL listing requirements

U.S. Export Control Classification Number: 1C981

Section 16: Other Information

Date of Issue:	1-Sep-2015
Status:	FINAL
Previous Issue Date:	1-Sep-2015
Revised Sections or Basis for Revision:	Identified Hazards (Section 2) Precautionary Statement(s) (Section 2) First Aid (Section 4) Exposure limits (Section 8) Shipping information (Section 14) Regulatory information (Section 15)
SDS Number:	730370

Guide to Abbreviations:

ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; GHS = Globally Harmonized System; IARC = International Agency for Research on Cancer; INSHT = National Institute for Health and Safety at Work; IOPC = International Oil Pollution Compensation; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

Disclaimer of Expressed and implied Warranties:

The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.



Produced Brine Water

Safety Data Sheet

Section 1: Identification of the substance or mixture and of the supplier

Product Name: Produced Brine Water
SDS Number: 401320

Intended Use: Process Water

Manufacturer: Ascent Resources
3501 N.W. 63rd
Oklahoma City, OK 73116

Emergency Health and Safety Number: Chemtrec: 800-424-9300 (24 Hours)

SDS Information: Phone: 800-642-3074
URL: www.ascentresources.com

Section 2: Hazard(s) Identification

Classification

H302 – Harmful if swallowed – Category 1
H319 – Eye damage/irritation – Category 2
H316 – Causes mild skin irritation – Category 1
H332 – Harmful if inhaled – Category 1
H350 – Carcinogenicity – Category 1A
H412 – May cause chronic harmful effects to aquatic life – Category 2

Label Elements



DANGER

Causes serious eye irritation. (H319)*
Harmful if swallowed. (H302)*
Harmful If Inhaled. (H332)*
May cause cancer. (H350)*
Toxic to aquatic life with long lasting effects. (H412)*

Precautionary Statement(s):

Obtain special instructions before use. (P201)*
Do not handle until all safety precautions have been read and understood. (P202)*
Do not breathe dust/fume/gas/mist/vapours/spray. (P261)
Wash thoroughly after handling. (P264)*
Do not eat, drink, or smoke when using this product. (P270)*
Avoid release to the environment. (P273)*
Use outdoors in a well ventilated space (P271)
Wear protective gloves / protective clothing / eye protection. (P281)*
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. (P305+P351+P338*)
If eye irritation persists: Get medical advice/attention. (P313)*
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. (P301+P312)*
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. (P304 + P340)*
Get medical advice/attention if you feel unwell. (P314)*
Collect spillage. (P391)*
Store locked up. (P405)*
Store in a well-ventilated place. Keep container tightly closed. (P403+P233)*
Dispose of contents/container to approved disposal facility. (P501)*

* (Applicable GHS hazard code.)

Section 3: Composition / Information on Ingredients

Component	CAS#	Concentration ¹
Water	7732-18-5	80-100%
Sodium chloride	91-20-3	<20%
Benzene	71-43-2	<2%

All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Section 4: First Aid Measures

Eye Contact: For direct contact, remove contact lenses if present and easy to do. Immediately hold eyelids apart and flush the affected eye(s) with clean water for at least 20 minutes. Seek immediate medical attention.

Skin Contact: Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops and persists, seek medical attention.

Inhalation (Breathing): If respiratory symptoms develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If breathing is difficult, oxygen or artificial respiration should be administered by qualified personnel. If symptoms persist, seek medical attention.

Ingestion (Swallowing): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Most important symptoms and effects

Acute: Headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue.

Delayed: Dry skin and possible irritation with repeated or prolonged exposure.

Notes to Physician: Federal regulations (29 CFR 1910.1028) specify medical surveillance programs for certain exposures to benzene above the action level or PEL (specified in Section (i)(1)(i) of the Standard). In addition, employees exposed in an emergency situation shall, as described in Section (i)(4)(i), provide a urine sample at the end of the shift for measurement of urine phenol.

Section 5: Fire-Fighting Measures



NFPA 704 Hazard Class

Health: 1 Flammability: 4 Instability: 0 (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. If container is not properly cooled, it can rupture in the heat of a fire.

Extinguishing Media: Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F / 100°C. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

Fire Fighting Instructions: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of nitrogen and sulfur may also be formed.

See Section 9 for Flammable Properties Including Flash Point and Flammable (Explosive) Limits

Section 6: Accidental Release Measures

Personal Precautions: This material may burn, but will not ignite readily. Keep all sources of ignition away from spill/release. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

Methods for Containment and Clean-Up: Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken. See Section 13 for information on appropriate disposal.

Section 7: Handling and Storage

Precautions for safe handling: Keep away from flames and hot surfaces. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe vapors or mists. Wear protective gloves/clothing and eye/face protection. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8).

Section 9: Physical and Chemical Properties

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance:	Varies (clear / amber / brown)
Physical Form:	Liquid
Odor:	Petroleum
Odor Threshold:	No data
pH:	4.9-8.5
Vapor Pressure:	No data available
Vapor Density (air=1):	>1
Initial Boiling Point/Range:	212 °F / 100 °C
Melting/Freezing Point:	32 °F / 0 °C
Pour Point:	No data
Solubility in Water:	Infinintely
Partition Coefficient (n-octanol/water) (Kow):	>10
Specific Gravity (water=1):	1.0 -1.1 °API
Viscosity:	No data available
Evaporation Rate (nBuAc=1):	No data available
Flash Point:	No data available
Test Method:	Not applicable
Lower Explosive Limits (vol % in air):	1%
Upper Explosive Limits (vol % in air):	46%
Auto-ignition Temperature:	No data available

Section 10: Stability and Reactivity

Stability: Stable under normal ambient and anticipated conditions of use.

Conditions to Avoid: Avoid all possible sources of ignition. Prevent vapor accumulation.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizing and reducing agents.

Hazardous Decomposition Products: Not anticipated under normal conditions of use.

Hazardous Polymerization: Not known to occur.

Section 11: Toxicological Information

Information on Toxicological Effects of Substance/Mixture

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Expected to have a low degree of toxicity by inhalation		No data
Skin Absorption	Unlikely to be harmful		No data
Ingestion (Swallowing)	Unlikely to be harmful		No data

Aspiration Hazard: Not expected to be an aspiration hazard.

Skin Corrosion/Irritation: Causes mild skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious Eye Damage/Irritation: Causes serious eye irritation.

Signs and Symptoms: Effects of overexposure may include irritation of the digestive tract, irritation of the respiratory tract, nausea, vomiting, diarrhea and signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue).

Skin Sensitization: Not expected to be a skin sensitizer.

Respiratory Sensitization: No information available.

Specific Target Organ Toxicity (Single Exposure): May cause drowsiness and dizziness.

Specific Target Organ Toxicity (Repeated Exposure): May cause damage to organs through prolonged or repeated exposure. Laboratory animal studies of hydrocarbon products by the dermal and inhalation exposure routes have demonstrated toxicity to the liver, blood, spleen and thymus

Carcinogenicity: May cause cancer, based on component information.

Germ Cell Mutagenicity: Inadequate information available.

Reproductive Toxicity: Inadequate information available.

Other Comments: This material may contain varying concentrations of polycyclic aromatic hydrocarbons (PAHs) which have been known to produce a phototoxic reaction when contaminated skin is exposed to sunlight. The effect is similar in appearance to an exaggerated sunburn, and is temporary in duration if exposure is discontinued. Continued exposure to sunlight can result in more serious skin problems including pigmentation (discoloration), skin eruptions (pimples), and possible skin cancers.

Information on Toxicological Effects of Components

Water

Carcinogenicity: No data available

Target Organs: No data available

Reproductive Toxicity: No data available

Germ Cell Mutagenicity: No data available

Sodium chloride

Carcinogenicity: No data available but sodium chloride has not been identified as a human carcinogen by IARC, the US National Toxicology Program and the US-Occupational Safety and Health Administration.

Target Organs: Eyes, respiratory system, central nervous system

Reproductive Toxicity: No data available

Germ Cell Mutagenicity: No data available

Benzene

Carcinogenicity: Benzene is an animal carcinogen and is known to produce acute myelogenous leukemia (a form of cancer) in humans. Benzene has been identified as a human carcinogen by IARC, the US National Toxicology Program and the US-Occupational Safety and Health Administration.

Target Organs: Prolonged or repeated exposures to benzene vapors can cause damage to the blood and blood forming organs, including disorders like leukopenia, thrombocytopenia, and aplastic anemia.

Reproductive Toxicity: Some studies in occupationally exposed women have suggested benzene exposure increased risk of miscarriage and stillbirth and decreased birth weight and gestational age. The size of the effects detected in these studies was small, and ascertainment of exposure and outcome in some cases relied on self-reports, which may limit the reliability of these results.

Germ Cell Mutagenicity: Benzene exposure has resulted in chromosomal aberrations in human lymphocytes and animal bone marrow cells. Exposure has also been associated with chromosomal aberrations in sperm cells in human and animal studies.

Section 12: Ecological Information

Toxicity: Not evaluated

Persistence and Degradability: Not evaluated

Persistence per IOPC Fund definition: Not evaluated

Bioaccumulative Potential: Not evaluated although the solubility and log KOW would indicate it has little bioaccumulative potential.

Mobility in Soil: Not evaluated although the solubility properties indicate produced water would be highly mobile throughout a system.

Other Adverse Effects: None anticipated.

Section 13: Disposal Considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)

- D018 - Toxicity characteristic (Benzene)

Section 14: Transport Information

U.S. Department of Transportation (DOT)

Shipping name: *Not regulated*

Note: Some states may require specific shipping labels. Contact each jurisdiction for more information.

Section 15: Regulatory Information

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):

This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health: Yes
Chronic Health: Yes
Fire Hazard: No
Pressure Hazard: No
Reactive Hazard: No

CERCLA/SARA - Section 313 and 40 CFR 372:

This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration ¹	de minimis
Benzene	<2	0.1%

EPA (CERCLA) Reportable Quantity (in pounds):

EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

Warning: This material may contain detectable quantities of the following chemicals identified on federal and individual state hazardous substances list. Contact each jurisdiction for more information.

Component	Type of Toxicity
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant

International Hazard Classification:

Canada:

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the Regulations.

WHMIS Hazard Class:

D2A
D2B

National Chemical Inventories

All components are either listed on the US TSCA Inventory, or are not regulated under TSCA
All components are either on the DSL, or are exempt from DSL listing requirements

U.S. Export Control Classification Number: 1C981

Section 16: Other Information

Date of Issue:
Status:

1-Sep-2015
FINAL

Revised Sections or Basis for Revision:

Identified Hazards (Section 2)
Precautionary Statement(s) (Section 2)
First Aid (Section 4)
Shipping information (Section 14)
Regulatory information (Section 15)
401320

SDS Number:

Guide to Abbreviations:

ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; GHS = Globally Harmonized System; IARC = International Agency for Research on Cancer; INSHT = National Institute for Health and Safety at Work; IOPC = International Oil Pollution Compensation; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

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Attachment I: Emission Units Table

Attachment I

Emission Units Table

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

Emission Unit ID ¹	Emission Point ID ²	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type ³ and Date of Change	Control Device ⁴
23S	23E	Sitewide Fugitive	2012	N/A	Mod	N/A
1S	1E	Production Unit Heater	2012	1.5 MMBtuH	Mod	N/A
2S	2E	Production Unit Heater	2012	1.5 MMBtuH	Mod	N/A
3S	3E	Production Unit Heater	2012	1.5 MMBtuH	Mod	N/A
4S	4E	Production Unit Heater	2012	1.5 MMBtuH	Mod	N/A
5S	5E	Production Unit Heater	2012	1.5 MMBtuH	Mod	N/A
6S	6E	Production Unit Heater	2012	1.5 MMBtuH	Mod	N/A
7S	7E	Condensate Heater	2012	.75 MMBtuH	Mod	N/A
8S	8E	Condensate Heater	2012	.75 MMBtuH	Mod	N/A
9S	9E	Tank 1 - Gunbarrel Storage Tank	2012	178-bbl	Mod	19C
10S	10E	Tank 2 - Gunbarrel Storage Tank	2012	178-bbl	Mod	19C
11S	11E	Tank 3 - Condensate Storage Tank	2012	210-bbl	Mod	19C
12S	12E	Tank 4 - Condensate Storage Tank	2012	210-bbl	Mod	19C
13S	13E	Tank 5 - Condensate Storage Tank	2012	210-bbl	Mod	19C
14S	14E	Tank 6 - Condensate Storage Tank	2012	210-bbl	Mod	19C
15S	15E	Tank 7 - Prod. Water Storage Tank	2012	210-bbl	Mod	19C
16S	16E	Tank 8 - Prod. Water Storage Tank	2012	210-bbl	Mod	19C
17S	17E	Tank 9 - Prod. Water Storage Tank	2012	210-bbl	Mod	19C
18S	18E	Tank 10 - Prod. Water Storage Tank	2012	210-bbl	Mod	19C
19S	19E	Enclosed Combustor	2016	2.5 MMBtuH	New	N/A
20S	20E	Condensate Truck Loading	2013	N/A	Mod	N/A
21S	21E	Produced Water Truck Loading	2013	N/A	Mod	N/A
22S	22E	Unpaved Road Sources	2013	N/A	Mod	N/A

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

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

³ New, modification, removal

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

Attachment J: Emission Points Data Summary Sheet

**Attachment J
EMISSION POINTS DATA SUMMARY SHEET**

Table 1: Emissions Data															
Emission Point ID No. (Must match Emission Units Table & Plot Plan)	Emission Point Type ¹	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot Plan)		Air Pollution Control Device (Must match Emission Units Table & Plot Plan)		Vent Time for Emission Unit (chemical processes only)		All Regulated Pollutants - Name/CAS ³ (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions ⁴		Maximum Potential Controlled Emissions ⁵		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used ⁶	Emission Concentration ⁷ (ppmv or mg/m ³)
		ID No.	Source	ID No.	Device Type	Short Term ²	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
23E	Fugitive	23E	23S	N/A	N/A	C	8760	VOC	2.03	8.87	2.03	8.87	Gas/Vapor	EE	
1E	Horizontal Stack	1E	1S	N/A	N/A	C	8760	VOC NOx CO PM	0.01 0.15 0.12 0.01	0.04 0.64 0.54 0.05	0.01 0.15 0.12 0.01	0.04 0.64 0.54 0.05	Gas/Vapor	EE	
2E	Horizontal Stack	2E	2S	N/A	N/A	C	8760	VOC NOx CO PM	0.01 0.15 0.12 0.01	0.04 0.64 0.54 0.05	0.01 0.15 0.12 0.01	0.04 0.64 0.54 0.05	Gas/Vapor	EE	
3E	Horizontal Stack	3E	3S	N/A	N/A	C	8760	VOC NOx CO PM	0.01 0.15 0.12 0.01	0.04 0.64 0.54 0.05	0.01 0.15 0.12 0.01	0.04 0.64 0.54 0.05	Gas/Vapor	EE	
4E	Horizontal Stack	4E	4S	N/A	N/A	C	8760	VOC NOx CO PM	0.01 0.15 0.12 0.01	0.04 0.64 0.54 0.05	0.01 0.15 0.12 0.01	0.04 0.64 0.54 0.05	Gas/Vapor	EE	

Table 1: Emissions Data

Emission Point ID No. (Must match Emission Units Table & Plot Plan)	Emission Point Type ¹	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot Plan)		Air Pollution Control Device (Must match Emission Units Table & Plot Plan)		Vent Time for Emission Unit (chemical processes only)		All Regulated Pollutants - Chemical Name/CAS ³ (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions ⁴		Maximum Potential Controlled Emissions ⁵		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used ⁶	Emission Concentration ⁷ (ppmv or mg/m ³)
		ID No.	Source	ID No.	Device Type	Short Term ²	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
5E	Horizontal Stack	5E	5S	N/A	N/A	C	8760	VOC NOx CO PM	0.01 0.15 0.12 0.01	0.04 0.64 0.54 0.05	0.01 0.15 0.12 0.01	0.04 0.64 0.54 0.05	Gas/Vapor	EE	
6E	Horizontal Stack	6E	6S	N/A	N/A	C	8760	VOC NOx CO PM	0.01 0.15 0.12 0.01	0.04 0.64 0.54 0.05	0.01 0.15 0.12 0.01	0.04 0.64 0.54 0.05	Gas/Vapor	EE	
7E	Horizontal Stack	7E	7S	N/A	N/A	C	8760	VOC NOx CO PM	0.01 0.07 0.06 0.01	0.02 0.32 0.27 0.02	0.01 0.07 0.06 0.01	0.02 0.32 0.27 0.02	Gas/Vapor	EE	
8E	Horizontal Stack	8E	8S	N/A	N/A	C	8760	VOC NOx CO PM	0.01 0.07 0.06 0.01	0.02 0.32 0.27 0.02	0.01 0.07 0.06 0.01	0.02 0.32 0.27 0.02	Gas/Vapor	EE	
9E	Vent / Combustor Vertical Stack	9E	9S	19E	Enclosed Combustor	C	8760	VOC	--	18.99	--	0.38	Gas/Vapor	O (Tanks 4.0.9d methodology, Promax)	

Table 1: Emissions Data

Emission Point ID No. (Must match Emission Units Table & Plot Plan)	Emission Point Type ¹	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot Plan)		Air Pollution Control Device (Must match Emission Units Table & Plot Plan)		Vent Time for Emission Unit (chemical processes only)		All Regulated Pollutants - Chemical Name/CAS ³ (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions ⁴		Maximum Potential Controlled Emissions ⁵		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used ⁶	Emission Concentration (ppmv or mg/m ³)
		ID No.	Source	ID No.	Device Type	Short Term ²	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
10E	Vent / Combust or Vertical Stack	10E	10S	19E	Enclosed Combustor	C	8760	VOC	--	18.99	--	0.38	Gas/Vapor	O (Tanks 4.0.9d methodology, Promax)	
11E	Vent / Combust or Vertical Stack	11E	11S	19E	Enclosed Combustor	C	8760	VOC	--	1.21	--	0.02	Gas/Vapor	O (Tanks 4.0.9d methodology)	
12E	Vent / Combust or Vertical Stack	12E	12S	19E	Enclosed Combustor	C	8760	VOC	--	1.21	--	0.02	Gas/Vapor	O (Tanks 4.0.9d methodology)	
13E	Vent / Combust or Vertical Stack	13E	13S	19E	Enclosed Combustor	C	8760	VOC	--	1.21	--	0.02	Gas/Vapor	O (Tanks 4.0.9d methodology)	
14E	Vent / Combust or Vertical Stack	14E	14S	19E	Enclosed Combustor	C	8760	VOC	--	1.21	--	0.02	Gas/Vapor	O (Tanks 4.0.9d methodology)	
15E	Vent / Combust or Vertical Stack	15E	15S	19E	Enclosed Combustor	C	8760	VOC	--	0.02	--	0.01	Gas/Vapor	O (Tanks 4.0.9d methodology)	

Table 1: Emissions Data															
Emission Point ID No. (Must match Emission Units Table & Plot Plan)	Emission Point Type ¹	Emission Unit Ventilated Through This Point (Must match Emission Units Table & Plot Plan)		Air Pollution Control Device (Must match Emission Units Table & Plot Plan)		Vent Time for Emission Unit (chemical processes only)		All Regulated Pollutants - Chemical Name/CAS ³ (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions ⁴		Maximum Potential Controlled Emissions ⁵		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used ⁶	Emission Concentration (ppmv or mg/m ⁴)
		ID No.	Source	ID No.	Device Type	Short Term ²	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
16E	Vent / Combustor Vertical Stack	16E	16S	19E	Enclosed Combustor	C	8760	VOC	--	0.02	--	0.01	Gas/Vapor	O (Tanks 4.0.9d methodology)	
17E	Vent / Combustor Vertical Stack	17E	17S	19E	Enclosed Combustor	C	8760	VOC	--	0.02	--	0.01	Gas/Vapor	O (Tanks 4.0.9d methodology)	
18E	Vent / Combustor Vertical Stack	18E	18S	19E	Enclosed Combustor	C	8760	VOC	--	0.02	--	0.01	Gas/Vapor	O (Tanks 4.0.9d methodology)	
19E	Vertical Stack	9E-18E, 19E	9S-18S, 19S	N/A	N/A	C	8760	NOx	0.17	0.74	0.17	0.74	Gas/Vapor	EE	
									0.78	3.39	0.78	3.39			
									0.23	1.01	0.23	1.01			
									0.02	0.08	0.02	0.08			
20E	Truck Vent	20E	20S	N/A	N/A	C	8760	VOC	52.47	1.81	52.47	1.81	Gas/Vapor	EE	
									<0.01	<0.01	<0.01	<0.01			

Table 1: Emissions Data																
Emission Point ID No. (Must match Emission Units Table & Plot Plan)	Emission Point Type	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot Plan)		Air Pollution Control Device (Must match Emission Units Table & Plot Plan)		Vent Time for Emission Unit (chemical processes only)		All Regulated Pollutants - Chemical Name/CAS ³ (Speciate VOCs & HAPs)		Maximum Potential Uncontrolled Emissions ⁴		Maximum Potential Controlled Emissions ⁵		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used ⁶	Emission Concentration ⁷ (ppmv or mg/m ³)
		ID No.	Source	ID No.	Device Type	Short Term ²	Max (hr/yr)	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr			
21E	Truck Vent	21E	21S	N/A	N/A	C	8760	VOC	0.52	0.07	0.52	0.07	0.07	Gas/Vapor	EE	
22E	Fugitive	22E	22S	N/A	N/A	C	8760	PM ₁₀ PM _{TOTAL}	0.11 0.37	0.48 1.62	0.11 0.37	0.48 1.62	0.48 1.62	Solid (PM)	EE	

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

- Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.
- Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (i.e., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).
- List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS₂, VOCs, H₂S, Inorganics, Lead, Organics, O₃, NO, NO₂, SO₂, SO₃, all applicable Greenhouse Gases (including CO₂ and methane), etc. DO NOT LIST H₂, H₂O, N₂, O₂, and Noble Gases.
- Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).
- Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).
- Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).
- Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m³) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO₂, use units of ppmv (See 45CSR10).

**Attachment J
EMISSION POINTS DATA SUMMARY SHEET**

Table 2: Release Parameter Data

Emission Point ID No. (Must match Emission Units Table)	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)			UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow ¹ (acfm) at operating conditions	Velocity (fps)	Ground Level (Height above mean sea level)	Stack Height ² (Release height of emissions above ground level)	Northing	Easting	
23E	N/A	N/A	N/A	N/A	1149	N/A	4382669	529386	
1E	N/A	N/A	N/A	N/A	1149	10	4382674	529391	
2E	N/A	N/A	N/A	N/A	1149	10	4382679	529396	
3E	N/A	N/A	N/A	N/A	1149	10	4382684	529401	
4E	N/A	N/A	N/A	N/A	1149	10	4382689	529406	
5E	N/A	N/A	N/A	N/A	1149	10	4382694	529411	
6E	N/A	N/A	N/A	N/A	1149	10	4382699	529416	
7E	N/A	N/A	N/A	N/A	1149	10	4382704	529421	
8E	N/A	N/A	N/A	N/A	1149	10	4382709	529426	
9E	N/A	N/A	N/A	N/A	1149	20	4382714	529431	
10E	N/A	N/A	N/A	N/A	1149	20	4382719	529436	
11E	N/A	N/A	N/A	N/A	1149	15	4382724	529441	
12E	N/A	N/A	N/A	N/A	1149	15	4382729	529446	
13E	N/A	N/A	N/A	N/A	1149	15	4382734	529451	
14E	N/A	N/A	N/A	N/A	1149	15	4382739	529456	
15E	N/A	N/A	N/A	N/A	1149	15	4382744	529461	
16E	N/A	N/A	N/A	N/A	1149	15	4382749	529466	

17E	N/A	N/A	N/A	N/A	N/A	1149	15	4382754	529471
18E	N/A	N/A	N/A	N/A	N/A	1149	15	4382759	529476
19E	2.83	Not to exceed 1800	N/A	N/A	N/A	1149	16	4382764	529481
20E	N/A	N/A	N/A	N/A	N/A	1149	N/A	4382769	529486
21E	N/A	N/A	N/A	N/A	N/A	1149	N/A	4382774	529491
22E	N/A	N/A	N/A	N/A	N/A	1149	N/A	4382779	529496

¹ Give at operating conditions. Include inerts.

² Release height of emissions above ground level.

Attachment K: Fugitive Emissions Data Summary Sheet

Attachment K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

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

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

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

FUGITIVE EMISSIONS SUMMARY		All Regulated Pollutants ¹ Chemical Name/CAS	Maximum Potential Uncontrolled Emissions ²		Maximum Potential Controlled Emissions ³		Est. Method Used ⁴
			lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads	N/A						
Unpaved Haul Roads	N/A (Included in Attachment L)						
Storage Pile Emissions	N/A						
Loading/Unloading Operations	N/A (Included in Attachment L)						
Wastewater Treatment Evaporation & Operations	N/A						
Equipment Leaks	VOC	2.03	8.87	2.03	8.87	EE	
General Clean-up VOC Emissions	N/A						
Other	N/A						

¹ List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS₂, VOCs, H₂S, Inorganics, Lead, Organics, O₃, NO, NO₂, SO₂, SO₃, all applicable Greenhouse Gases (including CO₂ and methane), etc. DO NOT LIST H₂, H₂O, N₂, O₂, and Noble Gases.

