CONSOLIDATED REGULATION 13 APPLICATION FOR DUNBAR HMA PLANT #30, FRAP SYSTEM, AND PORTABLE CRUSHING AND SCREENING SYSTEM

Prepared for:

West Virginia Paving, Inc.
2950 Charles Avenue
Dunbar, West Virginia 25064

Prepared by:

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7012 MacCorkle Avenue, SE
Charleston, West Virginia 25304
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Project No. 0101-16-0318-030

March 2018

POTESTA

TABLE OF CONTENTS

Attachments Not Applicable to this Application: Attachments H, M*, Q, R and S.
* Information on the cyclone and baghouse included in Attachment L.

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):*
West Virginia Paving, Inc.

2. Federal Employer ID No. ***(FEIN):***
55-0714092

3. Name of facility *(if different from above):*
Dunbar HMA Plant #30

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

5A. Applicant's mailing address:
2950 Charles Avenue
Dunbar, West Virginia 25064

5B. Facility's present physical address:
2950 Charles Avenue
Dunbar, West Virginia 25064

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: NA

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 owns site.

➪ 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.): Hot Mix Asphalt Plant, FRAP System, and Portable Crushing and Screening System.

10. North American Industry Classification System **(NAICS)** code for the facility:
324121

11A. DAQ Plant ID No. (for existing facilities only):
039-00020

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
G20-A014

All of the required forms and additional information cn 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 I-64 West, take exit 53 and take ramp right toward County Route 25. Go 0.1 mile and turn right onto 10th Street. Go 0.2 mile and turn right onto WV-25 (Fairlawn Avenue). Go 1.5 miles and turn left at stoplight onto King Street. Go approximately 0.5 miles toward the river and turn left onto Charles Avenue. Site is on the right.

.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
Same	Dunbar	Kanawha
12.E. UTM Northing (KM): 4,247.035	12F. UTM Easting (KM): 433.551	12G. UTM Zone: 17

13. Briefly describe the proposed change(s) at the facility:
West Virginia Paving, Inc. proposes to move from general permit registration to Regulation 13 permit to include the entire site in one permit and permit the portable RAP System.

14A. Provide the date of anticipated installation or change: 05/01/2018 ➪ If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen:	14B. Date of anticipated Start-Up if a permit is granted: 05/01/2018

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:
HMA: Hours Per Day 12; Days Per Week 6; Weeks Per Year 40
FRAP: Hours Per Day 12; Days Per Week 6; Weeks Per Year 9
Portable Crushing and Screening: Hours Per Day 24; Days Per Week 7; Weeks Per Year 52.

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

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

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

Section II. Additional attachments and supporting documents.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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 **Included in HMA EUDS**	☐ Flare
☐ Adsorption Systems	☐ Condenser	☒ Mechanical Collector **Included in HMA EUDS**
☐ 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 Brookover DATE: 3-2-18

(Please use blue ink) *(Please use blue ink)*

35B. Printed name of signee: Robert Brookover		35C. Title: Vice President
35D. E-mail: bbrookover@wvpaving.com	36E. Phone: 304-768-9733	36F. FAX: 304-720-6492
36A. Printed name of contact person (if different from above): Trey Mattox		36B. Title: Environmental Manager
36C. E-mail: tmattox@wvpaving.com	36D. Phone: 304-720-2422	36E. FAX: 304-720-6492

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

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
WEST VIRGINIA PAVING INC
2950 CHARLES AVE
DUNBAR, WV 25064-2103

BUSINESS REGISTRATION ACCOUNT NUMBER: **1036-6199**

This certificate is issued on: 06/14/2010

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with W.Va. Code § 11-12.

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

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

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

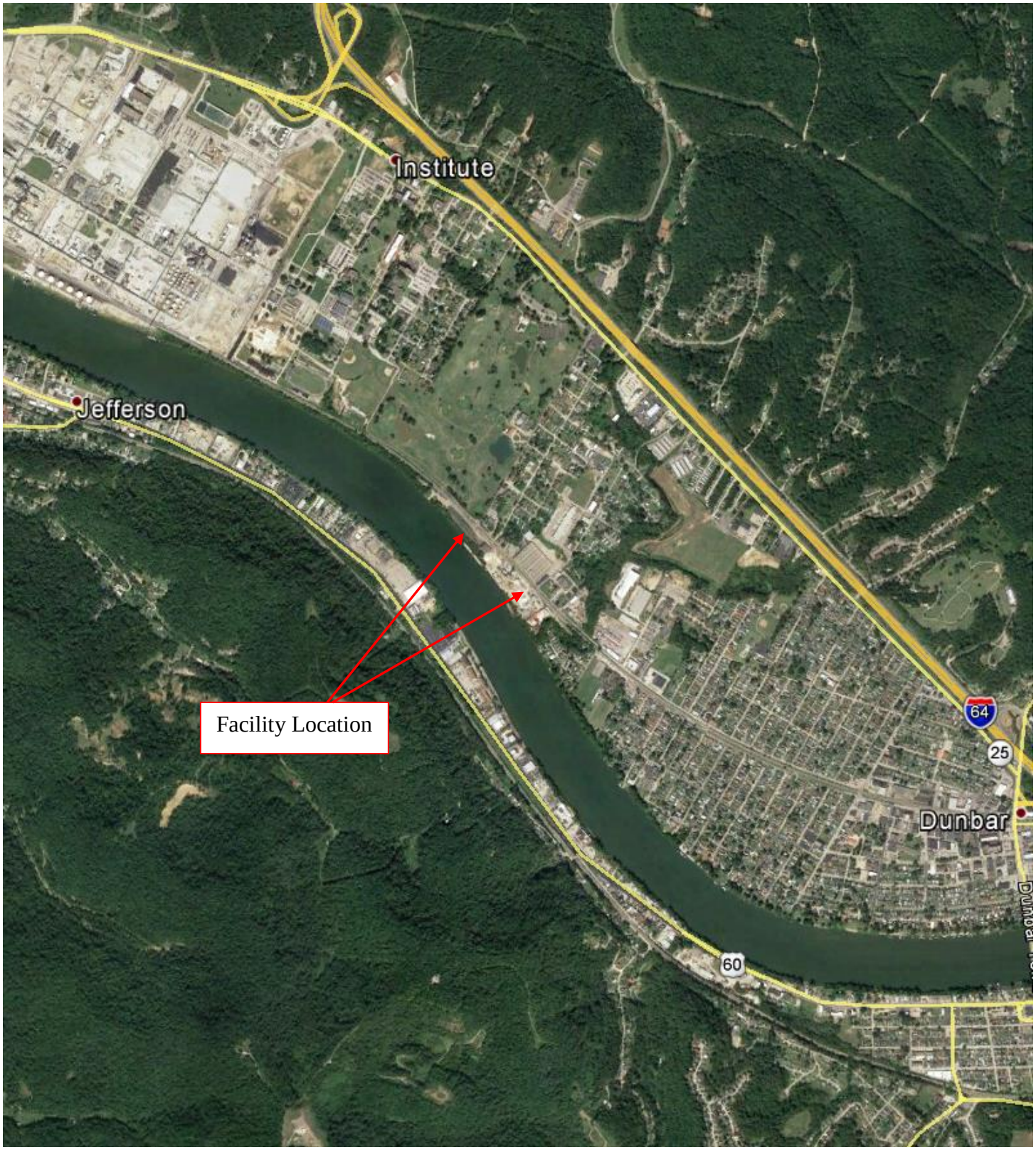
Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

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

atL006 v.1
L1112742656

ATTACHMENT B

AREA MAP



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Area Map

West Virginia Paving, Inc.
HMA, FRAP System, and Portable Crushing & Screening System
Dunbar Location
Kanawha County, West Virginia

ATTACHMENT C

INSTALLATION AND START UP SCHEDULE

ATTACHMENT C

SCHEDULE OF INSTALLATION

This permit application is being submitted to place the entire facility under a Regulation 13 Individual Permit. The application also includes permitting a portable crushing system which will be brought to the site as needed to size RAP. There is no construction activity related to this application. The facility will start operating under the individual permit upon issuance.

ATTACHMENT D

REGULATORY DISCUSSION

ATTACHMENT D

REGULATORY DISCUSSION

The facility is subject to the following regulations:

A. 45CSR7 requires the facility to maintain fugitive dust control systems and obtain required permits.

B. 45CSR3 – "To Prevent and Control Particulate Air Pollution from the Operation of Hot Mix Asphalt Plants"

C. 45CSR13 – "Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits, and Procedures for Evaluation"

D. 45CSR16 – "Standards of Performance for Stationary Sources," which incorporates by reference 40CFR60 Subpart I, "Standards of Performance for Hot Mix Asphalt Facilities", and 40CFR60 Subpart OOO, "Standards of Performance for Non-Metallic Mineral Processing Plants".

E. 45CSR22 – "Air Quality Management Fee Program"

F. 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 facility PTE does not exceed 100,000 metric tpy of CO2e and is therefore not subject to regulation under the rule.

