Noble Energy, Inc.

R-13 Permit Application

Moundsville 6 (MND 6) Natural Gas Production Site

Marshall County, West Virginia

Prepared By:

ENVIRONMENTAL RESOURCES MANAGEMENT, Inc.
Hurricane, West Virginia

February 2017

1000 Noble Energy Drive
Canonsburg, PA 15317
Tel: 724-820-3000
Fax: 724-820-3098
www.nobleenergyinc.com

February 27, 2017

Ms. Beverly McKeone
NSR Permitting Program Manager
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

RE: Noble Energy, Inc.
Moundsville 6 (MND 6) Natural Gas Production Site
45CSR13 NSR Permit Application
Marshall County, West Virginia

Dear Ms. McKeone:

Noble Energy, Inc respectfully submits the enclosed copies of a 45CSR13 NSR Permit Application for construction for the Moundsville 6 (MND 6) natural gas production facility. We look forward to working towards a timely review and issuance of the construction permit.

The intention of this submittal is to permit the construction of eight (8) production wellheads and associated well equipment at the MND 6 pad.

Please note that the newspaper notification will be published and the original affidavit remitted to the Department. Enclosed are one (1) original hard copy and two (2) complete PDFs included on CD-ROM of the 45CSR13 NSR Permit Registration Application for the MND 6 natural gas production site.

Should you have any questions or require further information the application package, please do not hesitate to contact me at Phil.Schlagel@nblenergy.com or 724-820-3000.

We thank you in advance for your efforts in reviewing this submittal.

Sincerely,

Phil Schlagel
Noble Energy, Inc

Enclosures:

1.0 INTRODUCTION NARRATIVE

Noble Energy Inc. (Noble) submits this Rule 13 permit application to the West Virginia Department of Environmental Protection Division of Air Quality (WVDAQ) for the Moundsville 6 (MND 6) natural gas production site located in Marshal County, West Virginia. This application addresses the operational activities associated with the production of natural gas, condensate, and produced water at the MND 6 pad.

On December 16, 2016 WVDAQ issued a Permit Applicability Determination to Noble for the operations of the MND 6 Pad. The evaluation concluded that a permit would not be required for the operation of the following equipment:

- One (1) Natural Gas Well;
- Two (2) Gas Production Units/Heaters each rated at 4.00 MMBtu/hr heat input;
- Two (2) 400 barrel (bbl) Produced Water Tanks; and
- Produced Water Truck Loadout;

With the submittal of this permit application, Noble seeks the construction authority to further develop the pad. Based upon the flare sizing required for the MND 6 facility, Noble seeks the authority to improve the facility under a Rule 13 permit to include the following equipment:

- Eight (8) Natural Gas Wells;
- Seven (7) Gas Production Units/Heaters each rated at 2.00 MMBtu/hr heat input;
- Two (2) Gas Production Units/Heaters each rated at 4.00 MMBtu/hr heat input;
- Four (4) 400 bbl Produced Water Tanks;
- Produced Water Truck Loadout;
- One (1) Vapor Combustor rated at 10.8 MMBtu/hr;
- One (1) Well Unloading Flare rated at 78.0 MMBtu/hr;
- One (1) Fuel Cell for electrical generation rated at 2,156 Btu/hr;
- One (1) Well Unloading pneumatic pump; and
- Other pneumatic and fugitive components detailed with this application.

Statement of aggregation

The MND 6 pad is located in Marshal County, WV and operated by Noble. Stationary sources of air pollutants may require aggregation of total emission levels if these sources share the same industrial grouping, are operating under common control, and are classified as contiguous or adjacent properties. Noble operates the MND 6 pad with the same industrial grouping as nearby facilities, and some of these facilities are under common control. However, the MND 6 pad is not subject to the aggregation of stationary emission sources because these sites do not meet the definition of contiguous or adjacent facilities.

The MND 6 pad operates under SIC code 1311 (Crude Petroleum and Natural Gas Extraction). There are surrounding wells operated by Noble that share the same two-digit major SIC code of 13 for Crude Petroleum and Natural Gas Extraction. Therefore, the MND 6 pad does share the same SIC codes as the surrounding wells.

Noble is the sole operator of the MND 6 pad. Noble is also the sole operator of other production sites and compressor stations in the area. Therefore, Noble does qualify as having nearby operations under common control.

On August 18, 2016 the EPA Administrator signed the *Source Determination for Certain Emission Units in the Oil and Natural Gas Sector*. This notice clarified EPA's position regarding how properties in the oil and natural gas sector are determined to be adjacent in order to assist permitting authorities and permit applicants in making consistent source determinations. The following proposed regulatory text defines "adjacent" for the oil and gas sector in terms of proximity.

> *Pollutant emitting activities shall be considered adjacent if they are located on the same surface site, or on surface sites that are located within ¼ mile of one another.*

There are no Noble owned or operated sites with a ¼ mile radius of the MND 6 pad. Nearby sites do not meet the definition of contiguous or adjacent properties since they are not in contact and do not share a common boundary. The operations conducted at the MND 6 site do not rely on or interact with other sites. Furthermore, operations separated by this distance do not meet the common sense notion of a "plant."

Based on the above reasoning, Noble is not subject to the aggregation of stationary emission sources since the stationary sources are not considered contiguous or adjacent facilities.

2.0 REGULATORY DISCUSSION

This section outlines the State air quality regulations that could be reasonably expected to apply to the MND 6 pad and makes an applicability determination for each regulation based on activities conducted at the site and the emissions of regulated air pollutants.

West Virginia State Air Regulations

45 CSR 02 – To Prevent and Control Particulate Air Pollution From Combustion of Fuel in Indirect Heat Exchangers

The line heaters associated with gas production units are indirect heat exchangers that combust natural gas but are exempt from this regulation since the heat input capacities are less than 10 MMBtu/hr.

45 CSR 04 – To Prevent and Control the Discharge of Air Pollutants into the Air Which Causes or Contributes to an Objectionable Odor

Operations conducted at the MND 6 wellpad are subject to this requirement. Based on the nature of the process at the wellpad, the presence of objectionable odors is unlikely.

45 CSR 06 – Control of Air Pollution from the Combustion of Refuse

The vapor combustor and well unloading flare will be subject to this Rule. Per 45 CSR 6-4.3, opacity of emissions from the enclosed combustion device shall not exceed 20 percent, except as provided by 4.4. Particulate matter emissions from this unit will not exceed the levels calculated in accordance with 6-4.4.

§45-6-4.4 Determination for Maximum Allowable Particulate Emissions

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

Vapor Combustor Emissions

Incinerator Capacity = 0.13 tons/hour or 252 lbs/hr

ρNG = 0.042 lb/scf – Density of NG from EPA AP42 – Sections 1.4 and 3.2 (NG combustion)

$$\frac{144{,}000\ scf}{day} * \frac{1\ day}{24\ hours} * \frac{0.042\ lb}{scf} = \frac{252\ lb}{hr} = \frac{0.13\ tons}{hr}$$

If the Incinerator Capacity is less than 15,000 lbs/hr, then F = 5.43

F = 5.43 * (0.13 tons per hour)

F = 0.71 lbs/hr

Well Unloading Flare Emissions

Incinerator Capacity = 0.92 tons/hour or 1837.5 lbs/hr

ρNG = 0.042 lb/scf – Density of NG from EPA AP42 – Sections 1.4 and 3.2 (NG combustion)

$$\frac{1{,}050{,}000\ scf}{day} * \frac{1\ day}{24\ hours} * \frac{0.042\ lb}{scf} = \frac{1837.5\ lb}{hr} = \frac{0.92\ tons}{hr}$$

If the Incinerator Capacity is less than 15,000 lbs/hr, then F = 5.43

F = 5.43 * (0.92 tons per hour)

F = 4.99 lbs/hr

The enclosed combustion devices utilize AP-42 Section 1.4 PM emission factors to determine emissions from the combustion of refuse natural gas. Based upon the type of fuel combusted and the emission factors utilized, the PM emissions from the enclosed combustion devices will be well below the maximum allowable particulate emissions mandated by 45 CSR 06.

45 CSR 10 – To Prevent and Control Air Pollution from the Emission of Sulfur Oxides

The line heaters are indirect heat exchangers that combust natural gas but are exempt from this regulation since the heat input capacities are less than 10 MMBtu/hr.

45 CSR 13 – Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants

This R13 permit application is submitted for the operational activities associated with Noble's production of natural gas.

45 CSR 14 – Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration

Federal construction permitting programs regulate new and modified sources of attainment pollutants under Prevention of Significant Deterioration (PSD). Operation of equipment at the MND 6 pad will not exceed emission thresholds established by this permitting program. Noble will monitor future construction and modification activities at the site closely and will compare any future increase in emissions with the PSD thresholds to ensure these activities will not trigger this program.

45 CSR 16 - Standards of Performance for New Stationary Sources (NSPS)

45 CSR 16 applies to all registrants that are subject to any of the NSPS requirements, which are described in more detail in the Federal Regulations section.

45 CSR 19 – Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contributed to Non-attainment

Federal construction permitting programs regulate new and modified sources of non-attainment pollutants under Non-Attainment New Source Review (NNSR). Marshall County, WV is in full attainment for all nonattainment for the 2010 Sulfur Dioxide standard with a National Ambient Air Quality Standard (NAAQS). The sulfur dioxide

potential to emit for the MND 6 site is 0.08 tpy. Noble will monitor future construction and modification activities at the site that would cause an increase in emissions.

45 CSR 25 – Control of Air Pollution from Hazardous Waste Treatment, Storage, and Disposal Facilities

No hazardous waste will be burned at this well site; therefore, it is not subject to this hazardous waste rule.

45 CSR 30 – Requirements for Operating Permits

45 CSR 30 applies to the requirements of the federal Title V operating permit program (40 CFR 70). The major source thresholds for the Title V operating permit program regulations are 10 tons per year (tpy) of a single hazardous air pollutant (HAP), 25 tpy of any combination of HAPs, or 100 tpy of all other regulated pollutants.

The potential emissions of all regulated pollutants at the proposed facility are below the corresponding major source threshold(s). Therefore, the wellpad will not be a major source under the Title V program.

45 CSR 34 – National Emission Standards for Hazardous Air Pollutants (NESHAP)

45 CSR 34 applies to all registrants that are subject to any of the NESHAP requirements. Additional discussion is provided in the federal discussion of this permit application.

Federal Regulations

New Source Performance Standards

40 CFR 60, Subpart OOOO (Standards of Performance for Crude oil and Natural Gas Production, Transmission and Distribution)

Subpart OOOO establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO_2) emissions from affected facilities that commence construction, modification or reconstruction between August 23, 2011 and September 18, 2015.

Based upon the construction date of MND 6, Noble is not subject to any of the requirements of NSPS OOOO.

Subpart OOOOa (Standards Of Performance For Crude Oil And Natural Gas Facilities For Which Construction, Modification, Or Reconstruction Commenced After September 18, 2015)

The MND 6 will commence construction after September 18, 2015 and qualifies as an affected facility under this OOOOa. Noble will operate the following affected facilities under the Rule:

- Each gas well affected facility, which is a single natural gas well; and
- Pneumatic pump affected facility.

The MND 6 does not operate equipment that would qualify as an affected facility for the following:

- Storage vessels: Emissions from each storage vessel are expected to be below 6 tons per year (tpy) of VOC. Therefore, the produced water tanks are not affected storage vessels; and
- Pneumatic devices: All pneumatic devices installed at the MND 6 facility are either low-continuous bleed or intermittent bleed and do not qualify as affected sources.
- Fugitive Emissions: The MND pad will be subject to the LDAR requirements of this Rule. Noble will comply by conducting scans by 2017 or 60 days after the start of production, whichever is later.

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

The MND 6 facility does not operate any engines.

No additional NSPS are expected to be applicable to this facility.

National Emissions Standards for Hazardous Air Pollutants

The following NESHAP are not applicable to the MND 6 facility:

- *40 CFR 63 Subpart HH (National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities).*
- *40CFR63 Subpart ZZZZ (National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines)*

No additional NESHAP are expected to be applicable to this facility.

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):*
Noble Energy, Inc.

2. Federal Employer ID No. ***(FEIN):***
73-0785597

3. Name of facility *(if different from above):*
Moundsville 6 (MND 6)

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
1000 Noble Energy Drive
Cannonsburg, PA 15317

5B. Facility's present physical address:
1652 Fish Creek Road
Proctor, WV 26055

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☐ **YES** ☒ **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 *proposed site?* ☒ **YES** ☐ **NO**

- If **YES,** please explain: Noble Energy, Inc. owns and operates the Moundsville 6 production facility.
- 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 Facility

10. North American Industry Classification System **(NAICS)** code for the facility:
211111

11A. DAQ Plant ID No. (for existing facilities only):
051-00232

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
N/A

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

12A.

- For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B**.

From WV Route 2 south, make a left turn onto CR 74 (Fish Creek Road) and travel 1.67 miles to intersection. Make a left and follow lease road to site.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
N/A	Proctor	Marshall
12.E. UTM Northing (KM): 517.8223	12F. UTM Easting (KM): 4407.5363	12G. UTM Zone: 17N

13. Briefly describe the proposed change(s) at the facility:
Addition of 7 well heads, 7 line heaters, a process flare, and a VOC combustor to the site.

14A. Provide the date of anticipated installation or change: 6/25/17 – If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: / /	14B. Date of anticipated Start-Up if a permit is granted: 6/25/17

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
Hours Per Day: 24 Days Per Week: 7 Weeks Per Year: 52

16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**

17**. Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18**. Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known).* A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known).* Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) **.**
– Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**
– Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

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

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**

– For chemical processes, provide a MSDS for each compound emitted to the air.

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:

☐ Bulk Liquid Transfer Operations	☒ Haul Road Emissions	☐ Quarry
☐ Chemical Processes	☐ Hot Mix Asphalt Plant	☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☒ Incinerator	☒ Storage Tanks
☐ Grey Iron and Steel Foundry	☐ Indirect Heat Exchanger	

☒ General Emission Unit, specify Pneumatic Controllers, Fuel Cell Generator, and Line Heaters

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

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

☐ Absorption Systems	☐ Baghouse	☒ Flare
☐ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☐ 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:

☐ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ 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: 2/27/17 *(Please use blue ink)*

35B. Printed name of signee: RJ Moses		35C. Title: Operations Manager
35D. E-mail: rj.moses@nblenergy.com	36E. Phone: 724-820-3000	36F. FAX: 724-820-3098
36A. Printed name of contact person (if different from above): Phil Schlagel		36B. Title: Air Quality Manager
36C. E-mail: phil.schlagel@nblenergy.com	36D. Phone: 281-872-3202	36E. FAX:

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

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

Table of Contents

Attachment A

State of West Virginia

Certificate

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

by the provisions of the West Virginia Code, Articles of Merger were received and filed,

MERGING NOBLE ENERGY MARKETING, INC. , A QUALIFIED DE ORGANIZATION, WITH AND INTO NOBLE ENERGY, INC., A QUALIFIED DE ORGANIZATION.

Therefore, I hereby issue this

CERTIFICATE OF MERGER

Given under my hand and the Great Seal of the State of West Virginia on this day of December 15, 2010

Natalie E Tennant

Secretary of State

State of Delaware
Secretary of State
Division of Corporations
Delivered 06:59 PM 12/17/2009
FILED 06:59 PM 12/17/2009
SRV 091114165 - 0738126 FILE

CERTIFICATE OF MERGER
OF
NOBLE ENERGY MARKETING, INC.
(a Delaware corporation)
WITH AND INTO
NOBLE ENERGY, INC.
(a Delaware corporation)

Pursuant to Title 8, Section 251(c) of the Delaware General Corporation Law, the undersigned corporation hereby certifies the following:

1. The name of the surviving corporation is Noble Energy, Inc., a Delaware corporation, and the name of the corporation being merged into the surviving corporation is Noble Energy Marketing, Inc., a Delaware corporation.

2. The Agreement of Merger has been approved, adopted, certified, executed, and acknowledged by each of the constituent corporations.

3. The name of the surviving corporation is Noble Energy, Inc., a Delaware corporation.

4. The Certificate of Incorporation of Noble Energy, Inc. shall be the Certificate of Incorporation of the surviving corporation.

5. The merger is to become effective at 11:59 p.m. Eastern time on December 31, 2009.

6. A copy of the Agreement of Merger is on file at the place of business of Noble Energy, Inc., which is located at 100 Glenborough Drive, Suite 100, Houston, Texas 77067.

7. Upon request, a copy of the Agreement of Merger will be furnished by Noble Energy, Inc., without cost, to any stockholder of the constituent corporations.

IN WITNESS WHEREOF, the undersigned has caused this Certificate of Merger to be executed by its duly authorized officer as of the 16th day of December, 2009.

NOBLE ENERGY, INC.