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

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

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

Attachment L: Emissions Unit Data Sheet(s)

**Attachment L
EMISSIONS UNIT DATA SHEET
BULK LIQUID TRANSFER OPERATIONS**

Furnish the following information for each new or modified bulk liquid transfer area or loading rack, as shown on the *Equipment List Form* and other parts of this application. This form is to be used for bulk liquid transfer operations such as to and from drums, marine vessels, rail tank cars, and tank trucks.

Identification Number (as assigned on <i>Equipment List Form</i>):				
1. Loading Area Name: 20E, 21E				
2. Type of cargo vessels accommodated at this rack or transfer point (check as many as apply): <input type="checkbox"/> Drums <input type="checkbox"/> Marine Vessels <input type="checkbox"/> Rail Tank Cars <input checked="" type="checkbox"/> Tank Trucks				
3. Loading Rack or Transfer Point Data:				
Number of pumps	2			
Number of liquids loaded	2 - Condensate, Produced Water			
Maximum number of marine vessels, tank trucks, tank cars, and/or drums loading at one time	1			
4. Does ballasting of marine vessels occur at this loading area? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Does not apply				
5. Describe cleaning location, compounds and procedure for cargo vessels using this transfer point: N/A				
6. Are cargo vessels pressure tested for leaks at this or any other location? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If YES, describe:				
7. Projected Maximum Operating Schedule (for rack or transfer point as a whole):				
Maximum	Jan. - Mar.	Apr. - June	July - Sept.	Oct. - Dec.
hours/day	1	1	1	1
days/week	7	7	7	7

weeks/quarter	13	13	13	13
---------------	----	----	----	----

8. Bulk Liquid Data (add pages as necessary):						
Pump ID No.	1	2				
Liquid Name	Condensate	Produced Water				
Max. daily throughput (1000 gal/day)	8 gal/hr	8 gal/hr				
Max. annual throughput (1000 gal/yr)	551.88 gal/yr	2161.53 gal/yr				
Loading Method ¹	SUB	SUB				
Max. Fill Rate (gal/min)	133.3	133.3				
Average Fill Time (min/loading)	60	60				
Max. Bulk Liquid Temperature (°F)	95	95				
True Vapor Pressure ²	6.98	6.98				
Cargo Vessel Condition ³	U	U				
Control Equipment or Method ⁴	N/A	N/A				
Minimum control efficiency (%)						
Maximum Emission Rate	Loading (lb/hr)	52.47	0.52			
	Annual (lb/yr)	3620	142			
Estimation Method ⁵	EPA	EPA				
¹ BF = Bottom Fill SP = Splash Fill SUB = Submerged Fill						
² At maximum bulk liquid temperature						
³ B = Ballasted Vessel, C = Cleaned, U = Uncleaned (dedicated service), O = other (describe)						
⁴ List as many as apply (complete and submit appropriate <i>Air Pollution Control Device Sheets</i>): CA = Carbon Adsorption LOA = Lean Oil Adsorption CO = Condensation SC = Scrubber (Absorption) CRA = Compressor-Refrigeration-Absorption TO = Thermal Oxidation or Incineration CRC = Compression-Refrigeration-Condensation VB = Dedicated Vapor Balance (closed system) O = other (describe)						
⁵ EPA = EPA Emission Factor as stated in AP-42 MB = Material Balance						

TM = Test Measurement based upon test data submittal
 O = other (describe)

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

<p>MONITORING</p> <p>Ascent will monitoring loading volume to ensure emissions do not exceed those listed in this application.</p>	<p>RECORDKEEPING</p> <p>Ascent will keep records loading volume to ensure emissions do not exceed those listed in this application.</p>
<p>REPORTING</p> <p>Ascent will submit reports as required.</p>	<p>TESTING</p> <p>N/A</p>

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

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

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

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

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

N/A

**Attachment L
EMISSIONS UNIT DATA SHEET
CHEMICAL PROCESS**

For chemical processes please fill out this sheet and all supplementary forms (see below) that apply. Please check all supplementary forms that have been completed.

- Emergency Vent Summary Sheet*
- Leak Sources Data Sheet*
- Toxicology Data Sheet*
- Reactor Data Sheet*
- Distillation Column Data Sheet*

1. Chemical process area name and equipment ID number (as shown in *Equipment List Form*)
Sitewide Fugitives (23E)

2. Standard Industrial Classification Codes (SICs) for process(es)
1311

3. List raw materials and attach MSDSs
N/A- fugitive gas emissions only

4. List Products and Maximum Production and attach MSDSs

Description and CAS Number	Maximum Hourly (lb/hr)	Maximum Annual (ton/year)

5. Complete the *Emergency Vent Summary Sheet* for all emergency relief devices.

6. Complete the *Leak Source Data Sheet* and describe below or attach to application the leak detection or maintenance program to minimize fugitive emissions. Include detection instruments, calibration gases or methods, planned inspection frequency, and record-keeping, and similar pertinent information. If subject to a rule requirement (e.g. 40CFR60, Subpart VV), please list those here.
Ascent staff will perform AVO walkthroughs during site visits, expected to be at least weekly.

7. Clearly describe below or attach to application Accident Procedures to be followed in the event of an accidental spill or release.
Ascent will repair and report any accidental release as soon as possible following the incident.

8A. Complete the *Toxicology Data Sheet* or attach to application a toxicology report (an up-to-date material safety data sheets (MSDS) may be used) outlining the currently known acute and chronic health effects of each compound or chemical entity emitted to the air. If these compounds have already been listed in Item 3, then a duplicate MSDS sheet is not required. Include data such as the OSHA time weighted average (TWA) or mutagenicity, teratogenicity, irritation, and other known or suspected effects should be addressed. Indicate where these are unknown, and provide references.

8B. Describe any health effects testing or epidemiological studies on these compounds that are being or may be conducted by the company or required under TSCA, RCRA or other federal regulations. Discuss the persistence in the environment of any emission (e.g. pesticides, etc.).

9. **Waste Products** - Waste products status: (If source is subject to RCRA or 45CSR25, please contact the Hazardous Waste Section of WVDEP, OAQ at (304) 926-3647.)

9A. Types and amounts of wastes to be disposed:

9B. Method of disposal and location of waste disposal facilities: N/A
 Carrier: _____ Phone: _____

9C. Check here if approved USEPA/State Hazardous Waste Landfill will be used

10. Maximum and Projected Typical Operating Schedule for process or project as a whole (circle appropriate units).

circle units:	(hrs/day) (hr/batch)	(days), (batches/day), (batches/week)	(days/yr), (weeks/year)
10A. Maximum	24 hrs/day	7 days/week	52 weeks/year
10B. Typical	24 hrs/day	7 days/week	52 weeks/year

11. Complete a *Reactor Data Sheet* for each reactor in this chemical process.

12. Complete a *Distillation Column Data Sheet* for each distillation column in this chemical process.

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

MONITORING Ascent staff will perform AVO walkthroughs during site visits, expected to be at least weekly.	RECORDKEEPING Ascent staff will note any detected leaks and the repairs done to repair them.
REPORTING In the case of a reportable event, Ascent with contact the WV DEP and comply with any applicable requirements.	TESTING N/A

MONITORING. Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment operation or air pollution control device.
RECORDKEEPING. Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING. Please describe the proposed frequency of reporting of the recordkeeping.
TESTING. Please describe any proposed emissions testing for this process equipment or air pollution control device.

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

INFORMATION REQUIRED FOR CHEMICAL PROCESSES

The notes listed below for chemical processes are intended to help the applicant submit a complete application to the OAQ; these notes are not intended to be all inclusive. The requirements for a complete application for a permit issued under 45CSR13 are designed to provide enough information for a permit reviewer to begin a technical review. Additional information beyond that identified may be required to complete the technical review of any individual application.

Process Description

Please keep these points in mind when completing your process description as part of this permit application.

1. Provide a general process overview. This brief, but complete, process description should include chemical or registered trademark names of chemical products, intermediates, and/or raw materials to be produced or consumed, and the ultimate use(s) of the product(s). A list of the various chemical compounds is helpful.
2. Describe each process step. Include the process chemistry and stoichiometrically balanced reaction equation or material mass balance on all components.
3. Describe the methods and equipment used to receive, store, handle, and charge raw materials.
4. Describe the methods and equipment used to handle, store, or package final products and intermediates.
5. Provide process flow diagrams or equipment layout drawings which clearly show the process flow relationships among all pieces of process and control equipment. Identify all air emission discharge points. Discuss instrumentation and controls for the process.
6. Discuss the possibilities of process upsets, the duration and frequency of upsets, and consequences (including air emissions) of these upsets. Include a description of rupture discs, pressure relief valves, and secondary containment systems.
7. Discuss any fugitive emissions and the methods used to minimize them.
8. Include the following plans for the process if available:
 - a. preventative maintenance and malfunction abatement plan (recommended for all control equipment).
 - b. continuous emissions (in-stack) monitoring plan
 - c. ambient monitoring plan
 - d. emergency response plan

Regulatory Discussion

The following state and federal air pollution control regulations may be applicable to your chemical process. You should review these regulations carefully to determine if they apply to your process. Please summarize the results of your review in your permit application along with any other regulations you believe are applicable.

- Title 45 Legislative Rule Division of Environmental Protection, Office of Air Quality contains West Virginia's air pollution control regulations, including the following promulgated rules which may require emissions reductions or control technologies for your chemical process:
 - a. 45CSR27 - Best Available Technology (BAT) for Toxic Air Pollutants (TAPs)
 - b. 45CSR21 - VOC emissions controls for ozone maintenance in Kanawha, Cabell, Putnam, Wayne, and Wood counties.
 - c. 45CSR13 (Table 45-13A) - plantwide emission thresholds for permitting for certain pollutants.
- Federal Guidelines for case-by-case MACT determinations under section 112(g) of the 1990 CAAA for individual and total HAPs greater than 10 and 25 tons per year, respectively.
- There are also subparts of the federal Standards of Performance for New Stationary Sources (NSPS), 40CFR60 60, and the National Emission Standards for Hazardous Air Pollutants (NESHAP) at 40CFR61 and 40CFR63, which apply to various chemical and nonchemical processes. These subparts are too numerous to list here, but these areas of the federal regulations should be consulted carefully to determine applicability to your process.

Emissions Summary and Calculations

Please keep these points in mind when submitting your emissions calculations as part of this permit application.

1. For each pollutant, provide the basis for the emissions estimate and for all emission reduction(s) or control efficiency(ies) claimed.
2. For all batch processes provide the following
 - a. Emissions of each pollutant in pound(s) per batch, from each process step
 - b. Annual emissions based on number of batches requested per year
 - c. The total time for each process step and the duration of the emissions during the process step
 - d. Total batch time, total emissions per batch (or per day), and annual emissions based on the number of batches requested per year.

LEAK SOURCE DATA SHEET

Source Category	Pollutant	Number of Source Components ¹	Number of Components Monitored by Frequency ²	Average Time to Repair (days) ³	Estimated Annual Emission Rate (lb/yr) ⁴
Pumps ⁵	light liquid VOC ^{6,7}				
	heavy liquid VOC ⁸				
	Non-VOC ⁹				
Valves ¹⁰	Gas VOC	200	0	7	2300
	Light Liquid VOC	200	0	7	9640
	Heavy Liquid VOC				
Safety Relief Valves ¹¹	Non-VOC				
	Gas VOC	35	0	7	2620
Open-ended Lines ¹²	Non VOC				
	VOC				
	Non-VOC				
Sampling Connections ¹³	VOC	1300	0	7	2420
	Non-VOC				
Compressors	VOC				
	Non-VOC				
	VOC				
Flanges	VOC	725	0	7	760
	Non-VOC				
Other	VOC				
	Non-VOC				

1 - 13 See notes on the following page.

Notes for Leak Source Data Sheet

1. For VOC sources include components on streams and equipment that contain greater than 10% w/w VOC, including feed streams, reaction/separation facilities, and product/by-product delivery lines. Do not include certain leakless equipment as defined below by category.
2. By monitoring frequency, give the number of sources routinely monitored for leaks, using a portable detection device that measures concentration in ppm. Do not include monitoring by visual or soap-bubble leak detection methods. "M/Q(M)/Q/SA/A/O" means the time period between inspections as follows:

Monthly/Quarterly, with Monthly follow-up of repaired leakers/Quarterly/Semi-annual/Annually/Other (specify time period)

If source category is not monitored, a single zero in the space will suffice. For example, if 50 gas-service valves are monitored quarterly, with monthly follow-up of those repaired, 75 are monitored semi-annually, and 50 are checked bimonthly (alternate months), with non checked at any other frequency, you would put in the category "valves, gas service:" 0/50/0/75/0/50 (bimonthly).

3. Give the average number of days, after a leak is discovered, that an attempt will be made to repair the leak.
4. Note the method used: MB - material balance; EE - engineering estimate; EPA - emission factors established by EPA (cite document used); O - other method, such as in-house emission factor (specify).
5. Do not include in the equipment count sealless pumps (canned motor or diaphragm) or those with enclosed venting to a control device. (Emissions from vented equipment should be included in the estimates given in the Emission Points Data Sheet.)
6. Volatile organic compounds (VOC) means the term as defined in 40 CFR 
7. A light liquid is defined as a fluid with vapor pressure equal to or greater than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if 20% w/w or more of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a light liquid.
8. A heavy liquid is defined as a fluid with a vapor pressure less than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if less than 20% w/w of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a heavy liquid.
9. LIST CO, H₂S, mineral acids, NO, NO₂, SO₃, etc. DO NOT LIST CO₂, H₂, H₂O, N₂, O₂, and Noble Gases.
10. Include all process valves whether in-line or on an open-ended line such as sample, drain and purge valves. Do not include safety-relief valves, or leakless valves such as check, diaphragm, and bellows seal valves.
11. Do not include a safety-relief valve if there is a rupture disk in place upstream of the valve, or if the valve vents to a control device.
12. Open-ended lines include purge, drain and vent lines. Do not include sampling connections, or lines sealed by plugs, caps, blinds or second valves.
13. Do not include closed-purge sampling connections.

REACTOR DATA SHEET

Provide the following information for each piece of equipment that is a potential or actual source of emissions as shown on the *Equipment List Form* and other parts of application.

Identification Number (as shown on <i>Equipment List Form</i>):							
1. Name and type of equipment (e.g. CSTR, plug flow, batch, etc.)							
2. Type of operation <input type="checkbox"/> Batch <input type="checkbox"/> Continuous <input type="checkbox"/> Semi-batch							
3. Projected Actual Equipment Operating Schedule (complete appropriate lines):							
hrs/day		days/week			weeks/year		
hrs/batch		batches/day, weeks (Circle one)			day, weeks/yr (Circle one)		
4. Feed Data Flow In = gal/hr, or gal/batch							
Material Name & CAS No.	Phase ^a	Specific Gravity	Vapor Pressure ^b	Charge Rate			Fill Time (min/batch, run) ^c
				Normal	Max	Units	
<p>a. S = Solid, L = Liquid, G = gas or vapor</p> <p>b. At feed conditions</p> <p>c. Total time that equipment is filling per batch or run (start-up), for tank or vessel-type equipment.</p>							
5. Provide all chemical reactions that will be involved (if applicable), including the residence time and any side reactions that may occur as well as gases that may be generated during these reactions. Indicate if the reaction(s) are exothermic or endothermic.							

6. Maximum Temperature <div style="text-align: right;">°C</div> <div style="text-align: right;">°F</div>	7A. Maximum Pressure 7B. Max. Set Pressure for venting <div style="text-align: center;">mmHg</div> <div style="text-align: center;">psig</div> <div style="text-align: right;">mmHg</div> <div style="text-align: right;">psig</div>
---	--

8. Output Data		Flow Out =					gal/hr or gal/batch	
Material Name and CAS No.	Phase	Specific Gravity	Vapor Pressure	Hourly or Batch Output Rate		Units		
				Normal	Maximum			

9. Complete the following emission data for equipment connected to a header exhaust system, giving emissions levels before entering header system (i.e. before control equipment).

Check here if not applicable

Emission Point ID (exhaust point of header system):

Material Name and CAS No.	Maximum Potential Emission Rate (lb/hr)	Method **

** MB - material balance; EE - Engineering Estimate; TM - Test Measurement (submit test data); O - other (Explain)

10. Provide the following information pertaining to each condenser that may be attached to this reactor. Attach additional pages as necessary if more than one condenser is used for this reactor. Complete the Condenser Air Pollution Control Device Sheet if necessary.

Check here if not applicable

- 10A. Cooling material
- 10B. Minimum and Maximum flowrate of cooling material (gal/hr)
- 10C. Inlet temperature of cooling material (°F)
- 10D. Outlet temperature of cooling material (°F)
- 10E. Pressure drop of gas to be condensed from inlet to outlet (psig)
- 10F. Inlet temperature of gas stream (°F)
- 10G. Outlet temperature of gas stream (°F)
- 10H. Number of passes
- 10I. Cooling surface area

11. Provide the following pertaining to auxiliary equipment that burns fuel (heaters, dryers, etc.):

Check here if not applicable

11A. Type of fuel and maximum fuel burn rate, per hour:

11B. Provide maximum percent sulfur (S), ash content of fuel, and the energy content using appropriate units:

%S

% Ash

BTU/lb, std. ft³/day, gal

(circle one)

11C. Theoretical combustion air requirement in SCFD per unit of fuel (circle appropriate unit) @ 70°F and 14.7 PSIA:

SCFD/lb, SCFD, gal (circle one)

11D. Percent excess air: %

11E. Type, amount, and BTU rating of burners and all other firing equipment that are planned to be used:

11F. Total maximum design heat input: ×10⁶ BTU/hr.

12. Proposed Monitoring, Recordkeeping, Reporting, and Testing

Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING

RECORDKEEPING

REPORTING

TESTING

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

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

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

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

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

NOTE: An *AIR POLLUTION CONTROL DEVICE SHEET* must be completed for any air pollution device(s) (except emergency relief devices) used to control emissions from this reactor.

DISTILLATION COLUMN DATA SHEET

Identification Number (as assigned on <i>Equipment List Form</i>):		
1. Name and type of equipment		
#. Projected actual equipment operating schedule (complete appropriate lines):		
hrs/day	days/week	weeks/year
hrs/batch	batches/day, batches/week (circle one)	days/yr, weeks/yr (circle one)
2. Number of stages (plates), excluding condenser		
3. Number of feed plates and stage location		
4. Specify details of any reheating, recycling, or stage conditioning along with the stage locations		
5. Specify reflux ratio, R (where R is defined as the ratio of the reflux to the overhead product, given symbolically as $R=L/D$, where L = liquid down column, D = distillation product)		
6. Specify the fraction of feed which is vaporized, f (where f is the molal fraction of the feed that leaves the feed plate continuously as vapor).		
7A. Type of condenser used: <input type="checkbox"/> total <input type="checkbox"/> partial <input type="checkbox"/> multiple <input type="checkbox"/> other		
7B. For each condenser provide process operating details including all inlet and outlet temperatures, pressures, and compositions.		
8. Feed Characteristics		
A. Molar composition		
B. Individual vapor pressure of each component		
C. Total feed stage pressure		
D. Total feed stage temperature		
E. Total mass flow rate of each stream into the system		
9. Overhead Product		
A. Molar composition of components		
B. Vapor pressure of components		
C. Total mass flow rate of all streams leaving the system as overhead products		
10. Bottom Product		
A. Molar composition of all components		
B. Total mass flow rate of all streams leaving the system as bottom products		

11. General Information

- A. Distillation column diameter
- B. Distillation column height
- C. Type of plates
- D. Plate spacing
- E. Murphree plate efficiency
- F. Any other information necessary of describe the operation of this distillation column.

12. Proposed Monitoring, Recordkeeping, Reporting, and Testing

Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING

RECORDKEEPING

REPORTING

TESTING

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

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

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

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

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

NOTE: An *AIR POLLUTION CONTROL DEVICE SHEET* must be completed for any air pollution device(s) (except emergency relief devices) used to control emissions from this distillation column.

**Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL**

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

Identification Number (as assigned on *Equipment List Form*): 7E-8E

<p>1. Name or type and model of proposed affected source:</p> <p>Two (2) Condensate Heaters</p>
<p>2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.</p>
<p>3. Name(s) and maximum amount of proposed process material(s) charged per hour:</p> <p>N/A</p>
<p>4. Name(s) and maximum amount of proposed material(s) produced per hour:</p> <p>Per Unit: 0.004 lb/hr VOC 0.07 lb/hr NO_x 0.06 lb/hr CO 0.01 lb/hr PM</p>
<p>5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:</p> <p>N/A</p>

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

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

@	N/A	°F and	psia
a. NO _x		0.07 lb/hr	grains/ACF
b. SO ₂		lb/hr	grains/ACF
c. CO		0.06 lb/hr	grains/ACF
d. PM ₁₀		0.01 lb/hr	grains/ACF
e. Hydrocarbons		lb/hr	grains/ACF
f. VOCs		0.004 lb/hr	grains/ACF
g. Pb		lb/hr	grains/ACF
h. Specify other(s)			
Benzene		<0.0001 lb/hr	grains/ACF
Formaldehyde		<0.0001 lb/hr	grains/ACF
n-Hexane		0.001 lb/hr	grains/ACF
Toluene		<0.0001 lb/hr	grains/ACF

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

(2) Complete the Emission Points Data Sheet.

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

<p>MONITORING N/A</p>	<p>RECORDKEEPING N/A</p>
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<p>REPORTING N/A</p>	<p>TESTING N/A</p>
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MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

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

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

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

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

**Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL**

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

Identification Number (as assigned on *Equipment List Form*): 1E-6E

1. Name or type and model of proposed affected source:

Six (6) Production Unit Heaters

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

N/A

4. Name(s) and maximum amount of proposed material(s) produced per hour:

Per Unit:
0.01 lb/hr VOC
0.15 lb/hr NOx
0.12 lb/hr CO
0.01 lb/hr PM

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

N/A

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

6. Combustion Data (if applicable):			
(a) Type and amount in appropriate units of fuel(s) to be burned:			
Natural Gas: 1470.6 scf/hr			
(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:			
See Attachment N, Table 18.			
(c) Theoretical combustion air requirement (ACF/unit of fuel):			
@	°F and	psia.	
(d) Percent excess air:			
(e) Type and BTU/hr of burners and all other firing equipment planned to be used:			
1.5 MMBtu/hr			
(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:			
(g) Proposed maximum design heat input: × 10⁶ BTU/hr.			
7. Projected operating schedule:			
Hours/Day	24	Days/Week	7
		Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:				
@	N/A	°F and		psia
a.	NO _x	0.15	lb/hr	grains/ACF
b.	SO ₂		lb/hr	grains/ACF
c.	CO	0.12	lb/hr	grains/ACF
d.	PM ₁₀	0.01	lb/hr	grains/ACF
e.	Hydrocarbons		lb/hr	grains/ACF
f.	VOCs	0.01	lb/hr	grains/ACF
g.	Pb		lb/hr	grains/ACF
h.	Specify other(s)			
	Benzene	<0.0001	lb/hr	grains/ACF
	Formaldehyde	<0.0001	lb/hr	grains/ACF
	n-Hexane	0.003	lb/hr	grains/ACF
	Toluene	<0.0001	lb/hr	grains/ACF

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

(2) Complete the Emission Points Data Sheet.

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

<p>MONITORING N/A</p>	<p>RECORDKEEPING N/A</p>
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<p>REPORTING N/A</p>	<p>TESTING N/A</p>
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MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

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

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

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

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

**Attachment L
FUGITIVE EMISSIONS FROM UNPAVED HAULROADS**

UNPAVED HAULROADS (including all equipment traffic involved in process, haul trucks, endloaders, etc.)

		PM	PM-10
k =	Particle size multiplier	0.80	0.36
s =	Silt content of road surface material (%)	10	10
p =	Number of days per year with precipitation >0.01 in.	150	150

Item Number	Description	Number of Wheels	Mean Vehicle Weight (tons)	Mean Vehicle Speed (mph)	Miles per Trip	Maximum Trips per Hour	Maximum Trips per Year	Control Device ID Number	Control Efficiency (%)
1	Light Vehicles	4	2.5	10	2	0.04	365	1	55
2	Heavy Trucks	18	23.5	10	2	0.04	365	1	55
3									
4									
5									
6									
7									
8									

Source: AP-42 Fifth Edition – 13.2.2 Unpaved Roads

$$E = k \times 5.9 \times (s + 12) \times (S \div 30) \times (W + 3)^{0.7} \times (w + 4)^{0.5} \times ((365 - p) + 365) = \text{lb/Vehicle Mile Traveled (VMT)}$$

Where:

		PM	PM-10
k =	Particle size multiplier	0.80	0.36
s =	Silt content of road surface material (%)	10	10
S =	Mean vehicle speed (mph)	10	10
W =	Mean vehicle weight (tons)	13	13
w =	Mean number of wheels per vehicle	5	5
p =	Number of days per year with precipitation >0.01 in.	150	150

For lb/hr: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] = lb/hr

For TPY: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] × [Ton ÷ 2000 lb] = Tons/year

SUMMARY OF UNPAVED HAULROAD EMISSIONS

Item No.	PM				PM-10			
	Uncontrolled lb/hr	Controlled TPY						
1	0.03	0.11	0.01	0.05	0.25	1.07	0.11	0.48
2								
3								
4								
5								
6								
7								
8								
TOTALS								

FUGITIVE EMISSIONS FROM PAVED HAULROADS

INDUSTRIAL PAVED HAULROADS (including all equipment traffic involved in process, haul trucks, endloaders, etc.)