G. 40CFR63 Subpart ZZZZ – "National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines" The clamshell engine (CE1) is subject to the provisions of this subpart, specifically requirements for existing non-emergency stationary engines with between 300 and 500 HP constructed at area sources before June 12, 2006. The engine has been retrofitted with a catalyst and has passed performance testing (Appendix).

Note on the Hot Oil Heater AH1: The DAQ "Policy on Regulations 2 and 10 Record Keeping and Reporting Requirements", exempts fuel burning units less than 10 million Btu's from the provisions of 45CSR2 and 45CSR10 as detailed in §45-2-11 and §45-10-9, and from the reporting and record keeping guidance found within the policy. As a result, AH-1 is not subject to any substantive requirement of 45CSR2 or 45CSR10.

Non-Road Engines

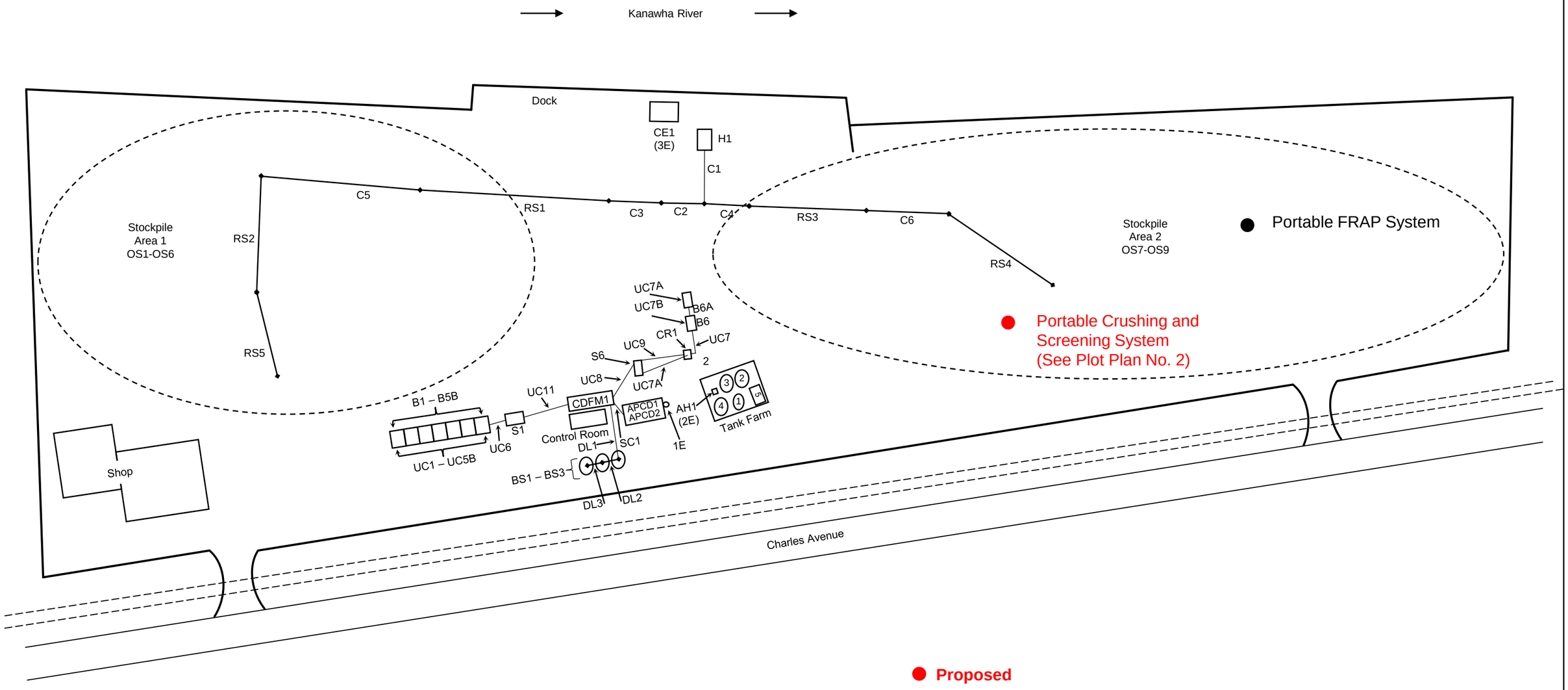
There are two engines in this application which are not subject to permitting. These engines are portable/transportable and do not remain in one location within a facility for 12 months. The engine on the FRAP system (F-ENG1) and the engine on the portable crushing and screening system (P-ENG1) meet the definition of a non-road engine in 40 CFR Part 1068.30. Non-road engines are not subject to 40CFR60 Subpart IIII or Subpart JJJJ nor 40CFR63 Part ZZZZ. Furthermore, these engines are not subject to permitting under Regulation 13, 45CSR13, Section 1.1., Scope, which excludes non-road engines.

Engine F-ENG1 is an onboard engine on a track-mounted system. The engine both powers the equipment and provides the unit with mobility to move around the site as needed. This type of engine was the subject of a Request for Determination in which the United States Environmental Protection Agency (EPA), Region III, issued a determination on February 21, 2018 which stated this type of engine was a non-road engine.

Engine P-ENG1 is a generator which is mounted in a trailer. The trailer's purpose is to move the engine to the location which it is needed to power other facilities (portable crushing and screening). EPA issued a determination specifically on this engine to West Virginia Paving, Inc. stating this engine was a non-road engine. The letter from EPA was undated but included a reference code of 3AP20.

ATTACHMENT E

PLOT PLAN



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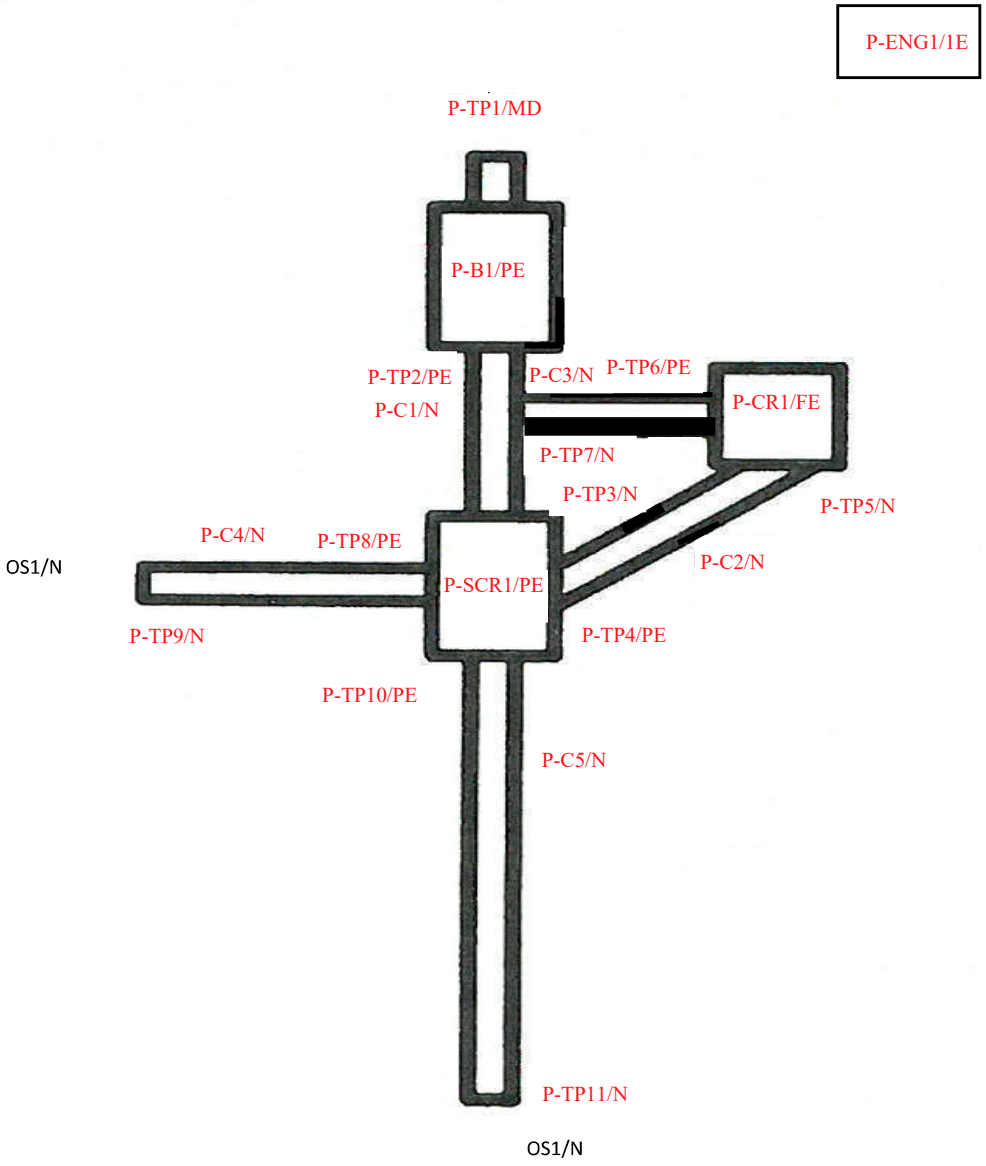
PLOT PLAN No. 1
WEST VIRGINIA PAVING, INC.
HMA PLANT #30 - DUNBAR, WV
JULY 2013

