APPLICATION FOR REGULATION 13 PERMIT

Prairie Bulk Terminal
Norfolk Southern Rail Line
Monongalia County, West Virginia

Prepared for:

Prairie Transportation, Inc.
110 E. Main Street, Suite 320
Ottawa, Illinois 61350

Prepared by:

Potesta & Associates, Inc.
7012 MacCorkle Avenue, S.E.
Charleston, West Virginia 25304
Phone: (304) 342-1400 Fax: (304) 343-9031
Email: potesta@potesta.com

Project No. 0101-15-0395

December 2015

POTESTA

TABLE OF CONTENTS

General Applicant Information ..... SECTION I - III

Business Certificate ..... ATTACHMENT A

Area Map ..... ATTACHMENT B

Installation and Start Up Schedule ..... ATTACHMENT C

Regulatory Discussion ..... ATTACHMENT D

Plot Plan ..... ATTACHMENT E

Detailed Process Flow Diagram ..... ATTACHMENT F

Process Description ..... ATTACHMENT G

Material Safety Data Sheets (MSDS) ..... ATTACHMENT H

Emission Units Table ..... ATTACHMENT I

Emission Points Data Summary Sheet ..... ATTACHMENT J

Fugitive Emissions Data Summary Sheet ..... ATTACHMENT K

Emissions Unit Data Sheets ..... ATTACHMENT L

Supporting Emissions Calculations ..... ATTACHMENT N

Monitoring/Recordkeeping/Reporting/Testing Plans ..... ATTACHMENT O

Public Notice ..... ATTACHMENT P

Attachments Not Applicable to this Application: Attachments M, Q, R, and S.

SECTION I - III

GENERAL APPLICANT INFORMATION

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):*
Prairie Transportation, Inc.

2. Federal Employer ID No. ***(FEIN):***
46-0473648

3. Name of facility *(if different from above):*
Prairie Bulk Terminal

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

5A. Applicant's mailing address:
110 E. Main Street
Suite 320
Ottawa, Illinois 61350

5B. Facility's present physical address:
741 Lazzelle Union Road
Maidsville, West Virginia 26541

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

⇨ If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**

⇨ If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation:

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**

⇨ If **YES,** please explain: Applicant is the owner/operator of the equipment. The property is leased from Norfolk Southern Corp.

⇨ 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.): Rail Bulk Terminal

10. North American Industry Classification System **(NAICS)** code for the facility:
488210 (SIC: 4013)

11A. DAQ Plant ID No. (for existing facilities only):
NA

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

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

12A.

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

From Exit 152 on I-79, take US-19 toward Westover/Morgantown, turn left on N. Dents Run Road in Westover, turn left on WV-100 N/Main Street for approximately 2.7 miles, site is on the left near the mouth of Robinson Run.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
Same	Maidsville	Monongalia
12.E. UTM Northing (KM): 4392.309	12F. UTM Easting (KM): 587.438	12G. UTM Zone: 17

13. Briefly describe the proposed change(s) at the facility:
The facility operates six (6) mobile conveyor systems to offload sand from railcars to trucks.

14A. Provide the date of anticipated installation or change: NA ➪ If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: 2012	14B. Date of anticipated Start-Up if a permit is granted: Operational

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

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

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

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

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

Section II. Additional attachments and supporting documents.

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

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

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

➪ Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

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

23. Provide a **Process Description** as **Attachment G.**

➪ Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

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

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

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

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

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

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

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

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

☒ General Emission Unit, specify: Six (6) mobile conveyor systems with small diesel 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:

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

☐ Other Collectors, specify

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

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

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

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

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

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

☐ **YES** ☒ **NO**

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

Section III. Certification of Information

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

☐ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ Authority of Limited Partnership

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

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

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

Certification of Truth, Accuracy, and Completeness

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

Compliance Certification

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

SIGNATURE Robert Smith *(Please use blue ink)* DATE: 11-23-15 *(Please use blue ink)*

35B. Printed name of signee: Robert Smith		35C. Title: President
35D. E-mail: bob.smith@prairietrans.com	36E. Phone: (815) 640-9020	36F. FAX: Use email.
36A. Printed name of contact person (if different from above): Sean Smith		36B. Title: Field Manager
36C. E-mail: ssmith7893@gmail.com	36D. Phone: (815) 640-9029	36E. FAX: (815) 433-0531

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

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

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

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

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

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

ATTACHMENT A

BUSINESS CERTIFICATE

State of West Virginia

Certificate

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

Prairie Transportation, Inc.

has filed the appropriate registration documents in my office according to the provisions of the West Virginia Code and hereby declare the organization listed above as duly registered with the Secretary of State's Office.

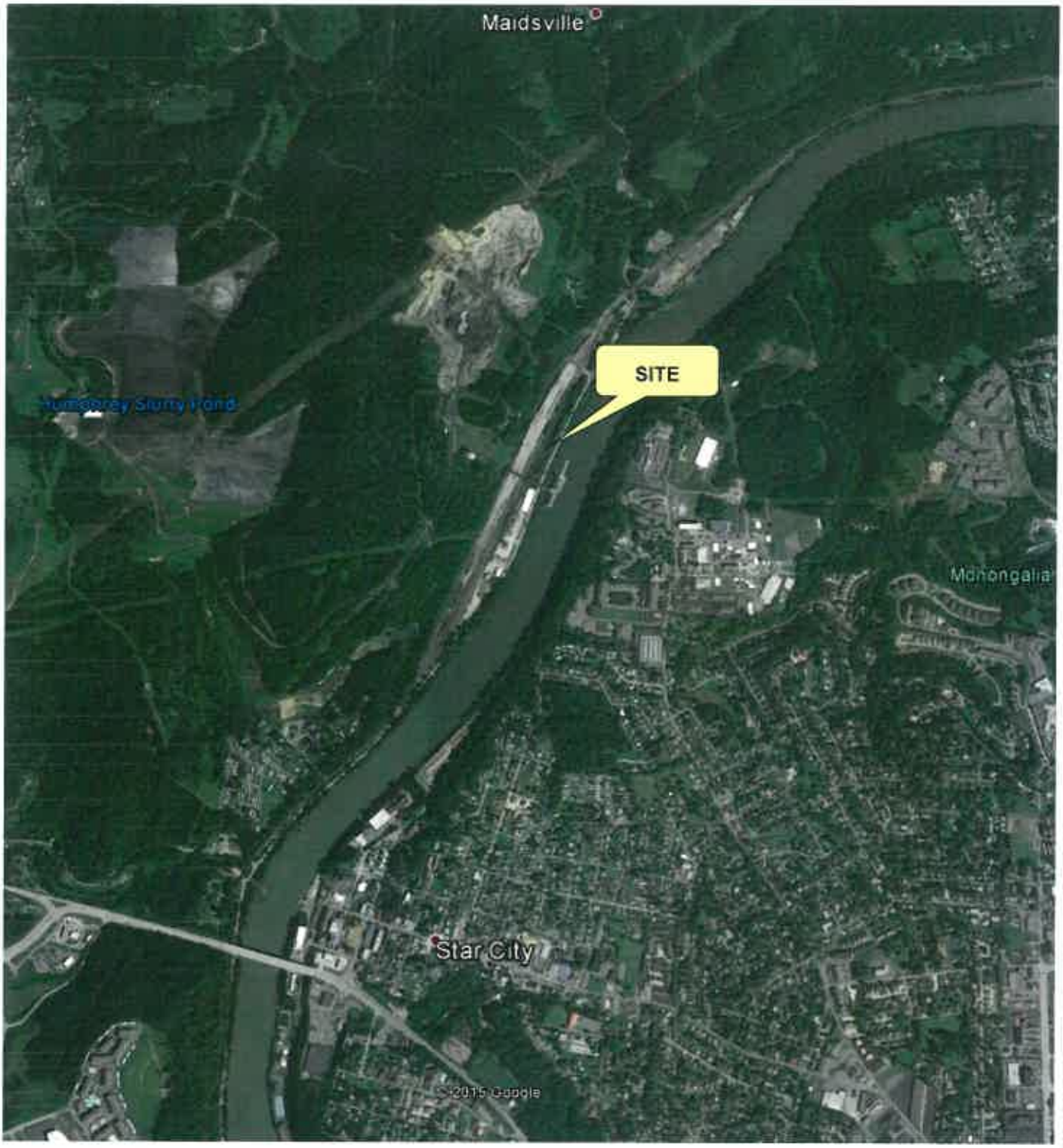
Given under my hand and
the Great Seal of West Virginia
on this day of
November 10, 2015

/s/ Natalie E Tennant

Secretary of State

ATTACHMENT B

AREA MAP



POTESTA

Engineers and Environmental Consultants

DATE: November 2015

PROJECT NO. 0101-15-0395

MAPPING FOR VISUAL REPRESENTATION ONLY

AREA MAP
PRAIRIE TRANSPORTATION, INC.
MAIDSVILLE, MONONGALIA COUNTY, WV

NOT TO SCALE

ATTACHMENT C

INSTALLATION AND START UP SCHEDULE

ATTACHMENT C

SCHEDULE OF INSTALLATION

The six (6) mobile conveyors are currently operating. Prairie Transportation, Inc. leased this site from Norfolk Southern in 2012 to start the off-loading of sand. Business expanded and additional off-loading units were brought on site. A total of six (6) units are on the site. With anticipated volumes of sand being transferred, we are now requesting an air permit for the site.

ATTACHMENT D

REGULATORY DISCUSSION

ATTACHMENT D

REGULATORY DISCUSSION

The facility is subject to the following regulations:

A. 45CSR13 – "Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits, and Procedures for Evaluation" requires facilities that meet definition to obtain a permit prior to construction. The emissions from this facility require a permit to be obtained.

B. 45CSR17 – "To Prevent and Control Particulate Matter Air Pollution from Material Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter." This facility is engaged in unloading railcars of material directly to trucks. This rule covers the activities at the site.