I =	Industrial augmentation factor (dimensionless)	N/A
n =	Number of traffic lanes	
s =	Surface material silt content (%)	
L =	Surface dust loading (lb/mile)	

Item Number	Description	Mean Vehicle Weight (tons)	Miles per Trip	Maximum Trips per Hour	Maximum Trips per Year	Control Device ID Number	Control Efficiency (%)
1							
2							
3							
4							
5							
6							
7							
8							

Source: AP-42 Fifth Edition – 11.2.6 Industrial Paved Roads

$$E = 0.077 \times I \times (4 + n) \times (s + 10) \times (L + 1000) \times (W + 3)^{0.7} = \text{lb/Vehicle Mile Traveled (VMT)}$$

Where:

I =	Industrial augmentation factor (dimensionless)	
n =	Number of traffic lanes	
s =	Surface material silt content (%)	
L =	Surface dust loading (lb/mile)	
W =	Average vehicle weight (tons)	

For lb/hr: $[\text{lb} \div \text{VMT}] \times [\text{VMT} \div \text{trip}] \times [\text{Trips} \div \text{Hour}] = \text{lb/hr}$

For TPY: $[\text{lb} \div \text{VMT}] \times [\text{VMT} \div \text{trip}] \times [\text{Trips} \div \text{Hour}] \times [\text{Ton} \div 2000 \text{ lb}] = \text{Tons/year}$

SUMMARY OF PAVED HAULROAD EMISSIONS

Item No.	Uncontrolled		Controlled	
	lb/hr	TPY	lb/hr	TPY
1				
2				
3				
4				
5				
6				
7				
8				
TOTALS				

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT www.epa.gov/tnn/tanks.html), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (<http://www.epa.gov/tnn/chief/>).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name	2. Tank Name Gunbarrel Storage Tank
3. Tank Equipment Identification No. (as assigned on <i>Equipment List Form</i>) 9E	4. Emission Point Identification No. (as assigned on <i>Equipment List Form</i>) 9E
5. Date of Commencement of Construction (for existing tanks) 2012	
6. Type of change <input type="checkbox"/> New Construction <input type="checkbox"/> New Stored Material <input checked="" type="checkbox"/> Other Tank Modification	
7. Description of Tank Modification (if applicable) Updated production	
7A. Does the tank have more than one mode of operation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (e.g. Is there more than one product stored in the tank?)	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.):	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. <p style="text-align: center;">178-bbl</p>	
9A. Tank Internal Diameter (ft) <p style="text-align: center;">8.0</p>	9B. Tank Internal Height (or Length) (ft) <p style="text-align: center;">20.0</p>
10A. Maximum Liquid Height (ft) <p style="text-align: center;">19.0</p>	10B. Average Liquid Height (ft) <p style="text-align: center;">18.0</p>
11A. Maximum Vapor Space Height (ft) <p style="text-align: center;">1</p>	11B. Average Vapor Space Height (ft) <p style="text-align: center;">4.5</p>
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. <p style="text-align: center;">7,476 gal</p>	

13A. Maximum annual throughput (gal/yr) 1,356,705	13B. Maximum daily throughput (gal/day) 3717
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume) 2.02	
15. Maximum tank fill rate (gal/min) N/A	
16. Tank fill method <input checked="" type="checkbox"/> Submerged <input type="checkbox"/> Splash <input type="checkbox"/> Bottom Loading	
17. Complete 17A and 17B for Variable Vapor Space Tank Systems <input checked="" type="checkbox"/> Does Not Apply	
17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year
18. Type of tank (check all that apply): <input checked="" type="checkbox"/> Fixed Roof <input checked="" type="checkbox"/> vertical ___ horizontal ___ flat roof ___ cone roof ___ dome roof ___ other (describe) <input type="checkbox"/> External Floating Roof ___ pontoon roof ___ double deck roof <input type="checkbox"/> Domed External (or Covered) Floating Roof <input type="checkbox"/> Internal Floating Roof ___ vertical column support ___ self-supporting <input type="checkbox"/> Variable Vapor Space ___ lifter roof ___ diaphragm <input type="checkbox"/> Pressurized ___ spherical ___ cylindrical <input type="checkbox"/> Underground <input type="checkbox"/> Other (describe)	

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction: <input checked="" type="checkbox"/> Riveted <input type="checkbox"/> Gunitite lined <input type="checkbox"/> Epoxy-coated rivets <input type="checkbox"/> Other (describe)		
20A. Shell Color Gray/Light	20B. Roof Color Gray/Light	20C. Year Last Painted
21. Shell Condition (if metal and unlined): <input checked="" type="checkbox"/> No Rust <input type="checkbox"/> Light Rust <input type="checkbox"/> Dense Rust <input type="checkbox"/> Not applicable		
22A. Is the tank heated? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
22B. If YES, provide the operating temperature (°F)		
22C. If YES, please describe how heat is provided to tank.		
23. Operating Pressure Range (psig): 14.7 to 14.7		
24. Complete the following section for Vertical Fixed Roof Tanks <input type="checkbox"/> Does Not Apply		
24A. For dome roof, provide roof radius (ft)		
24B. For cone roof, provide slope (ft/ft) 0.06		
25. Complete the following section for Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply		
25A. Year Internal Floaters Installed:		
25B. Primary Seal Type: <input type="checkbox"/> Metallic (Mechanical) Shoe Seal <input type="checkbox"/> Liquid Mounted Resilient Seal (check one) <input type="checkbox"/> Vapor Mounted Resilient Seal <input type="checkbox"/> Other (describe):		
25C. Is the Floating Roof equipped with a Secondary Seal? <input type="checkbox"/> YES <input type="checkbox"/> NO		
25D. If YES, how is the secondary seal mounted? (check one) <input type="checkbox"/> Shoe <input type="checkbox"/> Rim <input type="checkbox"/> Other (describe):		
25E. Is the Floating Roof equipped with a weather shield? <input type="checkbox"/> YES <input type="checkbox"/> NO		

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply	
26A. Deck Type: <input type="checkbox"/> Bolted <input type="checkbox"/> Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: <input type="checkbox"/> Continuous sheet construction 5 feet wide <input type="checkbox"/> Continuous sheet construction 6 feet wide <input type="checkbox"/> Continuous sheet construction 7 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 7.5 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 12 feet wide <input type="checkbox"/> Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft ²)
For column supported tanks:	26G. Diameter of each column:
26F. Number of columns:	

IV. SITE INFORMATION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. Charleston, WV
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft ² ·day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:	
34A. Minimum (°F)	34B. Maximum (°F)
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia)
37A. Average Liquid Surface Temperature (°F)	37B. Corresponding Vapor Pressure (psia)
38A. Maximum Liquid Surface Temperature (°F)	38B. Corresponding Vapor Pressure (psia)
39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.	
39A. Material Name or Composition	
39B. CAS Number	
39C. Liquid Density (lb/gal)	
39D. Liquid Molecular Weight (lb/lb-mole)	
39E. Vapor Molecular Weight (lb/lb-mole)	

**Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS**

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT www.epa.gov/tnn/tanks.html), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (<http://www.epa.gov/tnn/chief/>).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name	2. Tank Name Gunbarrel Storage Tank
3. Tank Equipment Identification No. (as assigned on <i>Equipment List Form</i>) 10E	4. Emission Point Identification No. (as assigned on <i>Equipment List Form</i>) 10E
5. Date of Commencement of Construction (for existing tanks) 2012	
6. Type of change <input type="checkbox"/> New Construction <input type="checkbox"/> New Stored Material <input checked="" type="checkbox"/> Other Tank Modification	
7. Description of Tank Modification (if applicable) Updated production	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.):	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 178-bbl	
9A. Tank Internal Diameter (ft) 8.0	9B. Tank Internal Height (or Length) (ft) 20.0
10A. Maximum Liquid Height (ft) 19.0	10B. Average Liquid Height (ft) 18.0
11A. Maximum Vapor Space Height (ft) 1	11B. Average Vapor Space Height (ft) 4.5
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 7,476 gal	

13A. Maximum annual throughput (gal/yr) 1,356,705	13B. Maximum daily throughput (gal/day) 3,717
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume) 9.55	
15. Maximum tank fill rate (gal/min) N/A	
16. Tank fill method <input checked="" type="checkbox"/> Submerged <input type="checkbox"/> Splash <input type="checkbox"/> Bottom Loading	
17. Complete 17A and 17B for Variable Vapor Space Tank Systems <input checked="" type="checkbox"/> Does Not Apply	
17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year
18. Type of tank (check all that apply): <input checked="" type="checkbox"/> Fixed Roof <input checked="" type="checkbox"/> vertical ___ horizontal ___ flat roof ___ cone roof ___ dome roof ___ other (describe) <input type="checkbox"/> External Floating Roof ___ pontoon roof ___ double deck roof <input type="checkbox"/> Domed External (or Covered) Floating Roof <input type="checkbox"/> Internal Floating Roof ___ vertical column support ___ self-supporting <input type="checkbox"/> Variable Vapor Space ___ lifter roof ___ diaphragm <input type="checkbox"/> Pressurized ___ spherical ___ cylindrical <input type="checkbox"/> Underground <input type="checkbox"/> Other (describe)	

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction: <input checked="" type="checkbox"/> Riveted <input type="checkbox"/> Gunite lined <input type="checkbox"/> Epoxy-coated rivets <input type="checkbox"/> Other (describe)		
20A. Shell Color Gray/Light	20B. Roof Color Gray/Light	20C. Year Last Painted
21. Shell Condition (if metal and unlined): <input checked="" type="checkbox"/> No Rust <input type="checkbox"/> Light Rust <input type="checkbox"/> Dense Rust <input type="checkbox"/> Not applicable		
22A. Is the tank heated? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
22B. If YES, provide the operating temperature (°F)		
22C. If YES, please describe how heat is provided to tank.		
23. Operating Pressure Range (psig): 14.7 to 14.7		
24. Complete the following section for Vertical Fixed Roof Tanks <input type="checkbox"/> Does Not Apply		
24A. For dome roof, provide roof radius (ft)		
24B. For cone roof, provide slope (ft/ft) 0.06		
25. Complete the following section for Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply		
25A. Year Internal Floaters Installed:		
25B. Primary Seal Type: <input type="checkbox"/> Metallic (Mechanical) Shoe Seal <input type="checkbox"/> Liquid Mounted Resilient Seal (check one) <input type="checkbox"/> Vapor Mounted Resilient Seal <input type="checkbox"/> Other (describe):		
25C. Is the Floating Roof equipped with a Secondary Seal? <input type="checkbox"/> YES <input type="checkbox"/> NO		
25D. If YES, how is the secondary seal mounted? (check one) <input type="checkbox"/> Shoe <input type="checkbox"/> Rim <input type="checkbox"/> Other (describe):		
25E. Is the Floating Roof equipped with a weather shield? <input type="checkbox"/> YES <input type="checkbox"/> NO		

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply	
26A. Deck Type: <input type="checkbox"/> Bolted <input type="checkbox"/> Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: <input type="checkbox"/> Continuous sheet construction 5 feet wide <input type="checkbox"/> Continuous sheet construction 6 feet wide <input type="checkbox"/> Continuous sheet construction 7 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 7.5 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 12 feet wide <input type="checkbox"/> Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft ²)
For column supported tanks:	26G. Diameter of each column:
26F. Number of columns:	

IV. SITE INFORMATION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. Charleston, WV
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft ² -day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:			
34A. Minimum (°F)		34B. Maximum (°F)	
35. Average operating pressure range of tank:			
35A. Minimum (psig)		35B. Maximum (psig)	
36A. Minimum Liquid Surface Temperature (°F)		36B. Corresponding Vapor Pressure (psia)	
37A. Average Liquid Surface Temperature (°F)		37B. Corresponding Vapor Pressure (psia)	
38A. Maximum Liquid Surface Temperature (°F)		38B. Corresponding Vapor Pressure (psia)	
39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.			
39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Attachment L EMISSIONS UNIT DATA SHEET STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT www.epa.gov/tnn/tanks.html), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (<http://www.epa.gov/tnn/chief/>).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name	2. Tank Name Condensate Storage Tank
3. Tank Equipment Identification No. (as assigned on <i>Equipment List Form</i>) 11E	4. Emission Point Identification No. (as assigned on <i>Equipment List Form</i>) 11E
5. Date of Commencement of Construction (for existing tanks) 2012	
6. Type of change <input type="checkbox"/> New Construction <input type="checkbox"/> New Stored Material <input checked="" type="checkbox"/> Other Tank Modification	
7. Description of Tank Modification (if applicable) Updated production	
7A. Does the tank have more than one mode of operation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (e.g. Is there more than one product stored in the tank?)	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.):	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. <div style="text-align: center;">210-bbl</div>	
9A. Tank Internal Diameter (ft) <div style="text-align: center;">10.0</div>	9B. Tank Internal Height (or Length) (ft) <div style="text-align: center;">15.0</div>
10A. Maximum Liquid Height (ft) <div style="text-align: center;">14.0</div>	10B. Average Liquid Height (ft) <div style="text-align: center;">11.0</div>
11A. Maximum Vapor Space Height (ft) <div style="text-align: center;">1</div>	11B. Average Vapor Space Height (ft) <div style="text-align: center;">4.5</div>
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. <div style="text-align: center;">8,820 gal</div>	

13A. Maximum annual throughput (gal/yr) 137,970	13B. Maximum daily throughput (gal/day) 378
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume) 16.77	
15. Maximum tank fill rate (gal/min) N/A	
16. Tank fill method <input checked="" type="checkbox"/> Submerged <input type="checkbox"/> Splash <input type="checkbox"/> Bottom Loading	
17. Complete 17A and 17B for Variable Vapor Space Tank Systems <input checked="" type="checkbox"/> Does Not Apply	
17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year
18. Type of tank (check all that apply): <input checked="" type="checkbox"/> Fixed Roof <input checked="" type="checkbox"/> vertical <input type="checkbox"/> horizontal <input type="checkbox"/> flat roof <input type="checkbox"/> cone roof <input type="checkbox"/> dome roof <input type="checkbox"/> other (describe) <input type="checkbox"/> External Floating Roof <input type="checkbox"/> pontoon roof <input type="checkbox"/> double deck roof <input type="checkbox"/> Domed External (or Covered) Floating Roof <input type="checkbox"/> Internal Floating Roof <input type="checkbox"/> vertical column support <input type="checkbox"/> self-supporting <input type="checkbox"/> Variable Vapor Space <input type="checkbox"/> lifter roof <input type="checkbox"/> diaphragm <input type="checkbox"/> Pressurized <input type="checkbox"/> spherical <input type="checkbox"/> cylindrical <input type="checkbox"/> Underground <input type="checkbox"/> Other (describe)	

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction: <input checked="" type="checkbox"/> Riveted <input type="checkbox"/> Gunite lined <input type="checkbox"/> Epoxy-coated rivets <input type="checkbox"/> Other (describe)		
20A. Shell Color Gray/Light	20B. Roof Color Gray/Light	20C. Year Last Painted
21. Shell Condition (if metal and unlined): <input checked="" type="checkbox"/> No Rust <input type="checkbox"/> Light Rust <input type="checkbox"/> Dense Rust <input type="checkbox"/> Not applicable		
22A. Is the tank heated? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
22B. If YES, provide the operating temperature (°F)		
22C. If YES, please describe how heat is provided to tank.		
23. Operating Pressure Range (psig): 14.7 to 14.7		
24. Complete the following section for Vertical Fixed Roof Tanks <input type="checkbox"/> Does Not Apply		
24A. For dome roof, provide roof radius (ft)		
24B. For cone roof, provide slope (ft/ft) 0.06		
25. Complete the following section for Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply		
25A. Year Internal Floaters Installed:		
25B. Primary Seal Type: (check one) <input type="checkbox"/> Metallic (Mechanical) Shoe Seal <input type="checkbox"/> Liquid Mounted Resilient Seal <input type="checkbox"/> Vapor Mounted Resilient Seal <input type="checkbox"/> Other (describe):		
25C. Is the Floating Roof equipped with a Secondary Seal? <input type="checkbox"/> YES <input type="checkbox"/> NO		
25D. If YES, how is the secondary seal mounted? (check one) <input type="checkbox"/> Shoe <input type="checkbox"/> Rim <input type="checkbox"/> Other (describe):		
25E. Is the Floating Roof equipped with a weather shield? <input type="checkbox"/> YES <input type="checkbox"/> NO		

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks		<input checked="" type="checkbox"/> Does Not Apply
26A. Deck Type: <input type="checkbox"/> Bolted <input type="checkbox"/> Welded		
26B. For Bolted decks, provide deck construction:		
26C. Deck seam:		
<input type="checkbox"/> Continuous sheet construction 5 feet wide <input type="checkbox"/> Continuous sheet construction 6 feet wide <input type="checkbox"/> Continuous sheet construction 7 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 7.5 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 12 feet wide <input type="checkbox"/> Other (describe)		
26D. Deck seam length (ft)	26E. Area of deck (ft ²)	
For column supported tanks:		26G. Diameter of each column:
26F. Number of columns:		

IV. SITE INFORMATION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. Charleston, WV
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft ² ·day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:			
34A. Minimum (°F)	34B. Maximum (°F)		
35. Average operating pressure range of tank:			
35A. Minimum (psig)	35B. Maximum (psig)		
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia)		
37A. Average Liquid Surface Temperature (°F)	37B. Corresponding Vapor Pressure (psia)		
38A. Maximum Liquid Surface Temperature (°F)	38B. Corresponding Vapor Pressure (psia)		
39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.			
39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Maximum Vapor Pressure 39F. True (psia)			
39G. Reid (psia)			
Months Storage per Year 39H. From			
39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): Does Not Apply

Carbon Adsorption¹

Condenser¹

Conservation Vent (psig)

Vacuum Setting

Pressure Setting

Emergency Relief Valve (psig)

Inert Gas Blanket of

Insulation of Tank with

Liquid Absorption (scrubber)¹

Refrigeration of Tank

Rupture Disc (psig)

Vent to Incinerator¹

Other¹ (describe): Enclosed Combustor

¹ Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss		Annual Loss (lb/yr)	Estimation Method ¹
		Amount	Units		
	See Attachment N, Table 12				

¹ EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT www.epa.gov/tnn/tanks.html), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (<http://www.epa.gov/tnn/chief/>).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name	2. Tank Name Condensate Storage Tank
3. Tank Equipment Identification No. (as assigned on <i>Equipment List Form</i>) 12E	4. Emission Point Identification No. (as assigned on <i>Equipment List Form</i>) 12E
5. Date of Commencement of Construction (for existing tanks) 2012	
6. Type of change <input type="checkbox"/> New Construction <input type="checkbox"/> New Stored Material <input checked="" type="checkbox"/> Other Tank Modification	
7. Description of Tank Modification (if applicable) Updated production	
7A. Does the tank have more than one mode of operation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (e.g. Is there more than one product stored in the tank?)	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.):	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 210-bbl	
9A. Tank Internal Diameter (ft) 10.0	9B. Tank Internal Height (or Length) (ft) 15.0
10A. Maximum Liquid Height (ft) 14.0	10B. Average Liquid Height (ft) 11.0
11A. Maximum Vapor Space Height (ft) 1	11B. Average Vapor Space Height (ft) 4.5
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 8,820 gal	

13A. Maximum annual throughput (gal/yr) 137,970	13B. Maximum daily throughput (gal/day) 378
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume) 16.77	
15. Maximum tank fill rate (gal/min) N/A	
16. Tank fill method <input checked="" type="checkbox"/> Submerged <input type="checkbox"/> Splash <input type="checkbox"/> Bottom Loading	
17. Complete 17A and 17B for Variable Vapor Space Tank Systems <input checked="" type="checkbox"/> Does Not Apply	
17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year
18. Type of tank (check all that apply): <input checked="" type="checkbox"/> Fixed Roof <input checked="" type="checkbox"/> vertical <input type="checkbox"/> horizontal <input type="checkbox"/> flat roof <input type="checkbox"/> cone roof <input type="checkbox"/> dome roof <input type="checkbox"/> other (describe) <input type="checkbox"/> External Floating Roof <input type="checkbox"/> pontoon roof <input type="checkbox"/> double deck roof <input type="checkbox"/> Domed External (or Covered) Floating Roof <input type="checkbox"/> Internal Floating Roof <input type="checkbox"/> vertical column support <input type="checkbox"/> self-supporting <input type="checkbox"/> Variable Vapor Space <input type="checkbox"/> lifter roof <input type="checkbox"/> diaphragm <input type="checkbox"/> Pressurized <input type="checkbox"/> spherical <input type="checkbox"/> cylindrical <input type="checkbox"/> Underground <input type="checkbox"/> Other (describe)	

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction: <input checked="" type="checkbox"/> Riveted <input type="checkbox"/> Gunite lined <input type="checkbox"/> Epoxy-coated rivets <input type="checkbox"/> Other (describe)		
20A. Shell Color Gray/Light	20B. Roof Color Gray/Light	20C. Year Last Painted
21. Shell Condition (if metal and unlined): <input checked="" type="checkbox"/> No Rust <input type="checkbox"/> Light Rust <input type="checkbox"/> Dense Rust <input type="checkbox"/> Not applicable		
22A. Is the tank heated? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
22B. If YES, provide the operating temperature (°F)		
22C. If YES, please describe how heat is provided to tank.		
23. Operating Pressure Range (psig): 14.7 to 14.7		
24. Complete the following section for Vertical Fixed Roof Tanks <input type="checkbox"/> Does Not Apply		
24A. For dome roof, provide roof radius (ft)		
24B. For cone roof, provide slope (ft/ft) 0.06		
25. Complete the following section for Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply		
25A. Year Internal Floaters Installed:		
25B. Primary Seal Type: <input type="checkbox"/> Metallic (Mechanical) Shoe Seal <input type="checkbox"/> Liquid Mounted Resilient Seal <input type="checkbox"/> Vapor Mounted Resilient Seal <input type="checkbox"/> Other (describe):		
25C. Is the Floating Roof equipped with a Secondary Seal? <input type="checkbox"/> YES <input type="checkbox"/> NO		
25D. If YES, how is the secondary seal mounted? (check one) <input type="checkbox"/> Shoe <input type="checkbox"/> Rim <input type="checkbox"/> Other (describe):		
25E. Is the Floating Roof equipped with a weather shield? <input type="checkbox"/> YES <input type="checkbox"/> NO		

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN - SLIDING COVER, GASKETED:	BUILT-UP COLUMN - SLIDING COVER, UNGASKETED:	PIPE COLUMN - FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN - SLIDING COVER, GASKETED:	PIPE COLUMN - SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply	
26A. Deck Type: <input type="checkbox"/> Bolted <input type="checkbox"/> Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: <input type="checkbox"/> Continuous sheet construction 5 feet wide <input type="checkbox"/> Continuous sheet construction 6 feet wide <input type="checkbox"/> Continuous sheet construction 7 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 7.5 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 12 feet wide <input type="checkbox"/> Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft ²)
For column supported tanks:	26G. Diameter of each column:
26F. Number of columns:	

IV. SITE INFORMATION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. Charleston, WV
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft ² ·day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:			
34A. Minimum (°F)		34B. Maximum (°F)	
35. Average operating pressure range of tank:			
35A. Minimum (psig)		35B. Maximum (psig)	
36A. Minimum Liquid Surface Temperature (°F)		36B. Corresponding Vapor Pressure (psia)	
37A. Average Liquid Surface Temperature (°F)		37B. Corresponding Vapor Pressure (psia)	
38A. Maximum Liquid Surface Temperature (°F)		38B. Corresponding Vapor Pressure (psia)	
39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.			
39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT www.epa.gov/tnn/tanks.html), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (<http://www.epa.gov/tnn/chief/>).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name	2. Tank Name Condensate Storage Tank
3. Tank Equipment Identification No. (as assigned on <i>Equipment List Form</i>) 13E	4. Emission Point Identification No. (as assigned on <i>Equipment List Form</i>) 13E
5. Date of Commencement of Construction (for existing tanks) 2012	
6. Type of change <input type="checkbox"/> New Construction <input type="checkbox"/> New Stored Material <input checked="" type="checkbox"/> Other Tank Modification	
7. Description of Tank Modification (if applicable) Updated production	
7A. Does the tank have more than one mode of operation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (e.g. Is there more than one product stored in the tank?)	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.):	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 210-bbl	
9A. Tank Internal Diameter (ft) 10.0	9B. Tank Internal Height (or Length) (ft) 15.0
10A. Maximum Liquid Height (ft) 14.0	10B. Average Liquid Height (ft) 11.0
11A. Maximum Vapor Space Height (ft) 1	11B. Average Vapor Space Height (ft) 4.5
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 8,820 gal	

