



December 28th, 2015

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

Re: Coopers Run Compressor Station- Rule 13 Permit Application

Please accept this letter and attached Rule 13 permit application as M3 Appalachia Gathering, LLC's formal request for approval of the proposed construction and operation of the Coopers Run natural gas compressor station located in Monongalia County, West Virginia. Startup of operation is planned to begin on or about the first day of May, 2016.

The estimated discharge amounts for regulated air pollutants are as follows: Nitrogen Oxides (NO_x) = 27.0 tons per year (tpy); Carbon Monoxide (CO) = 11.0 tpy; Volatile Organic Compounds (VOC) = 10.4 tpy; Sulfur Dioxide (SO_x) = 0.1 tpy; Particulate Matter (PM₁₀) = 0.01 tpy; Formaldehyde = 3.4 tpy; Hazardous Air Pollutants (HAPs) = 6.7 tpy; Carbon Dioxide Equivalents (CO₂(eq)) = 23330 tpy.

Included please find the check for the application fee in the amount of \$3,500 as well as the receipt for the legal advertisement. Please feel free to contact me with any further questions.

Sincerely,

Eric Tennison
Environmental Health & Safety Manager
M3 Appalachia Gathering, LLC
742 Fairmont Road, Suite E
Westover, WV 26501
e.tennison@m3midstream.com
304-212-4403 ext. 5006 (office)
724-705-3816 (cell)

Eric Tennison

From: Sarah V. Rivera <srivera@dominionpost.com>
Sent: Monday, December 28, 2015 3:26 PM
To: Eric Tennison
Subject: Thanks. This ad has been placed



Classified Advertising Ad Proof
Date Generated: 12/28/2015

No: 1051056
M3 APPALACHIA GATHERING
LLC

Account

Email:
WESTOVER, WV 26501
212-4403

Phone: 304-

Sales Associate: Sarah Rivera | **Phone:** 304-291-9420 | **Email:** classads@dominionpost.com

Urn: 010081143	Order	PO
Price: \$361.10	Number: PAYMENT INFORMATION Total Order	

AD COPY PROOF:
Not Shown Actual Size

010081143

December 30, 31 January 1, 2, 3, 4, 5, 6

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that M3 Appalachia Gathering, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Construction Permit Registration per the requirements of 45CSR13 (New Source Review Minor Air Emissions Source) for a Natural Gas Compressor Station located on Access Road off of WV-7E, near Blacksville, in Monongalia County, West Virginia. The latitude and longitude coordinates are: (Latitude: 39.703886; Longitude: 80.205344.) The applicant estimates the potential to discharge the following Regulated Air Pollutants will be:

Nitrogen Oxides (NOx) = 27.0 tons per year (tpy); Carbon Monoxide (CO) = 11.0 tpy; Volatile Organic Compounds (VOC) = 10.4 tpy; Sulfur Dioxide (SOx) = 0.1 tpy; Particulate Matter (PM10) = 0.01 tpy; Formaldehyde = 3.4 tpy; Hazardous Air Pollutants (HAPs) = 6.7 tpy; Carbon Dioxide Equivalents (CO2(eq)) = 23330 tpy.

Startup of operation is planned to begin on or about the first day of May, 2016. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

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

Dated this the 22nd day of December, 2015.
By: M3 Appalachia Gathering, LLC

James C. Roberts V.P. Environmental, Health, and Safety
742 Fairmont Road, Suite E
Westover, WV 26501

TITLES:

Title: Dominion Post | Class: 101 Legals
Start Date: 12/30/2015 | Stop Date: 1/6/2016
Insertions: 7 | Lines: 32.4008 ag

Thanks! This ad has been placed.

Sarah V. Rivera

Classified Ad-Visor
The Dominion Post
1251 Earl. L. Core Road
Morgantown, WV 26505
svivera@dominionpost.com
(304)291-9420



**Rule 13 Permit Application
Coopers Run Compressor Station
M3 Appalachia Gathering, LLC**

December 22, 2015

Table of Contents

1	Introduction.....	1-1
1.1	Facility and Project Description.....	1-1
1.1.1	Compressor Engines	1-1
1.1.2	Storage Tanks.....	1-1
1.1.3	Generator.....	1-2
1.1.4	Miscellaneous Equipment.....	1-2
1.2	Application Organization.....	1-2
2	Sample Emission Calculations and Discussion	2-1
2.1	Compressor Engines	2-1
2.2	Generator.....	2-1
2.3	Storage Tanks.....	2-1
2.4	Fugitive Emissions.....	2-1
3	WVDEP Rule 13 Application.....	3-1
4	Attachments	4-1
	• Attachment A: Business Certificate.....	4-2
	• Attachment B: Map(s).....	4-6
	• Attachment C: Installation and Start-Up Schedule.....	4-10
	• Attachment D: Regulatory Discussion.....	4-11
	• Attachment E: Plot Plan.....	4-17
	• Attachment F: Detailed Process Flow Diagram(s)	4-19
	• Attachment G: Process Description	4-21
	• Attachment H: Material Safety Data Sheets (MSDS).....	4-22
	• Attachment I: Emission Units Table.....	4-48
	• Attachment J: Emission Points Data Summary Sheet	4-50
	• Attachment K: Fugitive Emissions Data Summary Sheet	4-54
	• Attachment L: Emissions Unit Data Sheet(s)	4-57
	• Attachment M: Air Pollution Control Device Sheet(s).....	4-87
	• Attachment N: Supporting Emission Calculations	4-95
	• Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans	4-113
	• Attachment P: Public Notice.....	4-115
	• Attachment Q: Business Confidential Forms – N/A.....	4-117
	• Attachment R: Authority Forms – N/A	4-118
	• Attachment S: Title V Permit Revision Information – N/A	4-119
	• Application Fee.....	4-120

1 Introduction

M3 Appalachia Gathering, LLC (M3 AGS) is submitting this Rule 13 permit application to the West Virginia Department of Environmental Protection (WVDEP) for the proposed construction and operation of the Coopers Run natural gas compressor station located in Monongalia County, West Virginia.

1.1 Facility and Project Description.

The Coopers Run Compressor Station will compress lean wet natural gas (approximately 95-98% methane) that originates from 3rd party producers and compress the gas to pressures necessary to deliver into M3's Appalachia Gathering System (AGS) 24 inch pipeline. Between 75 MMSCFD and 100 MMSCFD of wet natural gas at approximately 300-450 psig first enters the compressor station via pipeline into a 60 inch diameter by 10 foot inlet separator. The gas then travels through a suction control valve and into the main suction header which feeds into three natural gas driven CAT G3606 engine/compressor units. The gas is compressed to 900-1125 psig and travels to an off-site downstream Dehydration Station, for ultimate delivery into the AGS gathering system. The compressor station will be located in Monongalia County, WV, at 39° 42' 15.21" N and 80° 12' 17.25" W.

Other major equipment on site will include one 30 barrel waste oil tank, three 500 gallon engine lube oil make-up tanks, three 500 gallon compressor lube oil tanks, two 30 barrel engine coolant tanks, and a 335 gallon methanol storage/containment tank.

1.1.1 Compressor Engines

M3 AGS is proposing to install three (3) natural gas-fired reciprocating engines (CAT G3606 Units) to compress the natural gas to main gathering system pressures. The engines will be 4-stroke, lean burn, spark ignition engines each rated at 1775 hp and equipped with oxidation catalyst for control of carbon monoxide (CO), volatile organic compound (VOC), and formaldehyde (HCHO) emissions.

1.1.2 Storage Tanks

The Coopers Run Compressor Station will include 10 storage tanks as follows. Only T02 (Methanol) is expected to have VOC emissions although they will be minimal. The other tanks consist of lube oils for both the engine and compressor on the Compression Units, engine coolant which consist of a 50% ethylene glycol and water mix, or wastes of each. All tanks will have secondary containment.

- T01 – Waste Lube Oil – 30 barrel

- T02 – Methanol 335 gallons
- T03 – Coolant Make Up Tank – 30 barrel
- T04 – Coolant Drain Tank – 30 barrel
- T05 – Engine Lube Oil for CE-1 – 500 gallon
- T06 – Compressor Lube Oil for CE-1 – 500 gallon
- T07 – Engine :Lube Oil for CE-2 – 500 gallon
- T08 – Compressor Lube Oil for CE-2 – 500 gallon
- T09 – Engine Lube Oil for CE-3 – 500 gallon
- T10 - Compressor Lube Oil for CE-3 – 500 gallon

1.1.3 **Generator**

There will be one small natural gas driven Generator set (GE-1) that will be required for electrical instrumentation and control purposes. The Genset will be a Gillette Generator natural gas driven 126 HP unit.

1.1.4 **Miscellaneous Equipment**

Other equipment located at the compressor station includes piping, separators, gas scrubbers, filters, valves, and meters. None of this equipment is expected to be a significant source of air emissions although are considered as part of the evaluation of fugitive emissions.

1.2 **Application Organization**

This Rule 13 application is organized as follows to ensure it matches up with the application form:

- Section 1 – Introduction
- Section 2 – Sample Emission Calculations
- Section 3 – Rule 13 Application Forms;
- Attachment A - Business Certificate;
- Attachment B - Map;
- Attachment C - Installation and Start Up Schedule;

- Attachment D - Regulatory Discussion;
- Attachment E - Plot Plan;
- Attachment F - Detailed Process Flow Diagram;
- Attachment G - Process Description;
- Attachment I - Emission Units Table;
- Attachment J - Emission Points Data Summary Sheet;
- Attachment K - Fugitive Emissions Data Summary Sheet;
- Attachment L - Emissions Unit Data Sheets;
- Attachment M - Air Pollution Control Device Sheet;
- Attachment N - Supporting Emission Calculations;
- Attachment O - Monitoring/Recordkeeping/Reporting/Testing Plans;
- Attachment P – Public Notice;
- Attachment S - Title V Revision Information – Not Applicable;
- Application Fee

2 Sample Emission Calculations and Discussion

The characteristics of air emissions from the Coopers Run Compressor Station, along with the methodology used for calculating emissions from the proposed new sources, are described in narrative form below. Detailed supporting calculations are also provided in Attachment N.

Emissions from the Coopers Run Compressor Station will result from the natural gas combustion in the compressor engines, natural gas combustion for the generator, and flashing, working, and breathing losses from the storage tanks. In addition, fugitive emissions from component leaks will result from the operation of the station. The methodologies employed in calculating emissions from these sources have been summarized below, with specific citations included in Attachment N.

2.1 Compressor Engines

Potential emissions of nitrogen oxides (NOX), CO, VOC, formaldehyde are calculated using factors provided by the engine and catalyst manufacturer. Potential emissions of sulfur dioxide (SO₂), particulate matter (PM/PM₁₀/PM_{2.5}), and all other hazardous air pollutants (HAPs) are calculated using U.S. EPA's AP-42 factors for four stroke lean burn engines. Potential emissions of greenhouse gas pollutants (GHGs) are calculated using manufacturer's data as available (CO₂ and CH₄ in this case) and U.S. EPA's emission factors from 40 CFR Part 98, Subpart C for all others.

2.2 Generator

Potential emissions of NOX, CO, VOC, methane, and CO₂ are calculated using manufacturer's emission data. Emissions of all other criteria pollutants and HAPs are calculated using U.S. EPA's AP-42 factors for natural gas internal combustion engines. These calculations use site specific heat content.

2.3 Storage Tanks

Working, standing, and flash loss emissions of VOC and HAPs from the methanol storage tanks are calculated using E&P Tank v4.09. Liquid loading emissions are calculated using EPA AP-42 emission factors. No other VOC or HAP emissions are expected from the other storage tanks.

2.4 Fugitive Emissions

Emissions from fugitive equipment leaks are calculated using published EPA emission factors and 40 CFR Part 98, Subpart W emission factors. Emissions from blowdown events are calculated using engineering estimates of the amount of gas vented during each event. Site specific gas analyses were used to speciate VOC, HAP, and GHG emissions.

3 WVDEP Rule 13 Application

The following WVDEP permit application forms contained in this application include all applicable R13 application forms including the required attachments per 45CSR13.



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): M3 Appalachia Gathering, LLC		2. Federal Employer ID No. (FEIN): 45-0718671	
3. Name of facility (if different from above): Coopers Run Compressor Station		4. The applicant is the: <input type="checkbox"/> OWNER <input type="checkbox"/> OPERATOR <input checked="" type="checkbox"/> BOTH	
5A. Applicant's mailing address: 742 Fairmont Rd, Suite E Westover, WV 26501		5B. Facility's present physical address: Access Road off of WV-7E, Blacksville, WV 26521	
6. West Virginia Business Registration. Is the applicant a resident of the State of West Virginia? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO – If YES , provide a copy of the Certificate of Incorporation/Organization/Limited Partnership (one page) including any name change amendments or other Business Registration Certificate as Attachment A . – If NO , provide a copy of the Certificate of Authority/Authority of L.L.C./Registration (one page) including any name change amendments or other Business Certificate as Attachment A .			
7. If applicant is a subsidiary corporation, please provide the name of parent corporation:			
8. Does the applicant own, lease, have an option to buy or otherwise have control of the <i>proposed site</i> ? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO – If YES , please explain: Owner/Operator – If NO , you are not eligible for a permit for this source.			
9. Type of plant or facility (stationary source) to be constructed, modified, relocated, administratively updated or temporarily permitted (e.g., coal preparation plant, primary crusher, etc.): Natural Gas Compressor Station		10. North American Industry Classification System (NAICS) code for the facility: 211111	
11A. DAQ Plant ID No. (for existing facilities only): -		11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):	

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

<p>12A.</p> <ul style="list-style-type: none"> For Modifications, Administrative Updates or Temporary permits at an existing facility, please provide directions to the <i>present location</i> of the facility from the nearest state road; For Construction or Relocation permits, please provide directions to the <i>proposed new site location</i> from the nearest state road. Include a MAP as Attachment B. <p>See Attachment B</p>		
12.B. New site address (if applicable):	12C. Nearest city or town: Blacksville, WV	12D. County: Monongalia
12.E. UTM Northing (KM): 4395.885	12F. UTM Easting (KM): 568.914	12G. UTM Zone: 17
<p>13. Briefly describe the proposed change(s) at the facility: Site will operate as a natural gas compressor station.</p>		
<p>14A. Provide the date of anticipated installation or change: 02/01/2016</p> <ul style="list-style-type: none"> If this is an After-The-Fact permit application, provide the date upon which the proposed change did happen: / / 		<p>14B. Date of anticipated Start-Up if a permit is granted: 03/01/2016</p>
<p>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).</p>		
<p>15. Provide maximum projected Operating Schedule of activity/activities outlined in this application: Hours Per Day 24 Days Per Week 7 Weeks Per Year 52</p>		
<p>16. Is demolition or physical renovation at an existing facility involved? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO</p>		
<p>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.</p>		
<p>18. Regulatory Discussion. List all Federal and State air pollution control regulations that you believe are applicable to the proposed process (<i>if known</i>). 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 (<i>if known</i>). Provide this information as Attachment D.</p>		
<p>Section II. Additional attachments and supporting documents.</p>		
<p>19. Include a check payable to WVDEP – Division of Air Quality with the appropriate application fee (per 45CSR22 and 45CSR13).</p>		
<p>20. Include a Table of Contents as the first page of your application package.</p>		
<p>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) .</p> <ul style="list-style-type: none"> Indicate the location of the nearest occupied structure (e.g. church, school, business, residence). 		
<p>22. Provide a Detailed Process Flow Diagram(s) showing each proposed or modified emissions unit, emission point and control device as Attachment F.</p>		
<p>23. Provide a Process Description as Attachment G.</p> <ul style="list-style-type: none"> Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable). 		
<p>All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.</p>		

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:

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

General Emission Unit, specify: **Compressor Engines**

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

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

<input type="checkbox"/> Absorption Systems	<input type="checkbox"/> Baghouse	<input type="checkbox"/> Flare
<input type="checkbox"/> Adsorption Systems	<input type="checkbox"/> Condenser	<input type="checkbox"/> Mechanical Collector
<input type="checkbox"/> Afterburner	<input type="checkbox"/> Electrostatic Precipitator	<input type="checkbox"/> Wet Collecting System

Other Collectors, specify **Catalyst**

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

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

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O**.
 ➤ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

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

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?
 YES NO
 ➤ If **YES**, identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's "**Precautionary Notice – Claims of Confidentiality**" guidance found in the **General Instructions** as **Attachment Q**.

Section III. Certification of Information

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

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

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

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

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

Certification of Truth, Accuracy, and Completeness

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

Compliance Certification

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

SIGNATURE:  DATE: 12/2/2015
(Please use blue ink) (Please use blue ink)

35B. Printed name of signee: James C. Roberts		35C. Title: VP, Environmental Health and Safety
35D. E-mail: j.roberts@m3midstream.com	36E. Phone: 970-769-1955	36F. FAX:
36A. Printed name of contact person (if different from above):		36B. Title:
36C. E-mail:	36D. Phone:	36E. FAX:

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

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

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

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

Forward 1 copy of the application to the Title V Permitting Group and:

For Title V Administrative Amendments:

NSR permit writer should notify Title V permit writer of draft permit,

For Title V Minor Modifications:

Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,

NSR permit writer should notify Title V permit writer of draft permit.

For Title V Significant Modifications processed in parallel with NSR Permit revision:

NSR permit writer should notify a Title V permit writer of draft permit,

Public notice should reference both 45CSR13 and Title V permits,

EPA has 45 day review period of a draft permit.

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

4 Attachments

The following Attachments are provided to supplement the Rule 13 Application and include all data required for all emission sources.

- **Attachment A: Business Certificate**

**WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION
CERTIFICATE**

ISSUED TO:
**M3 APPALACHIA GATHERING, LLC
600 TRAVIS ST 4910
HOUSTON, TX 77002-3025**

BUSINESS REGISTRATION ACCOUNT NUMBER: 2252-1954

This certificate is issued on: **06/28/2011**

*This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with Chapter 11, Article 12 of the West Virginia Code*

*The person or organization identified on this certificate is registered
to conduct business in the State of West Virginia at the location above.*

This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them.
CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

STATE OF WEST VIRGINIA
State Tax Department, Tax Account Administration Div
P. O. Box 2666
Charleston, WV 25330-2666



Earl Ray Tomblin, Governor

Craig A. Griffith, Tax Commissioner

M3 APPALACHIA GATHERING, LLC
1099 MAIN AVE STE 210
DURANGO CO 81301-5157

Letter Id: L0630373504
Issued: 06/2812011
Account#: 2252-1954

RE: Business Registration Certificate

The West Virginia State Tax Department would like to thank you for registering your business. Enclosed is your Business Registration Certificate. This certificate shall be permanent until cessation of business or until suspended, revoked or cancelled. Changes in name, ownership or location are considered a cessation of business; a new Business Registration Certificate and applicable fees are required. Please review the certificate for accuracy.

This certificate must be prominently displayed at the location for which issued. Engaging in business without conspicuously posting a West Virginia Business Registration Certificate in the place of business is a crime and may subject you to fines per W.Va. Code § 11-9.

When contacting the State Tax Department, refer to the appropriate account number listed on the back of this page. The taxes listed may not be all the taxes for which you are responsible. Account numbers for taxes are printed on the tax returns mailed by the State Tax Department. Failure to timely file tax returns may result in penalties for late filing.

Should the nature of your business activity or business ownership change, your liability for these and other taxes will change accordingly.

To learn more about these taxes and the services offered by the West Virginia State Tax Department, visit our web site at www.wvtax.gov.

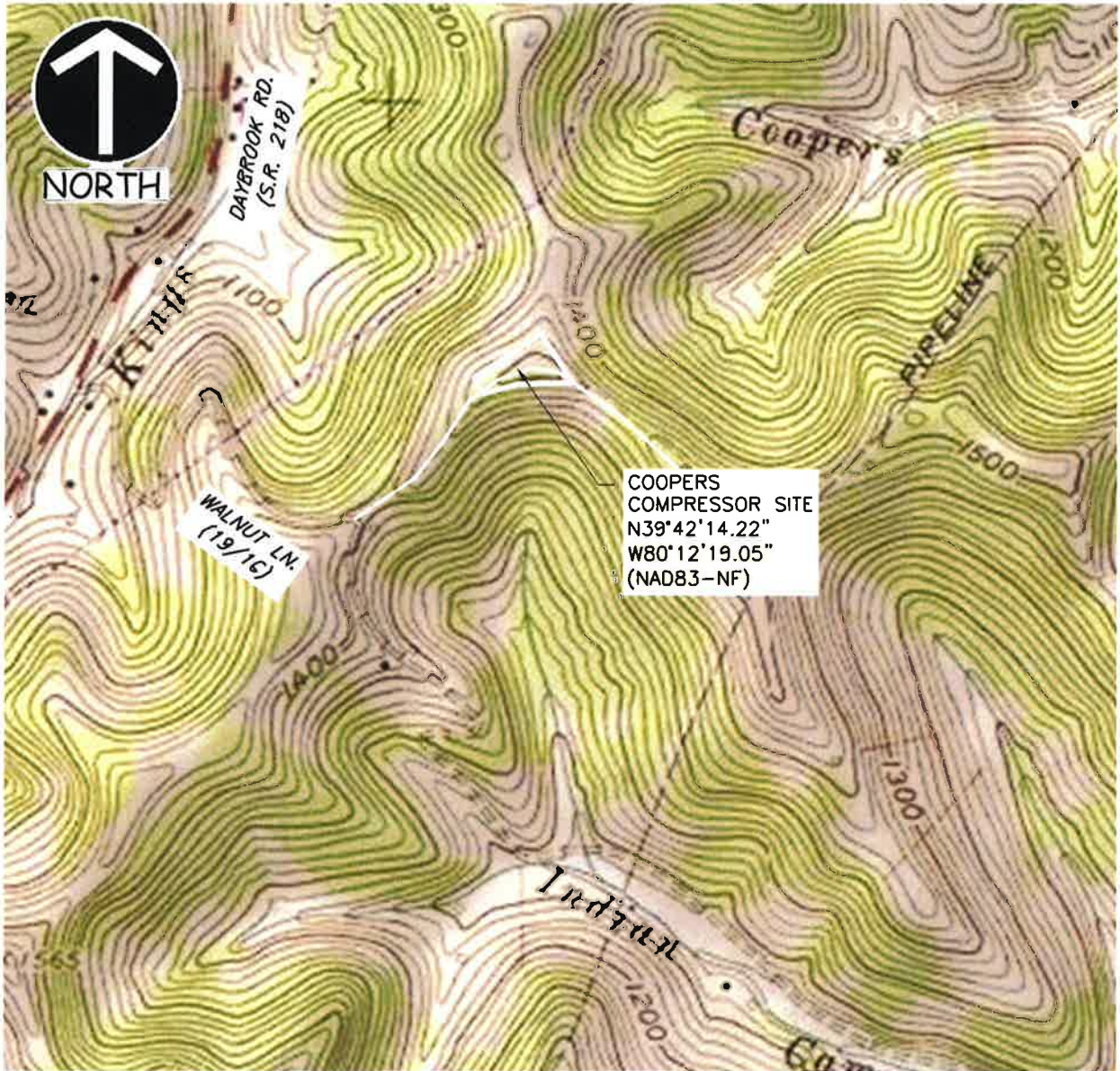
Enclosure

atL006 v.4

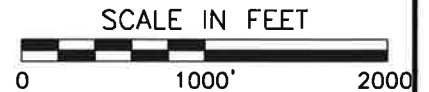
**Save a stamp and your time. You can now view, file and pay taxes at <https://mytaxes.wvtax.gov>
More taxes will be available for online access in the future.**

TAX	FILING FREQUENCY	ACCOUNT NUMBER
Business Registration Tax		2252- 1954
Combined Sales & Use Tax	Monthly	2255-1205
Pass Through Entity Tax	Annual	2255-1194
Severance Tax	Quarterly	2255- 1210
WC/Additional I Severance Tax	Quarterly	2255- 1211

- **Attachment B: Map(s)**



USGS 7.5 MIN. TOPOGRAPHIC QUADRANGLE BLACKSVILLE, WV, DATED 1978.



*HAND SIGNATURE ON FILE



Civil & Environmental Consultants, Inc.

