Mountain Gathering, LLC
810 Houston Street
Fort Worth, Texas 76102

(817) 870-2800
Fax: (817) 870-8441

September 3, 2015

CERTIFIED MAIL 7014 2870 0000 2303 0296

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

Re: Application for Rule 13 NSR Permit
Lumberport Compressor Station
Harrison County, West Virginia
DAQ Plant ID: 033-00196

To Whom It May Concern:

Attached to this letter is the relocation application for the above mentioned facility that is owned and operated by XTO Energy, Inc. and located in Harrison County, West Virginia. The facility is a compressor station and a natural gas production facility. The facility is being moved from the current location to a well pad site roughly 800 feet due east. The current compressor will be replaced with a CAT G3406 NA compressor engine. The facility consists of (1) well heads, (1) two phase separators, (1) Cat G3406 NA compressor engine, (1) 210 bbl produced water tanks, (1) 100 bbl compressor engine suction scrubber water tank, (1) 100 bbl lube oil tank, (1) truck loading for produced water, (1) truck loading for lube oil, fugitive components, and other equipment typical to a natural gas production facility.
The engine is subject to NSPS JJJJ. The tanks are less than 6 tpy and the pneumatics are all low bleed. None of the equipment at the site is subject to NSPS OOOO.

If you have any questions regarding the information presented in this submittal, please do not hesitate to contact me at (817) 885-2845.

Sincerely,

Dustin Simpson
Environmental Advisor

WV DEP - Division of Air Quality

Lumberport Compressor Station

Harrison County, West Virginia

Rule 13 Consturction/Modification Permit Application

Prepared by:

Dustin Simpson

Environmental Advisor

XTO Energy, Inc.

9/3/2015

Lumberport Compressor Station

Rule 13 NSR Permit Application

Table of Attachments

Section #1	Project Description
Section #2	NSR Permit Application Form
Attachment A	Current Business Certificate
Attachment B	Area Map
Attachment C	Installation and Start Up Schedule
Attachment D	Regulatory Discussion
Attachment E	Plot Plan
Attachment F	Process Flow Diagram
Attachment G	Process Description
Attachment H	MSDS
Attachment I	Emission Unit Table
Attachment J	Emission Points Data Summary Sheet
Attachment K	Fugitive Emissions Data Summary Sheet
Attachment L	Emission Unit Data Sheets
Attachment M	Air Pollution Control Device Sheets
Attachment N	Supporting Emission Calculations
Attachment O	Monitoring/Recordkeeping/Reporting/Testing Plans
Attachment P	Public Notice
Attachment T	Application Fee
Attachment U	Other Supporting Documentation

Section #1
Project Description

Project Description

Lumberport Compressor Station
Harrison County, West Virginia
XTO Energy, Inc.

XTO Energy, Inc. is submitting this Rule 13 NSR permit application for the Lumberport Compressor Station relocation located in Harrison County, West Virginia. The facility is a compressor station and a natural gas production facility. The facility is being moved from the current location to a well pad site roughly 800 feet due east. The current compressor will be replaced with a CAT G3406 NA compressor engine. The facility consists of (1) well heads, (1) two phase separators, (1) Cat G3406 NA compressor engine, (1) 210 bbl produced water tanks, (1) 100 bbl compressor engine suction scrubber water tank, (1) 100 bbl lube oil tank, (1) truck loading for produced water, (1) truck loading for lube oil, fugitive components, and other equipment typical to a natural gas production facility.

The engine is subject to NSPS JJJJ. The tanks are less than 6 tpy and the pneumatics are all low bleed. None of the equipment at the site is subject to NSPS OOOO.

Section #2
NSR Permit Application Form

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):*
XTO Energy, Inc.

75-2347769

3. Name of facility *(if different from above):*
Lumberport Compressor Station

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

5A. Applicant's mailing address:
810 Houston Street

Fort Worth, TX 76102

5B. Facility's present physical address:
NA

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: lease
- If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): compressor location with vertical gas well pad on site

10. North American Industry Classification System **(NAICS)** code for the facility:
21311

11A. DAQ Plant ID No. (for existing facilities only):
033 – 00196

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

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 the intersection of Jones Run Rd and CO Rte6/9, Head North on Co Rte 6/9 for ¼ miles and the entrance will be on the right.

12.B. New site address (if applicable):	12C. Nearest city or town: Lumberport	12D. County: Harrison
12.E. UTM Northing (KM): 4359.98725	12F. UTM Easting (KM): 555.00254	12G. UTM Zone: 17S

13. Briefly describe the proposed change(s) at the facility:
XTO will be adding a new compressor and associated equipment to the current gas well pad at the site. The previous Lumberport Compressor Station will no longer be in use.

14A. Provide the date of anticipated installation or change: 11/1/2015 – 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: 11/5/2015

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 Year52

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
☐ Chemical Processes
☐ Concrete Batch Plant
☐ Grey Iron and Steel Foundry
☒ General Emission Unit, specify compressor engine
☒ Haul Road Emissions
☐ Hot Mix Asphalt Plant
☐ Incinerator
☐ Indirect Heat Exchanger
☐ Quarry
☐ Solid Materials Sizing, Handling and Storage Facilities
☒ Storage Tanks

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
☐ Adsorption Systems
☐ Afterburner
☐ Baghouse
☐ Condenser
☐ Electrostatic Precipitator
☐ Flare
☐ Mechanical Collector
☐ Wet Collecting System
☒ Other Collectors, specify Catalytic Converter

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 Governmental Agency
☐ Authority of Partnership
☐ 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 Nina Hutton *(Please use blue ink)* DATE: 9/3/15 *(Please use blue ink)*

35B. Printed name of signee: Nina Hutton		35C. Title: VP EHS – XTO Energy, Inc.
35D. E-mail: nina_hutton@xtoenergy.com	36E. Phone: 817-885-2274	36F. FAX:
36A. Printed name of contact person (if different from above): Dustin Simpson		36B. Title: Environmental Advisor
36C. E-mail:dustin_simpson@xtoenergy.com	36D. Phone: 817-885-2845	36E. FAX: 817-885-1847

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.

Attachment A
Current Business Certificate

State of West Virginia

Certificate

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

XTO ENERGY INC.

a corporation formed under the laws of Delaware filed an application to be registered as a foreign corporation authorizing it to transact business in West Virginia. The application was found to conform to law and a "Certificate of Authority" was issued by the West Virginia Secretary of State on May 30, 2008.

I further certify that the corporation has not been revoked by the State of West Virginia nor has a Certificate of Withdrawal been issued to the corporation by the West Virginia Secretary of State.

Accordingly, I hereby issue this

CERTIFICATE OF AUTHORIZATION

Validation ID:6WV5R_YEDXX

Given under my hand and the Great Seal of the State of West Virginia on this day of March 10, 2015

Natalie E Tennant

Secretary of State

Notice: A certificate issued electronically from the West Virginia Secretary of State's Web site is fully and immediately valid and effective. However, as an option, the issuance and validity of a certificate obtained electronically may be established by visiting the Certificate Validation Page of the Secretary of State's Web site, https://apps.wv.gov/sos/businessentitysearch/validate.aspx entering the validation ID displayed on the certificate, and following the instructions displayed. Confirming the issuance of a certificate is merely optional and is not necessary to the valid and effective issuance of a certificate.

State of West Virginia

Certificate

I, Betty Ireland, Secretary of State of the State of West Virginia, hereby certify that

XTO ENERGY INC.

Control Number: 999BI

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 May 30, 2008.

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 May 30, 2008

Betty Ireland

Secretary of State

Betty Ireland
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 # 999BI

1. HOME STATE INFORMATION:

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

b. State of Delaware Date of Incorp. 10/9/90 Duration (# 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)

FILED

MAY 3 0 2008

IN THE OFFICE OF SECRETARY OF STATE WEST VIRGINIA

2. PRINCIPAL OFFICE INFORMATION:

a. Address of the principal office of the corporation:
No. & Street: 810 Houston Street
City/State/Zip: Fort Worth, TX 76102

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: _____
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 and Gas

4. AGENT OF PROCESS:
Properly designated person to whom notice of process may be sent, if any:
Name: Corporation Service Company
Address: 209 West Washington Street, Charleston, WV 25302

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
(see attached)	(see attached)	(see attached)

6. The number of acres of land it holds or expects to hold in West Virginia is: 0

7. **Contact and Signature Information**

a. Frank G. McDonald — Contact Name

(817) 870-2800 — Phone Number

b. Frank G. McDonald — Print or type name of signer

Sr. VP, GC and Asst. Secretary — Title or Capacity of Signer

c. Signature of Signer: [signature]

Date: May 8, 2008

XTO ENERGY INC.

Directors:

Class I	Phillip R. Kevil, Herbert D. Simons; Vaughn O. Vennerberg II (expires 5/09)
Class II	Lane G. Collins, Scott G. Sherman, Bob R. Simpson (expires 5/10)
Class III	William H. Adams III, Keith A. Hutton, Jack P. Randall (expires 5/08)

Business Address for XTO Energy Inc. Officers and Directors:

810 Houston Street, Fort Worth, TX 76102

Officers:

Chairman of the Board and Chief Executive Officer	Bob R. Simpson
President	Keith A. Hutton
Senior Executive Vice President and Chief of Staff	Vaughn O. Vennerberg II
Executive Vice President and Chief Financial Officer	Louis G. Baldwin
Executive Vice President - Acquisitions	Timothy L. Petrus
Senior Vice President and Treasurer	Brent W. Clum
Senior Vice President - Land	James L. Death
Senior Vice President - Natural Gas Operations	Nick J. Dungey
Senior Vice President - East Texas Operations	Ken K. Kirby
Senior Vice President and Controller	Bennie G. Kniffen
Senior Vice President, General Counsel and Assistant Secretary	Frank G. McDonald
Senior Vice President - Reservoir Engineering	F. Terry Perkins
Senior Vice President - Geology & Geophysics	Mark J. Pospisil
Senior Vice President - Land Administration	Edwin S. Ryan, Jr.
Senior Vice President - Marketing	Terry L. Schultz
Senior Vice President - Mid-Continent Operations	Douglas C. Schultze
Senior Vice President - Investor Relations and Finance	Gary D. Simpson
Senior Vice President - Engineering	Kenneth F. Staab
Senior Vice President - Taxation	Mark A. Stevens
Vice President - Financial Reporting	Scott T. Agosta
Vice President & Corporate Secretary	Virginia N. Anderson
Vice President, Associate General Counsel & Assistant Secretary	Kathy L. Cox
Vice President Operations - San Juan Division	Del L. Craddock
Vice President Operations - Permian Division & Alaska	Kyle M. Hammond
Vice President - Environmental, Health & Safety	Nina C. Hutton
Vice President Operations - Fort Worth Division	Timothy B. McIlwain
Vice President - Information Technology	L. Frank Thomas III
Vice President - Facilities	T. Joy Webster
Vice President - Human Resources	Karen S. Wilson
Assistant Treasurer	William B. Butler
Assistant Controller	Martha L. Montgomery

Rev. 5/8/08

Delaware

The First State

I, HARRIET SMITH WINDSOR, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY "XTO ENERGY 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 SIXTH DAY OF MAY, A.D. 2008.

AND I DO HEREBY FURTHER CERTIFY THAT THE SAID "XTO ENERGY INC." WAS INCORPORATED ON THE NINTH DAY OF OCTOBER, A.D. 1990.

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.

Harriet Smith Windsor

Harriet Smith Windsor, Secretary of State

2243325 8300

080510772

AUTHENTICATION: 6572039

DATE: 05-06-08

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

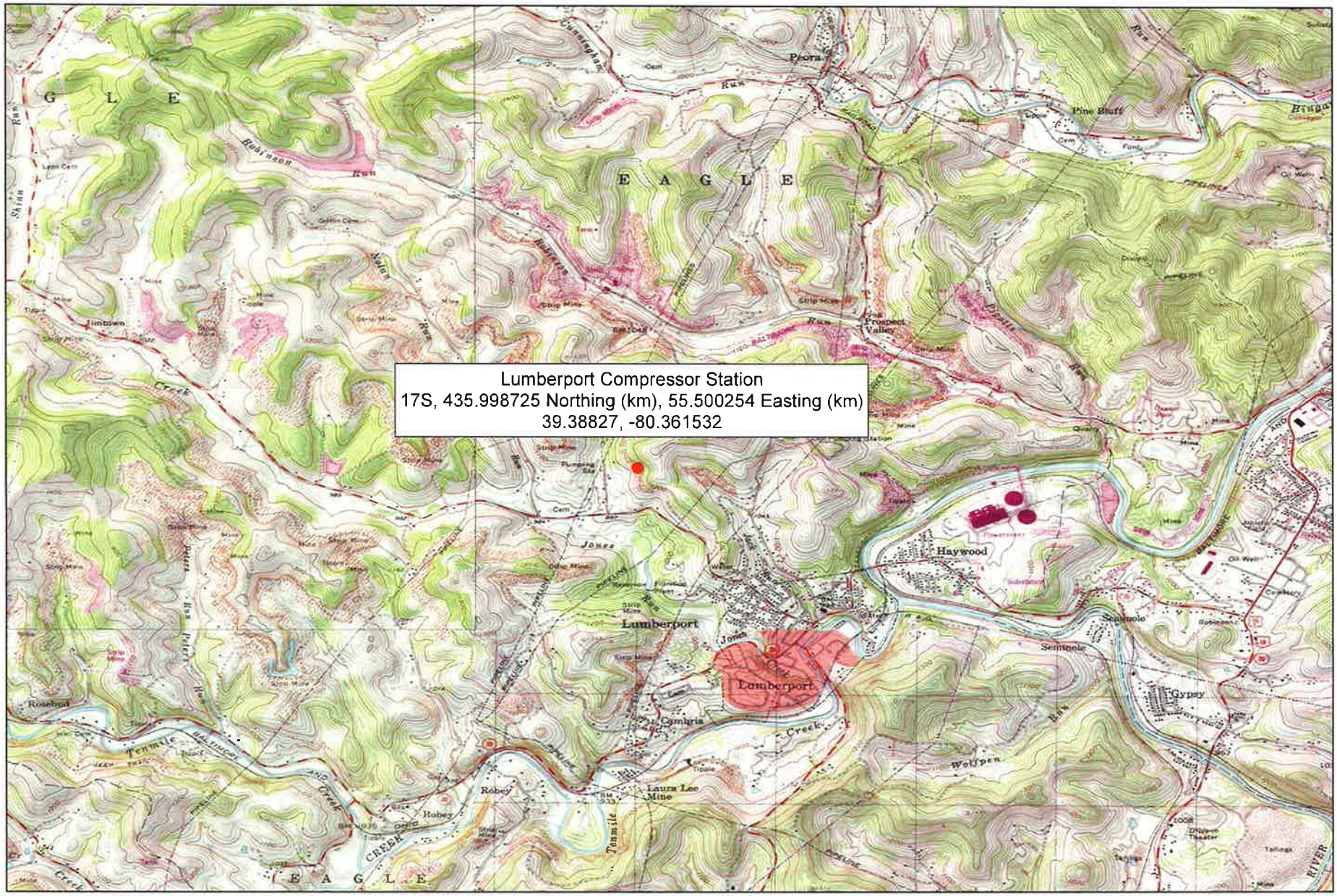
Attachment B
Area Map

0 0.25 0.5 1 1.5 2 Miles

1:24,000

Lumberport Compressor Station

N



0 0.25 0.5 1 1.5 2 Miles

1:24,000

● Lumberport Compressor Station

N

Attachment C
Installation and Start Up Schedule

Installation and Start up Schedule

Lumberport Compressor Station
Harrison County, West Virginia
XTO Energy, Inc.

The vertical well pad facility is already built at the proposed location. The changes to the facility will include the addition of a compressor engine, one water tank, and one lube oil tank. The well pad facility will continue to operate as is. The installation of the new equipment is planned for November 1, 2015, but will only occur after the receipt of a NSR permit providing construction authorization. The work required to set the compressor and add the associated equipment should take about two weeks. After that time the compressor, the associated equipment, and the associated activities will begin operation.