13A. Maximum annual throughput (gal/yr) 137,970	13B. Maximum daily throughput (gal/day) 378
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume) 16.77	
15. Maximum tank fill rate (gal/min) N/A	
16. Tank fill method <input checked="" type="checkbox"/> Submerged <input type="checkbox"/> Splash <input type="checkbox"/> Bottom Loading	
17. Complete 17A and 17B for Variable Vapor Space Tank Systems <input checked="" type="checkbox"/> Does Not Apply	
17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year
18. Type of tank (check all that apply): <input checked="" type="checkbox"/> Fixed Roof <input checked="" type="checkbox"/> vertical <input type="checkbox"/> horizontal <input type="checkbox"/> flat roof <input type="checkbox"/> cone roof <input type="checkbox"/> dome roof <input type="checkbox"/> other (describe) <input type="checkbox"/> External Floating Roof <input type="checkbox"/> pontoon roof <input type="checkbox"/> double deck roof <input type="checkbox"/> Domed External (or Covered) Floating Roof <input type="checkbox"/> Internal Floating Roof <input type="checkbox"/> vertical column support <input type="checkbox"/> self-supporting <input type="checkbox"/> Variable Vapor Space <input type="checkbox"/> lifter roof <input type="checkbox"/> diaphragm <input type="checkbox"/> Pressurized <input type="checkbox"/> spherical <input type="checkbox"/> cylindrical <input type="checkbox"/> Underground <input type="checkbox"/> Other (describe)	

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction: <input checked="" type="checkbox"/> Riveted <input type="checkbox"/> Gunite lined <input type="checkbox"/> Epoxy-coated rivets <input type="checkbox"/> Other (describe)		
20A. Shell Color Gray/Light	20B. Roof Color Gray/Light	20C. Year Last Painted
21. Shell Condition (if metal and unlined): <input checked="" type="checkbox"/> No Rust <input type="checkbox"/> Light Rust <input type="checkbox"/> Dense Rust <input type="checkbox"/> Not applicable		
22A. Is the tank heated? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
22B. If YES, provide the operating temperature (°F)		
22C. If YES, please describe how heat is provided to tank.		
23. Operating Pressure Range (psig): 14.7 to 14.7		
24. Complete the following section for Vertical Fixed Roof Tanks <input type="checkbox"/> Does Not Apply		
24A. For dome roof, provide roof radius (ft)		
24B. For cone roof, provide slope (ft/ft) 0.06		
25. Complete the following section for Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply		
25A. Year Internal Floaters Installed:		
25B. Primary Seal Type: <input type="checkbox"/> Metallic (Mechanical) Shoe Seal <input type="checkbox"/> Liquid Mounted Resilient Seal <input type="checkbox"/> Vapor Mounted Resilient Seal <input type="checkbox"/> Other (describe):		
25C. Is the Floating Roof equipped with a Secondary Seal? <input type="checkbox"/> YES <input type="checkbox"/> NO		
25D. If YES, how is the secondary seal mounted? (check one) <input type="checkbox"/> Shoe <input type="checkbox"/> Rim <input type="checkbox"/> Other (describe):		
25E. Is the Floating Roof equipped with a weather shield? <input type="checkbox"/> YES <input type="checkbox"/> NO		

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply	
26A. Deck Type: <input type="checkbox"/> Bolted <input type="checkbox"/> Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: <input type="checkbox"/> Continuous sheet construction 5 feet wide <input type="checkbox"/> Continuous sheet construction 6 feet wide <input type="checkbox"/> Continuous sheet construction 7 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 7.5 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 12 feet wide <input type="checkbox"/> Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft ²)
For column supported tanks:	26G. Diameter of each column:
26F. Number of columns:	

IV. SITE INFORMATION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. Charleston, WV
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft ² day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:			
34A. Minimum (°F)		34B. Maximum (°F)	
35. Average operating pressure range of tank:			
35A. Minimum (psig)		35B. Maximum (psig)	
36A. Minimum Liquid Surface Temperature (°F)		36B. Corresponding Vapor Pressure (psia)	
37A. Average Liquid Surface Temperature (°F)		37B. Corresponding Vapor Pressure (psia)	
38A. Maximum Liquid Surface Temperature (°F)		38B. Corresponding Vapor Pressure (psia)	
39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.			
39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

**Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS**

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT www.epa.gov/tnn/tanks.html), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (<http://www.epa.gov/tnn/chief/>).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name	2. Tank Name Condensate Storage Tank
3. Tank Equipment Identification No. (as assigned on <i>Equipment List Form</i>) 14E	4. Emission Point Identification No. (as assigned on <i>Equipment List Form</i>) 14E
5. Date of Commencement of Construction (for existing tanks) 2012	
6. Type of change <input type="checkbox"/> New Construction <input type="checkbox"/> New Stored Material <input checked="" type="checkbox"/> Other Tank Modification	
7. Description of Tank Modification (if applicable) Updated production	
7A. Does the tank have more than one mode of operation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (e.g. Is there more than one product stored in the tank?)	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.):	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 210-bbl	
9A. Tank Internal Diameter (ft) 10.0	9B. Tank Internal Height (or Length) (ft) 15.0
10A. Maximum Liquid Height (ft) 14.0	10B. Average Liquid Height (ft) 11.0
11A. Maximum Vapor Space Height (ft) 1	11B. Average Vapor Space Height (ft) 4.5
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 8,820 gal	

13A. Maximum annual throughput (gal/yr) 137,970	13B. Maximum daily throughput (gal/day) 378
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume) 16.77	
15. Maximum tank fill rate (gal/min) N/A	
16. Tank fill method <input checked="" type="checkbox"/> Submerged <input type="checkbox"/> Splash <input type="checkbox"/> Bottom Loading	
17. Complete 17A and 17B for Variable Vapor Space Tank Systems <input checked="" type="checkbox"/> Does Not Apply	
17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year
18. Type of tank (check all that apply): <input checked="" type="checkbox"/> Fixed Roof <input checked="" type="checkbox"/> vertical <input type="checkbox"/> horizontal <input type="checkbox"/> flat roof <input type="checkbox"/> cone roof <input type="checkbox"/> dome roof <input type="checkbox"/> other (describe) <input type="checkbox"/> External Floating Roof <input type="checkbox"/> pontoon roof <input type="checkbox"/> double deck roof <input type="checkbox"/> Domed External (or Covered) Floating Roof <input type="checkbox"/> Internal Floating Roof <input type="checkbox"/> vertical column support <input type="checkbox"/> self-supporting <input type="checkbox"/> Variable Vapor Space <input type="checkbox"/> lifter roof <input type="checkbox"/> diaphragm <input type="checkbox"/> Pressurized <input type="checkbox"/> spherical <input type="checkbox"/> cylindrical <input type="checkbox"/> Underground <input type="checkbox"/> Other (describe)	

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction: <input checked="" type="checkbox"/> Riveted <input type="checkbox"/> Gunite lined <input type="checkbox"/> Epoxy-coated rivets <input type="checkbox"/> Other (describe)		
20A. Shell Color Gray/Light	20B. Roof Color Gray/Light	20C. Year Last Painted
21. Shell Condition (if metal and unlined): <input checked="" type="checkbox"/> No Rust <input type="checkbox"/> Light Rust <input type="checkbox"/> Dense Rust <input type="checkbox"/> Not applicable		
22A. Is the tank heated? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
22B. If YES, provide the operating temperature (°F)		
22C. If YES, please describe how heat is provided to tank.		
23. Operating Pressure Range (psig): 14.7 to 14.7		
24. Complete the following section for Vertical Fixed Roof Tanks <input type="checkbox"/> Does Not Apply		
24A. For dome roof, provide roof radius (ft)		
24B. For cone roof, provide slope (ft/ft) 0.06		
25. Complete the following section for Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply		
25A. Year Internal Floaters Installed:		
25B. Primary Seal Type: <input type="checkbox"/> Metallic (Mechanical) Shoe Seal <input type="checkbox"/> Liquid Mounted Resilient Seal <input type="checkbox"/> Vapor Mounted Resilient Seal <input type="checkbox"/> Other (describe):		
25C. Is the Floating Roof equipped with a Secondary Seal? <input type="checkbox"/> YES <input type="checkbox"/> NO		
25D. If YES, how is the secondary seal mounted? (check one) <input type="checkbox"/> Shoe <input type="checkbox"/> Rim <input type="checkbox"/> Other (describe):		
25E. Is the Floating Roof equipped with a weather shield? <input type="checkbox"/> YES <input type="checkbox"/> NO		

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN - SLIDING COVER, GASKETED:	BUILT-UP COLUMN - SLIDING COVER, UNGASKETED:	PIPE COLUMN - FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN - SLIDING COVER, GASKETED:	PIPE COLUMN - SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply	
26A. Deck Type: <input type="checkbox"/> Bolted <input type="checkbox"/> Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: <input type="checkbox"/> Continuous sheet construction 5 feet wide <input type="checkbox"/> Continuous sheet construction 6 feet wide <input type="checkbox"/> Continuous sheet construction 7 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 7.5 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 12 feet wide <input type="checkbox"/> Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft ²)
For column supported tanks:	26G. Diameter of each column:
26F. Number of columns:	

IV. SITE INFORMATION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. Charleston, WV
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft ² -day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:	
34A. Minimum (°F)	34B. Maximum (°F)
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia)
37A. Average Liquid Surface Temperature (°F)	37B. Corresponding Vapor Pressure (psia)
38A. Maximum Liquid Surface Temperature (°F)	38B. Corresponding Vapor Pressure (psia)
39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.	
39A. Material Name or Composition	
39B. CAS Number	
39C. Liquid Density (lb/gal)	
39D. Liquid Molecular Weight (lb/lb-mole)	
39E. Vapor Molecular Weight (lb/lb-mole)	

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT www.epa.gov/tnn/tanks.html), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (<http://www.epa.gov/tnn/chief/>).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name	2. Tank Name Produced Water Storage Tank
3. Tank Equipment Identification No. (as assigned on <i>Equipment List Form</i>) 15E	4. Emission Point Identification No. (as assigned on <i>Equipment List Form</i>) 15E
5. Date of Commencement of Construction (for existing tanks) 2012	
6. Type of change <input type="checkbox"/> New Construction <input type="checkbox"/> New Stored Material <input checked="" type="checkbox"/> Other Tank Modification	
7. Description of Tank Modification (if applicable) Updated production	
7A. Does the tank have more than one mode of operation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (e.g. Is there more than one product stored in the tank?)	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.):	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 210-bbl	
9A. Tank Internal Diameter (ft) 10.0	9B. Tank Internal Height (or Length) (ft) 15.0
10A. Maximum Liquid Height (ft) 14.0	10B. Average Liquid Height (ft) 11.0
11A. Maximum Vapor Space Height (ft) 1	11B. Average Vapor Space Height (ft) 4.5
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 8,820 gal	

13A. Maximum annual throughput (gal/yr) 540,383	13B. Maximum daily throughput (gal/day) 1480.5
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume) 65.70	
15. Maximum tank fill rate (gal/min) N/A	
16. Tank fill method <input checked="" type="checkbox"/> Submerged <input type="checkbox"/> Splash <input type="checkbox"/> Bottom Loading	
17. Complete 17A and 17B for Variable Vapor Space Tank Systems <input checked="" type="checkbox"/> Does Not Apply	
17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year
18. Type of tank (check all that apply): <input checked="" type="checkbox"/> Fixed Roof <input checked="" type="checkbox"/> vertical <input type="checkbox"/> horizontal <input type="checkbox"/> flat roof <input type="checkbox"/> cone roof <input type="checkbox"/> dome roof <input type="checkbox"/> other (describe) <input type="checkbox"/> External Floating Roof <input type="checkbox"/> pontoon roof <input type="checkbox"/> double deck roof <input type="checkbox"/> Domed External (or Covered) Floating Roof <input type="checkbox"/> Internal Floating Roof <input type="checkbox"/> vertical column support <input type="checkbox"/> self-supporting <input type="checkbox"/> Variable Vapor Space <input type="checkbox"/> lifter roof <input type="checkbox"/> diaphragm <input type="checkbox"/> Pressurized <input type="checkbox"/> spherical <input type="checkbox"/> cylindrical <input type="checkbox"/> Underground <input type="checkbox"/> Other (describe)	

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction: <input checked="" type="checkbox"/> Riveted <input type="checkbox"/> Gunite lined <input type="checkbox"/> Epoxy-coated rivets <input type="checkbox"/> Other (describe)		
20A. Shell Color Gray/Light	20B. Roof Color Gray/Light	20C. Year Last Painted
21. Shell Condition (if metal and unlined): <input checked="" type="checkbox"/> No Rust <input type="checkbox"/> Light Rust <input type="checkbox"/> Dense Rust <input type="checkbox"/> Not applicable		
22A. Is the tank heated? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
22B. If YES, provide the operating temperature (°F)		
22C. If YES, please describe how heat is provided to tank.		
23. Operating Pressure Range (psig): 14.7 to 14.7		
24. Complete the following section for Vertical Fixed Roof Tanks <input type="checkbox"/> Does Not Apply		
24A. For dome roof, provide roof radius (ft)		
24B. For cone roof, provide slope (ft/ft) 0.06		
25. Complete the following section for Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply		
25A. Year Internal Floaters Installed:		
25B. Primary Seal Type: <input type="checkbox"/> Metallic (Mechanical) Shoe Seal <input type="checkbox"/> Liquid Mounted Resilient Seal <input type="checkbox"/> Vapor Mounted Resilient Seal <input type="checkbox"/> Other (describe):		
25C. Is the Floating Roof equipped with a Secondary Seal? <input type="checkbox"/> YES <input type="checkbox"/> NO		
25D. If YES, how is the secondary seal mounted? (check one) <input type="checkbox"/> Shoe <input type="checkbox"/> Rim <input type="checkbox"/> Other (describe):		
25E. Is the Floating Roof equipped with a weather shield? <input type="checkbox"/> YES <input type="checkbox"/> NO		

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN - SLIDING COVER, GASKETED:	BUILT-UP COLUMN - SLIDING COVER, UNGASKETED:	PIPE COLUMN - FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN - SLIDING COVER, GASKETED:	PIPE COLUMN - SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply	
26A. Deck Type: <input type="checkbox"/> Bolted <input type="checkbox"/> Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: <input type="checkbox"/> Continuous sheet construction 5 feet wide <input type="checkbox"/> Continuous sheet construction 6 feet wide <input type="checkbox"/> Continuous sheet construction 7 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 7.5 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 12 feet wide <input type="checkbox"/> Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft ²)
For column supported tanks:	26G. Diameter of each column:
26F. Number of columns:	

IV. SITE INFORMATION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. Charleston, WV
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft ² -day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:			
34A. Minimum (°F)		34B. Maximum (°F)	
35. Average operating pressure range of tank:			
35A. Minimum (psig)		35B. Maximum (psig)	
36A. Minimum Liquid Surface Temperature (°F)		36B. Corresponding Vapor Pressure (psia)	
37A. Average Liquid Surface Temperature (°F)		37B. Corresponding Vapor Pressure (psia)	
38A. Maximum Liquid Surface Temperature (°F)		38B. Corresponding Vapor Pressure (psia)	
39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.			
39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT www.epa.gov/tnn/tanks.html), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (<http://www.epa.gov/tnn/chief/>).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name	2. Tank Name Produced Water Storage Tank
3. Tank Equipment Identification No. (as assigned on <i>Equipment List Form</i>) 16E	4. Emission Point Identification No. (as assigned on <i>Equipment List Form</i>) 16E
5. Date of Commencement of Construction (for existing tanks) 2012	
6. Type of change <input type="checkbox"/> New Construction <input type="checkbox"/> New Stored Material <input checked="" type="checkbox"/> Other Tank Modification	
7. Description of Tank Modification (if applicable) Updated production	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.):	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 210-bbl	
9A. Tank Internal Diameter (ft) 10.0	9B. Tank Internal Height (or Length) (ft) 15.0
10A. Maximum Liquid Height (ft) 14.0	10B. Average Liquid Height (ft) 11.0
11A. Maximum Vapor Space Height (ft) 1	11B. Average Vapor Space Height (ft) 4.5
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 8,820 gal	

13A. Maximum annual throughput (gal/yr) 540,383	13B. Maximum daily throughput (gal/day) 1480.5
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume) 65.70	
15. Maximum tank fill rate (gal/min) N/A	
16. Tank fill method <input checked="" type="checkbox"/> Submerged <input type="checkbox"/> Splash <input type="checkbox"/> Bottom Loading	
17. Complete 17A and 17B for Variable Vapor Space Tank Systems <input checked="" type="checkbox"/> Does Not Apply	
17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year
18. Type of tank (check all that apply): <input checked="" type="checkbox"/> Fixed Roof <input checked="" type="checkbox"/> vertical <input type="checkbox"/> horizontal <input type="checkbox"/> flat roof <input type="checkbox"/> cone roof <input type="checkbox"/> dome roof <input type="checkbox"/> other (describe) <input type="checkbox"/> External Floating Roof <input type="checkbox"/> pontoon roof <input type="checkbox"/> double deck roof <input type="checkbox"/> Domed External (or Covered) Floating Roof <input type="checkbox"/> Internal Floating Roof <input type="checkbox"/> vertical column support <input type="checkbox"/> self-supporting <input type="checkbox"/> Variable Vapor Space <input type="checkbox"/> lifter roof <input type="checkbox"/> diaphragm <input type="checkbox"/> Pressurized <input type="checkbox"/> spherical <input type="checkbox"/> cylindrical <input type="checkbox"/> Underground <input type="checkbox"/> Other (describe)	

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction: <input checked="" type="checkbox"/> Riveted <input type="checkbox"/> Gunite lined <input type="checkbox"/> Epoxy-coated rivets <input type="checkbox"/> Other (describe)		
20A. Shell Color Gray/Light	20B. Roof Color Gray/Light	20C. Year Last Painted
21. Shell Condition (if metal and unlined): <input checked="" type="checkbox"/> No Rust <input type="checkbox"/> Light Rust <input type="checkbox"/> Dense Rust <input type="checkbox"/> Not applicable		
22A. Is the tank heated? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
22B. If YES, provide the operating temperature (°F)		
22C. If YES, please describe how heat is provided to tank.		
23. Operating Pressure Range (psig): 14.7 to 14.7		
24. Complete the following section for Vertical Fixed Roof Tanks <input type="checkbox"/> Does Not Apply		
24A. For dome roof, provide roof radius (ft)		
24B. For cone roof, provide slope (ft/ft) 0.06		
25. Complete the following section for Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply		
25A. Year Internal Floaters Installed:		
25B. Primary Seal Type: <input type="checkbox"/> Metallic (Mechanical) Shoe Seal <input type="checkbox"/> Liquid Mounted Resilient Seal (check one) <input type="checkbox"/> Vapor Mounted Resilient Seal <input type="checkbox"/> Other (describe):		
25C. Is the Floating Roof equipped with a Secondary Seal? <input type="checkbox"/> YES <input type="checkbox"/> NO		
25D. If YES, how is the secondary seal mounted? (check one) <input type="checkbox"/> Shoe <input type="checkbox"/> Rim <input type="checkbox"/> Other (describe):		
25E. Is the Floating Roof equipped with a weather shield? <input type="checkbox"/> YES <input type="checkbox"/> NO		

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN - SLIDING COVER, GASKETED:	BUILT-UP COLUMN - SLIDING COVER, UNGASKETED:	PIPE COLUMN - FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN - SLIDING COVER, GASKETED:	PIPE COLUMN - SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply	
26A. Deck Type: <input type="checkbox"/> Bolted <input type="checkbox"/> Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: <input type="checkbox"/> Continuous sheet construction 5 feet wide <input type="checkbox"/> Continuous sheet construction 6 feet wide <input type="checkbox"/> Continuous sheet construction 7 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 7.5 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 12 feet wide <input type="checkbox"/> Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft ²)
For column supported tanks:	26G. Diameter of each column:
26F. Number of columns:	

IV. SITE INFORMATION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. Charleston, WV
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft ² ·day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:			
34A. Minimum (°F)		34B. Maximum (°F)	
35. Average operating pressure range of tank:			
35A. Minimum (psig)		35B. Maximum (psig)	
36A. Minimum Liquid Surface Temperature (°F)		36B. Corresponding Vapor Pressure (psia)	
37A. Average Liquid Surface Temperature (°F)		37B. Corresponding Vapor Pressure (psia)	
38A. Maximum Liquid Surface Temperature (°F)		38B. Corresponding Vapor Pressure (psia)	
39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.			
39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Attachment L EMISSIONS UNIT DATA SHEET STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT www.epa.gov/tnn/tanks.html), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (<http://www.epa.gov/tnn/chief/>).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name	2. Tank Name Produced Water Storage Tank
3. Tank Equipment Identification No. (as assigned on <i>Equipment List Form</i>) 17E	4. Emission Point Identification No. (as assigned on <i>Equipment List Form</i>) 17E
5. Date of Commencement of Construction (for existing tanks) 2012	
6. Type of change <input type="checkbox"/> New Construction <input type="checkbox"/> New Stored Material <input checked="" type="checkbox"/> Other Tank Modification	
7. Description of Tank Modification (if applicable) Updated production	
7A. Does the tank have more than one mode of operation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (e.g. Is there more than one product stored in the tank?)	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.):	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. <p style="text-align: center;">210-bbl</p>	
9A. Tank Internal Diameter (ft) <p style="text-align: center;">10.0</p>	9B. Tank Internal Height (or Length) (ft) <p style="text-align: center;">15.0</p>
10A. Maximum Liquid Height (ft) <p style="text-align: center;">14.0</p>	10B. Average Liquid Height (ft) <p style="text-align: center;">11.0</p>
11A. Maximum Vapor Space Height (ft) <p style="text-align: center;">1</p>	11B. Average Vapor Space Height (ft) <p style="text-align: center;">4.5</p>
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. <p style="text-align: center;">8,820 gal</p>	

13A. Maximum annual throughput (gal/yr) 540,383	13B. Maximum daily throughput (gal/day) 1480.5
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume) 65.70	
15. Maximum tank fill rate (gal/min) N/A	
16. Tank fill method <input checked="" type="checkbox"/> Submerged <input type="checkbox"/> Splash <input type="checkbox"/> Bottom Loading	
17. Complete 17A and 17B for Variable Vapor Space Tank Systems <input checked="" type="checkbox"/> Does Not Apply	
17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year
18. Type of tank (check all that apply): <input checked="" type="checkbox"/> Fixed Roof <input checked="" type="checkbox"/> vertical <input type="checkbox"/> horizontal <input type="checkbox"/> flat roof <input type="checkbox"/> cone roof <input type="checkbox"/> dome roof <input type="checkbox"/> other (describe) <input type="checkbox"/> External Floating Roof <input type="checkbox"/> pontoon roof <input type="checkbox"/> double deck roof <input type="checkbox"/> Domed External (or Covered) Floating Roof <input type="checkbox"/> Internal Floating Roof <input type="checkbox"/> vertical column support <input type="checkbox"/> self-supporting <input type="checkbox"/> Variable Vapor Space <input type="checkbox"/> lifter roof <input type="checkbox"/> diaphragm <input type="checkbox"/> Pressurized <input type="checkbox"/> spherical <input type="checkbox"/> cylindrical <input type="checkbox"/> Underground <input type="checkbox"/> Other (describe)	

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction: <input checked="" type="checkbox"/> Riveted <input type="checkbox"/> Gunitite lined <input type="checkbox"/> Epoxy-coated rivets <input type="checkbox"/> Other (describe)		
20A. Shell Color Gray/Light	20B. Roof Color Gray/Light	20C. Year Last Painted
21. Shell Condition (if metal and unlined): <input checked="" type="checkbox"/> No Rust <input type="checkbox"/> Light Rust <input type="checkbox"/> Dense Rust <input type="checkbox"/> Not applicable		
22A. Is the tank heated? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
22B. If YES, provide the operating temperature (°F)		
22C. If YES, please describe how heat is provided to tank.		
23. Operating Pressure Range (psig): 14.7 to 14.7		
24. Complete the following section for Vertical Fixed Roof Tanks <input type="checkbox"/> Does Not Apply		
24A. For dome roof, provide roof radius (ft)		
24B. For cone roof, provide slope (ft/ft) 0.06		
25. Complete the following section for Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply		
25A. Year Internal Floaters Installed:		
25B. Primary Seal Type: <input type="checkbox"/> Metallic (Mechanical) Shoe Seal <input type="checkbox"/> Liquid Mounted Resilient Seal (check one) <input type="checkbox"/> Vapor Mounted Resilient Seal <input type="checkbox"/> Other (describe):		
25C. Is the Floating Roof equipped with a Secondary Seal? <input type="checkbox"/> YES <input type="checkbox"/> NO		
25D. If YES, how is the secondary seal mounted? (check one) <input type="checkbox"/> Shoe <input type="checkbox"/> Rim <input type="checkbox"/> Other (describe):		
25E. Is the Floating Roof equipped with a weather shield? <input type="checkbox"/> YES <input type="checkbox"/> NO		