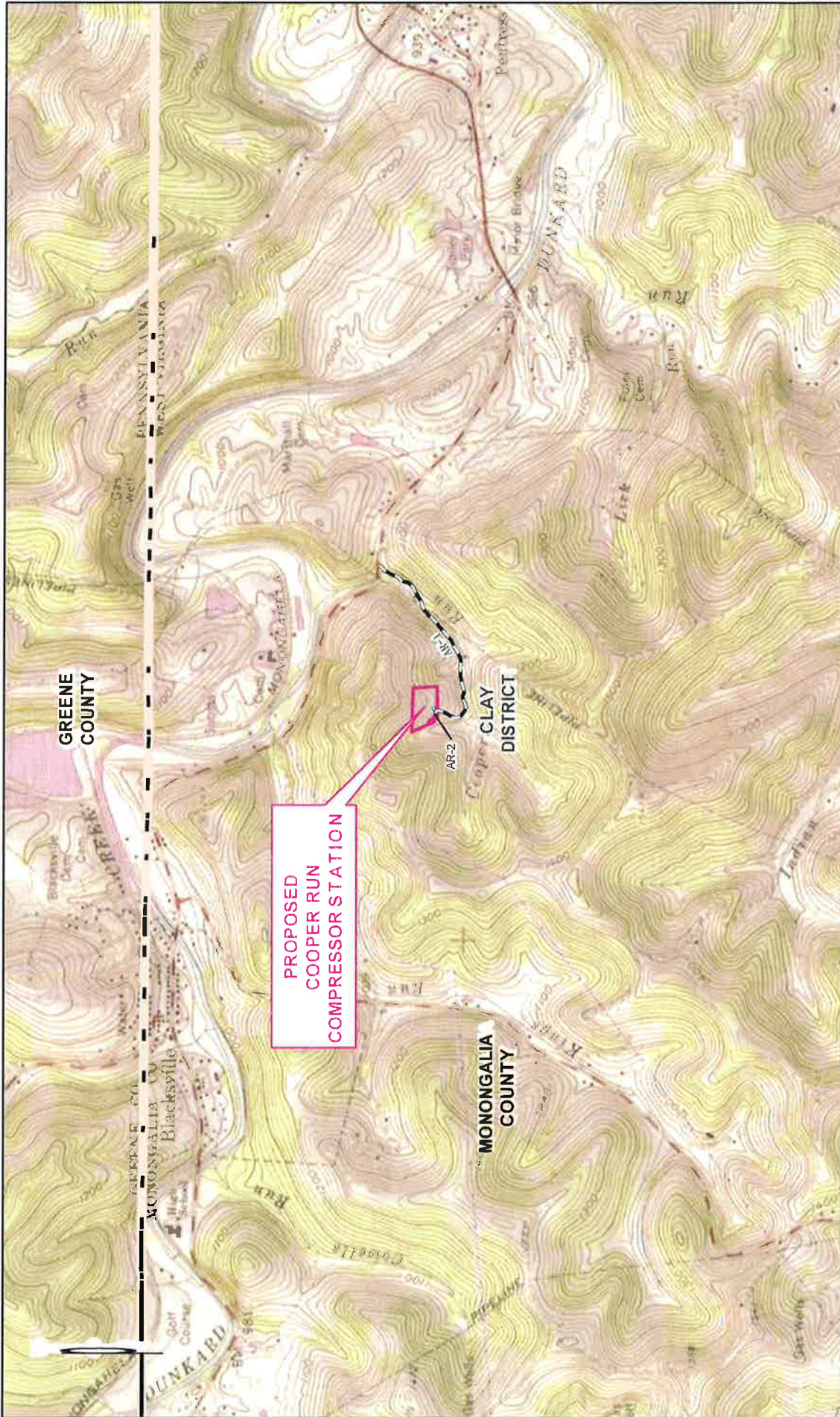
250 Old Wilson Bridge Road · Suite 250 · Worthington, OH 43085
 614-540-6633 · 888-598-6808
 www.cecinc.com








M3 APPALACHIA GATHERING SYSTEM, LLC.
 COOPERS COMPRESSOR SITE
 (AFE: A15-396)
 MONONGALIA COUNTY, WV

USGSEXHIBIT

DRAWN BY: BAB	CHECKED BY: AAG	APPROVED BY: *AAG	FIGURE NO.: 1
DATE: AUG. 2015	DWG SCALE: 1"=1000'	PROJECT NO: 152-142	

I:\Srv-columbus\projects\2015\152-142\CADD\Dwg\152142_C900-C304.dwg[EXHIBIT] LS:(8/3/2015 - bburkhart) - LP: 8/3/2015 7:51 AM



<p>PROJECT LOCATION</p>  <p>MONONGALIA COUNTY, WEST VIRGINIA</p>	<p>REFERENCED: USGS 7.5' TOPOGRAPHIC QUADRANGULAR: BLACKSVILLE (1978), WEST VIRGINIA, OBTAINED THROUGH ESRI USA TOPO MAPS, NATIONAL GEOGRAPHIC TOPOGRAPHIC, ACCESSED 06/2014.</p>	<p>LEGEND</p> <ul style="list-style-type: none">  FACILITY  EXISTING ACCESS ROAD  PROPOSED ACCESS ROAD  COUNTY BOUNDARY  DISTRICT BOUNDARY <p>0 1,000 2,000 4,000 Feet</p>	<p>FIGURE 1 PROJECT LOCATION MAP</p> <p> COOPER RUN COMPRESSOR STATION M3 APPALACHIA GATHERING G, LLC</p> <p>DRAWN BY: SW W DATE: 6/3/2014 CHECKED: AMS APPROVED: CET</p>
--	---	---	---

Coopers Run Directions:

From Charleston, WV, Merge onto I-64 to I-77/I-79/Beckley, continue on I-77 N for approximately 1.6 miles.

Continue onto I-79 N for approximately 154 miles.

Take exit 155 toward WV-7/West Virginia University.

Keep right on fork and follow signs for Star City/WVU/Osage and merge onto Chaplin Hill Road.

Turn left onto US-19N/WV-7 W.

Turn left onto WV-7 E and drive from approximately 13.0 miles.

Turn left onto the access road.

- **Attachment C: Installation and Start-Up Schedule**

Emission Unit	Installation Schedule	Start-up Schedule
CE-1, CE-2, CE-3 Three (3) 1775 HP G3616 engine/compressor units	3/1/2016	6/1/2016
GE-1 One (1) 126 HP Genset	3/1/2016	6/1/2016
T01 - T10 Ten (10) Storage Tanks	3/1/2016	6/1/2016

• **Attachment D: Regulatory Discussion**

This section documents the applicability determinations made for Federal and State air quality regulations. The monitoring, recordkeeping, reporting, and testing plan are presented in Attachment O. In this section, applicability or non-applicability of the following regulatory programs is addressed:

- Prevention of Significant Deterioration (PSD) permitting;
- Title V of the 1990 Clean Air Act Amendments;
- New Source Performance Standards (NSPS);
- National Emission Standards for Hazardous Air Pollutants (NESHAP); and > West Virginia State Implementation Plan (SIP) regulations.

This review is presented to supplement and/or add clarification to the information provided in the WVDEP Rule 13 permit application forms. In addition to providing a summary of applicable requirements, this section of the application also provides non-applicability determinations for certain regulations, allowing the WVDEP to confirm that identified regulations are not applicable to the Coopers Run Compressor Station. Note that explanations of non-applicability are limited to those regulations for which there may be some question of applicability specific to the operations at the Coopers Run Compressor Station. Regulations that are categorically non-applicable are not discussed (e.g., NSPS Subpart J, Standards of Performance for Petroleum Refineries).

Title V Operating Permit Program

Title 40 of the Code of Federal Regulations Part 70 (40 CFR 70) establishes the federal Title V operating permit program. West Virginia has incorporated the provisions of this federal program in its Title V operating permit program in West Virginia Code of State Regulations (CSR) 45-30. The major source thresholds with respect to the West Virginia Title V operating permit program regulations are 10 tons per year (tpy) of a single HAP, 25 tpy of any combination of HAP, and 100 tpy of all other regulated pollutants. The combined emissions for all sources at the Coopers Run Compressor Station are well below any of the major source thresholds. Therefore, the Coopers Run Compressor Station is not a major source with respect to the Title V permit program and as such is not required to submit a Title V operating permit application.

New Source Performance Standards

New Source Performance Standards (NSPS), located in 40 CFR 60, require new, modified, or reconstructed sources to control emissions to the level achievable by the

best demonstrated technology as specified in the applicable provisions. Moreover, any source subject to an NSPS is also subject to the general provisions of NSPS Subpart A, except where expressly noted. The following is a summary of applicability and non-applicability determinations for NSPS regulations of relevance to the Coopers Run Compressor Station.

NSPS Subparts K, Ka, and Kb

These subparts apply to storage tanks of certain sizes constructed, reconstructed, or modified during various time periods. Subpart K applies to storage tanks constructed, reconstructed, or modified prior to 1978, and Subpart Ka applies to those constructed, reconstructed, or modified prior to 1984. Both Subparts K and Ka apply to storage tanks with a capacity greater than 40,000 gallons. Subpart Kb applies to volatile organic liquid (VOL) storage tanks constructed, reconstructed, or modified after July 23, 1984 with a capacity equal to or greater than 75 m³ (~19,813 gallons): All of the proposed storage tanks at the Coopers Run Compressor Station have a capacity of 1260 gallons or less. As such, Subparts K, Ka, and Kb do not apply to the storage tanks at the Coopers Run Compressor Station.

NSPS Subparts IIII – Stationary Compression Ignition Internal Combustion Engines

This subpart applies to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines. The Coopers Run Compressor Station will not have any compression ignition internal combustion engine, and therefore the requirements of this subpart do not apply.

NSPS Subparts JJJJ – Stationary Spark Ignition Internal Combustion Engines

NSPS Subpart JJJJ affects owners and operators of stationary spark ignition internal combustion engines (SI ICE) that commence construction, reconstruction or modification after June 12, 2006. Applicability dates are based on the manufacture date for new engines. The applicability dates for new engines range from July 1, 2007 to January 1, 2009, depending upon the engine horsepower (hp) and application.

40 CFR §60.4230(a)(4) states:

Owners and operators of stationary SI ICE that commence construction after June 12, 2006, where the stationary SI ICE are manufactured:

- (i) On or after July 1, 2007, for engines with a maximum engine power greater than or equal to 500-hp (except lean burn engines with a maximum engine power greater than or equal to 500-hp and less than 1,350-hp);
- (ii) On or after January 1, 2008, for lean burn engines with a maximum engine power greater than or equal to 500-hp and less than 1,350-hp;
- (iii) On or after July 1, 2008, for engines with a maximum engine power less than 500-hp; or

(iv) On or after January 1, 2009, for emergency engines with a maximum engine power greater than 19 kW (25-hp).

The compressor engines proposed for installation at the Coopers Run Compressor Station are four stroke lean burn engines (each rated at 1775 HP) that were manufactured after July 1, 2007, and therefore NSPS JJJJ is applicable. Based on the engine manufacturer's specifications and the specifications for the associated catalyst, the engine complies with the emissions standards contain in 40 CFR §60.4233(e). M3 AGS will operate the engine according to the manufacturer's recommended practices and demonstrate compliance with the requirements specified in 40 CFR §60.4244 (testing methods) and 40 CFR §60.4243(b)(2) (maintenance plan/records and performance testing frequency) for non-certified affected SI ICE at the facility. Initial notification of construction commencement will be submitted as required in 40 CFR §60.7(a)(1) and §60.4245(c), and performance testing results will be reported as required in 40 CFR § 60.4245(d).

NSPS Subpart OOOO—Crude Oil and Natural Gas Production, Transmission, and Distribution

Subpart OOOO – Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution, applies to affected facilities that commenced construction, reconstruction, or modification after August 23, 2011. This NSPS was published in the Federal Register on August 16, 2012, with an effective date of October 15, 2012. The list of potentially affected facilities includes:

- Gas wells
- Centrifugal compressors
- Reciprocating compressors
- Pneumatic controllers
- Storage vessels
- Equipment (as defined in §60.5430) located at onshore natural gas processing plants
- Sweetening units located onshore that process natural gas produced from either onshore or offshore wells

The Coopers Run Compressor Station does not include gas wells or centrifugal compressors; therefore, the only potentially applicable requirements are those for reciprocating compressors, storage vessels, and pneumatic controllers. Rule applicability for each of these affected categories is discussed below.

Reciprocating Compressors- 40 CFR 60.5385 requires owners and operators of affected reciprocating compressors to change the rod packing prior to operating

26,000 hours or prior to 36 months since start up or the last packing replacement. M3 AGS will comply with this requirement for the proposed compressors.

Storage Vessels – M3 AGS will not be installing any produced fluid tanks at the Coopers Run Compressor Station and only one (1) 335 gallon methanol tank that has potential for VOC emissions. Potential VOC emissions from the 335 gallon methanol tank are less than 6 tpy. As such, the tank will not be a storage vessel affected facilities under this rule.

Pneumatic Controllers – The pneumatic controllers that will be installed will be potentially subject to NSPS OOOO. Per 60.5365(d)(2), a pneumatic controller affected facility is a single continuous bleed natural gas driven pneumatic controller operating at a natural gas bleed rate greater than 6 scfh. No pneumatic controllers installed will meet the definition of a pneumatic controller affected facility. Therefore, these units are not subject to the requirements of Subpart OOOO.

Non-Applicability of All Other NSPS

NSPS are developed for particular industrial source categories. Other than NSPS developed for natural gas operations (Subpart OOOO), internal combustion engines (Subparts IIII and JJJJ), and associated equipment (Subparts D-Dc, KKKK, and K-Kb), the applicability of a particular NSPS to the Coopers Run Compressor Station can be readily ascertained based on the industrial source category covered. All other NSPS are categorically not applicable to natural gas compressor stations.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

Part 63 NESHAP allowable emission limits are established on the basis of a maximum achievable control technology (MACT) determination for a particular major source. A HAP major source is defined as having potential emissions in excess of 25 tpy for total HAP and/or potential emissions in excess of 10 tpy for any individual HAP. The Coopers Run Compressor Station will be an Area (minor) source of HAP since its potential emissions of HAP are less than the 10/25 major source thresholds. NESHAP apply to sources in specifically regulated industrial source categories (Clean Air Act Section 112(d)) or on a case-by-case basis (Section 112(g)) for facilities not regulated as a specific industrial source type:

- 40 CFR Part 63 Subpart HH – Oil and Natural Gas Production Facilities
- 40 CFR Part 63 HHH – Natural Gas Transmission and Storage Facilities
- 40 CFR Part 63 YYYY – Stationary Combustion Turbines
- 40 CFR Part 63 Subpart ZZZZ- Stationary Reciprocating Internal Combustion Engines (RICE) > 40 CFR Part 63
- Subpart JJJJJ – Industrial, Commercial, and Institutional Boilers

The applicability of these NESHAP Subparts is discussed in the following sections.

40 CFR 63 Subpart HH – Oil and Natural Gas Production Facilities

This subpart applies to affected emission points that are located at facilities that are major and area sources of HAP and either process, upgrade, or store hydrocarbon liquids prior to custody transfer or that process, upgrade, or store natural gas prior to entering the natural gas transmission and storage source category. For purposes of this subpart, natural gas enters the natural gas transmission and storage source category after the natural gas processing plant, if present.

The proposed Coopers Run Compressor Station will not process or store hydrocarbon liquids and therefore this subpart will not apply.

40 CFR 63 Subpart HHH – Natural Gas Transmission and Storage Facilities

This standard applies to such units at natural gas transmission and storage facilities that are major sources of HAP emissions located downstream of the point of custody transfer (after processing and/or treatment in the production sector), but upstream of the distribution sector. The Coopers Run Compressor Station is not a transmission facility; therefore, the provisions of NESHAP Subpart HHH do not apply to the Coopers Run Compressor Station.

40 CFR 63 Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines

40 CFR §63.6590(c) states that a new or reconstructed stationary RICE located at an area HAP source must meet the requirements of NESHAP Subpart ZZZZ by meeting the requirements of NSPS Subpart JJJJ. No further requirements apply for such engines under NESHAP Subpart ZZZZ.

West Virginia SIP Regulations

The Coopers Run Compressor Station is potentially subject to regulations contained in the West Virginia Code of State Regulations, Chapter 45 (Code of State Regulations). The Code of State Regulations fall under two main categories, those regulations that are generally applicable (e.g., permitting requirements), and those that have specific applicability (e.g., PM standards for manufacturing equipment).

45 CSR 2: Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers

45 CSR 2 applies to fuel burning units, defined as equipment burning fuel “for the primary purpose of producing heat or power by indirect heat transfer”. There are no planned heaters or boilers planned at the Coopers Run Compressor Station so this regulation will not apply.

45 CSR 4: To Prevent and Control the Discharge of Air Pollutants into the Air Which Causes or Contributes to an Objectionable Odor

According to 45 CSR 4-3:

No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.

The Coopers Run Compressor Station is generally subject to this requirement. However, due to the nature of the process at the station, production of objectionable odor from the compressor station during normal operation is unlikely.

45 CSR 6: Control of Air Pollution from the Combustion of Refuse

45 CSR 6 applies to activities involving incineration of refuse, defined as “the destruction of combustible refuse by burning in a furnace designed for that purpose. For the purposes of this rule, the destruction of any combustible liquid or gaseous material by burning in a flare or flare stack, thermal oxidizer or thermal catalytic oxidizer stack shall be considered incineration.” The Coopers Run Compressor Station will not have any processes meeting this definition and therefore this regulation will not apply.

45 CSR 16: Standards of Performance for New Stationary Sources

45 CSR 16-1 incorporates the federal Clean Air Act (CAA) standards of performance for new stationary sources set forth in 40 CFR Part 60 by reference. As such, by complying with all applicable requirements of 40 CFR Part 60 at the Coopers Run Compressor Station (discussed earlier in this attachment), M3 AGS will be complying with 45 CSR 16.

45 CSR 17: To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter

According to 45 CSR 17-3.1:

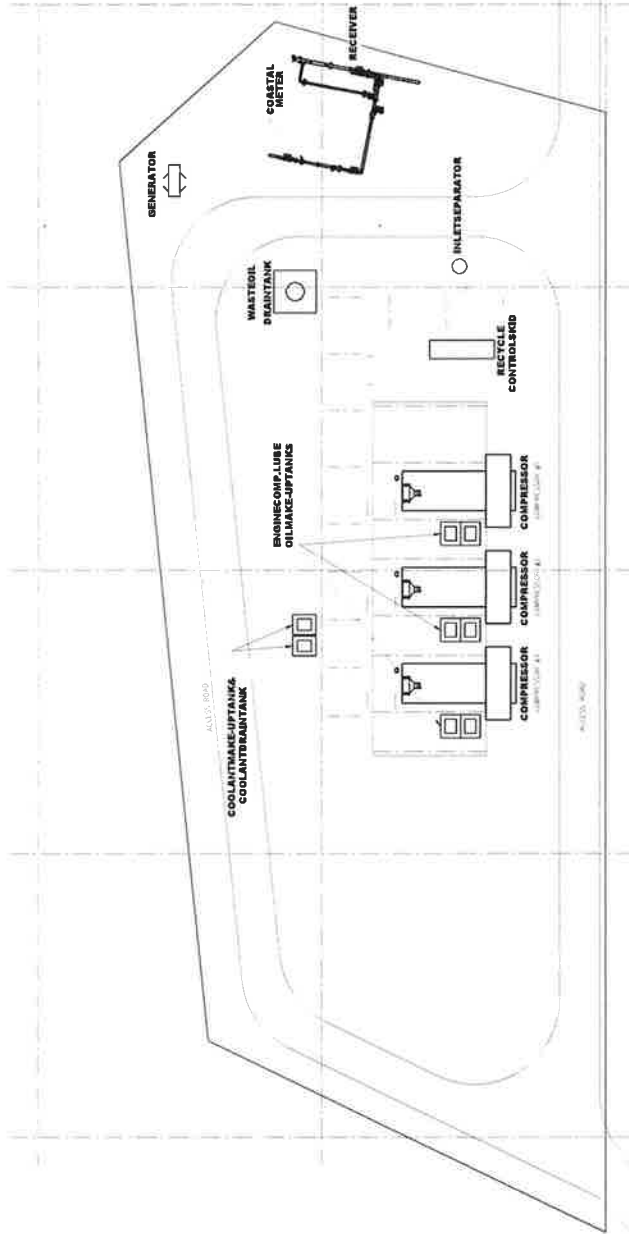
No person shall cause, suffer, allow or permit fugitive particulate matter to be discharged beyond the boundary lines of the property lines of the property on which the discharge originates or at any public or residential location, which causes or contributes to statutory air pollution.

Due to the nature of the activities at the Coopers Run Station it is unlikely that fugitive particulate matter emissions will be emitted under normal operating conditions. However, M3 AGS will take measures to ensure any fugitive particulate matter emissions will not cross the property boundary should any such emissions occur.

45 CSR 21-28: Petroleum Liquid Storage in Fixed Roof Tanks

45 CSR 21-28 applies to any fixed roof petroleum liquid storage tank with a capacity greater than 40,000 gallons. The capacity of each storage tank proposed for the Coopers Run Compressor Station is less than 1260 gallons and none of the tanks will contain petroleum liquids; therefore, 45 CSR 21-28 will not apply.