By: /s/ David L. Stover
Name: David L. Stover
Title: Vice President

Delaware

The First State

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF MERGER, WHICH MERGES:

"NOBLE ENERGY MARKETING, INC.", A DELAWARE CORPORATION,

WITH AND INTO "NOBLE ENERGY, INC." UNDER THE NAME OF "NOBLE ENERGY, INC.", A CORPORATION ORGANIZED AND EXISTING UNDER THE LAWS OF THE STATE OF DELAWARE, AS RECEIVED AND FILED IN THIS OFFICE THE SEVENTEENTH DAY OF DECEMBER, A.D. 2009, AT 6:59 O'CLOCK P.M.

AND I DO HEREBY FURTHER CERTIFY THAT THE EFFECTIVE DATE OF THE AFORESAID CERTIFICATE OF MERGER IS THE THIRTY-FIRST DAY OF DECEMBER, A.D. 2009, AT 11:59 O'CLOCK P.M.

FILED

DEC 15 2010

IN THE OFFICE OF
SECRETARY OF STATE

Jeffrey W. Bullock, Secretary of State

0738126 8100M

101192174

AUTHENTICATION: 8430215

DATE: 12-15-10

You may verify this certificate online at corp.delaware.gov/authver.shtml

State of West Virginia

Certificate

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

NOBLE ENERGY MARKETING, INC.

Control Number: 99D1Z

a corporation formed under the laws of Delaware has filed its "Application for Certificate of Authority" to transact business in West Virginia as required by the provisions of the West Virginia Code. I hereby declare the organization to be registered as a foreign corporation from its effective date of January 29, 2009.

Therefore, I issue this

CERTIFICATE OF AUTHORITY

to the corporation authorizing it to transact business in West Virginia

Given under my hand and the Great Seal of the State of West Virginia on this day of January 29, 2009

Natalie E Tennant

Secretary of State

Stamper

FILED

JAN 2 9 2009

IN THE OFFICE OF
SECRETARY OF STATE
WEST VIRGINIA

Natalie E. Tennant
Secretary of State
State Capitol
1900 Kanawha Blvd. E.
Charleston, WV 25305
FILE ONE ORIGINAL
FEES PER SCHEDULE

CERTIFICATE OF AUTHORITY

Penney Barker, Manager
Corporations Division
Tel. (304) 558-8000
Fax: (304) 558-8381
www.wvsos.com
Hours: 8:30am-5:00pm
PLEASE READ INSTRUCTIONS

CTRL # _____

1. **HOME STATE INFORMATION:**

a. The name of the corporation as it is registered in its home state is: Noble Energy Marketing, Inc.

b. State of Delaware Date of incorp. January 18, 1984 Duration (if yrs. or perpetual) Perpetual
Warning: Tax reporting requirements in West Va. will not end until a withdrawal is filed.

c. NAIC # _____ (If an insurance company)

2. **PRINCIPAL OFFICE INFORMATION:**

a. Address of the principal office of the corporation: No. & Street 100 Glenborough Drive, Suite 100
Houston, TX 77067
City/State/Zip _____

b. Mailing address, if different, from above address: Street/PO Box _____
City/State/Zip _____

3. **WEST VIRGINIA INFORMATION:**

a. Corporate name to be used in W. Va.: (check one, follow instructions)
☑ Home state name as listed on line 1.a. above, if available.
☐ DBA name

b. Address of registered office in West Virginia, if any: No. & Street 707 Virginia Street East
Charleston, WV 25301
City/State/Zip _____

c. Mailing address in WV, if different, from above: Street/PO Box _____
City/State/Zip _____

d. Proposed purpose(s) for transaction of business in WV: Oil & gas

4. **AGENT OF PROCESS:** Properly designated person to whom notice of process may be sent, if any:
Name C T Corporation System
Address 707 Virginia Street East, Charleston, WV 25301

5. **CORPORATE STATUS INFORMATION:**

a. Corporation is organized as (check one): ☑ For profit

☐ Non-profit

b. Directors and Officers: (Add extra page if necessary; please list all officers)

Officer	Name	Address
Please see attached list.		

6. The number of acres of land it holds or expects to hold in West Virginia is: None

7. **Contact and Signature Information**

a. Janet Fagan — Contact Name; 281.872.3100 — Phone Number

b. Kirk A. Myers — Print or type name of signer; Assistant Secretary — Title or Capacity of Signer

c. Signature of Signer: Kirk A. Myers Date: Jan 28, 2009

NOBLE ENERGY MARKETING, INC.
a Delaware corporation

Directors

Charles D. Davidson
100 Glenborough Drive, Suite 100
Houston, Texas 77067

Chris Tong
100 Glenborough Drive, Suite 100
Houston, Texas 77067

Arnold J. Johnson
100 Glenborough Drive, Suite 100
Houston, Texas 77067

Officers

Name	Title(s)	Address
Charles D. Davidson	Chief Executive Officer	100 Glenborough Drive, Suite 100 Houston, Texas 77067
David L. Stover	Vice President	100 Glenborough Drive, Suite 100 Houston, Texas 77067
Arnold J. Johnson	Vice President, General Counsel, and Secretary	100 Glenborough Drive, Suite 100 Houston, Texas 77067
Chris Tong	Vice President - Finance and Treasurer	100 Glenborough Drive, Suite 100 Houston, Texas 77067
Kirk A. Moore	Assistant Secretary	100 Glenborough Drive, Suite 100 Houston, Texas 77067

Delaware

The First State

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY "NOBLE ENERGY MARKETING, INC." IS DULY INCORPORATED UNDER THE LAWS OF THE STATE OF DELAWARE AND IS IN GOOD STANDING AND HAS A LEGAL CORPORATE EXISTENCE SO FAR AS THE RECORDS OF THIS OFFICE SHOW, AS OF THE TWENTY-NINTH DAY OF JANUARY, A.D. 2009.

AND I DO HEREBY FURTHER CERTIFY THAT THE SAID "NOBLE ENERGY MARKETING, INC." WAS INCORPORATED ON THE EIGHTEENTH DAY OF JANUARY, A.D. 1994.

AND I DO HEREBY FURTHER CERTIFY THAT THE ANNUAL REPORTS HAVE BEEN FILED TO DATE.

AND I DO HEREBY FURTHER CERTIFY THAT THE FRANCHISE TAXES HAVE BEEN PAID TO DATE.

Jeffrey W. Bullock, Secretary of State

2372438 8300

090081032

AUTHENTICATION: 7106879

DATE: 01-29-09

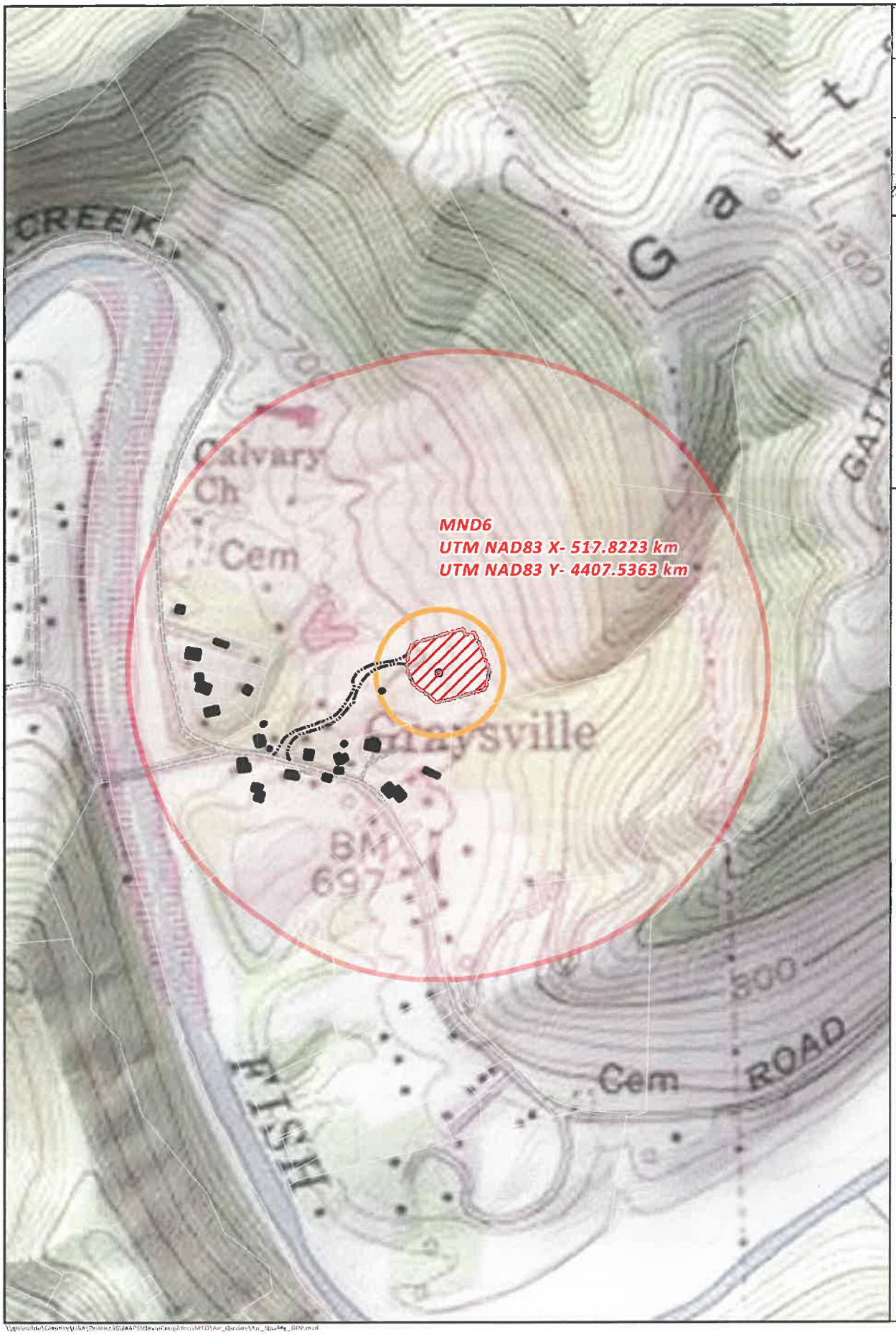
You may verify this certificate online at corp.delaware.gov/authver.shtml

Attachment B

noble energy

MND6 Pad
Marcellus Business Unit

GIS Services



0 300 600
Feet

N

1 inch = 625 feet

Main Data Frame Projection:
NAD 1983 UTM Zone 17N

Units: Meter

Author: devincreighton
Date Created:10/6/2016

- Approx. Pad Center
- Built Road
- Existing Road
- Existing Buildings
- Well Pad Boundary
- 1/4 mi. Pad Extent Buffer
- 300 ft Pad Center Buffer
- Surface Parcels (Resolved)

Attachment C

Attachment C
Schedule of Installation

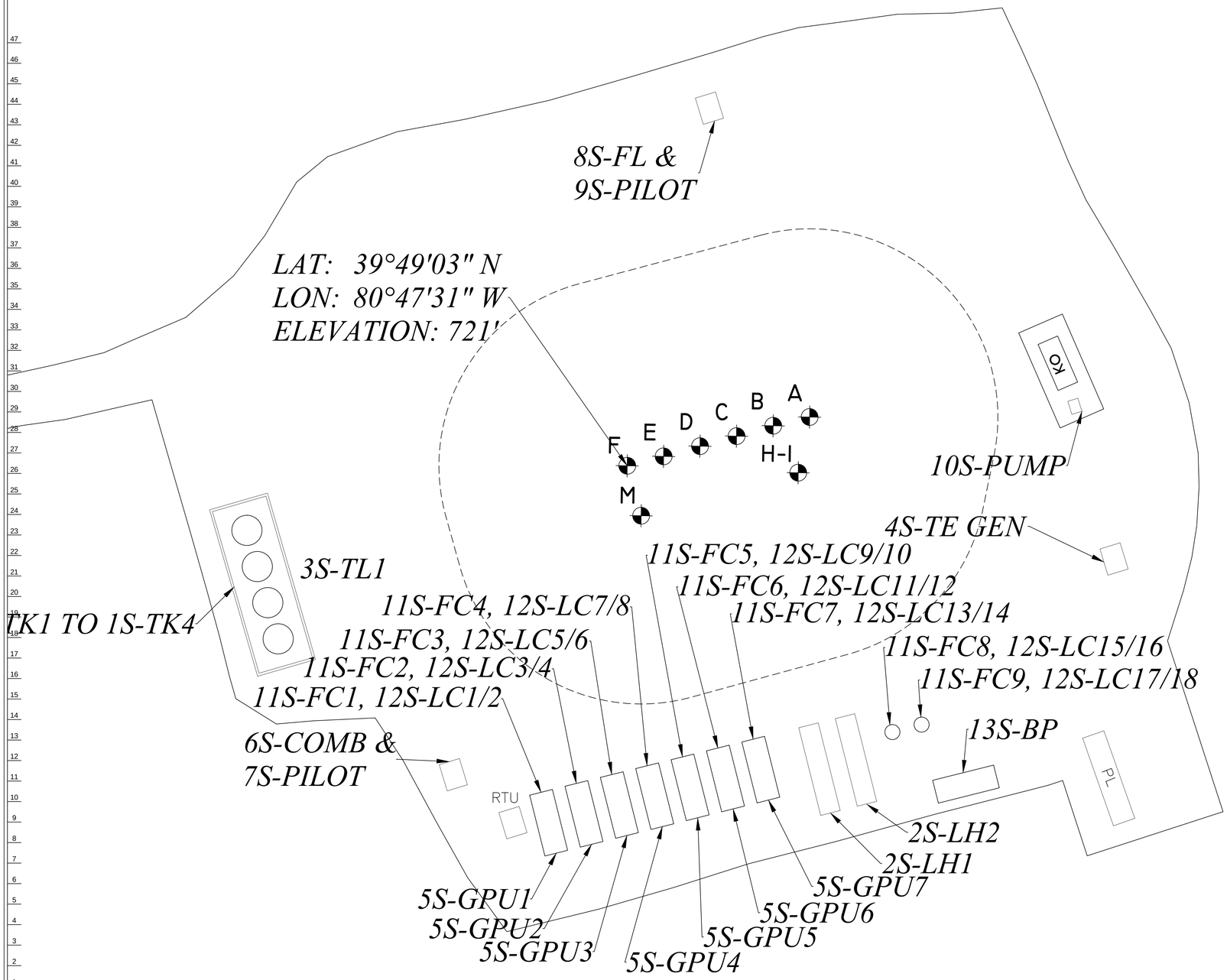
The natural gas production facility detailed within this permit application will commence construction on permit issuance.

Attachment D

Attachment D
Regulatory Discussion

A state and federal regulatory discussion is included within the introduction document submitted with the permit application forms.

Attachment E



Emission Unit ID	Emission Unit Description
1S-TK1	400 BBL PROD WATER STORAGE TANK
1S-TK2	400 BBL PROD WATER STORAGE TANK
1S-TK3	400 BBL PROD WATER STORAGE TANK
1S-TK4	400 BBL PROD WATER STORAGE TANK
2S-LH1	4.0 MMBTU/HR LINE HEATER
2S-LH2	4.0 MMBTU/HR LINE HEATER
3S-TL1	PRODUCED WATER TRUCK LOADING
4S-TE GEN	THERMO ELECRIC GENERATOR
5S-GPU1 THRU 7	2.0 MMBTU/HR HEATER
6S-COMB	VAPOR COMBUSTOR - Leed Fab EC48
7S-PILOT	COMBUSTOR PILOT
8S-FL	PROCESS FLARE - NOV
9S-PILOT	FLARE PILOT
10S-PUMP	SANDPIPER G20 DIAPHRAGM PUMP
11S-FC1 THRU 9	GPU FLOW VALVE CONTROLLER
12S-LC1 THRU 18	GPU LEVEL CONTROLLERS
13S-BP	BACKPRESSURE VALVE CONTROLLER
FUG	EQUIPT COMPONENT FUGITIVE ESTIMATE

0 15 30 60 Feet
SCALE: 1" = 30'

NOTE: DRAWING WAS CREATED ON 22x34 PAPER.REFER TO SCALE BAR FOR PROPER SCALING.