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN - SLIDING COVER, GASKETED:	BUILT-UP COLUMN - SLIDING COVER, UNGASKETED:	PIPE COLUMN - FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN - SLIDING COVER, GASKETED:	PIPE COLUMN - SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply	
26A. Deck Type: <input type="checkbox"/> Bolted <input type="checkbox"/> Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam:	
<input type="checkbox"/> Continuous sheet construction 5 feet wide <input type="checkbox"/> Continuous sheet construction 6 feet wide <input type="checkbox"/> Continuous sheet construction 7 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 7.5 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 12 feet wide <input type="checkbox"/> Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft ²)
For column supported tanks:	26G. Diameter of each column:
26F. Number of columns:	

IV. SITE INFORMATION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. Charleston, WV
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft ² ·day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:			
34A. Minimum (°F)		34B. Maximum (°F)	
35. Average operating pressure range of tank:			
35A. Minimum (psig)		35B. Maximum (psig)	
36A. Minimum Liquid Surface Temperature (°F)		36B. Corresponding Vapor Pressure (psia)	
37A. Average Liquid Surface Temperature (°F)		37B. Corresponding Vapor Pressure (psia)	
38A. Maximum Liquid Surface Temperature (°F)		38B. Corresponding Vapor Pressure (psia)	
39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.			
39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Maximum Vapor Pressure 39F. True (psia)			
39G. Reid (psia)			
Months Storage per Year 39H. From			
39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): Does Not Apply

Carbon Adsorption¹

Condenser¹

Conservation Vent (psig)

Vacuum Setting

Pressure Setting

Emergency Relief Valve (psig)

Inert Gas Blanket of

Insulation of Tank with

Liquid Absorption (scrubber)¹

Refrigeration of Tank

Rupture Disc (psig)

Vent to Incinerator¹

Other¹ (describe): Enclosed Combustor

¹ Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss		Annual Loss (lb/yr)	Estimation Method ¹
		Amount	Units		
	See Attachment N, Table 12				

¹ EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT www.epa.gov/tnn/tanks.html), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (<http://www.epa.gov/tnn/chief/>).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name	2. Tank Name Produced Water Storage Tank
3. Tank Equipment Identification No. (as assigned on <i>Equipment List Form</i>) 18E	4. Emission Point Identification No. (as assigned on <i>Equipment List Form</i>) 18E
5. Date of Commencement of Construction (for existing tanks) 2012	
6. Type of change <input type="checkbox"/> New Construction <input type="checkbox"/> New Stored Material <input checked="" type="checkbox"/> Other Tank Modification	
7. Description of Tank Modification (if applicable) Updated production	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.):	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 210-bbl	
9A. Tank Internal Diameter (ft) 10.0	9B. Tank Internal Height (or Length) (ft) 15.0
10A. Maximum Liquid Height (ft) 14.0	10B. Average Liquid Height (ft) 11.0
11A. Maximum Vapor Space Height (ft) 1	11B. Average Vapor Space Height (ft) 4.5
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 8,820 gal	

13A. Maximum annual throughput (gal/yr) 540,383	13B. Maximum daily throughput (gal/day) 1480.5
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume) 65.70	
15. Maximum tank fill rate (gal/min) N/A	
16. Tank fill method <input checked="" type="checkbox"/> Submerged <input type="checkbox"/> Splash <input type="checkbox"/> Bottom Loading	
17. Complete 17A and 17B for Variable Vapor Space Tank Systems <input checked="" type="checkbox"/> Does Not Apply	
17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year
18. Type of tank (check all that apply): <input checked="" type="checkbox"/> Fixed Roof <input checked="" type="checkbox"/> vertical <input type="checkbox"/> horizontal <input type="checkbox"/> flat roof <input type="checkbox"/> cone roof <input type="checkbox"/> dome roof <input type="checkbox"/> other (describe) <input type="checkbox"/> External Floating Roof <input type="checkbox"/> pontoon roof <input type="checkbox"/> double deck roof <input type="checkbox"/> Domed External (or Covered) Floating Roof <input type="checkbox"/> Internal Floating Roof <input type="checkbox"/> vertical column support <input type="checkbox"/> self-supporting <input type="checkbox"/> Variable Vapor Space <input type="checkbox"/> lifter roof <input type="checkbox"/> diaphragm <input type="checkbox"/> Pressurized <input type="checkbox"/> spherical <input type="checkbox"/> cylindrical <input type="checkbox"/> Underground <input type="checkbox"/> Other (describe)	

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction: <input checked="" type="checkbox"/> Riveted <input type="checkbox"/> Gunite lined <input type="checkbox"/> Epoxy-coated rivets <input type="checkbox"/> Other (describe)		
20A. Shell Color Gray/Light	20B. Roof Color Gray/Light	20C. Year Last Painted
21. Shell Condition (if metal and unlined): <input checked="" type="checkbox"/> No Rust <input type="checkbox"/> Light Rust <input type="checkbox"/> Dense Rust <input type="checkbox"/> Not applicable		
22A. Is the tank heated? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
22B. If YES, provide the operating temperature (°F)		
22C. If YES, please describe how heat is provided to tank.		
23. Operating Pressure Range (psig): 14.7 to 14.7		
24. Complete the following section for Vertical Fixed Roof Tanks <input type="checkbox"/> Does Not Apply		
24A. For dome roof, provide roof radius (ft)		
24B. For cone roof, provide slope (ft/ft) 0.06		
25. Complete the following section for Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply		
25A. Year Internal Floaters Installed:		
25B. Primary Seal Type: <input type="checkbox"/> Metallic (Mechanical) Shoe Seal <input type="checkbox"/> Liquid Mounted Resilient Seal (check one) <input type="checkbox"/> Vapor Mounted Resilient Seal <input type="checkbox"/> Other (describe):		
25C. Is the Floating Roof equipped with a Secondary Seal? <input type="checkbox"/> YES <input type="checkbox"/> NO		
25D. If YES, how is the secondary seal mounted? (check one) <input type="checkbox"/> Shoe <input type="checkbox"/> Rim <input type="checkbox"/> Other (describe):		
25E. Is the Floating Roof equipped with a weather shield? <input type="checkbox"/> YES <input type="checkbox"/> NO		

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks <input checked="" type="checkbox"/> Does Not Apply	
26A. Deck Type:	<input type="checkbox"/> Bolted <input type="checkbox"/> Welded
26B. For Bolted decks, provide deck construction:	
26C. Deck seam:	
<input type="checkbox"/> Continuous sheet construction 5 feet wide <input type="checkbox"/> Continuous sheet construction 6 feet wide <input type="checkbox"/> Continuous sheet construction 7 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 7.5 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 12 feet wide <input type="checkbox"/> Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft ²)
For column supported tanks:	26G. Diameter of each column:
26F. Number of columns:	

IV. SITE INFORMATION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. Charleston, WV
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft ² ·day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:			
34A. Minimum (°F)		34B. Maximum (°F)	
35. Average operating pressure range of tank:			
35A. Minimum (psig)		35B. Maximum (psig)	
36A. Minimum Liquid Surface Temperature (°F)		36B. Corresponding Vapor Pressure (psia)	
37A. Average Liquid Surface Temperature (°F)		37B. Corresponding Vapor Pressure (psia)	
38A. Maximum Liquid Surface Temperature (°F)		38B. Corresponding Vapor Pressure (psia)	
39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.			
39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Attachment M: Air Pollution Control Device Sheet(s)

Attachment M
Air Pollution Control Device Sheet
 (FLARE SYSTEM)

Control Device ID No. (must match Emission Units Table): 19E

Equipment Information

1. Manufacturer: HY-BON/EDI Model No. CH2.5	2. Method: <input type="checkbox"/> Elevated flare <input type="checkbox"/> Ground flare <input checked="" type="checkbox"/> Other Describe Enclosed Vapor Combustor
3. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.	
4. Method of system used: <input type="checkbox"/> Steam-assisted <input type="checkbox"/> Air-assisted <input type="checkbox"/> Pressure-assisted <input checked="" type="checkbox"/> Non-assisted	
5. Maximum capacity of flare: <div style="text-align: right;">scf/min</div> <div style="text-align: right;">scf/hr</div>	6. Dimensions of stack: <div style="text-align: right;">Diameter 2.83 ft.</div> <div style="text-align: right;">Height 16 ft.</div>
7. Estimated combustion efficiency: (Waste gas destruction efficiency) Estimated: 98 % Minimum guaranteed: 98 %	8. Fuel used in burners: <input checked="" type="checkbox"/> Natural Gas <input type="checkbox"/> Fuel Oil, Number <input type="checkbox"/> Other, Specify:
9. Number of burners: Rating: 2.5 MM BTU/hr	11. Describe method of controlling flame:
10. Will preheat be used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
12. Flare height: 16 ft	14. Natural gas flow rate to flare pilot flame per pilot light: <div style="text-align: right;">scf/min</div> <div style="text-align: right;">scf/hr</div>
13. Flare tip inside diameter: 0.75 ft	
15. Number of pilot lights: Total 0.05 MM BTU/hr	16. Will automatic re-ignition be used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
17. If automatic re-ignition will be used, describe the method: The flare pilot switches shall automatically trigger the ignition transformers to ignite the flare tip pilot.	
18. Is pilot flame equipped with a monitor? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, what type? <input type="checkbox"/> Thermocouple <input type="checkbox"/> Infra-Red <input type="checkbox"/> Ultra Violet <input type="checkbox"/> Camera with monitoring control room <input checked="" type="checkbox"/> Other, Describe: Flame Rod	
19. Hours of unit operation per year: 8760	

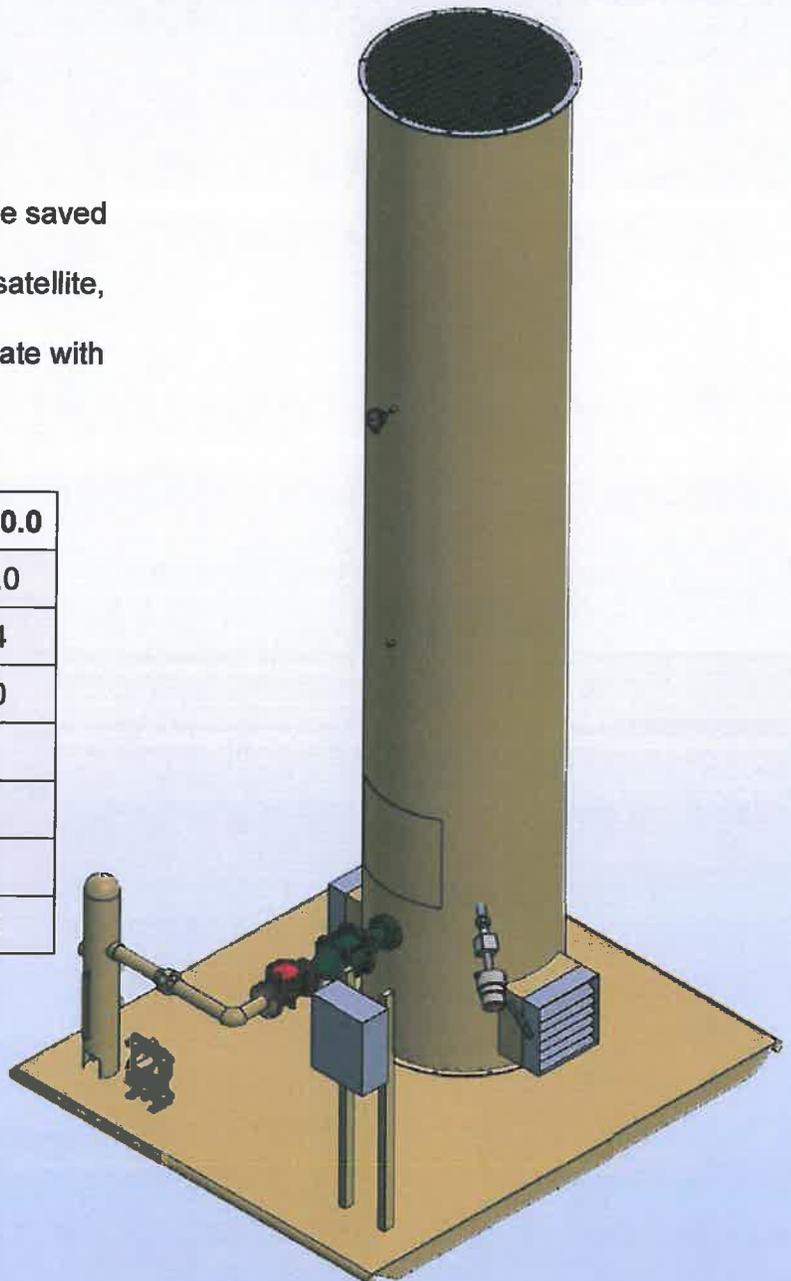
<p>44. Proposed Monitoring, Recordkeeping, Reporting, and Testing Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.</p>	
<p>MONITORING: Operator to check during routine walkthroughs.</p>	<p>RECORDKEEPING: Operator will keep records if combustor is found non-operational.</p>
<p>REPORTING: Notifications will be made as required.</p>	<p>TESTING: Testing will be conducted as required.</p>
<p>MONITORING: Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.</p> <p>RECORDKEEPING: Please describe the proposed recordkeeping that will accompany the monitoring.</p> <p>REPORTING: Please describe any proposed emissions testing for this process equipment on air pollution control device.</p> <p>TESTING: Please describe any proposed emissions testing for this process equipment on air pollution control device.</p>	
<p>45. Manufacturer's Guaranteed Capture Efficiency for each air pollutant. 98% VOC</p>	
<p>46. Manufacturer's Guaranteed Control Efficiency for each air pollutant. 99.99% VOC</p>	
<p>47. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty. N/A</p>	

Vapor Combustor Unit

HY-BON/EDI is pleased to provide the CH2.5 and CH10.0 enclosed combustors as an effective solution for eliminating VOC emissions. HY-BON/EDI's insulated combustors are automated and have been successfully tested per EPA 40, CFR 60 guidelines – making it the perfect blend of performance and safety. The combustor comes as a complete, skid mounted package containing the liquid knock-out vessel, liquid transfer pump, flame arrestor, bird screen and burner control system. Installation is simple and field performance adjustments can be made as production changes – making it the most flexible solution in the industry.

- EPA 40 CFR 60, Quad O Compliant
- Completely Enclosed Combustion
- 99.99% Destruction Efficiency
- User Friendly Automated System
- Operational and Quad O reporting data can be saved to a USB Key
- RS-232 or RS-485 Communication supports satellite, cellular, or radio
- Modbus Slave Protocol allows it to communicate with SCADA systems and other devices/software

GENERAL PROPERTIES	CH2.5	CH10.0
BURNER SIZE (MMBTU/hr)	2.5	10.0
OUTER DIAMETER (inches)	34	54
HEIGHT (feet)	16	20
INLET PRESSURE (oz/in ²)	≥ 0.5	
DESTRUCTION EFFICIENCY	≥ 99.99%	
SMOKELESS CAPACITY	100%	
TURN DOWN	SCALABLE	



2404 Commerce Drive
Midland, TX 79703

Phone: (432) 697-2292
Fax: (432) 697-2310

www.hy-bon.com

100 Ayers Blvd.
Belpre, OH 45714

Phone: (740) 401-4000
Fax: (740) 401-4005

www.ediplungerlift.com

Attachment N: Supporting Emissions Calculations

ATTACHMENT N
TABLE 1

FACILITY-WIDE POTENTIAL CRITERIA POLLUTANT EMISSIONS SUMMARY
HOYT 403
ASCENT RESOURCES – MARCELLUS, LLC

Emissions Source	Emission Point Identification	Criteria Pollutants ¹				Hazardous Air Pollutants ¹					
		NO _x		VOC		CO		PM		Total HAPS	
		(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)
Production Unit Heater (1.5 MMBtu/hr)	1E ⁽²⁾	0.15	0.64	0.01	0.04	0.12	0.54	0.01	0.05	0.003	0.01
Production Unit Heater (1.5 MMBtu/hr)	2E ⁽²⁾	0.15	0.64	0.01	0.04	0.12	0.54	0.01	0.05	0.003	0.01
Production Unit Heater (1.5 MMBtu/hr)	3E ⁽²⁾	0.15	0.64	0.01	0.04	0.12	0.54	0.01	0.05	0.003	0.01
Production Unit Heater (1.5 MMBtu/hr)	4E ⁽²⁾	0.15	0.64	0.01	0.04	0.12	0.54	0.01	0.05	0.003	0.01
Production Unit Heater (1.5 MMBtu/hr)	5E ⁽²⁾	0.15	0.64	0.01	0.04	0.12	0.54	0.01	0.05	0.003	0.01
Production Unit Heater (1.5 MMBtu/hr)	6E ⁽²⁾	0.15	0.64	0.01	0.04	0.12	0.54	0.01	0.05	0.003	0.01
Condensate Heater (0.75 MMBtu/hr)	7E ⁽²⁾	0.07	0.32	0.01	0.02	0.06	0.27	0.01	0.02	0.002	0.01
Condensate Heater (0.75 MMBtu/hr)	8E ⁽²⁾	0.07	0.32	0.01	0.02	0.06	0.27	0.01	0.02	0.002	0.01
Gun Barrel Storage Tank (178-bbl)	9E ⁽³⁾	—	—	—	0.38	—	—	—	—	—	0.01
Gun Barrel Storage Tank (178-bbl)	10E ⁽³⁾	—	—	—	0.38	—	—	—	—	—	0.01
Condensate Storage Tank (210-bbl)	11E ⁽³⁾	—	—	—	0.02	—	—	—	—	—	0.001
Condensate Storage Tank (210-bbl)	12E ⁽³⁾	—	—	—	0.02	—	—	—	—	—	0.001
Condensate Storage Tank (210-bbl)	13E ⁽³⁾	—	—	—	0.02	—	—	—	—	—	0.001
Condensate Storage Tank (210-bbl)	14E ⁽³⁾	—	—	—	0.02	—	—	—	—	—	0.001
Produced Water Storage Tank (210-bbl)	15E ⁽³⁾	—	—	—	0.01	—	—	—	—	—	0.001
Produced Water Storage Tank (210-bbl)	16E ⁽³⁾	—	—	—	0.01	—	—	—	—	—	0.001
Produced Water Storage Tank (210-bbl)	17E ⁽³⁾	—	—	—	0.01	—	—	—	—	—	0.001
Produced Water Storage Tank (210-bbl)	18E ⁽³⁾	—	—	—	0.01	—	—	—	—	—	0.001
Enclosed Combustor (2.5 MMBtu/hr)	19E ⁽⁴⁾	0.17	0.74	0.23	1.01	0.78	3.39	0.02	0.08	0.0001	0.0004
Condensate Truck Loading	20E ⁽⁵⁾	—	—	52.47	1.81	—	—	—	—	1.34	0.05
Produced Water Truck Loading	21E ⁽⁶⁾	—	—	0.52	0.07	—	—	—	—	0.01	0.002
Fugitive VOC Emissions	23E ⁽⁷⁾	—	—	2.03	8.87	—	—	—	—	0.004	0.02
Unpaved Road Sources	22E ⁽⁸⁾	—	—	—	—	—	—	0.37	1.62	—	—
Total Facility Emissions		1.21	5.22	55.33	12.92	1.62	7.17	0.47	2.04	1.38	0.18

Notes:

1. Emissions of SO₂ are assumed to be negligible since pipeline-quality natural gas is used as fuel. Refer to Table 2 for HAP emissions. Refer to Table 3 for GHG emissions.
2. Refer to Tables 4-11 for heater(s) potential emissions calculations.
3. Refer to Tables 12-13 for storage tank(s) potential emissions calculations.
4. Refer to Table 14 for combustor(s) potential emissions calculations.
5. Refer to Table 15 for condensate truck loading potential emissions calculations.
6. Refer to Table 16 for produced water truck loading potential emissions calculations.
7. Refer to Tables 17-18 for process piping fugitives potential emissions calculations.
8. Refer to Table 19 for unpaved road sources potential emissions calculations.

ATTACHMENT N
TABLE 2

FACILITY-WIDE POTENTIAL HAP EMISSIONS SUMMARY
HOYT 403
ASCENT RESOURCES - MARCELLUS, LLC

Emissions Source	Emission Point Identification	Hazardous Air Pollutants ¹											
		Formaldehyde		n-Hexane		Benzene		Toluene		Total HAPs			
		(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)		
Production Unit Heater (1.5 MMBtu/hr)	1E ⁽²⁾	0.0001	0.001	0.003	0.01	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.003	0.01
Production Unit Heater (1.5 MMBtu/hr)	2E ⁽²⁾	0.0001	0.001	0.003	0.01	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.003	0.01
Production Unit Heater (1.5 MMBtu/hr)	3E ⁽²⁾	0.0001	0.001	0.003	0.01	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.003	0.01
Production Unit Heater (1.5 MMBtu/hr)	4E ⁽²⁾	0.0001	0.001	0.003	0.01	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.003	0.01
Production Unit Heater (1.5 MMBtu/hr)	5E ⁽²⁾	0.0001	0.001	0.003	0.01	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.003	0.01
Production Unit Heater (1.5 MMBtu/hr)	6E ⁽²⁾	0.0001	0.001	0.003	0.01	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.003	0.01
Heater Treater (0.75 MMBtu/hr)	7E ⁽²⁾	0.0001	0.0002	0.001	0.01	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.002	0.01
Heater Treater (0.75 MMBtu/hr)	8E ⁽²⁾	0.0001	0.0002	0.001	0.01	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.002	0.01
Gun Barrel Storage Tank (178-bbl)	9E ⁽³⁾	—	—	—	—	—	0.004	—	—	—	0.001	—	0.01
Gun Barrel Storage Tank (178-bbl)	10E ⁽³⁾	—	—	—	0.01	—	0.004	—	—	—	0.001	—	0.01
Condensate Storage Tank (210-bbl)	11E ⁽³⁾	—	—	—	0.0003	—	0.0002	—	—	—	0.001	—	0.001
Condensate Storage Tank (210-bbl)	12E ⁽³⁾	—	—	—	0.0003	—	0.0002	—	—	—	0.001	—	0.001
Condensate Storage Tank (210-bbl)	13E ⁽³⁾	—	—	—	0.0003	—	0.0002	—	—	—	0.001	—	0.001
Condensate Storage Tank (210-bbl)	14E ⁽³⁾	—	—	—	0.0003	—	0.0002	—	—	—	0.001	—	0.001
Produced Water Storage Tank (210-bbl)	15E ⁽³⁾	—	—	—	0.0001	—	0.0001	—	—	—	0.001	—	0.001
Produced Water Storage Tank (210-bbl)	16E ⁽³⁾	—	—	—	0.0001	—	0.0001	—	—	—	0.001	—	0.001
Produced Water Storage Tank (210-bbl)	17E ⁽³⁾	—	—	—	0.0001	—	0.0001	—	—	—	0.001	—	0.001
Produced Water Storage Tank (210-bbl)	18E ⁽³⁾	—	—	—	0.0001	—	0.0001	—	—	—	0.001	—	0.001
Enclosed Combustor (2.5 MMBtu/hr)	19E ⁽⁴⁾	—	—	0.0001	0.0002	0.00004	0.0002	0.00004	0.00001	0.00004	0.0001	0.0001	0.0004
Condensate Truck Loading	20E ⁽⁵⁾	—	—	0.72	0.03	0.49	0.02	0.13	0.13	0.005	1.34	0.002	0.05
Produced Water Truck Loading	21E ⁽⁶⁾	—	—	0.01	0.001	0.005	0.001	0.001	0.001	0.001	0.002	0.01	0.002
Fugitive VOC Emissions	22E ⁽⁶⁾	—	—	0.003	0.01	0.001	0.003	0.001	0.001	0.003	0.004	0.004	0.02
Total Facility Emissions		0.001	0.003	0.75	0.13	0.49	0.03	0.13	0.13	0.01	1.38	0.01	0.18

Notes:

- 1 . To be conservative, emissions less than 0.0001 for each HAP were rounded up to 0.0001 lb/hr and 0.0001 T/yr.
- 2 . Refer to Tables 4-11 for heater(s) potential emissions calculations.
- 3 . Refer to Tables 12-13 for storage tank(s) potential emissions calculations.
- 4 . Refer to Table 14 for combustor(s) potential emissions calculations.
- 5 . Refer to Table 15 for condensate truck loading potential emissions calculations.
- 6 . Refer to Table 16 for produced water truck loading potential emissions calculations.
- 7 . Refer to Tables 17-18 for process piping fugitives potential emissions calculations.

**ATTACHMENT N
TABLE 3**

**ESTIMATION OF FACILITY-WIDE GHG EMISSIONS
HOYT 403
ASCENT REOURCES - MARCELLUS, LLC**

GHG Emission Source	Total GHG Emissions (m.t. CO ₂ e) (tons CO ₂ e)	
Natural Gas Combustion Tanks	4,885	5,385
Fugitives	426	470
Flares/Combustors	1,543	1,701
Total Estimated Facility Emissions:	6,854	7,556

Conversion Factors		Global Warming Potential	
1.0231	low/mid	CO ₂	1
0.001	m.t./kg	CH ₄	25
0.700	lb/yr	H ₂ O	298

CO ₂ (mol %)	CH ₄ (mol %)	C ₂ H ₆ (mol %)	C ₃ H ₈ (mol %)	C ₄ H ₁₀ (mol %)	C ₅ (mol %)
0.12%	82.40%	12.01%	3.31%	1.17%	0.58%

Notes:
Carbon Dioxide Equivalent (CO₂e) emissions are calculated in the tables below by multiplying emissions by global warming potentials for each pollutant.
Emissions estimates converted to short tons in the tables below using conversion factor from 40 CFR 98 Subpart A.
Global Warming Potentials obtained from 40 CFR 98 Subpart A, Table A-1.
Mol % values obtained from the gas analysis from a representative facility.