- **Attachment E: Plot Plan**



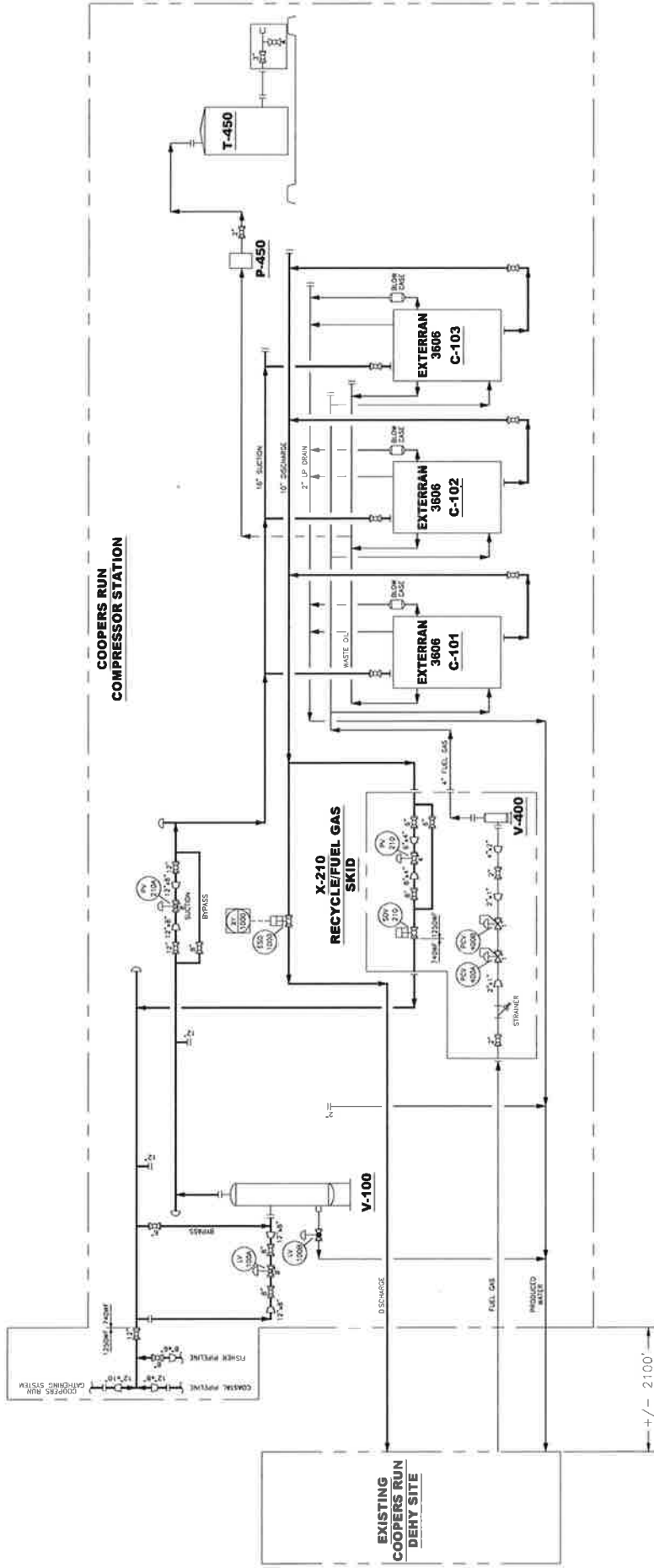
Momentum
 Momentum & Associates
 APPALACHIA GATHERING SYSTEM, LLC
 COOPER UNCOMPSTATION
 PERMITSITE PLAN

DATE: 10/15/2013
 DRAWN BY: J. H. HARRIS
 CHECKED BY: J. H. HARRIS
 PROJECT NO.: CRCS-20-PERMIT A

NO.	REVISION	DATE
1	ISSUE FOR PERMIT	10/15/2013
2	REVISED PERMIT	10/15/2013
3	REVISED PERMIT	10/15/2013
4	REVISED PERMIT	10/15/2013
5	REVISED PERMIT	10/15/2013
6	REVISED PERMIT	10/15/2013
7	REVISED PERMIT	10/15/2013
8	REVISED PERMIT	10/15/2013
9	REVISED PERMIT	10/15/2013
10	REVISED PERMIT	10/15/2013
11	REVISED PERMIT	10/15/2013
12	REVISED PERMIT	10/15/2013
13	REVISED PERMIT	10/15/2013
14	REVISED PERMIT	10/15/2013
15	REVISED PERMIT	10/15/2013
16	REVISED PERMIT	10/15/2013
17	REVISED PERMIT	10/15/2013
18	REVISED PERMIT	10/15/2013
19	REVISED PERMIT	10/15/2013
20	REVISED PERMIT	10/15/2013

- **Attachment F: Detailed Process Flow Diagram(s)**

COOPERS RUN COMPRESSOR STATION



V-100 INLET SEPARATOR
 SIZE 60" dia. x 10'-0" Ht
 MFR: VVO 5541 9 2007
 MW: 1140 P50
 FLOW: 150-1 MSC/D @ 500 P50

V-400 FUEL GAS SCRUBBER

C-101 COMPRESSOR
 ENGINE: MOBILE
 COMPRESSOR: MOBILE

C-102 COMPRESSOR
 ENGINE: MOBILE
 COMPRESSOR: MOBILE

C-103 COMPRESSOR
 ENGINE: MOBILE
 COMPRESSOR: MOBILE

P-450 WASTE OIL PUMP
 MFR: KOSCIUSKO
 CAPTY: 100

T-450 WASTE OIL DRAIN TANK
 DIA. (30) 60"
 SIZE: 6'-8" DIA. 5'-0" HIGH
 MFR: SPT 101
 SINGLE WALL

NOTES:

REFERENCE DRAWING:

DRAWING APPROVAL		REVISIONS	
DATE	BY/CD	NO.	DESCRIPTION

Momentum
 Momentum is the Stream

APPALACHIA GATHERING SYSTEM, LLC
COOPERS RUN COMP STATION - BFD
STATION FLOUT DIAGRAM

DATE: 7/2013
 DRAWN BY: []
 CHECKED BY: []
 PROJECT NO: []
 SHEET NO: 412-30
 SHEET TOTAL: 412-30
 DRAWING NO: CRC-10-010

- **Attachment G: Process Description**

The Coopers Run Compressor Station will compress lean wet natural gas (approximately 95-98% methane) that originates from 3rd party producers and compress the gas to pressures necessary to deliver into M3's Appalachia Gathering System (AGS) 24 inch pipeline. Between 75 MMSCFD and 100 MMSCFD of wet natural gas at approximately 300-450 psig first enters the compressor station via pipeline into a 60 inch diameter by 10 foot inlet separator. The gas then travels through a suction control valve and into the main suction header which feeds into three natural gas driven CAT G3606 engine/compressor units. The gas is compressed to 900-1125 psig and travels to an off-site downstream Dehydration Station, for ultimate delivery into the AGS gathering system. The compressor station will be located in Monongalia County, WV, at 39° 42' 15.21" N and 80° 12' 17.25" W.

Other major equipment on site will include one 30 barrel waste oil tank, three 500 gallon engine lube oil make-up tanks, three 500 gallon compressor lube oil tanks, two 30 barrel engine coolant tanks, and a 335 gallon methanol storage/containment tank.

- **Attachment H: Material Safety Data Sheets (MSDS)**

Section 1 Identification

Manufacturer Information:

Appalachia Gas Gathering, LLC
1099 Main Ave, Suite 210
Durango, CO. 81301
(970) 247-4423
www.m3midstream.com
Chemtrec (800) 424-9300
Appalachia Gas Gathering (800) 873-0647

Emergency Phone #:

Product Identification: NATURAL GAS

Trade Name/Synonyms:

Natural Gas, Residue Gas, Fuel Gas

Chemical Family:

Aliphatic Hydrocarbon

Recommended Use/Restrictions:

Industrial

Section 2 Hazard(s) Identification

GHS Classification:

Flammable Gas, Category 1

Health, Category 2

Gas under pressure

GHS Label Elements:



Signal Word:

Danger

Hazard Statement:

Extremely flammable

Forms explosive mixtures with air

Precautionary Statement:

Asphyxiant gas, oxygen deficiency must be considered. May cause cardiac sensitization. Overexposure may cause loss of consciousness. Liquefied material may cause frostnip, frostbite and freeze burns. Keep away from heat/flames/hot surfaces.

Section 3 Composition/ Info on Ingredients

Component	Cas No.	Typical%
Methane	74-82-8	95 - 100
Ethane	74 - 84 - 0	0 - 5
Nitrogen	7727 - 37 - 9	0 - 2
Carbon Dioxide	124 - 38 - 9	0 - 2
Propane	74-98-6	0 - 2
Butane	106 - 97 - 8	Trace
Isobutane	75 - 28 - 5	Trace

*Values do not reflect absolute minimums or maximums; those values may vary from time to time.

Section 4 First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, institute cardiopulmonary resuscitation (CPR). If breathing is difficult, ensure clear airway and give oxygen. Get immediate medical attention.

Skin:

Flush area with tepid water. Do not use hot water. Do not rub affected area

Eyes:

Burns due to either hot or cold contact require immediate medical attention. Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing.

Ingestion:

Although risk of ingestion is extremely unlikely, seek immediate medical attention

Re-warming:

Initiate controlled rapid re-warming in a warm bath with a temperature between 38 to 41.1 degrees Celsius (100 to 106 degrees Fahrenheit) as quickly as possible. The temperature of the bath should be kept constant. The bath should be large enough to permit complete immersion of the cryo-injured part, avoiding contact with the sides of the bath. A whirlpool bath would be ideal. Complete re-warming generally takes about 20 minutes and may be associated with increasing pain as thawing progresses.

Immediate Symptoms:

Symptoms include headache, excitation, euphoria, dizziness, un-coordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death.

Delayed Symptoms:

Acute or chronic overexposure to this material or its components may cause systemic toxicity, including adverse effects to the following: central nervous system, lungs, heart and testes.

This product contains asphyxiant and carbon dioxide, which may cause adverse reproductive and/or developmental effects. Pre-existing medical conditions, which may be aggravated by exposure, include disorders of the respiratory and cardiovascular systems and central nervous system.

Section 5 Fire Fighting Measures

Extinguishing Equipment:

Any extinguisher capable of handling Class B fires is recommended, including extinguishing media such as

CO₂, dry chemical or foam. Water spray is recommended to cool or protect exposed materials or structures. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Specific Hazards:

Containers can build up pressure if exposed to heat (fire). Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

Protective Equipment:

Firefighters must wear MSHA/NIOSH approved positive pressure breathing apparatus (SCBA) with full-face mask and full protective equipment.

Basic Fire Fighting Procedure:

Gas fires should not be extinguished unless flow of gas can be immediately stopped. Shut off gas source and allow gas to burn out.

If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak.

Use water spray to cool adjacent structures and to protect personnel. Shut off source flow if possible.

Explosion Hazard(s):

Extremely flammable. Vapors form flammable or explosive mixtures with air at room temperature. Vapor or gas may spread to distant ignition sources and flash back.

Fires involving this product may release carbon monoxide, carbon dioxide, reactive hydrocarbons and irritating vapors.

Fire and Explosion Data:

Flash point: Flammable Gas

Autoignition Temperature: 900-1170°F(482-632°C)

Flammability: Lower 3.8% (LEL) Upper 17% (LEL)

Section 6 Accidental Release Measures

Personal Precautions:

Caution should be exercised regarding personnel safety and exposure to the released product. Notify local authorities and the National Response Center, if required.

Emergency Procedures:

Evacuate area endangered by gas. Keep ignition sources out of the area. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind. (See Personal Protection Information Section). Isolate for ½ mile in all directions if tank, rail car or tank truck is involved in release.

Methods/Materials for Containment:

Keep ignition sources out of the area and shut off all ignition sources. Use water spray to reduce vapors. Shut off leak if safe to do so. Isolate hazard area and deny entry.

Cleanup Procedures:

Isolate area and deny entry. Remove sources of ignition. Ventilate closed in areas.

Section 7 Handling and Storage

Handling Procedures:

Avoid contact with strong oxidizers. Use non-sparking tools.

Safe Storage Procedures:

Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Ground lines and equipment used during transfer to reduce the possibility of

static spark-initiated fire or explosion.

Empty Containers:

Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards. Empty containers may contain product residue. Do not reuse without adequate precautions.

Section 8 Exposure Controls/PPE

Exposure Limits:

Concentrations greater than 5000 parts per million by volume.

Appropriate Engineering Controls:

If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional ventilation or exhaust systems may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).

Personal Protective Equipment:

Eyes/Face: Wear safety glasses with side shields. Have eye washing facilities readily available where eye contact can occur.

Skin: Avoid skin contact with this material. Use appropriate chemical protective gloves when handling. Use good personal hygiene.

Respiratory: Ventilation and other forms of engineering controls are the preferred means for controlling exposures.

Clothing/Gloves: Wear approved FRC clothing and gloves when required.

Section 9 Physical and Chemical Properties

Boiling Point:	-259°F (-162°C) Based on Methane
Specific Gravity:	0.693
Melting Point:	-297°F (-183°C) Based on Methane
% Volatile:	ND
Vapor Pressure:	ND
Evaporation Rate (Water = 1):	Very Fast
Vapor Density (Air = 1):	0.56 Based on Methane
Viscosity:	ND
% Solubility in Water:	Slightly Soluable
Octanol/Water Partition Coefficient:	ND
Pour Point:	ND
pH:	ND
Freezing Point:	ND
Appearance/Odor:	Colorless gas under pressure with a slight hydrocarbon odor.

Section 10 Stability and Reactivity

Reactivity:

Stable

HMIS Classification for Reactivity: 0

Chemical Stability:

Incompatible with oxidizing agents. See precautions under Handling/Storage.

Possibility of Hazardous Reaction:

Combustion may produce CO, NO_x, SO_x, and reactive hydrocarbons.

Conditions to Avoid:

Avoid heat, flames, sparks, and other ignition sources.

Incompatible Materials:

Avoid contact with strong oxidizers.

Hazardous Decomposition:

Combustion can yield carbon dioxide, carbon monoxide, other organic compounds and non-combusted hydrocarbons.

Section 11 Toxicological Information

Routes of Exposure:

Skin: Skin absorption is unlikely.

Eyes: Direct contact with liquefied material may cause frostbite and permanent damage

Inhalation: Concentrations greater than 5000 parts per million by volume in air can significantly lower the effective oxygen concentration, potentially causing loss of consciousness. Consider both concentration of Sweet Natural Gas and oxygen deficiency

Ingestion: Not a normal route of exposure.

Immediate Effects:

May cause cardiac sensitization. Overexposure may cause loss of consciousness. Liquefied material may cause frostnip, frostbite and freeze burns.

Delayed Effects:

Exposure to components of Natural Gas may cause the following specific symptoms, depending on the concentration and duration of exposure: eye flickering, muscle twitching and psychomotor agitation.

Chronic Effects:

Acute or chronic overexposure to this material or its components may cause systemic toxicity, including adverse effects to the following: central nervous system, lungs, heart and testes.

Measure of Toxicity:

HMIS Classification for Health: 1

Description of Symptoms:

Symptoms include headache, excitation, euphoria, dizziness, un-coordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death.

Target Organs:

Central nervous system, lungs, heart and testes.

Carcinogenicity:

Based on available information this product does not contain any components or chemicals currently known to the State of California to cause cancer, birth defects or reproductive harm at levels which would be subject to Proposition 65. Reformulation, use or processing of this product may affect its composition and require re-evaluation. All major components of this product are listed on the TSCA Inventory.

Section 12 Ecological Information

Aquatic Toxicity:

No ecotoxicity data are available for this product's components.

Persistence and Degradability:

Data Not Available

Mobility/Absorption:

Data Not Available

Bioaccumulative Potential:

Data Not Available


Section 13 Disposal Considerations

Disposal Methods:

Dispose of contents in accordance with local/regional/national/international regulations.

See section 7 for Handling Procedures. See section 8 for Personal Protective Equipment recommendations.

Section 14 Transport Information

<u>General Transportation Information:</u>	Natural gas, compressed
DOT Proper Shipping Name (49 CFR 172.101):	2.1
DOT Hazard Classes (49 CFR 172.101):	UN 1971
UN/NA Code (49 CFR 172.101):	NA
Packing Group (49 CFR 172.101):	Natural gas, compressed, 2.1, UN
Bill of Lading Description (49 CFR 172.202):	
DOT Labels Required (49 CFR 172.101):	Flammable gas
DOT Placards Required (49 CFR 172.504):	

Section 15 Regulatory Information

This product contains substances subject to accident prevention regulations when present above the threshold quantities of 10,000 pounds (Section 112 [r] of the Clean Air Act). There may be specific regulations at the local, regional or state level that pertain to this product.

Sara Title III Information: Listed below are the hazard categories for the Superfund Amendments and Reauthorization Act (SARA) Section 311/312 (40 CRF 370):

Immediate Hazard: x Delayed Hazard: x Fire Hazard: x
 Pressure Hazard: x Reactivity Hazard:

This product does not contain toxic chemicals (in excess of the applicable de minimis concentration) that are subject to the annual toxic chemical release reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313 (40 CFR 372).

Section 16 Other Information

NFPA Rating:	Health:	1
	Fire:	4
	Reactivity:	0



Manufacturer assumes no responsibility for injury to third party proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, manufacturer assumes no responsibility for injury to third party proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, third party assumes the risk in their use of the material

Revised: Feb 3, 2015

MATERIAL SAFETY DATA SHEET

Methanex Corporation encourages the user of this product to read and understand the entire MSDS, and expects the user to follow the precautions specified unless the conditions of use necessitate particular procedures or methods.

1. Identification

Product Name: Methanol

CAS Number: 67-56-1

Recommended Use: Solvent, fuel, feedstock

Prepared by: TOXI.COMM INC. 5815 Plantagenet St., Montreal, QC, H3S 2K4

Revision: March 1, 2013

Product:	Methanol (CH₃OH)	EMERGENCY NUMBERS 24-hour
Synonyms:	Methanol, methyl hydrate, wood spirit, methyl hydroxide	
Company Identification:	Methanex Corporation 1800 Waterfront Centre 200 Burrard Street Vancouver, B.C. V6C 3M1 Tel. #: (604)-661-2600 Methanex Methanol Company 15301 Dallas Parkway, Ste 900 Addison, TX 75001 Tel#: (972) 702-0909	CANUTEC Emergency Tel.# (613)-996-6666 (Canada) *666 (cellular) OR CHEMTREC Emergency Tel. #: 1-800-262-8200 (Canada and USA)

2. Hazard identification

Emergency Overview

Colourless liquid, with a mild, characteristic alcohol odour when pure. Readily absorbs moisture.

Flammable liquid and vapour: Burns with a clean, clear flame, which is almost invisible in daylight, or a light blue flame. Can decompose at high temperatures forming carbon monoxide and formaldehyde. Confined space hazard.

Toxic: May be harmful if inhaled, absorbed through the skin or swallowed. Mild central nervous system depressant. May cause headache, nausea, dizziness, drowsiness, and incoordination. Severe vision effects, including increased sensitivity to light, blurred vision, and blindness may develop following an 8-24 hour symptom-free period. Coma and death may result.

Irritant: Causes eye irritation.

Possible teratogen/embryotoxin: May harm the unborn child, based on animal information.

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects

Inhalation: Causes mild central nervous system (CNS) depression with nausea, headache, vomiting, dizziness, incoordination and an appearance of drunkenness. Metabolic acidosis and severe visual effects can occur following an 8-24 hour latent period. Coma and death, usually due to respiratory failure, may occur if medical treatment is not received. Visual effects may include reduced reactivity and/or increased sensitivity to light, blurred, double and/or snowy vision, and blindness.

Eye Contact: Moderate eye irritant.

Skin Contact: In general, primary alcohols such as methanol are not considered to be irritant to the skin. Repeated or prolonged exposure to methanol may cause dry, itchy, scaling skin (dermatitis).

Skin Absorption: Can be absorbed through the skin and cause harmful effects as described in "Inhalation" above.

Skin Sensitization: Not considered to be a sensitizer.

Respiratory Sensitization: Not considered to be a sensitizer.

Ingestion: There have been reports of accidental or intentional ingestion of methanol although ingestion is not a typical route of occupational exposure. Ingestion of as little as 10 ml of methanol can cause blindness and 30 ml (1 ounce) can cause death if victim is not treated. Ingestion causes mild central nervous system (CNS) depression with nausea, headache, vomiting, dizziness, incoordination and an appearance of drunkenness. Metabolic acidosis and severe visual effects can occur following an 8-24 hour latent period. Coma and death, usually due to respiratory failure, may occur if medical treatment is not received. Visual effects may include reduced reactivity and/or increased sensitivity to light, blurred, double and/or snowy vision, and blindness.

Birth Defects/Developmental Effects: has caused teratogenic and fetotoxic effects, in the absence of maternal toxicity in animal studies.

Reproductive Effects: Not considered a reproductive toxin.

3. Composition/information on ingredients

Component	CAS #	Amount%
Methanol	67-56-1	99-100

4. First-aid measures

Inhalation: Methanol is toxic and flammable. Take proper precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment and remove any sources of ignition). Remove source of contamination or move victim to fresh air, provide oxygen therapy if available. Immediately transport victim to an emergency care facility.

Skin Contact: Avoid direct contact. Wear chemical protective clothing, if necessary. As quickly as possible, remove contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Immediately flush with lukewarm, gently flowing water for 15-20 minutes. Immediately obtain medical attention. Completely decontaminate clothing, shoes and leather goods before re-use or discard.

Eye Contact: Avoid direct contact. Wear chemical protective goggles, if necessary. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 15-20 minutes, while

holding the eyelid(s) open. If a contact lens is present, **Do not** delay irrigation or attempt to remove the lens until flushing is done. Take care not to rinse contaminated water into the unaffected eye or onto the face. Immediately obtain medical attention.

Ingestion: **Never** give anything by mouth if victim is rapidly losing consciousness, is unconscious or convulsing. Have victim rinse mouth thoroughly with water. **Do not induce vomiting.** If vomiting occurs naturally, have victim rinse mouth with water again. Quickly transport victim to an emergency care facility.

First Aid Comments: Provide general supportive measures (comfort, warmth, rest). Consult a physician and/or the nearest Poison Control Centre for all exposures.

All first-aid procedures should be periodically reviewed by a physician familiar with the material and its conditions of use in the workplace.

Note to Physicians: The severity of outcome following methanol ingestion may be more related to the time between ingestion and treatment, rather than the amount ingested. Therefore, there is a need for rapid treatment of any ingestion exposure. Both ethanol and fomepizole are effective antidotes for methanol poisoning, although fomepizole is preferred.

5. Fire-fighting measures

Suitable Extinguishing Media: Synthetic Fire fighting foam AR-FFF (3% solution), carbon dioxide, dry chemical powder, water spray or fog. Water may be effective for cooling, diluting, or dispersing methanol, but may not be effective for extinguishing a fire because it will not cool methanol below its flash point. Fire-fighting foams, such as multipurpose alcohol-resistant foams, are recommended for most flammable liquid fires. If water is used for cooling, the solution will spread if not contained. Mixtures of methanol and water at concentrations greater than 20% methanol can burn.

Special Hazards Arising from the Chemical

Hazardous Combustion Products: During a fire, carbon monoxide, carbon dioxide and irritating and toxic gases such as formaldehyde may be generated.

Unusual Fire and Explosion Hazards: Can accumulate in confined spaces, resulting in a toxicity and flammability hazard. Closed containers may rupture violently and suddenly release large amounts of product when exposed to fire or excessive heat for a sufficient period of time. Flame may be invisible during the day. The use of infrared and or heat detection devices is recommended.

Advice for Firefighters

Fire-Fighting Procedures: Evacuate area and fight fire from a safe distance or protected location. Approach fire from upwind. Cool fire-exposed containers, tanks or equipment by applying hose streams.

Special Protective Equipment for Firefighters: Full face, positive pressure, self-contained breathing apparatus (NIOSH approved or equivalent) or airline and appropriate chemical protective fire-fighting clothing.

NOTE: The use of cartridge masks is NOT recommended.

6. Accidental release measures

Personal Precautions, Protective Equipment and Emergency Procedures: Restrict access to area until completion of cleanup. Ensure cleanup is conducted by trained personnel only. Wear adequate personal protective equipment. Extinguish or remove all sources of ignition. Notify government occupational health and safety and environmental authorities.

Methods and Materials for Containment and Cleaning up: Do not touch spilled material. Prevent material from entering sewers, waterways or confined spaces. Stop or reduce leak if safe to do so. Contain spill with earth, sand, or absorbent material which does not react with spilled

material. Remove liquid by intrinsically safe pumps or vacuum equipment designed for vacuuming flammable materials (i.e. equipped with inert gases and ignition sources controlled). Place in suitable, covered, labelled containers.

SMALL SPILLS: Soak up spill with absorbent material which does not react with spilled chemical. Put material in suitable, covered, labelled containers. Flush area with water.

Contaminated absorbent material may pose the same hazards as the spilled product.

LARGE SPILLS: If necessary, contain spill by diking. Alcohol resistant foams may be applied to spill to diminish vapour and fire hazard. Collect liquid with explosion proof pumps.

7. Handling and storage

Precautions for Handling: No smoking or open flame in storage, use or handling areas. Use explosion proof electrical equipment. Ensure proper electrical grounding and bonding equipment procedures are in place.

Storage: Store this material in a cool, dry, well-ventilated area away from oxidizing materials and corrosive atmospheres, in a fireproof area. Keep amount in storage to a minimum.

Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. It is recommended that storage procedures be evaluated using NFPA 70E standard and NFPA 497 practice. Do not store below ground level, or in confined spaces. Have appropriate fire extinguishers and spill cleanup equipment in or near storage area. Store away from strong oxidizers, mineral acids and metals. See Section 10, **Stability and reactivity** for more information.

Ground and bond all containers and storage vessels. Store away from heat and ignition sources and out of direct sunlight. Post storage area as a "No Smoking" area.

8. Exposure controls/personal protection

Exposure Limits

ACGIH

Time-Weighted Average (TLV-TWA): 200 ppm - Skin

Short-Term Exposure Limit (TLV-STEL): 250 ppm - Skin

TLV Basis - Critical Effect(s): Headache;
Eye damage;
Dizziness;
Nausea

Personal Protection

Eye/face Protection: Chemical safety goggles. A face shield may also be necessary.

Skin Protection: Chemical protective gloves, coveralls, boots, and/or other chemical protective clothing. Safety shower/eye-wash fountain should be readily available in the immediate work area.

Hand protection: Butyl or Viton®. Since methanol is recognized as a skin absorption hazard, check with glove manufacturers for appropriate glove material, thickness and resistance to breakthrough.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. Use an approved positive-pressure full-face self-contained breathing apparatus or a full-face supplied air respirator. The person wearing the respirator should be medically approved, fit tested and trained to operate the breathing apparatus.

Engineering Controls

Ventilation: Engineering methods to control hazardous conditions are preferred. Methods include

mechanical (local exhaust) ventilation, process or personnel enclosure and control of process conditions. Administrative controls and personal protective equipment may also be required. Because of the high potential hazard associated with this substance, stringent control measures such as enclosure (closed handling systems) should be considered. To reduce the fire/explosion hazard, consider the use of an inert gas in the process system.

Use approved explosion-proof equipment and intrinsically safe electrical systems in areas of use. For large-scale operations, consider the installation of leak and fire detection equipment along with a suitable, automatic fire suppression system.

Use a non-sparking, grounded, ventilation system separate from other exhaust ventilation systems. Exhaust directly to the outside.

Supply sufficient replacement air to make up for air removed by exhaust system.