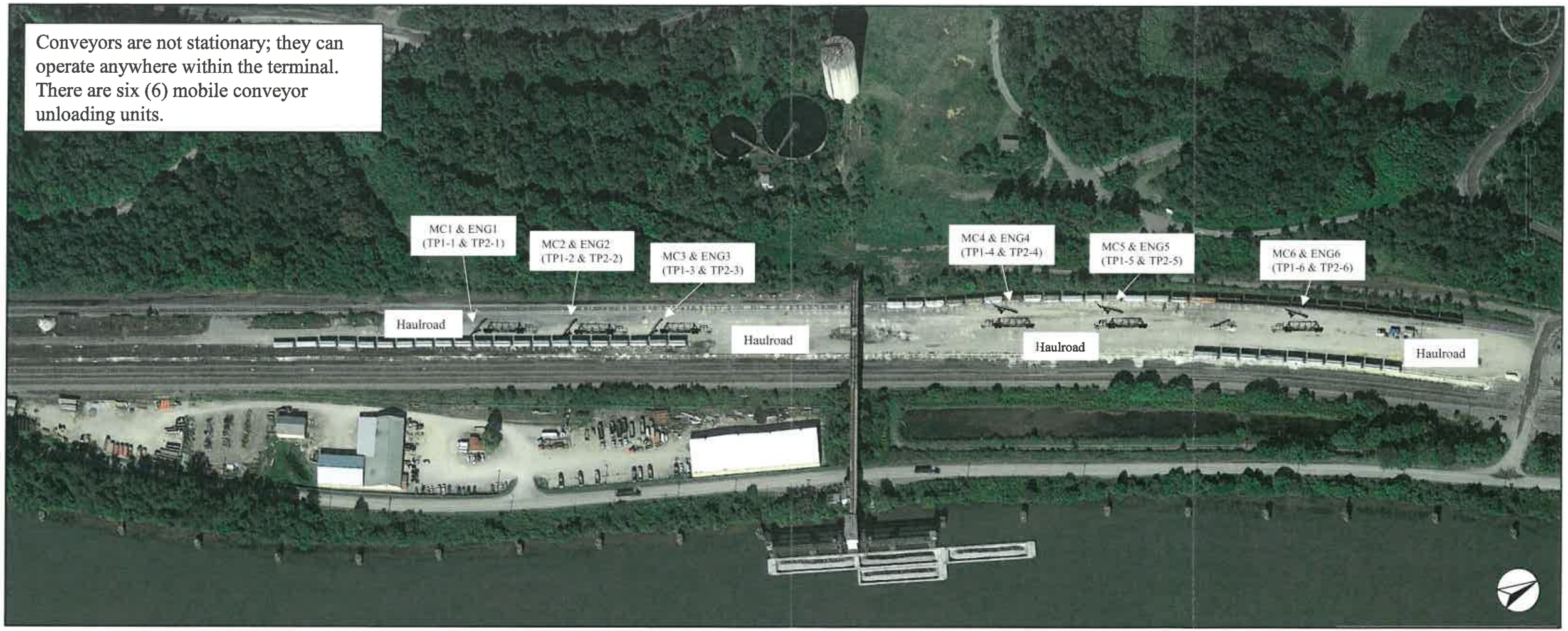
C. 45CSR22 – "Air Quality Management Fee Program" requires the facility to pay a minimum operating fee.

D. 45CSR30 – "Requirements for Operating Permits" (Deferred Source). The facility potential to emit (PTE) does not exceed 100 tons per year (tpy) of a regulated air pollutant or 10 tpy of a single HAP or 25 tpy of aggregated HAPs. The engines are subject to exemption to Title V permitting. Therefore, this facility is not a Title V source.

E. 40CFR60 Subpart IIII – "Standards of Performance for Stationary Compression Ignition Internal Combustion Engines." The engines on the conveying units are certified under this regulation.

ATTACHMENT E

PLOT PLAN



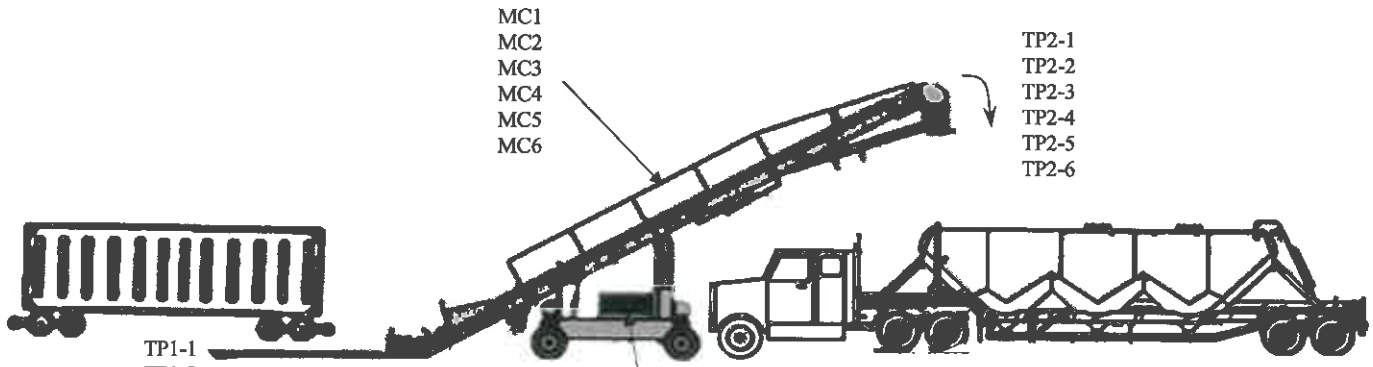
POTESTA
Engineers and Environmental Consultants

7012 MacCorkle Avenue, S.E
Charleston, West Virginia 25304
Phone: (304) 342-1400
Fax: (304) 343-9031

Plot Plan
Prairie Bulk Terminal
Prairie Transportation, Inc.
Monongalia County, West Virginia

ATTACHMENT F

DETAILED PROCESS FLOW DIAGRAM



POTESTA
Engineers and Environmental Consultants

7012 MacCorkle Avenue, SE
Charleston, West Virginia 25304
Phone: (304) 342-1400
Fax: (304) 343-9031

PROCESS FLOW DIAGRAM
PRAIRIE TRANSPORTATION, INC.
PRAIRIE BULK TERMINAL
MAIDSVILLE, WV
NOVEMBER 2015

Project No. 0101-15-0395
Prepared by JJD

ATTACHMENT G

PROCESS DESCRIPTION

ATTACHMENT G

PROCESS DESCRIPTION

Prairie Transportation, Inc.'s (Prairie) Prairie Bulk Terminal, located near Maidsville, Monongalia County, West Virginia, is requesting after-the-fact permitting.

Prairie operates a bulk rail terminal to which a variety of silica sand (sand) used in the oil and gas industry for hydraulic fracturing is delivered in railcars. Railcars are offloaded with diesel fueled portable conveyors into tractor trailers for transport. Prairie has six (6) portable conveyors that are used within the yard; each has an engine, and each transfers sand from the bottom hopper of railcars to the top of the sand trucks. All six mobile conveyors can operate simultaneously. Each mobile conveyor has a transfer capacity of 300 tons per hour.

There is no open stockpiling of sand on the property for sales purposes. Prairie has a small skid steer loader onsite for periodic clean-up activities. Spilled sand may be cleaned up from around the property and stacked in an area for disposal. There is no intent to open stockpile sand at this operation. Waste sand will be removed as needed. Once the sand is spilled to the ground, it can no longer be utilized for hydraulic fracturing.

Prairie also uses light plants as needed at different locations throughout the terminal. These units come and go as needed and are not part of the fixed facility.

ATTACHMENT H

MATERIAL SAFETY DATA SHEETS (MSDS)

MATERIAL SAFETY DATA SHEET

"Frac" Sand Proppant

HEALTH:	*1
FLAMMABILITY:	0
REACTIVITY:	0
PPE:	E

1. IDENTIFICATION OF SUBSTANCE/MIXTURE AND OF SUPPLIER

This Material Safety Data Sheet is for the following products:

MANUFACTURER:
Preferred Sands
One Radnor Corporate Center
100 Matsonford Road, Suite 101
Radnor, PA 19087

Manufacturer's Phone for General Inquiries: 610-834-1969
Emergency Phone: 1-800-424-9300 (CHEMTREC)

Product Name: Frac Sand Proppant

Specific Use: Proppant Sand

2. HAZARDS IDENTIFICATION

INHALATION: Quartz or Silica Sand can contain silica dust. Abrasive or aggressive handling of silica sand can generate silica dust. Avoid breathing silica dust. Silica (quartz) is classified as hazardous under the Occupational Safety and Health Administration (OSHA) regulations 29 CFR 1910.1200. Chronic inhalation of respirable crystalline silica may cause silicosis, a fibrosis or scarring of the lungs. Silicosis may be progressive and may lead to disability and death. Adverse health effects such as lung disease, silicosis, cancer, autoimmune disease, tuberculosis and nephrotoxicity can occur with exposure. There are generally no symptoms or signs of exposure to crystalline silica. Chronic silicosis often has no symptoms. Acute silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.

CANCER: Crystalline silica inhaled from occupational sources in sufficient concentrations is classified as carcinogenic to humans. In its Ninth Annual Report on Carcinogens, the National Toxicity Program (NTP) listed crystalline silica as a known human carcinogen, based on sufficient evidence of carcinogenicity from studies in humans indicating a causal relationship between exposure to respirable crystalline silica and increased lung cancer rates in workers exposed to crystalline silica dust. The International Agency for Research on Cancer (IARC) has evaluated crystalline silica and determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans.

AUTOIMMUNE DISEASES: There is evidence that exposure to respirable crystalline silica (without silicosis) or the disease silicosis may be associated with the increased incidence of several autoimmune disorders, scleroderma, systematic lupus erythematosus, rheumatoid arthritis and disease affecting the kidneys.

TUBERCULOSIS: Silicosis increases the risk of tuberculosis.

NEPHROTOXICITY: There is evidence that exposure to respirable crystalline silica (without silicosis) or the disease silicosis is associated with the increased incidence of kidney diseases, including end stage renal disease.

EXPOSURE GUIDELINES TO QUARTZ: Refer to NIOSH publication including Criteria Document for Crystalline Silica.

INGESTION: There are no known hazards associated with ingesting quartz or silica sand. Ingestion of large quantities of coated sand may cause severe abdominal discomfort.

EYE CONTACT: Exposure to quartz or silica sand causes eye irritation.

SKIN CONTACT: Quartz or silica sand may cause skin irritation due to the abrasive nature of repeated contact.

MEDICAL CONDITIONS POSSIBLY AGGRAVATED: No information found.

3. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENTS	CAS NUMBER	CONCENTRATION	OSHA PEL-TWA	ACGIH-TWA TLV	ACGIH-STEL/CEIL(C)
QUARTZ (SiO2) (Crystalline Silica)	14808-60-7	100 %	0.098 – 5 mg/m^3 (a) 0.294 – 15 mg/m^3 (b)	0.025 mg/m^3 (a)	Not listed

(a) Respirable
(b) Total dust respirable particles

NOTE: The OSHA PEL-TWA for respirable crystalline silica is a function of the percentage of crystalline silica in an airborne sample. The OSHA PEL-TWA for total dust respirable particles is determined from the fraction passing a size-selector.

4. FIRST AID MEASURES

INHALATION: Remove to fresh air.

INGESTION: Rinse mouth immediately and then dilute by drinking water. Do not induce vomiting unless instructed by a poison control center or doctor. If large amounts of product are ingested or abdominal pain or cramping becomes severe, seek immediate medical attention.

EYE CONTACT: Immediately flush eyes with running water for at least 15 minutes. Seek immediate medical attention.

SKIN CONTACT: Wash affected areas immediately with ample amounts of soap and water.

5. FIRE-FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Quartz (silica sand) is non-flammable and non-explosive.

EXTINGUISHING MEDIA: None required

SPECIAL FIRE FIGHTING PROCEDURES: Not applicable to silica (quartz) however for fire fighting ancillary fires were the silica may be present - fire fighters should wear a Self-Contained Breathing Apparatus (SCBA).

UNUSUAL FIRE AND EXPLOSION HAZARDS: Not applicable

HAZARDOUS DECOMPOSITION PRODUCTS: None

Crystalline silica (quartz) is incompatible with hydrofluoric acid, fluorine, chlorine trifluoride, or oxygen difluoride.