REV.	BY	DATE	DESCRIPTION	CONTRACTOR APPROVED	DATE	NOBLE ENERGY APPROVED	DATE
B	JH	11/28/2016	ISSUE FOR MARCELLUS PERMITTING	-	-	-	-

noble energy

MARCELLUS SHALE DEVELOPMENT
MOUNDSVILLE 6
PLOT PLAN
AQ PERMITTING

DATE DRAWN: 04/14/2015
DRAWN BY: NB
DWG. NO. MND6-P10-0001
B

SHEET 1 OF 1

FILE NAME AND PATH: G:\APPALACHIAN\WELL FILES\SURFACE FACILITY DRAWINGS\MND6\DESIGN\MND6 AIR PERMIT APPLICATION REV1.DWG
LAST SAVED BY: JUSTINHOLMES
LAST SAVED DATE: TUESDAY, NOVEMBER 29, 2016

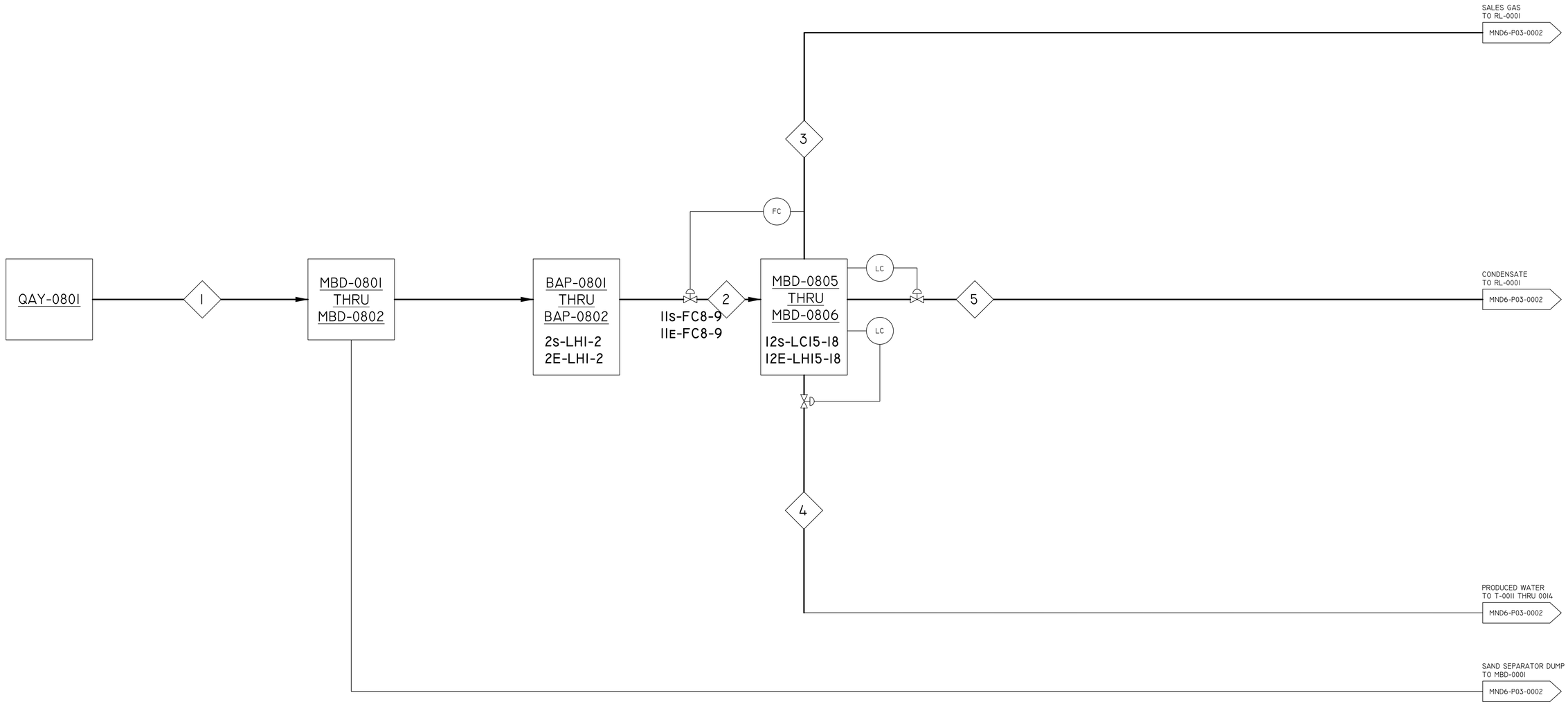
Attachment F

QAY-0801
UTICA WELLLHEAD
QAYUANTITY: 1

MBD-0801 THRU MBD-0802
SAND SEPARATOR
QAYUANTITY: 2

BAP-0801 TBAPRU BAP-0802
UTICA HEATER
QAYUANTITY: 2

MBD-0805 THRU MBD-0806
UTICA SEPARATOR
QAYUANTITY: 2



0 15 30 60 Feet
SCALE: 1" = 30'

NOTE: DRAWING WAS CREATED ON 22x34 PAPER. REFER TO SCALE BAR FOR PROPER SCALING.

REV.	BY	DATE	DESCRIPTION	CONTRACTOR APPROVED	DATE	NOBLE ENERGY APPROVED	DATE
					-		-

noble energy

MARCELLUS SHALE DEVELOPMENT
MOUNDSVILLE 6
PLOT PLAN
AQ PERMITTING

DATE DRAWN: 11/28/2016
DRAWN BY: JH
DWG. NO. MND6-P03-0001
A

SHEET 1 OF 1

FILE NAME AND PATH: G:\APPALACHIAN\WELL FILES\SURFACE FACILITY DRAWINGS\MND6\DESIGN\MND6 AIR PERMIT APPLICATION REV1.DWG
LAST SAVED BY: JUSTINHOLMES
LAST SAVED DATE: TUESDAY, NOVEMBER 29, 2016

QAY-0101 THRU QAY-0701
SINGLE WELL WELLLHEAD
QUANTITY: 7

BAP-0101 THRU BAP-0701
GPU HEATER
QUANTITY: 7

MBD-0101 THRU MBD-0701
GPU SEPARATOR
QUANTITY: 7

ABJ-0011 THRU ABJ-0014
WATER TANK
QUANTITY: 4

MBD-0001
WELL UNLOADING KNOCKOUT
QUANTITY: 1

EAW-0001
PROCESS FLARE
QUANTITY: 1

EAW-0002
VOC COMBUSTOR
QUANTITY: 1

P-0001
WELL UNLOADING PUMP
QUANTITY: 1

SALES GAS
FROM MBD-0805 & 0806
MND6-P03-0001

3

PIC
SEL
PDC
13S-BP
13E-BP

SALES GAS
TO PIG
LAUNCHER

8

CONDENSATE
FROM MBD-0805 & 0806
MND6-P03-0001

5

FC

GPU SKID BOUNDARY

QAY-0101
THRU
QAY-0701

6

BAP-0101
THRU
BAP-0701
5S-GPUI-8
5E-GPUI-8

11S-FCI-7
11E-FCI-7

7

MBD-0101
THRU
MBD-0701
12S-LCI-14
12E-LCI-14

LC
LC

10

4

PRODUCED WATER
FROM MBD-0805 & 0806
MND6-P03-0001

9

EAW-0001
8S-FL
8E-FL

EAW-0002
6S-COMB
6E-COMB

MBD-0001

SAND SEPARATOR DUMP
FROM MBD-0801/0802
MND6-P03-0001

P-0001
10S-PUMP
8E-FL

ABJ-0011
THRU
ABJ-0014
1S-TK1-4
6E-COMB

TANK LOADING
3S-TL
3E-TL

0 15 30 60 Feet
SCALE: 1" = 30'

NOTE: DRAWING WAS CREATED ON 22x34 PAPER. REFER TO SCALE BAR FOR PROPER SCALING.

REV.	BY	DATE	DESCRIPTION	CONTRACTOR APPROVED	DATE	NOBLE ENERGY APPROVED	DATE
				-	-	-	-

noble energy

MARCELLUS SHALE DEVELOPMENT
MOUNDSVILLE 6
PLOT PLAN
AQ PERMITTING

DATE DRAWN: 11/28/2016
DRAWN BY: JH
DWG. NO. MND6-P03-0002
A

SHEET 1 OF 1

FILE NAME AND PATH: G:\APPALACHIAN\WELL FILES\SURFACE FACILITY DRAWINGS\MND6\DESIGN\MND6 AIR PERMIT APPLICATION REV1.DWG
LAST SAVED BY: JUSTINHOLMES
LAST SAVED DATE: TUESDAY, NOVEMBER 29, 2016

Attachment G

Attachment G
Process Description

This permit application is being filed for Noble Energy Inc. for the production of condensate, gas, and produced water from eight (8) production wellheads and associated well equipment at the Moundsville 6 (MND 6) natural gas production facility.

Natural gas, condensate, and produced water flows from wellheads QAY 0101-0107 through seven (7) gas production units (GPU) and heaters (5S-GPU1-7) where three phase separation occurs. The natural gas and condensate from the GPUs will exit the facility via a sales gas pipeline. Produced water from the separators flows into four (4) Produced Water Tanks (1S-TK1-4). Produced water is transported off-site via tanker trucks. Emissions from the Produced Water Tanks and tanker truck loading activities are routed to a 10.8 MMBtu/hr VOC Combustor (6S-COMB).

Natural gas, condensate, and produced water flows from wellhead QAY-0801 through two (2) sand separators, GPU heaters (2S-LH1-2), and three phase separators. The gas and condensate will exit the facility via a sales gas pipeline and condensate pipeline, respectively. Produced water is sent to Produced Water Tanks (1S-TK1-4) and transported off-site via tanker trucks.

Liquids from well blowdown activities are routed to a well unloading knockout pot. The liquids are then pumped via the Well Unloading Pump (10S-PUMP) to Produced Water Tanks (1S-TK1-4) and transported off-site via tanker trucks. The pneumatically driven well unloading pump is controlled by the Well Unloading process flare. Emissions from the well unloading knockout pot and Well Unloading Pump are routed to the 78.0 MMBtu/hr Well Unloading process flare (8S-FL).

A process flow diagram is included as Attachment F.

Attachment I

ATTACHMENT I – EMISSION UNITS / EMISSION REDUCTION DEVICES (ERD) TABLE								
Include ALL emission units and air pollution control devices/ERDs that will be part of this permit application review. Do not include fugitive emission sources in this table. Deminimis storage tanks shall be listed in the Attachment L table. This information is required for all sources regardless of whether it is a construction, modification, or administrative update.								
Emission Unit ID[1]	**Emission Point ID[2]**	**Emission Unit Description**	**Year Installed**	**Manufac. Date[3]**	**Design Capacity**	**Type[4] and Date of Change**	**Control Device(s)[5]**	**ERD(s)[6]**
1S-TK1-4	6E-COMB	Produced Water Tanks	2017	2017	400 bbl each	New	N/A	6S-COMB
2S-LH1	2E-LH1	GPU Heater	2016	2016	4.0 MMBtu/hr	Existing	N/A	N/A
2S-LH2	2E-LH2	GPU Heater	2016	2016	4.0 MMBtu/hr	Existing	N/A	N/A
3S-TL	3E-TL	Tank Loading Rack	2016	2016	1,168,000 bbl/yr	Modified	Loading Rack	6S-COMB
5S-GPU1	5E-GPU1	GPU Heater	2017	2015	2.0 MMBtu/hr	New	N/A	N/A
5S-GPU2	5E-GPU2	GPU Heater	2017	2015	2.0 MMBtu/hr	New	N/A	N/A
5S-GPU3	5E-GPU3	GPU Heater	2017	2015	2.0 MMBtu/hr	New	N/A	N/A
5S-GPU4	5E-GPU4	GPU Heater	2017	2015	2.0 MMBtu/hr	New	N/A	N/A
5S-GPU5	5E-GPU5	GPU Heater	2017	2015	2.0 MMBtu/hr	New	N/A	N/A
5S-GPU6	5E-GPU6	GPU Heater	2017	2017	2.0 MMBtu/hr	New	N/A	N/A
5S-GPU7	5E-GPU7	GPU Heater	2017	2017	2.0 MMBtu/hr	New	N/A	N/A
6S-COMB	6E-COMB	Flare - VOC Combustor	2017	2017	10.8 MMBtu/hr	New	N/A	N/A
7S-FC	7E-FC	Fuel Cell	2017	2017	0.0022 MMBtu/hr	New	N/A	N/A
8S-FL	8E-FL	Process Flare - Well Unloading	2017	2017	78.0 MMBtu/hr	New	N/A	N/A

10S-PUMP	8E-FL	Well Unloading Pump	2017	2017	20.00 scf/min	New	N/A	8S-FL
11S-FC1-9	11E-FC1-9	Pneumatic Flow Control Valves	2017	2017	6.00 scf/hr	New	N/A	N/A
12S-LC1-18	12E-LC1-18	Pneumatic Level Control	2017	2017	0.02 scf/hr	New	N/A	N/A
13S-BP	13E-BP	Pneumatic Back Pressure Control Valve	2017	2017	6.00 scf/hr	New	N/A	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] When required by rule
[4] New, modification, removal, existing
[5] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.
[6] For ERDs use the following numbering system: 1D, 2D, 3D,... or other appropriate designation.

Attachment J

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 - 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^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
6E-COMB	Vent	1S-TK1-4	Produced Water Tanks - Liquids Unloading	6S-COMB	Flare	N/A	N/A	HAPs CO_2 CO_2e CH_4 VOCs	0.01 0.07 26.22 1.04 0.27	0.10 0.33 114.84 4.58 1.21	0.01 0.02 8.24 0.32 0.08	0.03 0.10 36.06 1.43 0.38	Gas/Vapor	AP-42	
2E-LH1	Heater	2S-LH1	GPU Heater	N/A	N/A	N/A	N/A	HAPs Hexane CO $PM_{10/2.5}$ CO_2 CO_2e NO_x CH_4 VOCs	<0.01 <0.01 0.32 <0.01 467.91 468.39 0.38 <0.01 0.02	0.03 0.03 1.40 0.03 2049.44 2051.56 1.67 0.04 0.09	<0.01 <0.01 0.32 <0.01 467.91 468.39 0.38 <0.01 0.02	0.03 0.03 1.40 0.03 2049.44 2051.56 1.67 0.04 0.09	Gas/Vapor	AP-42	
2E-LH2	Heater	2S-LH2	GPU Heater	N/A	N/A	N/A	N/A	HAPs Hexane CO $PM_{10/2.5}$ CO_2 CO_2e NO_x CH_4 VOCs	<0.01 <0.01 0.32 <0.01 467.91 468.39 0.38 <0.01 0.02	0.03 0.03 1.40 0.03 2049.44 2051.56 1.67 0.04 0.09	<0.01 <0.01 0.32 <0.01 467.91 468.39 0.38 <0.01 0.02	0.03 0.03 1.40 0.03 2049.44 2051.56 1.67 0.04 0.09	Gas/Vapor	AP-42	
5E-GPU1	Heater	5S-GPU1	GPU Heater	N/A	N/A	N/A	N/A	HAPs Hexane CO $PM_{10/2.5}$ CO_2 CO_2e NO_x CH_4 VOCs	<0.01 <0.01 0.16 <0.01 233.95 234.20 0.19 <0.01 0.01	0.02 0.02 0.70 0.02 1024.72 1025.78 0.83 0.02 0.05	<0.01 <0.01 0.16 <0.01 233.95 234.20 0.19 <0.01 0.01	0.02 0.02 0.70 0.02 1024.72 1025.78 0.83 0.02 0.05	Gas/Vapor	AP-42	
5E-GPU2	Heater	5S-GPU2	GPU Heater	N/A	N/A	N/A	N/A	HAPs Hexane CO $PM_{10/2.5}$ CO_2 CO_2e NO_x CH_4 VOCs	<0.01 <0.01 0.16 <0.01 233.95 234.20 0.19 <0.01 0.01	0.02 0.02 0.70 0.02 1024.72 1025.78 0.83 0.02 0.05	<0.01 <0.01 0.16 <0.01 233.95 234.20 0.19 <0.01 0.01	0.02 0.02 0.70 0.02 1024.72 1025.78 0.83 0.02 0.05	Gas/Vapor	AP-42	