9. Physical and chemical properties

Appearance: Liquid, clear, colourless

Odour: Mild characteristic alcohol odour

Odour Threshold: detection: 4.2 - 5960 ppm
(geometric mean) 160 ppm
recognition: 53 - 8940 ppm
(geometric mean) 690 ppm

pH: Not applicable

Freezing Point: -97.8°C

Boiling Point: 64.7°C

Boiling Range: Not determined

Flash Point: 11.0°C

Solubility: Completely soluble

Partial Coefficient: Log P (oct) = -0.82

Vapour Pressure: 12.8 kPa @ 20°C

Viscosity: 0.3 cP @ 25°C

Upper Explosive Limit (UEL): 36.5 %

Lower Explosive Limit (LEL): 6%

Auto Ignition Temperature: 464°C

Solvent Solubility: Soluble in all proportions in ethanol, benzene, other alcohols, chloroform, diethyl ether, other ethers, esters, ketones and most organic solvents

Critical Temperature: 239.4°C

Specific Gravity: 0.791-0.793 @ 20°C

Evaporation Rate: 4.1 (n-butyl acetate =1)

Vapour Density: 1.105 @ 15°C (air = 1)

Decomposition Temperature: Not determined

Sensitivity to Impact: No

Sensitivity to Static Charge: Low

Percent Volatility: 100

10. Stability and reactivity

Chemical Stability: Stable as supplied.

Possibility of Hazardous Reactions: Polymerisation will not occur

Conditions to Avoid: Heat, open flames, static discharge, sparks and other ignition sources.

Incompatible Materials: Avoid contact with strong oxidizers, strong mineral or organic acids, and strong bases. Contact with these materials may cause a violent or explosive reaction.

Methanol is not compatible with gasket and O-rings materials made of Buna-N and Nitrile.

Methanol is corrosive to type 12L14 carbon steel at room temperature and type 3003 aluminum,

copper (10-100% methanol solution) and admiralty brass, at 93 deg C. Methanol is not corrosive to most metals.

Methanol attacks some forms of plastic, rubber and coatings.

Hazardous Decomposition Products: Decomposes on heating to produce carbon monoxide and formaldehyde.

11. Toxicological information

Acute toxicity

Ingestion

LD50 (oral, rat): 5600 mg/kg

LD50 (oral, rabbit): 14200 mg/kg

Dermal

LD50 (dermal, rabbit): 15800 mg/kg

Inhalation

LC50 (rabbit): 81000 mg/m³/14h

LC50 (rat): 64000 ppm/4h

Eye Damage/Irritation

Moderate eye irritant.

Skin Corrosion/Irritation

Not considered to be an irritant.

Sensitization

Not considered to be a sensitizer.

Repeated Dose Toxicity

No relevant data found

Chronic Toxicity and Carcinogenicity

Not listed by IARC, NTP, ACGIH OR OSHA as a carcinogen.

Teratogenicity, Embryotoxicity and/or Fetotoxicity

Methanol has produced fetotoxicity in rats and teratogenicity in mice exposed by inhalation to high concentrations that did not produce significant maternal toxicity.

Reproductive Toxicity

Not considered to be a reproductive toxin.

Mutagenicity

There is insufficient information available to conclude that methanol is mutagenic.

12. Ecological information

LC50 (96h, fish): 15400 -29400 mg/l

EC50 (48h, daphnia): > 10000 mg/l

EC50 (72h, algae): 22000 mg/l *Selenastrum carpicornutum (Pseudokichnerela subcapitata)*

Persistence and degradability

Readily biodegradable

Bioaccumulation

Does not bioaccumulate. Partition coefficient: n-octanol/water 0.77

Mobility in Soil

Mobile in soils

PBT/vPvB

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT). This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

Terrestrial Fate

The mobility of methanol in the subsurface will not be significantly limited by adsorption. Sorption of methanol to organic carbon in soil will be minor, and methanol will tend to remain in soil pore water.

Aquatic Fate

Methanol is completely miscible with water. Accordingly, its mobility in the subsurface will not be limited by solubility. Methanol has been shown to undergo rapid biodegradation in a variety of screening studies using sewage seed and activated sludge inoculum, which suggests that biodegradation will occur in aquatic environments where the concentration does not inhibit bacterial activity.

Atmospheric Fate

Methanol has a vapour pressure of 127 mm Hg at 25°C and is expected to exist solely as a vapour in the ambient atmosphere. Vapour-phase methanol is degraded in the atmosphere by reaction with photo chemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 17 days.

Other Adverse Effects

Do not flush into surface water or sanitary sewer system.

13. Disposal considerations

Review federal, provincial or state, and local government requirements prior to disposal. Store material for disposal as indicated in Section 7, **Handling and storage**. Disposal by controlled incineration or by secure land fill may be acceptable.

Recycle wherever possible. Large volumes may be suitable for re-distillation or, if contaminated, incineration. Can be disposed of in a sewage treatment facility. Methanol levels of up to 0.1% act as a food source for bacteria; above this level may be toxic to bacteria. When pumping through sewage collection systems, the level of methanol should be kept below the flammable range (a 25% methanol/water mixture is non-flammable at temperatures below 39°C). 1 ppm of methanol is equivalent to 1.5 ppm BOD loading in the sewage plant.

Container disposal

Empty containers may contain hazardous residue. Return to supplier for reuse if possible. Never weld, cut or grind empty containers. If disposing of containers, ensure they are well rinsed with water, then disposed of at an authorised landfill. After cleaning, all existing labels should be removed.

14. Transport information**Canada Transportation of Dangerous Goods (TDG):**

UN Number: UN1230

Proper Shipping Name: Methanol

Hazard Class: 3(6.1)

Packing Group: II

Labels required: Flammable Liquid and Toxic

Limited Quantity: ≤ 1 litre

ERG Guide Number: 131

**United States Department of Transport (49CFR):
(Domestic Only)**

UN Number: UN1230
Proper Shipping Name: Methanol
Hazard Class: 3(6.1)
Packing Group: II
Labels required: Flammable Liquid and Toxic
Limited Quantity: ≤ 1 litre
ERG Guide Number: 131

International Air Transport Association (IATA):

UN Number: UN1230
Proper Shipping Name: Methanol
Hazard Class: 3(6.1)
Packing Group: II
Labels required: Flammable Liquid and Toxic (Toxic label may be eliminated under SP 104)

International Maritime Organization (IMO):

UN Number: UN1230
Proper Shipping Name: Methanol
Hazard Class: 3(6.1)
Packing Group: II
Labels required: Flammable Liquid and Toxic
Flash Point = 11°C
EmS No. F-E, S-D
Stowage Category "B", Clear of living quarters

Marine Pollutant:

No

15. Regulatory information**CANADIAN FEDERAL REGULATIONS****Hazardous Products Act Information: CPR Compliance**

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

WHMIS Classification

B2 - Flammable and combustible material - Flammable liquid
D1B - Poisonous and infectious material - Immediate and serious effects - Toxic
D2A - Poisonous and infectious material - Other effects - Very toxic
D2B - Poisonous and infectious material - Other effects - Toxic

CEPA, Domestic Substances List

Methanol is listed on the Domestic Substances List.

WHMIS Ingredient Disclosure List

Listed at 1%

UNITED STATES REGULATIONS

29CFR 1910.1200 (OSHA): Hazardous
 40CFR 116-117 (EPA): Hazardous
 40CFR 355, Appendices A and B: Subject to Emergency Planning and Notification
 40CFR 372 (SARA Title III): Listed
 40CFR 302 (CERCLA): Listed
 TOXIC SUBSTANCES CONTROL ACT (TSCA): Listed in the inventory
 CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986: Not listed
 OEHA/CALIFORNIA Title 27, Sec. 25306: Listed

16. Other Information

Hazard Rating System

NFPA	Health	Fire	Reactivity
	1	3	0

References:

1. International Programme on Chemical Safety, Methanol, Environmental Health Criteria, World Health Organization 1997
2. Patty's Industrial Hygiene and Toxicology, 5th Edition
3. Fire Protection Guide to Hazardous Materials, 13th Edition
4. Lanigan, S., Final report on the Safety Assessment of Methyl Alcohol, International Journal of Toxicology., Volume 20, Supplement 1 (2001)
5. Forsberg, K., Quick Selection Guide to Chemical Protective Clothing
6. Nelson, B.K., Teratological assessment of Methanol and Ethanol at high inhalation levels in rats, Fundamental and Applied Toxicology, Volume 5
7. NIOSH Guide to Chemical Hazards
8. Hazardous Substance Data Base (HSDB)
9. CCOHS Cheminfo.
10. RTECS

Original Preparation Date: September 22, 2005

Disclaimer: The information above is believed to be accurate and represents the best information currently available to us. Users should make their own investigations to determine the suitability of the information for their particular purposes. This document is intended as a guide to the appropriate precautionary handling of the material by a properly trained person using this product.

Methanex Corporation and its subsidiaries make no representations or warranties, either express or implied, including without limitation any warranties of merchantability, fitness for a particular purpose with respect to the information set forth herein or the product to which the information refers. Accordingly, Methanex Corp. will not be responsible for damages resulting from use of or reliance upon this information.

This Material Safety Data Sheet may not be changed, or altered in any way without the expressed knowledge and permission of Methanex Corporation.

MSDS version: 2.0

Revisions: Revised and re-issued March 1, 2013



Material Safety Data Sheet

The Dow Chemical Company

Product Name: NORKOOL(TM) SLH 50

Issue Date: 10/05/2009

Print Date: 30 Jul 2010

The Dow Chemical Company encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name

NORKOOL(TM) SLH 50

COMPANY IDENTIFICATION

The Dow Chemical Company
2030 Willard H. Dow Center
Midland, MI 48674
USA

Customer Information Number:

800-258-2436

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact:

989-636-4400

Local Emergency Contact:

989-636-4400

2. Hazards Identification

Emergency Overview

Color: Green to blue

Physical State: Liquid.

Odor: Characteristic

Hazards of product:

WARNING! Harmful or fatal if swallowed. May cause eye irritation. Isolate area.

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects

Eye Contact: May cause slight eye irritation. Corneal injury is unlikely. Vapor or mist may cause eye irritation.

Skin Contact: Brief contact is essentially nonirritating to skin. Prolonged contact may cause slight skin irritation with local redness. Repeated contact may cause skin irritation with local redness.

Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts. Repeated skin exposure to large quantities may result in absorption of harmful amounts. Massive

contact with damaged skin or of material sufficiently hot to burn skin may result in absorption of potentially lethal amounts.

Inhalation: At room temperature, exposure to vapor is minimal due to low volatility; vapor from heated material or mist may cause respiratory irritation and other effects.

Ingestion: Oral toxicity is expected to be moderate in humans due to ethylene glycol even though tests with animals show a lower degree of toxicity. Ingestion of quantities (approximately 65 mL (2 oz.) for diethylene glycol or 100 mL (3 oz.) for ethylene glycol) has caused death in humans. May cause nausea and vomiting. May cause abdominal discomfort or diarrhea. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis), and kidney failure.

Effects of Repeated Exposure: For Ethylene glycol: Repeated excessive exposure may cause irritation of the upper respiratory tract. In humans, effects have been reported on the following organs: Central nervous system. Observations in humans include: Nystagmus (involuntary eye movement). In animals, effects have been reported on the following organs: Kidney. Liver.

Birth Defects/Developmental Effects: Based on animal studies, ingestion of very large amounts of ethylene glycol appears to be the major and possibly only route of exposure to produce birth defects. Exposures by inhalation or skin contact, the primary routes of occupational exposure, had minimal effect on the fetus, in animal studies.

Reproductive Effects: Ingestion of large amounts of ethylene glycol has been shown to interfere with reproduction in animals.

3. Composition Information

Component	CAS #	Amount
Ethylene glycol	107-21-1	> 45.0 - < 55.0 %
Water	7732-18-5	> 45.0 - < 55.0 %

4. First-aid measures

Eye Contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

Skin Contact: Immediately flush skin with water while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Contaminated leather items such as shoes should be disposed of properly. Safety shower should be located in immediate work area.

Inhalation: Move person to fresh air; if effects occur, consult a physician.

Ingestion: Do not induce vomiting. Seek medical attention immediately. If person is fully conscious give 1 cup or 8 ounces (240 ml) of water. If medical advice is delayed and if an adult has swallowed several ounces of chemical, then give 3-4 ounces (1/3-1/2 Cup) (90-120 ml) of hard liquor such as 80 proof whiskey. For children, give proportionally less liquor at a dose of 0.3 ounce (1 1/2 tsp.) (8 ml) liquor for each 10 pounds of body weight, or 2 ml per kg body weight [e.g., 1.2 ounce (2 1/3 tbsp.) for a 40 pound child or 36 ml for an 18 kg child].

Notes to Physician: If several ounces (60 - 100 ml) of ethylene glycol have been ingested, early administration of ethanol may counter the toxic effects (metabolic acidosis, renal damage). Consider hemodialysis or peritoneal dialysis & thiamine 100 mg plus pyridoxine 50 mg intravenously every 6 hours. If ethanol is used, a therapeutically effective blood concentration in the range of 100 - 150 mg/dl may be achieved by a rapid loading dose followed by a continuous intravenous infusion. Consult standard literature for details of treatment. 4-Methyl pyrazole (Antizol®) is an effective blocker of alcohol dehydrogenase and should be used in the treatment of ethylene glycol (EG), di- or triethylene glycol (DEG, TEG), ethylene glycol butyl ether (EGBE), or methanol intoxication if available. Fomepizole protocol (Brent, J. et al., New England Journal of Medicine, Feb. 8, 2001, 344:6, p. 424-9): loading dose 15 mg/kg intravenously, follow by bolus dose of 10 mg/kg every 12 hours; after 48 hours, increase bolus dose to 15 mg/kg every 12 hours. Continue fomepizole until serum methanol, EG, DEG, TEG or EGBE are undetectable. The signs and symptoms of poisoning include anion gap metabolic acidosis, CNS depression, renal tubular injury, and possible late stage cranial nerve involvement. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. In severe

poisoning, respiratory support with mechanical ventilation and positive end expiratory pressure may be required. Maintain adequate ventilation and oxygenation of the patient. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. If burn is present, treat as any thermal burn, after decontamination. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

Emergency Personnel Protection: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

5. Fire Fighting Measures

Extinguishing Media: To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam.

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

Unusual Fire and Explosion Hazards: This material will not burn until the water has evaporated. Residue can burn.

Hazardous Combustion Products: Under fire conditions some components of this product may decompose. The smoke may contain unidentified toxic and/or irritating compounds. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide. Combustion products may include trace amounts of: Nitrogen oxides.

6. Accidental Release Measures

Steps to be Taken if Material is Released or Spilled: Small spills: Absorb with materials such as: Cat litter. Sawdust. Vermiculite. Zorb-all®. Collect in suitable and properly labeled containers. Large spills: Dike area to contain spill. Contain spilled material if possible. See Section 13, Disposal Considerations, for additional information.

Ignition Sources Removal: Keep away from sources of ignition.

Dust Control: Not applicable.

Personal Precautions: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. Refer to Section 7, Handling, for additional precautionary measures.

Environmental Precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. Handling and Storage

Handling

General Handling: Do not swallow. Avoid contact with eyes. Wash thoroughly after handling. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Storage

Do not store in: Galvanized steel. Opened or unlabeled containers. Store in the following material(s): Carbon steel. Stainless steel. Store in original unopened container. Additional storage and handling information on this product may be obtained by calling your sales or customer service contact. See Section 10 for more specific information.

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
Ethylene glycol	ACGIH	Ceiling Aerosol.	100 mg/m ³

Personal Protection

Eye/Face Protection: Use safety glasses (with side shields). If there is a potential for exposure to particles which could cause eye discomfort, wear chemical goggles. If exposure causes eye discomfort, use a full-face respirator.

Skin Protection: When prolonged or frequently repeated contact could occur, use protective clothing chemically resistant to this material. Selection of specific items such as faceshield, boots, apron, or full-body suit will depend on the task. When handling hot material, protect skin from thermal burns as well as from skin absorption.

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. If hands are cut or scratched, use gloves chemically resistant to this material even for brief exposures. Use gloves with insulation for thermal protection, when needed. Examples of preferred glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl chloride ("PVC" or "vinyl"). Avoid gloves made of: Polyvinyl alcohol ("PVA"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions, no respiratory protection should be needed; however, if material is heated or sprayed, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

Ingestion: Avoid ingestion of even very small amounts; do not consume or store food or tobacco in the work area; wash hands and face before smoking or eating.

Engineering Controls

Ventilation: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Physical State	Liquid.
Color	Green to blue
Odor	Characteristic
Odor Threshold	No test data available
Flash Point - Closed Cup	Water boils off
Flammability (solid, gas)	Not applicable to liquids

Flammable Limits In Air	Lower: No test data available Upper: No test data available
Autoignition Temperature	427 °C (801 °F) <i>Literature</i> Ethylene Glycol
Vapor Pressure	13 mmHg @ 20 °C <i>Literature</i>
Boiling Point (760 mmHg)	107 °C (225 °F) <i>Literature</i> .
Vapor Density (air = 1)	>1.0 <i>Literature</i>
Specific Gravity (H2O = 1)	1.079 <i>Literature</i>
Freezing Point	-38 °C (-36 °F) <i>ASTM D1177</i>
Melting Point	Not applicable to liquids
Solubility in water (by weight)	100 % <i>Literature</i>
pH	9.5 (@ 100 %) <i>ASTM D1287</i> (typical value)
Decomposition Temperature	No test data available
Partition coefficient, n-octanol/water (log Pow)	No data available for this product. See Section 12 for individual component data.
Evaporation Rate (Butyl Acetate = 1)	< 0.8 <i>Estimated</i> .
Kinematic Viscosity	3.7 cSt @ 20 °C <i>Literature</i>

10. Stability and Reactivity

Stability/Instability

Thermally stable at recommended temperatures and pressures.

Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems.

Incompatible Materials: Avoid contact with: Strong acids. Strong bases. Strong oxidizers.

Hazardous Polymerization

Will not occur.

Thermal Decomposition

Decomposition products depend upon temperature, air supply and the presence of other materials.

11. Toxicological Information

Acute Toxicity

Ingestion

For Ethylene glycol: Lethal Dose, Human, adult 3 Ounces

For Ethylene glycol: LD50, Rat 6,000 - 13,000 mg/kg

Skin Absorption

For Ethylene glycol: LD50, Rabbit > 22,270 mg/kg

Inhalation

For Ethylene glycol: LC50, 7 h, Aerosol, Rat > 3.95 mg/l

Repeated Dose Toxicity

For Ethylene glycol: Repeated excessive exposure may cause irritation of the upper respiratory tract. In humans, effects have been reported on the following organs: Central nervous system.

Observations in humans include: Nystagmus (involuntary eye movement). In animals, effects have been reported on the following organs: Kidney. Liver.

Chronic Toxicity and Carcinogenicity

Ethylene glycol did not cause cancer in long-term animal studies.

Developmental Toxicity

Based on animal studies, ingestion of very large amounts of ethylene glycol appears to be the major and possibly only route of exposure to produce birth defects. Exposures by inhalation or skin contact, the primary routes of occupational exposure, had minimal effect on the fetus, in animal studies.

Reproductive Toxicity

Ingestion of large amounts of ethylene glycol has been shown to interfere with reproduction in animals.

Genetic Toxicology

For Ethylene glycol: In vitro genetic toxicity studies were negative. For Ethylene glycol: Animal genetic toxicity studies were negative.

12. Ecological Information

ENVIRONMENTAL FATE

Data for Component: **Ethylene glycol**

Movement & Partitioning

Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Potential for mobility in soil is very high (Koc between 0 and 50). Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

Henry's Law Constant (H): 8.05E-09 atm*m3/mole; 25 °C Estimated.

Partition coefficient, n-octanol/water (log Pow): -1.36 Measured

Partition coefficient, soil organic carbon/water (Koc): 1 Estimated.

Distribution in Environment: Mackay Level 1 Fugacity Model:

Air	Water.	Biota	Soil	Sediment
2.1 %	98 %	< 0.01 %	< 0.01 %	< 0.01 %

Persistence and Degradability

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
8.32E-12 cm3/s	15 h	Estimated.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
> 94 %	28 d	OECD 301F Test
90 %	1 d	OECD 302B Test

Theoretical Oxygen Demand: 1.29 mg/mg

ECOTOXICITY

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

LC50, fathead minnow (Pimephales promelas): 15,400 mg/l

Aquatic Invertebrate Acute Toxicity

LC50, water flea Daphnia magna: 15,500 mg/l

Toxicity to Micro-organisms

EC50; bacteria, Growth inhibition (cell density reduction): > 5,000 mg/l

13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED

PRODUCT, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

14. Transport Information

DOT Non-Bulk
NOT REGULATED

DOT Bulk
Proper Shipping Name: OTHER REGULATED SUBSTANCES, LIQUID, NOS
Technical Name: CONTAINS ETHYLENE GLYCOL
Hazard Class: 9 **ID Number:** NA3082 **Packing Group:** PG III

IMDG
NOT REGULATED

ICAO/IATA
NOT REGULATED
Additional Information

Reportable quantity: 9,091 lb – ETHYLENE GLYCOL

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	Yes
Fire Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

This product contains the following substances which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and which are listed in 40 CFR 372.

Component	CAS #	Amount
Ethylene glycol	107-21-1	> 45.0 - < 55.0 %

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Ethylene glycol	107-21-1	> 45.0 - < 55.0 %

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

US. Toxic Substances Control Act

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

CEPA - Domestic Substances List (DSL)

This product contains one or more substances which are not listed on the Canadian Domestic Substances List (DSL). Contact your sales or technical service representative for more information.