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Avoid dust formation. Use personal protection equipment recommended in Section 8. Approved respiratory protection methods should be used. If spill is in well ventilated area, general sweeping and shoveling of material is acceptable.

Contain contaminated water/firefighting water. Do not discharge into drains/surface waters/groundwater.

Surfaces may be slippery due to roundness of material. Sweep up spilled materials to prevent falls.

Disposal or recycling per regulations is recommended in accordance with Section 13.

7. HANDLING AND STORAGE

HANDLING: Avoid dust formation. Avoid inhalation of dusts. Avoid prolonged skin contact. Pour downwind and allow as little free fall as possible when emptying bags into equipment. Breathing must be protected when large quantities are conveyed without local exhaust ventilation.

Do not abrade or crush this material. It is not to be used for abrasive blasting.

STORAGE: Keep material only in the original container in a cool, dry, well-ventilated location. Store container away from acids, bases and strong oxidizing agents. Protect from direct sunlight.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EYE/FACE PROTECTION: Eye goggles or safety glasses with side shields should be worn when handling material.

CLOTHING/GLOVES: Long sleeved shirt, full length pants, safety shoes should be worn when handling material.

RESPIRATORY PROTECTION: Utilize effective engineering controls such as local ventilation at the point of use. If over exposure is possible, utilize an approved respirator for dust. Consult applicable regulations to ensure proper training, fit and selection of appropriate and effective respiratory protection.

VENTILATION: Use local exhaust ventilation as required to maintain exposures below the occupational exposure limits. Reference ACGIH, Industrial Ventilation – Recommended Practices.

OTHER/GENERAL PROTECTION: When exposed to material, do not eat, drink or smoke. Hands and/or face should be washed before breaks and at the end of the shift. Gloves must be inspected regularly and prior to each use. Replace if necessary (e.g. pinhole leaks).

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:	Solid	EVAPORATION RATE (BUTYL ACETATE=1.0):	Not applicable
COLOR:	White or tan sand	VAPOR PRESSURE:	Not applicable
ODOR:	Odorless	VAPOR DENSITY (AIR=1):	Not applicable
PH:	N/A	SPECIFIC GRAVITY (Water = 1):	2.65 g/ml
BOILING POINT:	Not applicable	SOLUBILITY IN WATER:	Not soluble
FLASH POINT:	Not applicable	MELTING POINT:	3110F

10. STABILITY AND REACTIVITY

STABILITY:	The material is stable if stored and handled as indicated.
CONDITIONS TO AVOID:	Contact with powerful oxidizing agents such as hydrofluoric acid, fluorine, chlorine trifluoride, or oxygen difluoride, may cause fires
HAZARDOUS POLYMERIZATION:	Hazardous polymerization will not occur.
INCOMPATIBILITY:	Strong acids, strong bases, strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS:	Silica will dissolve in hydrofluoric acid and produce corrosive gas – silicon tetrafluoride.

11. TOXICOLOGICAL INFORMATION

ACUTE EFFECTS: See Section 2, *Hazards Identification*, for the hazards associated with the inhalation of silica dust.

CHRONIC EFFECTS: Smoking may aggravate the effects of exposure and may increase the risk of developing respiratory disease from exposure to respirable crystalline silica dust. Consult with your employer and your doctor for further information or if you believe you may be developing any breathing problems. There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an incidence of significant disease endpoint such as scleroderma (an immune system disorder manifested by fibrosis of the lungs, skin and other internal organs) and kidney disease. Silicosis is also reported to increase the risk of tuberculosis.

TSCA SECTION 8(b): The major concern is silicosis (lung disease), caused by the inhalation and retention of respirable crystalline silica dust. Silicosis can exist in several forms, chronic or ordinary silicosis, simple silicosis, Progressive Massive Fibrosis (PMF) or complicated silicosis, accelerated, or acute silicosis.

Chronic or Ordinary Silicosis is the most common and can occur after many years of exposure to levels above the occupational exposure limits for airborne respirable crystalline silica dust.

Simple Silicosis may be progressive and may develop into complicated silicosis or PMF.

PMF or Complicated Silicosis symptoms, if present, are shortness of breath, wheezing, cough and sputum (lower airway mucus) production. It is associated with decreased lung function and may be disabling. Advanced PMF or complicated silicosis can lead to heart disease secondary to the lung disease.

Accelerated and Acute Silicosis can occur with exposure to high concentrations of respirable crystalline silica over a short period of time, typically within 5 years for accelerated silicosis and as short as a few months for acute silicosis.

Excessive inhalation of silica dust can present delayed long term and permanent health hazards.

Exposure guidelines for quartz – refer to NIOSH publication including Criteria Document for Crystalline Silica. This product is not known to have respirable crystalline silica dust above the personal exposure limits (PEL) when handled and used per the recommended procedures. See Section 7. *Handling and Storage*.

Appropriate PPE and good ventilation is required when handling this material.

This product is not to be used for abrasive blasting.

LISTED CARCINOGENS: Crystalline silica

12. ECOLOGICAL INFORMATION

Crystalline silica is not known to be toxic to the ecology.

Polyurethane resin is not known to be toxic to the ecology.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Uncontaminated waste product is not a hazardous waste as defined by the U.S. Resource Conservation and Recovery Act. Dispose of in accordance with applicable federal, state, and local government regulations.

14. TRANSPORT INFORMATION

UN NUMBER:	Not applicable
UN PROPER SHIPPING NAME:	Not applicable

TRANSPORT HAZARD CLASS(ES):	Not applicable
PACKING GROUP, IF APPLICABLE:	Not applicable
ENVIRONMENTAL HAZARDS:	None
TRANSPORT IN BULK:	Not applicable
SPECIAL PRECAUTIONS:	None

15. REGULATORY INFORMATION

TSCA:	Quartz (SiO2) is listed in the TSCA inventory.
CERCLA REPORTABLE QUANTITIY :	Not applicable
CLEAN AIR ACT - HAZARDOUS AIR POLLUTANT (HAPS):	Not applicable
SARA TITLE III:	
SECTION 302:	Not regulated
SECTION 312:	Acute and Chronic health hazard
SECTION 313:	This product meets the definition of an article, and is exempt from reporting under Section 313.
CALIFORNIA STATE PROPOSITION 65:	Crystalline silica is known to the state of California to be a carcinogen.
CANADIAN REGULATIONS:	All information required by the Controlled Products Regulation (CPR) is contained in this MSDS. Product classified according to the hazards criteria of CPR.
CANADIAN ENVIRONMENTAL PROTECTION AGENGY (CEPA):	All chemical substances are listed on the Domestic Substance List (DSL) or otherwise are in compliance with CEPA new substances notification requirements.
WHMIS:	Class D 2A
OTHER:	EINECS No.: 231-545-4
	EEC Label (Risk/Safety Phrases) R 48/20, R 40/20, S22, S38
	IARC: Crystalline silica (quartz) is classified in IARC Group 1.
	National, state, city, county or local emergency planning, community right to know or other laws, regulations, or ordinances may be applicable – consult applicable national, state, provincial, or local laws.

16. OTHER INFORMATION

Hazardous Material Identification System (HMIS):		
HEALTH:	*1	Ratings are based on 0-4 rating scale, with 0 representing minimal hazard or risk, and 4
FLAMMABILITY:	0	Representing severe hazard or risk.
REACTIVITY:	0	* Indicates that the material may have chronic health affects.
PPE:	E	E: Safety glasses, gloves and a dust respirator

MATERIAL SAFETY DATA SHEET

DISCLAIMER: The information contained herein is based on data considered accurate and is offered at no charge. No warranty is expressed or implied regarding the accuracy of this data. Liability is expressly disclaimed for loss or injury arising out of use of this information or the use of any materials designated.

Safety Data Sheet

Rev. G – January 22, 2013

Section 1 – Identification

Product Identifier:	Silica Sand
Trade Names:	Trademarks and product names include Badger Frac, Badger Pac, Badger Cast, Badger Sand™ and Badger Enviromedia. Products also generally referred to as Taylor Silica, Fairwater Silica.
Product Use:	Frac Sands, Gravel Pack Sands, Resin Coating Base Sands, Foundry Core and Molding Sands, Industrial Sands, Glass Sands, Filtration Media, Environmental Sands, Grinding Media, Engine Sand, Industrial Fillers, Testing Sands, Recreational and Agricultural Sands.
Restriction on Use:	**This product is not to be used for abrasive blasting. This Safety Data Sheet (SDS) and the information contained herein were not developed for abrasive blasting.**
Manufacturer's Name:	Badger Mining Corporation
Manufacturer's Address:	409 South Church Street Berlin, WI 54923
Manufacturer's Telephone:	800-932-7263 (7:30 am – 5 pm Central Time Monday-Friday) 920-361-2388
Manufacturer's Fax:	920-361-2826
Emergency Number:	800-932-7263 (7:30 am – 5 pm Central Time Monday-Friday) 920-361-2388

Section 2 – Hazards Identification

GHS Classification:

Health:
Category 1A Carcinogen
Category 1 Specific Target Organ Toxicity (STOT) following repeated exposures
Category 2B Eye Irritation

Signal Word DANGER

Hazard Statements:
May cause cancer by inhalation.
Causes damage to lungs, kidneys and autoimmune system through prolonged or repeated exposure by inhalation.
Causes eye irritation.

Precautionary Statements
Do not handle until the safety information presented in this SDS has been read and understood.
DO NOT BREATHE DUST.
Do not eat drink or smoke while handling this product. Wash skin thoroughly after handling.
If exposed or concerned: Get medical attention.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do, and continue rinsing.
If eye irritation persists: Get medical advice/attention.
Avoid creating dust when handling, using or storing. Use with adequate ventilation to keep exposure below recommended exposure limits.

Wear eye protection and respiratory protection following this SDS, NIOSH guidelines and other applicable regulations.
Dispose of contents/container in accordance with local, regional, national or international regulations.

Please refer to Section 11 for details of specific health effects of crystalline silica.

Section 3 – Composition/ Information on Ingredients

Hazardous Ingredients

Name:	Silica, Quartz, SiO_2
CAS Number:	14808 - 60- 7
Concentration (%)	89.0-99.9%

Section 4 – First Aid Measures

Inhalation –If gross inhalation of silica occurs, remove the person to fresh air, perform artificial respiration as needed and obtain medical attention as needed.

Eye – Immediately wash the eye with plenty of water for at least 15 minutes, while holding eyelid(s) open. If irritation persists, seek medical attention.

Skin – If abrasion occurs wash with soap and water and seek medical attention if irritation persists or develops later.

Ingestion – If gastrointestinal discomfort occurs, give a large quantity of water. Never attempt to make an unconscious person drink or vomit. Seek medical attention.

Signs and Symptoms of Exposure: There are generally no signs or symptoms of exposure to crystalline silica (quartz). Often, chronic silicosis has no symptoms. The symptoms of chronic silicosis, if present, are shortness of breath, wheezing, cough and sputum production. The symptoms of acute silicosis which can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as 6 months, are the same as those associated with chronic silicosis; additionally, weight loss and fever may also occur. The symptoms of scleroderma, an autoimmune disease, include thickening and stiffness of the skin, particularly in the fingers, shortness of breath, difficulty swallowing and joint problems.