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^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
5E-GPU3	Heater	5S-GPU3	GPU Heater	N/A	N/A	N/A	N/A	HAPs Hexane CO $PM_{10/2.5}$ CO_2 CO_2e NO_x CH_4 VOCs	<0.01 <0.01 0.16 <0.01 233.95 234.20 0.19 <0.01 0.01	0.02 0.02 0.70 0.02 1024.72 1025.78 0.83 0.02 0.05	<0.01 <0.01 0.16 <0.01 233.95 234.20 0.19 <0.01 0.01	0.02 0.02 0.70 0.02 1024.72 1025.78 0.83 0.02 0.05	Gas/Vapor	AP-42	
5E-GPU4	Heater	5S-GPU4	GPU Heater	N/A	N/A	N/A	N/A	HAPs Hexane CO $PM_{10/2.5}$ CO_2 CO_2e NO_x CH_4 VOCs	<0.01 <0.01 0.16 <0.01 233.95 234.20 0.19 <0.01 0.01	0.02 0.02 0.70 0.02 1024.72 1025.78 0.83 0.02 0.05	<0.01 <0.01 0.16 <0.01 233.95 234.20 0.19 <0.01 0.01	0.02 0.02 0.70 0.02 1024.72 1025.78 0.83 0.02 0.05	Gas/Vapor	AP-42	
5E-GPU5	Heater	5S-GPU5	GPU Heater	N/A	N/A	N/A	N/A	HAPs Hexane CO $PM_{10/2.5}$ CO_2 CO_2e NO_x CH_4 VOCs	<0.01 <0.01 0.16 <0.01 233.95 234.20 0.19 <0.01 0.01	0.02 0.02 0.70 0.02 1024.72 1025.78 0.83 0.02 0.05	<0.01 <0.01 0.16 <0.01 233.95 234.20 0.19 <0.01 0.01	0.02 0.02 0.70 0.02 1024.72 1025.78 0.83 0.02 0.05	Gas/Vapor	AP-42	
5E-GPU6	Heater	5S-GPU6	GPU Heater	N/A	N/A	N/A	N/A	HAPs Hexane CO $PM_{10/2.5}$ CO_2 CO_2e NO_x CH_4 VOCs	<0.01 <0.01 0.16 <0.01 233.95 234.20 0.19 <0.01 0.01	0.02 0.02 0.70 0.02 1024.72 1025.78 0.83 0.02 0.05	<0.01 <0.01 0.16 <0.01 233.95 234.20 0.19 <0.01 0.01	0.02 0.02 0.70 0.02 1024.72 1025.78 0.83 0.02 0.05	Gas/Vapor	AP-42	
5E-GPU7	Heater	5S-GPU7	GPU Heater	N/A	N/A	N/A	N/A	HAPs Hexane CO $PM_{10/2.5}$ CO_2 CO_2e NO_x CH_4 VOCs	<0.01 <0.01 0.16 <0.01 233.95 234.20 0.19 <0.01 0.01	0.02 0.02 0.70 0.02 1024.72 1025.78 0.83 0.02 0.05	<0.01 <0.01 0.16 <0.01 233.95 234.20 0.19 <0.01 0.01	0.02 0.02 0.70 0.02 1024.72 1025.78 0.83 0.02 0.05	Gas/Vapor	AP-42	

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^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
6E-COMB	Stack	6S-COMB	Flare – VOC Combustor	N/A	N/A	N/A	N/A	HAPs CO $PM_{10/2.5}$ CO_2 CO_2e NO_x CH_4 N_2O SO_2 VOCs	0.23 4.00 0.04 1272.28 1280.69 0.74 10.51 0.01 <0.01 2.79	1.02 17.51 0.18 5572.57 5609.42 3.22 46.03 0.05 0.01 12.21	0.01 4.00 0.04 1272.28 1280.69 0.74 0.21 0.01 <0.01 0.06	0.02 17.51 0.18 5572.57 5609.42 3.22 0.92 0.05 0.01 0.24	Gas/Vapor	AP-42	
7E-FC	Fuel Cell	7S-FC	Fuel Cell	N/A	N/A	N/A	N/A	CO $PM_{10/2.5}$ CO_2 CO_2e NO_x CH_4 SO_2 VOCs	<0.01 <0.01 1.25 1.25 <0.01 <0.01 <0.01 <0.01	<0.01 <0.01 5.48 5.48 <0.01 <0.01 <0.01 <0.01	<0.01 <0.01 1.25 1.25 <0.01 <0.01 <0.01 <0.01	<0.01 <0.01 5.48 5.48 <0.01 <0.01 <0.01 <0.01	Gas/Vapor	AP-42	
8E-FL	Stack	8S-FL	Process Flare - Well Unloading	N/A	N/A	N/A	N/A	HAPs CO $PM_{10/2.5}$ CO_2 CO_2e NO_x CH_4 N_2O SO_2 VOCs	18.60 28.88 0.52 6973.78 12184.76 5.32 10387.41 0.06 0.04 14829.37	6.79 5.35 0.10 2636.55 3590.94 2.02 1895.70 0.02 0.01 2706.36	0.38 28.88 0.52 6973.78 12184.76 5.32 207.75 0.06 0.04 296.59	0.07 5.35 0.10 2636.55 3590.94 2.02 37.91 0.02 0.01 54.13	Gas/Vapor	AP-42	
8E-FL	Pump	10S-Pump	Diaphragm Pump	8S-FL	Flare	N/A	N/A	HAPs Hexane CO_2 CO_2e CH_4 VOCs	0.01 0.01 <0.01 53.02 2.12 0.38	<0.01 <0.01 <0.01 19.35 0.77 0.14	<0.01 <0.01 <0.01 1.06 0.04 0.01	<0.01 <0.01 <0.01 0.39 0.02 <0.01	Gas/Vapor	Manufacturer HYSYS Run, AP-42	
11E-FC1-9	Fugitive	11S-FC1-9	Pneumatic Flow Control Valves	N/A	N/A	N/A	N/A	HAPs Hexane CO_2 CO_2e CH_4 VOCs	0.01 0.01 <0.01 55.14 2.21 0.39	0.03 0.03 0.02 241.49 9.66 1.72	0.01 0.01 <0.01 55.14 2.21 0.39	0.03 0.03 0.02 241.49 9.66 1.72	Gas/Vapor	Manufacturer	
12E-LC1-18	Fugitive	12S-LC1-18	Pneumatic Level Control	N/A	N/A	N/A	N/A	HAPs Hexane CO_2 CO_2e CH_4 VOCs	<0.01 <0.01 <0.01 0.31 0.01 <0.01	<0.01 <0.01 <0.01 1.34 0.05 0.01	<0.01 <0.01 <0.01 0.31 0.01 <0.01	<0.01 <0.01 <0.01 1.34 0.05 0.01	Gas/Vapor	Manufacturer	

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^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
13E-BP	Fugitive	13S-BP	Pneumatic Back Pressure Control Valve	N/A	N/A	N/A	N/A	HAPs Hexane CO_2 CO_2e CH_4 VOCs	<0.01 <0.01 <0.01 6.13 0.25 0.04	<0.01 <0.01 <0.01 26.83 1.07 0.19	<0.01 <0.01 <0.01 6.13 0.25 0.04	<0.01 <0.01 <0.01 26.83 1.07 0.19	Gas/Vapor	Manufacturer	

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.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] 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).

[5] 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).

[6] 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).

[7] 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/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment K

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? ☒ Yes ☐ No ☐ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? ☐ Yes ☒ No ☐ If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? ☒ Yes ☐ No ☐ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? ☐ Yes ☒ No ☐ 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.)? ☒ Yes ☐ No ☐ 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? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? ☐ Yes ☒ No ☐ 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 - Chemical Name/CAS [1]	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						
Unpaved Haul Roads	PM_{Total}	1.45	6.29	1.45	6.29	EE
Storage Pile Emissions						
Loading/Unloading Operations	VOCs	0.27	1.21	0.08	0.38	EE
	HAPs	0.01	0.10	0.01	0.03	EE
Wastewater Treatment Evaporation & Operations						
Equipment Leaks	VOCs	Does not apply	1.47	Does not apply	1.47	
	HAPs	Does not apply	0.10	Does not apply	0.10	
General Clean-up VOC Emissions						
Other						

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. DO NOT LIST H_2, H_2O, N_2, O_2, 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

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*): 12S-LC1-18

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

   Kimray
   GEN II Level Controllers
   Intermitent Bleed

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:

   N/A

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:

N/A

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

N/A

(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:

N/A

(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:

N/A

(g) Proposed maximum design heat input: $\times 10^6$ 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:

@ °F and psia

a.	NO_X		lb/hr	grains/ACF
b.	SO_2		lb/hr	grains/ACF
c.	CO		lb/hr	grains/ACF
d.	PM_{10}		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)			
	HAPs	<0.01	lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			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.

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/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

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*): 11S-FC1-9

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

   Fischer Control
   DVC 6200
   Continuous Low Bleed Pneumatic Controllers

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:

   N/A

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:

N/A

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

N/A

(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:

N/A

(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:

N/A

(g) Proposed maximum design heat input: $\times 10^6$ 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:

@ °F and psia

a.	NO_X		lb/hr	grains/ACF
b.	SO_2		lb/hr	grains/ACF
c.	CO		lb/hr	grains/ACF
d.	PM_{10}		lb/hr	grains/ACF
e.	Hydrocarbons		lb/hr	grains/ACF
f.	VOCs	0.39	lb/hr	grains/ACF
g.	Pb		lb/hr	grains/ACF
h.	Specify other(s)			
	HAPs	0.01	lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			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.

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/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

< 6 scf/hr

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*): 13S-BP

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

   Fischer Control
   DVC 6200
   Continuous Low Bleed Pneumatic Controllers

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:

   N/A

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:

N/A

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

N/A

(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:

N/A

(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:

N/A

(g) Proposed maximum design heat input: $\times 10^6$ 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:

@ °F and psia

a.	NO_X		lb/hr	grains/ACF
b.	SO_2		lb/hr	grains/ACF
c.	CO		lb/hr	grains/ACF
d.	PM_{10}		lb/hr	grains/ACF
e.	Hydrocarbons		lb/hr	grains/ACF
f.	VOCs	0.04	lb/hr	grains/ACF
g.	Pb		lb/hr	grains/ACF
h.	Specify other(s)			
	HAPs	<0.01	lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			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.

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/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

< 6 scf/hr

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*): 10S-PUMP

1. Name or type and model of proposed affected source: Sandpiper G-20 Diaphragm Pump
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: N/A
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:

N/A

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

N/A

(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:

N/A

(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:

N/A

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	1	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:

@ °F and psia

a.	NO_X		lb/hr	grains/ACF
b.	SO_2		lb/hr	grains/ACF
c.	CO		lb/hr	grains/ACF
d.	PM_{10}		lb/hr	grains/ACF
e.	Hydrocarbons		lb/hr	grains/ACF
f.	VOCs	0.38	lb/hr	grains/ACF
g.	Pb		lb/hr	grains/ACF
h.	Specify other(s)			
	HAPs	0.01	lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			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.

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/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

Maximum 100 psi, exhaust routed to control device if/when driven by natural gas.

ATTACHMENT L – STORAGE VESSEL DATA SHEET

Complete this data sheet if you are the owner or operator of a storage vessel that contains condensate and/or produced water. This form must be completed for ***each*** new or modified bulk liquid storage vessel(s) that contains condensate and/or produced water. (If you have more than one (1) identical tank (i.e. 4-400 bbl condensate tanks), then you can list all on one (1) data sheet). **Include gas sample analysis, flashing emissions, working and breathing losses, USEPA Tanks, simulation software (ProMax, E&P Tanks, HYSYS, etc.), and any other supporting documents where applicable.**

The following information is REQUIRED:

□ Composition of the representative sample used for the simulation
□ For each stream that contributes to flashing emissions:
- □ Temperature and pressure (inlet and outlet from separator(s))
- □ Simulation-predicted composition
- □ Molecular weight
- □ Flow rate

□ Resulting flash emission factor or flashing emissions from simulation
□ Working/breathing loss emissions from tanks and/or loading emissions if simulation is used to quantify those emissions

Additional information may be requested if necessary.

GENERAL INFORMATION (REQUIRED)

1. Bulk Storage Area Name: MND 6 Produced Water Tanks Battery	2. Tank Name 400 bbl Produced Water Tanks
3. Emission Unit ID number 1S-TK1-4	4. Emission Point ID number 1E-TK1-4
5. Date Installed , Modified or Relocated *(for existing tanks)* 2016 Was the tank manufactured after August 23, 2011 and on or before September 18, 2015? ☐ Yes ☒ No Was the tank manufactured after September 18, 2015? ☒ Yes ☐ No	6. Type of change: ☒ New construction ☐ New stored material ☐ Other ☐ Relocation
7A. Description of Tank Modification *(if applicable)*	
7B. Will more than one material be stored in this tank? *If so, a separate form must be completed for each material.* ☐ Yes ☒ No	
7C. Was USEPA Tanks simulation software utilized? ☒ Yes ☐ No ***If Yes, please provide the appropriate documentation and items 8-42 below are not required.***	

TANK INFORMATION

8. Design Capacity *(specify barrels or gallons).* Use the internal cross-sectional area multiplied by internal height. 400 bbls	
9A. Tank Internal Diameter (ft.) 12	9B. Tank Internal Height (ft.) 20
10A. Maximum Liquid Height (ft.) 20	10B. Average Liquid Height (ft.) 10
11A. Maximum Vapor Space Height (ft.)	11B. Average Vapor Space Height (ft.)
12. Nominal Capacity *(specify barrels or gallons).* This is also known as "working volume". 400 bbls	
13A. Maximum annual throughput (gal/yr) 49,056,000	13B. Maximum daily throughput (gal/day) 134,400
14. Number of tank turnovers per year 2,920	15. Maximum tank fill rate (gal/min) 93.33
16. Tank fill method ☒ Submerged ☐ Splash ☐ Bottom Loading	
17. Is the tank system a variable vapor space system? ☐ Yes ☒ No If yes, (A) What is the volume expansion capacity of the system (gal)? (B) What are the number of transfers into the system per year?	
18. Type of tank (check all that apply): ☐ Fixed Roof ☒ vertical ☐ horizontal ☐ flat roof ☐ cone roof ☐ dome roof ☐ other (describe) ☐ External Floating Roof ☐ pontoon roof ☐ double deck roof ☐ Domed External (or Covered) Floating Roof ☐ Internal Floating Roof ☐ vertical column support ☐ self-supporting ☐ Variable Vapor Space ☐ lifter roof ☐ diaphragm ☐ Pressurized ☐ spherical ☐ cylindrical ☐ Other (describe)	

PRESSURE/VACUUM CONTROL DATA

19. Check as many as apply:

☒ Does Not Apply ☐ Rupture Disc (psig)

☐ Inert Gas Blanket of _____ ☐ Carbon Adsorption[1]

☐ Vent to Vapor Combustion Device[1] (vapor combustors, flares, thermal oxidizers, enclosed combustors)

☐ Conservation Vent (psig) ☐ Condenser[1]

Vacuum Setting Pressure Setting

☐ Emergency Relief Valve (psig)

Vacuum Setting Pressure Setting

☐ Thief Hatch Weighted ☐ Yes ☐ No

[1] Complete appropriate Air Pollution Control Device Sheet

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

Material Name	**Flashing Loss**		**Breathing Loss**		**Working Loss**		**Total Emissions Loss**		**Estimation Method[1]**
	lb/hr	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	
VOCs	2.47	10.82	<0.01	0.01	0.12	0.52	2.59	11.35	EPA/HYSYS
HAPs	0.21	0.90	<0.01	<0.01	0.01	0.04	0.22	0.94	EPA/HYSYS
CO_2	0.68	2.97	<0.01	<0.01	0.03	0.14	0.71	3.11	EPA/HYSYS
CH_4	9.32	40.82	0.01	0.05	0.45	1.96	9.78	42.83	EPA/HYSYS
CO_2e	233.7	1023.5	0.28	1.23	11.20	49.06	245.18	1073.79	EPA/HYSYS

[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 and other modeling summary sheets if applicable.

TANK CONSTRUCTION AND OPERATION INFORMATION		
21. Tank Shell Construction: ☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)		
21A. Shell Color: Gray/Medium	21B. Roof Color: Gray/Medium	21C. Year Last Painted:
22. Shell Condition (if metal and unlined): ☒ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable		
22A. Is the tank heated? ☐ Yes ☒ No	22B. If yes, operating temperature:	22C. If yes, how is heat provided to tank?
23. Operating Pressure Range (psig): 0.2521 **Must be listed for tanks using VRUs with closed vent system.**		
24. Is the tank a **Vertical Fixed Roof Tank**? ☒ Yes ☐ No	24A. If yes, for dome roof provide radius (ft): 6.00	24B. If yes, for cone roof, provide slope (ft/ft): 0.06
25. Complete item 25 for **Floating Roof Tanks** ☐ Does not apply ☒		
25A. Year Internal Floaters Installed:		
25B. Primary Seal Type *(check one):* ☐ Metallic (mechanical) shoe seal ☐ Liquid mounted resilient seal ☐ Vapor mounted resilient seal ☐ Other (describe):		
25C. Is the Floating Roof equipped with a secondary seal? ☐ Yes ☐ No		
25D. If yes, how is the secondary seal mounted? *(check one)* ☐ Shoe ☐ Rim ☐ Other (describe):		
25E. Is the floating roof equipped with a weather shield? ☐ Yes ☐ No		
25F. Describe deck fittings:		
26. Complete the following section for **Internal Floating Roof Tanks** ☒ Does not apply		
26A. Deck Type: ☐ Bolted ☐ Welded	26B. For bolted decks, provide deck construction:	
26C. Deck seam. Continuous sheet construction: ☐ 5 ft. wide ☐ 6 ft. wide ☐ 7 ft. wide ☐ 5 x 7.5 ft. wide ☐ 5 x 12 ft. wide ☐ other (describe)		
26D. Deck seam length (ft.):	26E. Area of deck (ft^2):	26F. For column supported tanks, # of columns:	26G. For column supported tanks, diameter of column:
27. Closed Vent System with VRU? ☐ Yes ☐ No		
28. Closed Vent System with Enclosed Combustor? ☐ Yes ☐ No		
SITE INFORMATION		
29. Provide the city and state on which the data in this section are based: Pittsburgh, PA		
30. Daily Avg. Ambient Temperature (°F): 50.31	31. Annual Avg. Maximum Temperature (°F): 59.88	
32. Annual Avg. Minimum Temperature (°F): 40.73	33. Avg. Wind Speed (mph): 9.075	
34. Annual Avg. Solar Insulation Factor (BTU/ft^2-day): 1202.96	35. Atmospheric Pressure (psia): 14.1085	
LIQUID INFORMATION		
36. Avg. daily temperature range of bulk liquid (°F): 58.50	36A. Minimum (°F): 49.32	36B. Maximum (°F): 67.67
37. Avg. operating pressure range of tank (psig):	37A. Minimum (psig):	37B. Maximum (psig):
38A. Minimum liquid surface temperature (°F):	38B. Corresponding vapor pressure (psia):	
39A. Avg. liquid surface temperature (°F):	39B. Corresponding vapor pressure (psia):	
40A. Maximum liquid surface temperature (°F):	40B. Corresponding vapor pressure (psia):	
41. Provide the following for each liquid or gas to be stored in the tank. Add additional pages if necessary.		