Attachment D
Regulatory Discussion

XTO Energy, Inc.
Lumberport Compressor Station
Federal Regulations: Applicability Determinations

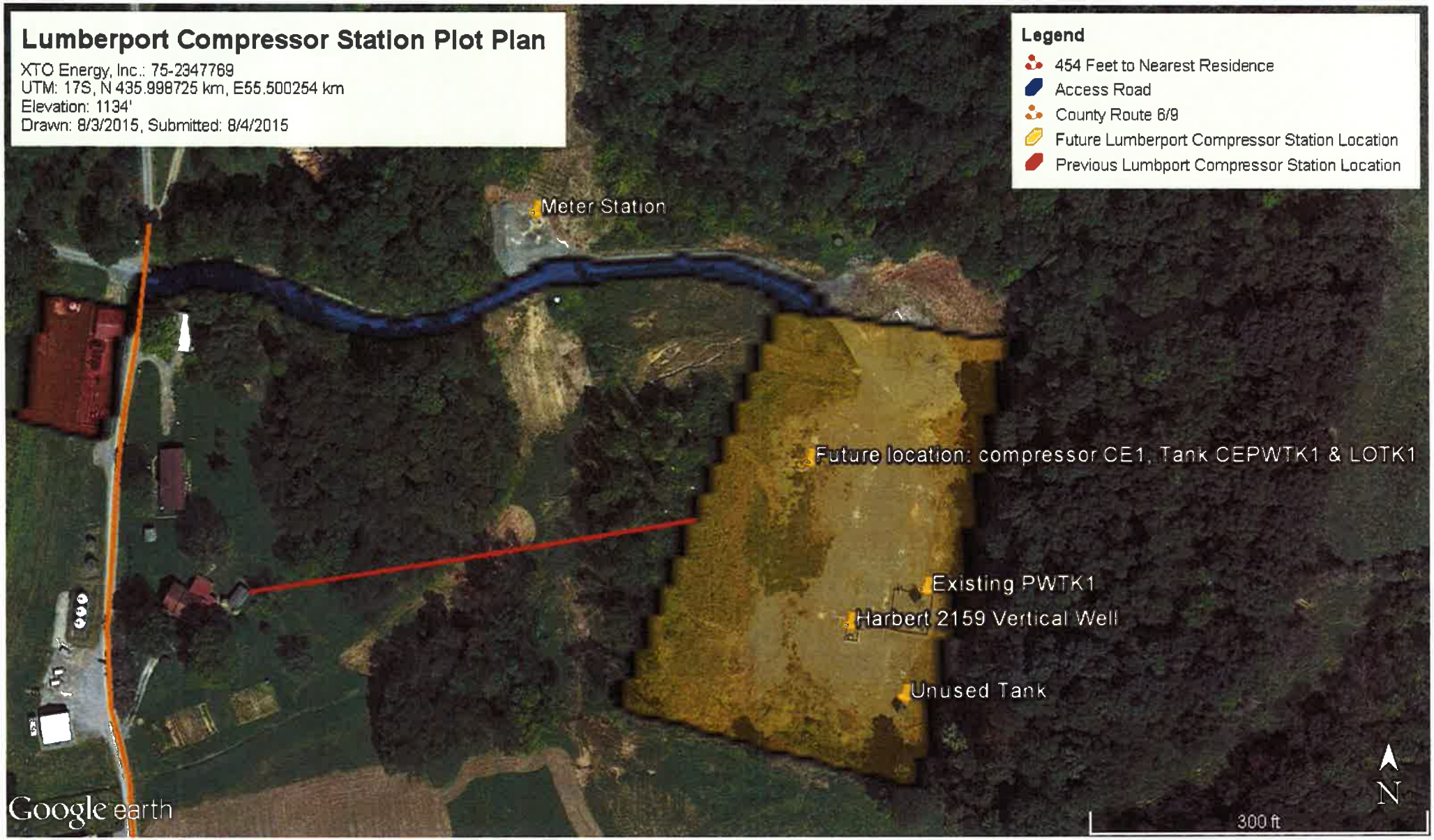
Applicability Determinations

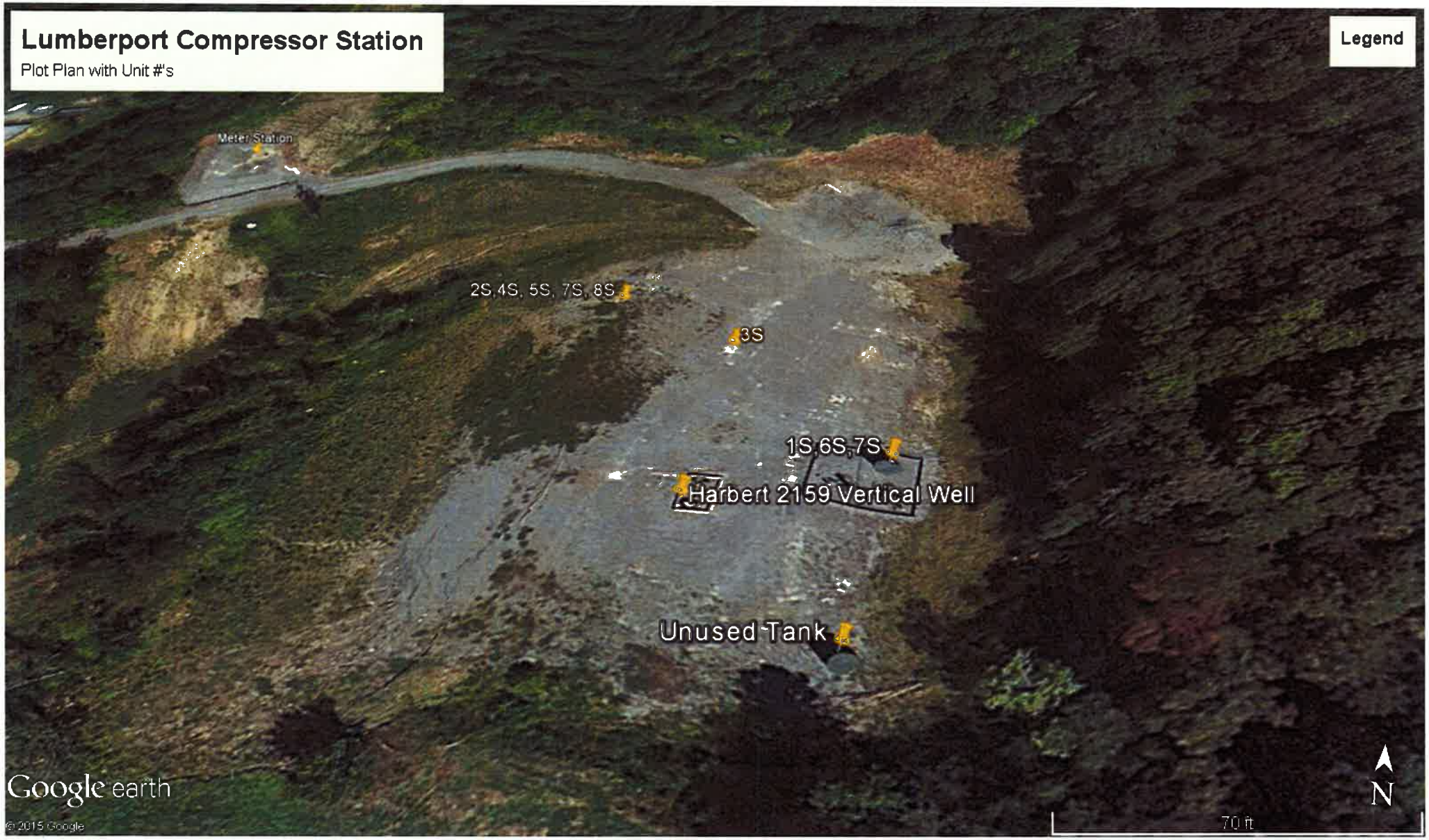
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP): MACT STANDARDS	
40 CFR 63 Subpart HH	N/A - This regulation is not applicable to this facility.
40 CFR 63 Subpart ZZZZ	NA - This facility does not have any ZZZZ engines.
40 CFR 63 Subpart DDDDD	N/A - This regulation is not applicable to this facility.

NEW SOURCE PREFORMANCE STANDARDS (NSPS)	
40 CFR 60 Subpart Ka/Kb	N/A - The storage tanks at this facility are below the 40,000 gallon applicablity threshold limit.
40 CFR 60 Subpart KKK	N/A - Since this facility does not recover a "Y-Grade Product," it is not subject to LDAR.
40 CFR 60 Subpart LLL	N/A - This facility is not defined as an Onshore Natural Gas Processing Plant, thus this regulations is not applicable.
40 CFR 60 Subpart JJJJ	The engine is subject to NSPS JJJJ. This engine will be required to be tested within 180 days from start up of authorization.
40 CFR 60 Subpart IIII	N/A - Since this facility does not have any Diesel engines, this regulation is not applicable.
40 CFR 60 Subpart GG or KKKK	N/A - Since this facility does not have any Turbines, these regulations are not applicable.
40 CFR 60 Subpart OOOO	The gas well facility is a conventional well and therefore not applicable to NSPS OOOO. There are no high bleed pneumatics or any tanks with emissions greater than 6 tpy applicable to NSPS OOOO.

EPA RISK MANAGEMENT PLAN	
40 CFR 68 Subpart G	N/A - This facility does not store more than 10,000 pounds of a regulated material, thus it is not subject to the provisions of the EPA RMP Requirements.

Attachment E
Plot Plan

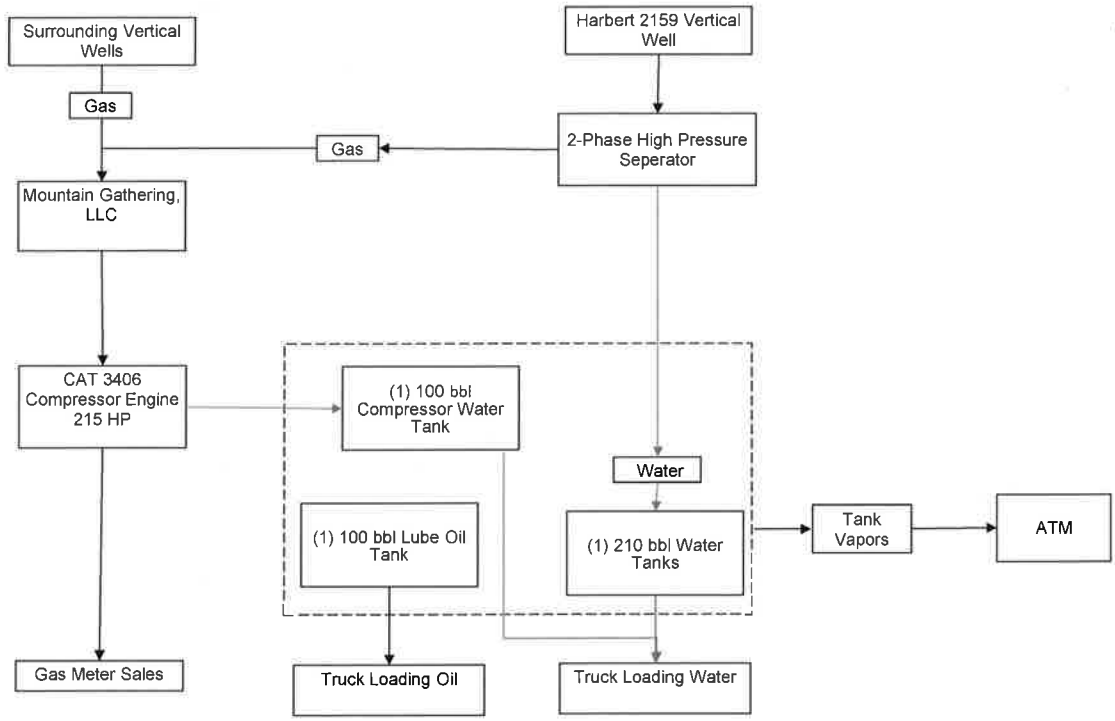

Lumberport Compressor Station Plot Plan
XTO Energy, Inc.: 75-2347769
UTM: 17S, N 435.998725 km, E55.500254 km
Elevation: 1134'
Drawn: 8/3/2015, Submitted: 8/4/2015
Legend
454 Feet to Nearest Residence
Access Road
County Route 6/9
Future Lumberport Compressor Station Location
Previous Lumbport Compressor Station Location
Meter Station
Future location: compressor CE1, Tank CEPWTK1 & LOTK1
Existing PWTK1
Harbert 2159 Vertical Well
Unused Tank
Google earth
300 ft
N


Lumberport Compressor Station
Plot Plan with Unit #'s
Legend
Meter Station
2S,4S, 5S, 7S, 8S
3S
1S,6S,7S
Harbert 2159 Vertical Well
Unused Tank
Google earth
© 2015 Google
N
70 ft

Attachment F
Process Flow Diagram

XTO Energy, Inc
Lumberport Compressor Station

Process Flow Diagram



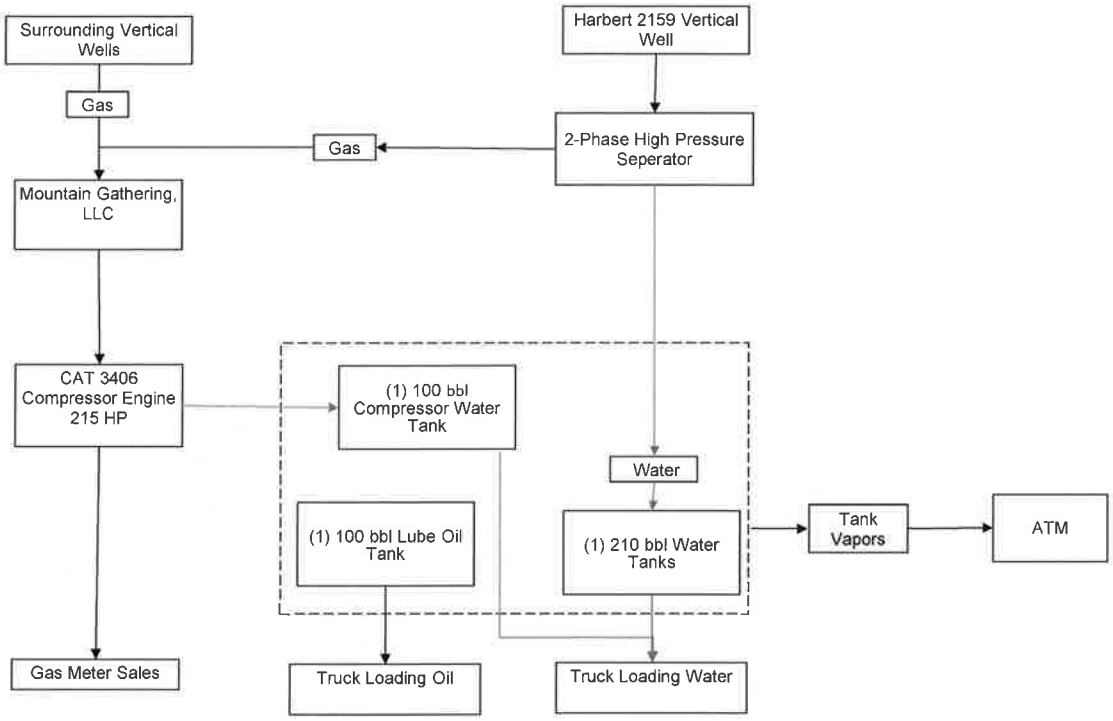
Process Description

Associated gas and liquids production from the Harbert 2159 Vertical Well flow through a 2-phase high pressure separator. The gas is sent to Mountain Gathering, LLC. The produced liquids go into one (1) 210 bbl water storage tanks on the site. Water is trucked off site from the storage tanks. Gas sold to Mountain Gathering, LLC. is compressed with other gas streams from surrounding wells through a CAT 3406 NA compressor engine and sold at a gas meter sales to a third party. The compressor package sends water to one 100 bbl tank where the water is stored and then trucked off site. There is also a 100 bbl lube oil storage tank on site for the compressor. Lube oil is trucked off site or loaded as needed. Truck loading emissions include PM emissions for the miles traveled by the loading trucks. Also included in the emission calculations is MSS emissions for compressor blowdowns in order to performe maintenance when needed. All tanks are uncontrolled and vented to the atmosphere.