16. Other Information

Hazard Rating System

NFPA	Health	Fire	Reactivity
	1	1	0

Recommended Uses and Restrictions

Engine Cooling Line Heaters Intended as a heat transfer fluid for closed-loop systems. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

Revision

Identification Number: 1354 / 1001 / Issue Date 10/05/2009 / Version: 3.0

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

The Dow Chemical Company urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have

obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

- **Attachment I: Emission Units Table**

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

Emission Unit ID ¹	Emission Point ID ²	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type ³ and Date of Change	Control Device ⁴
CE-1	CE-1	CAT G3616 Compressor Engine	2016	1775 HP	New	Ox Cat (C1)
CE-2	CE-2	CAT G3616 Compressor Engine	2016	1775 HP	New	Ox Cat (C2)
CE-3	CE-3	CAT G3616 Compressor Engine	2016	1775 HP	New	Ox Cat (C3)
GE-1	GE-1	Gillette Natural Gas Generator	2016	126 HP	New	N/A
T01	T01	Waste Lube Oil	2016	30 BBL	New	N/A
T02	T02	Methanol	2016	335 Gal	New	N/A
T03	T03	Coolant Make Up Tank	2016	30 BBL	New	N/A
T04	T04	Coolant Drain Tank	2016	30 BBL	New	N/A
T05	T05	Engine Lube Oil for CE-1	2016	500 Gal	New	N/A
T06	T06	Compressor Lube Oil for CE-1	2016	500 Gal	New	N/A
T07	T07	Engine Lube Oil for CE-2	2016	500 Gal	New	N/A
T08	T08	Compressor Lube Oil for CE-2	2016	500 Gal	New	N/A
T09	T09	Engine Lube Oil for CE-3	2016	500 Gal	New	N/A
T10	T10	Compressor Lube Oil for CE-3	2016	500 Gal	New	N/A

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

- **Attachment J: Emission Points Data Summary Sheet**

**Attachment J
EMISSION POINTS DATA SUMMARY SHEET**

Table 1: Emissions Data

Emission Point ID No. (Must match Emission Units Table & Plot Plan)	Emission Point Type ¹	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot Plan)		Air Pollution Control Device (Must match Emission Units Table & Plot Plan)		Vent Time for Emission Unit (chemical processes only)		All Regulated Pollutants - Chemical Name/CAS ³ (Speciate VOCs & HAPs)	Maximum Potential Uncontrolled Emissions ⁴		Maximum Potential Controlled Emissions ⁵		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used ⁶	Emission Concentration ⁷ (ppmv or mg/m ⁴)
		ID No.	Source	ID No.	Device Type	Short Term ²	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
CE-1	Upward vertical stack	CE-1	Compress -or engine	C-1	Oxidation catalyst	N/A	N/A	NOx CO VOC SO2 PM/PM10 Formaldehyde Total HAP CO2(eq)	1.96	8.57	1.96	8.57	Gas/Vapor	EE O - Vendor data (see Att. L and N)	
									10.72	46.96	0.63	2.74			
									2.47	10.80	0.67	2.91			
									0.007	0.03	0.007	0.03			
									0.001	0.004	0.001	0.004			
									1.02	4.46	0.24	1.03			
1.24	5.43	0.45	1.99												
1726	7559	1726	7559												
CE-2	Upward vertical stack	CE-2	Compress -or engine	C-2	Oxidation catalyst	N/A	N/A	NOx CO VOC SO2 PM/PM10 Formaldehyde Total HAP CO2(eq)	1.96	8.57	1.96	8.57	Gas/Vapor	EE O - Vendor data (see Att. L and N)	
									10.72	46.96	0.63	2.74			
									2.47	10.80	0.67	2.91			
									0.007	0.03	0.007	0.03			
									0.001	0.004	0.001	0.004			
									1.02	4.46	0.24	1.03			
1.24	5.43	0.45	1.99												
1726	7559	1726	7559												
CE-3	Upward vertical stack	CE-3	Compress -or engine	C-3	Oxidation catalyst	N/A	N/A	NOx CO VOC SO2 PM/PM10 Formaldehyde Total HAP CO2(eq)	1.96	8.57	1.96	8.57	Gas/Vapor	EE O - Vendor data (see Att. L and N)	
									10.72	46.96	0.63	2.74			
									2.47	10.80	0.67	2.91			
									0.007	0.03	0.007	0.03			
									0.001	0.004	0.001	0.004			
									1.02	4.46	0.24	1.03			
1.24	5.43	0.45	1.99												
1726	7559	1726	7559												
GE-1	Tank Vent	GE-1	Generator Engine	N/A	N/A	N/A	N/A	NOx CO VOC SO2 PM/PM10 Formaldehyde Total HAP CO2(eq)	0.28	1.22	0.28	1.22	Gas/Vapor	EE O - Vendor data (see Att. L and N)	
									0.56	2.43	0.56	2.43			
									0.19	0.85	0.19	0.85			
									0.001	0.003	0.001	0.003			
									0.013	0.06	0.013	0.06			
									0.07	0.30	0.07	0.30			
0.09	0.41	0.09	0.41												
123	537	123	537												

T-01	Relief Vent	T-01	Waste Lube Oil Tank	N/A	N/A	N/A	N/A	N/A	NOx CO VOC SO2 PM/PM10 Formaldehyde Total HAP CO2(eq)	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	Gas/Vapor	EE (see Att. H and N - Tanks 4.09 - min VOC)
T-02	Relief Vent	T-02	Methanol Tank	N/A	N/A	N/A	N/A	N/A	NOx CO VOC SO2 PM/PM10 Formaldehyde Total HAP CO2(eq)	0.00 0.00 0.002 0.00 0.00 0.00 0.002 0.00	0.00 0.00 0.009 0.00 0.00 0.00 0.002 0.00	0.00 0.00 0.002 0.00 0.00 0.00 0.002 0.00	Gas/Vapor	EE (see Att. H, L and N)
T-03 and T-04	Relief Vent	T-03 and T-04	Coolant Make up and Drain Tanks	N/A	N/A	N/A	N/A	N/A	NOx CO VOC SO2 PM/PM10 Formaldehyde Total HAP CO2(eq)	0.00 0.00 0.00 0.00 0.00 0.00 0.002 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.002 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.002 0.00	Gas/Vapor	EE (see Att. H-SDS)
T-05 through T-10	Relief Vent	T-05 -T-10	Engine and Compress -or Lube Oil Tanks	N/A	N/A	N/A	N/A	N/A	NOx CO VOC SO2 PM/PM10 Formaldehyde Total HAP CO2(eq)	0.00 0.00 0.00 0.00 0.00 0.00 0.002 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.002 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.002 0.00	Gas/Vapor	EE (see Att. H and N - Tanks 4.09 for Waste Lube Oil)

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 (e.g., 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. <i>(Must match Emission Units Table)</i>	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)			UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow ¹ (acfm) <i>at operating conditions</i>	Velocity (fps)	Ground Level <i>(Height above mean sea level)</i>	Stack Height ² <i>(Release height of emissions above ground level)</i>	Northing	Eastng	
CE-1	1.67	847	12213	93.3	1511	34	4395.885	568.922	
CE-2	1.67	847	12213	93.3	1511	34	4395.885	568.914	
CE-3	1.67	847	12213	93.3	1511	34	4395.885	568.906	
GE-1	0.30	1300	1063	250.7	1511	15	4395.905	568.926	

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

- **Attachment K: Fugitive Emissions Data Summary Sheet**

Attachment K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

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

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

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

FUGITIVE EMISSIONS SUMMARY		All Regulated Pollutants ¹ Chemical Name/CAS 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							
Storage Pile Emissions							
Loading/Unloading Operations		VOC HAP	0.008 0.008	0.033 0.033	0.008 0.008	0.033 0.033	O-EPA AP-42 Sec 5.2
Wastewater Treatment Evaporation & Operations							
Equipment Leaks		VOC HAP CO2(eq)	Does not apply	0.339 0.293 112.00	Does not apply	0.339 0.293 112.00	O-EPA 453.40 CFR O ⁴ & 98
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, CS₂, VOCs, H₂S, Inorganics, Lead, Organics, O₃, NO, NO₂, SO₂, SO₃, all applicable Greenhouse Gases (including CO₂ and methane), etc. DO NOT LIST H₂, H₂O, N₂, O₂, and Noble Gases.

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

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

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

- **Attachment L: Emissions Unit Data Sheet(s)**

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

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

Identification Number (as assigned on *Equipment List Form*): CE-1 through CE-3

<p>1. Name or type and model of proposed affected source:</p> <p>Compressor Engine #1 – #3: Three (3) Caterpillar 3606 natural gas fired compressor engines equipped with oxidation catalyst. Unless otherwise noted, emission numbers and ratings are for each engine.</p>
<p>2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.</p>
<p>3. Name(s) and maximum amount of proposed process material(s) charged per hour:</p> <p>N/A</p>
<p>4. Name(s) and maximum amount of proposed material(s) produced per hour:</p> <p>Does not produce any materials. Compresses natural gas to maintain pipeline pressure.</p>
<p>5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:</p> <p>Internal combustion of natural gas.</p>

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

6. Combustion Data (if applicable):			
(a) Type and amount in appropriate units of fuel(s) to be burned:			
Natural gas – 13,080 scf/hr (each engine), 114.6 MMscf/yr (each engine)			
(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:			
Natural gas with negligible H ₂ S and ash content.			
(c) Theoretical combustion air requirement (ACF/unit of fuel):			
22.6	@	60	°F and 14.7 psia.
(d) Percent excess air: Unknown			
(e) Type and BTU/hr of burners and all other firing equipment planned to be used:			
13.51 MMBtu/hr spark ignition reciprocating internal combustion engine.			
(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:			
N/A			
(g) Proposed maximum design heat input:			
		13.51	× 10 ⁶ BTU/hr.
7. Projected operating schedule:			
Hours/Day	24	Days/Week	7
		Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:				
@	847	°F and	14.7	psia
a.	NO _x	1.96	lb/hr	grains/ACF
b.	SO ₂	0.007	lb/hr	grains/ACF
c.	CO	10.72	lb/hr	grains/ACF
d.	PM ₁₀	0.001	lb/hr	grains/ACF
e.	Hydrocarbons		lb/hr	grains/ACF
f.	VOCs	2.47	lb/hr	grains/ACF
g.	Pb	N/A	lb/hr	grains/ACF
h.	Specify other(s)			
	Formaldehyde	1.02	lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

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

(2) Complete the Emission Points Data Sheet.

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

MONITORING

Replace the reciprocating compressor rod packing before
 26,000 hours or 36 months from the date of the most recent rod packing element
 Monitor the number of hours of operation for each reciprocating compressor

RECORDKEEPING

Maintain records of maintenance conducted on the engine
 Maintain documentation that the engine meets the emission standards of 40 CFR 60.4233(e)
 Maintain records of all notification submitted
 Maintain records of the date and time of each reciprocating compressor rod packing element
 Maintain records of the deviations in cases where the compressor was not operated in compliance with 60.5383

REPORTING

Submission of an initial notification as required in 40 CFR 60.7(a)(1)
 Submit a copy of each performance test
 Submit an annual NSPS OOOO report one year from the initial annual report

TESTING

Initial performance test and subsequent performance testing every 8760 hours or every three years, whichever comes first.

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

See attached manufacturer specification sheet

**Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL**

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

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

<p>1. Name or type and model of proposed affected source:</p> <p>Genset Engine #1: One (1) natural gas fired generator engines.</p>
<p>2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.</p>
<p>3. Name(s) and maximum amount of proposed process material(s) charged per hour:</p> <p>N/A</p>
<p>4. Name(s) and maximum amount of proposed material(s) produced per hour:</p> <p>Does not produce any materials. Electrical natural gas fired generator to provide compressor station power.</p>
<p>5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:</p> <p>Internal combustion of natural gas.</p>

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

6. Combustion Data (if applicable):			
(a) Type and amount in appropriate units of fuel(s) to be burned:			
Natural gas – 1330 scf/hr, 11.6 MMscf/yr			
(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:			
Natural gas with negligible H2S and ash content.			
(c) Theoretical combustion air requirement (ACF/unit of fuel):			
14.2	@	60	°F and 14.7 psia.
(d) Percent excess air: Unknown			
(e) Type and BTU/hr of burners and all other firing equipment planned to be used:			
1.33 MMBtu/hr spark ignition reciprocating internal combustion engine.			
(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:			
N/A			
(g) Proposed maximum design heat input: 1.33 × 10 ⁶ BTU/hr.			
7. Projected operating schedule:			
Hours/Day	24	Days/Week	7
		Weeks/Year	52

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

@	1300	°F and	14.7	psia
a. NO _x		0.28	lb/hr	grains/ACF
b. SO ₂		0.001	lb/hr	grains/ACF
c. CO		0.56	lb/hr	grains/ACF
d. PM ₁₀		0.013	lb/hr	grains/ACF
e. Hydrocarbons			lb/hr	grains/ACF
f. VOCs		0.19	lb/hr	grains/ACF
g. Pb		N/A	lb/hr	grains/ACF
h. Specify other(s)				
Formaldehyde		0.07	lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

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

(2) Complete the Emission Points Data Sheet.

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

<p>MONITORING</p> <p>None</p>	<p>RECORDKEEPING</p> <p>None</p>
--------------------------------------	---

<p>REPORTING</p> <p>None</p>	<p>TESTING</p> <p>None</p>
-------------------------------------	-----------------------------------

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

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

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

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

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

See attached manufacturer specification sheet

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 Coopers Run Compressor Station	2. Tank Name Methanol Tank
3. Tank Equipment Identification No. (as assigned on <i>Equipment List Form</i>) T-02	4. Emission Point Identification No. (as assigned on <i>Equipment List Form</i>) T-02
5. Date of Commencement of Construction (for existing tanks)	
6. Type of change <input checked="" type="checkbox"/> New Construction <input type="checkbox"/> New Stored Material <input type="checkbox"/> Other Tank Modification	
7. Description of Tank Modification (if applicable)	
7A. Does the tank have more than one mode of operation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (e.g. Is there more than one product stored in the tank?)	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.): None	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. <p style="text-align: center;">335 Gallons</p>	
9A. Tank Internal Diameter (ft) <p style="text-align: center;">3</p>	9B. Tank Internal Height (or Length) (ft) <p style="text-align: center;">6</p>
10A. Maximum Liquid Height (ft) <p style="text-align: center;">3</p>	10B. Average Liquid Height (ft) <p style="text-align: center;">2</p>
11A. Maximum Vapor Space Height (ft) <p style="text-align: center;">1</p>	11B. Average Vapor Space Height (ft) <p style="text-align: center;">1</p>
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. <p style="text-align: center;">335 Gallons</p>	

13A. Maximum annual throughput (gal/yr) 3685	13B. Maximum daily throughput (gal/day) 335
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume) 4	
15. Maximum tank fill rate (gal/min) 10	
16. Tank fill method <input type="checkbox"/> Submerged <input checked="" type="checkbox"/> Splash <input type="checkbox"/> Bottom Loading	
17. Complete 17A and 17B for Variable Vapor Space Tank Systems <input checked="" type="checkbox"/> Does Not Apply	
17A. Volume Expansion Capacity of System (gal) N/A	17B. Number of transfers into system per year 4
18. Type of tank (check all that apply): <input checked="" type="checkbox"/> Fixed Roof <input type="checkbox"/> vertical <input type="checkbox"/> horizontal <input type="checkbox"/> flat roof <input type="checkbox"/> cone roof <input type="checkbox"/> dome roof x other (describe) Horizontal poly tank <input type="checkbox"/> External Floating Roof <input type="checkbox"/> pontoon roof <input type="checkbox"/> double deck roof <input type="checkbox"/> Domed External (or Covered) Floating Roof <input type="checkbox"/> Internal Floating Roof <input type="checkbox"/> vertical column support <input type="checkbox"/> self-supporting <input type="checkbox"/> Variable Vapor Space <input type="checkbox"/> lifter roof <input type="checkbox"/> diaphragm <input type="checkbox"/> Pressurized <input type="checkbox"/> spherical <input type="checkbox"/> cylindrical <input type="checkbox"/> Underground <input type="checkbox"/> Other (describe)	

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

19. Tank Shell Construction: <input type="checkbox"/> Riveted <input type="checkbox"/> Gunitite lined <input type="checkbox"/> Epoxy-coated rivets <input checked="" type="checkbox"/> Other (describe) Poly tank		
20A. Shell Color N/A	20B. Roof Color N/A	20C. Year Last Painted
21. Shell Condition (if metal and unlined): <input type="checkbox"/> No Rust <input type="checkbox"/> Light Rust <input type="checkbox"/> Dense Rust <input checked="" type="checkbox"/> Not applicable		
22A. Is the tank heated? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
22B. If YES, provide the operating temperature (°F)		
22C. If YES, please describe how heat is provided to tank.		
23. Operating Pressure Range (psig): 0 to 5		
24. Complete the following section for Vertical Fixed Roof Tanks		<input checked="" type="checkbox"/> Does Not Apply
24A. For dome roof, provide roof radius (ft)		
24B. For cone roof, provide slope (ft/ft)		
25. Complete the following section for Floating Roof Tanks		<input checked="" type="checkbox"/> Does Not Apply
25A. Year Internal Floaters Installed:		
25B. Primary Seal Type: (check one) <input type="checkbox"/> Metallic (Mechanical) Shoe Seal <input type="checkbox"/> Liquid Mounted Resilient Seal <input type="checkbox"/> Vapor Mounted Resilient Seal <input type="checkbox"/> Other (describe): N/A		
25C. Is the Floating Roof equipped with a Secondary Seal? <input type="checkbox"/> YES <input type="checkbox"/> NO		
25D. If YES, how is the secondary seal mounted? (check one) <input type="checkbox"/> Shoe <input type="checkbox"/> Rim <input type="checkbox"/> Other (describe):		
25E. Is the Floating Roof equipped with a weather shield? <input type="checkbox"/> YES <input type="checkbox"/> NO		

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

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

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

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

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

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

Attachment L
EMISSIONS UNIT DATA SHEET
BULK LIQUID TRANSFER OPERATIONS

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

Identification Number (as assigned on <i>Equipment List Form</i>):				
1. Loading Area Name: Methanol Loading T-02				
2. Type of cargo vessels accommodated at this rack or transfer point (check as many as apply):				
<input type="checkbox"/> Drums <input type="checkbox"/> Marine Vessels <input type="checkbox"/> Rail Tank Cars <input checked="" type="checkbox"/> Tank Trucks				
3. Loading Rack or Transfer Point Data:				
Number of pumps	1			
Number of liquids loaded	1			
Maximum number of marine vessels, tank trucks, tank cars, and/or drums loading at one time	1			
4. Does ballasting of marine vessels occur at this loading area?				
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Does not apply				
5. Describe cleaning location, compounds and procedure for cargo vessels using this transfer point:				
6. Are cargo vessels pressure tested for leaks at this or any other location?				
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
If YES, describe:				
7. Projected Maximum Operating Schedule (for rack or transfer point as a whole):				
Maximum	Jan. - Mar.	Apr. - June	July - Sept.	Oct. - Dec.
hours/day	24	24	24	24
days/week	7	7	7	7

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

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing

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

<p>MONITORING</p> <p>None</p>	<p>RECORDKEEPING</p> <p>Throughput of liquid loaded at site (gal/yr)</p>
<p>REPORTING</p> <p>None</p>	<p>TESTING</p> <p>None</p>

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

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

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

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

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

GAS COMPRESSION APPLICATION

M3 Coopers Run/Hamilton

ENGINE SPEED (rpm): 1000
 COMPRESSION RATIO: 9.2:1
 AFTERCOOLER TYPE: SCAC
 JACKET WATER OUTLET (°F): 190
 ASPIRATION: TA
 COOLING SYSTEM: JW, OC+AC
 CONTROL SYSTEM: CIS/ADEM3
 EXHAUST MANIFOLD: DRY
 COMBUSTION: LOWEMISSION
 NOx EMISSION LEVEL (g/bhp-hr NOx): 0.5

RATING STRATEGY: STANDARD
 RATING LEVEL: CONTINUOUS
 FUEL SYSTEM: GAV
 WITH AIR FUEL RATIO CONTROL

SITE CONDITIONS:
 FUEL: Gas Analysis
 FUEL PRESSURE RANGE (psig): 42.8-47.0
 FUEL METHANE NUMBER: 90.8
 FUEL LHV (Btu/scf): 929
 ALTITUDE (ft): 1500
 MAXIMUM INLET AIR TEMPERATURE (°F): 100
 STANDARD RATED POWER: 1775 bhp@1000rpm

RATING	NOTES	LOAD	SITING RATING AT MAXIMUM INLET AIR TEMPERATURE			
			100%	100%	75%	50%
ENGINE POWER (WITHOUT FAN)	(1)	bhp	1775	1775	1331	888
INLET AIR TEMPERATURE		°F	100	100	100	100
ENGINE DATA						
FUEL CONSUMPTION (LHV)	(2)	Btu/bhp-hr	6860	6860	7102	7619
FUEL CONSUMPTION (HHV)	(2)	Btu/bhp-hr	7610	7610	7879	8453
AIR FLOW (@inlet air temp, 14.7 psia) (WET)	(3)(4)	ft3/min	4921	4921	3806	2564
AIR FLOW (WET)	(3)(4)	lb/hr	20924	20924	16181	10900
FUEL FLOW (60°F, 14.7 psia)		scfm	218	218	170	121
INLET MANIFOLD PRESSURE	(5)	in Hg(abs)	74.3	74.3	57.9	41.2
EXHAUST TEMPERATURE - ENGINE OUTLET	(6)	°F	847	847	870	937
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia) (WET)	(7)(4)	ft3/min	12213	12213	9613	6821
EXHAUST GAS MASS FLOW (WET)	(7)(4)	lb/hr	21496	21496	16625	11218
EMISSIONS DATA - ENGINE OUT						
NOx (as NO2)	(8)(9)	g/bhp-hr	0.50	0.50	0.50	0.50
CO	(8)(9)	g/bhp-hr	2.74	2.74	2.74	2.74
THC (mol. wt. of 15.84)	(8)(9)	g/bhp-hr	6.30	6.30	6.50	6.77
NMHC (mol. wt. of 15.84)	(8)(9)	g/bhp-hr	0.94	0.94	0.98	1.01
NMNEHC (VOCs) (mol. wt. of 15.84)	(8)(9)(10)	g/bhp-hr	0.63	0.63	0.65	0.68
HCHO (Formaldehyde)	(8)(9)	g/bhp-hr	0.26	0.26	0.28	0.31
CO2	(8)(9)	g/bhp-hr	441	441	460	494
EXHAUST OXYGEN	(8)(11)	% DRY	12.8	12.8	12.1	11.1
HEAT REJECTION						
HEAT REJ. TO JACKET WATER (JW)	(12)	Btu/min	18749	18749	15593	13024
HEAT REJ. TO ATMOSPHERE	(12)	Btu/min	7103	7103	6619	6199
HEAT REJ. TO LUBE OIL (OC)	(12)	Btu/min	9132	9132	8667	8453
HEAT REJ. TO AFTERCOOLER (AC)	(12)(13)	Btu/min	17645	17645	9609	1869
COOLING SYSTEM SIZING CRITERIA						
TOTAL JACKET WATER CIRCUIT (JW)	(13)	Btu/min	20624			
TOTAL AFTERCOOLER CIRCUIT (OC+AC)	(13)(14)	Btu/min	29487			
A cooling system safety factor of 0% has been added to the cooling system sizing criteria.						

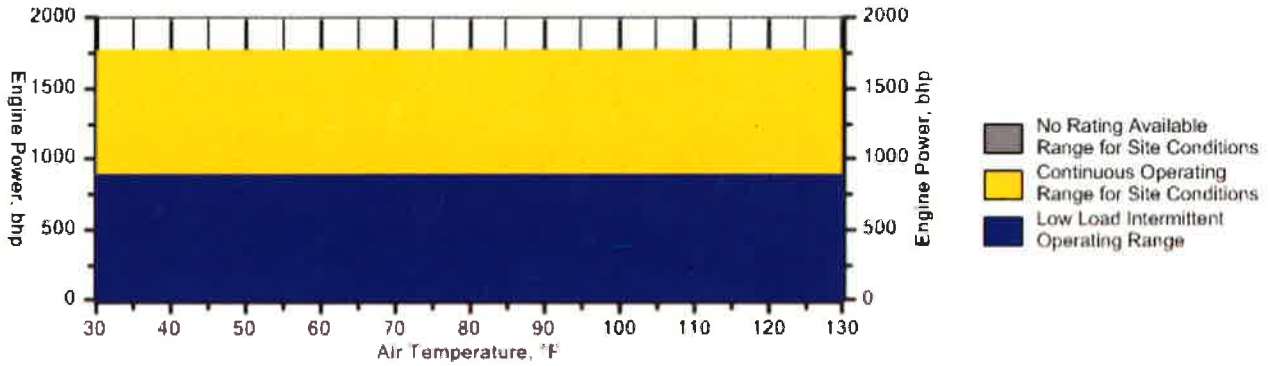
CONDITIONS AND DEFINITIONS

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 at the specified aftercooler inlet temperature 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.

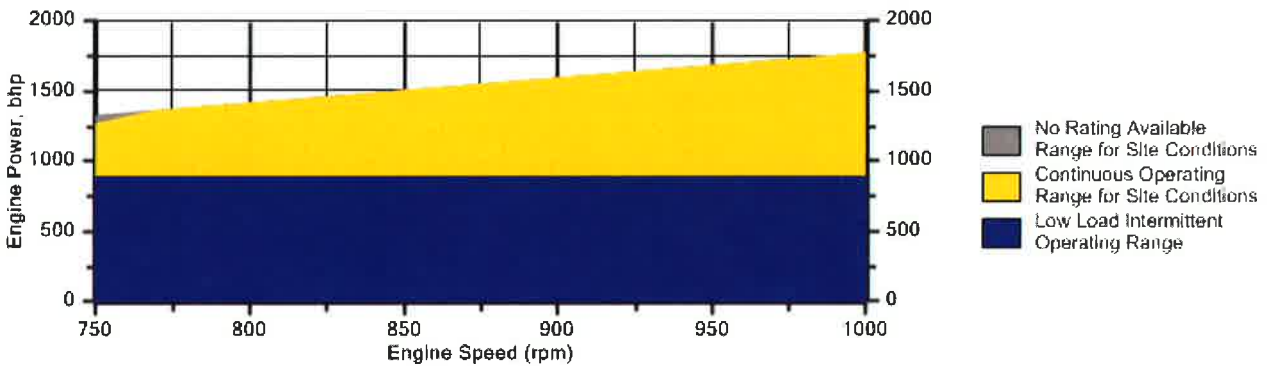
Engine Power vs. Inlet Air Temperature

Data represents temperature sweep at 1500 ft and 1000 rpm



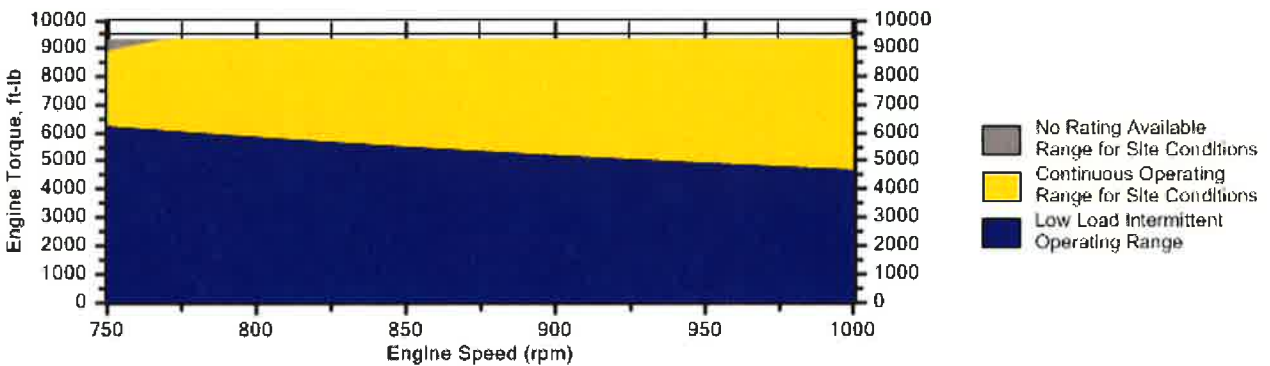
Engine Power vs. Engine Speed

Data represents speed sweep at 1500 ft and 100 °F



Engine Torque vs. Engine Speed

Data represents speed sweep at 1500 ft and 100 °F



Note: At site conditions of 1500 ft and 100°F inlet air temp., constant torque can be maintained down to 770 rpm. The minimum speed for loading at these conditions is 750 rpm.