41A. Material name and composition:	Produced Water		
41B. CAS number:			
41C. Liquid density (lb/gal):			
41D. Liquid molecular weight (lb/lb-mole):	18.17		
41E. Vapor molecular weight (lb/lb-mole):	19.91		
41F. Maximum true vapor pressure (psia):	0.2521		
41G. Maximum Reid vapor pressure (psia):			
41H. Months Storage per year. From: Jan To: Dec	12		
42. Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations.			

STORAGE TANK DATA TABLE

List all deminimis storage tanks (i.e. lube oil, glycol, diesel etc.)

Source ID #[1]	Status[2]	Content[3]	Volume[4]

1. Enter the appropriate Source Identification Numbers (Source ID #) for each storage tank located at the well site. Tanks should be designated T01, T02, T03, etc.

2. Enter storage tank Status using the following:
   - EXIST Existing Equipment
   - NEW Installation of New Equipment
   - REM Equipment Removed

3. Enter storage tank content such as condensate, pipeline liquids, glycol (DEG or TEG), lube oil, diesel, mercaptan etc.

4. Enter the maximum design storage tank volume in gallons.

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 *Equipment List Form*):

1. Loading Area Name: Tank Loading

2. Type of cargo vessels accommodated at this rack or transfer point (check as many as apply):
☐ Drums ☐ Marine Vessels ☐ Rail Tank Cars ☒ Tank Trucks

3. Loading Rack or Transfer Point Data:

Number of pumps	1
Number of liquids loaded	1 – 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?
☐ Yes ☐ No ☒ Does not apply

5. Describe cleaning location, compounds and procedure for cargo vessels using this transfer point:

6. Are cargo vessels pressure tested for leaks at this or any other location?
☐ Yes ☒ 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	24	24	24	24
days/week	7	7	7	7

weeks/quarter	13	13	13	13

8. Bulk Liquid Data *(add pages as necessary):*							
Pump ID No.		3S-TL					
Liquid Name		Produced Water					
Max. daily throughput (1000 gal/day)		134.4					
Max. annual throughput (1000 gal/yr)		49056					
Loading Method [1]		SUB					
Max. Fill Rate (gal/min)		93.33					
Average Fill Time (min/loading)		45					
Max. Bulk Liquid Temperature (^{o}F)		53.39					
True Vapor Pressure [2]		0.2521					
Cargo Vessel Condition [3]		U					
Control Equipment or Method [4]		O – Loading Rack					
Minimum control efficiency (%)		70					
Maximum Emission Rate	Loading (lb/hr)	0.27					
	Annual (lb/yr)	2420					
Estimation Method [5]		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 *Air Pollution Control Device Sheets*):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 (descibe)

[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.

MONITORING	RECORDKEEPING
Follow all applicable regulations.	Keep records of produced water throughputs to tanker trucks.
REPORTING	TESTING
Follow all applicable regulations.	

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

ATTACHMENT L – SMALL HEATERS AND REBOILERS NOT SUBJECT TO 40CFR60 SUBPART DC
DATA SHEET

Complete this data sheet for each small heater and reboiler not subject to 40CFR60 Subpart Dc at the facility. ***The Maximum Design Heat Input (MDHI) must be less than 10 MMBTU/hr.***

Emission Unit ID#[1]	Emission Point ID#[2]	Emission Unit Description (manufacturer, model #)	Year Installed/ Modified	Type[3] and Date of Change	Maximum Design Heat Input (MMBTU/hr)[4]	Fuel Heating Value (BTU/scf)[5]
2S-LH1	2E-LH1	GPU Heater	2016	Existing	4.00	1050
2S-LH2	2E-LH2	GPU Heater	2016	Existing	4.00	1050
5S-GPU1	5E-GPU1	GPU Heater	2017	New	2.00	1050
5S-GPU2	5E-GPU2	GPU Heater	2017	New	2.00	1050
5S-GPU3	5E-GPU3	GPU Heater	2017	New	2.00	1050
5S-GPU4	5E-GPU4	GPU Heater	2017	New	2.00	1050
5S-GPU5	5E-GPU5	GPU Heater	2017	New	2.00	1050
5S-GPU6	5E-GPU6	GPU Heater	2017	New	2.00	1050
5S-GPU7	5E-GPU7	GPU Heater	2017	New	2.00	1050

[1] Enter the appropriate Emission Unit (or Source) identification number for each fuel burning unit located at the production pad. Gas Producing Unit Burners should be designated GPU-1, GPU-2, etc. Heater Treaters should be designated HT-1, HT-2, etc. Heaters or Line Heaters should be designated LH-1, LH-2, etc. For sources, use 1S, 2S, 3S…or other appropriate designation. Enter glycol dehydration unit Reboiler Vent data on the Glycol Dehydration Unit Data Sheet.

[2] Enter the appropriate Emission Point identification numbers for each fuel burning unit located at the production pad. Gas Producing Unit Burners should be designated GPU-1, GPU-2, etc. Heater Treaters should be designated HT-1, HT-2, etc. Heaters or Line Heaters should be designated LH-1, LH-2, etc. For emission points, use 1E, 2E, 3E…or other appropriate designation.

[3] New, modification, removal.

[4] Enter design heat input capacity in MMBtu/hr.

[5] Enter the fuel heating value in BTU/standard cubic foot.

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 (%)	4.8	4.8
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	Liquids Hauling	14	30	10	0.25	1	11680	N/A	N/A
2	Employee Vehicles	4	3	10	0.25	1	200	N/A	N/A
3									
4									
5									
6									
7									
8									

Source: *AP-42 Fifth Edition – 13.2.2 Unpaved Roads*

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

Where:

		PM	PM-10
k =	Particle size multiplier	0.80	0.36
s =	Silt content of road surface material (%)	4.8	4.8
S =	Mean vehicle speed (mph)	10	10
W =	Mean vehicle weight (tons)	30,3	30,3
w =	Mean number of wheels per vehicle	14,4	14,4
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		Controlled		Uncontrolled		Controlled	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
1	1.07	6.25			0.27	1.59		
2	0.38	0.04			0.10	0.01		
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 =	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*

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

Where:

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

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 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
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*): 7S-FC

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

   Acumentrics ARP500
   Remote Power System - Fuel Cell

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:

   N/A

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

   Combustion of propane.

* 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:

2.4 gal/day of propane.

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(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:

(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: $\times 10^6$ 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:

@ °F and psia

a.	NO_X		lb/hr	grains/ACF
b.	SO_2		lb/hr	grains/ACF
c.	CO		lb/hr	grains/ACF
d.	PM_{10}		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)			
	HAPs	<0.01	lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			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.

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/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

Max power output is 0.5 kW.

Attachment M

Attachment M
Air Pollution Control Device Sheet
(FLARE SYSTEM)

Control Device ID No. (must match Emission Units Table): 8S-FL

Equipment Information

1. Manufacturer: National Oilwell Varco
   Model No. Process Flare - Well Unloading

2. Method: ☒ Elevated flare ☐ Ground flare ☐ Other
   Describe

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:
   ☐ Steam-assisted ☐ Air-assisted ☐ Pressure-assisted ☒ Non-assisted

5. Maximum capacity of flare:
   729.17 scf/min
   43,750 scf/hr

6. Dimensions of stack:
   Diameter 0.25 ft.
   Height 20.17 ft.

7. Estimated combustion efficiency:
   (Waste gas destruction efficiency)
   Estimated: 98 %
   Minimum guaranteed: 98 %

8. Fuel used in burners:
   ☒ Natural Gas
   ☐ Fuel Oil, Number
   ☐ Other, Specify:

9. Number of burners:
   Rating: 1 @ 78.0MM BTU/hr

10. Will preheat be used? ☐ Yes ☒ No

11. Describe method of controlling flame:
    Adjust manual choke upstream of unloading vessel to regulate pressure.

12. Flare height: 22.67 ft

13. Flare tip inside diameter: 0.33 ft

14. Natural gas flow rate to flare pilot flame per pilot light: NSCR scf/min
    240 scf/hr

15. Number of pilot lights:
    Total BTU/hr

16. Will automatic re-ignition be used?
    ☐ Yes ☒ No

17. If automatic re-ignition will be used, describe the method:
    N/A - Flare is only operational while personnel are present and routing stream to vessel.

18. Is pilot flame equipped with a monitor? ☒ Yes ☐ No
    If yes, what type? ☒ Thermocouple ☐ Infra-Red
    ☐ Ultra Violet ☐ Camera with monitoring control room
    ☐ Other, Describe:

19. Hours of unit operation per year: 730

Steam Injection

20. Will steam injection be used? ☐ Yes ☒ No	21. Steam pressure PSIG Minimum Expected: Design Maximum:
22. Total Steam flow rate: LB/hr	23. Temperature: °F
24. Velocity ft/sec	25. Number of jet streams
26. Diameter of steam jets: in	27. Design basis for steam injected: LB steam/LB hydrocarbon
28. How will steam flow be controlled if steam injection is used?	

Characteristics of the Waste Gas Stream to be Burned

29.

Name	Quantity Grains of H_2S/100 ft^3	Quantity (LB/hr, ft^3/hr, etc)	Source of Material
Well Unloading Gas	N/A	62,013 lb/hr	Wellhead

30. Estimate total combustible to flare: LB/hr or ACF/hr (Maximum mass flow rate of waste gas) scfm	
31. Estimated total flow rate to flare including materials to be burned, carrier gases, auxiliary fuel, etc.: 62,013 lb/hr LB/hr or ACF/hr	
32. Give composition of carrier gases:	
33. Temperature of emission stream: °F Heating value of emission stream: 1350 BTU/ft^3 Mean molecular weight of emission stream: MW = lb/lb-mole	34. Identify and describe all auxiliary fuels to be burned. BTU/scf BTU/scf BTU/scf BTU/scf
35. Temperature of flare gas: °F	36. Flare gas flow rate: 729.17 scf/min
37. Flare gas heat content: BTU/ft^3	38. Flare gas exit velocity: scf/min
39. Maximum rate during emergency for one major piece of equipment or process unit: N/A scf/min	
40. Maximum rate during emergency for one major piece of equipment or process unit: N/A BTU/min	
41. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):	
42. Describe the collection material disposal system:	
43. Have you included ***Flare Control Device*** in the Emissions Points Data Summary Sheet?	

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.

MONITORING:	RECORDKEEPING:
Personnel monitoring at all times when flare is operating.	Track volume of gas flowed to flare.
REPORTING:	TESTING:
In accordance with regulations.	In accordance with regulations.

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.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

45. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
100%

46. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
98%

47. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
125 psig maximum inlet pressure

Attachment M
Air Pollution Control Device Sheet
(FLARE SYSTEM)

Control Device ID No. (must match Emission Units Table): 6S-COMB

Equipment Information

1. Manufacturer: LEED Fabrication

   Model No. L30-0011-00

2. Method: ☐ Elevated flare ☒ Ground flare ☐ Other
   Describe

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:
   ☐ Steam-assisted ☐ Air-assisted ☐ Pressure-assisted ☒ Non-assisted

5. Maximum capacity of flare:
   100 scf/min
   6,000 scf/hr

6. Dimensions of stack:
   Diameter 4 ft.
   Height 25 ft.

7. Estimated combustion efficiency:
   (Waste gas destruction efficiency)
   Estimated: 98 %
   Minimum guaranteed: 98 %

8. Fuel used in burners:
   ☒ Natural Gas
   ☐ Fuel Oil, Number
   ☐ Other, Specify:

9. Number of burners:
   Rating: 10.8 BTU/hr

10. Will preheat be used? ☐ Yes ☐ No

11. Describe method of controlling flame:
    N/A

12. Flare height: 25 ft

13. Flare tip inside diameter: ft

14. Natural gas flow rate to flare pilot flame per pilot light: scf/min
    scf/hr

15. Number of pilot lights:
    Total 1 @ 15,000 BTU/hr

16. Will automatic re-ignition be used?
    ☒ Yes ☐ No

17. If automatic re-ignition will be used, describe the method:
    Piezoelectric igniter

18. Is pilot flame equipped with a monitor? ☒ Yes ☐ No
    If yes, what type? ☒ Thermocouple ☐ Infra-Red
    ☐ Ultra Violet ☐ Camera with monitoring control room
    ☐ Other, Describe:

19. Hours of unit operation per year: 8760

Steam Injection

20. Will steam injection be used? ☐ Yes ☒ No	21. Steam pressure PSIG Minimum Expected: Design Maximum:
22. Total Steam flow rate: LB/hr	23. Temperature: °F
24. Velocity ft/sec	25. Number of jet streams
26. Diameter of steam jets: in	27. Design basis for steam injected: LB steam/LB hydrocarbon
28. How will steam flow be controlled if steam injection is used?	

Characteristics of the Waste Gas Stream to be Burned

29.

Name	Quantity Grains of H_2S/100 ft^3	Quantity (LB/hr, ft^3/hr, etc)	Source of Material
Produced Water Vapor	N/A	6000 scf/hr	Tanks/Loading Losses

30. Estimate total combustible to flare: LB/hr or ACF/hr (Maximum mass flow rate of waste gas) scfm	
31. Estimated total flow rate to flare including materials to be burned, carrier gases, auxiliary fuel, etc.: LB/hr or ACF/hr	
32. Give composition of carrier gases:	
33. Temperature of emission stream: °F Heating value of emission stream: 1950 BTU/ft^3 Mean molecular weight of emission stream: MW = 19.91 lb/lb-mole	34. Identify and describe all auxiliary fuels to be burned. BTU/scf BTU/scf BTU/scf BTU/scf
35. Temperature of flare gas: 70 °F	36. Flare gas flow rate: 6000 scf/min
37. Flare gas heat content: 1950 BTU/ft^3	38. Flare gas exit velocity: scf/min
39. Maximum rate during emergency for one major piece of equipment or process unit: scf/min	
40. Maximum rate during emergency for one major piece of equipment or process unit: BTU/min	
41. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):	
42. Describe the collection material disposal system:	
43. Have you included ***Flare Control Device*** in the Emissions Points Data Summary Sheet?	

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.

MONITORING:	RECORDKEEPING:
Periodic visible emission monitoring per regulation	Pilot records
REPORTING:	TESTING:
In accordance with regulations.	In accordance with regulations.

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.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

45. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
100%

46. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
98%

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

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 *Equipment List Form*):

1. Loading Area Name: Tank Loading

2. Type of cargo vessels accommodated at this rack or transfer point (check as many as apply):
☐ Drums ☐ Marine Vessels ☐ Rail Tank Cars ☒ Tank Trucks

3. Loading Rack or Transfer Point Data:

Number of pumps	1
Number of liquids loaded	1 – 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?
☐ Yes ☐ No ☒ Does not apply

5. Describe cleaning location, compounds and procedure for cargo vessels using this transfer point:

6. Are cargo vessels pressure tested for leaks at this or any other location?
☐ Yes ☒ 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	24	24	24	24
days/week	7	7	7	7

weeks/quarter	13	13	13	13

8. Bulk Liquid Data *(add pages as necessary):*							
Pump ID No.		3S-TL					
Liquid Name		Produced Water					
Max. daily throughput (1000 gal/day)		134.4					
Max. annual throughput (1000 gal/yr)		49056					
Loading Method [1]		SUB					
Max. Fill Rate (gal/min)		93.33					
Average Fill Time (min/loading)		45					
Max. Bulk Liquid Temperature (^{o}F)		53.39					
True Vapor Pressure [2]		0.2521					
Cargo Vessel Condition [3]		U					
Control Equipment or Method [4]		O – Loading Rack					
Minimum control efficiency (%)		70					
Maximum Emission Rate	Loading (lb/hr)	0.27					
	Annual (lb/yr)	2420					
Estimation Method [5]		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 *Air Pollution Control Device Sheets*):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 (descibe)

[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.