Attachment G
Process Description

XTO Energy, Inc
Lumberport Compressor Station

Process Flow Diagram



Process Description

Associated gas and liquids production from the Harbert 2159 Vertical Well flow through a 2-phase high pressure separator. The gas is sent to Mountain Gathering, LLC. The produced liquids go into one (1) 210 bbl water storage tanks on the site. Water is trucked off site from the storage tanks. Gas sold to Mountain Gathering, LLC. is compressed with other gas streams from surrounding wells through a CAT 3406 NA compressor engine and sold at a gas meter sales to a third party. The compressor package sends water to one 100 bbl tank where the water is stored and then trucked off site. There is also a 100 bbl lube oil storage tank on site for the compressor. Lube oil is trucked off site or loaded as needed. Truck loading emissions include PM emissions for the miles traveled by the loading trucks. Also included in the emission calculations is MSS emissions for compressor blowdowns in order to performe maintenance when needed. All tanks are uncontrolled and vented to the atmosphere.

Attachment H
MSDS

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **MOBIL DTE OIL EXTRA HEAVY**
Product Description: Base Oil and Additives
Product Code: 201560501595, 600205-00, 970010
Intended Use: Circulating oil

COMPANY IDENTIFICATION

Supplier: **EXXON MOBIL CORPORATION**
3225 GALLOWS RD.
FAIRFAX, VA. 22037 USA

24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300
ExxonMobil Transportation No.	281-834-3296
Product Technical Information	800-662-4525, 800-947-9147
MSDS Internet Address	http://www.exxon.com, http://www.mobil.com

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

No Reportable Hazardous Substance(s) or Complex Substance(s).

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

POTENTIAL HEALTH EFFECTS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

NFPA Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0
HMIS Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use

adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO_2) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Smoke, Fume, Aldehydes, Sulfur oxides, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: >227°C (441°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

PROTECTIVE MEASURES

Avoid contact with spilled material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders. For emergency responders: Respiratory protection: respiratory protection will be necessary only in special cases, e.g., formation of mists. Half-face or full-face respirator with filter(s) for dust/organic vapor or Self Contained Breathing Apparatus (SCBA) can be used depending on the size of spill and potential level of exposure. If the exposure cannot be completely characterized or an oxygen deficient atmosphere is possible or anticipated, SCBA is recommended. Work gloves that are resistant to hydrocarbons are recommended. Gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Chemical goggles are recommended if splashes or contact with eyes is possible. Small spills: normal antistatic work clothes are usually adequate. Large spills: full body suit of chemical resistant, antistatic material is recommended.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do it without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do it without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Static Accumulator: This material is a static accumulator.

STORAGE

The container choice, for example storage vessel, may effect static accumulation and dissipation. Do not store in open or unlabelled containers. Keep away from incompatible materials.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits/standards for materials that can be formed when handling this product: When mists/aerosols can occur the following are recommended: 5 mg/m³ - ACGIH TLV (inhalable fraction), 5 mg/m³ - OSHA PEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Form: Clear
Color: Amber
Odor: Characteristic
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.89
Flash Point [Method]: >227°C (441°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: > 316°C (600°F)
Vapor Density (Air = 1): > 2 at 101 kPa
Vapor Pressure: < 0.013 kPa (0.1 mm Hg) at 20 °C
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 146.2 cSt (146.2 mm2/sec) at 40 °C | 14.4 cSt (14.4 mm2/sec) at 100°C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -12°C (10°F)
DMSO Extract (mineral oil only), IP-346: < 3 %wt

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m3	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: No end point data.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitizing in test animals.

Additional information is available by request.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY
Biodegradation:
Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL
Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS
Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Protect the environment. Dispose of used oil at designated sites. Minimize skin contact. Do not mix used oils with solvents, brake fluids or coolants.

REGULATORY DISPOSAL INFORMATION
RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrositivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT): Not Regulated for Land Transport

LAND (TDG): Not Regulated for Land Transport

SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA): Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this material is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

Complies with the following national/regional chemical inventory requirements:: AICS, DSL, EINECS, ENCS, IECSC, KECI, PICCS, TSCA

EPCRA: This material contains no extremely hazardous substances.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

SARA (313) TOXIC RELEASE INVENTORY: This material contains no chemicals subject to the supplier notification requirements of the SARA 313 Toxic Release Program.

The following ingredients are cited on the lists below:

Chemical Name	CAS Number	List Citations
PHOSPHORODITHOIC ACID, O,O-DI C1-14-ALKYL ESTERS, ZINC SALTS (2:1) (ZDDP)	68649-42-3	15

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Revision Changes:
Section 06: Notification Procedures - Header was modified.
Section 13: Disposal Considerations - Disposal Recommendations was modified.
Section 10 Stability and Reactivity - Header was modified.
Section 13: Disposal Recommendations - Note was modified.
Section 09: Phys/Chem Properties Note was modified.
Section 09: Boiling Point C(F) was modified.
Section 08: Comply with applicable regulations phrase was modified.
Section 08: Personal Protection was modified.
Section 08: Hand Protection was modified.

Section 09: Vapor Pressure was modified.
Section 07: Handling and Storage - Handling was modified.
Section 07: Handling and Storage - Storage Phrases was modified.
Section 11: Dermal Lethality Test Data was modified.
Section 11: Oral Lethality Test Data was modified.
Section 05: Hazardous Combustion Products was modified.
Section 06: Accidental Release - Spill Management - Water was modified.
Section 09: Relative Density - Header was modified.
Section 09: Flash Point C(F) was modified.
Section 09: Viscosity was modified.
Section 09: Viscosity was modified.
Section 14: Sea (IMDG) - Header was modified.
Section 14: Air (IATA) - Header was modified.
Section 14: LAND (TDG) - Header was modified.
Section 14: LAND (DOT) - Header was modified.
Section 15: List Citation Table - Header was modified.
Section 14: LAND (DOT) - Default was modified.
Section 14: LAND (TDG) Default was modified.
Section 14: Sea (IMDG) - Default was modified.
Section 14: Air (IATA) - Default was modified.
Section 15: National Chemical Inventory Listing - Header was modified.
Section 15: National Chemical Inventory Listing was modified.
Section 16: Code to MHCs was modified.
Section 08: Exposure limits/standards was modified.
Hazard Identification: OSHA - May be Hazardous Statement was modified.
Section 06: Notification Procedures was modified.
Section 09: Oxidizing Properties was modified.
Section 01: Company Contact Methods Sorted by Priority was modified.
Section 06: Protective Measures was added.
Section 06: Accidental Release - Protective Measures - Header was added.

The information and recommendations contained herein are, to the best of ExxonMobil's knowledge and belief, accurate and reliable as of the date issued. You can contact ExxonMobil to insure that this document is the most current available from ExxonMobil. The information and recommendations are offered for the user's consideration and examination. It is the user's responsibility to satisfy itself that the product is suitable for the intended use. If buyer repackages this product, it is the user's responsibility to insure proper health, safety and other necessary information is included with and/or on the container. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, re-publication or retransmission of this document, in whole or in part, is not permitted. The term, "ExxonMobil" is used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliates in which they directly or indirectly hold any interest.

Internal Use Only
MHC: 0B, 0B, 0, 0, 0, 0 PPEC: A

DGN: 2007114XUS (1013921)

Copyright 2002 Exxon Mobil Corporation, All rights reserved

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **MOBIL PEGASUS 805**
Product Description: Base Oil and Additives
Product Code: 602466-00, 97D936
Intended Use: Natural gas engine oil

COMPANY IDENTIFICATION

Supplier: **EXXON MOBIL CORPORATION**
3225 GALLOWS RD.
FAIRFAX, VA. 22037 USA

24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300
ExxonMobil Transportation No.	281-834-3296
Product Technical Information	800-662-4525, 800-947-9147
MSDS Internet Address	http://www.exxon.com, http://www.mobil.com

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	Concentration*
BENZENE PROPANOIC ACID, 3,5-BIS(1,1-DIMETHYLETHYL)-4-HYDROXY-, C7-9 BRANCHED ALKYL ESTERS	125643-61-0	1 - 5%

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

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

POTENTIAL HEALTH EFFECTS

Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

NFPA Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0
HMIS Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO_2) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Smoke, Fume, Aldehydes, Sulfur oxides, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: >245°C (473°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

PROTECTIVE MEASURES

Avoid contact with spilled material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

For emergency responders: Respiratory protection: respiratory protection will be necessary only in special cases, e.g., formation of mists. Half-face or full-face respirator with filter(s) for dust/organic vapor or Self Contained Breathing Apparatus (SCBA) can be used depending on the size of spill and potential level of exposure. If the exposure cannot be completely characterized or an oxygen deficient atmosphere is possible or anticipated, SCBA is recommended. Work gloves that are resistant to hydrocarbons are recommended. Gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Chemical goggles are recommended if splashes or contact with eyes is possible. Small spills: normal antistatic work clothes are usually adequate. Large spills: full body suit of chemical resistant, antistatic material is recommended.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do it without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do it without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Static Accumulator: This material is a static accumulator.

STORAGE

The container choice, for example storage vessel, may effect static accumulation and dissipation. Do not store in open or unlabelled containers.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits/standards for materials that can be formed when handling this product: When mists/aerosols can occur the following are recommended: 5 mg/m³ - ACGIH TLV (inhalable fraction), 5 mg/m³ - OSHA PEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Color: Amber
Odor: Characteristic
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.89
Flash Point [Method]: >245°C (473°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: > 288°C (550°F)
Vapor Density (Air = 1): > 2 at 101 kPa
Vapor Pressure: < 0.013 kPa (0.1 mm Hg) at 20 °C
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 130 cSt (130 mm2/sec) at 40 °C | 13.5 cSt (13.5 mm2/sec) at 100°C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -12°C (10°F)
DMSO Extract (mineral oil only), IP-346: < 3 %wt
Decomposition Temperature: N/D

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Negligible hazard at ambient/normal handling temperatures.
Ingestion	
Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin	
Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Negligible irritation to skin at ambient temperatures. Based on assessment of the components.
Eye	
Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.

CHRONIC/OTHER EFFECTS

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitizing in test animals.

Sulfonates: This product contains sulfonates which have been reported to cause skin sensitization.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL

Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Protect the environment. Dispose of used oil at designated sites. Minimize skin contact. Do not mix used oils with solvents, brake fluids or coolants.

REGULATORY DISPOSAL INFORMATION

RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrositivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT): Not Regulated for Land Transport

LAND (TDG): Not Regulated for Land Transport

SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA): Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this material is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

Complies with the following national/regional chemical inventory requirements: AICS, DSL, ENCS, KECI, PICCS, TSCA

Special Cases:

Inventory	Status
IECSC	Restrictions Apply

EPCRA SECTION 302: This material contains no extremely hazardous substances.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

SARA (313) TOXIC RELEASE INVENTORY: This material contains no chemicals subject to the supplier notification requirements of the SARA 313 Toxic Release Program.

The following ingredients are cited on the lists below:

Chemical Name	CAS Number	List Citations
ZINC DITHIOPHOSPHATE	68649-42-3	15, 19

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Revision Changes:
Section 13: Disposal Considerations - Disposal Recommendations information was modified.
Section 10 Stability and Reactivity - Header information was modified.

Section 13: Disposal Recommendations - Note information was modified.
Section 09: Phys/Chem Properties Note information was modified.
Section 09: Boiling Point C(F) information was modified.
Section 09: Pour Point C(F) information was modified.
Section 08: Comply with applicable regulations phrase information was modified.
Section 08: Personal Protection information was modified.
Section 09: Vapor Pressure information was modified.
Section 07: Handling and Storage - Handling information was modified.
Section 07: Handling and Storage - Storage Phrases information was modified.
Hazard Identification: Health Hazards information was modified.
Section 11: Dermal Lethality Test Data information was modified.
Section 11: Dermal Lethality Test Comment information was modified.
Section 11: Oral Lethality Test Data information was modified.
Section 11: Inhalation Lethality Test Data information was modified.
Section 11: Dermal Irritation Test Data information was modified.
Section 11: Eye Irritation Test Data information was modified.
Section 11: Oral Lethality Test Comment information was modified.
Section 11: Inhalation Lethality Test Comment information was modified.
Section 11: Dermal Irritation Test Comment information was modified.
Section 11: Eye Irritation Test Comment information was modified.
Section 11: Inhalation Irritation Test Data information was modified.
Section 05: Hazardous Combustion Products information was modified.
Section 06: Accidental Release - Spill Management - Water information was modified.
Section 09: Relative Density - Header information was modified.
Section 09: Flash Point C(F) information was modified.
Section 09: Viscosity information was modified.
Section 09: Viscosity information was modified.
Section 14: Sea (IMDG) - Header information was modified.
Section 14: Air (IATA) - Header information was modified.
Section 14: LAND (TDG) - Header information was modified.
Section 14: LAND (DOT) - Header information was modified.
Composition: Component table information was modified.
Section 15: List Citations Table information was modified.
Section 15: List Citation Table - Header information was modified.
Section 14: LAND (DOT) - Default information was modified.
Section 14: LAND (TDG) Default information was modified.
Section 14: Sea (IMDG) - Default information was modified.
Section 14: Air (IATA) - Default information was modified.
Section 11: Inhalation Lethality Test Comment information was modified.
Section 11: Other Health Effects Header information was modified.
Section 15: National Chemical Inventory Listing - Header information was modified.
Section 15: National Chemical Inventory Listing information was modified.
Section 15: Community RTK - Header information was modified.
Section 11: Additional Health Information information was modified.
Section 16: MSN, MAT ID information was modified.
Section 08: Exposure limits/standards information was modified.
Section 15: Special Cases Table information was modified.
Hazard Identification: OSHA - May be Hazardous Statement information was modified.
Section 11: Chronic Tox - Component information was modified.
Section 09: Oxidizing Properties information was modified.
Section 01: Company Contact Methods Sorted by Priority information was modified.
Section 06: Protective Measures information was added.

Section 06: Accidental Release - Protective Measures - Header information was added.
Section 09: Decomposition Temperature information was added.
Section 09: Decomposition Temp - Header information was added.
Section 11: Other Health Effects information was deleted.
Section 11: Other Health Effects information was deleted.

The information and recommendations contained herein are, to the best of ExxonMobil's knowledge and belief, accurate and reliable as of the date issued. You can contact ExxonMobil to insure that this document is the most current available from ExxonMobil. The information and recommendations are offered for the user's consideration and examination. It is the user's responsibility to satisfy itself that the product is suitable for the intended use. If buyer repackages this product, it is the user's responsibility to insure proper health, safety and other necessary information is included with and/or on the container. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, re-publication or retransmission of this document, in whole or in part, is not permitted. The term, "ExxonMobil" is used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliates in which they directly or indirectly hold any interest.

Internal Use Only
MHC: 0B, 0B, 0, 0, 0, 0 PPEC: A

DGN: 2007675XUS (1015410)

Copyright 2002 Exxon Mobil Corporation, All rights reserved

MATERIAL SAFETY DATA SHEET – NATURAL GAS (PIPELINE QUALITY - MSDS #526)

Revision Date: February 05, 2015
Supersedes Date: January 26, 2012

Section 1: PRODUCT AND COMPANY IDENTIFICATION

FortisBC
16705 Fraser Highway
Surrey, BC
V3S 2X7

Company Phone Number: (604) 576-7000
Emergency Phone Number: 1-800-663-9911

Product Name: Natural Gas (Pipeline Quality)
Material Use: Fuel

Manufacturer: Duke Energy Inc.
1333 West Georgia Street
Vancouver, BC
V6E 3K9

Supplier: FortisBC
16705 Fraser Highway
Surrey, BC
V3S 2X7

WHMIS Class: A – Compressed Gas;
B1 – Flammable and Combustible Material – Division 1 Flammable Gases
UN/PIN Number: 1971
TDG Classification: Class 2.1 Flammable Gases
TDG Shipping Name: Natural gas, compressed with high methane content
Chemical Family: Simple hydrocarbon
Chemical Formula: Natural gas (considered a complex mixture)
Molecular Weight: Not applicable (natural gas is considered a complex mixture)
CAS Number: 8006-14-2
Trade Names / Synonyms: Methane, marsh gas

Section 2: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance/Odour: Gas like odour and colourless gas
Flammable: Yes. Can cause flash fire
Potential Health Effects: See Section 11 for more information
Potential Environmental Effects: See Section 12 for more information
Likely Routes of Exposure: Acute inhalation
Acute Inhalation: At high concentrations, natural gas can displace oxygen causing asphyxiation and cause central nervous system (CNS) depression and cardiac sensitization.
Eye and Skin Contact None
Chronic- Inhalation None
Ingestion: None
Skin Adsorption: None

Section 3: COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS #	% by Wt.	Exposure Limits NOTE 1
Methane	74-82-8	95	Simple asphyxiant
Ethane	74-84-0	3	Simple asphyxiant
Propane	74-98-6	1	Simple asphyxiant
Inert Gas	Not available	<1	Not available
Sulphur Compounds	Not available	Trace	Not available
Mercaptan Odourant	Mixture	3 ppm	0.5 ppm (ethyl mercaptan) 0.5 ppm (methyl mercaptan)

NOTE 1. See Section 8 for additional exposure limit information for C_1 to C_3 Aliphatic Hydrocarbon Gases (i.e., methane, ethane, propane).