Project No. 0101-16-0318-030



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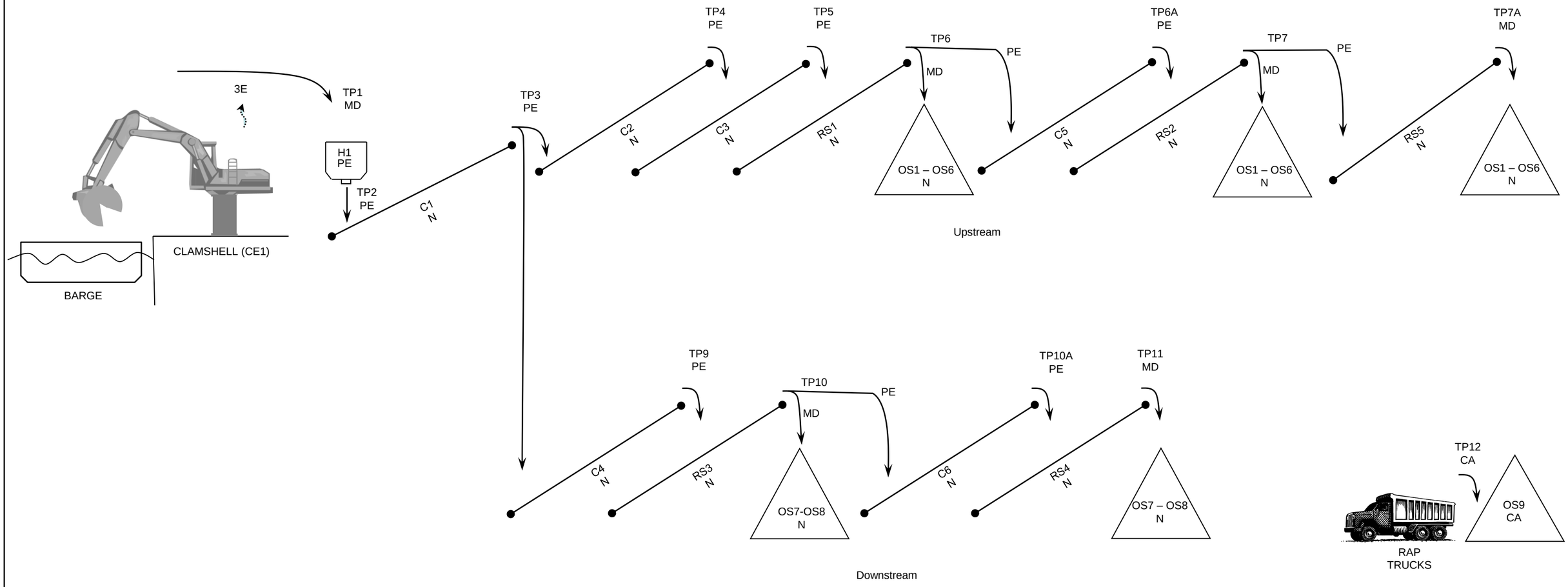
PLOT PLAN No. 2
Portable Crushing and Screening Facility
West Virginia Paving, Inc.
Project No. 0101-16-0318-030

ATTACHMENT F

DETAILED PROCESS FLOW DIAGRAM



POTESTA
Engineers and Environmental Consultants

7012 MacCorkle Avenue, SE
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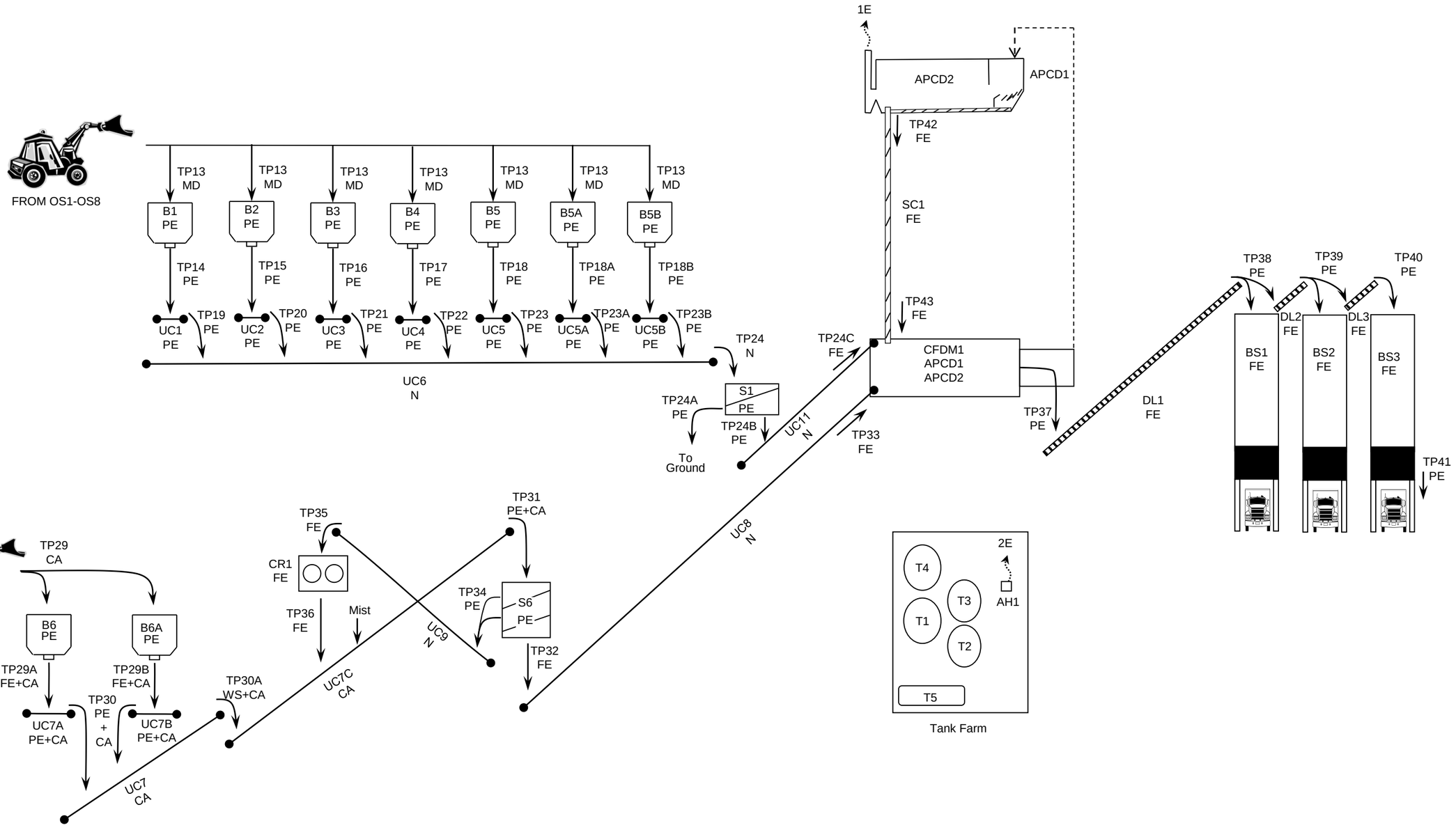
PROCESS FLOW DIAGRAM No. 1
WEST VIRGINIA PAVING, INC.
HMA PLANT #30 - DUNBAR, WV
JULY 2013