Section 5 – Fire Fighting Measures

Extinguishing Media:	Compatible with all media; use the medium appropriate to the surrounding fire.
Unusual Fire and Explosion Habits:	None known.
Special Fire Fighting Procedures:	None known.
Hazardous Combustion Products:	None known.

Section 6 – Accidental Release Measures

Wear appropriate personal protective equipment. Ensure appropriate respirators are worn during and following clean up or whenever airborne dust is present to ensure worker exposures remain below occupational exposure limits (Refer to Section 8). Follow respiratory protection selection guidelines as described in Section 8 of this document.

Collect the material using a method that does not produce dust such as a High-Efficiency Particulate Air (HEPA) vacuum or thoroughly wetting down the silica-containing dust before cleaning up. Place the silica-containing dust in a covered container appropriate for disposal. Dispose of the silica-containing dust according to federal, state and local regulations.

This product is not subject to the reporting requirements of Title III of SARA, 1986, and 40 CFR 372.

Section 7 – Handling and Storage

This product is **not** to be used for abrasive blasting. Do not breathe dust, which may be created during the handling of this product. Do not rely on vision to determine whether respirable silica is present in the air, as it may be present without a visible cloud. Use good housekeeping procedures to prevent the accumulation of silica dust in the workplace. Avoid the creation of respirable dust. Avoid standing on piles of materials as they may be unstable.

Use adequate ventilation and dust collection equipment. Ensure that the dust collection system is adequate to reduce airborne dust levels to below the appropriate occupational exposure limits. If the airborne dust levels are above the appropriate occupational exposure limits, use respiratory protection during the establishment of engineering controls. Refer to Section 8 - Exposure Controls/Personal Protection for further information.

In accordance with OSHA's Hazard Communication Standard (29 CFR 1910.1200, 1915.99, 1917.28, 1918.90, 1926.59, 1928.21), state, and/or local right-to-know laws and regulations, familiarize your employees with this SDS and the information contained herein. Warn your employees, your customers and other third parties (in case of resale or distribution to others) of the potential health risks associated with the use of this product and train them in the appropriate use of personal protective equipment and engineering controls, which will reduce their risks of exposure.

See also ASTM International standard practice E 1132-06, "Standard Practice for Health Requirements Relating to Occupational Exposure to Respirable Crystalline Silica."

For safe handling and use of this product for Hydraulic Fracturing, please see the OSHA/NIOSH Hazard Alert Worker Exposure to Silica during Hydraulic Fracturing DHHS (NIOSH) Publication No. 2012-166 (2012). http://www.osha.gov/dts/hazardalerts/hydraulic_frac_hazard_alert.pdf

Section 8 – Exposure Controls/Personal Protection

Occupational Exposure Limits (respirable fraction) in air for dust containing crystalline silica (quartz):

Standard	Exposure Limits
MSHA/OSHA PEL* (8-Hour Time-Weighted Average)	$\frac{10 \text{ mg/m}^3}{\% \text{ SiO}_2+2}$
ACGIH TLV** (8-Hour Time-Weighted Average)	0.025 mg/m^3
NIOSH REL** (10-Hour Time-Weighted Average, 40-hour work week)	0.05 mg/m^3

* The OSHA/MSHA PEL for dust containing crystalline silica (quartz) is based on the silica content of the respirable dust sample. The OSHA/MSHA PEL for crystalline silica as tridymite and cristobalite is one-half the PEL for crystalline silica (quartz).
** The ACGIH and NIOSH limits are for crystalline silica (quartz), independent of the dust concentration.
The ACGIH TLV for crystalline silica as cristobalite is equal to the TLV for crystalline silica as quartz. In 2005, ACGIH withdrew the TLV for crystalline silica as tridymite. Refer to Section 10 for thermal stability information for crystalline silica (quartz).

Occupational Exposure Limits in air for inert/nuisance dust:

Standard	Respirable Dust	Total Dust
MSHA/OSHA PEL (as Inert or Nuisance Dust)	5 mg/m^3	15 mg/m^3
ACGIH TLV (as Particles Not Otherwise Specified)	3 mg/m^3	*10 mg/m^3

Note: The limits for Inert Dust are provided as guidelines. Nuisance dust is limited to particulates not known to cause systemic injury or illness.
* The TLV provided is for inhalable particles not otherwise specified.

California Inhalation Reference Exposure Limit (REL): The California chronic REL for respirable crystalline silica (quartz, cristobalite, tridymite) is 3 ug/m^3. [Dated December 18, 2008] A chronic REL is an airborne level of a chemical at or below which no adverse health effects are anticipated in individuals indefinitely exposed to that level. [Dated 2/10/05]

Canadian OEL**:**

Canada Labour Code: 0.025 mg/m^3 (respirable)
Alberta, British Columbia: 0.025 mg/m^3 (respirable quartz and cristobalite)
Saskatchewen: 2 mg/m^3 (respirable, amorphous: silica fume); 0.1 mg/m^3 (respirable, amorphous: silica fused); 0.05 mg/m^3 (respirable, cristobalite); 0.05 mg/m^3 (respirable tridymite); 0.1 mg/m^3 (respirable, quartz); 0.1 mg/m^3 (respirable, tripoli)
Manitoba, Newfoundland, Prince Edward Island: 0.025 mg/m^3 (respirable)
Ontario: 0.05 mg/m^3 (respirable cristobalite, tridymite); 0.1 mg/m^3 (quartz, tripoli); 0.1 mg/m^3 (silica fused); 2 mg/m^3 (silica fume)
Quebec: 0.05 mg/m^3 (respirable, cristobalite, tridymite); 0.1 mg/m^3 (quartz, tripoli)
New Brunswick: 0.1 mg/m^3 (quartz); 0.05 mg/m^3 (cristobalite)
Nova Scotia: 0.025 mg/m^3 (quartz, cristobalite)
Yukon: 2 mg/m^3 (respirable, amorphous); 300 particles/ml measured with a konimeter (quartz, and tripoli); 150 particles/ML measured with a konimeter (cristobalite and tridymite)
Northwest Territories, Nunavut: 2 mg/m^3 (respirable, amorphous); 0.05 mg/m^3 (respirable, cristobalite, tridymite, silica flour); 0.1 mg/m^3 (respirable, fused silica, quartz, tripoli)

Austria OEL - Maximum concentration 0.15 mg/m^3

Japan OEL - Japan Society of Occupational Health Respirable crystalline silica 0.03 mg/m^3

Poland OEL TWA -2 mg/m^3 (total inhalable dust, containing >50% free crystalline silica);
0.3 mg/ mg/m^3 m^3 (respirable dust, containing >50% free crystalline silica);
4.0 mg/m^3 (total inhalable dust, containing 2% to 50% free crystalline silica);
1.0 mg/m^3 (respirable dust, containing 2% to 50% free crystalline silica)

United Kingdom OEL – 0.1 mg/m^3

Mexico – 0.1 mg/m^3 (quartz, inhalable)
0.05 mg/m^3 (cristobalite, inhalable)
0.05 mg/m^3 (tridymite, inhalable)
0.1 mg/m^3 (tripoli containing respirable quartz powder, inhalable)
(Also refer to ACGIH)

Argentina – 0.05 mg/m^3 (quartz, respirable)
0.05 mg/m^3 (cristobalite, respirable)
0.05 mg/m^3 (tridymite, respirable)
0.1 mg/m^3 (tripoli, respirable)

Engineering Controls:

Ventilation: Use local exhaust, general ventilation or natural ventilation adequate to maintain exposures below appropriate exposure limits.

Other control measures: Respirable dust and quartz levels should be monitored regularly. Dust and quartz levels in excess of appropriate exposure limits should be reduced by all feasible engineering controls, including (but not limited to) dust suppression (wetting), ventilation, process enclosure, and enclosed employee work stations.

This product is <u>not</u> to be used for abrasive blasting.

Respiratory Protection:

Consult with OSHA regulations, Canadian CCOHS, NIOSH recommendations and other applicable regulatory agencies to determine the appropriate respiratory protection to be worn during use of this product, and use only such recommended respiratory protection equipment. Avoid breathing dust produced during the use and handling of this product. If the workplace airborne crystalline silica concentration is unknown for a given task, conduct air monitoring to determine the appropriate level of respiratory protection to be worn. Consult with a certified industrial hygienist, your insurance risk manager or the OSHA Consultative Services group for detailed information. Ensure appropriate respirators are

worn during and following the task, including clean up or whenever airborne dust is present, to ensure worker exposures remain below occupational exposure limits. Provisions should be made for a respiratory protection training program (see 29 CFR 1910.134 – Respiratory Protection for minimum program requirements). See also ANSI standard Z88.2 (latest revision) "American National Standard for Respiratory Protection," 29 CFR 1910.134 and 1926.103, and 42 CFR 84.

Respirator Recommendations:
For respirable quartz levels that exceed, or are likely to exceed, ten times the applicable limit, which NIOSH designates as an 8 hour-TWA of 0.5 mg/m^3, a NIOSH-approved 100 series particulate filter respirator must be worn.

NIOSH recommendations for respiratory protection include:
Up to 0.5 mg/m^3:
(APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100.
Up to 1.25 mg/m^3:
(APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter.
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
Up to 2.5 mg/m^3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
Up to 25 mg/m^3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode
Respirator use must comply with applicable MSHA or OSHA standards, which include provisions for a user training program, respirator maintenance and cleaning, respirator fit testing, and other requirements. For additional information contact NIOSH at 1-800-35-NIOSH or visit website: http://www.cdc.gov/niosh/npg (search for crystalline silica).

Emergency or planned entry into unknown concentrations or IDLH conditions (50 mg/m^3 for crystalline silica-quartz): Any self-contained breathing apparatus that has a full-face piece and is operated in a pressure-demand or other positive-pressure mode or any supplied-air respirator that has a full-face piece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus.

Escape from unknown or IDLH conditions (50 mg/m^3 for crystalline silica-quartz): Any air-purifying, full-face piece respirator with a high-efficiency particulate filter or any appropriate escape-type, self-contained breathing apparatus.

Gloves: Recommended in situations where abrasion from sand may occur.

Eye/Face: Safety glasses with side shields should be worn as minimum protection. Dust goggles should be worn when excessively (visible) dusty conditions are present or are anticipated. There is a potential for severe eye irritation for those wearing contact lenses.

General Hygiene Considerations: There are no known hazards associated with this material when used as recommended. Following the guidelines in this SDS is recognized as good industrial hygiene practice. Avoid breathing dust. Wash dust-exposed skin with soap and water before eating, drinking, smoking, and using toilet facilities.