Section 4: FIRST AID MEASURES

Skin Contact: First aid is not normally required.

Eye contact: If irritation/redness develops, move victim away from exposure into fresh air and flush eyes with clean water.

Inhalation: Ensure your own safety before attempting rescue. Move victim to fresh air. Administer oxygen if breathing has stopped. If heart beat can not be detected begin CPR. If person is overcome or been adversely affected by the emergency, obtain medical attention immediately.

Ingestion: Unlikely route of exposure as this is a gas at normal room temperature and pressure.

General Advise: Use extreme care in handling due to high flammability.

Section 5: FIRE FIGHTING MEASURES

Flammability: Flammable gas and can be ignited by heat, flames, sparks or other sources of ignition (e.g., static electricity, pilot lights or mechanical/electrical equipment).

Suitable Extinguishing Media: Dry chemical, carbon dioxide, water spray or fog.

Special Procedures: Shut off flow of gas from a safe location. Use full protective equipment and self-contained breathing apparatus (SCBA). Do not extinguish flame until gas flow is shut off. Use gas detectors in confined spaces. Evaporate area if cooling of containers is not possible. For large fires nonessential personnel should be evacuated beyond 750 metres.

Products of Combustion: Carbon dioxide and carbon monoxide

Protection of Firefighters: Firefighters should wear SCBA in case of oxygen deficient atmosphere.

Sensitivity to Static Discharge: Flammable

Sensitivity to Mechanical Impact: None

Explosive Power: Not available

Rate of Burning: Not available

TDG Flammability Class 2.1

Section 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protection recommended in Section 8.

Environmental Precautions: Not applicable

Leak and Spill Procedure: Evacuate area. Call emergency services and gas supplier. For large releases nonessential personnel should be evacuated beyond 750 metres. Eliminate any source of ignition.

Methods for Containment: Stay away and upwind of spill/release.

Waste Disposal: Vent to outside atmosphere.

Other Information: Allow to vapourize and disperse to atmosphere.

In case of an emergency and no response at FortisBC, call SERVICE CENTER: 1 (800) 663-9911.

Section 7: HANDLING AND STORAGE

Handling: Observe handling regulations for compressed gases and flammable materials. To be handled by trained personnel only and followed with approved operating procedures.

Storage: Comply with storage regulations for compressed gases and flammable materials. No smoking or open flames in storage area.

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits: Simple asphyxiant - Maintain a minimum 19.5% oxygen (O_2) content (below 19.5% O_2 is considered to be O_2 deficient).

Constituent[NOTE 2]	ACGIH (8-hour TWA)	WorkSafeBC (8-hour TWA)
Methane	Minimum O_2 content	1000 ppm
Ethane	Minimum O_2 content	1000 ppm
Propane	Minimum O_2 content	1000 ppm
Mercaptan Odourant	0.5 ppm (ethyl mercaptan) 0.5 ppm (methyl mercaptan)	0.5 ppm (ethyl mercaptan) 0.5 ppm (methyl mercaptan)

NOTE 2. Mercaptan odourant mixtures commonly contain ethyl mercaptan and/or methyl mercaptan (both ethyl mercaptan and methyl mercaptan have 8-hour TWA exposure limits of 0.5 ppm).

Personal Protective Equipment: Ensure use of proper personal protective equipment (PPE) at all times when handling this product.

Eye/face: Eye protection (e.g., safety glasses) and/or face shields.

Skin: Safety work boots. Chemical resistant gloves are not required but recommended as good practice when handling chemicals. Flame retardant clothing should be worn in potentially flammable areas.

Respiratory: If engineering controls and work practices are not effective in controlling exposure to natural gas, then wear suitable respiratory protection. Supplied air or SCBA.

Other Considerations: None

Engineering Controls: All installations (i.e., mechanical ventilation) must conform to code requirements. Provide adequate ventilation to maintain below exposure limits and explosive limits.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Gas
Colour:	Colourless
Odour:	Gas odour
Specific Gravity (Water = 1):	Not applicable
Odour Threshold (ppm):	2500
Vapour Pressure (mm Hg):	Not applicable
Vapour Density (Air = 1):	0.59
Evaporation Rate (nButAC = 1):	Not applicable (gas at room temperature)
Boiling Point (°C):	-160
Freezing Point (°C):	Not applicable
Solubility in water (20°C):	Slight
Percent Volatile (by volume):	Not available
pH:	Not available
Density (g/ml):	Not available
Partition Coefficient (water/oil):	Not available
Flash Point (°C):	Flammable gas
Flammability (solid, gas):	Flammable gas
Lower Explosion Limit (%):	5 (by volume)
Upper Explosion Limit (%):	15 (by volume)
Auto-ignition Temperature (°C):	537

Section 10: STABILITY AND REACTIVITY

Chemical Stability: Yes

Conditions to Avoid: High heat
Incompatibility with Other Substances: Avoid contact with strong oxidizing agents
Hazardous Decomposition Products: COx, luminous clean flame on combustion
Reactivity (and Under What Conditions): Strong oxidizing agents increase risk of fire (peroxides, perchlorates, chlorine, liquid oxygen).

Section 11: TOXICOLOGICAL INFORMATION

LD50: Not applicable
LC50: Not applicable
Acute Effects: Simple asphyxiant: at high concentrations, natural gas can displace oxygen and cause asphyxiation. The ACGIH TLV-TWA for C_1 to C_3 Aliphatic Hydrocarbon Gases is believed to be protective against potential health effects that include CNS depression and cardiac sensitization. The TLV-TWA is based upon the abilities of these gases (methane, ethane, propane) to produce weak depressant effects on the CNS at high concentration levels approaching the lower explosive limit. It has also been reported that ethane and propane can induce cardiac arrhythmias under certain conditions leading to ventricular fibrillation which can result in death in the presence of high epinephrine levels.
Chronic Effects: None
Carcinogenicity: Not considered carcinogenic by IARC, NTP, ACGIH or OSHA.
Reproductive Effects: Not available
Teratogenicity: Not available
Mutagenicity: Not available
Irritant: Not available
Sensitizer: Not available
Synergistic Effects: Not available

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity: Not available
Persistence/ Degradability: Not available
Bioaccumulation/ Accumulation: Not available

There is no information available on the ecotoxicological effects of natural gas. Because of the high volatility of natural gas, it is unlikely to cause ground or water pollution. Natural gas released into the environment will disperse rapidly into the atmosphere and undergo photochemical degradation.

Section 13: DISPOSAL CONSIDERATIONS

Disposal: Allow to dissipate to the atmosphere (if permitted by federal/provincial/municipal requirements). Dispose in a safe location, preferably by burning with a flare. If disposal of natural gas cannot be flared, care must be taken to ensure complete dissipation of the gas to a concentration below its flammable limits.

Section 14: TRANSPORT INFORMATION

TDG Classification: Class 2.1 Flammable Gases
UN/PIN Number: 1971
TDG Shipping Description: Natural gas, compressed with high methane content
Special Shipping Information: Handle as extremely flammable gas. Electronically ground/bond during transfer to avoid static accumulation. Precaution should be taken to minimize inhalation of natural gas.

Section 15: REGULATORY INFORMATION

DSL (Canada): This product is on the DSL list (Canada).
WHMIS Class: A – Compressed Gas;
B1 – Flammable and Combustible Material – Division 1 Flammable Gases

Section 16: OTHER INFORMATION

National Fire Protection Association (NFPA 704) Ratings:

Health	1	LEGEND	0 = minimal hazard
Flammability	4		1 = slight hazard
Instability	0		2 = moderate hazard
(For natural gas from NFPA 325)			3 = severe hazard
			4 = extreme hazard

Hazardous Materials Identification System (HMIS) Ratings:

Health	1	LEGEND	0 = minimal hazard
Flammability	4		1 = slight hazard
Physical Hazard	3		2 = moderate hazard
(For methane from HMIS Chemical Ratings Guide)			3 = serious hazard
			4 = severe hazard

Prepared by: AMEC Foster Wheeler
Environment & Infrastructure
Occupational Hygiene and Safety Group

Phone Number: (604) 294-3811
Preparation Date: February 05, 2015

Additional Information and Comments: This MSDS has been revised and updated from the last revision date of January 26, 2012. All sections and the order that which they appear have been documented as per American National Standard – *For Hazardous Industrial Chemicals – Material Safety Data Sheets Preparation* (ANSI Z400.1-2004).

The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for their own particular use.

Information Sources: Various

Attachment I
Emission Unit Table

Attachment I

Emission Units Table

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

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
1S	1E	Truck loading produced water	2015	100 BWPD	NEW	NA
2S	2E	Truck loading lube oil	2015	2 BOPD	NEW	NA
3S	3E	Fugitive Emissions	2015	NA	NEW	NA
4S	4E	Equipment Blowdowns	2015	NA	NEW	NA
5S	5E	CAT 3406 NA Compressor Engine	2015	215 HP	NEW	5C
6S	6E	Produced Water Tank	2015	210 BBL	NEW	NA
7S	7E	Compressor Suction Water Tank	2015	100 BBL	NEW	NA
8S	8E	Lube Oil Tank	2015	100 BBL	NEW	NA

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

Attachment J
Emission Points Data Summary Sheet

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. (Must match Emission Units Table & Plot Plan)	Emission Point Type[1]	Emission Unit Vented Throuhg This Point (Must match Emission Unit 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 condition, Solid, Liquid or Gas/Vapor)	Est. Method Used [6]	Emission Concentration[7] (ppmv or mg/m^3)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
1E	Vent	1S	Truck loading PW	NA	NA	NA	NA	VOC Total HAPS	0.77 <0.01	0.08 <0.01	NA NA	NA NA	Gas Gas	EE EE	
2E	Vent	2S	Truck loading Lube Oil	NA	NA	NA	NA	VOC Total HAPS	0.06 0.00	<0.01 0.00	NA NA	NA NA	Gas Gas	EE EE	
3E	Fugitive	3S	Fugitive Emissions	NA	NA	NA	NA	VOC Total HAPS PM10/PPM2.5	0.22 0.03 3.86	0.95 0.13 0.39	NA NA NA	NA NA NA	Gas Gas Solid	EE EE EE	
4E	Vertical	4S	Equipment Blowdowns	NA	NA	NA	NA	VOC Total HAPS	43.47 5.73	1.09 0.15	NA NA	NA NA	Gas Gas	EE EE	
5E	Vertical	5S	CAT 3406 NA Comp Engine	5C	Catalyst	NA	NA	Nox CO VOC PM10/PM2.5 SO2 HCHO Total HAPS	7.70 7.70 0.48 0.02 <0.01 0.13 0.14	33.74 33.74 2.08 0.09 <0.01 0.56 0.58	0.95 1.90 0.48 0.02 <0.01 0.13 0.14	4.16 8.31 2.08 0.09 <0.01 0.56 0.58	Gas Gas Gas Gas Gas Gas Gas	EE EE EE EE EE EE EE	

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 Throuhg This Point (Must match Emission Unit 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 condition, Solid, Liquid or Gas/Vapor)	Est. Method Used [6]	Emission Concentration[7] (ppmv or mg/m^3)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
6E	Vertical	6S	Produced Water Tanks	NA	NA	NA	NA	VOC Total HAPS	<0.01 <0.01	0.03 <0.01	NA NA	NA NA	Gas Gas	EE EE	
7E	Vertical	7S	Comp Suction Water Tank	NA	NA	NA	NA	VOC Total HAPS	<0.01 <0.01	0.02 <0.01	NA NA	NA 1E	Gas Gas	EE EE	
8E	Vertical	8S	Lube Oil Tank	NA	NA	NA	NA	VOC Total HAPS	<0.01 <0.01	<0.01 <0.01	NA NA	NA NA	Gas Gas	EE EE	

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

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, CS2, VOCs, H2S, Inorganics, Lead, Organics, O3, NO, NO2, SO2, SO3, all applicable Greenhouse Gases (including CO2 and methane), etc. DO NOT LIST H2, H2O, N2, O2, and Noble Gases.

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/m3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data								
Emission Point ID No. (Must match Emission Units Table)	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (*F)	Volumetric Flow [1] (acfm) at operating conditions	Velocity (fps)	Ground Level (Height above mean sea level)	Stack Height [2] (Release height of emissions above ground level)	Northing	Easting
1E	varies per truck	ambient	5.34	0.45	1135	10	4359.9647	555.0141
2E	varies per truck	ambient	1	0.09	1135	10	4360.0058	554.98
3E	NA	ambient	NA	NA	1135	1	4359.9705	555.00271
4E	0.33	ambient	44	8.57	1135	10	4360.0058	554.98
5E	0.67	1151	1030	50.18	1135	15	4360.0058	554.98
6E	0.33	ambient	5.34	0.45	1135	10	4359.9647	555.0141
7E	0.33	ambient	5.34	0.45	1135	10	4359.9647	555.0141
8E	0.33	ambient	1	0.09	1135	10	4360.0058	554.98

1 Give at operating conditions. Include inerts.
2 Release height of emissions above ground level.

Attachment K
Fugitive Emissions Data Summary Sheet

Attachment K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

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

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

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.) Will there be haul road activities? ☒ 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	PM10/2.5	3.86	0.39	3.86	0.39	EE
Storage Pile Emissions						
Loading/Unloading Operations	VOC/HAPS	0.42/<0.01	0.08/<0.01	0.42/<0.01	0.08/<0.01	EE
Wastewater Treatment Evaporation & Operations						
Equipment Leaks	VOC/HAPS	Does not apply	0.95/0.13	Does not apply	0.95/0.13	EE
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
Emission Unit Data Sheets

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

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

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

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name Tanks	2. Tank Name Produced Water, Comp Suction Water, & Lube Oil Tank
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) 6S, 7S, 8S	4. Emission Point Identification No. (as assigned on *Equipment List Form*) 6E, 7E, 8E
5. Date of Commencement of Construction (for existing tanks) 6E - 8/1/2010	
6. Type of change ☒ New Construction ☐ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable)	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) ☐ Yes ☒ No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode). 6S and 7S are produced water, 8S is lube oil	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.): limits to BWPD of 50 for each 6S and 7S, limit of 2 BOPD for 8S	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 6S - 210 BBL, 7S - 100 BBL, 8S - 100 BBL	
9A. Tank Internal Diameter (ft) 6S - 10, 7S - 7.5, 8S - 7.5	9B. Tank Internal Height (or Length) (ft) 6S - 15, 7S - 10, 8S - 10
10A. Maximum Liquid Height (ft) 6S - 12, 7S - 9, 8S - 9	10B. Average Liquid Height (ft) 6S - 5, 7S - 5, 8S - 5
11A. Maximum Vapor Space Height (ft) 6S - 14, 7S - 9, 8S - 9	11B. Average Vapor Space Height (ft) 6S - 10, 7S - 5, 8S - 5
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 6S - 200 BBL, 7S - 90 BBL, 8S - 90 BBL	

13A. Maximum annual throughput (gal/yr) 6S - 363079, 7S - 363079, 8S - 30660	13B. Maximum daily throughput (gal/day) 6S - 2100, 7S - 2100, 8S - 84

14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume) 6S - 69, 7S - 258, 8S - 11

15. Maximum tank fill rate (gal/min) 6S - 3, 7S - 3, 8S - 1

16. Tank fill method ☒ Submerged ☐ Splash ☐ Bottom Loading

17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply

17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year

18. Type of tank (check all that apply):
- ☒ Fixed Roof X vertical ___ horizontal ___ flat roof X 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
- ☐ Underground
- ☐ Other (describe)

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

19. Tank Shell Construction: ☒ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)

20A. Shell Color Green	20B. Roof Color Green	20C. Year Last Painted 2010

21. Shell Condition (if metal and unlined): ☐ No Rust ☒ Light Rust ☐ Dense Rust ☐ Not applicable

22A. Is the tank heated? ☐ YES ☒ NO

22B. If YES, provide the operating temperature (°F)

22C. If YES, please describe how heat is provided to tank.