Project No. 0101-16-0318-030

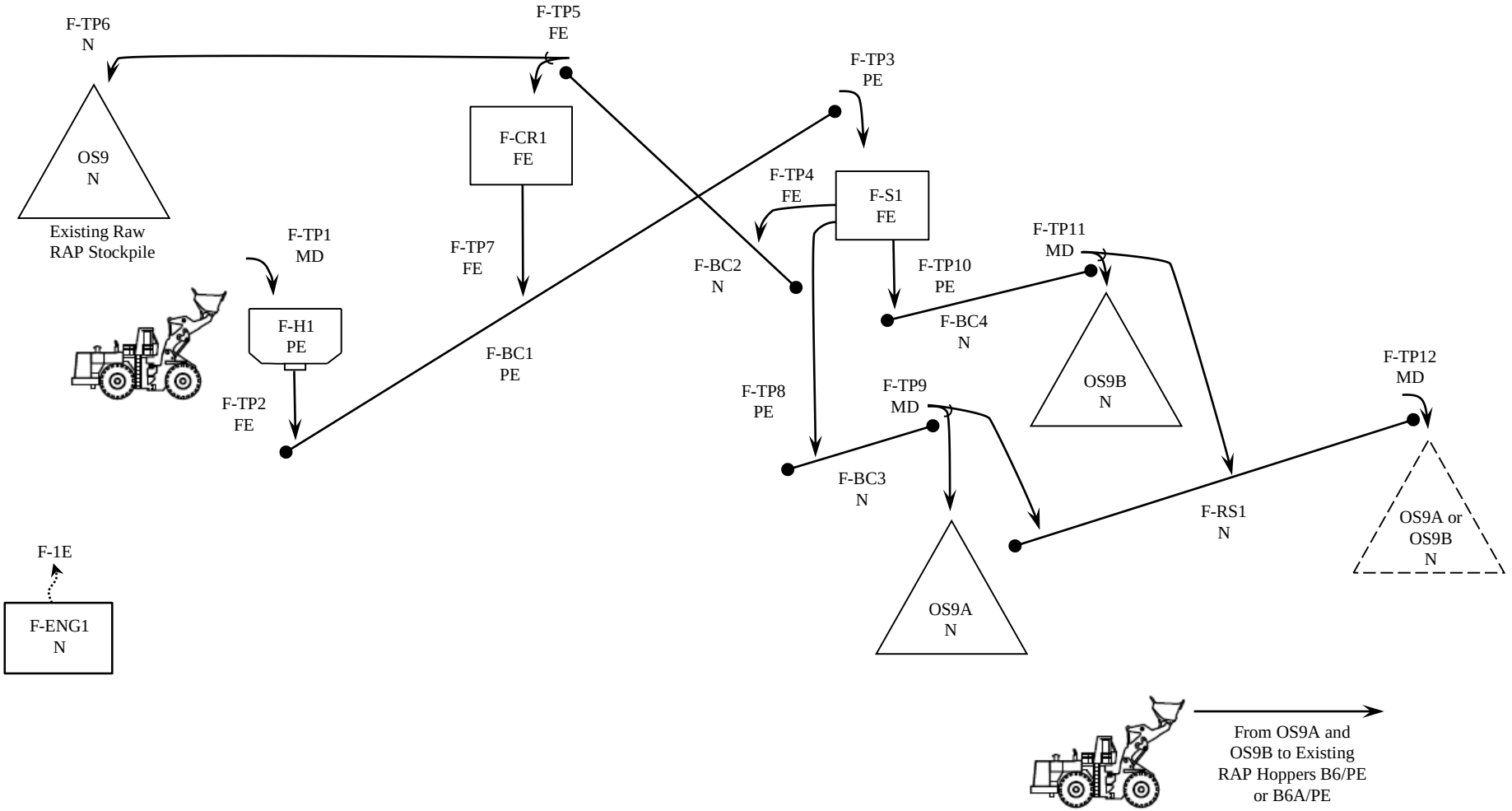


POTESTA
Engineers and Environmental Consultants

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

PROCESS FLOW DIAGRAM No. 2
WEST VIRGINIA PAVING, INC.
HMA PLANT #30 - DUNBAR, WV
JULY 2013

Project No. 0101-16-0318-030



Notes: F-RS1 will be fed by F-BC3 or F-BC4 at any given time, not both at the same time.
OS9A and OS9B will be considered part of existing RAP stockpile OS9.

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7012 MacCorkle Avenue, SE
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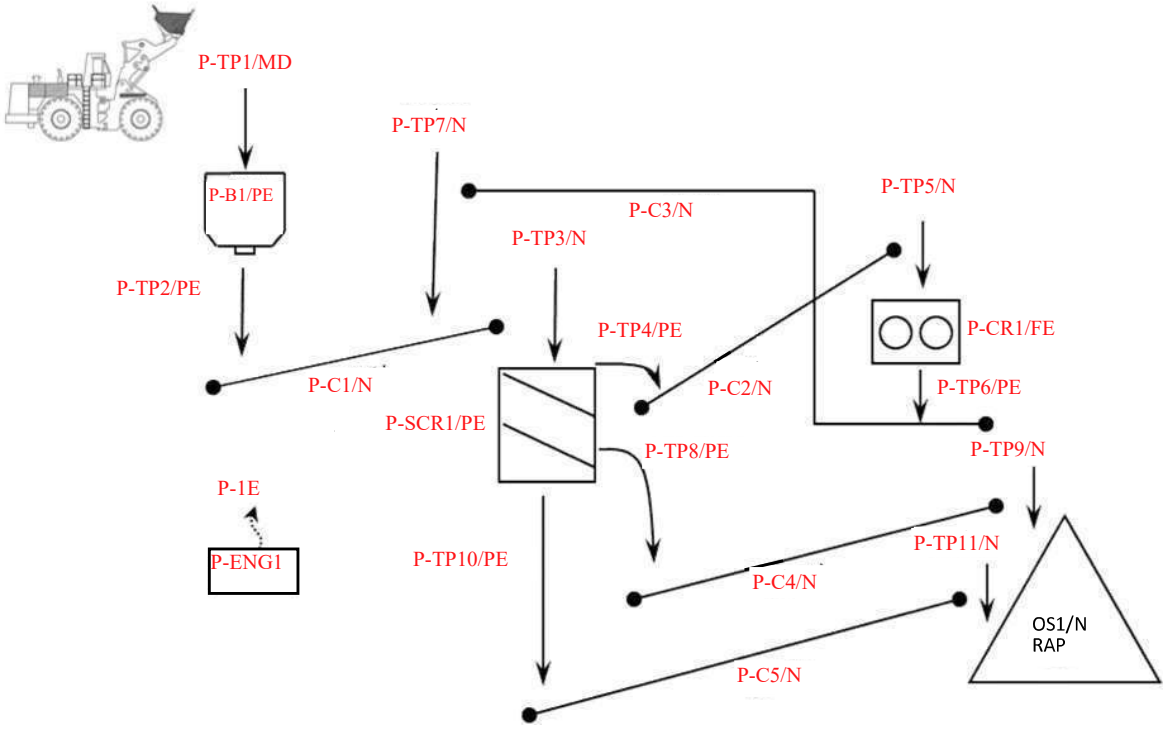
PROCESS FLOW DIAGRAM No. 3
PORTABLE FRAP PROCESSING SYSTEM
WEST VIRGINIA PAVING, INC.
August 2014

Project No. 0101-16-0318-030



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PROCESS FLOW DIAGRAM No. 4
Portable Crushing and Screening Facility
West Virginia Paving, Inc.
Project No. 0101-16-0318-030

ATTACHMENT G

PROCESS DESCRIPTION

ATTACHMENT G

PROCESS DESCRIPTION

The hot mix asphalt plant (HMA) and the portable fractionated reclaimed asphalt pavement (FRAP) system are currently permitted under General Permit G20-B187B. This application is being submitted to move that equipment from the G20-B187B permit to a Regulation 13 Individual Permit and to permit the portable crushing and screening system which will be brought to the site as needed.

The facility description below is provided to the three main operations: HMA plant, FRAP system, and the portable crushing and screening system.

HMA

Aggregates (sand, limestone, and slag) delivered to the site by barge and are unloaded by a stationary clamshell powered by a compression engine CE1/N (3E) which deposits material into a hopper H1/PE (TP1/MD). Material drops from the hopper onto a stationary conveyor belt, C1/N (TP2/PE). C1/N transfers material to one of two additional conveyor belts, C2/N or C4/N (TP3/PE).

Conveyor C2/N transfers material to conveyor C3/N (TP4/PE), then onto a radial stacker RS1/N (TP5/PE). From this radial stacker, material can either be placed in several stockpiles, OS1-OS6/N (TP6/MD) or material can transfer to another conveyor belt C5/N (TP6/PE). From C5/N, material is transferred to another radial stacker, RS2/N (TP6A/PE), which currently places material into stockpiles OS1-OS6/N (TP7/MD). This modification will add an additional radial stacker, RS5/N which will accept material transferred from RS2/N (TP7/PE) and move the material to stockpiles OS1-OS6/N (TP7A/MD).

Conveyor C4/N transfers material to radial stacker RS3/N (TP9/PE), which transports material to stockpile OS7/N or OS8/N (TP10/MD) or to conveyor C6/N (TP10/PE). Conveyor C6/N transfers material to radial stacker RS4/N (TP10A/PE), which transfers material to stockpile OS7/N or OS8/N (TP11/MD).

Recycled asphalt pavement (RAP) is trucked to the site and stored in stockpile OS9/CA (TP12/CA).