NOTES

1. Engine rating is with two engine driven water pumps. Tolerance is $\pm 3\%$ of full load.
2. Fuel consumption tolerance is $\pm 2.5\%$ of full load data.
3. Air flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of $\pm 5\%$.
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 $\pm 5\%$.
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 $\pm 6\%$.
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. An oxidation catalyst may be required to meet Federal, State or local CO or HC requirements.
10. VOCs - Volatile organic compounds as defined in US EPA 40 CFR 60, subpart JJJJ
11. Exhaust Oxygen level is the result of adjusting the engine to operate at the specified NOx level. Tolerance is ± 0.5 .
12. Heat rejection values are nominal. Tolerances, based on treated water, are $\pm 10\%$ for jacket water circuit, $\pm 50\%$ for radiation, $\pm 20\%$ for lube oil circuit, and $\pm 5\%$ for aftercooler circuit.
13. Aftercooler heat rejection includes an aftercooler heat rejection factor for the site elevation and inlet air temperature specified. Aftercooler heat rejection values at part load are for reference only. Do not use part load data for heat exchanger sizing.
14. Cooling system sizing criteria are maximum circuit heat rejection for the site, with applied tolerances.

Constituent	Abbrev	Mole %	Norm		
Water Vapor	H2O	0.0115	0.0115		
Methane	CH4	96.7490	96.7380	Fuel Makeup:	Gas Analysis
Ethane	C2H6	2.4777	2.4774	Unit of Measure:	English
Propane	C3H8	0.1257	0.1257		
Isobutane	iso-C4H10	0.0200	0.0200	<u>Calculated Fuel Properties</u>	
Norbutane	nor-C4H10	0.0210	0.0210	Caterpillar Methane Number:	90.8
Isopentane	iso-C5H12	0.0204	0.0204		
Norpentane	nor-C5H12	0.0134	0.0134	Lower Heating Value (Btu/scf):	929
Hexane	C6H14	0.0346	0.0346	Higher Heating Value (Btu/scf):	1031
Heptane	C7H16	0.0000	0.0000	WOBBE Index (Btu/scf):	1227
Nitrogen	N2	0.2943	0.2943	THC: Free Inert Ratio:	184.82
Carbon Dioxide	CO2	0.2438	0.2438	Total % Inerts (% N2, CO2, He):	0.54%
Hydrogen Sulfide	H2S	0.0000	0.0000	RPC (%) (To 905 Btu/scf Fuel):	100%
Carbon Monoxide	CO	0.0000	0.0000		
Hydrogen	H2	0.0000	0.0000	Compressibility Factor:	0.998
Oxygen	O2	0.0000	0.0000	Stoich A/F Ratio (Vol/Vol):	9.70
Helium	HE	0.0000	0.0000	Stoich A/F Ratio (Mass/Mass):	16.94
Neopentane	neo-C5H12	0.0000	0.0000	Specific Gravity (Relative to Air):	0.573
Octane	C8H18	0.0000	0.0000	Specific Heat Constant (K):	1.311
Nonane	C9H20	0.0000	0.0000		
Ethylene	C2H4	0.0000	0.0000		
Propylene	C3H6	0.0000	0.0000		
TOTAL (Volume %)		100.0114	100.0001		

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.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2015 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

**OFFICE OF TRANSPORTATION
 AND AIR QUALITY**
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: Power Solutions International, Inc.
 (U.S. Manufacturer or Importer)

Certificate Number: FPSIB8.80NGP-020

Effective Date:
 12/09/2014

Expiration Date:
 12/31/2015


 Byron J. Bunker, Division Director
 Compliance Division

Issue Date:
 12/09/2014

Revision Date:
 N/A

Manufacturer: Power Solutions International, Inc.

Engine Family: FPSIB8.80NGP

Certification Type: Mobile and Stationary

Fuel: Natural Gas (CNG/LNG)
 LPG/Propane

Emission Standards: NOx (g/HP-hr) : 1

CO (g/HP-hr) : 2

VOC (g/HP-hr) : 0.7NMHC + NOx (g/kW-hr) : 2.7

CO (g/kW-hr) : 4.4

HC + NOx (g/kW-hr) : 2.7

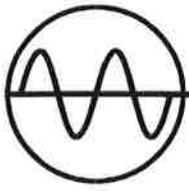
Emergency Use Only: N

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 1048, 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 1048, 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 1048, 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 1048, 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 1048, 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 1048, 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.



PRIME POWER SYSTEMS

By Gillette Generators, Inc.

PRIME MODEL
PR-800
60 HERTZ

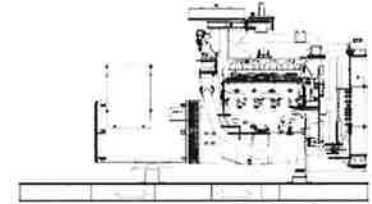
LIQUID COOLED NG ENGINE GENERATOR SET

KW POWER RATINGS RANGE FOR 60 HZ

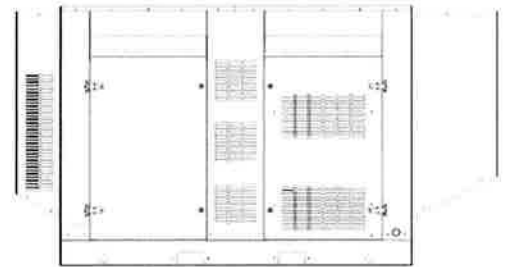
Model	PRIME 105°C RISE	
	HZ	NATURAL GAS
PR-800-60 HERTZ	60	80

STANDARD FEATURES

- All generator sets are USA prototype built and thoroughly tested. Production models are USA factory built and 100% load tested.
- Mastertrak telematics remote monitoring equipment with 2 year service subscription. Required for all prime powered generators.
- All generators are UL-1446 certified.
- Solid state, frequency compensated voltage regulation is standard on all gen-sets.
- Electronic engine governor incorporates a throttle body actuator, which allows precise isochronous frequency regulation.
- A brushless rotating field generator design with shunt wound excitation system and connectable at 1 phase or a broad range of 3 phase voltages.
- SENTINEL "ULTIMATE" digital controller allows programming to basic engine functions in the field. Controller has stop-manual-auto mode and engine shutdowns, signaled by full text LCD indicators.
- Heavy Duty 100%-125% rated Circuit Breaker is standard on all gen-sets.
- All generator set control systems components and accessories provide a 1-year limited warranty at time of initial start-up. Generators and engines are governed by separate warranties.
- "OPEN" Generator Sets: There is no enclosure, so gen-set must be placed within a weather protected area, un-inhabited by humans or animals, with proper ventilation. Muffler and flexible exhaust hose are not supplied, as installation requirements are not known. However, these two items are available as optional equipment.
- "LEVEL 2" Aluminum Housing: Full weather protection and superior sound attenuation for specific low noise applications. Critical grade muffler is standard.



"OPEN" GEN-SET



"LEVEL 2" HOUSED GEN-SET

GENERATOR RATINGS

GENERATOR MODEL	VOLTAGE		PH	HZ	NATURAL GAS FUEL		POWER LEAD CONNECTIONS
	L-N	L-L			105°C RISE PRIME RATING		
					KW/KVA	AMP	
PR-800-1-1	120	240	1	60	80/80	333	4 LEAD DEDICATED 1 PH.
PR-800-3-2	120	208	3	60	80/100	278	12 LEAD LOW WYE
PR-800-3-3	120	240	3	60	80/100	241	12 LEAD HIGH DELTA
PR-800-3-4	277	480	3	60	80/100	120	12 LEAD HIGH WYE
PR-800-3-5	127	220	3	60	80/100	263	12 LEAD LOW WYE
PR-800-3-16	346	600	3	60	80/100	96	4 LEAD DEDICATED 3 PH.

RATINGS: All single phase gen-sets are dedicated 4 lead windings, rated at unity (1.0) power factor. All three phase gen-sets are 12 lead windings, rated at (.8) power factor. 105°C "PRIME RATINGS" are strictly for gen-sets provide the prime source of electric power, where normal utility power is unavailable or unreliable. A 10% overload is allowed for a total of 1 hour, within every 12 hours of operation of PRIME RATED systems. All gen-set power ratings are based on temperature rise measured by resistance method as defined by MIL-STD 705C and IEEE STD 115, METHOD 6.4.4. All generators have class H (180°C) insulation system on both rotor and stator windings. All factory tests and KW/KVA charts shown above are based on 105°C (prime) R/R winding temperature, within a maximum 40°C ambient condition. Specifications & ratings are subject to change without prior notice.

APPLICATION AND ENGINEERING DATA FOR MODEL PR-800-60 HZ

GENERATOR SPECIFICATIONS

Manufacturer Marathon Electric Generators
 Model & Type 363CSL1617, 4 Pole, 4 Lead, Single Phase
 362CSL1606, 4 Pole, 12 Lead, re-connectable, Three Phase
 362PSL1635, 4 Pole, 4 Lead, Three Phase
 Exciter Brushless, shunt excited
 Voltage Regulator Solid State, HZ/Volts
 Voltage Regulation ½%, No load to full load
 Frequency Field convertible, 60 HZ to 50 HZ
 Frequency Regulation ½% (½ cycle, no load to full load)
 Unbalanced Load Capability 100% of prime amps
 Total Stator and Load Insulation Class H, 180°C
 Temperature Rise 105°C R/R, prime rating @ 40°C amb.
 1 Ø Motor Starting @ 30% Voltage Dip (240V) 210 kVA
 3 Ø Motor Starting @ 30% Voltage Dip (208-240V) 260 kVA
 3 Ø Motor Starting @ 30% Voltage Dip (480V) 340 kVA
 Bearing 1, Pre-lubed and sealed
 Coupling Direct flexible disc
 Total Harmonic Distortion Max 3½% (MIL-STD705B)
 Telephone Interference Factor Max 50 (NEMA MG1-22)
 Deviation Factor Max 5% (MIL-STD 405B)
 Ltd. Warranty Period 24 Months from date of start-up or
 1000 hours use, first to occur.

GENERATOR FEATURES

- World Renown Marathon Electric Generator having UL-1446 certification.
- Full generator protection with SENTINEL "ULTIMATE" controller, having UL-508 certification.
- Automatic voltage regulator with over-excitation, under-frequency compensation, under-speed protection, and EMI filtering. Entire solid-state board is encapsulated for moisture protection.
- Generator power ratings are based on temperature rise, measured by resistance method, as defined in MIL-STD 705C and IEEE STD 115, Method 6.4.4.
- Power ratings will not exceed temperature rise limitation for class H insulation as per NEMA MG1-22.40.
- Insulation resistance to ground, exceeds 1.5 meg-ohm.
- Stator receives 2000 V. hi-potential test on main windings, and rotor windings receive a 1500 V. hi-potential test, as per MIL-STD 705B.
- Full amortisseur windings with UL-1446 certification.
- Complete engine-generator torsional acceptance, confirmed during initial prototype testing.
- Full load testing on all engine-generator sets, before shipping.
- Self ventilating and drip-proof & revolving field design

ENGINE SPECIFICATIONS AND APPLICATIONS DATA

ENGINE

Manufacturer Power Solutions Inc. (PSI)
 Model and Type Ind, Power Train, Vortec, 8.8L, 4 cycle
 Aspiration Naturally
 Cylinder Arrangement 8 Cylinders, V-8
 Displacement Cu. In. (Liters) 537 (8.8)
 Bore & Stroke In. (Cm.) 4.35 x 4.50 (11.5 x 11.4)
 Compression Ratio 10.1:1
 Main Bearings & Style 5, Bi-Metal Steel and Aluminum
 Cylinder Head Cast Iron
 Pistons Cast Aluminum
 Crankshaft Nodular Iron
 Exhaust Valve Inconel, A193
 Governor Electronic
 Frequency Reg. (no load-full load) Isochronous
 Frequency Reg. (steady state) ± 1/4%
 Air Cleaner Dry, Replaceable Cartridge
 Engine Speed 1800
 Piston Speed, ft/min (m./min) 1311 (399)
 Max Power, bhp (kwm) Prime/NG 126 (94)
 Ltd. Warranty Period 12 Months or 2000 hrs., first to occur

FUEL SYSTEM

Type NAT. GAS, Vapor Withdrawal
 Fuel Pressure (kpa), in. H₂O (1.74), 7"
 Secondary Fuel Regulator NG or LPG Vapor System
 Auto Fuel Lock-Off Solenoid Standard on all sets
 Fuel Supply Inlet Line 1¼" NPTF

FUEL CONSUMPTION

NAT. GAS: FT ³ /HR (M ³ /HR)	PRIME
100% LOAD	1330 (37.6)
75% LOAD	1030 (29.1)
50% LOAD	730 (20.6)
NG = 1000 BTU X FT ³ /HR = Total BTU/HR	

OIL SYSTEM

Type Full Pressure
 Oil Pan Capacity qt. (L) 8.5 (8.0)
 Oil Pan Cap. W/ filter qt. (L) 9.0 (8.5)
 Oil Filter 1, Replaceable Spin-On

ELECTRICAL SYSTEM

Ignition System Electronic
 Eng. Alternator and Starter:
 Ground Negative
 Volts, DC 12
 Recommended Battery to -18°C (0°F): ... 12 VDC, Size BCI# 27,
 Max Dimensions: 12" lg X 6 3/4" wi X 9" hi, with standard
 round posts. Min output at 700 CCA. Battery tray (max. dim. at
 12"lg x 7"wi), hold down straps, battery cables, and battery
 charger, is furnished. Installation of (1) starting battery is
 required, with possible higher AMP/HR rating, as described
 above, if normal environment averages -13°F (-25°C) or cooler.

APPLICATION AND ENGINEERING DATA FOR MODEL PR-800-60 HZ

COOLING SYSTEM

Type of System	Pressurized, closed recovery
Coolant Pump	Pre-lubricated, self-sealing
Cooling Fan Type (no. of blades)	Pusher (12)
Fan Diameter inches (cm)	23.6" (599)
Ambient Capacity of Radiator °F (°C).....	125 (51.6)
Engine Jacket Coolant Capacity Gal (L).....	3.6 (13.7)
Radiator Coolant Capacity Gal. (L).....	5.6 (25.5)
Maximum Restriction of Cooling Air Intake and discharge side of radiator in. H ₂ O (kpa).....	0.5 (.125)
Water Pump Capacity gpm (L/min).....	33 (125)
Heat Reject Coolant: Btu/min (kw)	7320 (129)
Low Radiator Coolant Level Shutdown.....	Standard
Note: Coolant temp. shut-down switch setting at 212°F (100°C) with 50/50 (water/antifreeze) mix.	

AIR REQUIREMENTS

Combustion Air, cfm (m ³ /min)	314 (8.9)
Radiator Air Flow cfm (m ³ /min).....	12,000 (340)
Heat Rejected to Ambient:	
Engine: kw (btu/min).....	24.9 (1476)
Alternator: kw (btu/min).....	16 (912)

EXHAUST SYSTEM

Exhaust Outlet Size.....	3.5"
Max. Back Pressure, in. hg (KPA).....	3.0 (10.2)
Exhaust Flow, at rated kw: cfm (m ³ /min)	1063 (30.1)
Exhaust Temp., at rated kw: °F (°C)	1300 (704)
Engines are EPA certified for LPG and Natural Gas.	

SOUND LEVELS MEASURED IN dB(A)

	<u>Open Set</u>	<u>Level 2 Encl.</u>
Level 1, Residential Silencer.....	91	N/A
Level 2, Critical Silencer	88	81
Level 3, Hospital Silencer	86	80

Note: Open sets (no enclosure) has (3) optional silencer system choices due to unknown job-site applications. Level 2 enclosure has installed critical silencer with upgrade to hospital silencer. Sound tests are averaged from several test points and taken at 23 ft. (7 m) from source of noise at normal operation.

DERATE GENERATOR FOR ALTITUDE

3% per 1000 ft.(305m) above 3000 ft. (914m) from sea level .

DERATE GENERATOR FOR TEMPERATURE

2% per 10°F(5.6°C) above 85°F (29.4°C)

DIMENSIONS AND WEIGHTS

	<u>Open Set</u>	<u>Level 2 Enclosure</u>
Length in (cm).....	98 (248).....	134 (339)
Width in (cm).....	48 (122).....	48 (122)
Height in (cm).....	64 (163).....	72.5 (183)
1 Ø Net Weight lbs (kg).....	2684 (1217).....	3484 (1580)
1 Ø Ship Weight lbs (kg)	2874 (1303).....	3734 (1694)
3 Ø Net Weight lbs (kg).....	2624 (1190).....	3444 (1562)
3 Ø Ship Weight lbs (kg)	2814 (1276).....	3694 (1676)

SENTINEL ULTIMATE DIGITAL MICROPROCESSOR CONTROLLER



SENTINEL ULTIMATE

The "Ultimate" controller is an auto start mains (utility) failure module for single gen-set applications. This controller includes a backlit LCD display which continuously displays the status of the engine and generator at all times.

The "Ultimate" controller will also monitor speed, frequency, voltage, current, oil pressure, coolant temp., and fuel levels. These modules have been designed to display warning and shut down status. It also includes: (11) configurable inputs • (8) configurable outputs • voltage monitoring • mains (utility) failure detection • (250) event logs • configurable timers • automatic shutdown or warning during fault detection • remote start (on load) • engine preheat • advanced metering capability • hour meter • text LCD displays • protected solid state outputs • test buttons for: stop/reset • manual mode • auto mode • lamp test • start button • power monitoring (kWh, kVAr, kVAh, kVArh)

This controller includes the "Ultimate" in expansion features including RS232, RS484 (using MODBUS-RTU/TCP), direct USB connection with PC, expansion optioned using DSEnet for remote annunciation and remote relay interfacing for a distance of up to 3300FT. The controller software is freely downloadable from the internet and allows monitoring with direct USB cable, LAN, or by internet via the built in web interface.



Further expansion is available by adding the optional "WebNet" gateway interface module. This device will allow comprehensive monitoring of the generator via the cloud including identification, location, and status. Some advantages of this module include: reduced site visits and maintenance costs • remote fuel management • fault analysis • asset tracking • automatic system alerts • maximized system up-time.

STANDARD AND OPTIONAL FEATURES FOR MODEL PR-800-60 HZ

STANDARD FEATURES

CONTROL PANEL:

- SENTINEL "ULTIMATE" digital microprocessor with logic allows programming in the field. Controller has:
- STOP-MANUAL-AUTO modes and automatic engine shutdowns, signaled by full text LCD indicators:
 - Low oil pressure
 - High engine temp
 - Low Radiator Level
 - Three auxiliary alarms
 - Battery fail alarm
 - Engine fail to start
 - Engine over speed
 - Engine under speed
 - Over & under voltage
- Also included is tamper-proof engine hour meter

ENGINE:

- Full flow oil filter • Air filter • Oil pump • Solenoid type starter motor • Hi-temp radiator • Jacket water pump • Thermostat • Pusher fan and guard • Exhaust manifold • Residential Silencer • 12 VDC battery charging alternator • Flexible exhaust connector • "Isochronous" duty, electronic governor • Secondary dry fuel regulator • Dry fuel lock-off solenoid • Vibration isolators • Closed coolant recovery system with 50/50 water to anti-freeze mixture

AC GENERATOR SYSTEM:

- AC generator • Shunt excited • Brushless design • Circuit Breaker installed and wired to gen-set • Direct connection to engine with flex disc • Class H, 180°C insulation • Self ventilated • Drip proof construction • UL Certified

VOLTAGE REGULATOR:

- ½% Voltage regulation • EMI filter • Under-speed protection • Over-excitation protection • total encapsulation

DC ELECTRICAL SYSTEM:

- Battery tray • Battery cables • Battery hold down straps • 2-stage battery float charger with maintaining & recharging automatic charge stages

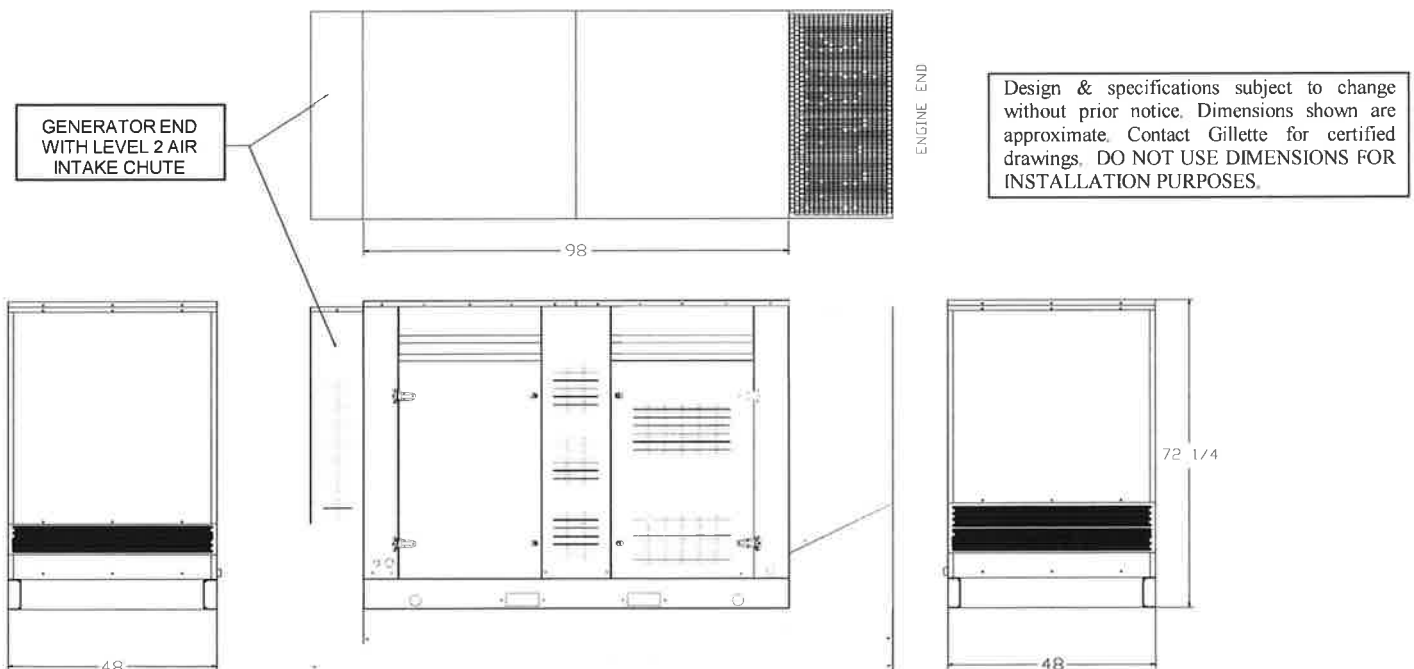
WEATHER/SOUND PROOF ALUMINUM HOUSING CORROSION RESISTANT PROTECTION CONSISTING OF:

- 9 Heated And Agitated Wash Stages.
- Zinc Phosphate Etching-coating Stage
- Final Baked On Enamel Powder Coat
- 18/8 Stainless Steel Hardware

ACCESSORY ITEMS

- D Engine Coolant Heater with automatic 80°F on, 100°F off, thermostat
- D Starting Battery Heater Blanket with automatic 60°F on, 80°F off, thermostat
- D Battery Charger Upgrade, float type, 12 VDC at max. charge, with ammeter on charger.
- D External Permanent Magnet Generator (PMG) for increased induction motor starting capacity on 1Ø or 3Ø sets, & short circuit protection.
- D Exhaust Silencer Hospital Grade.