23. Operating Pressure Range (psig): -.03 to .03

24. Complete the following section for **Vertical Fixed Roof Tanks** ☐ Does Not Apply

24A. For dome roof, provide roof radius (ft) 6S - 10, 7S - 7.5, 8S - 7.5

24B. For cone roof, provide slope (ft/ft) 6S - 0.4, 7S - 0.27, 8S - 0.27

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

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

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

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

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

34. Average daily temperature range of bulk liquid:	
34A. Minimum (°F)	34B. Maximum (°F)
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia)
37A. Average Liquid Surface Temperature (°F)	37B. Corresponding Vapor Pressure (psia)
38A. Maximum Liquid Surface Temperature (°F)	38B. Corresponding Vapor Pressure (psia)

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.

39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

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

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

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

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☐ Other[1] (describe):

[1] Complete appropriate Air Pollution Control Device Sheet.

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

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss		Annual Loss (lb/yr)	Estimation Method[1]
		Amount	Units		
6S - VOC/HAPS	<0.01	<0.01	lb/hr	47.62	EPA
7S - VOC/HAPS	<0.01	<0.01	lb/hr	31.81	EPA
8S - VOC/HAPS	<0.01	<0.01	lb/hr	0.02	EPA

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

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

Attachment L
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 (%)	8.9	8.9
p =	Number of days per year with precipitation >0.01 in.	0	0

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	Truck Loading	18	40	10	0.5	1	400	NA	NA
2									
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 (%)	8.9	8.9
S =	Mean vehicle speed (mph)	10	10
W =	Mean vehicle weight (tons)	40	40
w =	Mean number of wheels per vehicle	18	18
p =	Number of days per year with precipitation >0.01 in.	0	0

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	3.86	0.39	NA	NA	1.74	0.18	NA	NA
2								
3								
4								
5								
6								
7								
8								
TOTALS	3.86	0.39			1.74	0.18		

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
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*): 1E, 2E

1. Loading Area Name: Lumberport Compressor Station

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

3. Loading Rack or Transfer Point Data:

Number of pumps	0
Number of liquids loaded	2
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: These are third party vessels that have to meet DOT testing regs.

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.		NA	NA				
Liquid Name		water	lube oil				
Max. daily throughput (1000 gal/day)		8.4	4.2				
Max. annual throughput (1000 gal/yr)		1533	30.6				
Loading Method [1]		BF	BF				
Max. Fill Rate (gal/min)		140	140				
Average Fill Time (min/loading)		60	60				
Max. Bulk Liquid Temperature (°F)		115	115				
True Vapor Pressure [2]		0.4	0.1				
Cargo Vessel Condition [3]		U	U				
Control Equipment or Method [4]							
Minimum control efficiency (%)		0	0				
Maximum Emission Rate	Loading (lb/hr)	0.77	0.06				
	Annual (lb/yr)	0.08	<0.01				
Estimation Method [5]		EPA	EPA				

[1] BF = Bottom Fill SP = Splash Fill SUB = Submerged Fill

[2] At maximum bulk liquid temperature

[3] B = Ballasted Vessel, C = Cleaned, U = Uncleaned (dedicated service), O = other (describe)

[4] List as many as apply (complete and submit appropriate *Air Pollution Control Device Sheets*):CA = Carbon Adsorption LOA = Lean Oil AdsorptionCO = 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 -
Visual inspection when loading. Because the emission basis is uncontrolled, worst case is permitted.	load runs date and times
REPORTING - NA	TESTING - NA

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 M
Air Pollution Control Device Sheets

Attachment M
Air Pollution Control Device Sheet
(OTHER COLLECTORS)

Control Device ID No. (must match Emission Units Table):5E

Equipment Information

1. Manufacturer: Phillips and Temro Model No. CH-06A113001	2. Control Device Name: CAT 3406 NA Catalyst Type: Catalyst
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. On a separate sheet(s) supply all data and calculations used in selecting or designing this collection device.	
5. Provide a scale diagram of the control device showing internal construction.	
6. Submit a schematic and diagram with dimensions and flow rates.	
7. Guaranteed minimum collection efficiency for each pollutant collected: NOx – 88%, CO -76%	
8. Attached efficiency curve and/or other efficiency information. See Spec Sheet	
9. Design inlet volume: 1030 SCFM	10. Capacity:1100
11. Indicate the liquid flow rate and describe equipment provided to measure pressure drop and flow rate, if any.NA	
12. Attach any additional data including auxiliary equipment and operation details to thoroughly evaluate the control equipment.	
13. Description of method of handling the collected material(s) for reuse of disposal. Once catalyst service life is complete it is replaced and sent to the manufacturer for catalyst "washing".	

Gas Stream Characteristics

14. Are halogenated organics present?	☐ Yes	X☐ No
Are particulates present?	X☐ Yes	☐ No
Are metals present?	☐ Yes	X☐ No

15. Inlet Emission stream parameters:	Maximum	Typical
Pressure (mmHg):	24.8	24.8
Heat Content (BTU/scf):	1134	1092
Oxygen Content (%):	0.4	0.4
Moisture Content (%):		
Relative Humidity (%):		

16. Type of pollutant(s) controlled: ☐ SO_x ☐ Odor
☐ Particulate (type): X☐ Other NOx, CO

17. Inlet gas velocity: 17 ft/sec

18. Pollutant specific gravity: NOx – 2.62, CO – 0.97

19. Gas flow into the collector:
1030 ACF @ 1151°F and PSIA

20. Gas stream temperature:
Inlet: 1151 °F
Outlet: °F

21. Gas flow rate:
Design Maximum: 1030 ACFM
Average Expected: 990 ACFM

22. Particulate Grain Loading in grains/scf:
Inlet: NA
Outlet: NA

23. Emission rate of each pollutant (specify) into and out of collector:

Pollutant	IN Pollutant		Emission Capture Efficiency %	OUT Pollutant		Control Efficiency %
	lb/hr	grains/acf		lb/hr	grains/acf	
A NOx	7.702		88	0.92		88
B CO	7.702		76	1.85		76

24. Dimensions of stack: Height 15 ft. Diameter 0.67 ft.

25. Supply a curve showing proposed collection efficiency versus gas volume from 25 to 130 percent of design rating of collector. Emission calculations are based on worst case scenario. The gas flow cannot go above 100%.

Particulate Distribution

26. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	NA	
2 – 4		
4 – 6		
6 – 8		
8 – 10		
10 – 12		
12 – 16		
16 – 20		
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		

>100		

27. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):There is no conditioning

28. Describe the collection material disposal system: Housed in Catalysts, catalysts is replaced when no longer operating and sent to manufacturer

29. Have you included ***Other Collectores Control Device*** in the Emissions Points Data Summary Sheet?Yes

30. **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: Comply with NSPS JJJJ	RECORDKEEPING: Comply with NSPS JJJJ
REPORTING: Comply with NSPS JJJJ	TESTING: Comply with NSPS JJJJ

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.

31. Manufacturer's Guaranteed Control Efficiency for each air pollutant. NOx – 88%, CO 76%

32. Manufacturer's Guaranteed Control Efficiency for each air pollutant. NOx – 88%, CO 76%

33. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty. Unit is maintained by rental company. They ensure that maintenance procedures are conducted to stay within the Manufacturer warranty.

Attachment N
Supporting Emission Calculations

XTO Energy, Inc.

Lumberport Compressor Station

Facility Emission Summary

Emissions Summary Table

Emission Source	PIN	EPN	NOx		CO		Total VOC (Includes Total HAPs)		SO_2		$PM_{10\ \&\ 2.5}$		Total HAPs	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Truck Loading: Produced Water	1S	1E	-	-	-	-	0.7676	0.0757	-	-	-	-	0.0000	0.0001
Truck Loading: Lube Oil	2S	2E	-	-	-	-	0.0552	0.0004	-	-	-	-	-	-
Fugitive Emissions: Equipment Leaks & Truck Loading Dust Emissions	3S	3E	-	-	-	-	0.2160	0.9463	-	-	3.8558	0.3856	0.0284	0.1246
Equipment Blowdowns: MSS	4S	4E	-	-	-	-	43.4667	1.0867	-	-	-	-	5.7239	0.1431
Cat 3406 NA 215 hp Compressor Engine	5S	5E	0.9480	4.1521	1.8959	8.3042	0.4740	2.0761	0.0011	0.0049	0.0190	0.0831	0.1321	0.5785
Produced Water Tank: 210 bbl	6S	6E	-	-	-	-	0.0056	0.0247	-	-	-	-	0.0000	0.0000
Suction Scrubber Water Tank: 100 bbl	7S	7E	-	-	-	-	0.0038	0.0168	-	-	-	-	0.0000	0.0000
Lube Oil Tank: 100 bbl	8S	8E	-	-	-	-	0.0001	0.0005	-	-	-	-	0.0000	0.0000

TOTAL EMISSIONS	NOx		CO		Total VOC (Includes Total HAPs)		SO_2		$PM_{10\ \&\ 2.5}$		Total HAPs	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
	0.9923	**4.3464**	**1.9332**	**8.4675**	**44.9916**	**4.2379**	**0.0014**	**0.0060**	**3.8781**	**0.4835**	**5.8853**	**0.8501**

XTO Energy, Inc.

Lumberport Compressor Station

Gas Analysis - Representative

Conversion of Mole Percent to Weight Percent

Component	Mole %	MW	Mole % *MW	Weight %
Carbon Dioxide	0.094	44.01	0.0412	0.220%
Nitrogen	0.823	28.01	0.2306	1.232%
Hydrogen Sulfide	0.000	34.08	0.0000	0.000%
Methane	87.843	16.04	14.0918	75.304%
Ethane	7.088	30.07	2.1313	11.389%
Propane	2.318	44.10	1.0223	5.463%
Iso-Butane	0.410	58.12	0.2381	1.272%
N-Butane	0.657	58.12	0.3820	2.041%
Iso-Pentane	0.226	72.15	0.1631	0.871%
N-Pentane	0.168	72.15	0.1209	0.646%
n-Hexane	0.000	86.18	0.0000	0.000%
Hexanes	0.000	86.16	0.0000	0.000%
2,4-Dimethylpentane	0.000	114.24	0.0000	0.000%
Methycyclohexane	0.000	96.00	0.0000	0.000%
Benzene*	0.374	78.11	0.2921	1.561%
Cyclohexane	0.000	84.51	0.0000	0.000%
Heptanes	0.000	100.20	0.0000	0.000%
Toluene	0.000	92.13	0.0000	0.000%
Ethylbenzene	0.000	106.17	0.0000	0.000%
Xylenes	0.000	106.17	0.0000	0.000%
Octanes	0.000	114.23	0.0000	0.000%
Nonanes	0.000	128.28	0.0000	0.000%
Decanes+	0.000	155.00	0.0000	0.000%
Total	100.001	-	18.71	100.000%

Molecular Weight	18.71	
Relative Density	0.649	
Lower Heating Value	1127	
NMHC	4.3497	23.244%
VOCs (NMNEHC)	2.2184	11.855%
HAPs	0.2921	1.561%
Total HC	18.4415	98.547%
THC:VOC Ratio	12.0295	12.030%

* All Hexane+ ran as Benzene to be conservative

XTO Energy, Inc.
Lumberport Compressor Station
Fugitive Emissions - VOC

Fugitive Emission Calculations

Component Type	Service	Estimated Components Count	Hours	Factors	Total VOC Weight %	Emissions	
						lb/year	tons/year
Valves	Gas/Vapor	120	8760	0.00992000	11.85%	1236.2049	0.6181
	Light Oil		8760	0.00550000	10.00%	0.0000	0.0000
	Heavy Oil		8760	0.00001900	10.00%	0.0000	0.0000
	Water/Light Oil	100	8760	0.00021600	10.00%	18.9216	0.0095
Pumps	Gas/Vapor		8760	0.00529000	11.85%	0.0000	0.0000
	Light Oil		8760	0.02866000	10.00%	0.0000	0.0000
	Heavy Oil		8760	0.00113000	10.00%	0.0000	0.0000
	Water/Light Oil	2	8760	0.00005300	10.00%	0.0929	0.0000
Flanges	Gas/Vapor	200	8760	0.00086000	11.85%	178.6183	0.0893
	Light Oil		8760	0.00024300	10.00%	0.0000	0.0000
	Heavy Oil		8760	0.00000086	10.00%	0.0000	0.0000
	Water/Light Oil	200	8760	0.00000620	10.00%	1.0862	0.0005
Open-ended Lines	Gas/Vapor	4	8760	0.00441000	11.85%	18.3188	0.0092
	Light Oil		8760	0.00309000	10.00%	0.0000	0.0000
	Heavy Oil		8760	0.00030900	10.00%	0.0000	0.0000
	Water/Light Oil	8	8760	0.00055000	10.00%	3.8544	0.0019
Connectors	Gas/Vapor	160	8760	0.00044000	11.85%	73.1089	0.0366
	Light Oil		8760	0.00046300	10.00%	0.0000	0.0000
	Heavy Oil		8760	0.00001700	10.00%	0.0000	0.0000
	Water/Light Oil	120	8760	0.00024300	10.00%	25.5442	0.0128
Other:	Gas/Vapor	10	8760	0.01940000	11.85%	201.4648	0.1007
	Light Oil		8760	0.01650000	10.00%	0.0000	0.0000
	Heavy Oil		8760	0.00006800	10.00%	0.0000	0.0000
	Water/Light Oil	5	8760	0.03090000	10.00%	135.3420	0.0677

	lb/hr	lb/year	TPY
Total VOC Emissions	0.216	1892.557	0.946
HAPs	0.028	249.220	0.125

XTO Energy, Inc.
Lumberport Compressor Station
Engines, Turbines, & Pumps

Emission Calculations - Compressor Engines

					Manufacturer's Data g/hp-hr				AP-42 Factors lb/MMBtu		lb/hr						tpy					
EPN	Unit Description	Yearly Operating Hours	Rated HP	MMbtu/hp-hr (HHV)	NOx	CO	VOC	HCHO	SO_2	$PM_{10\ \&\ 2.5}$[1]	NOx	CO	VOC*	HCHO	SO_2	$PM_{10\ \&\ 2.5}$	NOx	CO	VOC*	HCHO	SO_2	$PM_{10\ \&\ 2.5}$
CE1	CAT G3406NA	8760	215	0.008767	2.00	4.00	1.00	0.27	0.00059	0.010064	0.95	1.90	0.47	0.13	0.00	0.02	4.15	8.30	2.08	0.56	0.00	0.08

*Includes HCHO

[1]PM Emission Factor = 7.71E-05 lb/MMBTU + 7.71E-05 lb/MMBTU + 9.91E-03 lb/MMBTU = 0.01006 lb/MMBTU

**Nox and CO and VOC limits are based on JJJJ limits

Total Emissions Per Pollutant (TPY)	NOx	CO	VOC*	HCHO	SO_2	$PM_{10\ \&\ 2.5}$
	4.15	**8.30**	**2.08**	**0.56**	**0.00**	**0.08**

					AP-42 Facotrs lb/mmbtu						lb/hr						tpy					
EPN	Unit Description	Yearly Operating Hours	Rated HP	MMbtu/hp-hr (HHV)	Benzene	Ethyl-Benzene	Toluene	Xylene	n-Hexane	--	Benzene	Ethyl-Benzene	Toluene	Xylene	n-Hexane	HCHO	Benzene	Ethyl-Benzene	Toluene	Xylene	n-Hexane	HCHO
CE1	CAT G3406NA	8760	215	0.008767	0.00044	0.00004	0.00041	0.00018	0.00111	--	0.0008	0.0001	0.0008	0.0003	0.0021	0.1280	0.0036	0.0003	0.0034	0.0015	0.0092	0.5605

Total HAPS	TPY
	0.579

XTO Energy, Inc.

Lumberport Compressor Station

Well Produced Water Storage Tank

Emissions Calculations - Total Tank Emissions

Average BWPD	Number of Produced Water Tanks	Emissions Controlled (Yes/No)	Control Type (Flare, VRU, etc.)
50	1	No	N/A

Total Uncontrolled Emissions - Emission Rate for All Tanks Combined			
Uncontrolled VOC Emissions		Uncontrolled HAP Emissions	
0.006	lb/hr	0.000	lb/hr
0.025	tpy	0.000	tpy

Total Uncontrolled Emissions - Emission Rates Per Tank			
Uncontrolled VOC Emissions		Uncontrolled HAP Emissions	
0.006	lb/hr	0.000	lb/hr
0.025	tpy	0.000	tpy

Tank Emissions are based from Tanks 4.09d calculations & Flash GOR (both use a 100% additional safety factor)

XTO Energy, Inc.