Aggregates from OS1/N through OS6/N transferred by a front-end loader to aggregate feed bins B1/PE through B5/PE (TP13/MD). This modification will add two additional aggregate bins, B5A/PE and B5B/PE (TP13/MD). From the bins, material drops onto conveyor belts located beneath each bin then onto a single conveyor belt; B1/PE to UC1/PE (TP14/PE) to UC6/PE (TP19/PE), B2/PE to UC2/PE (TP15/PE) to UC6/PE (TP20/PE), B3/PE to UC3/PE (TP16/PE) to UC6/PE (TP21/PE), B4/PE to UC4/PE (TP17/PE) to UC6/PE (TP22/PE), B5/PE to UC5/PE (TP18/PE) to UC6/PE (TP23/PE), B5A/PE to UC5A/PE (TP18A/PE) to UC6/PE (TP23A/PE), and B5B/PE to UC5B/PE (TP18B/PE) to UC6/PE (TP23B/PE).

Conveyor UC6/PE feeds an in-line scalping screen S1/PE (TP24/N). Oversized material drops to the ground (TP24A/PE) and properly sized material drops onto conveyor belt UC11/N (TP24B/PE) which feeds the new dryer/drum CFDM1/APCD1 & APCD2 (TP24C/FE).

RAP from OS9/CA is transferred by front-end loader to the existing RAP hopper B6/PE (TP29/CA), or the new RAP hopper B6A/PE (TP29/CA) that is being added as part of this modification. The RAP drops from the existing hopper B6/PE onto conveyor belt UC7A/PE+CA (TP29A/FE+CA) and then onto conveyor belt UC7/CA (TP30/PE+CA). From the new hopper B6A/PE, RAP drops onto new conveyor belt UC7B/PE+CA (TP29B/PE+CA) and then onto conveyor belt UC7/CA (TP30/PE+CA). Conveyor UC7/CA feeds conveyor belt UC7C/CA (TP30A/WS+CA), which feeds the RAP screen S6\PE (TP31/PE+CA). Oversized material from both screen decks drops onto conveyor belt UC9/N (TP34/PE), which feeds the RAP crusher CR1\FE (TP35/FE). RAP leaves the crusher and drops back onto conveyor belt UC7C/CA (TP36/FE), which returns the material to the RAP screen. A mister is located along this conveyor belt just after TP36/FE. Properly sized material leaves from the bottom deck of the screen only and drops onto conveyor belt UC8/N (TP32/FE), which transports the material to the new dryer/drum CFDM1/APCD1 & APCD2 (TP33/FE).

Liquid asphaltic cement from T1 and T4 is piped to CFDM1/APCD1 & APCD2, where the various materials are mixed to form hot mix asphalt (HMA) or warm mix asphalt (WMA). The dryer/drum is fired with natural gas, number 2 fuel oil from tank T2, or used oil from tank T3. The dryer/drum CFDM1 is vented to a baghouse equipped with an inertial separator APCD1 & APCD2.

Once mixed, the HMA/WMA leaves the drum and drops onto drag link conveyor DL1/FE (TP37/PE). HMA/WMA leaving drag link conveyor DL1/FE drops into asphalt silo BS1/FE or onto drag link conveyor DL2/FE via TP38/PE. From drag link conveyor DL2/FE, asphalt drops into asphalt silo BS2/FE or drag link conveyor DL3/FE via TP39/PE. From drag link conveyor DL3/FE, asphalt drops into BS3/FE (TP40/PE).

The HMA/WMA is transferred to trucks via the truck load-outs at the base of each of the silos (TP41/PE) and is shipped offsite.

Emissions from CFDM1 are vented to the inertial separator and baghouse APCD1 & APCD2 (1E). Collected particulate matter is returned to CFDM1/APCD1 & APCD2 via auger SC1/FE (TP42/FE and TP43/FE), where it becomes part of the product.

Asphaltic cement is trucked to the site and stored in heated tanks T1 and T4. Both tanks are heated via a natural gas-fired asphalt heater AH1/N (2E). Number 2 fuel oil is trucked to the site and stored in tank T2 and used oil is trucked to the site and stored in tank T3. Natural gas is piped to the facility. Asphalt emulsion (tack) is trucked to the site and stored in tank T5. This material is not used in the manufacture of HMA; rather it is transferred to asphalt paving contractor trucks for use off-site.

PORTABLE FRAP SYSTEM

West Virginia Paving, Inc. uses an ASTEC ProSizer® 3100 (a portable FRAP processing system), to process reclaimed asphalt pavement (RAP) at the site into high-quality, well-graded aggregate coated with asphaltic cement. The ASTEC ProSizer 3100 is equipped with a 200 tph double-deck screen and a 75 tph horizontal shaft impactor. The unit is powered by a John Deere 6068H 173 hp engine (F-ENG1/N [F-1E]) which is a non-road engine. A portable radial stacker is used with the system and is powered by the same engine. The unit is utilized for a short time before it is moved to another site and returns to the site as needed. FRAP is fed into the asphalt plant via the existing RAP feed system and the RAP throughput of the asphalt plant is not increased. There is no change in the permitted throughput or maximum storage capacity of the facility's raw and sized RAP stockpile (OS9/N).

RAP from existing RAP stockpile (OS9/N) is loaded into feed hopper F-H1/PE by an end loader [F-TP1/MD]. The feed bin feeds belt conveyor F-BC1/PE [F-TP2/FE], which transports the RAP to the double-deck screen F-S1/FE [F-TP3/PE]. Oversized material is fed to belt conveyor F-BC2/N [F-TP4/FE], which transports the material to the horizontal shaft impactor F-CR1/FE [F-TP5/FE]. The material drops from the crusher onto belt conveyor F-BC1/PE [F-TP7/FE], which transports it back to the screen. The crusher can also be arranged so that oversized material from the screen bypasses the crusher and returns to the RAP stockpile OS9/N [F-TP6/N].

The smaller fractions from the screen are discharged to belt conveyor F-BC3/N [F-TP8/PE] and F-BC4/N [F-TP10/PE]. F-BC3/N and F-BC4/N can transfer material directly to the sized RAP stockpiles OS9A/N [F-TP9/MD] and OS9B/N [F-TP11/MD] or to radial stacker F-RS1/N [F-TP9/MD or F-TP11/MD]. The radial stacker is only fed by one of the belt conveyors F-BC3/N or F-BC4/N at any given time; not both at the same time. Material from F-RS1/N is transferred to OS9A/N or OS9B/N [F-TP12/MD]. From stockpiles OS9A/N and OS9B/N, materials are transferred via end loader to the existing stationary RAP hopper B6/PE [TP-29/PE] or B6A/PE [TP-29PE].

When FRAP is transferred to the existing RAP system, the flop gate on the screen is opened so that the fractionated RAP passes through the screen and is not double-processed.

Sized FRAP stockpiles OS9A/N and OS9B/N will be part of the existing RAP stockpile OS9/N. The throughput of RAP will not be changed with this application, nor will additional storage be created. RAP will either be sized to a single size using the existing RAP equipment and there will be a single large RAP stockpile OS9/N or RAP will be sized to two different sizes with the portable FRAP equipment and there will be two smaller sized FRAP stockpiles OS9A/N and OS9B/N, but the capacity and base of the RAP/FRAP stockpile will remain unchanged.

PORTABLE CRUSHING AND SCREENING

West Virginia Paving, Inc. is submitting this application to have a Portable Crushing and Screening System for its Dunbar facility in Kanawha City permitted together with the HMA Plant and FRAP System under the same Regulation 13 Individual Permit. The portable unit

crushes RAP and is powered by a diesel generator set (P-ENG1 [P-1E]). The portable system may be located anywhere at the existing RAP stockpile. RAP is transferred from the existing site pile permitted under G20-B187B by front endloader to RAP bin P-B1/PE (P-TP1/MD). P-B1/PE drops material onto belt conveyor P-C1/N (P-TP2/PE) to screen P-SCR1/PE (P-TP3/N). Oversized material transfers to belt conveyor P-C2/N (P-TP4/PE) and is transported to the RAP crusher P-CR1/FE (P-TP5/N). Material leaving the crusher transfers to belt conveyor P-C3/N (P-TP6/PE) and back to P-C1/N (P-TP7/N) then to P-SCR1/PE. Pass through RAP from P-SCR1/PE transfers to conveyor P-C4/N (P-TP8/PE) to OS1/N (P-TP9/N) and to conveyor P-C5/N (P-TP10/PE) to OS1/N (P-TP11/N).

The diesel generator set (P-ENG1 [P-1E]) is a non-road engine. This genset is mounted in a trailer. When the portable crushing and screening facility is brought to this location, it will be powered by the non-road engine-genset. The genset is brought to the site and parked. The genset is not fastened to the ground or installed in any manner except being parked on the site.