Natural Gas & Diesel Combustion Emissions

Emission Source	Emission Point Identification	Rated Horsepower	Capacity (MMBtu/hr)	BSFC (lb/HP-hr)	Operation (hr/yr)	Emission Factors ¹			Emissions (m.t.)			Emissions (m.t. CO ₂ e)			Total Emissions (m.t. CO ₂ e) (tons CO ₂ e)	
						CO ₂ (lb/MMBtu)	CH ₄ (lb/MMBtu)	N ₂ O (lb/MMBtu)	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CO ₂ e
Production Unit Heater (1.5 MMBtu/hr)	1E	---	1.5	---	8,700	63.06	0.001	0.0001	617.21	0.013	0.0013	617.21	0.33	0.362	618	700
Production Unit Heater (1.5 MMBtu/hr)	2E	---	1.5	---	8,700	63.06	0.001	0.0001	617.21	0.013	0.0013	617.21	0.33	0.36	618	700
Production Unit Heater (1.5 MMBtu/hr)	3E	---	1.5	---	8,700	63.06	0.001	0.0001	617.21	0.013	0.0013	617.21	0.33	0.36	618	700
Production Unit Heater (1.5 MMBtu/hr)	4E	---	1.5	---	8,700	63.06	0.001	0.0001	617.21	0.013	0.0013	617.21	0.33	0.36	618	700
Production Unit Heater (1.5 MMBtu/hr)	5E	---	1.5	---	8,700	63.06	0.001	0.0001	617.21	0.013	0.0013	617.21	0.33	0.36	618	700
Production Unit Heater (1.5 MMBtu/hr)	6E	---	1.5	---	8,700	63.06	0.001	0.0001	617.21	0.013	0.0013	617.21	0.33	0.36	618	700
Condensate Heater (0.75 MMBtu/hr)	7E	---	0.75	---	8,700	63.06	0.001	0.0001	348.00	0.007	0.0007	348.00	0.18	0.20	348	386
Condensate Heater (0.75 MMBtu/hr)	8E	---	0.75	---	8,700	63.06	0.001	0.0001	348.00	0.007	0.0007	348.00	0.18	0.19	348	386
Total Natural Gas Combustion:													4,885	5,385		

Notes:
1. Emission factors for GHG obtained from 40 CFR 98 Subpart C, Tables C-1 and C-2.

Tank Sources

Emission Source	Emission Point Identification	Annual Condensate Production (bbl/yr)	Annual Condensate Production (1,000 gal/yr)	Default Liquid CH ₄ Content ¹ (mol %)	Actual VOC Gas/Oil Ratio (m.t./m.t. oil)	Emissions ² CH ₄ (m.t.)	Total Emissions (m.t. CO ₂ e) (tons CO ₂ e)	Control Efficiency (%)	Total Controlled Emissions (m.t. CO ₂ e) (tons CO ₂ e)		
									CH ₄ (m.t.)	CO ₂ e	
Gas Barrel Storage Tank (170-bbl)	9E	32,303	1,367	27.4	58.81	0.0059	2,397	2,942	98%	0.06	0.05
Gas Barrel Storage Tank (170-bbl)	10E	32,303	1,367	27.4	58.81	0.0058	2,397	2,942	98%	0.05	0.05
Condensate Storage Tank (210-bbl)	11E	3,285	138	27.4	58.81	0.07	24.37	28.87	98%	0.49	0.54
Condensate Storage Tank (210-bbl)	12E	3,285	138	27.4	58.81	0.07	24.37	28.87	98%	0.49	0.54
Condensate Storage Tank (210-bbl)	13E	3,285	138	27.4	58.81	0.07	24.37	28.87	98%	0.49	0.54
Condensate Storage Tank (210-bbl)	14E	3,285	138	27.4	58.81	0.07	24.37	28.87	98%	0.49	0.54
Produced Water Storage Tank (210-bbl)	15E	12,895	540	27.4	58.81	0.0382	0.95	1.05	98%	0.02	0.02
Produced Water Storage Tank (210-bbl)	16E	12,895	540	27.4	58.81	0.0382	0.95	1.05	98%	0.02	0.02
Produced Water Storage Tank (210-bbl)	17E	12,895	540	27.4	58.81	0.0382	0.95	1.05	98%	0.02	0.02
Produced Water Storage Tank (210-bbl)	18E	12,895	540	27.4	58.81	0.0382	0.95	1.05	98%	0.02	0.02
Total Tanks:										2.12	2.34

Notes:
1. Default CH₄ content for crude oil per API Compendium Section 5.4 and Appendix B.
2. Emissions estimated using API Compendium, Section 5.6.

Loading Sources

Emission Source	Emission Point Identification	Annual Production (bbl/yr)	Annual Production (1,000 gal/yr)	Default Liquid CH ₄ Content ¹ (mol %)	Emission Factor VOC (lb/1,000 gal)	Emissions VOC (tons)		Emissions ² CH ₄ (m.t.)	Total Emissions (m.t. CO ₂ e) (tons CO ₂ e)	
						CO ₂	CH ₄		CO ₂	CH ₄
Condensate Tank Loading	20E	13,140	552	27.4	0.58	1.81	1.84	0.480	0.48	0.50
Produced Water Tank Loading	21E	61,495	2,462	27.4	0.07	0.07	0.06	0.018	0.02	0.02
Total Loading:								0.47	0.52	

Notes:
1. Default CH₄ content for crude oil per API Compendium Section 5.4 and Appendix B.
2. Emissions estimated using API Compendium, Section 5.6.

Fugitive Sources

Source Type/Service ¹	Number of Sources	Maximum Hours of Operation	CO ₂ (mol %)	CH ₄ (mol %)	Emission Factor CH ₄ (m.t./hr component)	Emissions ² (m.t.)		Emissions (m.t. CO ₂ e)		Total Emissions (m.t. CO ₂ e) (tons CO ₂ e)	
						CO ₂	CH ₄	CO ₂	CH ₄	CO ₂	CH ₄
Valves - Gas/Vapor	200	8,700	0.0012	0.8240	0.0000045	0.0270	0.50	0.0270	182.40	182.43	178.05
Flanges - Gas/Vapor	700	8,700	0.0012	0.8240	0.0000039	0.0082	1.97	0.0082	48.28	49.27	54.31
Connectors - Gas/Vapor	800	8,700	0.0012	0.8240	0.0000002	0.00	1.15	0.00	28.87	28.88	31.83
Relief Valves - Gas/Vapor	20	8,700	0.0012	0.8240	0.0000017	0.0102	2.49	0.0102	61.36	61.36	67.84
Valves - Light Liquid	200	8,700	0.0012	0.8240	0.0000015	0.0150	3.21	0.0150	90.22	90.24	98.47
Flanges - Light Liquid	25	8,700	0.0012	0.8240	0.0000011	0.0006	0.02	0.0006	0.50	0.50	0.55
Connectors - Light Liquid	600	8,700	0.0012	0.8240	0.0000021	0.003	0.78	0.003	18.95	18.95	20.89
Relief Valves - Light Liquid	15	8,700	0.0012	0.8240	0.0000028	0.0024	0.58	0.0024	14.59	14.59	16.05
Total Fugitives:										428	470

Notes:
1. Number of each component and type of service estimated based on a similar station.
2. Emissions estimated using API Compendium, Section 5.0, Tables 5-12 and 5-21.

Flare

Emission Source	Emission Point Identification	Burner Rating (MMBtu/hr)	Annual Gas Usage ¹ (m.t./yr)	CO ₂ (mol %)	CH ₄ (mol %)	Emission Factor H ₂ O (m.t./MMBtu)	Emissions ² (m.t.)			Emissions (m.t. CO ₂ e)			Total Emissions (m.t. CO ₂ e) (tons CO ₂ e)	
							CO ₂	CH ₄	H ₂ O	CO ₂	CH ₄	H ₂ O	CO ₂	CH ₄
Employed Combustor (2.5 MMBtu/hr)	19E	2.5	21,470,588	0.0012	0.8240	5.90E-07	1,374	7	0.00001	1,374	0.004	1,374	1,843	1,701
Total Flare Emissions:													1,843	1,701

Notes:
1. Annual gas usage calculated using the (10) heating value of 1,020 Btu/cf.
2. Emissions estimated using API Compendium, Section 4.6 for Flare Emissions.

**ATTACHMENT N
TABLE 4**

**POTENTIAL EMISSIONS SUMMARY
PRODUCTION UNIT HEATER (1E)
HOYT 403
ASCENT RESOURCES – MARCELLUS, LLC**

Pollutant ¹	Emission Factors ² (lb/MMSCF)	Potential Emission Rates ³	
		(lb/hr)	(T/yr)
NO _x	100.0	0.15	0.64
VOC	5.5	0.01	0.04
CO	84.0	0.12	0.54
PM	7.6	0.01	0.05
Benzene	0.0021	<0.0001	<0.0001
Formaldehyde	0.075	<0.0001	0.0005
n-Hexane	1.8	0.003	0.01
Toluene	0.0034	<0.0001	<0.0001

Notes:

1. HAP emissions include Benzene, Formaldehyde, n-Hexane, and Toluene.
2. Emission factors obtained from AP-42 Section 1.4 (7/98), Table 1.4-1 through 1.4-3 for commercial boilers.
3. Potential emissions based on AP-42 emission factors, maximum firing rate of 1.5 MMBtu/hr, 1,020 Btu/scf fuel heating value, and 8,760 hours of operation per year.

**ATTACHMENT N
TABLE 5**

**POTENTIAL EMISSIONS SUMMARY
PRODUCTION UNIT HEATER (2E)
HOYT 403
ASCENT RESOURCES – MARCELLUS, LLC**

Pollutant ¹	Emission Factors ² (lb/MMSCF)	Potential Emission Rates ³	
		(lb/hr)	(T/yr)
NO _x	100.0	0.15	0.64
VOC	5.5	0.01	0.04
CO	84.0	0.12	0.54
PM	7.6	0.01	0.05
Benzene	0.0021	<0.0001	<0.0001
Formaldehyde	0.075	<0.0001	0.0005
n-Hexane	1.8	0.003	0.01
Toluene	0.0034	<0.0001	<0.0001

Notes:

1. HAP emissions include Benzene, Formaldehyde, n-Hexane, and Toluene.
2. Emission factors obtained from AP-42 Section 1.4 (7/98), Table 1.4-1 through 1.4-3 for commercial boilers.
3. Potential emissions based on AP-42 emission factors, maximum firing rate of 1.5 MMBtu/hr, 1,020 Btu/scf fuel heating value, and 8,760 hours of operation per year.

**ATTACHMENT N
TABLE 6**

**POTENTIAL EMISSIONS SUMMARY
PRODUCTION UNIT HEATER (3E)
HOYT 403
ASCENT RESOURCES – MARCELLUS, LLC**

Pollutant ¹	Emission Factors ² (lb/MMSCF)	Potential Emission Rates ³	
		(lb/hr)	(T/yr)
NO _x	100.0	0.15	0.64
VOC	5.5	0.01	0.04
CO	84.0	0.12	0.54
PM	7.6	0.01	0.05
Benzene	0.0021	<0.0001	<0.0001
Formaldehyde	0.075	<0.0001	0.0005
n-Hexane	1.8	0.003	0.01
Toluene	0.0034	<0.0001	<0.0001

Notes:

1. HAP emissions include Benzene, Formaldehyde, n-Hexane, and Toluene.
2. Emission factors obtained from AP-42 Section 1.4 (7/98), Table 1.4-1 through 1.4-3 for commercial boilers.
3. Potential emissions based on AP-42 emission factors, maximum firing rate of 1.5 MMBtu/hr, 1,020 Btu/scf fuel heating value, and 8,760 hours of operation per year.

**ATTACHMENT N
TABLE 7**

**POTENTIAL EMISSIONS SUMMARY
PRODUCTION UNIT HEATER (4E)
HOYT 403
ASCENT RESOURCES – MARCELLUS, LLC**

Pollutant ¹	Emission Factors ² (lb/MMSCF)	Potential Emission Rates ³	
		(lb/hr)	(T/yr)
NO _x	100.0	0.15	0.64
VOC	5.5	0.01	0.04
CO	84.0	0.12	0.54
PM	7.6	0.01	0.05
Benzene	0.0021	<0.0001	<0.0001
Formaldehyde	0.075	<0.0001	0.0005
n-Hexane	1.8	0.003	0.01
Toluene	0.0034	<0.0001	<0.0001

Notes:

1. HAP emissions include Benzene, Formaldehyde, n-Hexane, and Toluene.
2. Emission factors obtained from AP-42 Section 1.4 (7/98), Table 1.4-1 through 1.4-3 for commercial boilers.
3. Potential emissions based on AP-42 emission factors, maximum firing rate of 1.5 MMBtu/hr, 1,020 Btu/scf fuel heating value, and 8,760 hours of operation per year.

**ATTACHMENT N
TABLE 8**

**POTENTIAL EMISSIONS SUMMARY
PRODUCTION UNIT HEATER (5E)
HOYT 403
ASCENT RESOURCES – MARCELLUS, LLC**

Pollutant ¹	Emission Factors ² (lb/MMSCF)	Potential Emission Rates ³	
		(lb/hr)	(T/yr)
NO _x	100.0	0.15	0.64
VOC	5.5	0.01	0.04
CO	84.0	0.12	0.54
PM	7.6	0.01	0.05
Benzene	0.0021	<0.0001	<0.0001
Formaldehyde	0.075	<0.0001	0.0005
n-Hexane	1.8	0.003	0.01
Toluene	0.0034	<0.0001	<0.0001

Notes:

1. HAP emissions include Benzene, Formaldehyde, n-Hexane, and Toluene.
2. Emission factors obtained from AP-42 Section 1.4 (7/98), Table 1.4-1 through 1.4-3 for commercial boilers.
3. Potential emissions based on AP-42 emission factors, maximum firing rate of 1.5 MMBtu/hr, 1,020 Btu/scf fuel heating value, and 8,760 hours of operation per year.

**ATTACHMENT N
TABLE 9**

**POTENTIAL EMISSIONS SUMMARY
PRODUCTION UNIT HEATER (6E)
HOYT 403
ASCENT RESOURCES – MARCELLUS, LLC**

Pollutant ¹	Emission Factors ² (lb/MMSCF)	Potential Emission Rates ³	
		(lb/hr)	(T/yr)
NO _x	100.0	0.15	0.64
VOC	5.5	0.01	0.04
CO	84.0	0.12	0.54
PM	7.6	0.01	0.05
Benzene	0.0021	<0.0001	<0.0001
Formaldehyde	0.075	<0.0001	0.0005
n-Hexane	1.8	0.003	0.01
Toluene	0.0034	<0.0001	<0.0001

Notes:

1. HAP emissions include Benzene, Formaldehyde, n-Hexane, and Toluene.
2. Emission factors obtained from AP-42 Section 1.4 (7/98), Table 1.4-1 through 1.4-3 for commercial boilers.
3. Potential emissions based on AP-42 emission factors, maximum firing rate of 1.5 MMBtu/hr, 1,020 Btu/scf fuel heating value, and 8,760 hours of operation per year.

**ATTACHMENT N
TABLE 10**

**POTENTIAL EMISSIONS SUMMARY
CONDENSATE HEATER (7E)
HOYT 403
ASCENT RESOURCES – MARCELLUS, LLC**

Pollutant ¹	Emission Factors ² (lb/MMSCF)	Potential Emission Rates ³	
		(lb/hr)	(T/yr)
NO _x	100.0	0.07	0.32
VOC	5.5	0.004	0.02
CO	84.0	0.06	0.27
PM	7.6	0.01	0.02
Benzene	0.0021	<0.0001	<0.0001
Formaldehyde	0.075	<0.0001	0.0002
n-Hexane	1.8	0.001	0.01
Toluene	0.0034	<0.0001	<0.0001

Notes:

- HAP emissions include Benzene, Formaldehyde, n-Hexane, and Toluene.
- Emission factors obtained from AP-42 Section 1.4 (7/98), Table 1.4-1 through 1.4-3 for commercial boilers.
- Potential emissions based on AP-42 emission factors, maximum firing rate of 0.75 MMBtu/hr, 1,020 Btu/scf fuel heating value, and 8,760 hours of operation per year.

**ATTACHMENT N
TABLE 11**

**POTENTIAL EMISSIONS SUMMARY
CONDENSATE HEATER (8E)
HOYT 403
ASCENT RESOURCES – MARCELLUS, LLC**

Pollutant ¹	Emission Factors ² (lb/MMSCF)	Potential Emission Rates ³	
		(lb/hr)	(T/yr)
NO _x	100.0	0.07	0.32
VOC	5.5	0.004	0.02
CO	84.0	0.06	0.27
PM	7.6	0.01	0.02
Benzene	0.0021	<0.0001	<0.0001
Formaldehyde	0.075	<0.0001	0.0002
n-Hexane	1.8	0.001	0.01
Toluene	0.0034	<0.0001	<0.0001

Notes:

1. HAP emissions include Benzene, Formaldehyde, n-Hexane, and Toluene.
2. Emission factors obtained from AP-42 Section 1.4 (7/98), Table 1.4-1 through 1.4-3 for commercial boilers.
3. Potential emissions based on AP-42 emission factors, maximum firing rate of 0.75 MMBtu/hr, 1,020 Btu/scf fuel heating value, and 8,760 hours of operation per year.

ATTACHMENT N
TABLE 12

POTENTIAL EMISSIONS SUMMARY
CONDENSATE AND PRODUCED WATER STORAGE TANKS
HOYT 403
ASCENT RESOURCES - MARCELLUS, LLC

Source	Source ID	Annual Throughput (gallons/year)	Tank Capacity (gallons)	Potential VOC Emissions ¹				Potential HAP Emissions						
				Annual Breathing Losses ² (lbs)	Annual Working Losses ² (lbs)	Annual Flash Losses ³ (T/yr)	Flare Capture Efficiency ⁴ (%)	Total Annual Emissions ⁵ (T/yr)	Benzene Emissions ⁶ (T/yr)	Toluene Emissions ⁶ (T/yr)	Ethylbenzene Emissions ⁶ (T/yr)	Xylenes Emissions ⁶ (T/yr)	n-Hexane Emissions ⁶ (T/yr)	
Gun Barrel Storage Tank (178-bbl)	9E	1,356,705	7,476	525.48	132.74	18.66	98%	0.38	0.004	0.001	<0.0001	<0.0001	<0.0001	0.01
Gun Barrel Storage Tank (178-bbl)	10E	1,356,705	7,476	525.48	132.74	18.66	98%	0.38	0.004	0.001	<0.0001	<0.0001	<0.0001	0.01
Condensate Storage Tank (210-bb)	11E	137,970	8,820	1,143.65	1,269.07	---	98%	0.02	0.0002	0.0001	<0.0001	<0.0001	<0.0001	0.0003
Condensate Storage Tank (210-bb)	12E	137,970	8,820	1,143.65	1,269.07	---	98%	0.02	0.0002	0.0001	<0.0001	<0.0001	<0.0001	0.0003
Condensate Storage Tank (210-bb)	13E	137,970	8,820	1,143.65	1,269.07	---	98%	0.02	0.0002	0.0001	<0.0001	<0.0001	<0.0001	0.0003
Condensate Storage Tank (210-bb)	14E	137,970	8,820	1,143.65	1,269.07	---	98%	0.02	0.0002	0.0001	<0.0001	<0.0001	<0.0001	0.0003
Produced Water Storage Tank (210-bb)	15E	540,383	8,820	1,143.65	3,098.12	---	98%	0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Produced Water Storage Tank (210-bb)	16E	540,383	8,820	1,143.65	3,098.12	---	98%	0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Produced Water Storage Tank (210-bb)	17E	540,383	8,820	1,143.65	3,098.12	---	98%	0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Produced Water Storage Tank (210-bb)	18E	540,383	8,820	1,143.65	3,098.12	---	98%	0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Notes:

1. Based on the following maximum annual throughput values:

Condensate = 13,140-bbls/yr

Produced Water = 51,465-bbls/yr

2. Annual breathing and working losses were determined using AP-42 Section 7 (11/06).

3. Annual flash losses were based on Promax simulation method. A copy of the Promax output file is available upon request. Throughput is initially routed through a gunbarrel. Therefore all flashing occurs at the gunbarrel tank.

4. Breathing, working and flash emissions from the gunbarrels and working and breathing emissions from the storage tanks are routed to an enclosed flare which has a capture efficiency of 98%. Refer to Table 14 for enclosed flare emissions calculations.

5. To be conservative, breathing, working, and flash losses for produced water were calculated using condensate, assuming 1% is emitted.

$$\text{Total Annual Emissions (T/yr)} = \left[\frac{(\text{Breathing Losses (lbs)} + \text{Working Losses (lbs)})}{2000} + \frac{\text{Flash Losses (T/yr)}}{1} \right] \times [1 - \text{Enclosed Combustor Capture Efficiency (\%)}]$$

$$\text{Total Annual Emissions (T/yr)} = \left[\frac{(\text{Breathing Losses (lbs)} + \text{Working Losses (lbs)})}{2000} \right] \times [1 - \text{Enclosed Combustor Capture Efficiency (\%)}]$$

$$\text{Total Annual Emissions (T/yr)} = \left[\frac{(\text{Breathing Losses (lbs)} + \text{Working Losses (lbs)})}{2000} \right] \times [1 - \text{Enclosed Combustor Capture Efficiency (\%)}] \times 1\%$$

6. Estimated HAP Composition (% by Weight) from Promax.

Benzene = 0.925%

Toluene = 0.249%

Ethylbenzene = 0.000%

Xylenes = 0.000%

n-Hexane = 1.380%

ATTACHMENT N
TABLE 13

POTENTIAL EMISSIONS SUMMARY
AP-42 SECTION 7 (EPA TANKS 4.0.9d) FIXED-ROOF TANK EMISSIONS
HOYT 403
ASCENT RESOURCES - MARCELLUS, LLC

Tank Identification	Hoyt 403 , 9E-2	Hoyt 403 , 11E-6	Hoyt 403 , 15E-10
Actual Location	WV	WV	WV
Location for Calculation Purposes	Charleston, West Virginia	Charleston, West Virginia	Charleston, West Virginia
Contents of Tank	Gasoline (RVP 11)	Gasoline (RVP 11)	Gasoline (RVP 11)
Tank/Roof Type	Dome	Dome	Dome
Underground?	Aboveground	Aboveground	Aboveground
Diameter, ft	8.0	10.0	10.0
Shell Height or Length, ft	20.0	15.0	15.0
Nominal Capacity, gal	7,476	8,820	8,820
Throughput, gallons/yr	14,431	137,970	540,383
Tank Paint Color	Gray/Light	Gray/Light	Gray/Light
Tank Paint Condition	Good	Good	Good
Effective Diameter, ft	8.0	10.0	10.0
Geometric Capacity, gal	7,144	8,225	8,225
Maximum Liquid Height, ft	19.0	14.0	14.0
Average Liquid Height, ft	18	11	11
Cone Tank Roof Slope, ft/ft	0.0625	0.0625	0.0625
Dome Tank Roof Radius, ft	8.00	10.00	10.00
Dome Tank Roof Height, ft	1.072	1.340	1.340
Roof Outage, ft	0.549	0.686	0.686
Vapor Space Outage, ft	2.55	5.19	5.19
Vapor Space Volume, ft ³	128	407	407
Average Daily Minimum Ambient Temperature, F	44.22	44.22	44.22
Average Daily Maximum Ambient Temperature, F	65.75	65.75	65.75
Daily Total Solar Insolation Factor, Btu/ft ² /day	1251	1251	1251
Daily Average Ambient Temperature, F	55.0	55.0	55.0
Tank Paint Solar Absorbance, dimensionless	0.540	0.540	0.540
Daily Vapor Temperature Range, R	34.4	34.4	34.4
Daily Average Liquid Surf. Temperature, F	61.6	61.6	61.6
Daily Minimum Liquid Surf. Temperature, F	53.0	53.0	53.0
Daily Maximum Liquid Surf. Temperature, F	70.2	70.2	70.2
Liquid Bulk Temperature	57.22	57.22	57.22
Vapor Molecular Weight, lb/lbmol	65.0	65.0	65.0
Antoine's Coefficient A	N/A	N/A	N/A
Antoine's Coefficient B	N/A	N/A	N/A
Antoine's Coefficient C	N/A	N/A	N/A
Type of Substance (for use in calculations)	Gas	Gas	Gas
Vapor Pressure at Daily Av. Liquid Surf. Temp., psia	5.943	5.943	5.943
Vapor Pressure at Daily Min. Liquid Surf. Temp., psia	5.032	5.032	5.032
Vapor Pressure at Daily Max. Liquid Surf. Temp., psia	6.981	6.981	6.981
Vapor Pressure Calculation Method	AP-42 Figure 7.1-14b: RVP=11 ASTM Slope=3	AP-42 Figure 7.1-14b: RVP=11 ASTM Slope=3	AP-42 Figure 7.1-14b: RVP=11 ASTM Slope=3
Vapor Density, lb/ft ³	0.069067	0.069067	0.069067
Daily Vapor Pressure range, psi	1.949	1.949	1.949
Breather Vent Pressure Setting, psig	0.0300	0.0300	0.0300
Breather Vent Vacuum Setting, psig	-0.0300	-0.0300	-0.0300
Breather Vent Pressure Setting Range, psi	0.0600	0.0600	0.0600
Ambient Pressure, psia	14.3	14.3	14.3
Vapor Space Expansion Factor	0.2933	0.2933	0.2933
Vented Vapor Saturation Factor	0.555	0.380	0.380
Annual Turnovers	2.02	16.77	65.70
Turnover Factor	1.00	1.00	0.62
Working Loss Product Factor	1.00	1.00	1.00
Standing Storage Loss, lb/yr	525.47964	1143.65074	1143.65074
Working Loss, lb/yr	132.74102	1269.06642	3098.12375
Total Losses, lb/yr	658.22066	2412.71717	4241.77449
Standing Storage Loss, TPY	0.26274	0.57183	0.57183
Working Loss, TPY	0.06637	0.63453	1.54906
Total Losses, TPY	0.32911	1.20636	2.12089

Based on AP-42, February 1996, Section 7.1.3.1.