- D All brushed type 304 stainless steel weather and sound deadening housing for coastal areas.
- D DSE WebNet Gateway expansion module will allow communications with a host server via Ethernet and the DSE cloud connection for mapping static locations, real time instrumentation, control event log tables, and automatic system alerts via email.
- D Remote Annunciator for up to (10) reporting functions. An additional relay expansion module, plus a second Annunciator adds another (10) reporting functions.



NALCO Champion

An Ecolab Company

10/13/15

Momentum

Cole Caudill
Project Manager
1099 Main Ave. Suite 210
Durango, CO 81301

Recommendation for Injection Equipment

As per your request, the following is a recommendation for Injection Equipment for the Statler pad. The Statler pad is quoted at 10 gallons per day against 1100psi.

Equipment

Nalco Champion has found in the Northeast that the Tank Vault tank and containment best suit our customer needs. This tank consists of a 335 gallon poly tank with poly containment and cover. It is durable and easy access that utilizes quick connect pins. An added feature is that it completely keeps the chemical and pump under cover and out of the weather.

Nalco Champion has worked with several pumps in the Marcellus and Utica. Nalco Champion has found that the Timberline is one of the most efficient and dependable pumps for the solar application. This system comes with 100 feet of stainless for injection as well as an atomized injection system.

The Below pricing includes the hydrate inhibitor, all hardware, and installation of each tank system. This tank and pump has the capability of pumping up to 10 gallons per day against 1100psi.



NALCO Champion

An Ecolab Company

Solar Pricing per set with chemical

1. 335/gal Black Tank Assembly - containment, tank, solar pole, ground mount panel,
335/gal Tank Cover
1 Timberline Model 4001 single head solar powered chemical injection pump, 1 battery in
a box, 1 – 140W Panel
1 Retractable Injector Atomizer K-1000-1 with spring tip
100 feet of 3/8 inch stainless
All fittings to connect tank to the injection point
330 gallons HI-18FB

Nalco Champion will collect, deliver, and install all equipment

Total Equipment Cost \$7,890.38

Total Chemical Cost \$3,488.10

Total Cost per setup \$11,378.48

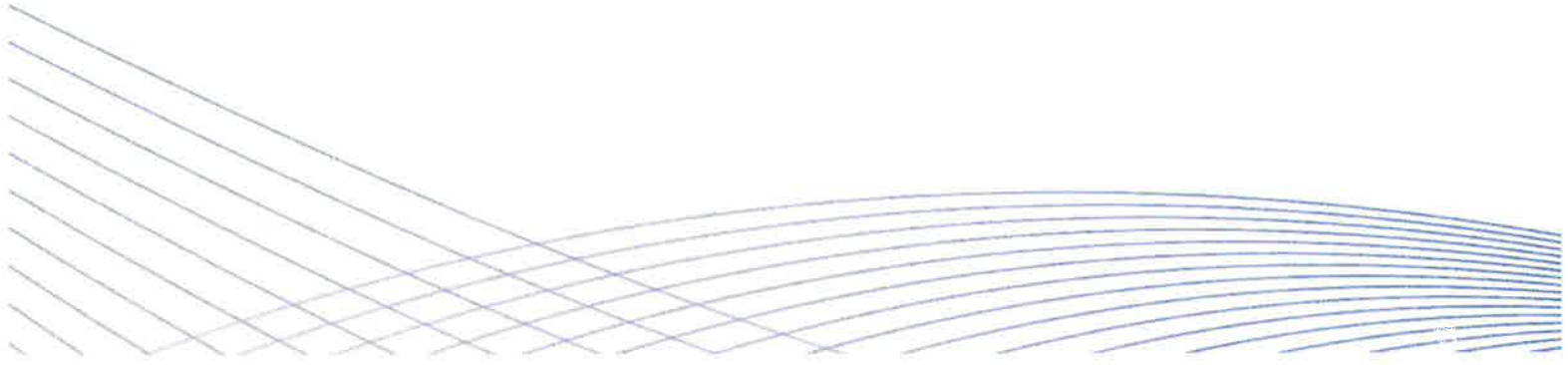
Please feel free to contact me at 304- 282-4678 or Bryan.Hooton@champ-tech.com to order all products or if you require more information.

Sincerely,

Bryan Hooton
Northeast Salesman
NALCO Champion | An Ecolab Company
193 Weatherford Blvd
Buckhannon WV 26201

NALCO Champion

An Ecolab Company



- **Attachment M: Air Pollution Control Device Sheet(s)**

Attachment M
Air Pollution Control Device Sheet
(OTHER COLLECTORS)

Control Device ID No. (must match Emission Units Table): C1 - C3

Equipment Information

1. Manufacturer: EMIT Technologies Model No. ELS-4200-1820F-4CEO-361	2. Control Device Name: C1-C3 (Oxidation Catalysts) Type: Catalytic Oxidation 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: CO – 94% (Estimated), VOC (NMNEHC) – 73% (Estimated) Formaldehyde – 77% (Estimated)	
8. Attached efficiency curve and/or other efficiency information.	
9. Design inlet volume: 12213 SCFM	10. Capacity: N/A
11. Indicate the liquid flow rate and describe equipment provided to measure pressure drop and flow rate, if any. N/A	
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 or disposal. N/A	

Gas Stream Characteristics

14. Are halogenated organics present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Are particulates present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Are metals present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
15. Inlet Emission stream parameters:	Maximum	Typical	
Pressure (mmHg):			
Heat Content (BTU/scf):			
Oxygen Content (%):			
Moisture Content (%):			
Relative Humidity (%):			

16. Type of pollutant(s) controlled: <input type="checkbox"/> SO _x <input type="checkbox"/> Odor <input type="checkbox"/> Particulate (type): <input checked="" type="checkbox"/> Other				
17. Inlet gas velocity: ft/sec	18. Pollutant specific gravity:			
19. Gas flow into the collector: 12213 ACF @ 847 °F and PSIA	20. Gas stream temperature: Inlet: 847 °F Outlet: Varies °F			
21. Gas flow rate: Design Maximum: ACFM Average Expected: 12213 ACFM	22. Particulate Grain Loading in grains/scf: Inlet: Outlet:			
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 CO	10.72		0.63	94
B VOC (NMNEHC)	2.47		0.66	73
C Formaldehyde	1.02		0.23	77
D				
E				
24. Dimensions of stack: Height 34 ft. Diameter 1.67 ft.				
25. Supply a curve showing proposed collection efficiency versus gas volume from 25 to 130 percent of design rating of collector.				

Particulate Distribution

26. Complete the table:	Particle Size Distribution at Inlet to Collector	Fraction Efficiency of Collector
Particulate Size Range (microns)	Weight % for Size Range	Weight % for Size Range
0 – 2		
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): None

28. Describe the collection material disposal system:

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

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:

Operate and maintain catalyst element according to the recommendations of the manufacturer

RECORDKEEPING:

Keep records of all catalytic reduction device maintenance

REPORTING:

None

TESTING:

None

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.

CO – 94% (Estimated), VOC (NMNEHC) – 73% (Estimated) Formaldehyde – 77% (Estimated)

32. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

CO – 94% (Estimated), VOC (NMNEHC) – 73% (Estimated) Formaldehyde – 77% (Estimated)

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

See attached manufacturer's specification sheet.



2585 Heartland Or.
 Sheridan, WY 82801
 Office: I Direct: +1 (307) 675.5081
 riamas@emittechnologies.com

Prepared For:
 Doug Kern
 EXTERRAN

QUOTE: QU0-16826-Y8N1
 Expires: October 29, 2015

INFORMATION PROVIDED BY CATERPILLAR

Engine: G3606
 Horsepower: 1775
 RPM: 1000
 Compression Ratio: 9.0
 Exhaust Flow Rate: 12213 CFM
 Exhaust Temperature: 847 °F
 Reference: OM8605-06-001
 Fuel: Natural Gas
 Annual Operating Hours: 8760

Uncontrolled Emissions

	g/bhp-hr	Lb/Hr	Tons/Year
NOx:	0.50	1.96	8.57
CO:	2.74	10.72	46.96
THC:	6.30	24.65	107.98
NMHC:	0.94	3.68	16.11
NMNEHC:	0.63	2.47	10.80
HCHO:	0.26	1.02	4.46
O2:	12.80%		

POST CATALYST EMISSIONS

g/bhp-hr
 Unaffected by Oxidation Catalyst
 NOx: <0.16
 CO: <0.17
 VOC: <0.06
 HCHO: <0.06

CONTROL EQUIPMENT

Catalyst Housing

Model: ELS-4200-1820F-4CE0-361
 Manufacturer: EMIT Technologies, Inc
 Element Size: Rectangle 36" x 15" x 3.5"
 Housing Type: 4 Element Capacity
 Catalyst Installation: Accessible Housing
 Construction: 10 gauge Carbon Steel
 Sample Ports: 9 (0.5" NPN)
 Inlet Connections: 18" Flat Face Flange
 Outlet Connections: 20" Flat Face Range
 Configuration: End In / Side Out

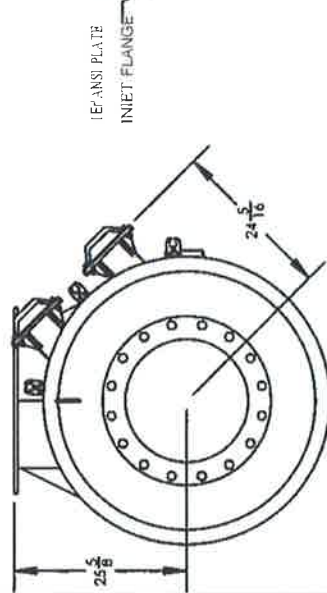
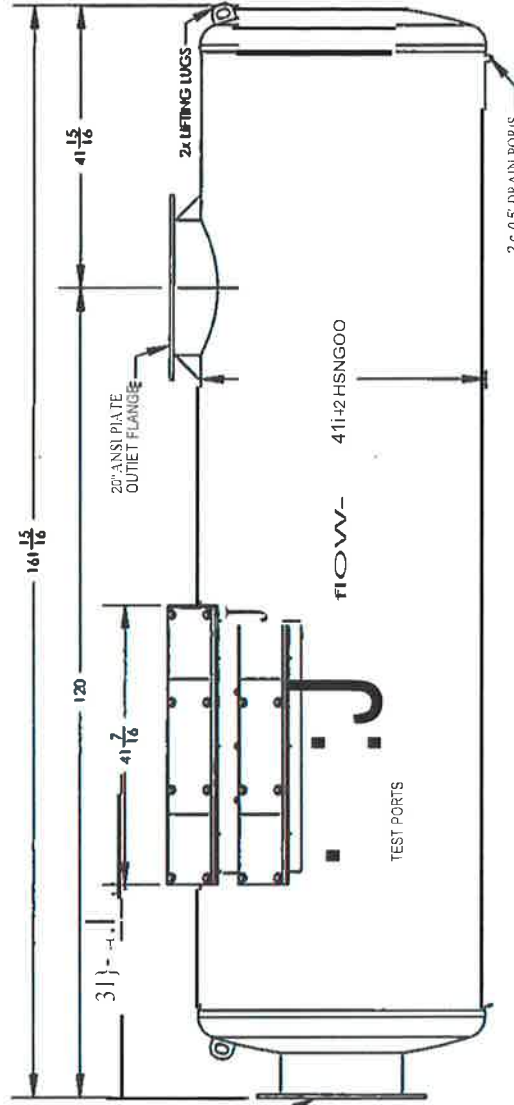
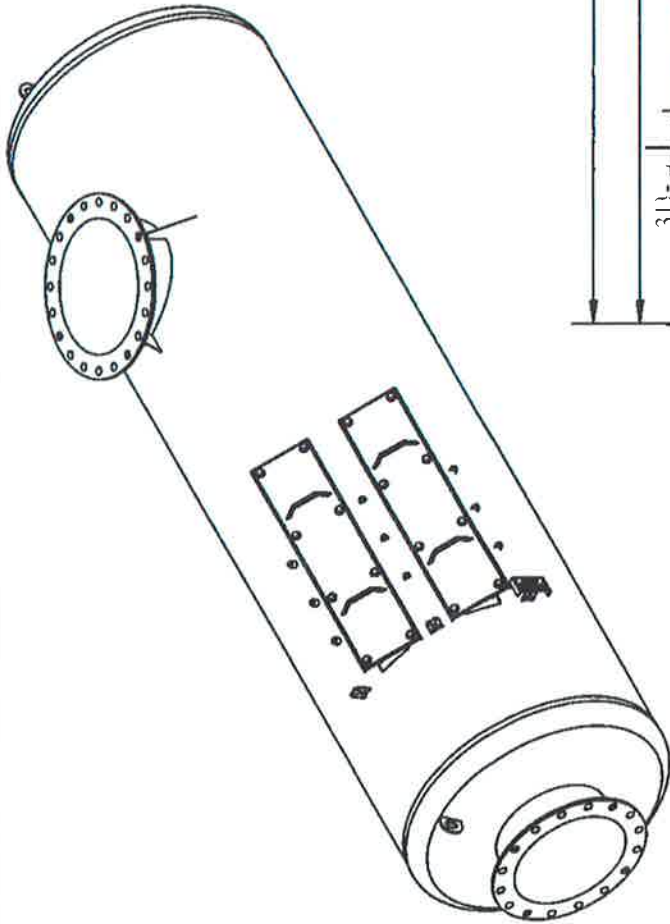
Silencer

Silencer Grade: I
 Insertion Loss:
 Estimated Lead Time: 2 Weeks to Ship

Catalyst Element

Model: **RT-3615-Z**
 Catalyst Type: Oxidation, Standard Precious Group Metals
 Substrate Type: BRAZED
 Manufacturer: EMIT Technologies, Inc
 Element Quantity: 2
 Element Size: Rectangle 36" x 15" x 3.5"
 Estimated Lead Time: 7-10 Business Days to Ship





EMIT
 TECHNOLOGIES
 P.O. Box 6785
 Sheridan, WY 82801
 Ph. 307-673-0883
 Fax 307-675-5977

DESCRIPTION: ELS-4200-1820F-4CED-361

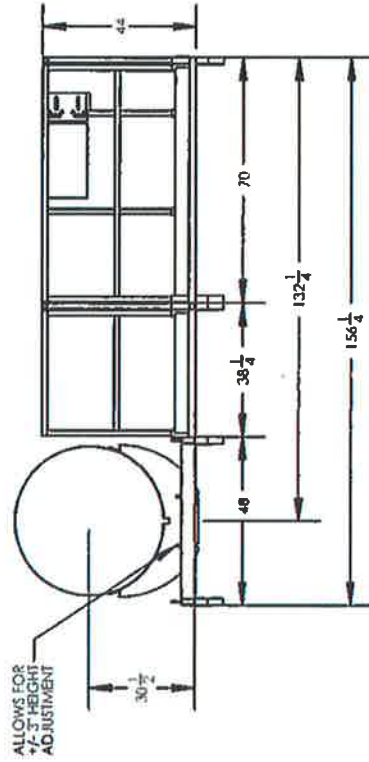
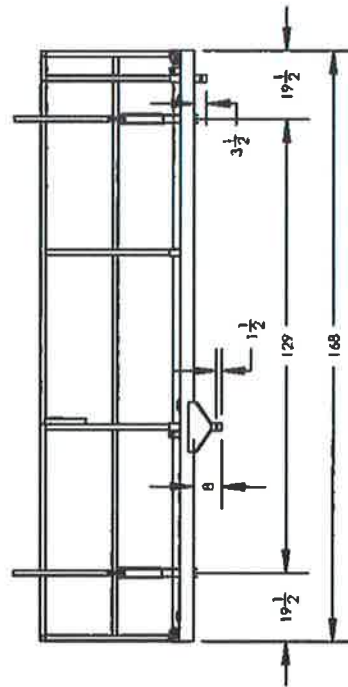
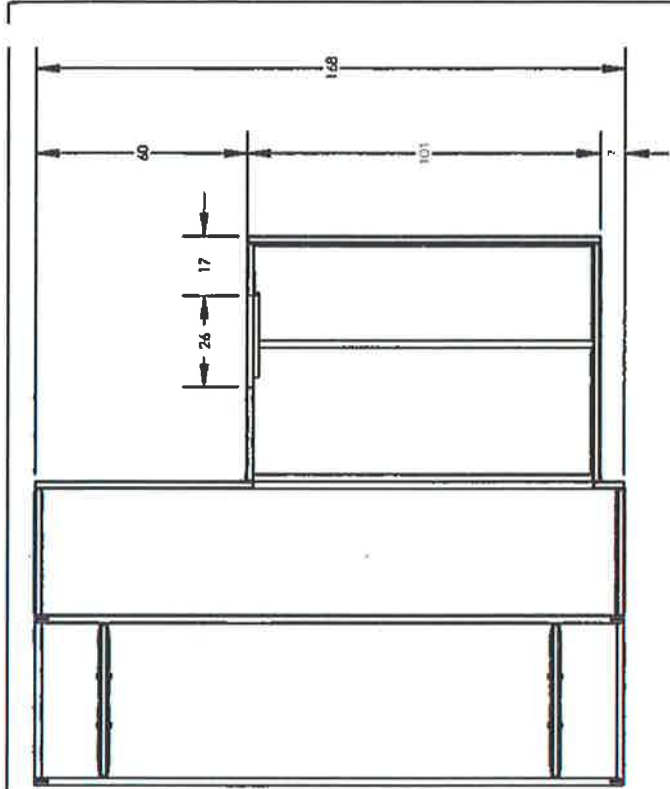
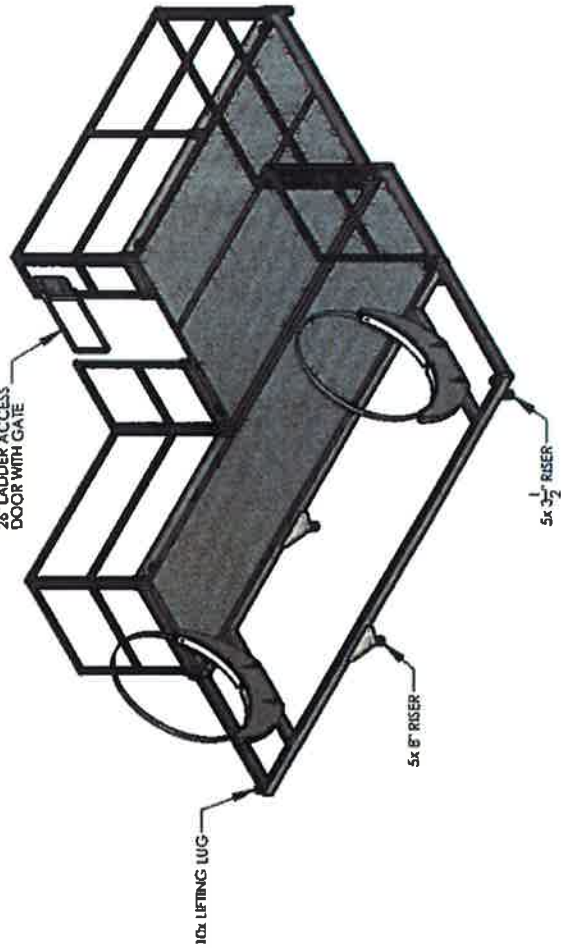
SCALE: 1/25 WEIGHT: 1650 lbs.

DO NOT SCALE DRAWING	CUSTOMER	ENGINE	COOLER	LOCATION	SITE NAME	UNIT NUMBER
DIMENSIONS ARE IN INCHES TWO DECIMAL THREE DECIMAL	ENGINE	COOLER	LOCATION	SITE NAME	UNIT NUMBER	DATE
MATERIAL CARBON STEEL	ENGINE	COOLER	LOCATION	SITE NAME	UNIT NUMBER	DATE
DRAWN BY TJS	ENGINE	COOLER	LOCATION	SITE NAME	UNIT NUMBER	DATE
CHECKED BY	ENGINE	COOLER	LOCATION	SITE NAME	UNIT NUMBER	DATE
SIZE ITEM NO. A	ENGINE	COOLER	LOCATION	SITE NAME	UNIT NUMBER	DATE
REV. BA	ENGINE	COOLER	LOCATION	SITE NAME	UNIT NUMBER	DATE
SHEET 1 OF 1	ENGINE	COOLER	LOCATION	SITE NAME	UNIT NUMBER	DATE

NOTES:
 TJS JI T CRITICAL
 LANGES.

THIS DRAWING AND SPECIFICATIONS ARE THE PROPERTY OF EMIT TECHNOLOGIES AND SHALL NOT BE REPRODUCED, DISTRIBUTED, DISCLOSED OR USED FOR MANUFACTURE OR SALE WITHOUT THE PERMISSION OF EMIT TECHNOLOGIES.

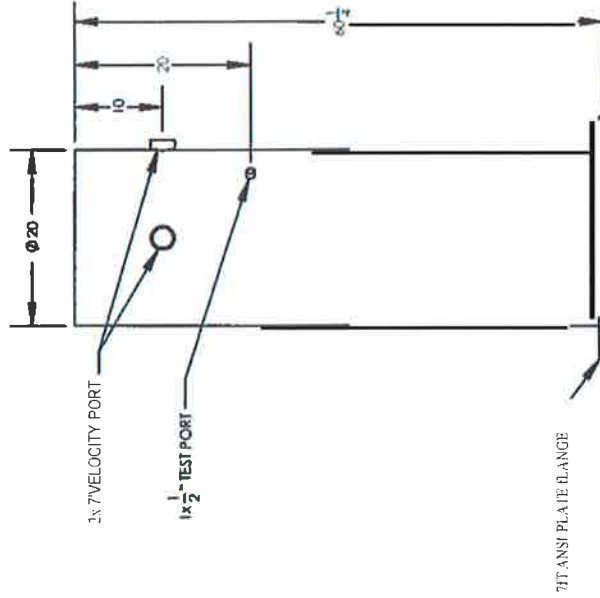
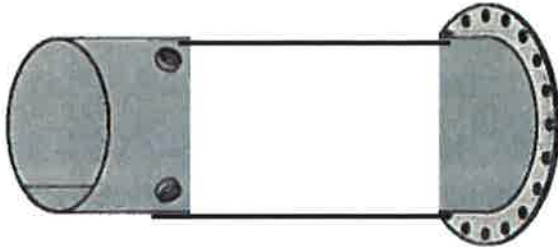
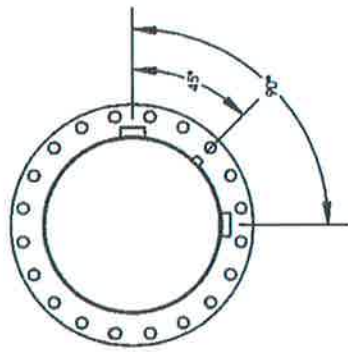
26" LADDER ACCESS DOOR WITH GATE



CASE NUMBER	EJN	CUSTOMER	DO NOT SCALE DRAWING			
			DIMENSIONS ARE IN INCHES	TWO DECIMAL ±		
PROJECT REVISION	1	ENGINE	THREE DECIMAL ±			
NOTES	<p>PROPRIETARY AND CONFIDENTIAL</p> <p>THIS DRAWING AND SPECIFICATIONS ARE THE PROPERTY OF EMT TECHNOLOGIES AND SHALL NOT BE REPRODUCED, DISTRIBUTED, DISCLOSED OR USED FOR MANUFACTURE OR SALE WITHOUT THE PERMISSION OF EMT TECHNOLOGIES.</p>					
	<p>MATERIAL: CARBON STEEL</p>					
	<p>DRAWN BY: RPI</p>					
	<p>CHECKED BY: H-PF-H-003</p>					
	<p>DATE: 8/30/2015</p>					
<p>DESCRIPTION: air W/82801</p> <p>DESIGN: TEL: 100-11</p> <p>CITY: H-PF-H-003</p>			<p>REV. BA</p>	<p>SCALE: 1:50</p>	<p>WEIGHT: 1924lbs</p>	<p>SHEET 1 OF 1</p>



h: 307-673-0883
 sk: 307-673-9977



<p>EMIT TECHNOLOGIES P.O. Box 6785 Sheridan, WY 82801 Ph: 307-672-0883 Fax: 307-675-5977</p>		<p>DO NOT SCALE DRAWING DIMENSIONS ARE IN INCHES THO DECIMAL 2 THREE DECIMAL 2</p>
<p>CASE NUMBER EIN</p>	<p>CUSTOMER ENGINE COOLER LOCATION SITE NAME UNIT NUMBER</p>	<p>MATERIAL CARBON STEEL DRAWN BY MIWJ CHECKED BY DATE</p>
<p>NOTES PROPRIETARY AND CONFIDENTIAL THIS DRAWING AND SPECIFICATIONS ARE THE PROPERTY OF EMIT TECHNOLOGIES AND SHALL NOT BE REPRODUCED, DISTRIBUTED, DISCLOSED OR USED FOR MANUFACTURE OR SALE WITHOUT THE PERMISSION OF EMIT TECHNOLOGIES.</p>		<p>DESCRIPTION TPA-200-X-1046-0600-0500-0100-R-S-XX-CS</p>
<p>SCALE: 1:20 WEIGHT: 146.48 lbs.</p>		<p>SIZE ITEM NO. A 68820-2000</p>
<p>REV. BA</p>		<p>SHEET 1 OF 1</p>

- **Attachment N: Supporting Emission Calculations**

Attachment N - Table 2 - VOC Fugitive Emissions - Emission Unit

Average inlet product composition VOC weight fraction: 0.010

Component	Service	Emission Factor ⁽¹⁾ (lb/hr-unit)	Number of Components ⁽²⁾	Uncontrolled Emissions ^{(3) (4)}	
				lbs/hr	tpy
Valves	Gas/Vapor	0.00992	70	0.007	0.030
	Light Oil/Liquid	0.00551	10	0.055	0.241
	Heavy Oil	0.0000185	0	0.000	0.000
Pumps	Light Oil/Liquid	0.02866	1	0.010	0.042
	Heavy Oil	0.00113	0	0.000	0.000
Flanges	Gas/Vapor	0.00086	40	0.000	0.002
	Light Oil/Liquid	0.000243	5	0.000	0.000
	Heavy Oil	0.00000086	0	0.000	0.000
Connectors	Gas/Vapor	0.00044	20	0.000	0.000
	Light Oil/Liquids	0.0004630	5	0.002	0.010
	Heavy Oil	0.00001653	0	0.000	0.000
Other/Compressors	Gas/Vapor	0.0194	3	0.001	0.003
Relief Valves	Gas/Vapor	0.0194	12	0.002	0.010
Total VOC				0.077	0.339
Total HAPS				0.067	0.293

Notes:

Average VOC weight fraction estimated based on Neel well natural gas analysis (approx 1030 BTU/SCF).