Lumberport Compressor Station

Suction Scrubber Water Storage Tank

Emissions Calculations - Total Tank Emissions

Average BWPD	Number of Produced Water Tanks	Emissions Controlled (Yes/No)	Control Type (Flare, VRU, etc.)
50	1	No	N/A

Total Uncontrolled Emissions - Emission Rate for All Tanks Combined			
Uncontrolled VOC Emissions		Uncontrolled HAP Emissions	
0.004	lb/hr	0.000	lb/hr
0.017	tpy	0.000	tpy

Total Uncontrolled Emissions - Emission Rates Per Tank			
Uncontrolled VOC Emissions		Uncontrolled HAP Emissions	
0.004	lb/hr	0.000	lb/hr
0.017	tpy	0.000	tpy

Tank Emissions are based from Tanks 4.09d calculations & Flash GOR (both use a 100% additional safety factor)

XTO Energy, Inc.

Lumberport Compressor Station

Tank Vapor Analysis - Representative

Conversion of Mole Percent to Weight Percent

Component	Mole %	MW	Mole % *MW	Weight %
Carbon Dioxide	1.5529	44.0100	0.6834	0.2247
Nitrogen	1.2181	28.0100	0.3412	0.0002
Hydrogen Sulfide	0.0000	34.0800	0.0000	0.0000
Helium	0.0000	4.0000	0.0000	0.0000
Methane	88.8214	16.0400	14.2470	0.3167
Ethane	7.3093	30.0700	2.1979	0.3100
Propane	0.9392	44.1000	0.4142	0.0440
Iso-Butane	0.0300	58.1200	0.0174	0.0017
N-Butane	0.0130	58.1200	0.0076	0.0012
Iso-Pentane	0.0021	72.1500	0.0015	0.0000
N-Pentane	0.0010	72.1500	0.0007	0.0000
Methylcyclopentane	0.0000	86.0000	0.0000	0.0000
n-Hexane	0.0014	86.1800	0.0012	0.0000
Hexane +	0.0041	86.1600	0.0035	0.0000
2,2,4-Trimethylpentane	0.0000	114.2400	0.0000	0.0000
Methycyclohexane	0.0000	96.0000	0.0000	0.0000
Benzene	0.0160	78.1100	0.0125	0.0002
Cyclohexane	0.0102	84.0000	0.0086	0.0000
Heptanes	0.0080	100.2000	0.0080	0.0671
Toluene	0.0397	92.1300	0.0366	0.0000
Ethylbenzene	0.0039	106.1700	0.0041	0.0000
Xylenes	0.0160	106.1700	0.0170	0.0000
Octanes+	0.0116	114.2300	0.0133	0.0241
Nonanes+	0.0014	128.2800	0.0018	0.0099
Decanes+	0.0000	155.7100	0.0000	0.0004
Total	99.999	-	18.0175	100.000%

Molecular Weight	18.02	
Specific Gravity	0.721	
Gross WET BTU	1037	
NMHC	2.7459	45.843%
VOCs (NMNEHC)	0.5480	14.846%
HAPs	0.0714	0.02%
H2S Mole Fraction	0.0000	0.000%
Total HC	16.9928	77.512%
THC:VOC Ratio	3.2248	3.225%

XTO Energy, Inc.

Lumberport Compressor Station

Production Tank Vapors

Oil/Condensate Production	0	BOPD
Produced Water Production	100	BWPD
E&P Tanks Output - Gas-to-Oil Ratio*	1.78	SCF / Barrel (GOR)
Quanitiy Released	35.6	(BOPD * GOR) + (BWPD * GOR * 0.2)
Duration	24	Hours/Day
Flared	No	(Yes/No)
Vented	Yes	(Yes/No)
BTU	1037	

Component	Estimated Quantity Vented (lb/day)	Estimated Quantity Emitted from the Flare (lb/day)	Total Estimated Quantity Emitted (lb/day)	Hourly Emission Rate (lb/hr)	Annualized Emission Rate (TPY)
Carbon Monoxide	0.000	0.000	0.000	0.000	0.000
NOx	0.000	0.000	0.000	0.000	0.000
Total VOCs	0.005	0.000	0.005	0.000	0.001
Total HAPs	0.000	0.000	0.000	0.000	0.000
Sulfur Dioxide	0.000	0.000	0.000	0.000	0.000
Carbon Dioxide	0.374	0.000	0.374	0.016	0.068
Nitrogen	0.000	0.000	0.000	0.000	0.000
Hydrogen Sulfide	0.000	0.000	0.000	0.000	0.0000
Helium	0.000	0.000	0.000	0.000	0.000
Methane	0.527	0.000	0.527	0.022	0.096
Ethane	0.516	0.000	0.516	0.021	0.094
Propane	0.073	0.000	0.073	0.003	0.013
Iso-Butane	0.003	0.000	0.003	0.000	0.001
N-Butane	0.002	0.000	0.002	0.000	0.000
Iso-Pentane	0.000	0.000	0.000	0.000	0.000
N-Pentane	0.000	0.000	0.000	0.000	0.000
Methylcyclopentane	0.000	0.000	0.000	0.000	0.000
n-Hexane	0.000	0.000	0.000	0.000	0.000
Hexanes	0.000	0.000	0.000	0.000	0.000
2,4-Dimethylpentane	0.000	0.000	0.000	0.000	0.000
Methycyclohexane	0.000	0.000	0.000	0.000	0.000
Benzene	0.000	0.000	0.000	0.000	0.000
Cyclohexane	0.000	0.000	0.000	0.000	0.000
Heptanes	0.112	0.000	0.112	0.005	0.020
Toluene	0.000	0.000	0.000	0.000	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	0.000
Xylenes	0.000	0.000	0.000	0.000	0.000
Octanes	0.040	0.000	0.040	0.002	0.007
Nonanes	0.016	0.000	0.016	0.001	0.003
Decanes+	0.001	0.000	0.001	0.000	0.000
$PM_{10 \& 2.5}$	0.000	0.000	0.000	0.000	0.000

XTO Energy, Inc.

Lumberport Compressor Station

PRODUCED WATER TRUCK LOADING EMISSIONS

Truck Loading Losses Calculations

Produced Water Production:	**100**	**bbls / Day**
Operating Schedule	**365**	**Day / Year**
Total Production:	**36500**	**bbls / Year**

LL= 12.46 * SPM/T * (1-EFF/100)

Saturation Factor (S) =	0.6
True Vapor Pressure of liquid loaded (P) =	0.40
Temperature of bulk liquid loaded in Rankin (T) =	540.0
Molecular Weight (M)[1] =	18.02
Control Efficiency * Collection Efficiency (EFF)=	0
LL (lb Total HC / bbl Throughput) =	0.0041
Estimated Throughput (bbls/Year) =	36500
Truck Loading Rate (bbls/hour) =	185
Estimated # of Loads (Approximately 1 hr/Load) =	197

Total VOC Emissions	lb/hr	TPY
	0.77	0.08

[1]Molecular Weight and VP is from Tanks 4.09 d report

XTO Energy, Inc.

Lumberport Compressor Station

Lube Oil Storage Tank

Emissions Calculations - Total Tank Emissions

Average BOPD	Number of Produced Water Tanks	Emissions Controlled (Yes/No)	Control Type (Flare, VRU, etc.)
2	1	No	N/A

Total Uncontrolled Emissions - Emission Rate for All Tanks Combined			
Uncontrolled VOC Emissions		Uncontrolled HAP Emissions	
0.000	lb/hr	0.000	lb/hr
0.001	tpy	0.000	tpy

Total Uncontrolled Emissions - Emission Rates Per Tank			
Uncontrolled VOC Emissions		Uncontrolled HAP Emissions	
0.000	lb/hr	0.000	lb/hr
0.001	tpy	0.000	tpy

Tank Emissions are based from Tanks 4.09d calculations & Flash GOR (both use a 100% additional safety factor)

XTO Energy, Inc.

Lumberport Compressor Station

LUBE OIL TRUCK LOADING EMISSIONS

Truck Loading Losses Calculations

Produced Water Production:	**2**	**bbls / Day**
Operating Schedule	**365**	**Day / Year**
Total Production:	**730**	**bbls / Year**

LL= 12.46 * SPM/T * (1-EFF/100)

Saturation Factor (S) =	0.6
True Vapor Pressure of liquid loaded (P) =	0.01
Temperature of bulk liquid loaded in Rankin (T) =	540.0
Molecular Weight (M)[1] =	190.00
Control Efficiency * Collection Efficiency (EFF)=	0
LL (lb Total HC / bbl Throughput) =	0.0011
Estimated Throughput (bbls/Year) =	730
Truck Loading Rate (bbls/hour) =	50
Estimated # of Loads (Approximately 1 hr/Load) =	15

Total VOC Emissions	lb/hr	TPY
	0.06	0.0004

[1]Molecular Weight and VP is from Tanks 4.09 d report

XTO Energy, Inc.

Lumberport Compressor Station

MSS Gas Analysis

Conversion of Mole Percent to Weight Percent

Component	Mole %	MW	Mole % *MW	Weight %
Carbon Dioxide	0.0936	44.0150	0.0412	0.220%
Nitrogen	0.8233	28.0137	0.2306	1.232%
Hydrogen Sulfide	0.0000	34.0800	0.0000	0.000%
Methane	87.8431	16.0420	14.0918	75.304%
Ethane	7.0880	30.0685	2.1313	11.389%
Propane	2.3181	44.1000	1.0223	5.463%
Iso-Butane	0.4096	58.1200	0.2381	1.272%
N-Butane	0.6572	58.1200	0.3820	2.041%
Iso-Pentane	0.2260	72.1500	0.1631	0.871%
N-Pentane	0.1676	72.1517	0.1209	0.646%
n-Hexane	0.0000	86.1800	0.0000	0.000%
Hexane +	0.0000	86.1600	0.0000	0.000%
2,4-Dimethylpentane	0.0000	114.2400	0.0000	0.000%
Methycyclohexane	0.0000	96.0000	0.0000	0.000%
Benzene*	0.3740	78.1100	0.2921	1.561%
Cyclohexane	0.0000	84.5062	0.0000	0.000%
Heptanes	0.0000	100.2000	0.0000	0.000%
Toluene	0.0000	92.1300	0.0000	0.000%
Ethylbenzene	0.0000	106.1700	0.0000	0.000%
Xylenes	0.0000	106.1700	0.0000	0.000%
Octanes+	0.0000	114.2300	0.0000	0.000%
Nonanes+	0.0000	128.2800	0.0000	0.000%
Decanes+	0.0000	155.0000	0.0000	0.000%
Total	100.00	-	-	100.000%

Molecular Weight	18.71	
Specific Gravity	0.649	
Gross WET BTU	1127	
NMHC	4.3497	23.244%
VOCs (NMNEHC)	2.2184	11.855%
HAPs	0.2921	1.56%
H2S Mole Fraction	0.0000	0.000%
Total HC	18.4415	98.547%
THC:VOC Ratio	12.0295	12.030%

* All C6+ ran as benzene for a conservative estimate.

XTO Energy, Inc.

Lumberport Compressor Station

Equipment Blowdowns & Purging Emissions

Equipment Blowdowns & Purging - Emission Calculations

Vessel Information - (Basis for Volume: Compressor Discharge Filter Separator)		
Volume of the Vessels	75.40	ft^3
Estimated Volume of Gas in Vessel Under Pressure[1]	2639.96	Standard ft^3
Vessel Pressure	500	psig
Vessel Pressure	514.7	psia
Vessel / Atmospheric Temperature	80	°F
Vessel / Atmospheric Temperature	540	°R

Gas Composition Information		
Atmospheric Pressure	14.7	Psia
Universal Gas Constant (R)	10.73	ft^3 psi/°R lb-mol
Molecular Weight	18.71	lb/lb-mole
Compressibility Factor	0.9962	Z
VOC Weight Percent	11.85%	Percentage
HAP Weight Percent	1.56%	Percentage
H_2S Weight Percent	0.00%	Percentage
Ending Gas Density (ρ_2)[2]	0.0477	lb/ft³
Starting Gas Density (ρ_1)[3]	1.6686	lb/ft³
Density (ρ_{TOTAL})[4]	1.6210	lb/ft³

Emission Calculations		
Density (ρ_{TOTAL})	1.6210	lb/ft³
Estimated Max Amount of Gas Vented[5]	122.22	lbs/Event
Estimated Number of Equipment Blowdowns	50	Events/Year
Estimated Equipment Purge Count	3	Times/Event
Estimated Total Amount of Gas Released (Includes Methane & Ethane)	18332.99	lbs/Year
Estimated Total Amount of Gas Released (Includes Methane & Ethane)	9.17	Tons/Year

Estimated Total Emissions		
Total VOC Emissions (Includes Total HAPs)	2173.34	lbs/Year
	43.47	lbs/Event
	1.09	Tons/Year
Total HAPs Emissions	286.19	lbs/Year
	5.72	lbs/Event
	0.143	Tons/Year

Calculation Methodology

[1]Ideal Gas Law - Constant Temp: $(V_1 * P_1) / P_2$

[2]$\rho_1=(P_1*MW)/R*T_1*Z$

[3]$\rho_2=(P_2*MW)/R*T_2*Z$

[4]$\rho TOTAL = \rho 1 - \rho 2$

[5]Estimated Max Gas Vented (lb/Event) = $\rho TOTAL * V_1$

Attachment O

Monitoring/Recordkeeping/Reporting/Testing Plans

Monitoring/Recordkeeping/Reporting/Testing Plans

Lumberport Compressor Station
Harrison County, West Virginia
XTO Energy, Inc.

Storage Tanks (6S,7S,8S)

Monitoring – Visual inspections of the equipment will be done during routine site inspection in order to insure that all equipment is in proper working order.

Recordkeeping – Records of material throughput will be kept.

Reporting – No reporting should be required. Emission estimates were based on throughput and calculated as uncontrolled sources. A safety factor of at least 300% was used on the throughputs. Recordkeeping showing material throughput less than what was used for the basis of calculations should be sufficient.

Testing – No testing is necessary because the emissions were calculated as uncontrolled.

Truck Loading (1S,2S)

Monitoring – Visual inspections of the equipment will be done during routine site inspection in order to insure that all equipment is in proper working order.

Recordkeeping – Records of material loaded will be kept.

Reporting – No reporting should be required. Emission estimates were based on throughput and calculated as uncontrolled sources. A safety factor of at least 300% was used on the throughputs. Recordkeeping showing material loaded less than what was used for the basis of calculations should be sufficient.

Testing – No testing is necessary because the emissions were calculated as uncontrolled.

Fugitive Emissions and Equipment Blowdowns (3S,4S)

Monitoring – Visual inspections of the equipment will be done during routine site inspection in order to insure that all equipment is in proper working order. When leaks are detected, they will be repaired in the appropriate time frame.

Recordkeeping – Records of maintenance/repair conducted and the number of equipment blowdowns with volumes will be maintained. Records of truck loads creating fugitive dust will be maintained.

Reporting – No reporting should be required.

Testing – No testing is necessary because the emissions were calculated as uncontrolled.

CAT 3406 NA Compressor Engine (5S)

Will comply with all NSPS JJJJ monitoring/recordkeeping/reporting/testing requirements.

Attachment P
Public Notice

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that XTO Energy, Inc. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a NSR (45CSR13) Construction/Modification Permit Registration for a Compressor Station/Well Head Facility located on Co. Rte 6/9, near Lumberport in Harrison County, West Virginia. The latitude and longitude coordinates are: 39.387563, -80.361377.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be: 4.3464 TPY NOx, 8.4675 TPY CO, 4.2379 TPY VOC, 0.0060 TPY SO_2, 0.4835 TPY PM, 0.8501 TPY HAPs).

Startup of operation is planned to begin on or about the 1st day of November, 2015. 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 1227, during normal business hours.
Dated this the 3rd day of September, 2015.