MONITORING	RECORDKEEPING
Follow all applicable regulations.	Keep records of produced water throughputs to tanker trucks.
REPORTING	TESTING
Follow all applicable regulations.	

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

Attachment N

Moundsville (MND) 6 Production Site

2.0 MMBtu/hr Line Heaters

Line Heaters BAP0101-BAP0701

Pollutant	Emission Factor	Emission Factor Units	Emission Factor Basis / Source	Boiler Rating (MMBtu/hr)	Heat Value of Natural Gas	Annual Operating	Max. Hourly Emissions.	Max. Annual Emissions.
VOC's	5.5	lb/10^6 scf	AP-42 Chapter 1.4	2.00	1,050	8,760	0.01	0.05
Hexane	1.8	lb/10^6 scf	AP-42 Chapter 1.4	2.00	1,050	8,760	<0.01	0.02
Formaldehyde	0.1	lb/106 scf	AP-42 Chapter 1.4	2.00	1,050	8,760	<0.01	<0.01
Benzene	0.0021	lb/10^6 scf	AP-42 Chapter 1.4	2.00	1,050	8,760	<0.01	<0.01
Toluene	0.0034	lb/10^6 scf	AP-42 Chapter 1.4	2.00	1,050	8,760	<0.01	<0.01
Pb	0.0005	lb/10^6 scf	AP-42 Chapter 1.4	2.00	1,050	8,760	<0.01	<0.01
CO	84	lb/10^6 scf	AP-42 Chapter 1.4	2.00	1,050	8,760	0.16	0.70
NOx	100	lb/10^6 scf	AP-42 Chapter 1.4	2.00	1,050	8,760	0.19	0.83
$PM_{Filterable}$	1.9	lb/10^6 scf	AP-42 Chapter 1.4	2.00	1,050	8,760	<0.01	0.02
$PM_{Condensable}$	5.7	lb/10^6 scf	AP-42 Chapter 1.4	2.00	1,050	8,760	0.01	0.05
PM_{Total}	7.6	lb/10^6 scf	AP-42 Chapter 1.4	2.00	1,050	8,760	0.01	0.06
SO_2	0.6	lb/10^6 scf	AP-42 Chapter 1.4	2.00	1,050	8,760	<0.01	<0.01
CO_2	53.06	kg CO_2 / MMBtu	40 CFR Subpart C	2.00	1,050	8,760	233.95	1024.72
CH_4	0.001	kg CO_2 / MMBtu	40 CFR Subpart C	2.00	1,050	8,760	<0.01	0.02
N_2O	0.0001	kg CO_2 / MMBtu	40 CFR Subpart C	2.00	1,050	8,760	<0.01	<0.01
Total HAPs							<0.01	0.02
Total CO_2e							234.20	1025.78

Notes:

-Emission rates displayed above represent the max. hourly and max. annual emissions for one line heater. Cumulative emission rates for all 7 line heaters are diplayed in the Total Site Emissions Table.

-Greenhouse Gas Emissions are calculated using 40 CFR 98 Subpart C Table C-1 and C-2 emission factors.

-AP-42, Chapter 1.4 references are from the July 1998 revision.

-Max. Annual Emissions based upon Max. Hourly Emissions @ 8760 hr/yr.

-CO_2 equivalency solved for using Global Warming Potentials found in 40CFR98 Table A-1 (Updated January 2014). GWP CO_2=1, GWP CH_4=25, GWP N_2O=298

Example Equations:

Max. Hourly Emission Rate **(lb/hr) =** Emission Factor **(lb/10^6 scf) ÷** Heating Value of Natural Gas **(Btu/scf)** x Boiler Rating (**MMBtu/hr)**

Moundsville (MND) 6 Production Site

4.0 MMBtu/hr Line Heaters

Line Heaters BAP0801, BAP0802

Pollutant	Emission Factor	Emission Factor Units	Emission Factor Basis / Source	Boiler Rating (MMBtu/hr)	Heat Value of Natural Gas (Btu/scf)	Annual Operating Hours	Max. Hourly Emissions. (lb/hr)	Max. Annual Emissions. (tpy)
VOC's	5.5	lb/10^6 scf	AP-42 Chapter 1.4	4.00	1,050	8,760	0.02	0.09
Hexane	1.8	lb/10^6 scf	AP-42 Chapter 1.4	4.00	1,050	8,760	<0.01	0.03
Formaldehyde	0.1	lb/106 scf	AP-42 Chapter 1.4	4.00	1,050	8,760	<0.01	<0.01
Benzene	0.0021	lb/10^6 scf	AP-42 Chapter 1.4	4.00	1,050	8,760	<0.01	<0.01
Toluene	0.0034	lb/10^6 scf	AP-42 Chapter 1.4	4.00	1,050	8,760	<0.01	<0.01
Pb	0.0005	lb/10^6 scf	AP-42 Chapter 1.4	4.00	1,050	8,760	<0.01	<0.01
CO	84	lb/10^6 scf	AP-42 Chapter 1.4	4.00	1,050	8,760	0.32	1.40
NOx	100	lb/10^6 scf	AP-42 Chapter 1.4	4.00	1,050	8,760	0.38	1.67
$PM_{Filterable}$	1.9	lb/10^6 scf	AP-42 Chapter 1.4	4.00	1,050	8,760	<0.01	0.03
$PM_{Condensable}$	5.7	lb/10^6 scf	AP-42 Chapter 1.4	4.00	1,050	8,760	0.02	0.10
PM_{Total}	7.6	lb/10^6 scf	AP-42 Chapter 1.4	4.00	1,050	8,760	0.03	0.13
SO_2	0.6	lb/10^6 scf	AP-42 Chapter 1.4	4.00	1,050	8,760	<0.01	0.01
CO_2	53.06	kg CO_2 / MMBtu	40 CFR Subpart C	4.00	1,050	8,760	467.91	2049.44
CH_4	0.001	kg CO_2 / MMBtu	40 CFR Subpart C	4.00	1,050	8,760	<0.01	0.04
N_2O	0.0001	kg CO_2 / MMBtu	40 CFR Subpart C	4.00	1,050	8,760	<0.01	<0.01
Total HAPs							<0.01	0.03
Total CO_2e							468.39	2051.56

Notes:

-Emission rates displayed above represent the max. hourly and max. annual emissions for one line heater. Cumulative emission rates for both line heaters are diplayed in the Total Site Emissions Table.

-Greenhouse Gas Emissions are calculated using 40 CFR 98 Subpart C Table C-1 and C-2 emission factors.

-AP-42, Chapter 1.4 references are from the July 1998 revision.

˙Max. Annual Emissions based upon Max. Hourly Emissions @ 8760 hr/yr.

-CO_2 equivalency solved for using Global Warming Potentials found in 40CFR98 Table A-1 (Updated January 2014). GWP CO_2=1, GWP CH_4=25, GWP N_2O=298

Example Equations:

Max. Hourly Emission Rate **(lb/hr) =** Emission Factor **(lb/10^6 scf)** ÷ Heating Value of Natural Gas **(Btu/scf)** x Boiler Rating (**MMBtu/hr)**

Moundsville (MND) 6 Production Site
Fuel Cell

Source ID Number	7S-FC	
Equipment ID	ARP500	
Equipment Usage	Remote Power System	
Equipment Make	Acumentrics	
Equipment Model	Propane	
Serial Number	TBD	
Installation Date	NEW CONST.	
Emission Controls	None	
Fuel Heating Value	21564	Btu/gal
Design Heat Rate*	2156.4	Btu/hr
Site Heat Rate*	0.0022	MMBtu/hr
Potential Operation	8760	hr/yr
Potential Fuel Usage	2.4	gal/day

Potential Emissions

Pollutant	Emission Factor (lb/10^3 gal)	Hrs of Operation (hrs/yr)	Estimated Emissions (lb/hr)	Estimated Emissions (tpy)	Source of Emission Factor
NOx	13.00	8760	<0.01	<0.01	AP-42[1]
CO	7.50	8760	<0.01	<0.01	AP-42[1]
VOC	1.00	8760	<0.01	<0.01	AP-42[1]
SO2	0.10	8760	<0.01	<0.01	AP-42[1]
PM_{Total}	0.70	8760	<0.01	<0.01	AP-42[1]
PM_{Con}	0.50	8760	<0.01	<0.01	AP-42[1]
PM_{Filt}	0.20	8760	<0.01	<0.01	AP-42[1]
CO_2	12500.00	8760	1.25	5.48	AP-42[1]
CH_4	0.20	8760	<0.01	<0.01	AP-42[1]
CO_2e			1.25	5.48	

[1] EPA AP-42, Volume I, Fifth Edition - July 2008, Table 1.5-1, Emission Factors for LPG Combustion

Noble Energy, Inc; MND 6 Production Site

Pump Detail Sheet

Source ID Number	10S-PUMP	
Equipment ID	P-0001	
Equipment Usage	Well Unloading Pump	
Equipment Make	Sandpiper	
Equipment Model	G20	
Serial Number	Unknown	
Installation Date	06/25/17	
Pump Design Rate	20.00	scf/min
Potential Operation	730	hours/yr
Control Efficiency	98.00%	%

Potential Emissions

Pollutant	wt frac	Estimated Uncontrolled Emissions (lb/hr)	Estimated Uncontrolled Emissions (tpy)	Source of Emission Factor	Control
VOC	**1.20E-01**	**0.38**	**0.14**	HYSYS	8S-FL
Benzene	7.90E-06	0.00	0.00	HYSYS	8S-FL
Toluene	1.38E-05	0.00	0.00	HYSYS	8S-FL
Ethylbenzene	1.02E-06	0.00	0.00	HYSYS	8S-FL
Xylene	6.95E-06	0.00	0.00	HYSYS	8S-FL
n-Hexane	2.37E-03	0.01	0.00	HYSYS	8S-FL
Total HAPs	**2.40E-03**	**0.01**	**0.00**	HYSYS	8S-FL
CH_4	6.70E-01	2.12	0.774	HYSYS	8S-FL
CO_2	1.09E-03	0.00	0.001	HYSYS	8S-FL
CO_2e		53.02	19.351	40CFR98	

Controlled Emissions

Pollutant	wt frac	Estimated Uncontrolled Emissions (lb/hr)	Estimated Uncontrolled Emissions (tpy)	Source of Emission Factor	Control
VOC		**0.01**	**0.00**	HYSYS	8S-FL
Benzene		0.00	0.00	HYSYS	8S-FL
Toluene		0.00	0.00	HYSYS	8S-FL
Ethylbenzene		0.00	0.00	HYSYS	8S-FL
Xylene		0.00	0.00	HYSYS	8S-FL
n-Hexane		0.00	0.00	HYSYS	8S-FL
Total HAPs		**0.00**	**0.00**	HYSYS	8S-FL
CH_4		0.04	0.015	HYSYS	8S-FL
CO_2		0.00	0.000	HYSYS	8S-FL
CO_2e		1.06	0.387	40CFR98	

Noble Energy, Inc; MND 6 Production Site

Well Unloading Sheet

Source ID Number	MBD-0001	
Equipment ID	Well Unloading Knockout	
Equipment Usage	Well Blowdowns	
Equipment Make		
Equipment Model		
Serial Number		
Installation Date	06/25/17	
Number of Wells	8	
Potential Operation	730	hours/yr
Control Efficiency	98.00%	%

Potential Emissions

Pollutant	wt frac	Estimated Uncontrolled Emissions (lb/hr)	Estimated Uncontrolled Emissions (tpy)	Source of Emission Factor	Control
VOC	**1.20E-01**	**7414.31**	**2706.22**	HYSYS	8S-FL
Benzene	7.90E-06	0.06	0.02	HYSYS	8S-FL
Toluene	1.38E-05	0.11	0.04	HYSYS	8S-FL
Ethylbenzene	1.02E-06	0.01	0.00	HYSYS	8S-FL
Xylene	6.95E-06	0.05	0.02	HYSYS	8S-FL
n-Hexane	2.37E-03	18.36	6.70	HYSYS	8S-FL
Total HAPs	**2.40E-03**	**18.59**	**6.79**	HYSYS	8S-FL
CH_4	6.70E-01	5191.58	1894.93	HYSYS	8S-FL
CO_2	1.09E-03	8.49	3.10	HYSYS	8S-FL
CO_2e		129798.09	47376.30	40CFR98	

Controlled Emissions

Pollutant		Estimated Controlled Emissions (lb/hr)	Estimated Controlled Emissions (tpy)	Source of Emission Factor	Control
VOC		**148.29**	**54.12**	HYSYS	8S-FL
Benzene		0.00	0.00	HYSYS	8S-FL
Toluene		0.00	0.00	HYSYS	8S-FL
Ethylbenzene		0.00	0.00	HYSYS	8S-FL
Xylene		0.00	0.00	HYSYS	8S-FL
n-Hexane		0.37	0.13	HYSYS	8S-FL
Total HAPs		**0.37**	**0.14**	HYSYS	8S-FL
CH_4		103.83	37.899	HYSYS	8S-FL
CO_2e		2595.96	947.526	40CFR98	

Moundsville (MND) 6 Production Site

Tanks ABJ-0011 - ABJ-0014

Tank Flashing Emissions

Potential Produced Water Production (bbl/day)	3200
Potential Produced Water Production (bbl/yr)	1,168,000
Gas to Oil Ratio (GOR)	2.35

Potential Emissions

Pollutant	Emission Factor (lb/bbl)	Hours of Operation (hrs/yr)	Estimated Uncontrolled Emissions			Source of Emission Factor
			(lb/hr)	(tpy)	(lb/yr)	
VOCs	1.85E-02	8760	2.47	10.82	21646.25	Flash Gas Analysis
Benzene	1.20E-04	8760	0.02	0.07	140.72	Flash Gas Analysis
Ethylbenzene	1.35E-05	8760	0.00	0.01	15.81	Flash Gas Analysis
Toluene	2.40E-04	8760	0.03	0.14	279.87	Flash Gas Analysis
Xylene	1.91E-04	8760	0.03	0.11	222.95	Flash Gas Analysis
n-Hexane	9.77E-04	8760	0.13	0.57	1141.61	Flash Gas Analysis
Total HAPs	1.54E-03	8760	0.21	0.90	1800.96	Flash Gas Analysis
CO_2	5.09E-03	8760	0.68	2.97	5948.37	Flash Gas Analysis
CH_4	6.99E-02	8760	9.32	40.82	81639.11	Flash Gas Analysis
CO_2e	N/A	8760	233.67	1023.46	2046926.08	N/A

Pollutant	Emission Factor (lb/bbl)	Hours of Operation (hrs/yr)	Estimated Controlled Emissions			Source of Emission Factor
			(lb/hr)	(tpy)	(lb/yr)	
VOCs	1.85E-02	8760	0.05	0.22	432.93	Flash Gas Analysis
Benzene	1.20E-04	8760	0.00	0.00	2.81	Flash Gas Analysis
Ethylbenzene	1.35E-05	8760	0.00	0.00	0.32	Flash Gas Analysis
Toluene	2.40E-04	8760	0.00	0.00	5.60	Flash Gas Analysis
Xylene	1.91E-04	8760	0.00	0.00	4.46	Flash Gas Analysis
n-Hexane	9.77E-04	8760	0.00	0.01	22.83	Flash Gas Analysis
Total HAPs	1.54E-03	8760	0.00	0.02	36.02	Flash Gas Analysis
CO_2	5.09E-03	8760	0.01	0.06	118.97	Flash Gas Analysis
CH_4	6.99E-02	8760	0.19	0.82	1632.78	Flash Gas Analysis
CO_2e	N/A	8760	4.67	20.47	40938.52	N/A

[1]Emissions only from tank flashing losses

[2]Emission Factor Calculation: **(lb/bbl)** = GOR **(scf/bbl)** * Ideal Gas Law Conversion Factor **(1 lbmol/379.3 scf)** * MW of gas **(lb gas/lbmol)** * Pollutant **(lb pollutant/lb gas)**

[3]CO_2 equivalency solved for using Global Warming Potentials found in 40CFR98 Table A-1 (Updated January 2014). GWP CO_2=1, GWP CH_4=25, GWP N_2O=298

[4]GOR from Sand Hill 8J - Flash Liberation of Separator Water FESCO Analysis

Noble Energy, Inc; MND 6 Production Facility
Tank Working and Breathing Emissions Detail Sheet