ATTACHMENT I

EMISSION UNITS TABLE

HMA PLANT

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]
CE1	3E	Clamshell Compression Engine	2000 (Man.)	NA	No Change	N
HI	HI	Aggregate Hopper	2001	400 tph	No Change	N
C1	C1	Conveyor Belt	2001	400 tph	No Change	N
C2	C2	Conveyor Belt	2001	400 tph	No Change	N
C3	C3	Conveyor Belt	2001	400 tph	No Change	N
RS1	RS1	Radial Stacker	2001	400 tph	No Change	N
C5	C5	Conveyor Belt	2001	400 tph	No Change	N
RS2	RS2	Radial Stacker	2001	400 tph	No Change	N
RS5	RS5	Radial Stacker	2013	400 tph	No Change	N
C4	C4	Conveyor Belt	2001	400 tph	No Change	N
RS3	RS3	Radial Stacker	2001	400 tph	No Change	N
C6	C6	Conveyor Belt	2001	400 tph	No Change	N
RS4	RS4	Radial Stacker	2001	400 tph	No Change	N
B1	B1	Aggregate Bin	2001	400 tph	No Change	PE
B2	B2	Aggregate Bin	2001	400 tph	No Change	PE
B3	B3	Aggregate Bin	2001	400 tph	No Change	PE
B4	B4	Aggregate Bin	2001	400 tph	No Change	PE
B5	B5	Aggregate Bin	2001	400 tph	No Change	PE
B5A	B5A	Aggregate Bin	2001	400 tph	No Change	PE
B5B	B5B	Aggregate Bin	2001	400 tph	No Change	PE

[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 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]
UC1	UC1	Conveyor Belt	2001	400 tph	No Change	PE
UC2	UC2	Conveyor Belt	2001	400 tph	No Change	PE
UC3	UC3	Conveyor Belt	2001	400 tph	No Change	PE
UC4	UC4	Conveyor Belt	2001	400 tph	No Change	PE
UC5	UC5	Conveyor Belt	2001	400 tph	No Change	PE
UC5A	UC5A	Conveyor Belt	2001	400 tph	No Change	PE
UC5B	UC5B	Conveyor Belt	2001	400 tph	No Change	PE
UC6	UC6	Conveyor Belt	2001	400 tph	No Change	N
S1	S1	Scalping Screen	2001	400 tph	No Change	PE
UC11	UC11	Conveyor Belt	2001	400 tph	No Change	N
B6	B6	RAP Bin	2001	100 tph	No Change	PE
B6A	B6A	RAP Bin	2013	100 tph	No Change	PE
UC7A	UC7A	Conveyor Belt	2001	100 tph	No Change	PE+CA
UC7B	UC7B	Conveyor Belt	2013	100 tph	No Change	PE+CA
UC7	UC7	Conveyor Belt	2001	100 tph	No Change	CA
UC7C	UC7C	Conveyor Belt	2001	100 tph	No Change	CA
S6	S6	RAP Screen	2001	100 tph	No Change	PE
UC8	UC8	Conveyor Belt	2001	100 tph	No Change	N
UC9	UC9	Conveyor Belt	2001	100 tph	No Change	N
CR1	CR1	RAP Crusher	2001	100 tph	No Change	FE

[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 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]
CFDM1	1E	Counterflow Drum Mixer	2013	400 tph	No Change	APCD1 & APCD2
DL1	DL1	Drag Link Conveyor	2001	400 tph	No Change	FE
DL2	DL2	Drag Link Conveyor	2001	400 tph	No Change	FE
DL3	DL3	Drag Link Conveyor	2001	400 tph	No Change	FE
SC1	SC1	Screw Conveyor	2013	40 tph	No Change	FE
BS1	BS1	HMA Storage Silo	2001	400 tph	No Change	FE
BS2	BS2	HMA Storage Silo	2001	400 tph	No Change	FE
BS3	BS3	HMA Storage Silo	2001	400 tph	No Change	FE
OS1	OS1	Aggregate Stockpile	2001	400 tph	No Change	N
OS2	OS2	Aggregate Stockpile	2001	400 tph	No Change	N
OS3	OS3	Aggregate Stockpile	2001	400 tph	No Change	N
OS4	OS4	Aggregate Stockpile	2001	400 tph	No Change	N
OS5	OS5	Aggregate Stockpile	2001	400 tph	No Change	N
OS6	OS6	Aggregate Stockpile	2001	400 tph	No Change	N
OS7	OS7	Aggregate Stockpile	2001	400 tph	No Change	N
OS8	OS8	Aggregate Stockpile	2001	400 tph	No Change	N
OS9	OS9	RAP Stockpile	2001	400 tph	No Change	N
T1	T1	Asphaltic Cement Tank	2001	35,000 gal	No Change	N
T2	T2	No. 2 Fuel Oil Tank	2001	20,000 gal	No Change	N
T3	T3	Used Oil Tank	2001	22,000 gal	No Change	N
T4	T4	Asphaltic Cement Tank	2001	30,000 gal	No Change	N
T5	T5	Asphaltic Emulsion (Tack) Tank	2013	5,000 gal	No Change	N
AH1	2E	Asphalt Heater	2001	NA	No Change	N

[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.

PORTABLE FRAP SYSTEM

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]
F-H1	F-H1	RAP Hopper	2015	25 tons	No Change	PE
F-CR1	F-CR1	RAP Crusher	2015	75 tph	No Change	FE
F-S1	F-S1	Screen	2015	200 tph	No Change	FE
F-BC1	F-BC1	Belt Conveyor	2015	200 tph	No Change	PE
F-BC2	F-BC2	Belt Conveyor	2015	75 tph	No Change	N
F-BC3	F-BC3	Belt Conveyor	2015	200 tph	No Change	N
F-BC4	F-BC4	Belt Conveyor	2015	200 tph	No Change	N
F-RS1	F-RS1	Belt Conveyor	2015	200 tph	No Change	N
F-ENG1	F-1E	Gen Set (Non-Road)*	2015	9.28 gal/hr	No Change	N

*The engine meets the definition of a non-road engine under 40CFR Part 1068.30 and is not subject to Regulation 13 per Section 1.1., Scope.

[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

PORTABLE CRUSHING AND SCREENING SYSTEM

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]
P-B1	P-B1	RAP Bin	2018	20 tons	New	PE
P-C1	P-C1	Belt Conveyor	2018	100 tph	New	N
P-SCR1	P-SCR1	Screen	2018	100 tph	New	PE
P-C2	P-C2	Belt Conveyor	2018	100 tph	New	N
P-CR1	P-CR1	RAP Crusher	2018	100 tph	New	FE
P-C3	P-C3	Belt Conveyor	2018	100 tph	New	N
P-C4	P-C4	Belt Conveyor	2018	100 tph	New	N
P-C5	P-C5	Belt Conveyor	2018	100 tph	New	N
P-ENG1	P-1E	Gen Set (Non-Road)*	2018	47.5 gal/hr	New	N

*The engine meets the definition of a non-road engine under 40CFR Part 1068.30 and is not subject to Regulation 13 per Section 1.1., Scope.

[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 - **HMA PLANT**															
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			
IE	UVS	CFDM1	Counter Flow Drum Mixer	APCD1 APDC2	Inertial Separator Baghouse	NA	NA	PM PM10 PM2.5 SOx NOx CO VOC HCl HAPS-VOC* HAPS-Metal*	5,264 1,211 290 23.20 22.00 52.00 12.80 0.08 4.15 0.0495	3,290 757 181 14.50 13.75 32.50 8.00 0.05 2.60 0.0312	26.32 6.05 1.45 23.20 22.00 52.00 12.80 0.08 4.15 0.0495	16.45 3.60 0.86 14.50 13.75 32.50 8.00 0.05 2.60 0.0312	Solid Solid Solid Vapor Vapor Vapor Vapor Mist Vapor Solid	EE	NA
2E	UVS	AH1	Hot Oil Heater	NA	NA	NA	NA	PM PM10 PM2.5 SOx NOx CO VOC HAPS*	0.01 0.01 0.01 0.001 0.14 0.11 0.01 0.0026	0.04 0.04 0.04 0.004 0.59 0.50 0.03 0.0112	0.01 0.01 0.01 0.001 0.14 0.11 0.01 0.0026	0.04 0.04 0.04 0.004 0.59 0.50 0.03 0.0112	Solid Solid Solid Vapor Vapor Vapor Vapor Vapor	EE	NA
3E	UVS	CE1	Diesel Engine	NA	NA	NA	NA	PM PM10 PM2.5 SOx NOx CO VOC HAPS*	0.45 0.45 0.45 0.43 6.47 1.39 0.53 0.0055	1.30 1.30 1.30 1.24 18.63 4.00 1.53 0.0160	0.45 0.45 0.45 0.43 6.47 1.39 0.53 0.0055	1.30 1.30 1.30 1.24 18.63 4.00 1.53 0.0160	Solid Solid Solid Vapor Vapor Vapor Vapor Vapor	EE	NA
CR1	NA	CR1	RAP Crusher	FE	Full Enclosure	NA	NA	PM PM10 PM2.5	0.20 0.10 0.02	0.06 0.03 0.01	0.04 0.02 0.01	0.01 0.01 0.01	Solid Solid Solid	EE	NA
S1	NA	SI	Aggregate Screen	PE	Partial Enclosure	NA	NA	PM PM10 PM2.5	10.00 3.48 0.71	6.25 2.18 0.45	5.00 1.74 0.36	3.13 1.09 0.22	Solid Solid Solid	EE	NA