* Only pump in VOC service is methanol transfer pump - assume 100% VOC for estimate and 4 months of winter operating time.

Notes:

(1) Emission factors are from Table 2-4 of the USEPA guidance EPA-453/R-95-017 dated November 1995 and 40 CFR 60 Subpart OOOO requirements.

(2) Component counts based on assumption that all 3 compressors are in operation and includes methanol in light liquids.

(3) Annual emission calculations based on 8760 hrs/year.

(4) No HAPS in gas analysis - only HAP is methanol.

Attachment N - Table 3 - GHG Fugitive Emissions

Average inlet gas composition Methane weight fraction: 0.946

Component	Service	Emission Factor ⁽¹⁾ (lb/hr-unit)	Number of Components ⁽²⁾	LDAR Program	Uncontrolled Emissions ⁽³⁾	
					lbs/hr	tpy
Valves	Gas/Vapor	0.00992	70	N/A	0.657	2.877
	Light Oil	0.00551	10	N/A	0.052	0.228
	Heavy Oil	0.0000185	0	N/A	0.000	0.000
Pumps	Light Oil	0.02866	1	N/A	0.000	0.000
	Heavy Oil	0.00113	0	N/A	0.000	0.000
Flanges	Gas/Vapor	0.00086	40	N/A	0.033	0.143
	Light Oil	0.000243	5	N/A	0.000	0.000
	Heavy Oil	0.00000086	0	N/A	0.000	0.000
Connectors	Gas/Vapor	0.00044	20	N/A	0.008	0.037
	Light Oil	0.0004630	5	N/A	0.000	0.000
	Heavy Oil	0.00001653	0	N/A	0.000	0.000
Other/Compressors	Gas/Vapor	0.0194	3	N/A	0.055	0.241
Relief Valves	Gas/Vapor	0.0194	12	N/A	0.220	0.965
					1.025	4.490

Notes:

Methane weight fraction based on Neel Well gas analysis. Methanol included as light liquids with no methane content.

Pollutant	Total Potential Emission Rate (lbs/hr)	Total Potential Emission Rate (tons/year)	CO ₂ equivalents	
			25.630	112.259
Methane	1.025	4.490		
			Total CO₂e	112 tpy

Greenhouse gas emission factors are based on 40 CFR Part 98 (Mandatory Greenhouse Gas Reporting) Subpart C (General Stationary Fuel Combustion Sources) Tables C-1 and C-2 (Updated November 2013)

CO ₂ equivalents	
GWP (Methane) =	25

Global Warming Potential (GWP), Table A-1, 40 CFR Part 98, Subpart A

Notes:

(1) Emission factors are from Table 2-4 of the USEPA guidance EPA-453/R-95-017 dated November 1995 and 40 CFR 60 Subpart OOOO requirements.

(2) Component counts based on assumption that all 3 compressors are in operation and includes methanol injection.

(3) Annual emission calculations based on 8760 hrs/year.

Attachment N - Table 4 - GHG Combustion Emissions

Component	HP	Pollutant	Emission Factor ⁽¹⁾	Units	Uncontrolled Emissions ⁽²⁾		CO2(eq)	
					lbs/hr	tpy	CO2(eq) lb/hr	CO2(eq) tpy
Compressor Engine CE-1	1775	CH4	0.001	Kg/MMBtu	0.03	0.13	0.74	3.25
		CO2	441	g/hp-hr	1724.17	7551.88	1724.17	7551.88
		N2O	0.0001	Kg/MMBtu	0.00	0.01	0.89	3.88
Compressor Engine CE-2	1775	CH4	0.001	Kg/MMBtu	0.03	0.13	0.74	3.25
		CO2	441	g/hp-hr	1724.17	7551.88	1724.17	7551.88
		N2O	0.0001	Kg/MMBtu	0.00	0.01	0.89	3.88
Compressor Engine CE-3	1775	CH4	0.001	Kg/MMBtu	0.03	0.13	0.74	3.25
		CO2	441	g/hp-hr	1724.17	7551.88	1724.17	7551.88
		N2O	0.0001	Kg/MMBtu	0.00	0.01	0.89	3.88
Generator Engine GE-1	126	CH4	0.001	Kg/MMBtu	0.00	0.01	0.07	0.32
		CO2	441	g/hp-hr	122.39	536.08	122.39	536.08
		N2O	0.0001	Kg/MMBtu	0.00	0.00	0.09	0.38
							5299.96	23213.82

GE-3606 Engine CO2 (eq) Emissions each = **1725.80** **7559.01**
 Genset Engine CO2 (eq) Emissions each = **122.55** **536.78**

Notes:
 Greenhouse gas emission factors are based on 40 CFR Part 98 (Mandatory Greenhouse Gas Reporting) Subpart C (General Stationary Fuel Combustion Sources) Tables C-1 and C-2 (Updated November 2013)

CO2 equivalents	
GWP (Methane) =	25
GWP (N2O) =	298

Global Warming Potential (GWP), Table A-1, 40 CFR Part 98, Subpart A

Notes:

- (1) Emission factors for CO2 are from CAT engine data sheet for G3606 engines and also used for Genset engine. Emission Factor from 40 CFR 98 Table C-2 of 0.001 kg/MMBtu for CH4 and 0.0001 kg/MMBtu for N2O from natural gas combustion. HHV = 7610 Btu/bhp-hr used for calc. on CAT 3606 engine. For Genset fuel usage factor = 1330 ft3/hr = 1.33 MMBtu/hr used.
- (2) Annual emission calculations based on 8760 hrs/year.

Attachment N - Table 5 - Truck Loading Associated with Methanol (T02)

Emission Point	Loading Properties			Throughput ^(a) Annual (1,000 gal/yr)
	Loading Temperature (F)	Loading Temperature (R)	Vapor Pressure (psi)	
Methanol Product Loading	62	521.67	1.6	3.69

Emission Point	Saturation Factor ^(b)	Loading Loss ^(c) (lb/10 ³ gal)	Uncontrolled VOC Emissions ^(d)		Uncontrolled HAP Emissions ^(e)	
			Annual (ton/yr)	Hourly (lb/hr)	Annual (ton/yr)	Hourly (lb/hr)
Methanol Product Loading	1.45	18.165	0.033	0.008	0.033	0.008

Notes:

(a) Maximum annual throughput methanol: 3,685 gal/yr

(b) Saturation factor for splash loading, dedicated loading taken from Table 5.2-1 (dedicated normal service) of Section 5.2 of AP-42, Fifth Edition, Volume 1.

(c) Loading loss calculated according to the methodology in Section 5.2 of AP-42, Fifth Edition, Volume 1.

Sample Calculation, average loading loss for methanol:

$$L_L \text{ (lb/10}^3 \text{ gal)} = 12.46 \text{ SMP} / T ; S = \text{Saturation Factor (-)}$$

$$M = \text{Vapor Molecular Weight (lb/lb-mol)}$$

$$P = \text{Vapor Pressure (psi)}$$

$$T = \text{Loading Temperature (R)}$$

$$L_L = (12.46) (1.5) (32 \text{ lb/lb-mol}) (1.600 \text{ psi}) = 18.165 \text{ lb / 10}^3 \text{ gal}$$

$$521.67 \text{ R}$$

(d) Emissions estimated by applying the loading loss to the applicable loading throughput.

sample calculation for methanol, annual emissions:

$$\frac{18.165 \text{ lb}}{1,000 \text{ gal}} \times \frac{4 \times 1,000 \text{ gal}}{\text{yr}} \times \frac{\text{ton}}{2,000 \text{ lb}} = 0.033 \frac{\text{VOC.ton}}{\text{yr}}$$

(e) Total HAP emissions estimated from vapor compositions:

$$= \frac{\text{Methanol}}{100.00\%}$$

(f) Control efficiency

$$= 0\%$$

J-W Measurement Company
 Shreveport,LA Tyler,TX Victoria,TX Midland,TX
 Fairfield,TX Oklahoma City,OK Mounds,OK Tulsa,OK
 WWW.JWOPERATING.COM
 888-226-9110

JWMC Number: MAGL1001
Customer Name: M-3
Station Name: NEEL
Station Number:
Producer:
Field:
Co. or Pr.: MARION
State: WV.

Run Date: 03/01/13
Eff. Date: 3/1/2013
Sampled by: CK
Procure Date: 02/21/13
Pressure (lbs.): 450.00
Temperature (° F): 28
Bottle Number: 5606

Remarks:

<u>Component</u>	<u>Mole Percent</u>	<u>GPM @ 14.696</u>	<u>Ideal BTU @ 14.696</u>
Hydrogen Sulfide	0.0000		
Nitrogen	0.3367		
Methane	97.1829		981.55
Carbon Dioxide	0.2282		0.00
Ethane	2.1392	0.571	37.86
Propane	0.1025	0.028	2.58
I-Butane	0.0023	0.001	0.07
N-Butane	0.0072	0.002	0.23
I-Pentane	0.0004	0.000	0.02
N-Pentane	0.0006	0.000	0.02
2,2-Dimethylbutane	0.0000	0.000	0.00
2,3-Dimethylbutane	0.0000	0.000	0.00
2-Methylpentane	0.0000	0.000	0.00
3-Methylpentane	0.0000	0.000	0.00
n-Hexane	0.0000	0.000	0.00
2,2-Dimethylpentane	0.0000	0.000	0.00
Methylcyclopentane	0.0000	0.000	0.00
Benzene	0.0000	0.000	0.00
3,3-Dimethylpentane	0.0000	0.000	0.00
Cyclohexane	0.0000	0.000	0.00
2-Methylhexane	0.0000	0.000	0.00
2,3 dimethylpentane	0.0000	0.000	0.00
3- methylhexane	0.0000	0.000	0.00
1t,2-Dimethylcyclopentane	0.0000	0.000	0.00
1c,2-Dimethylcyclopentane	0.0000	0.000	0.00
n-heptane	0.0000	0.000	0.00
Methylcyclohexane	0.0000	0.000	0.00
2,5-Dimethylhexane	0.0000	0.000	0.00
2,4-Dimethylhexane	0.0000	0.000	0.00
Toluene	0.0000	0.000	0.00
2-Methylheptane	0.0000	0.000	0.00
4-Methylheptane	0.0000	0.000	0.00

We appreciate your business

J-W Measurement Company
 Shreveport, LA Tyler, TX Victoria, TX Midland, TX
 Fairfield, TX Oklahoma City, OK Mounds, OK Tulsa, OK
 WWW.JWOPERATING.COM
 888-226-9110

Customer Name: M-3
Station Name: NEEL
Station Number:
Eff. Date: 3/1/2013
Sampled by: CK

3-Methylheptane	0.0000	0.000	0.00
1c,2-Dimethylcyclohexane	0.0000	0.000	0.00
N-Octane	0.0000	0.000	0.00
1t,2-Dimethylcyclohexane	0.0000	0.000	0.00
1t,3-Dimethylcyclohexane	0.0000	0.000	0.00
1c,3-Dimethylcyclohexane	0.0000	0.000	0.00
Ethylcyclohexane	0.0000	0.000	0.00
Ethylbenzene	0.0000	0.000	0.00
M-Xylene	0.0000	0.000	0.00
P-Xylene	0.0000	0.000	0.00
O-Xylene	0.0000	0.000	0.00
N-Nonane	0.0000	0.000	0.00
Decanes	0.0000	0.000	0.00
Undecanes	0.0000	0.000	0.00
TOTAL	100.0000	0.602	1022.33

Ideal Gravity 0.5690 **Real Gravity** 0.5702
Compressibility Factor (Z) @ 14.696 PSIA & 60 DEG. F = 0.9979

Base Pressures	14.73	14.65	15.025
GPM	0.604	0.600	0.616
Ideal BTU Dry	1024.70	1019.13	1045.22
Ideal BTU Sat.	1006.87	1001.30	1027.35
Real BTU Dry	1026.83	1021.25	1047.44
Real BTU Sat.	1008.97	1003.37	1029.53

GPA METHOD 2286-95

Note: Calibration, Standards, and testing procedures are achieved pursuant to GPA regulations.

This Analysis Report is not intended for submission to Louisiana Department of Environmental Quality.

Dorothy Murphy

 J-W ANALYST

DISTRIBUTION:	1	35
----------------------	---	----

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

Identification
 User Identification: Methanol WW
 City: West Virginia
 State: West Virginia
 Company: Horizontal Tank
 Type of Tank: Methanol WW
 Description:

Tank Dimensions
 Shell Length (ft): 6.50
 Diameter (ft): 3.00
 Volume (gallons): 335.00
 Turnovers: 11.00
 Net Throughput(gal/yr): 3,685.00
 Is Tank Heated (y/n): N
 Is Tank Underground (y/n): N

Paint Characteristics
 Shell Color/Shade: Gray/Medium
 Shell Condition: Good

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

Meteorological Data used in Emissions Calculations: Charleston, West Virginia (Avg Atmospheric Pressure = 14.25 psia)

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

Methanol WV - Horizontal Tank

Mixture/Component	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
	Month	Avg.	Min.		Max.	Avg.	Min.					
Methyl alcohol	All	63.43	53.60	73.25	58.06	1.6051	1.1753	2.1628	32.0400		32.04	Option 2: A=7.897, B=1474.08, C=229.13

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

Methanol WV - Horizontal Tank

Annual Emission Calculations

Standing Losses (lb): 12.8668
 Vapor Space Volume (cu ft): 29.2648
 Vapor Density (lb/cu ft): 0.0092
 Vapor Space Expansion Factor: 0.1485
 Vented Vapor Saturation Factor: 0.8668

Tank Vapor Space Volume: 29.2648
 Vapor Space Volume (cu ft): 3.0000
 Tank Diameter (ft): 4.9841
 Effective Diameter (ft): 1.5000
 Vapor Space Outage (ft): 6.5000
 Tank Shell Length (ft):

Vapor Density 0.0092
 Vapor Density (lb/cu ft): 32.0400
 Vapor Molecular Weight (lb/lb-mole):
 Vapor Pressure at Daily Average Liquid Surface Temperature (psia): 1.6051
 Daily Avg. Liquid Surface Temp. (deg. R): 523.0962
 Daily Average Ambient Temp. (deg. F): 54.9833
 Ideal Gas Constant R 10.731
 (psia cuft / (lb-mol-deg R)):
 Liquid Bulk Temperature (deg. R): 517.7333
 Tank Paint Solar Absorptance (Shell): 0.6600
 Daily Total Solar Insulation Factor (Btu/sqft day): 1,250.5726

Vapor Space Expansion Factor 0.1485
 Vapor Space Expansion Factor:
 Daily Vapor Temperature Range (deg. R): 39.3149
 Daily Vapor Pressure Range (psia): 0.9875
 Breather Vent Press. Setting Range(psia): 0.0600
 Vapor Pressure at Daily Average Liquid Surface Temperature (psia): 1.6051
 vapor Pressure at daily minimum Liquid Surface Temperature (psia): 1.1753
 Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia): 2.1628
 Daily Avg. Liquid Surface Temp. (deg R): 523.0962
 Daily Min. Liquid Surface Temp. (deg R): 513.2575
 Daily Max. Liquid Surface Temp. (deg R): 532.9249
 Daily Ambient Temp. Range (deg. R): 21.5333

Vented Vapor Saturation Factor 0.8668
 Vented Vapor Saturation Factor:
 Vapor Pressure at Daily Average Liquid Surface Temperature (psia): 1.6051
 Vapor Space Outage (ft): 1.5000

Working Losses (lb): 4.5122
 Vapor Molecular Weight (lb/lb-mole): 32.0400
 Vapor Pressure at Daily Average Liquid Surface Temperature (psia): 1.6051
 Annual Net Throughput (gal/yr.): 3,685.0000
 Annual Turnovers: 11.0000
 Turnover Factor: 1.0000
 Tank Diameter (ft): 3.0000

Working Loss Product Factor:

1.0000

Total Losses (lb):

17.3990

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

Emissions Report for: Annual

Methanol WV - Horizontal Tank

Components	Losses(lbs)		Total Emissions
	Working Loss	Breathing Loss	
Methyl alcohol	4.51	12.89	17.40

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

Identification
 User Identification: Waste Lube Oils

City: West Virginia
 State: West Virginia
 Company: Vertical Fixed Roof Tank
 Type of Tank: Waste Lube Oils
 Description:

Tank Dimensions
 Shell Height (ft): 5.00
 Diameter (ft): 6.50
 Liquid Height (ft) : 5.00
 Avg. Liquid Height (ft): 5.00
 Volume (gallons): 1,241.14
 Turnovers: 1.00
 Net Throughput(gal/yr): 1,241.14
 Is Tank Heated (y/n): N

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

Roof Characteristics
 Type: Dome
 Height (ft): 0.00
 Radius (ft) (Dome Roof): 0.00

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

Meteorological Data used in Emissions Calculations: Charleston, West Virginia (Avg Atmospheric Pressure = 14.25 psia)

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

Waste Lube Oils - Vertical Fixed Roof Tank
, West Virginia

Mixture/Component	Daily Liquid Surf. Temperature (deg F)		Liquid Bulk Temp (deg F)	Vapor Pressure (psia)		Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations	
	Avg.	Min.		Max.	Avg.						Min.
Residual oil no. 6	63.43	53.60	73.25	0.0000	0.0000	0.0001	190.0000	0.0000	0.0000	387.00	Option 1: VP60 = .00004 VP70 = .00006

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

Waste Lube Oils - Vertical Fixed Roof Tank
, West Virginia

Annual Emission Calculations	
Standing Losses (lb):	0.0006
Vapor Space Volume (cu ft):	14.7943
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0770
Vented Vapor Saturation Factor:	1.0000
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	14.7943
Tank Diameter (ft):	6.5000
Vapor Space Outage (ft):	0.4458
Tank Shell Height (ft):	5.0000
Average Liquid Height (ft):	5.0000
Roof Outage (ft):	0.4458
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.4458
Dome Radius (ft):	6.5000
Shell Radius (ft):	3.2500
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):	523.0962
Daily Average Ambient Temp. (deg. F):	54.9833
Ideal Gas Constant R (psia cu ft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	517.7333
Tank Paint Solar Absorbance (Shell):	0.6800
Tank Paint Solar Absorbance (Roof):	0.6800
Daily Total Solar Insulation Factor (lb/unitsq/day):	1,250.5726
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0710
Daily Vapor Temperature Range (deg. R):	39.3149
Daily Vapor Pressure Range (psia):	0.0000
Breather Vent Press. Settling 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):	523.0962
Daily Min. Liquid Surface Temp. (deg R):	513.2675
Daily Max. Liquid Surface Temp. (deg R):	532.9249
Daily Ambient Temp. Range (deg. R):	21.5333
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):	0.4458
Working Losses (lb):	0.0003

Vapor Molecular Weight (lb/lb-mole):	190.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0000
Annual Net Throughput (gall/yr):	1,241,1372
Annual Turnovers:	1.0000
Turnover Factor:	1.0000
Maximum Liquid Volume (gall):	1,241,1372
Maximum Liquid Height (ft):	5.0000
Tank Diameter (ft):	6.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.0009

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

Emissions Report for: Annual

Waste Lube Oils - Vertical Fixed Roof Tank
, West Virginia

Components	Losses(lbs)		Total Emissions
	Working Loss	Breathing Loss	
Residual oil no. 6	0.00	0.00	0.00

- **Attachment O:
Monitoring/Recordkeeping/Reporting/Testing Plans**

ATTACHMENT O - MONITORING, RECORDING, REPORTING, AND TESTING PLANS

Plan Type	Emission unit	Pollutant	Requirements	Frequency	Method of Measurement	Regulatory Reference
Monitoring, Recordkeeping	Compressor Engines	NOX, CO, VOC	Performance test	Initial and every three years or 8,760 hours of operation	EPA Test Methods	NSPS JJJJ
Monitoring, Recordkeeping	Compressor Engines	N/A	Maintenance records	Each occurrence	N/A	NSPS JJJJ
Monitoring, Recordkeeping	Compressor	VOC	Change rod packing	Every 36 months or 26,000 hours of operation	N/A	NSPS OOOO
Monitoring, Recordkeeping Monthly Records	Liquid Loading	VOC	Monitor throughput of loading	Monthly	Records	

See Attachment D for more regulatory information

- **Attachment P: Public Notice**

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that **M3 Appalachia Gathering, LLC** has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a **Construction Permit Registration per the requirements of 45CSR13 (New Source Review – Minor Air Emissions Source)** for a **Natural Gas Compressor Station** located on **Access Road off of WV-7E, near Blacksville**, in **Monongalia** County, West Virginia. The latitude and longitude coordinates are: (**Latitude: 39.703886; Longitude: 80.205344.**)

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be:

Nitrogen Oxides (NO_x) = 27.0 tons per year (tpy);
Carbon Monoxide (CO) = 11.0 tpy;
Volatile Organic Compounds (VOC) = 10.4 tpy;
Sulfur Dioxide (SO_x) = 0.1 tpy;
Particulate Matter (PM₁₀) = 0.01 tpy;
Formaldehyde = 3.4 tpy;
Hazardous Air Pollutants (HAPs) = 6.7 tpy;
Carbon Dioxide Equivalents (CO₂(eq)) = 23330 tpy.

Startup of operation is planned to begin on or about the **first** day of **May, 2016**. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

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

Dated this the **22nd** day of **December, 2015**.

By: **M3 Appalachia Gathering, LLC**
James C. Roberts V.P. Environmental, Health, and Safety
742 Fairmont Road, Suite E
Westover, WV 26501

- **Attachment Q: Business Confidential Forms – N/A**

Not Applicable for this permit application.

- **Attachment R: Authority Forms – N/A**

Not applicable for this application.

- **Attachment S: Title V Permit Revision Information –
N/A**

Not applicable for this application.

- **Application Fee**

Total Fee = \$2,500 = \$1000 Construction (45CSR13) + \$1,000 NSPS Applicability (45CSR22-3) + \$500 (45CSR22 Group 8 Facility/Source Category)