By: XTO Energy, Inc.
Nina Hutton
VP Environmental, Health & Safety
810 Houston Street
Fort Worth, TX 76102

- *This Legal Notice was run in the Exponent/Telegram on September 3rd, 2015. A copy of the affidavit will be submitted as soon as it is received from the newspaper.*

Attachment T
Application Fee

XTO ENERGY INC. FORT WORTH, TEXAS 76102-6298 817-885-2195

INVOICE NUMBER / DESCRIPTION	INVOICE DATE	INVOICE AMOUNT
REQ 08252015B WV PERMIT FEES: LUMBERPORT STA	8/25/2015	2,000.00

VENDOR NUMBER	VENDOR NAME	CHECK NUMBER	CHECK TOTAL
8009190	WEST VIRGINIA DEPARTMENT OF	0007788702	$2,000.00

REMITTANCE ADVICE PLEASE DETACH STUB BEFORE DEPOSITING CHECK

THE ORIGINAL DOCUMENT HAS A WHITE REFLECTIVE WATERMARK ON THE BACK. HOLD AT AN ANGLE TO VIEW. DO NOT CASH IF NOT PRESENT.

XTO ENERGY

XTO ENERGY INC.
810 HOUSTON ST. - FORT WORTH, TEXAS 76102-6298

Citibank, N.A.
One Penn's Way - New Castle DE 19720
62-20/311

0007788702

CHECK NO. 0007788702 VENDOR NO. 8009190 DATE 9/01/15

EXACTLY TWO THOUSAND DOLLARS AND ZERO CENTS

PAY$ $2,000.00

VOID AFTER 90 DAYS
VENDOR

000040 090115

PAY TO THE ORDER OF:
WEST VIRGINIA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS
601 57TH STREET, S.E.
CHARLESTON, WV 25304-2345

Evan M Van Kirk

AUTHORIZED SIGNATURE

FORM NO. XTO-005-AP

COPYBAN CAPTURE® ANTI-FRAUD PROTECTION

⑈0007788702⑈ ⑆031100209⑆ 388786 28⑈

Attachment U
Other Supporting Documentation

USA COMPRESSION

USA Compression Unit 1962 Caterpillar G3406NA Engine Emissions

Date of Manufacture	October 3, 2008	Engine Serial Number	4FD03437	Date Modified/Reconstructed	N/A
Driver Rated HP	215	Rated Speed in RPM	1800	Combustion Type	Spark Ignited 4 Stroke
Number of Cylinders	6	Compression Ratio	10.5:1	Combustion Setting	Rich Burn
Displacement, in^3	893	Fuel Delivery Method	Carburetor	Combustion Air Treatment	Naturally Aspirated

Raw Engine Emissions (905 LHV BTU/SCF Fuel Gas with little to no H2S)

Fuel Consumption *7926 LHV BTU/bhp-hr or 8767 HHV BTU/bhp-hr*
Altitude *1200 ft*
Maximum Air Inlet Temp *90 F*

	g/bhp-hr [1]	lb/MMBTU [2]	lb/hr	TPY
Nitrogen Oxides (NOx)	16.25		7.702	33.736
Carbon Monoxide (CO)	16.25		7.702	33.736
Volatile Organic Compounds (VOC or NMNEHC excluding CH2O)	0.25		0.118	0.519
Formaldehyde (CH2O)	0.27		0.128	0.561
Particulate Matter (PM) Filterable+Condensable		1.94E-02	0.037	0.160
Sulfur Dioxide (SO2)		5.88E-04	0.001	0.005

	g/bhp-hr [1]	lb/MMBTU [2]	lb/hr	Metric Tonne/yr
Carbon Dioxide (CO2)	564	110.0	207	824
Methane (CH4)	1.4	0.23	0.434	1.722

[1] g/bhp-hr are based on Caterpillar Specifications. Note that g/bhp-hr values are based on 100% Load Operation.
It is recommended to add a safety margin to emissions to allow for operational flexibility and fuel gas composition variability.
[2] Emission Factor obtained from EPA's AP-42, Fifth Edition, Volume I, Chapter 3: Stationary Internal Combution Sources (Section 3.2 Natural Gas-Fired Reciprocating Engines, Table 3.2-3).

Catalytic Converter Emissions

Catalytic Converter Make and Model: *Phillips and Temro, CH-06A113001*
Element Type: *3-Way Replacement element.*
Number of Elements in Housing: *1*
Air/Fuel Ratio Control *Compliance Controls, AFR-9*

	% Reduction		lb/hr	TPY
Nitrogen Oxides (NOx)	88	*or* 2 g/bhp-hr	**0.92**	**4.05**
Carbon Monoxide (CO)	76	*or* 4 g/bhp-hr	**1.85**	**8.10**
Volatile Organic Compounds (VOC or NMNEHC)	0	< 1 g/bhp-hr	**0.09**	**0.37**
Formaldehyde (CH2O)	0		**0.13**	**0.56**
Particulate Matter (PM)	0		**3.66E-02**	**1.60E-01**
Sulfur Dioxide (SO2)	0		**1.11E-03**	**4.85E-03**

	% Reduction	lb/hr	Metric Tonne/yr
Carbon Dioxide (CO2)	0	**207**	**824**
Methane (CH4)	0	**0.43**	**1.72**

G3406

GAS COMPRESSION APPLICATION

GAS ENGINE SITE SPECIFIC TECHNICAL DATA
XTO Lumberport Quote 7-10-15

CATERPILLAR®

ENGINE SPEED (rpm):	1800
COMPRESSION RATIO:	10.3:1
JACKET WATER OUTLET (°F):	210
ASPIRATION:	NA
COOLING SYSTEM:	JW+OC
CONTROL SYSTEM:	CDIS
EXHAUST MANIFOLD:	WC
COMBUSTION:	CATALYST SETTING
EXHAUST OXYGEN (% O2):	0.4
SET POINT TIMING:	22

RATING STRATEGY:	STANDARD
RATING LEVEL:	CONTINUOUS
FUEL SYSTEM:	LPG IMPCO
	WITH CUSTOMER SUPPLIED AIR FUEL RATIO CONTROL

SITE CONDITIONS:

FUEL:	XTO Lumberport
FUEL PRESSURE RANGE(psig):	1.5-5.0
FUEL METHANE NUMBER:	63.3
FUEL LHV (Btu/scf):	1033
ALTITUDE(ft):	1200
MAXIMUM INLET AIR TEMPERATURE(°F):	90
STANDARD RATED POWER:	215 bhp@1800rpm

				MAXIMUM RATING	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE		
RATING		**NOTES**	**LOAD**	**100%**	**100%**	**75%**	**53%**
ENGINE POWER	(WITHOUT FAN)	(1)	bhp	215	204	153	107
INLET AIR TEMPERATURE			°F	63	90	90	90
ENGINE DATA							
FUEL CONSUMPTION (LHV)		(2)	Btu/bhp-hr	7926	8020	8573	9524
FUEL CONSUMPTION (HHV)		(2)	Btu/bhp-hr	8767	8871	9482	10534
AIR FLOW (@inlet air temp, 14.7 psia)	(WET)	(3)(4)	ft3/min	300	303	245	190
AIR FLOW	(WET)	(3)(4)	lb/hr	1364	1313	1061	821
FUEL FLOW (60°F, 14.7 psia)			scfm	27	26	21	16
INLET MANIFOLD PRESSURE		(5)	in Hg(abs)	24.8	24.8	20.3	16.1
EXHAUST TEMPERATURE - ENGINE OUTLET		(6)	°F	1151	1142	1094	1053
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(WET)	(7)(4)	ft3/min	1030	986	772	582
EXHAUST GAS MASS FLOW	(WET)	(7)(4)	lb/hr	1445	1391	1124	870
EMISSIONS DATA - ENGINE OUT							
NOx (as NO2)		(8)(9)	g/bhp-hr	16.25	16.35	17.06	17.81
CO		(8)(9)	g/bhp-hr	16.25	16.35	17.06	17.81
THC (mol. wt. of 15.84)		(8)(9)	g/bhp-hr	1.87	1.93	2.29	2.76
NMHC (mol. wt. of 15.84)		(8)(9)	g/bhp-hr	0.47	0.49	0.58	0.70
NMNEHC (VOCs) (mol. wt. of 15.84)		(8)(9)(10)	g/bhp-hr	0.25	0.25	0.30	0.36
HCHO (Formaldehyde)		(8)(9)	g/bhp-hr	0.27	0.27	0.27	0.27
CO2		(8)(9)	g/bhp-hr	564	571	616	681
EXHAUST OXYGEN		(8)(11)	% DRY	0.4	0.4	0.4	0.4
HEAT REJECTION							
HEAT REJ. TO JACKET WATER (JW)		(12)	Btu/min	9189	8991	7772	6642
HEAT REJ. TO ATMOSPHERE		(12)	Btu/min	1134	1092	875	681
HEAT REJ. TO LUBE OIL (OC)		(12)	Btu/min	1453	1422	1229	1050
COOLING SYSTEM SIZING CRITERIA							
TOTAL JACKET WATER CIRCUIT (JW+OC)		(13)	Btu/min	11852			
A cooling system safety factor of 0% has been added to the cooling system sizing criteria.							

CONDITIONS AND DEFINITIONS

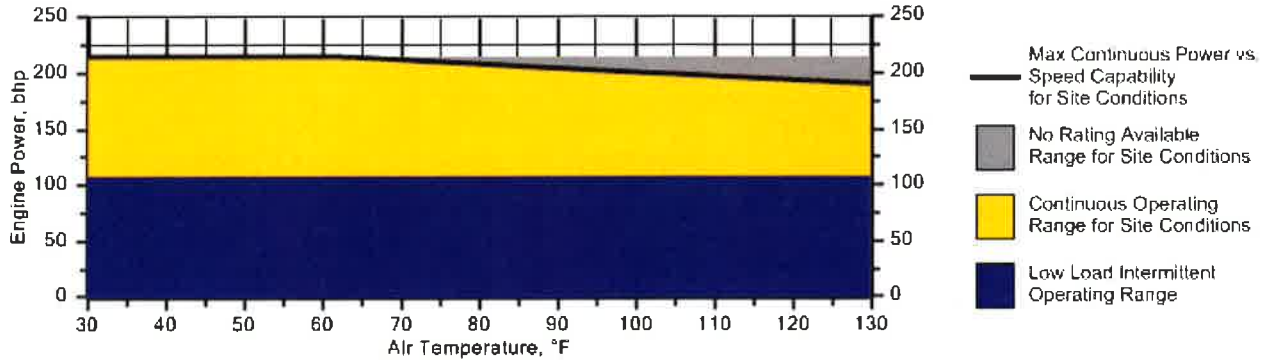
Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature. 100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature. Maximum rating is the maximum capability for the specified fuel at site altitude and reduced inlet air temperature. Lowest load point is the lowest continuous duty operating load allowed. No overload permitted at rating shown.

For notes information consult page three.

PREPARED BY: Chris Magee, USAC
Data generated by Gas Engine Rating Pro Version 5.01.00
Ref. Data Set DM5076-04-001, Printed 10Jul2015

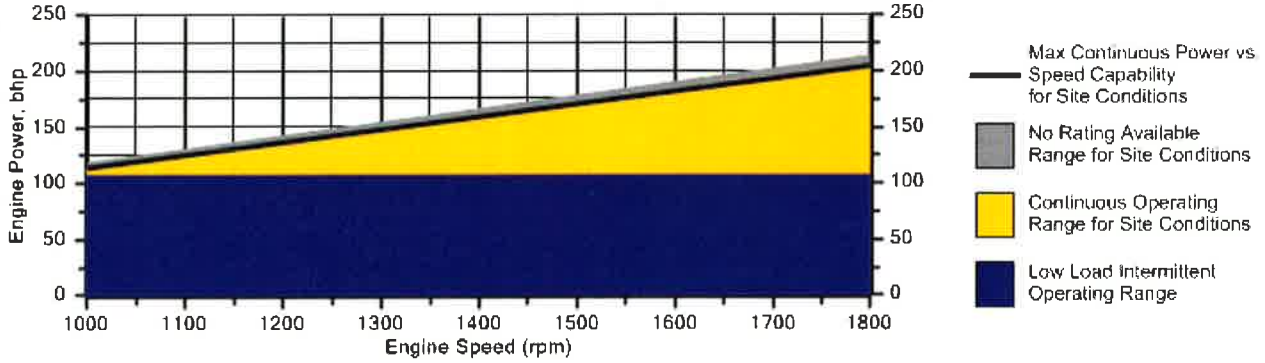
Engine Power vs. Inlet Air Temperature

Data represents temperature sweep at 1200 ft and 1800 rpm



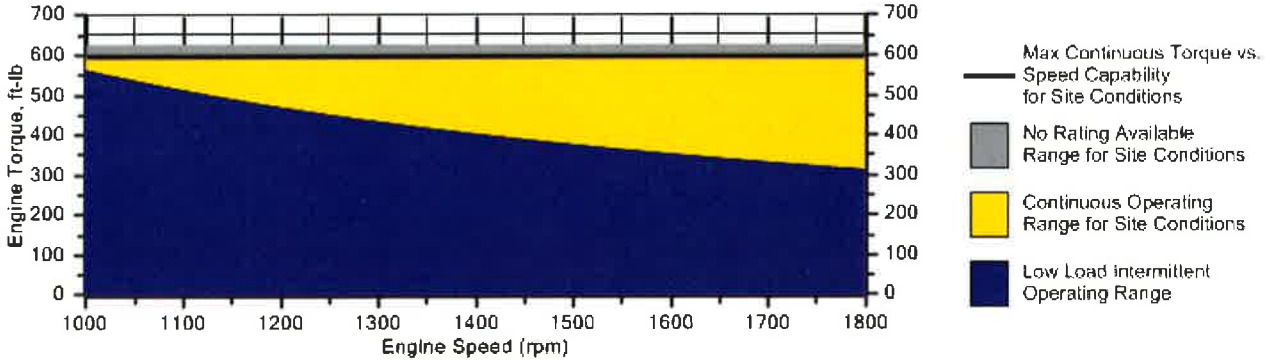
Engine Power vs. Engine Speed

Data represents speed sweep at 1200 ft and 90 °F



Engine Torque vs. Engine Speed

Data represents speed sweep at 1200 ft and 90 °F



Note: At site conditions of 1200 ft and 90°F inlet air temp., constant torque can be maintained down to 1000 rpm. The minimum speed for loading at these conditions is 1000 rpm.

NOTES

1. Engine rating is with one engine driven jacket water pump. Tolerance is ± 3% of full load.

2. Fuel consumption tolerance is ± 5.0% of full load data.

3. Air flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 5 %.

4. Inlet and Exhaust Restrictions must not exceed A&I limits based on full load flow rates from the standard technical data sheet.

5. Inlet manifold pressure is a nominal value with a tolerance of ± 5 %.

6. Exhaust temperature is a nominal value with a tolerance of (+)63°F, (-)54°F.

7. Exhaust flow value is on a "wet" basis. Flow is a nominal value with a tolerance of ± 6 %.

8. Emissions data is at engine exhaust flange prior to any after treatment.

9. Emission values are based on engine operating at steady state conditions. Fuel methane number cannot vary more than ± 3. Values listed are higher than nominal levels to allow for instrumentation, measurement, and engine-to-engine variations. They indicate "Not to Exceed" values. THC, NMHC, and NMNEHC do not include aldehydes. Part Load data requires customer supplied air fuel ratio control.

10. VOCs - Volatile organic compounds as defined in US EPA 40 CFR 60, subpart JJJJ

11. Exhaust Oxygen tolerance is ± 0.2.

12. Heat rejection values are nominal. Tolerances, based on treated water, are ± 10% for jacket water circuit, ± 50% for radiation, ± 20% for lube oil circuit.