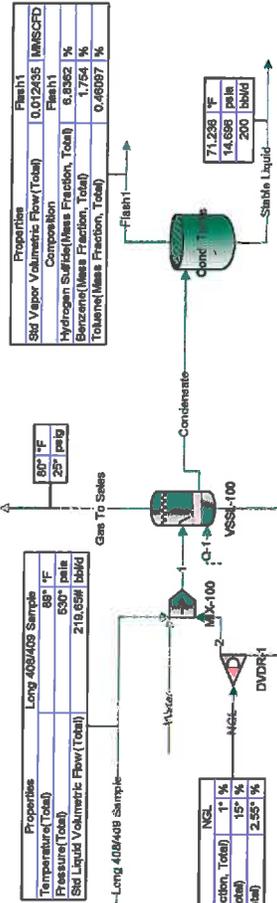
Oil Tanks

Annual tank loss calculations for "Stable Liquid"
 Total working and breathing losses from the Vertical Cylinder are 28.84 ton/yr.
 Loading losses are 1,311 ton/yr of loaded liquid.
 * All components are reported.

OT Working & Breathing Losses
 OT Loading Losses
 OT Residual Stream

Annual tank loss calculations for "Produced Water" using percent side.
 Total working and breathing losses from the Vertical Cylinder are 0.3048 ton/yr.
 Loading losses are 0.407 ton/yr of loaded liquid.
 * All components are reported.

WT Working & Breathing Losses
 WT Loading Losses
 WT Residual Stream



"Flash1" C3+ Mass Flow = 199.5 ton/yr

PStreams "Flash1"/"Stable Liquid" VOCs EF= 5.467 lb/bbl

"Flash2" C3+ Mass Flow = 1.878 ton/yr

PStreams "Flash2"/"Produced Water" VOCs EF= 0.01439 lb/bbl

Name	Units	WT Working & Breathing Losses	OT Loading Losses	OT Residual Stream*
Hydrogen Sulfide (Mass Fraction)	%	6.22*	6.22*	0.113*
n-Hexane (Mass Fraction)	%	1.38*	1.38*	3.68*
Benzene (Mass Fraction)	%	0.929*	0.929*	4.09*
Toluene (Mass Fraction)	%	0.249*	0.249*	3.83*
Ethylbenzene (Mass Fraction)	%	0*	0*	0*
p-Xylene (Mass Fraction)	%	0*	0*	0*

Name	Units	WT Working & Breathing Losses	WT Loading Losses	WT Residual Stream*
Hydrogen Sulfide (Mass Fraction)	%	6.22*	6.22*	0.132*
n-Hexane (Mass Fraction)	%	1.38*	1.38*	3.67*
Benzene (Mass Fraction)	%	0.929*	0.929*	4.09*
Toluene (Mass Fraction)	%	0.249*	0.249*	3.82*
Ethylbenzene (Mass Fraction)	%	0*	0*	0*
p-Xylene (Mass Fraction)	%	0*	0*	0*

**There are three streams connected to the right side of the Tank Losses shapes, which are populated with composition, flow rate, and temperature of the Working and Breathing loss, Loading loss, and residual streams. The residual stream is the total mass flow rate of the designated stream less the Working and Breathing Losses. Since these streams are set to be saturated vapor, the pressure may be different from the pressure specified in the shape in order to achieve the saturated condition.

February 3, 2015

FESCO, Ltd.
1100 FESCO Avenue - Alice, Texas 78332

For: American Energy Utica
301 N W 63rd, Suite 600
Oklahoma City, Oklahoma 73116

Sample: Long Well Pad
Stabilizer Outlet Hydrocarbon Liquid
Sampled @ 40 psig & 110 °F

Date Sampled: 01/16/15

Job Number: 51315.002

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2186-M

COMPONENT	MOL %	LIQ VOL %	WT %
Nitrogen	0.020	0.005	0.006
Carbon Dioxide	0.000	0.000	0.000
Methane	0.075	0.029	0.012
Ethane	1.315	0.808	0.412
Propane	5.171	3.272	2.377
Isobutane	2.774	2.085	1.681
n-Butane	8.392	6.077	5.085
2,2 Dimethylpropane	0.131	0.115	0.098
Isopentane	6.489	5.451	4.880
n-Pentane	7.635	6.357	5.742
2,2 Dimethylbutane	0.485	0.465	0.436
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.683	0.643	0.614
2 Methylpentane	4.644	4.428	4.172
3 Methylpentane	3.071	2.880	2.759
n-Hexane	6.732	6.358	6.047
Heptanes Plus	<u>52.384</u>	<u>61.028</u>	<u>65.678</u>
Totals:	100.000	100.000	100.000

Characteristics of Heptanes Plus:

Specific Gravity ----- 0.7514 (Water=1)
°API Gravity ----- 56.81 @ 60°F
Molecular Weight ----- 120.3
Vapor Volume ----- 19.83 CF/Gal
Weight ----- 6.26 Lbs/Gal

Characteristics of Total Sample:

Specific Gravity ----- 0.6982 (Water=1)
°API Gravity ----- 71.16 @ 60°F
Molecular Weight ----- 95.9
Vapor Volume ----- 23.10 CF/Gal
Weight ----- 5.82 Lbs/Gal

Base Conditions: 14.850 PSI & 60 °F

Certified: FESCO, Ltd. - Alice, Texas

Analyst: XG
Processor: XGdjv
Cylinder ID: W-754

David Dannhaus 361-661-7015

TANKS DATA INPUT REPORT - GPA 2186-M

COMPONENT	Mol %	LiqVol %	Wt %
Carbon Dioxide	0.000	0.000	0.000
Nitrogen	0.020	0.005	0.006
Methane	0.075	0.029	0.012
Ethane	1.315	0.808	0.412
Propane	5.171	3.272	2.377
Isobutane	2.774	2.085	1.681
n-Butane	8.522	6.192	5.183
Isopentane	6.489	5.451	4.880
n-Pentane	7.635	6.357	5.742
Other C-6's	8.884	8.416	7.981
Heptanes	15.467	15.774	15.786
Octanes	14.680	15.704	16.587
Nonanes	5.766	7.129	7.621
Decanes Plus	13.158	19.613	22.164
Benzene	0.126	0.081	0.103
Toluene	0.742	0.571	0.713
E-Benzene	0.701	0.621	0.775
Xylenes	1.743	1.535	1.929
n-Hexane	6.732	6.358	6.047
2,2,4 Trimethylpentane	<u>0.000</u>	<u>0.000</u>	<u>0.000</u>
Totals:	100.000	100.000	100.000

Characteristics of Total Sample:

Specific Gravity -----	0.6982 (Water=1)
°API Gravity -----	71.16 @ 60°F
Molecular Weight -----	95.9
Vapor Volume -----	23.10 CF/Gal
Weight -----	5.82 Lbs/Gal

Characteristics of Decanes (C10) Plus:

Specific Gravity -----	0.7890 (Water=1)
Molecular Weight -----	161.6

Characteristics of Atmospheric Sample:

°API Gravity -----	68.22 @ 60°F
Reid Vapor Pressure (ASTM D-5191) -----	10.85 psi

QUALITY CONTROL CHECK			
	Sampling Conditions	Test Samples	
Cylinder Number	---	W-754*	W-1106
Pressure, PSIG	40	10	8
Temperature, °F	110	70	70

* Sample used for analysis

TOTAL EXTENDED REPORT - GPA 2186-M

COMPONENT	Mol %	LiqVol %	Wt %
Nitrogen	0.020	0.005	0.006
Carbon Dioxide	0.000	0.000	0.000
Methane	0.075	0.029	0.012
Ethane	1.315	0.808	0.412
Propane	5.171	3.272	2.377
Isobutane	2.774	2.085	1.681
n-Butane	8.392	6.077	5.085
2,2 Dimethylpropane	0.131	0.115	0.098
Isopentane	6.489	5.451	4.880
n-Pentane	7.635	6.357	5.742
2,2 Dimethylbutane	0.485	0.465	0.436
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.683	0.643	0.614
2 Methylpentane	4.644	4.428	4.172
3 Methylpentane	3.071	2.880	2.759
n-Hexane	6.732	6.358	6.047
Methylcyclopentane	1.100	0.894	0.965
Benzene	0.126	0.081	0.103
Cyclohexane	1.013	0.792	0.889
2-Methylhexane	3.856	4.118	4.028
3-Methylhexane	3.208	3.383	3.351
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C-7's	1.588	1.605	1.642
n-Heptane	4.702	4.982	4.911
Methylcyclohexane	3.161	2.919	3.236
Toluene	0.742	0.571	0.713
Other C-8's	8.728	9.501	10.028
n-Octane	2.791	3.284	3.323
E-Benzene	0.701	0.621	0.775
M & P Xylenes	0.730	0.651	0.808
O-Xylene	1.012	0.884	1.121
Other C-9's	4.237	5.152	5.576
n-Nonane	1.529	1.977	2.045
Other C-10's	3.823	5.109	5.631
n-decane	0.849	1.196	1.259
Undecanes(11)	3.012	4.129	4.615
Dodecanes(12)	1.945	2.881	3.265
Tridecanes(13)	1.291	2.049	2.355
Tetradecanes(14)	0.842	1.432	1.668
Pentadecanes(15)	0.603	1.098	1.294
Hexadecanes(16)	0.314	0.611	0.727
Heptadecanes(17)	0.202	0.416	0.499
Octadecanes(18)	0.094	0.205	0.247
Nonadecanes(19)	0.063	0.142	0.172
Eicosanes(20)	0.019	0.045	0.055
Heneicosanes(21)	0.007	0.017	0.021
Docosanes(22)	0.009	0.024	0.030
Tricosanes(23)	0.020	0.053	0.065
Tetracosanes(24)	0.006	0.017	0.022
Pentacosanes(25)	0.013	0.037	0.046
Hexacosanes(26)	0.010	0.029	0.037
Heptacosanes(27)	0.009	0.027	0.034
Octacosanes(28)	0.008	0.025	0.032
Nonacosanes(29)	0.008	0.025	0.032
Triacontanes(30)	0.006	0.022	0.028
Hentriacontanes Plus(31+)	<u>0.006</u>	<u>0.024</u>	<u>0.031</u>
Total	100.000	100.000	100.000



FESCO, Ltd.
1100 Fesco Avenue - Alice, Texas 78332

For: American Energy Utica
301 N W 63rd, Suite 600
Oklahoma City, Oklahoma 73116

Date Sampled: 01/16/15

Date Analyzed: 01/28/15

Sample: Long Well Pad

Job Number: J51315

FLASH LIBERATION OF HYDROCARBON LIQUID		
	Separator HC Liquid	Stock Tank
Pressure, psig	40	0
Temperature, °F	110	70
Gas Oil Ratio (1)	-----	62.0
Gas Specific Gravity (2)	-----	1.894
Separator Volume Factor (3)	1.0816	1.000

STOCK TANK FLUID PROPERTIES	
Shrinkage Recovery Factor (4)	0.9245
Oil API Gravity at 60 °F	68.22
Reid Vapor Pressure, psi (5)	10.85

Quality Control Check			
	Sampling Conditions	Test Samples	
Cylinder No.	-----	W-754*	W-1106
Pressure, psig	40	10	8
Temperature, °F	110	70	70

(1) - Scf of flashed vapor per barrel of stock tank oil

(2) - Air = 1.000

(3) - Separator volume / Stock tank volume

(4) - Fraction of first stage separator liquid

(5) - Absolute pressure at 100 deg F

Analyst E.F.

* Sample used for flash study

Base Conditions: 14.65 PSI & 60 °F

Certified: FESCO, Ltd. - Alice, Texas

David Dannhaus 361-661-7015

February 2 , 2015

FESCO, Ltd.
1100 Fesco Ave. - Alice, Texas 78332

For: American Energy Utica
301 N W 63rd, Suite 600
Oklahoma City, Oklahoma 73116

Sample: Long Well Pad
Gas Evolved from Hydrocarbon Liquid Flashed
From 40 psig & 110 °F to 0 psig & 70 °F

Date Sampled: 01/16/15

Job Number: 51315.001

CHROMATOGRAPH EXTENDED ANALYSIS - SUMMATION REPORT

COMPONENT	MOL%	GPM
Hydrogen Sulfide*	< 0.001	
Nitrogen	0.077	
Carbon Dioxide	0.035	
Methane	1.088	
Ethane	14.858	3.951
Propane	32.416	8.880
Isobutane	9.381	3.052
n-Butane	20.807	6.522
2-2 Dimethylpropane	0.272	0.103
Isopentane	7.189	2.614
n-Pentane	6.242	2.250
Hexanes	5.080	2.082
Heptanes Plus	<u>2.555</u>	<u>1.107</u>
Totals	100.000	30.562

Computed Real Characteristics Of Heptanes Plus:

Specific Gravity ----- 3.558 (Air=1)
Molecular Weight ----- 100.19
Gross Heating Value ----- 5304 BTU/CF

Computed Real Characteristics Of Total Sample:

Specific Gravity ----- 1.894 (Air=1)
Compressibility (Z) ----- 0.9723
Molecular Weight ----- 53.34
Gross Heating Value
Dry Basis ----- 3075 BTU/CF
Saturated Basis ----- 3022 BTU/CF

*Hydrogen Sulfide tested in laboratory by: Stain Tube Method (GPA 2377)

Results: <0.013 Gr/100 CF, <0.2 PPMV or <0.001 Mol %

Base Conditions: 14.650 PSI & 60 Deg F

Certified: FESCO, Ltd. - Alice, Texas

Analyst: MR
Processor: AL
Cylinder ID: FL# 6 S

David Dannhaus 361-861-7015

**CHROMATOGRAPH EXTENDED ANALYSIS
TOTAL REPORT**

COMPONENT	MOL %	GPM	WT %
Hydrogen Sulfide*	< 0.001		< 0.001
Nitrogen	0.077		0.040
Carbon Dioxide	0.035		0.029
Methane	1.088		0.328
Ethane	14.858	3.951	8.375
Propane	32.416	8.880	26.796
Isobutane	9.381	3.052	10.221
n-Butane	20.807	6.522	22.671
2,2 Dimethylpropane	0.272	0.103	0.368
Isopentane	7.189	2.614	9.723
n-Pentane	6.242	2.250	8.443
2,2 Dimethylbutane	0.265	0.110	0.428
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.346	0.141	0.559
2 Methylpentane	1.672	0.690	2.701
3 Methylpentane	1.010	0.410	1.632
n-Hexane	1.787	0.731	2.887
Methylcyclopentane	0.137	0.047	0.216
Benzene	0.033	0.009	0.048
Cyclohexane	0.173	0.059	0.273
2-Methylhexane	0.344	0.159	0.646
3-Methylhexane	0.339	0.154	0.637
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C7's	0.372	0.161	0.692
n-Heptane	0.370	0.170	0.695
Methylcyclohexane	0.259	0.104	0.477
Toluene	0.052	0.017	0.090
Other C8's	0.302	0.140	0.624
n-Octane	0.062	0.032	0.133
Ethylbenzene	0.002	0.001	0.004
M & P Xylenes	0.017	0.007	0.034
O-Xylene	0.002	0.001	0.004
Other C9's	0.054	0.027	0.128
n-Nonane	0.008	0.004	0.019
Other C10's	0.010	0.006	0.026
n-Decane	0.006	0.004	0.016
Undecanes (11)	<u>0.013</u>	<u>0.008</u>	<u>0.037</u>
Totals	100.000	30.562	100.000

Computed Real Characteristics Of Total Sample:

Specific Gravity -----	1.894	(Air=1)
Compressibility (Z) -----	0.9723	
Molecular Weight -----	53.34	
Gross Heating Value		
Dry Basis -----	3075	BTU/CF
Saturated Basis -----	3022	BTU/CF

**ATTACHMENT N
TABLE 14**

**POTENTIAL EMISSIONS SUMMARY
ENCLOSED COMBUSTOR (19E)
HOYT 403
ASCENT RESOURCES - MARCELLUS, LLC**

Pollutant	Emission Factors ¹ (lb/MMBtu)	Potential Tank Losses ²		Flare Destruction Efficiency (%)	Total Potential Emission Rates ³	
		(lb/hr)	(T/yr)		(lb/hr)	(T/yr)
NO _x	0.068	---	---	---	0.17	0.74
CO	0.310	---	---	---	0.78	3.39
PM ⁴	7.6	---	---	---	0.02	0.08
VOC	---	11.48	50.27	98%	0.23	1.01
Benzene	---	0.002	0.01	98%	0.00004	0.0002
Toluene	---	0.0005	0.002	98%	0.00001	0.00004
n-Hexane	---	0.003	0.01	98%	0.0001	0.0002

Notes:

1. Emission factors for NO_x and CO obtained from AP-42 Table 13.5-1 (4/15) for industrial flares.
2. Potential tank emissions are estimated based on the breathing, working, and flash losses from the storage tank(s) and a 98% capture efficiency at the combustor (refer to Table 12).
3. Potential emissions for NO_x and CO are based on AP-42 emission factors, an estimated heat value of 2.5 MMBtu/hr, and 8,760 hours of operation per year. Potential emissions for VOC are based on a 98% capture efficiency from the storage tank(s), a 98% destruction efficiency from the enclosed flare, and 8,760 hours of operation per year.
4. lb/MMscf: Criteria Pollutant Emission Factors obtained from AP-42 Nat Gas Combustion, Table 1.4-1, (7/98) < 100 MMBtu/hr heat input; & Table 1.4-2, (7/98).

**ATTACHMENT N
TABLE 15**

**POTENTIAL EMISSIONS SUMMARY
CONDENSATE TRUCK LOADING (20E)
HOYT 403
ASCENT RESOURCES – MARCELLUS, LLC**

Material Name	Constituent	Saturation Factor ¹ (S)	True Vapor Pressure (P)	MW of Vapors (M) (lb/lb-mole)	Temp of Loaded Liquid (°F)	Emission Factor ¹ (lb VOC/10 ³ gal)	Maximum Hourly Throughput ² (gals)	Annual Throughput ³ (gals)	Uncontrolled VOC Emissions	
									Hourly Emissions ⁴ (lb/hr)	Annual Emissions ⁵ (T/yr)
Condensate	VOC	0.6	6.98	65.00	57.22	6.559	8,000	551,880	52.47	1.81

Notes:

1. Per AP-42, 5th Edition (6/08), Section 5.2, Equation 1

$$Emission\ Factor\ \left(\frac{lb\ VOC}{10^3\ gal}\right) = \left(\frac{S \times P \times M}{P + 460}\right) \times 12.46$$

- Maximum hourly throughput is the amount of condensate loaded out from the storage tank(s).
- Annual Throughput is the amount of condensate loaded out from the storage tank(s).
- Uncontrolled Hourly Emissions = Hourly Throughput / 1000 x Emission Factor
- Uncontrolled Annual Emissions = Annual Throughput / 1000 x Emission Factor / 2000 lb/T

Estimated HAP Composition (% by Weight)**

Pollutant	Wt%	Uncontrolled Emissions	
		(lb/hr)	(tpy)
Benzene	0.920%	0.49	0.02
Toluene	0.249%	0.13	0.005
n-Hexane	1.380%	0.72	0.02
Total HAPs	2.558%	1.34	0.05

** Estimated HAP Composition based on Promax.

**ATTACHMENT N
TABLE 16**

**POTENTIAL EMISSIONS SUMMARY
PRODUCED WATER TRUCK LOADING (21E)
HOYT 403
ASCENT RESOURCES – MARCELLUS, LLC**

Material Name	Constituent	Saturation Factor ¹ (S)	True Vapor Pressure (P)	MW of Vapors (M) (lb/lb-mole)	Temp of Loaded Liquid (°F)	Emission Factor ¹ (lb VOC/10 ³ gal)	Maximum		Uncontrolled VOC Emissions	
							Hourly Throughput ² (gals)	Annual Throughput ³ (gals)	Hourly Emissions ⁴ (lb/hr)	Annual Emissions ⁵ (T/yr)
Condensate ⁶	VOC	0.6	6.98	65.00	57.22	6.559	8,000	2,161,530	0.52	0.07

Notes:

1. Per AP-42, 5th Edition (6/08), Section 5.2, Equation 1

$$Emission\ Factor\ \left(\frac{lb\ VOC}{10^3\ gal}\right) = \left(\frac{S \times P \times M}{P + 460}\right) \times 12.46$$

- Maximum hourly throughput is the amount of produced water loaded out from the storage tank(s).
- Annual Throughput is the amount of produced water loaded out from the storage tank(s).
- Uncontrolled Hourly Emissions = Hourly Throughput / 1000 x Emission Factor
- Uncontrolled Annual Emissions = Annual Throughput / 1000 x Emission Factor / 2000 lb/T
- Loading emissions for produced water were calculated using condensate, assuming 1% is emitted.

Estimated HAP Composition (% by Weight)**

Pollutant	Uncontrolled Emissions	
	Wt%	(lb/hr)
Benzene	0.929%	0.005
Toluene	0.249%	0.001
n-Hexane	1.380%	0.01
Total HAPs	2.558%	0.01

** Estimated HAP Composition based on Promax.

**ATTACHMENT N
TABLE 17**

**POTENTIAL EMISSIONS SUMMARY
PROCESS PIPING FUGITIVES (23E)
HOYT 403
ASCENT RESOURCES - MARCELLUS, LLC**

Component Type	Type of Service ¹	Number of Components ¹	Emission Factors (lb/hr-component) ²	Percent VOC ³	Potential VOC Emission Rates ⁴	
					(lb/hr)	(T/yr)
Valves	Gas/Vapor	200	0.00992	13.25%	0.26	1.15
Flanges	Gas/Vapor	700	0.00086	13.25%	0.08	0.35
Relief Valves	Gas/Vapor	20	0.0194	13.25%	0.05	0.23
Connectors	Gas/Vapor	800	0.00044	13.25%	0.05	0.20
Valves	Light Liquid	200	0.0055	100.00%	1.10	4.82
Flanges	Light Liquid	25	0.000243	100.00%	0.01	0.03
Relief Valves	Light Liquid	15	0.0165	100.00%	0.25	1.08
Connectors	Light Liquid	500	0.000463	100.00%	0.23	1.01
Totals:	---	2,460	---	---	2.03	8.87

Notes:

1. Number of each component and type of service estimated based on a similar station.
2. Emission factors based on EPA's natural gas processing factors for process piping fugitive emissions.
3. Percent VOC for Gas/Vapor service based on gas analysis from the Facility (refer to Table 18).
4. Emission rates based on 8,760 hours of operation per year.