* See Attachment N for speciation of VOCs and HAPs

Table 1: Emissions Data (continued) - **HMA PLANT**

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			
S6	NA	S6	RAP Screen	PE	Partial Enclosure	NA	NA	PM PM10 PM2.5	2.50 0.87 0.18	2.34 0.82 0.17	1.25 0.44 0.09	1.17 0.41 0.0	Solid Solid Solid	EE	NA
TP1 to TP36	NA	TP1 to TP36	Transfer Points	Various	Various	NA	NA	PM PM10 PM2.5	24.15 11.71 1.47	14.72 7.14 0.96	14.64 7.11 0.91	9.13 4.39 0.66	Solid Solid Solid	EE	NA
TP37 to TP40	NA	TP37 to TP40	Silo Filling	Various	Various	NA	NA	PM PM10 PM2.5 VOC CO HAPS*	0.92 0.20 0.04 19.48 1.88 0.253	0.60 0.12 0.04 12.20 1.16 0.158	0.46 0.10 0.02 19.48 1.88 0.253	0.30 0.06 0.02 12.20 1.16 0.158	Solid Solid Solid Vapor Vapor Vapor	EE	NA
TP41	NA	TP41	HMA Loadout	Various	Various	NA	NA	PM PM10 PM2.5 VOC CO HAPS*	0.21 0.05 0.01 1.56 0.54 0.025	0.13 0.03 0.01 0.98 0.34 0.016	0.11 0.03 0.01 1.56 0.54 0.025	0.07 0.02 0.01 0.98 0.34 0.016	Solid Solid Solid Vapor Vapor Vapor	EE	NA
TP42 & TP 43	NA	TP42 & TP 43	Baghouse Dust Return	FE	FE	NA	NA	PM PM10 PM2.5	0.26 0.12 0.02	0.16 0.08 0.02	0.06 0.04 0.02	0.04 0.02 0.02	Solid Solid Solid	EE	NA

* 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 - **HMA PLANT**								
Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (^{o}F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
1E	NAv	220-365	76,718	NAv	~591 ft.	NAv	4,247.035	433.551
2E	NAv	NAv	NAv	NAv	~591 ft.	NAv	4,247.035	433.551
3E	NAv	NAv	NAv	NAv	~591 ft.	NAv	4,247.035	433.551

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

Attachment J – Emission Points Data Summary Sheet

Table 1: Emissions Data (continued) – **PORTABLE FRAP SYSTEM**

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			
F-TP1-12	NA	F-TP1-12	Transfer Points	Various	Various	NA	NA	PM PM10 PM2.5	0.94 0.57 0.08	0.30 0.18 0.02	0.64 0.38 0.05	0.21 0.12 0.02	Solid Solid Solid	EE	NA
F-CR1	NA	F-CR1	FRAP Crusher	FE	Full Enclosure	NA	NA	PM PM10 PM2.5	0.15 0.08 0.02	0.05 0.02 0.01	0.03 0.02 0.01	0.01 0.01 0.01	Solid Solid Solid	EE	NA
F-S1	NA	F-S1	FRAP Screen	FE	Full Enclosure	NA	NA	PM PM10 PM2.5	5.0 1.74 0.36	1.56 0.54 0.11	1.00 0.35 0.07	0.31 0.11 0.02	Solid Solid Solid Vapor Vapor Vapor	EE	NA
F-E1	UVS	F-ENG1	Diesel Engine	NA	NA	NA	NA	NON-ROAD ENGINE NOT INCLUDED IN PTE						EE	NA

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 - **PORTABLE FRAP SYSTEM**								
Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (^oF)	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
F-E1	NA	NA	NA	NA	~591 ft.	NA	4,247.0348	433.5511

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

Attachment J – Emission Points Data Summary Sheet

Table 1: Emissions Data (continued) - **PORTABLE CRUSHING AND SCREENING SYSTEM**															
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			
P-TP1-11	NA	P-TP1-11	Transfer Points	Various	Various	NA	NA	PM PM10 PM2.5	3.14 1.52 0.19	1.55 0.75 0.14	2.50 1.20 0.15	1.25 0.61 0.12	Solid Solid Solid	EE	NA
P-CR1	NA	P-CR1	RAP Crusher	FE	Full Enclosure	NA	NA	PM PM10 PM2.5	0.20 0.10 0.02	0.06 0.04 0.01	0.04 0.02 0.01	0.02 0.01 0.01	Solid Solid Solid	EE	NA
P-SCR1	NA	P-SCR1	RAP Screen	PE	Partial Enclosure	NA	NA	PM PM10 PM2.5	3.75 1.31 0.27	2.34 0.82 0.17	1.88 0.66 0.13	1.17 0.41 0.08	Solid Solid Solid	EE	NA
P-1E	UVS	P-ENG1	Diesel Engine	NA	NA	NA	NA	NON-ROAD ENGINE NOT INCLUDED IN PTE						EE	NA

* 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 – **PORTABLE CRUSHING AND SCREENING SYSTEM**								
Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (^{o}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
P-1E	0.67	891	4,587	NA	~588 ft.	NA	4,247.2606	433.3526

[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

HMA PLANT

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	PM PM10 PM2.5	18.50 3.70 0.93	9.31 1.86 0.47	4.63 0.93 0.23	2.33 0.47 0.12	EE
Unpaved Haul Roads	PM PM10 PM2.5	126.79 37.36 3.81	77.74 22.91 2.33	31.70 9.35 0.95	19.44 5.73 0.58	EE
Storage Pile Emissions	PM PM10 PM2.5	0.258 0.123 0.020	1.128 0.537 0.090	0.258 0.123 0.020	1.128 0.537 0.090	EE
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 K – Fugitive Emissions Data Summary Sheet

FRAP PLANT

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	NA	NA	NA	NA	NA
Unpaved Haul Roads	PM PM10 PM2.5	34.20 10.09 1.01	10.69 3.15 0.32	10.26 3.03 0.30	3.21 0.95 0.10	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 K – Fugitive Emissions Data Summary Sheet

PORTABLE CRUSHING AND SCREENING SYSTEM

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 - Endloaders	NA					
Unpaved Haul Roads - Endloaders	PM PM10 PM2.5	17.10 5.05 0.50	10.69 3.15 0.32	5.13 1.52 0.15	3.21 0.95 0.10	EE
Storage Pile Emissions	PM PM10 PM2.5	0.11 0.05 0.01	0.47 0.22 0.04	0.11 0.05 0.01	0.47 0.22 0.04	EE
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

HMA PLANT PRODUCTION AFFECTED SOURCE SHEET

General HMA Plant Information	Source Identification Number[1]	CFDM1		
	Manufacturer & Model Number	ASTEC RDB-9640		
	Date of Manufacture	2013		
	Plant Type[2]	CFDM		
	Max Production Rate (ton/hour)	400		
	Max Yearly Production (tons/year)	500,000		
	Annual Operation (hours/year)	5,760		
Batch Plant Information	Tons per Batch	NA		
	Batches per Hour	NA		
Drum Mixer Information	Drum Length (ft)	40		
	Drum Diameter (ft)	8		
Burner, Fuel & Combustion Data	Burner Manufacturer & Model Number	ASTEC WJ-100-G-OH-SF-S		
	Design Heat Input (mmBTU/hour)	110	110	110
	Excess Air (%)	20-25	25-30	25-30
	Fuel Type[3]	PNG	#2FO	UO
	Maximum Fuel Usage[4]	110,000 SCF/hr	774 gal/hr5760	774 gal/hr
	Fuel Heating Value[5]	1,028 Btu/SCF	138,000 Btu/gal	139,000 Btu/gal
	Maximum Sulfur Content (%)	20 gr/100 SCF	0.5%	0.5%
	Maximum Ash Content (%)	NA	0.01%	2.0%

1. Enter the appropriate Source Identification Number for each rotary dryer or drum mixer. Batch plant rotary dryer should be designated BPRD-1, parallel flow drum mixer designated PFDM-1, and counterflow drum mixer designated CDFM-1, etc.

2. Enter the Plant Type designation using the following codes:

Batch	Batch Plant	PFDM	Parallel Flow Drum Mix Plant
CFDM	Counterflow Drum Mix Plant	CNMX	Continuous Mix Plant
COMB	Combination Batch/Drum Mix Plant		

3. Enter the Fuel Type(s) using the following code:

PNG	Pipeline Quality Natural Gas	#2FO	Number 2 Fuel Oil
UO	Used or Recycled Oil		

4. Enter the maximum fuel use in standard cubic feet per hour (natural gas) or gallons per hour (fuel oil). List appropriate units.

5. Enter the Fuel heating value in Btu per standard cubic foot (natural gas) or Btu per gallon (fuel Oil). List appropriate units.