13. Cooling system sizing criteria are maximum circuit heat rejection for the site, with applied tolerances.

Constituent	Abbrev	Mole %	Norm
Water Vapor	H2O	0.0000	0.0000
Methane	CH4	87.8431	87.8431
Ethane	C2H6	7.0880	7.0880
Propane	C3H8	2.3181	2.3181
Isobutane	iso-C4H1O	0.4096	0.4096
Norbutane	nor-C4H1O	0.6572	0.6572
Isopentane	iso-C5H12	0.2260	0.2260
Norpentane	nor-C5H12	0.1676	0.1676
Hexane	C6H14	0.3735	0.3735
Heptane	C7H16	0.0000	0.0000
Nitrogen	N2	0.8233	0.8233
Carbon Dioxide	CO2	0.0936	0.0936
Hydrogen Sulfide	H2S	0.0000	0.0000
Carbon Monoxide	CO	0.0000	0.0000
Hydrogen	H2	0.0000	0.0000
Oxygen	O2	0.0000	0.0000
Helium	HE	0.0000	0.0000
Neopentane	neo-C5H12	0.0000	0.0000
Octane	C8H18	0.0000	0.0000
Nonane	C9H20	0.0000	0.0000
Ethylene	C2H4	0.0000	0.0000
Propylene	C3H6	0.0000	0.0000
TOTAL (Volume %)		100.0000	100.0000

Fuel Makeup:	XTO Lumberport
Unit of Measure:	English

Calculated Fuel Properties

Caterpillar Methane Number:	63.3
Lower Heating Value (Btu/scf):	1033
Higher Heating Value (Btu/scf):	1142
WOBBE Index (Btu/scf):	1284
THC: Free Inert Ratio:	108.06
Total % Inerts (% N2, CO2, He):	0.92%
RPC (%) (To 905 Btu/scf Fuel):	100%
Compressibility Factor:	0.997
Stoich A/F Ratio (Vol/Vol):	10.75
Stoich A/F Ratio (Mass/Mass):	16.62
Specific Gravity (Relative to Air):	0.647
Specific Heat Constant (K):	1.298

CONDITIONS AND DEFINITIONS

Caterpillar Methane Number represents the knock resistance of a gaseous fuel. It should be used with the Caterpillar Fuel Usage Guide for the engine and rating to determine the rating for the fuel specified. A Fuel Usage Guide for each rating is included on page 2 of its standard technical data sheet.

RPC always applies to naturally aspirated (NA) engines, and turbocharged (TA or LE) engines only when they are derated for altitude and ambient site conditions.

Project specific technical data sheets generated by the Caterpillar Gas Engine Rating Pro program take the Caterpillar Methane Number and RPC into account when generating a site rating.

Fuel properties for Btu/scf calculations are at 60F and 14.696 psia.

Caterpillar shall have no liability in law or equity, for damages, consequently or otherwise, arising from use of program and related material or any part thereof.

FUEL LIQUIDS

Field gases, well head gases, and associated gases typically contain liquid water and heavy hydrocarbons entrained in the gas. To prevent detonation and severe damage to the engine, hydrocarbon liquids must not be allowed to enter the engine fuel system. To remove liquids, a liquid separator and coalescing filter are recommended, with an automatic drain and collection tank to prevent contamination of the ground in accordance with local codes and standards.

To avoid water condensation in the engine or fuel lines, limit the relative humidity of water in the fuel to 80% at the minimum fuel operating temperature.

GAS ANALYTICAL SERVICES

Gas Analytical

C6+ Gas Analysis Report

Report Date: Jun 24, 2015 8:41a

Client:	XTO Energy	Date Sampled:	Jun 18, 2015 10:15a
Site:	Lumberport Compressor	Analysis Date:	Jun 22, 2015 10:33a
Field No:	9998	Collected By:	Levi Miner
Meter:	3040336027	Date Effective:	Jun 18, 2015 12:00a
Source Laboratory	Clarksburg (Bridgeport), WV	Sample Pressure (PSI):	29.6
Lab File No:	**X_CH1-4180.CHR**	Sample Temp (°F):	79
Sample Type:	Spot	Field H2O (lb/MMSCFD):	No Test
Reviewed By:		Field H2S (PPM):	No Test

Component	Mol %	Gal/MSCF
Methane	87.8431	
Ethane	7.0880	1.88
Propane	2.3181	0.64
I-Butane	0.4096	0.13
N-Butane	0.6572	0.21
I-Pentane	0.2260	0.08
N-Pentane	0.1676	0.06
Nitrogen	0.8233	
Oxygen	<MDL	
Carbon Dioxide	0.0936	
Hexanes+	0.3735	0.15
TOTAL	100.0000	3.16

Analytical Results at Base Conditions (Real)	
BTU/SCF (Dry):	1,146.0856 BTU/ft³
BTU/SCF (Saturated):	1,127.0164 BTU/ft³
PSIA:	14.730 PSI
Temperature (°F):	60.00 °F
Z Factor (Dry):	0.99723
Z Factor (Saturated):	0.99684

Analytical Results at Contract Conditions (Real)	
BTU/SCF (Dry):	1,146.0856 BTU/ft³
BTU/SCF (Saturated):	1,127.0164 BTU/ft³
PSIA:	14.730 PSI
Temperature (°F):	60.00 °F
Z Factor (Dry):	0.99723
Z Factor (Saturated):	0.99684

Calculated Specific Gravities			
Ideal Gravity:	0.6481	Real Gravity:	0.6496
Molecular Wt:	18.7696 lb/lbmol		

Gross Heating Values are Based on:
GPA 2145-09, 2186
Compressibility is Calculated using AGA-8.

Source	Date	Notes
Gas Analytical	Jun 22, 2015	Email results to Dave Oldaker and Levi Miner 304-406-2455

<MDL = Less than Method Detection Limits, NG = Not Given, NT = Not Tested

Epic Natural Gas Analysis Report

Sample Information

	Sample Information
Sample Name	3140331547_Harbert A3H
Operator	Drew Nicholas
Injection Date	2014-08-22 11:54:29
NGA Phys. Property Data Source	GPA Standard 2145-09 (FPS)

Component Results

Component Name	Raw Amount	Norm%	Gross HV (Dry) (BTU /IDL cu.ft.)	Gross HV (Sat.) (BTU /IDL cu.ft.)	Relative Gas Density (Dry)	GPM (Dry) (Gal. / 1000 cu.ft.)
Nitrogen	0.2872	0.2872	0.0000	0.0000	0.0028	0.0317
Methane	95.4281	95.4216	965.9879	949.1719	0.5285	16.2079
Carbon Dioxide	0.1589	0.1589	0.0000	0.0000	0.0024	0.0272
Ethane	3.8233	3.8230	67.8122	66.6326	0.0397	1.0244
Propane	0.2724	0.2724	6.8697	6.7512	0.0041	0.0752
i-Butane	0.0150	0.0150	0.4889	0.4791	0.0003	0.0049
n-Butane	0.0188	0.0188	0.6147	0.6049	0.0004	0.0059
i-Pentane	0.0019	0.0019	0.0762	0.0762	0.0000	0.0007
n-Pentane	0.0012	0.0012	0.0482	0.0482	0.0000	0.0004
n-Hexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Heptane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Octane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total:	100.0068	100.0000	1041.8978	1023.7615	0.5783	17.3783

Results Summary

Result	Dry	Sat.
Total Raw Mole% (Dry)	100.0068	
Total Normalzed Mole%	100.0000	100.0000
Pressure Base (psia)	14.730	
Temperature Base	60.0	
Flowing Temperature (Deg. F)	69.70	
Flowing Pressure (PSIG)	847.63	
Gross Heating Value (BTU / Ideal cu.ft.)	1041.8978	1023.7615
Gross Heating Value (BTU / Real cu.ft.)	1044.1624	1026.3386
Relative Density (G), Ideal	0.5783	0.5791
Relative Density (G), Real	0.5793	0.5803
Gas Density, Real (lbm / cu.ft.)	0.04433	0.04441
Compressibility (Z) Factor	0.9978	0.9975

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

Identification

User Identification:	Lumberport Compressor Station
City:	Pittsburgh
State:	West Virginia
Company:	XTO Energy, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Well Pad Tank Run at 50 BWPD

Tank Dimensions

Shell Height (ft):		15.00
Diameter (ft):		10.00
Liquid Height (ft) :		9.00
Avg. Liquid Height (ft):		5.00
Volume (gallons):		5,287.69
Turnovers:		68.67
Net Throughput(gal/yr):		363,078.95
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Red/Primer
Shell Condition	Poor
Roof Color/Shade:	Red/Primer
Roof Condition:	Poor

Roof Characteristics

Type:	Cone	
Height (ft)		2.00
Slope (ft/ft) (Cone Roof)		0.40

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

Lumberport Compressor Station - Vertical Fixed Roof Tank
Pittsburgh, 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	61.45	50.34	72.56	54.77	0.2697	0.1801	0.3960	18.0200			18.02	Option 2: A=8.10765, B=1750.286, C=235

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

Lumberport Compressor Station - Vertical Fixed Roof Tank
Pittsburgh, West Virginia

Annual Emission Calcaulations	
Standing Losses (lb):	22.2607
Vapor Space Volume (cu ft):	837.7580
Vapor Density (lb/cu ft):	0.0009
Vapor Space Expansion Factor:	0.0965
Vented Vapor Saturation Factor:	0.8677
Tank Vapor Space Volume	
Vapor Space Volume (cu ft):	837.7580
Tank Diameter (ft):	10.0000
Vapor Space Outage (ft):	10.6667
Tank Shell Height (ft):	15.0000
Average Liquid Height (ft):	5.0000
Roof Outage (ft):	0.6667
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.6667
Roof Height (ft):	2.0000
Roof Slope (ft/ft):	0.4000
Shell Radius (ft):	5.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0009
Vapor Molecular Weight (lb/lb-mole):	18.0200
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2697
Daily Avg. Liquid Surface Temp. (deg. R):	521.1240
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):	514.4383
Tank Paint Solar Absorptance (Shell):	0.9100
Tank Paint Solar Absorptance (Roof):	0.9100
Daily Total Solar Insulation Factor (Btu/sqft day):	1,202.9556
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0965
Daily Vapor Temperature Range (deg. R):	44.4393
Daily Vapor Pressure Range (psia):	0.2159
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2697
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.1801
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.3960
Daily Avg. Liquid Surface Temp. (deg R):	521.1240
Daily Min. Liquid Surface Temp. (deg R):	510.0142
Daily Max. Liquid Surface Temp. (deg R):	532.2338
Daily Ambient Temp. Range (deg. R):	19.1500
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.8677
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.2697
Vapor Space Outage (ft):	10.6667
Working Losses (lb):	25.3570
Vapor Molecular Weight (lb/lb-mole):	18.0200
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2697
Annual Net Throughput (gal/yr.):	363,078.9480
Annual Turnovers:	68.6650
Turnover Factor:	0.6036
Maximum Liquid Volume (gal):	5,287.6851
Maximum Liquid Height (ft):	9.0000
Tank Diameter (ft):	10.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	47.6178

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

Emissions Report for: Annual

Lumberport Compressor Station - Vertical Fixed Roof Tank
Pittsburgh, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Produced Water	25.36	22.26	47.62

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

Identification

User Identification:	Lumberport Compressor Station
City:	Pittsburgh
State:	West Virginia
Company:	XTO Energy, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Compressor Scrubber Tank Run at 50 BWPD

Tank Dimensions

Shell Height (ft):		10.00
Diameter (ft):		7.50
Liquid Height (ft) :		9.00
Avg. Liquid Height (ft):		5.00
Volume (gallons):		2,974.32
Turnovers:		257.71
Net Throughput(gal/yr):		766,500.00
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Red/Primer
Shell Condition	Poor
Roof Color/Shade:	Red/Primer
Roof Condition:	Poor

Roof Characteristics

Type:	Cone	
Height (ft)		1.00
Slope (ft/ft) (Cone Roof)		0.27

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

Lumberport Compressor Station - Vertical Fixed Roof Tank
Pittsburgh, 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	61.45	50.34	72.56	54.77	0.2697	0.1801	0.3960	18.0200			18.02	Option 2: A=8.10765, B=1750.286, C=235

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

Lumberport Compressor Station - Vertical Fixed Roof Tank
Pittsburgh, West Virginia

Annual Emission Calcaulations	
Standing Losses (lb):	6.7043
Vapor Space Volume (cu ft):	235.6194
Vapor Density (lb/cu ft):	0.0009
Vapor Space Expansion Factor:	0.0965
Vented Vapor Saturation Factor:	0.9292
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	235.6194
Tank Diameter (ft):	7.5000
Vapor Space Outage (ft):	5.3333
Tank Shell Height (ft):	10.0000
Average Liquid Height (ft):	5.0000
Roof Outage (ft):	0.3333
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.3333
Roof Height (ft):	1.0000
Roof Slope (ft/ft):	0.2700
Shell Radius (ft):	3.7500
Vapor Density	
Vapor Density (lb/cu ft):	0.0009
Vapor Molecular Weight (lb/lb-mole):	18.0200
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2697
Daily Avg. Liquid Surface Temp. (deg. R):	521.1240
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)	514.4383
Tank Paint Solar Absorptance (Shell):	0.9100
Tank Paint Solar Absorptance (Roof)	0.9100
Daily Total Solar Insulation Factor (Btu/sqft day):	1,202.9556
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0965
Daily Vapor Temperature Range (deg. R):	44.4393
Daily Vapor Pressure Range (psia):	0.2159
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2697
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.1801
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.3960
Daily Avg. Liquid Surface Temp. (deg R):	521.1240
Daily Min. Liquid Surface Temp. (deg R):	510.0142
Daily Max. Liquid Surface Temp. (deg R):	532.2338
Daily Ambient Temp. Range (deg. R):	19.1500
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9292
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.2697
Vapor Space Outage (ft):	5.3333
Working Losses (lb):	25.1066
Vapor Molecular Weight (lb/lb-mole):	18.0200
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2697
Annual Net Throughput (gal/yr.):	766,500.0000
Annual Turnovers:	257.7057
Turnover Factor:	0.2831
Maximum Liquid Volume (gal):	2,974.3229
Maximum Liquid Height (ft):	9.0000
Tank Diameter (ft):	7.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	31.8109

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

Emissions Report for: Annual

Lumberport Compressor Station - Vertical Fixed Roof Tank
Pittsburgh, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Produced Water	25.11	6.70	31.81

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

Identification

User Identification:	Lumberport Compressor Station
City:	Pittsburgh
State:	West Virginia
Company:	XTO Energy, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Compressor Lube Oil Tank at 2 BOPD

Tank Dimensions

Shell Height (ft):		10.00
Diameter (ft):		7.50
Liquid Height (ft) :		9.00
Avg. Liquid Height (ft):		5.00
Volume (gallons):		2,974.32
Turnovers:		10.31
Net Throughput(gal/yr):		30,660.00
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Red/Primer
Shell Condition	Poor
Roof Color/Shade:	Red/Primer
Roof Condition:	Poor

Roof Characteristics

Type:	Cone	
Height (ft)		1.00
Slope (ft/ft) (Cone Roof)		0.27

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

Lumberport Compressor Station - Vertical Fixed Roof Tank
Pittsburgh, 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
Residual oil no. 6	All	61.45	50.34	72.56	54.77	0.0000	0.0000	0.0001	190.0000			387.00	Option 1: VP60 = .00004 VP70 = .00006

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

Lumberport Compressor Station - Vertical Fixed Roof Tank
Pittsburgh, West Virginia

Annual Emission Calcaulations	
Standing Losses (lb):	0.0102
Vapor Space Volume (cu ft):	235.6194
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0810
Vented Vapor Saturation Factor:	1.0000
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	235.6194
Tank Diameter (ft):	7.5000
Vapor Space Outage (ft):	5.3333
Tank Shell Height (ft):	10.0000
Average Liquid Height (ft):	5.0000
Roof Outage (ft):	0.3333
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.3333
Roof Height (ft)	1.0000
Roof Slope (ft/ft):	0.2700
Shell Radius (ft):	3.7500
Vapor Density	
Vapor Density (lb/cu ft):	0.0000
Vapor Molecular Weight (lb/lb-mole):	190.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0000
Daily Avg. Liquid Surface Temp. (deg. R):	521.1240
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):	514.4383
Tank Paint Solar Absorptance (Shell):	0.9100
Tank Paint Solar Absorptance (Roof):	0.9100
Daily Total Solar Insulation Factor (Btu/sqft day):	1,202.9556
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0810
Daily Vapor Temperature Range (deg. R):	44.4393
Daily Vapor Pressure Range (psia):	0.0000
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0000
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0000
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0001
Daily Avg. Liquid Surface Temp. (deg R):	521.1240
Daily Min. Liquid Surface Temp. (deg R):	510.0142
Daily Max. Liquid Surface Temp. (deg R):	532.2338
Daily Ambient Temp. Range (deg. R):	19.1500
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	1.0000
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0000
Vapor Space Outage (ft):	5.3333
Working Losses (lb):	0.0060
Vapor Molecular Weight (lb/lb-mole):	190.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0000
Annual Net Throughput (gal/yr.):	30,660.0000
Annual Turnovers:	10.3082
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	2,974.3229
Maximum Liquid Height (ft):	9.0000
Tank Diameter (ft):	7.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.0161

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

Emissions Report for: Annual

Lumberport Compressor Station - Vertical Fixed Roof Tank
Pittsburgh, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Residual oil no. 6	0.01	0.01	0.02