Estimated HAP Composition (% by Weight)**

Pollutant	Wt% ¹	Total Fugitive HAP	
		Uncontrolled Emissions (lb/hr)	(T/yr)
Benzene	0.029%	0.001	0.003
Toluene	0.029%	0.001	0.003
Ethylbenzene	0.0017%	0.00003	0.0001
Xylenes	0.009%	0.0002	0.001
n-Hexane	0.142%	0.003	0.01
Total HAPs	0.211%	0.004	0.02
Total VOCs	13.247%	2.03	8.87

Based on Gas Analyses. An extended analysis was unavailable, therefore, GRI GlyCalc factors for production were used to estimate C6+ breakout

**ATTACHMENT N
TABLE 18**

**GAS ANALYSIS
HOYT 403
ASCENT RESOURCES – MARCELLUS, LLC**

Component ¹	Molecular Weight	Mol % ²	Molar Weight ³	Average Mass % ⁴
Carbon Monoxide	28.01	0.000%	0.000	0.000%
Hydrogen Sulfide	34.08	0.000%	0.000	0.000%
Oxygen	16.04	0.000%	0.000	0.000%
Helium	4	0.000%	0.000	0.000%
Nitrogen	28.02	0.406%	0.114	0.580%
Carbon Dioxide	44.01	0.125%	0.055	0.280%
Methane	16.04	82.397%	13.217	67.457%
Ethane	30.07	12.013%	3.612	18.437%
Propane	44.09	3.307%	1.458	7.442%
i-Butane	58.12	0.427%	0.248	1.266%
n-Butane	58.12	0.748%	0.435	2.219%
i-Pentane	72.15	0.189%	0.137	0.697%
n-Pentane	72.15	0.170%	0.122	0.624%
Other Hexanes	86.17	0.140%	0.121	0.615%
n-Hexane	86.17	0.032%	0.028	0.142%
Heptanes	100.2	0.015%	0.015	0.077%
2,2,4-Trimethylpentane	114.23	0.006%	0.007	0.034%
Benzene	78.11	0.007%	0.006	0.029%
Toluene	92.14	0.006%	0.006	0.029%
Octanes +	114.23	0.011%	0.012	0.061%
e-Benzene	106.17	0.000%	0.000	0.002%
Xylenes	106.17	0.002%	0.002	0.009%
Totals:		100.00%	19.59	100.00%
⁵ VOC Totals:		5.06%	2.60	13.25%

Notes:

1. Typical components listed in gas analysis for field gas.
2. Mol % values obtained from the gas analysis from the Facility.
3. Molar weight = Molecular weight x Mol % /100.
4. Average mass % = Molar weight / Total molar weight.
5. VOC Totals include the following components (C3+):

Propane	n-Hexane
i-Butane	Heptanes
n-Butane	Benzene
i-Pentane	Toluene
n-Pentane	Octanes
Hexanes	e-Benzene
	Xylenes

Invoice

R. L. LAUGHLIN & COMPANY, INC.
5012 W. Washington Street
Charleston, WV 25313
(304) 778-7740

Customer Number: 0071700
Invoice Number: 1502348-IN
Invoice Date: 2/20/2015
Terms: Net 30 Days
Customer P.O.:

RECEIVED
MAR 13 2015

To: American Energy Utica
P. O. Box 13678
Oklahoma City, OK 73113

Et:

Finance Charge is 1.5% per month / Annual rate of 18%.

Item Code	Description	UM	Quantity	Price	Amount
	FEBRUARY 6, 2015				
	403 1H				
	403 2H				
	403 3H				
	403 4H				
	403 5H				
	403 6H				
717-GA	GAS ANALYSIS		6.00	55.00	330.00

Net Invoice:	330.00
Freight:	0.00
Sales Tax:	0.00
Total Amount Due:	330.00

R.L. Laughlin®

Natural Gas Consultants Since 1970

Website www.rllco.com
 Phone 304-776-7740
 Email CustomerService@rllco.com

Client: 71700
 MID: 4031H
 Customer: AMERICAN ENERGY Test Pressure: 535
 Taken By: JF Collection Date: 2-2-15
 Location: 403 1H

Results Date/Time 02/06/2015 11:38
 Stream Number 4
 Manifold Temp 145.879 (deg F)
 Oven Temp 140.016 (deg F)
 Calculation Type AGA-8
 Stream Application Rev 2103507-008
 Metrology Control Number 2103313-001
 Flash Software Part Number 2102411-033
 Contract Pressure 14.730 (psia)
 Contract Temp 60.000 (deg F)
 Carrier Pressure(1) 29.000 (psig)
 Carrier Pressure(2) 14.600 (psig)
 Sample Pressure 14.802 (psig)

Comp Factor	Response	UnNorm%	Norm%	P Area	P Height (USgal/MCF)	P Time (Btu/SCF)	Liquids	Ideal	Rel. Den.
Propane	2.2551	3.1584	3.1776	12742383	134744	50.10	0.8779	79.953	0.0484
Hydrogen Sulfide	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
IsoButane	1.8250	0.3848	0.3872	1787486	15856	72.13	0.1271	12.591	0.0078
Butane	7.8552	0.6535	0.6575	3079015	24598	80.72	0.2079	21.449	0.0132
NeoPentane	0.3300	0.0071	0.0071	37718	246	104.88	0.0026	0.286	0.0002
IsoPentane	0.3044	0.1698	0.1708	919305	4705	138.48	0.0626	6.834	0.0043
Pentane	1.5045	0.1468	0.1477	780137	3812	161.23	0.0537	5.920	0.0037
Hexane+	0.1390	0.2047	0.2059	1787266	19029	20.40	0.0000	0.000	0.0000
Nitrogen	3.5828	0.3821	0.3844	1192372	13430	42.53	0.0424	0.000	0.0037
Methane	1.0077	82.1821	82.6829	196893614	727864	53.03	14.0569	835.097	0.4580
CarbonDioxide	0.9961	0.1229	0.1236	458588	1960	95.78	0.0212	0.000	0.0019
Ethane	0.8097	11.9821	12.0551	49061096	91691	214.28	3.2331	213.340	0.1252
Hexane	0.0000	0.0000	0.2059	0	0	0.00	0.0849	9.793	0.0061
Heptane+	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Heptane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Octane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Nonane+	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Nonane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Decane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Undecane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Dodecane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Ethane-	0.0000	0.0000	0.0000	138531578	1443522	33.10	0.0000	0.000	0.0000
Propane +	0.0000	0.0000	0.0000	25817189	201389	23.63	0.0000	0.000	0.0000
Oxygen	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Total		99.3943	100.00				18.7703	1185.264	0.6741

Inferior Wobbe	1427.0624 (Btu/SCF)	Superior Wobbe	1451.3685 (Btu/SCF)
Compressibility	0.9969	Density	0.0516 (lbm/ft3)
Real Rel Density	0.6741	Ideal CV	1185.2637 (Btu/SCF)
Inferior CV	1170.9707 (Btu/SCF)	Superior CV	1191.6681 (Btu/SCF)

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Client: 71700
 MID: 4032H
 Customer: AMERICAN ENERGY Test Pressure: 530
 Taken By: JF Collection Date: 2-2-15
 Location: 403 2H

Results Date/Time 02/06/2015 09:55
 Stream Number 4
 Manifold Temp 145.881 (deg F)
 Oven Temp 140.016 (deg F)
 Calculation Type AGA-8
 Stream Application Rev 2103507-008
 Metrology Control Number 2103313-001
 Flash Software Part Number 2102411-033
 Contract Pressure 14.730 (psia)
 Contract Temp 60.000 (deg F)
 Carrier Pressure(1) 29.000 (psig)
 Carrier Pressure(2) 14.600 (psig)
 Sample Pressure 15.104 (psig)

Comp Factor	Response	UnNorm%	Norm%	P Area	P Height (USgal/MCF)	P Time (Btu/SCF)	Liquids	Ideal	Rel. Den.
Propane	2.2551	3.2690	3.2886	13181922	139356	50.10	0.9086	82.745	0.0501
Hydrogen Sulfide	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
IsoButane	1.8250	0.4316	0.4342	2004187	17795	72.13	0.1425	14.119	0.0087
Butane	7.8552	0.7916	0.7964	3720393	29670	80.72	0.2518	25.980	0.0160
NeoPentane	0.3300	0.0088	0.0088	46677	302	104.93	0.0032	0.354	0.0002
IsoPentane	0.3044	0.1996	0.2008	1080735	5531	138.50	0.0736	8.034	0.0050
Pentane	1.5045	0.1709	0.1719	908206	4407	161.25	0.0625	6.892	0.0043
Hexane+	0.1390	0.2004	0.2016	1749621	18734	20.43	0.0000	0.000	0.0000
Nitrogen	3.5828	0.3979	0.4003	1240033	13929	42.55	0.0442	0.000	0.0039
Methane	1.0077	82.1296	82.6231	196779462	728218	53.03	14.0472	834.493	0.4577
CarbonDioxide	0.9961	0.1180	0.1187	440596	1886	95.78	0.0203	0.000	0.0018
Ethane	0.8097	11.6854	11.7556	47868868	89778	214.50	3.1529	208.039	0.1220
Hexane	0.0000	0.0000	0.2016	0	0	0.00	0.0831	9.586	0.0060
Heptane+	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Heptane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Octane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Nonane+	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Nonane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Decane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Undecane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Dodecane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Ethane-	0.0000	0.0000	0.0000	138516491	1443077	33.10	0.0000	0.000	0.0000
Propane +	0.0000	0.0000	0.0000	27804586	213200	23.63	0.0000	0.000	0.0000
Oxygen	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Total		99.4027	100.00				18.7899	1190.243	0.6775

Inferior Wobbe	1429.6102 (Btu/SCF)	Superior Wobbe	1453.9016 (Btu/SCF)
Compressibility	0.9969	Density	0.0518 (lbm/ft3)
Real Rel Density	0.6775	Ideal CV	1190.2429 (Btu/SCF)
Inferior CV	1175.9272 (Btu/SCF)	Superior CV	1196.7113 (Btu/SCF)

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Client: 71700
 MID: 4033H
 Customer: AMERICAN ENERGY Test Pressure: 530
 Taken By: JF Collection Date: 2-2-15
 Location: 403 3H

Results Date/Time 02/06/2015 10:13
 Stream Number 4
 Manifold Temp 145.879 (deg F)
 Oven Temp 140.016 (deg F)
 Calculation Type AGA-8
 Stream Application Rev 2103507-008
 Metrology Control Number 2103313-001
 Flash Software Part Number 2102411-033
 Contract Pressure 14.730 (psia)
 Contract Temp 60.000 (deg F)
 Carrier Pressure(1) 29.000 (psig)
 Carrier Pressure(2) 14.600 (psig)
 Sample Pressure 15.047 (psig)

Comp Factor	Response	UnNorm%	Norm%	P Area	P Height (USgal/MCF)	P Time (Btu/SCF)	Liquids	Ideal	Rel. Den.
Propane	2.2551	3.6218	3.6419	14581595	153643	50.05	1.0063	91.634	0.0554
Hydrogen sulfide	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
IsoButane	1.8250	0.4863	0.4890	2257744	20051	72.10	0.1605	15.902	0.0098
Butane	7.8552	0.8545	0.8592	4011195	31994	80.70	0.2717	28.030	0.0172
NeoPentane	0.3300	0.0095	0.0096	50659	326	104.97	0.0035	0.384	0.0002
IsoPentane	0.3044	0.2153	0.2165	1165955	5964	138.48	0.0794	8.664	0.0054
Pentane	1.5045	0.1819	0.1829	966375	4650	161.23	0.0665	7.331	0.0046
Hexane+	0.1390	0.1944	0.1955	1697695	18439	20.43	0.0000	0.000	0.0000
Nitrogen	3.5828	0.3735	0.3756	1166268	13127	42.53	0.0414	0.000	0.0036
Methane	1.0077	81.0535	81.5030	194439170	723079	53.08	13.8580	823.180	0.4514
CarbonDioxide	0.9961	0.1069	0.1075	399313	1711	95.75	0.0184	0.000	0.0016
Ethane	0.8097	12.3509	12.4194	50541289	94113	214.03	3.3312	219.786	0.1289
Hexane	0.0000	0.0000	0.1955	0	0	0.00	0.0806	9.297	0.0058
Heptane+	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Heptane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Octane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Nonane+	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Nonane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Decane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Undecane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Dodecane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Ethane-	0.0000	0.0000	0.0000	136788466	1434487	33.10	0.0000	0.000	0.0000
Propane +	0.0000	0.0000	0.0000	30330862	233366	23.63	0.0000	0.000	0.0000
Oxygen	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Total		99.4485	100.00				18.9176	1204.207	0.6861

Inferior wobble 1437.5604 (Btu/SCF) Superior wobble 1461.8407 (Btu/SCF)
 Compressibility 0.9968 Density 0.0525 (lbm/ft3)
 Real Rel Density 0.6861 Ideal CV 1204.2073 (Btu/SCF)
 Inferior CV 1189.8348 (Btu/SCF) Superior CV 1210.8646 (Btu/SCF)

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Client: 71700
 MID: 4034H
 Customer: AMERICAN ENERGY Test Pressure: 530
 Taken By: JF Collection Date: 2-2-15
 Location: 403 4H

Results Date/Time 02/06/2015 10:44
 Stream Number 4
 Manifold Temp 145.879 (deg F)
 Oven Temp 140.016 (deg F)
 Calculation Type AGA-8
 Stream Application Rev 2103507-008
 Metrology Control Number 2103313-001
 Flash Software Part Number 2102411-033
 Contract Pressure 14.730 (psia)
 Contract Temp 60.000 (deg F)
 Carrier Pressure(1) 29.000 (psig)
 Carrier Pressure(2) 14.600 (psig)
 Sample Pressure 15.239 (psig)

Comp Factor	Response	UnNorm%	Norm%	P Area	P Height (USgal/MCF)	P Time (Btu/SCF)	Liquids	Ideal	Rel. Den.
Propane	2.2551	3.6011	3.6197	14499721	152692	50.05	1.0002	91.076	0.0551
Hydrogen sulfide	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Isobutane	1.8250	0.4592	0.4616	2132362	18923	72.10	0.1515	15.011	0.0093
Butane	7.8552	0.7554	0.7593	3552639	28370	80.72	0.2401	24.772	0.0152
NeoPentane	0.3300	0.0081	0.0082	43267	280	104.85	0.0030	0.327	0.0002
IsoPentane	0.3044	0.1766	0.1776	956453	4894	138.48	0.0651	7.104	0.0044
Pentane	1.5045	0.1392	0.1399	739868	3627	161.20	0.0509	5.609	0.0035
Hexane+	0.1390	0.1717	0.1726	1499616	15911	20.40	0.0000	0.000	0.0000
Nitrogen	3.5828	0.3702	0.3721	1156172	12992	42.53	0.0411	0.000	0.0036
Methane	1.0077	80.8236	81.2405	193938313	721383	53.10	13.8132	820.529	0.4500
CarbonDioxide	0.9961	0.1022	0.1027	381960	1638	95.75	0.0176	0.000	0.0016
Ethane	0.8097	12.8793	12.9457	52659104	97452	213.75	3.4723	229.101	0.1344
Hexane	0.0000	0.0000	0.1726	0	0	0.00	0.0712	8.209	0.0051
Heptane+	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Heptane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Octane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Nonane+	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Nonane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Decane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Undecane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Dodecane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Ethane-	0.0000	0.0000	0.0000	136271611	1432785	33.10	0.0000	0.000	0.0000
Propane +	0.0000	0.0000	0.0000	28823047	226695	23.63	0.0000	0.000	0.0000
Oxygen	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Total		99.4867	100.00				18.9261	1201.739	0.6843

Inferior Wobbe 1436.4047 (Btu/SCF) Superior Wobbe 1460.6956 (Btu/SCF)
 Compressibility 0.9968 Density 0.0524 (lbm/ft3)
 Real Rel Density 0.6843 Ideal CV 1201.7389 (Btu/SCF)
 Inferior CV 1187.3771 (Btu/SCF) Superior CV 1208.3643 (Btu/SCF)

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Client: 71700
 MID: 4035H
 Customer: AMERICAN ENERGY Test Pressure: 530
 Taken By: JF Collection Date: 2-2-15
 Location: 403 5H

Results Date/Time 02/06/2015 11:18
 Stream Number 4
 Manifold Temp 145.878 (deg F)
 Oven Temp 140.016 (deg F)
 Calculation Type AGA-8
 Stream Application Rev 2103507-008
 Metrology Control Number 2103313-001
 Flash Software Part Number 2102411-033
 Contract Pressure 14.730 (psia)
 Contract Temp 60.000 (deg F)
 Carrier Pressure(1) 29.000 (psig)
 Carrier Pressure(2) 14.600 (psig)
 Sample Pressure 14.926 (psig)

Comp Factor	Response	UnNorm%	Norm%	P Area	P Height (USgal/MCF)	P Time (Btu/SCF)	Liquids	Ideal	Rel. Den.
Propane	2.2551	3.3458	3.3673	13486901	142435	50.08	0.9304	84.726	0.0513
Hydrogen sulfide	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
IsoButane	1.8250	0.4616	0.4646	2143191	19027	72.10	0.1525	15.107	0.0093
Butane	7.8552	0.7840	0.7891	3685190	29392	80.70	0.2495	25.742	0.0158
NeoPentane	0.3300	0.0097	0.0097	51390	334	104.83	0.0036	0.389	0.0002
IsoPentane	0.3044	0.2213	0.2227	1198264	6127	138.48	0.0817	8.912	0.0055
Pentane	1.5045	0.1821	0.1833	967860	4680	161.23	0.0666	7.349	0.0046
Hexane+	0.1390	0.2298	0.2313	2006708	21892	20.43	0.0000	0.000	0.0000
Nitrogen	3.5828	0.3749	0.3773	1170533	13170	42.55	0.0416	0.000	0.0036
Methane	1.0077	81.6924	82.2195	195829221	725917	53.05	13.9791	830.417	0.4554
CarbonDioxide	0.9961	0.1233	0.1241	460018	1968	95.75	0.0212	0.000	0.0019
Ethane	0.8097	11.9341	12.0111	48868121	91399	214.30	3.2215	212.560	0.1247
Hexane	0.0000	0.0000	0.2313	0	0	0.00	0.0954	11.000	0.0069
Heptane+	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Heptane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Octane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Nonane+	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Nonane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Decane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Undecane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Dodecane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Ethane-	0.0000	0.0000	0.0000	137782246	1438635	33.08	0.0000	0.000	0.0000
Propane +	0.0000	0.0000	0.0000	28720222	218615	23.63	0.0000	0.000	0.0000
Oxygen	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Total		99.3589	100.00				18.8431	1196.202	0.6812
Inferior Wobbe	1432.9677 (Btu/SCF)			Superior Wobbe	1457.2531 (Btu/SCF)				
Compressibility	0.9969			Density	0.0521 (lbm/ft3)				
Real Rel density	0.6812			Ideal CV	1196.2015 (Btu/SCF)				
Inferior CV	1181.8625 (Btu/SCF)			Superior CV	1202.7517 (Btu/SCF)				

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 Email CustomerService@rilco.com

Client: 71700
 MID: 4036H
 Customer: AMERICAN ENERGY Test Pressure: 530
 Taken By: JF Collection Date: 2-2-15
 Location: 403 6H

Results Date/Time 02/06/2015 11:29
 Stream Number 4
 Manifold Temp 145.879 (deg F)
 Oven Temp 140.016 (deg F)
 Calculation Type AGA-8
 Stream Application Rev 2103507-008
 Metrology Control Number 2103313-001
 Flash Software Part Number 2102411-033
 Contract Pressure 14.730 (psia)
 Contract Temp 60.000 (deg F)
 Carrier Pressure(1) 29.000 (psig)
 Carrier Pressure(2) 14.600 (psig)
 Sample Pressure 14.849 (psig)

Comp Factor	Response	UnNorm%	Norm%	P Area	P Height (USgal/MCF)	P Time (Btu/SCF)	Liquids	Ideal	Rel. Den.
Propane	2.2551	3.2132	3.2348	12960412	137156	50.10	0.8937	81.392	0.0493
Hydrogen sulfide	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
IsoButane	1.8250	0.4379	0.4408	2033346	18050	72.10	0.1447	14.335	0.0088
Butane	7.8552	0.7162	0.7210	3370567	26935	80.72	0.2280	23.522	0.0145
NeoPentane	0.3300	0.0088	0.0089	47028	305	104.97	0.0033	0.356	0.0002
IsoPentane	0.3044	0.1959	0.1972	1060496	5428	138.50	0.0723	7.889	0.0049
Pentane	1.5045	0.1558	0.1569	827993	4052	161.23	0.0570	6.288	0.0039
Hexane+	0.1390	0.2230	0.2245	1947655	20858	20.40	0.0000	0.000	0.0000
Nitrogen	3.5828	0.3654	0.3678	1141645	12873	42.53	0.0406	0.000	0.0036
Methane	1.0077	82.1186	82.6704	196755516	727340	53.00	14.0551	834.971	0.4579
CarbonDioxide	0.9961	0.1176	0.1184	439038	1878	95.75	0.0203	0.000	0.0018
Ethane	0.8097	11.7801	11.8592	48249284	90372	214.32	3.1806	209.873	0.1231
Hexane	0.0000	0.0000	0.2245	0	0	0.00	0.0926	10.679	0.0067
Heptane+	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Heptane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Octane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Nonane+	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Nonane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Decane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Undecane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Dodecane	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Ethane-	0.0000	0.0000	0.0000	138422926	1443278	33.10	0.0000	0.000	0.0000
Propane +	0.0000	0.0000	0.0000	27108815	208282	23.63	0.0000	0.000	0.0000
Oxygen	0.0000	0.0000	0.0000	0	0	0.00	0.0000	0.000	0.0000
Total		99.3324	100.00				18.7882	1189.304	0.6765

Inferior wobble	1429.4778 (Btu/SCF)	Superior wobble	1453.7839 (Btu/SCF)
Compressibility	0.9969	Density	0.0518 (lbm/ft3)
Real Rel Density	0.6765	Ideal CV	1189.3044 (Btu/SCF)
Inferior cv	1174.9924 (Btu/SCF)	Superior cv	1195.7606 (Btu/SCF)

ATTACHMENT N
TABLE 19

POTENTIAL EMISSIONS SUMMARY
UNPAVED ROADS (22E)
HOYT 403
ASCENT RESOURCES – MARCELLUS, LLC

Name	Vehicle Miles Traveled ¹		Emission Factor ²		PM Emissions ⁴			
	(VMT/hr)	(VMT/yr)	PM ₁₀ (lb/VMT)	PM _{2.5} (lb/VMT)	PM ₁₀ (lb/hr)	PM _{2.5} (lb/hr)	PM ₁₀ (T/yr)	PM _{2.5} (T/yr)
Unpaved Roads	0.17	1,480.0	0.15	4.33	0.01	0.05	0.48	0.37
		Total			0.01	0.05	0.48	0.37

Notes:
1. Facility vehicle data based on estimates, GPS, and AP-42 Section 13.2.2 (11/06) defaults for industrial unpaved roads.

Light Vehicles (Passenger Trucks and Cars)	Heavy Trucks (Trailer Trucks)
2.5	23.7
4	18
1.0	1.0
2	2
365	365
730.0	730.0

Average vehicle weight (tons):
Number of wheels per vehicle type:
Average number of round trips/day:
Distance per round trip (miles/trip):
Number of days operational (days/yr):
Vehicle miles travelled VMT (miles/yr):
Vehicle miles traveled was calculated with the following equation:

$$VMT = \sum_{\text{vehicle type}} \left(\frac{\text{avg. number of round trips}}{\text{day}} \times \frac{\text{vehicle miles traveled}}{\text{round trip}} \times \frac{\text{days of operation}}{\text{year}} \right)$$

2. Emission factor obtained from AP-42 Section 13.2.2 Table 13.2.2-1 (11/06), formula (1a) and formula (2).

$$E_{\text{ext}} = E \left[\frac{(365 - P)}{365} \right]$$

$$E = k \left(\frac{s}{12} \right)^a \left(\frac{W}{Z} \right)^b \quad (\text{lb/VMT})$$

where:

- E_{ext} = annual size-specific emission factor extrapolated for natural mitigation (lb/VMT)
- E = emission factor (lb/VMT)
- P = number of days in a year with at least 0.01 in of precipitation
- s = surface material silt content (%)
- W = mean vehicle weight (tons)
- k, a, b = empirical constants

P (days/year):	150
a (%):	1.0
W (tons):	13.10

$$\text{where: } W_{\text{avg}} = \left(\frac{W_{\text{empty}} + W_{\text{loaded}}}{2} \right)$$

Constants	PM-10	PM-2.5 (TSF)
k:	1.5	4.9
a:	0.9	0.7
b:	0.45	0.45

3. Natural control efficiency based on moisture ratio and AP-42 Section 13.2.2 Figure 13.2.2-2 (11/06). Controlled emissions are based on the natural rainfall cycles and no plant control.

Moisture Ratio: 2
Natural Control Efficiency (%): 55
Estimated based on 0.4% controlled and 0.2% uncontrolled surface water content

4. Potential emissions based on AP-42 Section 13.2.2 Table 13.2.2-1 (11/06) emission factors and the listed control efficiency.

$$\text{Total Annual Emissions (T/yr)} = \left(\frac{VMT}{\text{yr}} \times \frac{\text{Emission Factor}}{2000} \right) \times (1 - \text{Control Efficiency})$$

Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans

Monitoring/Recordkeeping/Reporting/Testing Plans

Ascent will monitor, record, report, and test as required by 45CSR6 and 45CSR13.

Attachment P: Public Notice

AIR QUALITY PERMIT NOTICE Notice of Application

Notice is given that Ascent Resources – Marcellus, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Construction Permit for the Hoyt 403 facility located near Wileyville, in Wetzel County, West Virginia. The latitude and longitude coordinates are: 39.593244°N, 80.6577583°W

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be:

NO_x = 5.22 TPY
CO = 7.17 TPY
VOC = 12.92 TPY
PM₁₀ = 2.04 TPY
SO₂ = <0.01 TPY
HAPs = 0.18 TPY

Startup of operation is planned to begin on or about the 31st day of August, 2016. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.

Dated this the 31st day of August, 2016.

By: Ascent Resources – Marcellus, LLC
Tim Cummings
VP - Operations
PO Box 13678
Oklahoma City, OK 73113

Attachment Q: Business Confidential Claims (Not Applicable)

Attachment R: Authority Forms (Not Applicable)

Attachment S: Title V Permit Revision Information (Not Applicable)

Application Fee