Potential Produced Water Production (bbl/yr) 1,168,000

HAP Speciation		
BTEX	3.05% wt% of VOC	Based on FESCO PW study; ratio of lb BTEX/bbl to lb VOC/bbl of PW
Total HAPs	8.32% wt% of VOC	
GHG Speciation		
Methane	377.15%	Based on FESCO PW study; ratio of lb GHG/bbl to lb VOC/bbl of PW
Carbon Dioxide	27.48%	Based on FESCO PW study; ratio of lb GHG/bbl to lb VOC/bbl of PW

Pollutant	Losses (lbs/yr)[1]			Losses (tpy)		
	Working Loss	Breathing Loss	Total Emissions	Working Loss	Breathing Loss	Total Emissions
VOCs	1037.62	26.05	1063.67	0.52	0.01	0.53
HAPs	86.33	2.17	88.50	0.04	0.00	0.04
CH_4	3913.40	98.25	4011.64	1.96	0.05	2.01
CO_2	285.14	7.16	292.30	0.14	0.00	0.15
CO_2e	98120.05	2463.36	100583.40	49.06	1.23	50.29

[1]Losses calculated in MND 6 EPA TANKS 4.0.9d report

Noble Energy, Inc; MND 6 Production Facility
Produced Water Truck Loadout

Source Description	Produced Water Truck Loadout		
Source Usage	Produced Water Truck Loadout		
Potential operation	8,760		
Capture Efficiency	70%		
Control Efficiency	98%		
HAP Speciation			
BTEX	3.05%	wt% of VOC	Based on FESCO PW study; ratio of lb BTEX/bbl to lb VOC/bbl of PW
Total HAPs	8.32%	wt% of VOC	
GHG Speciation			
Methane	377.15%		Based on FESCO PW study; ratio of lb GHG/bbl to lb VOC/bbl of PW
Carbon Dioxide	27.48%		Based on FESCO PW study; ratio of lb GHG/bbl to lb VOC/bbl of PW

Potential Emissions

Pollutant	EPA S Factor	True VP of Liquid (psia)	Mol. Wt. of Vapors[4] (lb/lb-mol)	T of Liquid[5] (R)	Oil Volume (bbl/yr)[2]	Estimated Emissions (lb/1000 gal)	Estimated Emissions (lb/hr)	Estimated Emissions (tpy)	Source of Emission Factor	Notes
VOC	0.6	5.20	66.00	518	11,680	4.95	0.08	0.36	AP-42[1]	ATMOSPHERE
HAPs							0.01	0.03	AP-42[1]	ATMOSPHERE
CH_4							0.31	1.37	AP-42[1]	ATMOSPHERE
CO_2							0.02	0.10	AP-42[1]	ATMOSPHERE
CO2e							7.87	34.45	AP-42[1]	ATMOSPHERE
VOC	0.6	5.20	66.00	518	11,680	4.95	0.19	0.85	AP-42[1]	To VDU
HAPs							0.00	0.07	AP-42[1]	To VDU
CH_4							0.73	3.21	AP-42[1]	To VDU
CO_2							0.05	0.23	AP-42[1]	To VDU
CO2e							18.35	80.39	AP-42[1]	To VDU
VOC	0.6	5.20	66.00	518	11,680	4.95	0.00	0.02	AP-42[1]	Controlled
HAPs							0.00	0.00	AP-42[1]	Controlled
CH_4							0.01	0.06	AP-42[1]	Controlled
CO_2							0.00	0.00	AP-42[1]	Controlled
CO2e							0.37	1.61	AP-42[1]	Controlled

[1] EPA AP-42, Volume I, Fifth Edition - January 1995, Table 5.2-1, Saturation (S) Factors for Calculating Petroleum Liquid Loading Losses

[2]The oil volume for this calculation assumes that 1.0% of the produced water volume is oil.

[3]EPA AP-42, Volume I, Fifth Edition - January 1995, Section 5.2.2.1.1. Assumes a minimum collection efficiency of 70%.

[4]Molecular Weight of Vapors and True VP of Liquid comes from TANKS4.0.9 Gasoline RVP 10 properties

[5]Temperature comes from TANKS 4.0.9d Emission Report

Noble Energy, Inc; MND 6 Production Site
Enclosed Flare Detail Sheet

Source ID Number	6S-COMB	
Equipment ID	EAW-0002	
Equipment Usage	Vapor Combustor	
Equipment Make	Leed	
Equipment Model		
Serial Number	Unknown	
Installation Date	06/25/17	
Emission Controls	None	
Pilot		
Fuel Heating Value	1950	Btu/scf
Design Heat Rate	0.02	MMBtu/hr
Site Heat Rate	0.02	MMBtu/hr
Potential Operation	365	days/yr
Potential Fuel Usage	**0.18**	Mscf/day

Truck Loading Emissions & Tank Emissions

	VOC		HAPs		CH_4		CO_2		CO_2e	
Produced Water Tanks - Flashing	10.82	tpy VOC	0.90	tpy HAPs	40.82	tpy CH4	2.97	tpy CO2	1023.46	tpy CO2e
Produced Water Tanks - W&B	0.53	tpy VOC	0.04	tpy HAPs	2.01	tpy CH4	0.15	tpy CO2	50.29	tpy C02e
Liquids Unloading	0.85	tpy VOC	0.07	tpy HAPs	3.21	tpy CH4	0.23	tpy C02	80.39	tpy C02e
Total Uncontrolled Emissions	12.21	tpy VOC	1.02	tpy HAPs	46.03	tpy CH4	3.35	tpy C02	1154.15	tpy C02e
Control Efficiency	0.98		0.98		0.98					
Controlled Emissions	0.24	tpy VOC	0.02	tpy HAPs	0.92	tpy CH4				

Combustion		
Molecular Weight of Vapors		lb/lb-mol
Fuel Heating Value	1950	Btu/scf
Potential Heat Output	10.8	MMBtu/hr
VOC Vapors sent to flare	24410.3	lbs/yr
Potential Operation	365	days/yr
Ave. Gas Flared	144.000	Mscf/day

9S-PILOT1
Combustor Pilot Emissions

Pollutant	Emission Factor lb/MMSCF	Annual gas Usage MMSCF/yr	Hrs of Operation (hrs/yr)	Estimated Emissions (lb/hr)	Estimated Emissions Pilot tpy	Source of Emission Factor
NOx	100	0.07	8760	0.00	0.00	AP-42[2]
CO	84	0.07	8760	0.00	0.00	AP-42[2]
PM10	8	0.07	8760	0.00	0.00	AP-42[2]
VOC	6	0.07	8760	0.00	0.00	AP-42[2]
N_2O	1.0	0.07	8760	0.00	0.00	API
SO_2	0.6	0.07	8760	0.00	0.00	AP-42[2]
Hexane	1.8	0.07	8760	0.00	0.00	AP-42[2]
Formaldehyde	0.1	0.07	8760	0.00	0.00	AP-42[2]
CO_2	120,000	0.07	8760	0.92	4.04	AP-42[2]

Potential Combustion Emissions

Pollutant	Emission Factor lb/MMBtu	Annual gas Usage MMBtu/yr	Estimated Emissions tpy	Emission Factor Source
NOx	0.068	94608	3.22	AP-42[1]
CO	0.370	94608	17.50	AP-42[1]
PM10	0.004	94608	0.18	AP-42[2]
N_2O	0.001	94608	0.05	API
SO_2	0.000	94608	0.01	AP-42[2]
Formaldehyde	0.000	94608	0.00	AP-42[2]
CO2	117.6	94608	5565.18	AP-42[1]

Total Potential Vapor Combustor Emissions

Pollutant	tpy	lb/hr
NOx	3.22	0.74
CO	17.51	4.00
PM10	0.18	0.04
VOC	0.24	0.06
HAPs	0.02	0.01
N_2O	0.05	0.01
SO_2	0.01	0.003
CH_4	0.92	0.210
CO_2	5572.57	1272.28
CO_2e	5609.42	1280.69

[1] EPA AP-42, Volume I, Fifth Edition - April 2015, Table 13.5-1, Emission Factors for Flare Operations.

[2] EPA AP-42, Volume I, Fifth Edition - September 1991, Table 1.4, Emission Factors for Natural Gas Combustion

$$E_{n,CH_4}(un-combusted) = V_n * (1-\eta) * X_{CH_4} \qquad \text{(Eq. W-19}$$

$$E_{n,CO2}(un-combusted) = V_n * X_{CO2} \qquad \text{(Eq. W-20}$$

$$E_{n,CO2}(combusted) = \sum_{i=1}^{x} (\eta * V_n * Y_i * R_i) \qquad \text{(Eq. W-21}$$

Noble Energy, Inc; MND 6 Production Site
Flare Detail Sheet

Source ID Number	8S-FL
Equipment ID	EAW-0001
Equipment Usage	Well Unloading Control
	Well Unloading Pump Control
Equipment Make	NOV
Equipment Model	Produced Gas Flare
Serial Number	Unknown
Installation Date	06/25/17

Pilot

Fuel Heating Value	1350	Btu/scf
Design Heat Rate	0.26	MMBtu/hr
Site Heat Rate	0.26	MMBtu/hr
Potential Operation	365	days/yr
Potential Fuel Usage	4.693	Mscf/day

Well Blowdown Emissions

	VOC		HAPs			CH_4			CO_2			CO_2e		
Unloading Vessel	2706.22	tpy	6.79	tpy		1894.93	tpy		3.10	tpy		47376.30	tpy	
Diaphragm Pump	0.14	tpy	0.00	tpy		0.77	tpy		0.00	tpy		19.35	tpy	
Total Emissions	2706.36	tpy UNCONTROLLED	6.79	tpy	UNCONTROLLED	1895.70	tpy	UNCONTROLLED	3.10	tpy	UNCONTROLLED	47395.66	tpy	UNCONTROLLED
	14829.37	lb/hr UNCONTROLLED	37.20	lb/hr	UNCONTROLLED	10387.41	lb/hr	UNCONTROLLED	16.98	lb/hr	UNCONTROLLED	259702.22	lb/hr	UNCONTROLLED
Control Efficiency	98%		98%			98%								
Controlled Emissions	54.13	tpy CONTROLLED	0.14	tpy	CONTROLLED	37.91	tpy	CONTROLLED						
	296.59	lb/hr CONTROLLED	0.74	lb/hr	CONTROLLED	207.75	lb/hr	CONTROLLED						

Fuel Heating Value	1350.000	Btu/scf
Potential Heat Output	78.000	MMBtu/hr
VOC Vapors sent to flare	5412721.9	lbs/yr
Potential Operation	30.4	days/yr
MAX. Gas Flared	1050.000	Mscf/day

Flare Pilot Emissions

Pollutant	Emission Factor lb/MMSCF	Annual gas Usage MMSCF/yr	Hrs of Operation (hrs/yr)	Estimated Emissions (lb/hr)	Estimated Emissions Pilot tpy	Source of Emission Factor
NOx	100.0	1.71	8760	0.02	0.09	AP-42[2]
CO	84.0	1.71	8760	0.02	0.07	AP-42[2]
PM_{10}	7.6	1.71	8760	0.00	0.01	AP-42[2]
VOC	5.5	1.71	8760	0.00	0.00	AP-42[2]
N_2O	1.0	1.71	8760	0.00	0.00	API
SO_2	0.6	1.71	8760	0.00	0.00	AP-42[2]
Hexane	1.8	1.71	8760	0.00	0.00	AP-42[2]
Formaldehyde	0.1	1.71	8760	0.00	0.00	AP-42[2]
CO_2	120000.0	1.71	8760	23.47	102.78	AP-42[2]

Flare Combustion Emissions

Pollutant	Emission Factor lb/MMBtu	Usage MMBtu/hr	Hrs of Operation (hrs/yr)	Estimated Emissions lb/hr	Estimated Emissions tpy	Emission Factor Source
NOx	0.068	78.00	730	5.30	1.94	AP-42[1]
CO	0.370	78.00	730	28.86	10.53	AP-42[1]
PM_{10}	0.006	78.00	730	0.44	0.16	AP-42[2]
SO_2	0.000	78.00	730	0.03	0.01	AP-42[2]
N_2O	0.001	78.00	730	0.06	0.02	API
Formaldehyde	0.000	78.00	730	0.00	0.00	AP-42[2]
CO_2	88.889	78.00	730	6933.33	2530.67	AP-42[1]

Total Potential Vapor Combustor Emissions

Pollutant	tpy	lb/hr
NOx	2.02	5.32
CO	10.61	28.88
PM10	0.17	0.44
SO_2	0.01	0.04
VOC	54.13	296.59
HAPs	0.14	0.75
N_2O	0.02	0.06
CH_4	37.91	207.75
CO_2	2636.55	6973.78
CO_2e	3590.94	12184.76

[1] EPA AP-42, Volume I, Fifth Edition - April 2015, Table 13.5-1, Emission Factors for Flare Operations.

[2] EPA AP-42, Volume I, Fifth Edition - September 1991, Table 1.4, Emission Factors for Natural Gas Combustion

$$E_{ex(n)}\left(un-combusted\right)=V_g*\left(1-\eta\right)*X_{CH4} \quad \text{(Eq. W-19)}$$

$$E_{ex(0)}\left(un-combusted\right)=V_g*X_{CO2} \quad \text{(Eq. W-20)}$$

$$E_{ex(i)}\left(combusted\right)=\sum_{j=1}^{5}\left(\eta*V_g*Y_j*R_j\right) \quad \text{(Eq. W-21)}$$

Noble Energy, Inc; MND 6 Production Site
Pneumatic Controllers

Equipment ID	**11S-FC1-9, 13S-BP**	
Equipment Usage	Flow Control / Back Pressure	
Equipment Make	Fischer Control	
Equipment Model	DVC 6200	
Emission Controls	None	
Equipment Count	10	
Design Flow*	6.00	SCFH
Potential Operation	8760	hr/yr
Service	NG	

Equipment ID	**12S-LC1-18**	
Equipment Usage	Separator Level Control	
Equipment Make	KIMRAY	
Equipment Model	GEN II level Controllers	
Emission Controls	None	
Equipment Count	18	
Design Flow*	0.02	SCFH
Potential Operation	8760	hr/yr
Service	NG	

Potential Emissions 11S-FC1-9

Pollutant	**% of Gas**	**Emission Factor (lb/SCF)**	**Hrs of Operation (hrs/yr)**	**Estimated Emissions**		**Source of Emission Factor**
				(lb/hr)	**(tpy)**	
VOC	1.20E-01	0.06	8760	0.39	1.72	Manufacturer Factor
n-Hexane	2.37E-03			0.01	0.03	Manufacturer Factor
Benzene	7.90E-06			0.00	0.00	Manufacturer Factor
Toluene	1.38E-05			0.00	0.00	Manufacturer Factor
Ethylbenzene	1.02E-06			0.00	0.00	Manufacturer Factor
Xylenes	6.95E-06			0.00	0.00	Manufacturer Factor
Total HAPs	2.40E-03		8760	0.01	0.03	Manufacturer Factor
CH4	6.70E-01			2.21	9.66	Manufacturer Factor
CO_2	1.09E-03			0.00	0.02	Manufacturer Factor
CO_{2e}				55.14	241.49	40CFR98

Potential Emissions 13S-BP

Pollutant	% of Gas	Emission Factor (lb/SCF)	Hrs of Operation (hrs/yr)	Estimated Emissions (lb/hr)	Estimated Emissions (tpy)	Source of Emission Factor
VOC	1.20E-01	0.06	8760	0.04	0.19	Manufacturer Factor
n-Hexane	2.37E-03			0.00	0.00	Manufacturer Factor
Benzene	7.90E-06			0.00	0.00	Manufacturer Factor
Toluene	1.38E-05			0.00	0.00	Manufacturer Factor
Ethylbenzene	1.02E-06			0.00	0.00	Manufacturer Factor
Xylenes	6.95E-06			0.00	0.00	Manufacturer Factor
Total HAPs	2.40E-03		8760	0.00	0.00	Manufacturer Factor
CH_4	6.70E-01			0.25	1.07	Manufacturer Factor
CO_2	1.09E-03			0.00	0.00	Manufacturer Factor
CO_2e				6.13	26.83	40CFR98

Potential Emissions 12S-LC1-18

Pollutant	% of VOC	Emission Factor (lb/SCF)	Hrs of Operation (hrs/yr)	Estimated Emissions (lb/hr)	Estimated Emissions (tpy)	Source of Emission Factor
VOC	1.20E-01	0.06	8760	0.00	0.01	Manufacturer Factor
n-Hexane	2.37E-03			0.00	0.00	Manufacturer Factor
Benzene	7.90E-06			0.00	0.00	Manufacturer Factor
Toluene	1.38E-05			0.00	0.00	Manufacturer Factor
Ethylbenzene	1.02E-06			0.00	0.00	Manufacturer Factor
Xylenes	6.95E-06			0.00	0.00	Manufacturer Factor
Total HAPs	2.40E-03		8760	0.00	0.00	Manufacturer Factor
CH_4	6.70E-01			0.01	0.05	Manufacturer Factor
CO_2	1.09E-03			0.00	0.00	Manufacturer Factor
CO_2e				0.31	1.34	40CFR98