Section 9 – Physical and Chemical Properties

Appearance:	Granular Solid, Light Buff to White Sand
Odor:	None
Odor threshold:	None
pH:	Not Applicable
Boiling Point or Range, °F:	2230°C (4046°F) for Quartz
Melting Point or Range, °F:	1710°C (3110°F) for Quartz
Flashpoint:	None
Evaporation Rate	Not Applicable
Flammability	Non-combustible solid
Upper/Lower Explosive Limit:	Non-combustible solid
Vapor Pressure	Not Applicable
Vapor Density:	Not Applicable
Specific Gravity:	2.65 (Quartz)
Solubility In Water:	Insoluble
Partition coefficient: n-octanol/water	Not applicable
Auto ignition Temperature:	None
Viscosity	Not applicable

Section 10 – Stability and Reactivity

Reactivity	Reactive with strong oxidizing agents
Chemical Stability:	Stable
Thermal Stability:	If crystalline silica (quartz) is heated to more than 870°C (1598°F), it can change to a form of crystalline silica known as tridymite, and if crystalline silica (quartz) is heated to more than 1470°C (2678°F), it can change to a form of crystalline silica known as cristobalite.
Incompatibility:	Strong oxidizing agents, such as fluorine, chlorine trifluoride, hydrogen fluoride, oxygen difluoride, hydrogen peroxide, etc.; acetylene and ammonia.
Hazardous Decomposition Products:	Silica will dissolve in hydrofluoric acid and produce a corrosive gas – silicon tetrafluoride.
Hazardous Polymerization:	Not known to polymerize.

Section 11 – Toxicological Information

CAUTION: Crystalline silica exists in several forms, the most common of which is quartz. Crystalline silica as tridymite and cristobalite are more fibrogenic than crystalline silica as quartz.

Potential Health Effects

Primary routes(s) of exposure: ■ Inhalation ☐ Skin ☐ Ingestion

Inhalation:

Acute Effects: One form of silicosis, acute silicosis, can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as 6 months. The symptoms of acute silicosis include (but are not limited to) progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.

Chronic Effects: The adverse health effects – lung disease, silicosis, cancer, autoimmune disease, tuberculosis, and nephrotoxicity -- are chronic effects.

Eye Contact: Crystalline silica (quartz) may cause abrasion of the cornea.

Skin Contact: May cause abrasion to skin.

Ingestion: No adverse effects expected for incidental ingestion. Ingestion of large amounts may cause gastrointestinal tract irritation.

Medical Conditions Generally Aggravated by Exposure: The condition of individuals with lung disease (e.g., bronchitis, emphysema, chronic obstructive pulmonary disease) can be aggravated by exposure.

A. SILICOSIS

The major concern is silicosis (lung disease), caused by the inhalation and retention of respirable crystalline silica dust. Silicosis can exist in several forms, chronic (or ordinary), accelerated or acute.

Chronic or Ordinary Silicosis is the most common form of silicosis and can occur after many years of exposure to levels above the occupational exposure limits for airborne respirable crystalline silica dust. It is further defined as either simple or complicated silicosis.

Simple Silicosis is characterized by lung lesions (shown as radiographic opacities) less than 1 centimeter in diameter, primarily in the upper lung zones. Often, simple silicosis is not associated with symptoms, detectable changes in lung function or disability. Simple silicosis may be progressive and may develop into complicated silicosis or progressive massive fibrosis (PMF).

Complicated Silicosis or PMF is characterized by lung lesions (shown as radiographic opacities) greater than 1 centimeter in diameter. Although there may be no symptoms associated with complicated silicosis or PMF, the symptoms, if present, are shortness of breath, wheezing, cough and sputum production. Complicated silicosis or PMF may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease (cor pumonale) secondary to the lung disease.

Accelerated Silicosis can occur with exposure to high concentrations of respirable crystalline silica over a relatively short period; the lung lesions can appear within five (5) years of the initial exposure. The progression can be rapid. Accelerated silicosis is similar to chronic or ordinary silicosis, except that the lung lesions appear earlier and the progression is more rapid.

Acute Silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.

B. CANCER

IARC - The International Agency for Research on Cancer ("IARC") concluded that there is "*sufficient evidence* in humans for the carcinogenicity of crystalline silica in the form of quartz or cristobalite", there is "*sufficient evidence* in experimental animals for the carcinogenicity of quartz dust" and that there is "*limited evidence* in experimental animals for the carcinogenicity of tridymite dust and cristobalite dust." The overall IARC evaluation was that "crystalline silica inhaled in the form of quartz or cristobalite dust is *carcinogenic to humans* (*Group 1*)." The IARC evaluation noted that not all industrial circumstances studied evidenced carcinogenicity. The monograph also stated that "Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs." For further information on the IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 100C, "Silica Dust, Crystalline, in the Form of Quartz or Cristobalite" (2012).

NTP - In its Eleventh Annual Report on Carcinogens, concluded that respirable crystalline silica is known to be a human carcinogen, based on sufficient evidence of carcinogenicity from studies in humans indicating a causal relationship between exposure to respirable crystalline silica and increased lung cancer rates in workers exposed to crystalline silica dust.

OSHA - Crystalline silica is not on the OSHA carcinogen list.

There have been many articles published on the carcinogenicity of crystalline silica, which the reader should consult for additional information; the following are examples of recently published articles: (1) "Dose-Response Meta-Analysis of Silica and Lung Cancer", *Cancer Causes Control*, (20):925-33 (2009); (2) "Occupational Silica Exposure and Lung Cancer Risk: A Review of Epidemiological Studies 1996-2005', *Ann Oncol*, (17) 1039-50 (2006); (3) "Lung Cancer Among Industrial Sand Workers Exposed to Crystalline Silica", *Am J Epidemiol*, (153) 695-703 (2001); (4) "Crystalline Silica and The Risk of Lung Cancer in The Potteries", *Occup Environ Med*, (55) 779-785 (1998); (5) "Is Silicosis Required for Silica-Associated Lung Cancer?", *American Journal of Industrial Medicine*, (37) 252- 259 (2000); (6) " Silica, Silicosis, and Lung Cancer: A Risk Assessment", *American Journal of Industrial Medicine*, (38) 8-18 (2000); (7) "Silica, Silicosis, and Lung Cancer: A Response to a Recent Working Group Report", *Journal of Occupational and Environmental Medicine*, (42) 704-720 (2000).

C. AUTOIMMUNE DISEASES

There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders, -- scleroderma, systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys. For a review of the subject, the following may be consulted: (1) "Antinuclear Antibody and Rheumatoid Factor in Silica-Exposed Workers", *Arh Hig Rada Toksikol*, (60) 185-90 (2009); (2) "Occupational Exposure to Crystalline Silica and Autoimmune Disease", *Environmental Health Perspectives*, (107) Supplement 5, 793-802 (1999); (3) "Occupational Scleroderma", *Current Opinion in Rheumatology*, (11) 490-494 (1999); (4) "Connective Tissue Disease and Silicosis", *Am J Ind Med*, (35), 375-381 (1999).

D. TUBERCULOSIS

Individuals with silicosis are at increased risk to develop pulmonary tuberculosis, if exposed to persons with tuberculosis. The following may be consulted for further information: (1) "Tuberculosis and Silicosis: Epidemiology, Diagnosis and Chemoprophylaxis", *J Bras Pneumol*, (34) 959-66 (2008); (2) *Occupational Lung Disorders*, Third Edition, Chapter 12, entitled "Silicosis and Related Diseases", Parkes, W. Raymond (1994); (3) "Risk of Pulmonary Tuberculosis Relative to Silicosis and Exposure to Silica Dust in South African Gold Miners," *Occup Environ Med*, (55) 496-502 (1998); (4) "Occupational Risk Factors for Developing Tuberculosis", *Am J Ind Med*, (30) 148-154 (1996).

E. KIDNEY DISEASE

There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis is associated with the increased incidence of kidney diseases, including end stage renal disease. For additional information on the subject, the following may be consulted: (1) "Mortality from Lung and Kidney Disease in a Cohort of North American Industrial Sand Workers: An Update", *Ann Occup Hyg*, (49) 367-73 (2005); (2) "Kidney Disease and Silicosis", *Nephron*, (85) 14-19 (2000); (3) "End Stage Renal Disease Among Ceramic Workers Exposed to Silica", *Occup Environ Med*, (56) 559-561 (1999); (4) "Kidney Disease and Arthritis in a Cohort Study of Workers Exposed to Silica", *Epidemiology*, (12) 405-412 (2001).

F. NON-MALIGNANT RESPIRATORY DISEASES

NIOSH has cited the results of studies that report an association between dusts found in various mining operations and non-malignant respiratory disease, particularly among smokers, including bronchitis, emphysema, and small airways disease. *NIOSH Hazard Review – Health Effects of Occupational Exposure to Respirable Crystalline Silica*, published in April 2002, available from NIOSH, 4676 Columbia Parkway, Cincinnati, OH 45226, or at http://www.cdc.gov/niosh/02-129A.html.

Section 12 – Ecological Information

Crystalline silica is not known to be ecotoxic.

Section 13 – Disposal Considerations

General: Crystalline silica may be landfilled. Material should be placed in covered containers to minimize generation of airborne dust.

RCRA: Crystalline silica (quartz) is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR §261 et seq.

The above information applies to Badger Mining Corporation silica sand only as sold. The product may be contaminated during use and it is the responsibility of the user to assess the appropriate disposal method in this situation.

Section 14 – Transport Information

Crystalline silica (quartz) is not a hazardous material for purposes of transportation under the U. S. Department of Transportation Table of Hazardous Materials, 49 CFR §172.101, and Transportation of Dangerous Goods Regulations in the European Union, Canada, Argentina, Republic of Uzbekistan and Japan.
Consult applicable international, national, state, provincial or local laws.

Section 15 – Regulatory Information

OTHER US REGULATORY INFORMATION:

OSHA: Crystalline Silica is not listed as a carcinogen.
SARA Title III: This product is not subject to the reporting requirements of Title III of SARA, 1986
TSCA.: Crystalline silica (quartz) appears on the EPA TSCA inventory under the CAS No. 14808-60-7.
RCRA: Crystalline silica (quartz) is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR §261 et seq.
CERCLA: Crystalline silica (quartz) is not classified as a hazardous substance under regulations of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 40 CFR §302.4
EPCRA (Emergency Planning and Community Right to Know Act): Crystalline silica (quartz) is not an extremely hazardous substance under regulations of the Emergency Planning and Community Right to Know Act, 40 CFR Part 355, Appendices A and B and is not a toxic chemical subject to the requirements of Section 313.
Clean Air Act: Crystalline silica (quartz) mined and processed by Badger Mining Corporation was not processed with or does not contain any Class I or Class II ozone depleting substances.
FDA: Silica is included in the list of substances that may be included in coatings used in food contact surfaces, 21 CFR §175.300(b)(3).(The FDA standard primarily applies to products containing silica used in the coatings of food contact surfaces).
California Proposition 65: Respirable crystalline silica (quartz) is classified as a substance known to the state of California to be a carcinogen.
Massachusetts Toxic Use Reduction Act: Respirable crystalline silica is considered toxic per the Massachusetts Toxic Use Reduction Act.
Pennsylvania Worker and Community Right to Know Act: Quartz is considered hazardous for purposes of the Act, but it is not a special hazardous substance or an environmental hazardous substance.

CANADA

Canadian Regulations: All information required by Controlled Products Regulation (CPR) is contained in this SDS. Product classified according to the hazard criteria of CPR.
National Pollutant Release Inventory (NPRI), CEPA subsection 16(1): None required.
Domestic Substances List: Badger Mining Corporation's product, a naturally occurring substance, is on the Canadian DSL.
WHMIS Classification: D-2A and D-2B

OTHER

EINECS No.: 231-545-4 (for silica)
EEC Label (Risk/Safety Phrases): R 48/20, R 40/20, S22, S38 (for silica)
IARC: Silica dust, crystalline, in the form of quartz or cristobalite is classified in IARC Group 1. Silica, amorphous is classified in IARC Group 3.
NTP: Respirable crystalline silica is classified as a known carcinogen.
IARC: Crystalline silica inhaled in the form of quartz or cristobalite dust is carcinogenic to humans (Group 1).

National, state, provincial or local emergency planning, community right to know or other laws, regulations or ordinances may be applicable--consult applicable national, state, provincial or local laws.

Section 16 – Other Information

Definitions of Acronyms
ACGIH: American Conference of Governmental Industrial Hygienists
ANSI: American National Standards Institute
APF: Assigned Protection Factor
California REL: California Inhalation Reference Exposure Limit
CAS: Chemical Abstracts Service
CCOHS: Canadian Centre for Occupational Health and Safety
CEPA: Canadian Environmental Protection Agency
CERCLA: Comprehensive Environmental Response, Compensation and Liability Act
CFR: US Code of Federal Regulations
CPR: Controlled Products Regulation
DHHS: Department of Health and Human Services
DSL: Domestic Substances List
EEC: European Economic Community Guidelines
EINECS: European Inventory of Existing Commercial chemical Substances
EPA: Environmental Protection Agency
EPCRA: Emergency Planning and Community Right to Know Act
FDA: Food and Drug Administration
GHS: Globally Harmonized System
HEPA: High-Efficiency Particulate Air
IARC: International Agency for Research on Cancer
IDLH: Immediately Dangerous to Life and Health
MSHA: Mine Safety and Health Administration
NIOSH: National Institute for Occupational Safety and Health, US Department of Health and Human Services
NIOSH REL: NIOSH Recommended Exposure Limit
NPRI: National Pollutant Release Inventory
NTP: National Toxicology Program
OEL: Occupational Exposure Limit
OSHA: Occupational Safety and Health Administration, US Department of Labor
PEL: Permissible Exposure Limit
PMF: Progressive Massive Fibrosis
RCRA: Resource Conservation and Recovery Act
SARA Title III: Title III of the Superfund Amendments and Reauthorization Act, 1986
SDS: Safety Data Sheet
STOT: Specific Target Organ Toxicity
TLV: Threshold Limit Value
TSCA: Toxic Substance Control Act
TWA: Time-Weighted Average
WHMIS: Workplace Hazardous Materials Information System

User's Responsibility: The OSHA Hazard Communication Standard 29 CFR 1910.1200 requires that this SDS be made available to your employees who handle or may be exposed to this product. Educate and train your employees regarding applicable precautions. Instruct your employees to handle this product properly.

Disclaimer: The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for one's own particular use. Since the actual use of the product described herein is beyond our control, Badger Mining Corporation, assumes no liability arising out of the use of the product by others. Appropriate warnings and safe handling procedures should be provided to handlers and users.

An electronic version of this SDS is available at www.badgerminingcorp.com . More information on the effects of crystalline silica exposure may be obtained from OSHA (phone number: 1-800-321-OSHA; website: http://www.osha.gov) or from NIOSH (phone number: 1-800-35-NIOSH; website: http://www.cdc.gov/niosh).

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]
MC1	MC1	Mobile Conveyor #1	2011	300 tph	NA	PE
ENG1	E1	Diesel Engine	2011	48 hp	NA	N
MC2	MC2	Mobile Conveyor #2	2011	300 tph	NA	PE
ENG2	E2	Diesel Engine	2011	48 hp	NA	N
MC3	MC3	Mobile Conveyor #3	2011	300 tph	NA	PE
ENG3	E3	Diesel Engine	2011	48 hp	NA	N
MC4	MC4	Mobile Conveyor #4	2014	300 tph	NA	PE
ENG4	E4	Diesel Engine	2014	69.7 hp	NA	N
MC5	MC5	Mobile Conveyor #5	2015	300 tph	NA	PE
ENG5	E5	Diesel Engine	2015	69.7 hp	NA	N
MC5	MC6	Mobile Conveyor #6	2008	300 tph	NA	PE
ENG6	E6	Diesel Engine	2008	26.55 hp	NA	N
VA	VA	Vehicle Activity	NA	NA	NA	HR-WS

[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.
Note: PF = Process Fugitive Emissions, OD = Open Dust Emissions

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			
MC1 – MC6	NA	MC1 – MC6	Mobile Conveyor	PE	Partial Enclosure	NA	NA	PM PM10 PM2.5	13.32 6.31 0.95	3.70 1.75 0.27	6.72 3.18 0.48	1.86 0.88 0.13	Solid Solid Solid	AP42	NA
E1	Vertical Stack	ENG1	Diesel Engine	N	NA	NA	NA	PM PM10 PM2.5 NOX CO SO2 VOC HAPS	0.02 0.02 0.02 0.52 0.22 0.10 0.12 0.0017	0.08 0.08 0.08 2.29 0.96 0.44 0.53 0.0074	0.02 0.02 0.02 0.52 0.22 0.10 0.12 0.0017	0.08 0.08 0.08 2.29 0.96 0.44 0.53 0.0074	Solid Solid Solid Gas Gas Gas Gas Gas	Engine Certificate/ AP42	NA
E2	Vertical Stack	ENG2	Diesel Engine	N	NA	NA	NA	PM PM10 PM2.5 NOX CO SO2 VOC HAPS	0.02 0.02 0.02 0.52 0.22 0.10 0.12 0.0017	0.08 0.08 0.08 2.29 0.96 0.44 0.53 0.0074	0.02 0.02 0.02 0.52 0.22 0.10 0.12 0.0017	0.08 0.08 0.08 2.29 0.96 0.44 0.53 0.0074	Solid Solid Solid Gas Gas Gas Gas Gas	Engine Certificate/ AP42	NA
E3	Vertical Stack	ENG3	Diesel Engine	N	NA	NA	NA	PM PM10 PM2.5 NOX CO SO2 VOC HAPS	0.02 0.02 0.02 0.52 0.22 0.10 0.12 0.0017	0.08 0.08 0.08 2.29 0.96 0.44 0.53 0.0074	0.02 0.02 0.02 0.52 0.22 0.10 0.12 0.0017	0.08 0.08 0.08 2.29 0.96 0.44 0.53 0.0074	Solid Solid Solid Gas Gas Gas Gas Gas	Engine Certificate/ AP42	NA

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			
E4	Vertical Stack	ENG4	Diesel Engine	N	NA	NA	NA	PM	0.02	0.10	0.02	0.10	Solid	Engine Certificate/ AP42	NA
								PM10	0.02	0.10	0.02	0.10	Solid		
								PM2.5	0.02	0.10	0.02	0.10	Solid		
								NOX	0.43	1.89	0.43	1.89	Gas		
								CO	0.19	0.81	0.19	0.81	Gas		
								SO2	0.14	0.63	0.14	0.63	Gas		
								VOC	0.17	0.76	0.17	0.76	Gas		
								HAPS	0.0024	0.0104	0.0024	0.0104	Gas		
E5	Vertical Stack	ENG5	Diesel Engine	N	NA	NA	NA	PM	0.02	0.10	0.02	0.10	Solid	Engine Certificate/ AP42	NA
								PM10	0.02	0.10	0.02	0.10	Solid		
								PM2.5	0.02	0.10	0.02	0.10	Solid		
								NOX	0.43	1.89	0.43	1.89	Gas		
								CO	0.19	0.81	0.19	0.81	Gas		
								SO2	0.14	0.63	0.14	0.63	Gas		
								VOC	0.17	0.76	0.17	0.76	Gas		
								HAPS	0.0024	0.0104	0.0024	0.0104	Gas		
E6	Vertical Stack	ENG6	Diesel Engine	N	NA	NA	NA	PM	0.06	0.26	0.06	0.26	Solid	AP42	NA
								PM10	0.06	0.26	0.06	0.26	Solid		
								PM2.5	0.06	0.26	0.06	0.26	Solid		
								NOX	0.82	3.60	0.82	3.60	Gas		
								CO	0.18	0.78	0.18	0.78	Gas		
								SO2	0.05	0.24	0.05	0.24	Gas		
								VOC	0.07	0.29	0.07	0.29	Gas		
								HAPS	0.0012	0.0053	0.0012	0.0053	Gas		

* See Attachment N for speciation of HAPs

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 (i.e., 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 the 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).

Table 2: Release Parameter Data

Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
E1	NA	NA	NA	NA	825	~5	4392.309	587.438
E2	NA	NA	NA	NA	825	~5	4392.309	587.438
E3	NA	NA	NA	NA	825	~5	4392.309	587.438
E4	NA	NA	NA	NA	825	~5	4392.309	587.438
E5	NA	NA	NA	NA	825	~5	4392.309	587.438
E6	NA	NA	NA	NA	825	~5	4392.309	587.438

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

ATTACHMENT K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

Attachment K – Fugitive Emissions Data Summary Sheet

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

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

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

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads	NA					
Unpaved Haul Roads	PM PM10 PM2.5	87.45 25.81 2.58	145.74 43.02 4.30	26.23 7.74 0.77	43.72 12.91 1.29	EE
Storage Pile Emissions	NA					
Loading/Unloading Operations	NA					
Wastewater Treatment Evaporation & Operations	NA					
Equipment Leaks	NA					
General Clean-up VOC Emissions	NA					
Other	NA					

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

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

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

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

ATTACHMENT L

EMISSION UNIT DATA SHEETS

Attachment L
EMISSIONS UNIT DATA SHEET
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*): MC1, MC2, MC3, MC4, MC5, MC6

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

   Mobile Conveyors (See Page L5 for engine information). Each mobile conveyor has an engine to drive it on the property and to power the conveying operation.

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

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

   Each of the six (6) mobile conveyors can handle 300 tph.

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

   NA

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

   None

* 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): NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

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

(c) Theoretical combustion air requirement (ACF/unit of fuel): NA

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

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

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

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

@ °F and psia

a.	NO_X		lb/hr	‼ FORMTEXT	grains/ACF
b.	SO_2		lb/hr		grains/ACF
c.	CO		lb/hr		grains/ACF
d.	PM_{10}	6.31 (total of all six units)	lb/hr	NA	grains/ACF
e.	Hydrocarbons		lb/hr		grains/ACF
f.	VOCs		lb/hr		grains/ACF
g.	Pb		lb/hr		grains/ACF
h.	Specify other(s)				
			lb/hr		grains/ACF
			lb/hr		grains/ACF
			lb/hr		grains/ACF
			lb/hr		grains/ACF

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

(2) Complete the Emission Points Data Sheet.

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

MONITORING	RECORDKEEPING
Total amount of sand shipped off-site.	Total amount of sand shipped off-site.
REPORTING	**TESTING**
None.	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 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

None.