Total Pneumatic Potential Emissions

Pollutant	Estimated Emissions	
	(lb/hr)	(tpy)
VOC	0.44	1.93
n-Hexane	<0.01	0.04
Benzene	<0.01	<0.01
Toluene	<0.01	<0.01
Ethylbenzene	<0.01	<0.01
Xylenes	<0.01	<0.01
Total HAPs	<0.01	0.04
CH_4	2.46	10.79
CO_2	<0.01	0.02
CO_2e	61.57	269.67

Fugitive Emissions from Unpaved Haul Roads

Constant	Industrial Roads		
	PM	PM-10	PM-2.5
k (lb/VMT)	4.9	1.5	0.15
a	0.7	0.9	0.9
b	0.45	0.45	0.45

where

k		Patricle size multiplier[1]
s	4.8	Silt content of road surface material (%)
p	150	Number of days per year with precipitation

Item Number	Description	Number of Wheels	W 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 (%)	PM Emissions (lbs/hr)	PM Emissions (tons/yr)	PM-10 Emissions (lbs/hr)	PM-10 Emissions (tons/yr)	PM-2.5 Emissions (lbs/hr)	PM-2.5 Emissions (tons/yr)
1	Liquids Hauling	14	30	10	0.25	1	11,680	NA	NA	1.07	6.25	0.27	1.59	0.03	0.16
2	Employee Vehicles	4	3	10	0.25	1	200	NA	NA	0.38	0.04	0.10	0.01	0.01	<0.001
									Totals:	**1.45**	**6.29**	**0.37**	**1.60**	**0.04**	**0.16**

Notes:

[1] - Particle Size Multiplier used from AP-42 13.2.2 - Final Version 11/2006

[2] - Silt Content of Road Surface uses Sand and Gravel Processing Plant Road from AP-42 13.2.2 - Final Version 11/2006

[3] - Number of days per year with precipitation >0.01 in3 found using AP-42 13.2.2 Figure 13.2.2-1 - Final Version 11/2006

Example Calculations:

Emissions (lb/Vehicle Mile Traveled) - $E = k \times (s/12)^a \times (W/3)^b$ Equation 1a from AP-42 13.2.2 - Final Version 11/2006

Size Specific Emissions (lb/VMT) - $E_{ext} = E[(365-p)/365]$ Equation 2 from AP-42 13.2.2 - Final Version 11/2006

Fugitive Leaks

Default Average Component Counts for Major Onshore Natural Gas Production Equipment[1]				
Facility Equipment Type	**Valves**	**Connectors**	**Open-ended Lines**	**Pressure Relief Valves**
Wellheads	8	38	0.5	0
Separators	1	6	0	0
Meters/Piping	12	45	0	0
Compressors	12	57	0	0
In-line Heaters	14	65	0	0
Dehydrators	24	90	0	0

[1]- Table W-1B to 40CFR98 Subpart W

Well Specific Equipment Counts	
Facility Equipment Type	**Count on Site**
Wellheads	8
Separators	7
Meters/Piping	8
Compressors	0
In-line Heaters	9
Dehydrators	0

Gas Composition														
Emissions from Flaring Operations	**Propane**	**Butane**	**Pentanes**	**Heptane**	**Octanes**	**Nonanes**	**Decanes**	**Hexane**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylene**	**CO_2**	**CH_4**
Weight %	5.44	2.66	0.97	0.23	0.21	0.08	0.030	0.63	0.00	0.010	0.002	0.016	0.07	42.61

Fugitive Emissions													
Facility Equipment Type	**Total Count**	**Emission Rate (scf/hr/component)[2]**	**Hours of Operation**	**VOCs (lbs/hr)**	**VOCs (tons/yr)**	**HAPs (lbs/hr)**	**HAPs (tons/yr)**	**CO_2 (lbs/hr)**	**CO_2 (tons/yr)**	**CH_4 (lbs/hr)**	**CH_4 (tons/yr)**	**Total CO_2e (lbs/hr)**	**Total CO_2e (tons/yr)**
Valves	293	0.027	8760	0.21	0.94	0.014	0.06	0.001	0.006	0.89	3.90	22.24	97.40
Connectors	1291	0.003	8760	0.10	0.46	0.007	0.03	<0.001	0.003	0.44	1.91	10.89	47.68
Open-ended Lines	4	0.06	8760	0.01	0.03	<0.001	0.002	<0.001	<0.001	0.03	0.12	0.69	3.00
Pressure Relief Valves	9	0.04	8760	0.010	0.04	<0.001	0.003	<0.001	<0.001	0.04	0.18	1.01	4.43
			Total Emissions:	**0.34**	**1.47**	**0.02**	**0.10**	**<0.01**	**0.01**	**1.39**	**6.10**	**34.82**	**152.52**

[2]- Table W-1A to 40CFR98 Subpart W

Notes:
-Gas Composition data taken from attached HYSYS run

Example Equations:
Fugitive Emissions (lb/hr) = Count x Emission Rate x Hours of Operation ÷ 379 scf/lb x Weight % pollutant

Total MND 6 Site Emission Levels

	VOCs		HAPs		CO		NO_x		PM (Total)		PM (Filterable)		PM (Condensable)		SO_2		CO_2		CH_4		N_2O		CO_2e	
Emission Sources	**lb/hr**	**tons/yr**	**lb/hr**	**tons/yr**	**lb/hr**	**tons/yr**	**lb/hr**	**tons/yr**	**lb/hr**	**tons/yr**	**lb/hr**	**tons/yr**	**lb/hr**	**tons/yr**	**lb/hr**	**tons/yr**	**lb/hr**	**tons/yr**	**lb/hr**	**tons/yr**	**lb/hr**	**tons/yr**	**lb/hr**	**tons/yr**
Line Heater BAP-0101	0.01	0.05	<0.01	0.02	0.16	0.70	0.19	0.83	0.01	0.06	<0.01	0.02	0.01	0.05	<0.01	<0.01	233.95	1024.72	<0.01	0.02	<0.01	<0.01	234.20	1025.78
Line Heater BAP-0201	0.01	0.05	<0.01	0.02	0.16	0.70	0.19	0.83	0.01	0.06	<0.01	0.02	0.01	0.05	<0.01	<0.01	233.95	1024.72	<0.01	0.02	<0.01	<0.01	234.20	1025.78
Line Heater BAP-0301	0.01	0.05	<0.01	0.02	0.16	0.70	0.19	0.83	0.01	0.06	<0.01	0.02	0.01	0.05	<0.01	<0.01	233.95	1024.72	<0.01	0.02	<0.01	<0.01	234.20	1025.78
Line Heater BAP-0401	0.01	0.05	<0.01	0.02	0.16	0.70	0.19	0.83	0.01	0.06	<0.01	0.02	0.01	0.05	<0.01	<0.01	233.95	1024.72	<0.01	0.02	<0.01	<0.01	234.20	1025.78
Line Heater BAP-0501	0.01	0.05	<0.01	0.02	0.16	0.70	0.19	0.83	0.01	0.06	<0.01	0.02	0.01	0.05	<0.01	<0.01	233.95	1024.72	<0.01	0.02	<0.01	<0.01	234.20	1025.78
Line Heater BAP-0601	0.01	0.05	<0.01	0.02	0.16	0.70	0.19	0.83	0.01	0.06	<0.01	0.02	0.01	0.05	<0.01	<0.01	233.95	1024.72	<0.01	0.02	<0.01	<0.01	234.20	1025.78
Line Heater BAP-0701	0.01	0.05	<0.01	0.02	0.16	0.70	0.19	0.83	0.01	0.06	<0.01	0.02	0.01	0.05	<0.01	<0.01	233.95	1024.72	<0.01	0.02	<0.01	<0.01	234.20	1025.78
Line Heater BAP-0801	0.02	0.09	<0.01	0.03	0.32	1.40	0.38	1.67	0.03	0.13	<0.01	0.03	0.02	0.10	<0.01	0.01	467.91	2049.44	<0.01	0.04	<0.01	<0.01	468.39	2051.56
Line Heater BAP-0802	0.02	0.09	<0.01	0.03	0.32	1.40	0.38	1.67	0.03	0.13	<0.01	0.03	0.02	0.10	<0.01	0.01	467.91	2049.44	<0.01	0.04	<0.01	<0.01	468.39	2051.56
Fuel Cell	<0.01	<0.01	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.25	5.48	<0.01	<0.01	--	--	1.25	5.48
Flare EAW-0002 (10.8 MMBtu/hr)	0.06	0.24	<0.01	0.02	4.00	17.51	0.74	3.22	0.04	0.18	0.04	0.18	--	--	0.00	0.01	1272.28	5572.57	0.21	0.92	0.01	0.05	1280.69	5609.42
Flare EAW-0001 (78.0 MMBtu/hr)	296.59	54.13	0.75	0.14	28.88	10.61	5.32	2.02	0.44	0.17	0.44	0.17	--	--	0.04	0.01	6973.78	2636.55	207.75	37.91	0.06	0.02	12184.76	3590.94
Tank Truck Loading Activities	0.08	0.36	0.01	0.03	--	--	--	--	--	--	--	--	--	--	--	--	0.02	0.10	0.31	1.37	--	--	7.87	34.45
Pneumatic Devices	0.44	1.93	<0.01	0.04	--	--	--	--	--	--	--	--	--	--	--	--	<0.01	0.02	2.46	10.79	--	--	61.57	269.67
Haul Roads	--	--	--	--	--	--	--	--	1.45	6.29	1.45	6.29	--	--	--	--	--	--	--	--	--	--	--	--
Fugitives Leaks	0.34	1.47	0.02	0.10	--	--	--	--	--	--	--	--	--	--	--	--	<0.01	0.01	1.39	6.10	--	--	34.82	152.52
Totals	**297.62**	**58.64**	**0.83**	**0.50**	**34.63**	**35.82**	**8.16**	**14.42**	**2.09**	**7.34**	**1.97**	**6.82**	**0.12**	**0.52**	**0.05**	**0.08**	**10820.84**	**19486.64**	**212.18**	**57.31**	**0.07**	**0.09**	**16147.12**	**20946.04**

Total MND 6 Site Emission Levels - HAP Speciation

	Total HAPs		Formaldehyde		Hexane		Benzene		Toluene		Ethylbenzene		Xylene	
Emission Sources	**lb/hr**	**tons/yr**	**lb/hr**	**tons/yr**	**lb/hr**	**tons/yr**	**lb/hr**	**tons/yr**	**lb/hr**	**tons/yr**	**lb/hr**	**tons/yr**	**lb/hr**	**tons/yr**
Line Heater BAP-0101	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Line Heater BAP-0201	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Line Heater BAP-0301	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Line Heater BAP-0401	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Line Heater BAP-0501	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Line Heater BAP-0601	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Line Heater BAP-0701	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Line Heater BAP-0801	<0.01	0.03	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Line Heater BAP-0802	<0.01	0.03	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fuel Cell	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Flare EAW-0002 (10.8 MMBtu/hr)	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Flare EAW-0001 (78.0 MMBtu/hr)	0.75	0.14	<0.01	<0.01	0.37	0.13	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tank Truck Loading Activities	0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pneumatic Devices	<0.01	0.04	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Haul Roads	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fugitives Leaks	0.02	0.10	<0.01	<0.01	0.02	0.09	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Totals	**0.83**	**0.50**	**<0.01**	**<0.01**	**0.43**	**0.43**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	MND-6 PW Tanks ABJ-0011 - ABJ-0014
City:	Charleston
State:	West Virginia
Company:	Noble Energy
Type of Tank:	Vertical Fixed Roof Tank
Description:	PW Water Emissions from Noble Energy's Moundsville 6 (MND-6) production site.

Tank Dimensions

Shell Height (ft):	20.00
Diameter (ft):	12.00
Liquid Height (ft) :	20.00
Avg. Liquid Height (ft):	10.00
Volume (gallons):	16,800.00
Turnovers:	2,920.00
Net Throughput(gal/yr):	49,056,000.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	0.00
Slope (ft/ft) (Cone Roof)	0.06

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Pittsburgh, Pennsylvania (Avg Atmospheric Pressure = 14.11 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

MND-6 PW Tanks ABJ-0011 - ABJ-0014 - Vertical Fixed Roof Tank
Charleston, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Produced Water	All	58.50	49.32	67.67	53.39	0.2521	0.1813	0.3463	19.9123			18.17	
Gasoline (RVP 10)						5.0362	4.1975	6.0042	66.0000	0.0100	0.1307	92.00	Option 4: RVP=10, ASTM Slope=3
Water						0.2427	0.1734	0.3351	18.0200	0.9900	0.8693	18.02	Option 2: A=8.10765, B=1750.286, C=235

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

MND-6 PW Tanks ABJ-0011 - ABJ-0014 - Vertical Fixed Roof Tank
Charleston, West Virginia

Annual Emission Calcaulations	
Standing Losses (lb):	26.0467
Vapor Space Volume (cu ft):	1,144.5450
Vapor Density (lb/cu ft):	0.0009
Vapor Space Expansion Factor:	0.0784
Vented Vapor Saturation Factor:	0.8809
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,144.5450
Tank Diameter (ft):	12.0000
Vapor Space Outage (ft):	10.1200
Tank Shell Height (ft):	20.0000
Average Liquid Height (ft):	10.0000
Roof Outage (ft):	0.1200
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.1200
Roof Height (ft):	0.0000
Roof Slope (ft/ft):	0.0600
Shell Radius (ft):	6.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0009
Vapor Molecular Weight (lb/lb-mole):	19.9123
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2521
Daily Avg. Liquid Surface Temp. (deg. R):	518.1654
Daily Average Ambient Temp. (deg. F):	50.3083
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	513.0583
Tank Paint Solar Absorptance (Shell):	0.6800
Tank Paint Solar Absorptance (Roof):	0.6800
Daily Total Solar Insulation Factor (Btu/sqft day):	1,202.9556
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0784
Daily Vapor Temperature Range (deg. R):	36.6923
Daily Vapor Pressure Range (psia):	0.1650
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2521
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.1813
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.3463
Daily Avg. Liquid Surface Temp. (deg R):	518.1654
Daily Min. Liquid Surface Temp. (deg R):	508.9923
Daily Max. Liquid Surface Temp. (deg R):	527.3385
Daily Ambient Temp. Range (deg. R):	19.1500
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.8809
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.2521
Vapor Space Outage (ft):	10.1200
Working Losses (lb):	1,037.6248
Vapor Molecular Weight (lb/lb-mole):	19.9123
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2521
Annual Net Throughput (gal/yr.):	49,056,000.0000
Annual Turnovers:	2,920.0000
Turnover Factor:	0.1769
Maximum Liquid Volume (gal):	16,800.0000
Maximum Liquid Height (ft):	20.0000
Tank Diameter (ft):	12.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	1,063.6715

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

MND-6 PW Tanks ABJ-0011 - ABJ-0014 - Vertical Fixed Roof Tank
Charleston, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 10)	135.64	3.40	139.05
Water	901.98	22.64	924.63
Produced Water	1,037.62	26.05	1,063.67

Attachment O

Attachment O

Monitoring, Recording, Reporting, and Testing Plans

Noble will comply with all Monitoring, Recording, Reporting, and Testing Requirements reflected in the final Rule 13 permit.

Attachment P

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that Noble Energy, Inc. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a 45CSR13 NSR Construction Permit for the Moundsville 6 (MND 6) natural gas production site located in Proctor, Marshall, West Virginia. The latitude and longitude coordinates are: 39.81750 and -80.79194.

The applicant estimates the potential to discharge the following regulated air pollutants on a facility-wide basis will be:

Carbon Monoxide (CO) = 35.82 tpy
Nitrogen Oxides (NO_x) = 14.42 tpy
Particulate Matter – Total = 7.34 tpy
Sulfur Dioxide (SO_2) = 0.08 tpy
Volatile Organic Compounds (VOC) = 58.64 tpy
Hexane = 0.43 tpy
Hazardous Air Pollutants (HAPs) = 0.50 tpy
Carbon Dioxide Equivalents (CO_2e) = 20,946.04 tpy

Startup of operation is planned to begin on or about the 25th day of June, 2017. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.

Dated this the 27th day of February, 2017.

By: Noble Energy, Inc.
RJ Moses
Operations Manager
1000 Noble Energy Drive
Cannonsburg, PA 15317