ENGINE DATA SHEET

Source Identification Number[1]		ENG1, ENG2, ENG3		ENG4, ENG5		ENG6	
Engine Manufacturer and Model		Deutz AG D2011L03		Kubota V3600-ET		Hatz	
Manufacturer's Rated bhp/rpm		48.8/2800		69.7/2600		26.55/NA	
Source Status[2]		ES		ES		ES	
Date Installed/Modified/Removed[3]		2012		2012		2012	
Engine Manufactured/Reconstruction Date[4]		2012		2012		2012	
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart IIII? (Yes or No)[5]		Yes		Yes		Yes	
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart JJJJ? (Yes or No)[6]		No		No		No	
Engine, Fuel and Combustion Data	Engine Type[7]	NA		NA		NA	
	APCD Type[8]	A/F		A/F		A/F	
	Fuel Type[9]	2FO		2FO		2FO	
	H_2S (gr/100 scf)	NA		NA		NA	
	Operating bhp/rpm	48.8/2800		69.7/2600		26.55/NA	
	BSFC (Btu/bhp-hr)	NA		NA		NA	
	Fuel throughput (ft^3/hr)	2.96 gal/hr		4.37 gal/hr		1.36 gal/hr	
	Fuel throughput ($MMft^3$/yr)	NA		NA		NA	
	Operation (hrs/yr)	8760		8760		8760	
Reference[10]	Potential Emissions[11]	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
	NO_X	0.52	2.29	0.43	1.89	0.82	3.60
	CO	0.22	0.96	0.19	0.81	0.18	0.78
	VOC	0.12	0.53	0.17	0.76	0.07	0.29
	SO_2	0.10	0.44	0.14	0.63	0.05	0.24
	PM_{10}	0.02	0.08	0.02	0.10	0.06	0.26
	Formaldehyde	0.0005	0.0021	0.0007	0.0031	0.0003	0.0013

1. Enter the appropriate Source Identification Number for each emergency generator. Generator engines should be designated EG-1, EG-2, EG-3 etc. If more than three (3) engines exist, please use additional sheets.

2. Enter the Source Status using the following codes:

   NS Construction of New Source (installation) ES Existing Source
   MS Modification of Existing Source RS Removal of Source

3. Enter the date (or anticipated date) of the engine's installation (construction of source), modification or removal.

4. Enter the date that the engine was manufactured, modified or reconstructed.

5. Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart IIII. If so, the engine and control device must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance according to 40CFR§60.4210 as appropriate.

Provide a manufacturer's data sheet for all engines being registered.

6. Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart JJJJ. If so, the engine and control device must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance according to 40CFR§60.4243a(2)(i) through (iii), as appropriate.

   Provide a manufacturer's data sheet for all engines being registered.

7. Enter the Engine Type designation(s) using the following codes:

LB2S	Lean Burn Two Stroke	RB4S	Rich Burn Four Stroke
LB4S	Lean Burn Four Stroke		

8. Enter the Air Pollution Control Device (APCD) type designation(s) using the following codes:

A/F	Air/Fuel Ratio	IR	Ignition Retard
HEIS	High Energy Ignition System	SIPC	Screw-in Precombustion Chambers
PSC	Prestratified Charge	LEC	Low Emission Combustion
NSCR	Rich Burn & Non-Selective Catalytic Reduction	SCR	Lean Burn & Selective Catalytic Reduction

9. Enter the Fuel Type using the following codes:

PQ	Pipeline Quality Natural Gas	RG	Raw Natural Gas
2FO	#2 Fuel Oil	LPG	Liquid Propane Gas

10. Enter the Potential Emissions Data Reference designation using the following codes. Attach all referenced data to this *Compressor/Generator Data Sheet(s).*

MD	Manufacturer's Data	AP	AP-42	
GR	GRI-HAPCalc™	OT	Other _____	(please list)

11. Enter each engine's Potential to Emit (PTE) for the listed regulated pollutants in pounds per hour and tons per year. PTE shall be calculated at manufacturer's rated brake horsepower and may reflect reduction efficiencies of listed Air Pollution Control Devices. Emergency generator engines may use 500 hours of operation when calculating PTE. PTE data from this data sheet shall be incorporated in the *Emissions Summary Sheet.*

Attachment L
FUGITIVE EMISSIONS FROM UNPAVED HAULROADS

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

		PM	PM-10
k =	Particle size multiplier	4.9	1.5
s =	Silt content of road surface material (%)	10	10
p =	Number of days per year with precipitation >0.01 in.	157	157

Item Number	Description	Number of Wheels	Mean Vehicle Weight (tons)	Mean Vehicle Speed (mph)	Miles per Trip	Maximum Trips per Hour	Maximum Trips per Year	Control Device ID Number	Control Efficiency (%)
1	Vehicle Activity	18	29	~10	0.94	14	45,455	WS	70
2									
3									
4									
5									
6									
7									
8									

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

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

Where:

		PM	PM-10
k =	Particle size multiplier	4.9	1.5
s =	Silt content of road surface material (%)	10	10
S =	Mean vehicle speed (mph)	NA	NA
W =	Mean vehicle weight (tons)	29	29
w =	Mean number of wheels per vehicle	18	18
p =	Number of days per year with precipitation >0.01 in.	157	157

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

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

SUMMARY OF UNPAVED HAULROAD EMISSIONS

Item No.	PM				PM-10			
	Uncontrolled		Controlled		Uncontrolled		Controlled	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
1	87.45	145.74	26.23	43.72	25.81	43.02	7.74	12.91
2								
3								
4								
5								
6								
7								
8								
TOTALS	87.45	145.74	26.23	43.72	25.81	43.02	7.74	12.91

ATTACHMENT N

SUPPORTING EMISSIONS CALCULATIONS

Prairie Transportation, Inc.
Prairie Bulk Terminal

Potesta & Associates, Inc.
Project Number 0101-15-0395

By: JJD
Date: 10/08/2015

Checked By: MAF
Date: 10/14/2015

Facility PTE

Emission Type	Point Source				Fugitive			
	Uncontrolled		Controlled		Uncontrolled		Controlled	
	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PM	13.47	4.38	6.87	2.54	87.45	145.74	26.23	43.72
PM_{10}	6.47	2.43	3.34	1.56	25.81	43.02	7.74	12.91
$PM_{2.5}$	1.11	0.94	0.64	0.81	2.58	4.30	0.77	1.29
VOC	0.78	3.42	0.78	3.42	Not Applicable			
SO_2	0.64	2.80	0.64	2.80				
NO_x	3.25	14.25	3.25	14.25				
CO	1.21	5.29	1.21	5.29				
Benzene	0.0025	0.0108	0.0025	0.0108				
Toluene	0.0011	0.0048	0.0011	0.0048				
Xylenes	0.0008	0.0035	0.0008	0.0035				
1,3-Butadiene	0.0002	0.0009	0.0002	0.0009				
Formaldehyde	0.0032	0.0139	0.0032	0.0139				
Acetaldehyde	0.0021	0.0090	0.0021	0.0090				
Acrolein	0.0006	0.0026	0.0006	0.0026				
Naphthalene	0.0006	0.0026	0.0006	0.0026				
Total HAPs	0.0110	0.0482	0.0110	0.0482				

Emission Type	Facility Total			
	Uncontrolled		Controlled	
	lb/hr	tons/yr	lb/hr	tons/yr
PM	100.92	150.12	33.10	46.26
PM_{10}	32.28	45.45	11.08	14.47
$PM_{2.5}$	3.69	5.24	1.41	2.10
VOC	0.78	3.42	0.78	3.42
SO_2	0.64	2.80	0.64	2.80
NO_x	3.25	14.25	3.25	14.25
CO	1.21	5.29	1.21	5.29
Benzene	0.0025	0.0108	0.0025	0.0108
Toluene	0.0011	0.0048	0.0011	0.0048
Xylenes	0.0008	0.0035	0.0008	0.0035
1,3-Butadiene	0.0002	0.0009	0.0002	0.0009
Formaldehyde	0.0032	0.0139	0.0032	0.0139
Acetaldehyde	0.0021	0.0090	0.0021	0.0090
Acrolein	0.0006	0.0026	0.0006	0.0026
Naphthalene	0.0006	0.0026	0.0006	0.0026
Total HAPs	0.0110	0.0482	0.0110	0.0482

Materials Handling

Defining transfer point empirical expression variables, where:

$e = k(0.0032)(U/5)^{1.3}/(M/2)^{1.4}$

e =	?	lb/ton	Conversion Factors
k for PM =	0.74	dimensionless	NA
k for PM10	0.35	dimensionless	2.11
k for PM2.5	0.053	dimensionless	13.96
U =	7	mean wind speed, mph	
M =	2	material moisture content, %	

Calculating transfer point emission factor for PM:

e = 0.0037 lb/ton

Throughput rate: 300 tph 1,000,000 tpy

Rounding = 2

ID	Description	Transfer Capacities		e lb/T	Control Device		Emissions Uncontrolled		Emissions Controlled	
		tons/hour	tons/year		Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
TP1-1	railcar to conveyor	300	1,000,000	0.0037	PE	50	1.11	1.85	0.56	0.93
TP1-2	railcar to conveyor	300	1,000,000	0.0037	PE	50	1.11	1.85	0.56	0.93
TP1-3	railcar to conveyor	300	0	0.0037	PE	50	1.11	0.00	0.56	0.00
TP1-4	railcar to conveyor	300	0	0.0037	PE	50	1.11	0.00	0.56	0.00
TP1-5	railcar to conveyor	300	0	0.0037	PE	50	1.11	0.00	0.56	0.00
TP1-6	railcar to conveyor	300	0	0.0037	PE	50	1.11	0.00	0.56	0.00
TP2-1	conveyor to truck	300	0	0.0037	PE	50	1.11	0.00	0.56	0.00
TP2-2	conveyor to truck	300	0	0.0037	PE	50	1.11	0.00	0.56	0.00
TP2-3	conveyor to truck	300	0	0.0037	PE	50	1.11	0.00	0.56	0.00
TP2-4	conveyor to truck	300	0	0.0037	PE	50	1.11	0.00	0.56	0.00
TP2-5	conveyor to truck	300	0	0.0037	PE	50	1.11	0.00	0.56	0.00
TP2-6	conveyor to truck	300	0	0.0037	PE	50	1.11	0.00	0.56	0.00
						PM	13.32	3.70	6.72	1.86
						PM10	6.31	1.75	3.18	0.88
						PM2.5	0.95	0.27	0.48	0.13

* A zero input for a transfer point indicates the transfer point is not included in the maximum emission scenario. Total yearly throughput is shown in other transfer points.

Prairie Transportation, Inc.
Prairie Bulk Terminal

Potesta & Associates, Inc.
Project Number 0101-15-0395

By: JJD
Date: 10/08/2015

Checked By: MAF
Date: 10/14/2015

ENGINE EMISSIONS (ENG1 - ENG3)
2012 Deutz Ag CDZXL03.1041

Fuel Usage:	20.90	lbs/hr	CARB Certificate
	2.96	gal/hr	Calculated
Weight of Diesel:	7.05	lbs/gal	AP-42 Appendix A
Assumed Heating Value of Diesel Fuel:	138,000	Btu/gallon	HHV from 40 CFR 98, Table C-1
Maximum Fuel Input:	0.41	MMBtu/hour	Calculated
Maximum Horsepower:	48.8	hp	CARB Certificate
	37	kW	Max Rated Power Class

Constants
0.002204622 lb/ gram

Hours Per Year = 8,760
Number of Engines = 3

Regulated Pollutant	Emission Factor (1) (lb/hp-hr)	Emission Factor (2) (g/kW-hr)	Emissions Per Engine (lbs/hr)	Emissions Per Engine (tons/year)	Total Emissions 3 Engines (lbs/hr)	Total Emissions 3 Engines (tons/year)
NO_X		6.4	0.52	2.29	1.57	6.86
CO		2.7	0.22	0.96	0.66	2.89
SO_2	0.00205		0.10	0.44	0.30	1.31
$PM/PM_{10}/PM_{2.5}$		0.21	0.02	0.08	0.05	0.23
TOC (VOC)	0.0025		0.12	0.53	0.37	1.60

Hazardous Air Pollutants (HAPS)	Emission Factor (lb/MMBtu)		Emissions Per Engine (lbs/hr)	Emissions Per Engine (tons/year	Total Emissions 3 Engines (lbs/hr)	Total Emissions 3 Engines (tons/year)
Benzene	9.33E-04		0.0004	0.0017	0.0011	0.0050
Toluene	4.09E-04		0.0002	0.0007	0.0005	0.0022
Xylenes	2.85E-04		0.0001	0.0005	0.0003	0.0015
1,3-Butadiene	3.91E-05		0.0000	0.0001	0.0000	0.0002
Formaldehyde	1.18E-03		0.0005	0.0021	0.0014	0.0063
Acetaldehyde	7.67E-04		0.0003	0.0014	0.0009	0.0041
Acrolein	9.25E-05		0.0001	0.0004	0.0003	0.0013
Naphthalene	8.48E-05		0.0001	0.0004	0.0003	0.0013
Total HAPS			0.0017	0.0074	0.0050	0.0221

Notes:
(1) Emission factors from AP-42 Table 3.3-1(Criteria Pollutants) Table 3.3-2 (HAPS) unless noted.
(2) NOx, CO, and PM emission factors taken from California EPA Air Resources Board (CARB) engine certificate.

Prairie Transportation, Inc.
Prairie Bulk Terminal

Potesta & Associates, Inc.
Project Number 0101-15-0395

By: JJD
Date: 10/08/2015

Checked By: MAF
Date: 10/14/2015

ENGINE EMISSIONS (ENG4 & ENG5)
2012 Kubota CKBXL03.6BCD

Fuel Usage:	30.80	lbs/hr	CARB Certificate
	4.37	gal/hr	Calculated
Weight of Diesel:	7.05	lbs/gal	AP-42 Appendix A
Assumed Heating Value of Diesel Fuel:	138,000	Btu/gallon	HHV from 40 CFR 98, Table C-1
Maximum Fuel Input:	0.60	MMBtu/hour	Calculated
Maximum Horsepower:	69.7	hp	CARB Certificate
	56	kW	Max Rated Power Class

Constants
0.002204622 lb/ gram

Hours Per Year = 8,760
Number of Engines = 2

Regulated Pollutant	Emission Factor (1) (lb/hp-hr)	Emission Factor (2) (g/kW-hr)	Emissions Per Engine		Total Emissions 2 Engines	
			(lbs/hr)	(tons/year)	(lbs/hr)	(tons/year)
NO_X		3.5	0.43	1.89	0.86	3.79
CO		1.5	0.19	0.81	0.37	1.62
SO_2	0.00205		0.14	0.63	0.29	1.25
$PM/PM_{10}/PM_{2.5}$		0.18	0.02	0.10	0.04	0.19
TOC (VOC)	0.0025		0.17	0.76	0.35	1.53

Hazardous Air Pollutants (HAPS)	Emission Factor (lb/MMBtu)		Emissions Per Engine		Total Emissions 2 Engines	
			(lbs/hr)	(tons/year	(lbs/hr)	(tons/year)
Benzene	9.33E-04		0.0006	0.0025	0.0011	0.0049
Toluene	4.09E-04		0.0002	0.0011	0.0005	0.0022
Xylenes	2.85E-04		0.0002	0.0008	0.0003	0.0015
1,3-Butadiene	3.91E-05		0.0000	0.0001	0.0000	0.0002
Formaldehyde	1.18E-03		0.0007	0.0031	0.0014	0.0062
Acetaldehyde	7.67E-04		0.0005	0.0020	0.0009	0.0041
Acrolein	9.25E-05		0.0001	0.0004	0.0002	0.0009
Naphthalene	8.48E-05		0.0001	0.0004	0.0002	0.0009
Total HAPS			0.0024	0.0104	0.0048	0.0208

Notes:
(1) Emission factors from AP-42 Table 3.3-1(Criteria Pollutants) Table 3.3-2 (HAPS) unless noted.
(2) NOx, CO, and PM emission factors taken from California EPA Air Resources Board (CARB) engine certificate.

By: JJD
Date: 10/08/2015

Checked By: MAF
Date: 10/14/2015

ENGINE EMISSIONS (ENG6)
Hatz Engine

Fuel Usage:	7,000	Btu/hp-hr	AP-42 3.3-6.a.
	1.36	gal/hr	Calculated
Heating Value of Diesel:	137,000	btu/gal	AP-42 Appendix A
Maximum Fuel Input:	0.19	MMBtu/hour	Calculated
Maximum Horsepower:	26.55	hp	Client

Hours Per Year = **8,760**
Number of Engines = 1

Regulated Pollutant	Emission Factor (1) (lb/hp-hr)	Emission Factor (g/kW-hr)	Emissions (lbs/hr)	Emissions (tons/year)
NO_X	0.031		0.82	3.60
CO	0.00668		0.18	0.78
SO_2	0.00205		0.05	0.24
$PM/PM_{10}/PM_{2.5}$	0.0022		0.06	0.26
TOC (VOC)	0.0025		0.07	0.29

Hazardous Air Pollutants (HAPS)	Emission Factor (lb/MMBtu)		Emissions Per Engine (lbs/hr)	Emissions Per Engine (tons/year)
Benzene	9.33E-04		0.0002	0.0009
Toluene	4.09E-04		0.0001	0.0004
Xylenes	2.85E-04		0.0001	0.0004
1,3-Butadiene	3.91E-05		0.0001	0.0004
Formaldehyde	1.18E-03		0.0003	0.0013
Acetaldehyde	7.67E-04		0.0002	0.0009
Acrolein	9.25E-05		0.0001	0.0004
Naphthalene	8.48E-05		0.0001	0.0004
Total HAPS			0.0012	0.0053

Notes:
(1) Emission factors from AP-42 Table 3.3-1(Criteria Pollutants) Table 3.3-2 (HAPS) unless noted.

Prairie Transportation, Inc.
Prairie Bulk Terminal

Potesta & Associates, Inc.
Project Number 0101-15-0395

By: JJD
Date: 10/08/2015

Checked By: MAF
Date: 10/14/2015

VEHICLE ACTIVITY: Unpaved Haulroad

Emission Factor Equation from AP-42 Section 13.2.2, Unpaved Roads:

$e = k\,(s/12)^a\,(W/3)^b\,[(365-p)/365]$

	PM	PM10	PM2.5	
e =	6.82	2.01	0.20	lb/VMT
k =	4.9	1.5	0.15	constant, AP-42 Table 13.2.2-2 (dimensionless)
s =	10	10	10	%, surface material silt content
W =	29	29	29	tons, mean vehicle weight
a =	0.7	0.9	0.9	constant, AP-42 Table 13.2.2-2 (dimensionless)
b =	0.45	0.45	0.45	constant, AP-42 Table 13.2.2-2 (dimensionless)
p =	157	157	157	days/year with at least 0.01 in. of precipitation

Vehicle Activity	
14	trucks per hour
45,455	trucks per year
29	mean vehicle weight
18	truck weight (tons)
22	load weight (tons)

Rounding to 2

Vehicular Traffic ID	Miles/Trip	Number of Trips/Hour	Number of Trips/Year	Emission Factor (lbs/VMT)	Control Device Type	Control Device Effic(%)	TSP Emissions Uncontrolled (lb/hr)	Uncontrolled (tpy)	Controlled (lb/hr)	Controlled (tpy)
Trucks	0.94	14	45,455	6.82	HR-WS	70	87.45	145.74	26.23	43.72
							87.45	**145.74**	**26.23**	**43.72**

Vehicular Traffic ID	Miles/Trip (miles)	Number of Trips/Hour (trips/hour)	Number of Trips/Year (trips/year)	Emission Factor (lbs/VMT)	Control Device Type	Control Device Effic(%)	PM10 Emissions Uncontrolled (lb/hr)	Uncontrolled (tpy)	Controlled (lb/hr)	Controlled (tpy)
Trucks	0.94	14	45,455	2.01	HR-WS	70	25.81	43.02	7.74	12.91
							25.81	**43.02**	**7.74**	**12.91**

Vehicular Traffic ID	Miles/Trip (miles)	Number of Trips/Hour (trips/hour)	Number of Trips/Year (trips/year)	Emission Factor (lbs/VMT)	Control Device Type	Control Device Effic(%)	PM2.5 Emissions Uncontrolled (lb/hr)	Uncontrolled (tpy)	Controlled (lb/hr)	Controlled (tpy)
Trucks	0.94	14	45,455	0.20	HR-WS	70	2.58	4.30	0.77	1.29
							2.58	**4.30**	**0.77**	**1.29**

ATTACHMENT O

MONITORING/RECORDKEEPING/REPORTING/TESTING PLANS

ATTACHMENT O

MONITORING/RECORDKEEPING/ REPORTING/TESTING PLANS

Prairie Transportation, Inc. plans to follow the monitoring, recordkeeping, reporting, and testing required by the issued permit.

ATTACHMENT P

PUBLIC NOTICE

Attachment P – Public Notice

AIR QUALITY PERMIT NOTICE

Notice of Application

Notice is given that Prairie Transportation, Inc. has applied to the West Virginia Department of Environmental Protection for an after-the-fact permit of the Prairie Bulk Terminal on Lazzelle Union Road near Maidsville, Monongalia County, West Virginia. The latitude and longitude coordinates are: 39.6764 and -79.9808.

The applicant estimates the potential to discharge the following Regulated Air Pollutants from the facility will be: PM of 46.26 tons per year (tpy), PM10 of 14.47 tpy, PM2.5 of 2.10 tpy, VOC of 3.42 tons per year (tpy), SO2 of 2.80 tons per year (tpy), NOx of 14.25 tons per year (tpy), CO of 5.29 tons per year (tpy), and HAPS of 0.0482 tons per year (tpy).

Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, 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 (PLEASE INSERT DAY) day of December 2015.

By: Prairie Transportation
Robert Smith
President
110 E. Main Street
Suite 320
Ottawa, Illinois 61350