AIR POLLUTION CONTROL DEVICE AFFECTED SOURCE SHEET

HMA PLANT AIR POLLUTION CONTROL DEVICE DATA SHEET		PRIMARY COLLECTION (INERTIAL SEPARATOR)	SECONDARY COLLECTION (BAGHOUSE)
General Information	APCD Identification Number[1]	APCD1	APCD2
	Manufacturer & Model Number	No separate model number	ASTEC RBH-76
Physical Parameters	Number of Cylinders		
	Number of Compartments	1 compartment, 7 baffles	1 compartment, 1,152 bags
	Cylinder Diameter (ft)		
	Cylinder Length (ft)		
	Cone Length (ft)		
	Gas Inlet Area (ft)		25.56
	Gas Outlet Area (ft)		14.33
	Bag Cleaning Mechanism[2]		Pulse jet
	Total Cloth (fabric) Area (ft^2)		13,949
	Draft Fan HP		300
	Outlet Stack Area (ft^2)		13.77
Operational Parameters	Minimum Design ΔP (in H20)		2
	Maximum Design ΔP (in H20)		6
	Inlet Gas Flow Rate (ACFM)		76,718
	Inlet Gas Temperature (°F)		220-365
	Inlet Gas Pressure (PSIA)		Varies, typically ~4 in. WC
	Inlet Gas Velocity (ft/sec)		Up to 50.0
	PM Inlet Rate (grains/ACF)		48.7 (based on maximum air flow)
	PM Outlet Rate (grains/ACF)		0.04*
	Operating Air/Cloth Ratio (ft/min)		5.5

1. Enter the appropriate Air Pollution Control Device Identification Number for the primary and secondary collectors. The primary collector should be designated APCD-1 and the secondary collector designated APCD-2. If the secondary collector incorporates a knockdown or settling chamber and combines the functions of a primary and secondary collector, enter NONE for the primary collector APCD identification number and designate the secondary collector APCD-1.

2. Enter method used to clean bags: shaker, pulse jet, reverse jet or other.

* Emission limit from 40CFR60, Subpart I.

HMA PLANT PARTICULATE MATTER CAPTURE SYSTEM AFFECTED SOURCE SHEET

Pursuant to Section 2.3.5 of General Permit G-20B and 45CSR3, the registrant shall not cause, allow or permit a hot mix asphalt plant to operate that is not equipped with a particulate matter capture system. Such systems and devices shall be designed, operated and maintained in such a manner as to prevent the emission of particulate matter from any point other than a stack outlet.

A particulate matter capture system shall be used to confine, collect and transport particulate matter from dryers, hot elevators, screens, drum mixers, pugmills, weigh hoppers, hot bins and related components to air pollution control devices. Particulate matter capture systems shall include but not be limited to hoods, bins, ductwork, enclosures, air pollution control devices and fans.

Provide a written description of the hot mix asphalt plant's particulate matter capture system below:

The particulate matter capture system is comprised of an inertial separator, baghouse; exhaust fans, motors, and ducting. The particulates pass from the dryer through the ductwork and into the inertial separator where the larger particles are pulled out of the air stream to the bottom of the baghouse. The airflow continues into the baghouse where the remaining fines are captured by the bags and released by pulse jet air to the bottom of the baghouse. The fines and large particles are returned to the drum mixer through an auger system and become part of the final product.

HMA PLANT MATERIAL STORAGE & HANDLING AFFECTED SOURCE SHEET

Source Identification Number[1]	OS1	OS2	OS3	OS4	OS5	OS6
Material Stored[2]	Natural Sand Slag Sand	Slag	#8 Limestone	#8 Limestone	#67 Limestone	Limestone Sand
Maximum Yearly Throughput (tons/year)[3]	75,000 10,000	100,000	50,000	50,000	200,000	10,000
Typical Moisture Content (%)[4]	7	3	3	3	3	7
Average % of Material Passing Through 200 Mesh Sieve[5]	6	1	1	1	1	6
Maximum Stockpile Base Area (ft^2)[6]	12,000	15,900	4,500	10,500	13,225	8,000
Maximum Stockpile Height (ft)[7]	50	50	50	50	50	25
Maximum Storage Capacity (tons)[8]	25,000	10,000	8,500	8,500	10,000	3,000
Dust Control Method Applied to Storage[9]	N	N	N	N	N	N
Method of Material Load-in to Bin or Stockpile[10]	MC	MC	MC	MC	MC	MC
Dust Control Method Applied During Load-in[11]	MD	MD	MD	MD	MD	MD
Method of Material Load-out from Bin or Stockpile[10]	FE	FE	FE	FE	FE	FE
Dust Control Method Applied During Load-out[11]	MD	MD	MD	MD	MD	MD

1. Enter the appropriate Source Identification Number for each storage activity using the following codes. For example, if the facility utilizes four open stockpiles and one storage silo, the Source Identification Numbers should be OS-1, OS-2, OS-3, and OS-4; and BS-1, respectively.
   - OS Open Stockpile
   - BS Bin or Storage Silo (full enclosure)
   - SF Stockpiles with wind fences
   - E3 Enclosure (three-sided enclosure)
   - SB Storage Building (full enclosure)
   - OT Other (please specify)
2. Describe the type of material stored or stockpiled.
3. Enter the maximum yearly storage throughput for each storage activity.
4. Enter the average percent moisture content of the stored material.
5. Enter the average percent of material that will pass through a 200 mesh sieve.
6. For stockpiles, enter the maximum stockpile base area.
7. For stockpiles, enter the maximum stockpile height.
8. Enter the maximum storage capacity for each storage activity in tons (e.g. silo capacity, maximum stockpile size, etc.).
9. Enter the dust control method applied to storage activity using the following codes:
   - CA Crusting Agent
   - FE Full Enclosure
   - OT Other _____ (please specify)
   - WS Water Spray
   - NO None
10. Enter the method of load-in or load-out to/from stockpiles or bins using the following codes:
    - FE Front Endloader
    - ST Stacking Tube
    - CS Clamshell
    - OT Other _____ (please specify)
    - SS Stationary Conveyor/Stacker
    - MC Mobile Conveyor/Stacker
    - TD Truck Dump
11. Enter the dust control method applied during load-in or load-out using the following codes:
    - CA Crusting Agent
    - FE Full Enclosure
    - ST Stacking Tube
    - WS Water Spray
    - MD Minimize Drop Height
    - NO None

HMA PLANT MATERIAL STORAGE & HANDLING AFFECTED SOURCE SHEET

Source Identification Number[1]	OS7	OS8	OS9	B1	B2	B3
Material Stored[2]	467's Limestone	Crusher Run Limestone	RAP	Aggregates		
Maximum Yearly Throughput (tons/year)[3]	100,000	10,000	125,000	500,000 for B1-B5B combined		
Typical Moisture Content (%)[4]	3	3	3	3-7		
Average % of Material Passing Through 200 Mesh Sieve[5]	1	1	1	1-6		
Maximum Stockpile Base Area (ft^2)[6]	10,000	10,350	84,000			
Maximum Stockpile Height (ft)[7]	50	25	50			
Maximum Storage Capacity (tons)[8]	5,500	3,000	100,000	20	20	20
Dust Control Method Applied to Storage[9]	N	N	CA	PE	PE	PE
Method of Material Load-in to Bin or Stockpile[10]	MC	MC	TD	FE	FE	FE
Dust Control Method Applied During Load-in[11]	MD	MD	MD	MD	MD	MD
Method of Material Load-out from Bin or Stockpile[10]	FE	FE	FE	SS	SS	SS
Dust Control Method Applied During Load-out[11]	MD	MD	CA	PE	PE	PE

1. Enter the appropriate Source Identification Number for each storage activity using the following codes. For example, if the facility utilizes four open stockpiles and one storage silo, the Source Identification Numbers should be OS-1, OS-2, OS-3, and OS-4; and BS-1, respectively.
   - OS Open Stockpile
   - BS Bin or Storage Silo (full enclosure)
   - SF Stockpiles with wind fences
   - E3 Enclosure (three-sided enclosure)
   - SB Storage Building (full enclosure)
   - OT Other _____ (please specify)
2. Describe the type of material stored or stockpiled.
3. Enter the maximum yearly storage throughput for each storage activity.
4. Enter the average percent moisture content of the stored material.
5. Enter the average percent of material that will pass through a 200 mesh sieve.
6. For stockpiles, enter the maximum stockpile base area.
7. For stockpiles, enter the maximum stockpile height.
8. Enter the maximum storage capacity for each storage activity in tons (e.g. silo capacity, maximum stockpile size, etc.).
9. Enter the dust control method applied to storage activity using the following codes:
   - CA Crusting Agent
   - FE Full Enclosure
   - OT Other _____ (please specify)
   - WS Water Spray
   - NO None
10. Enter the method of load-in or load-out to/from stockpiles or bins using the following codes:
    - FE Front Endloader
    - ST Stacking Tube
    - CS Clamshell
    - OT Other _____ (please specify)
    - SS Stationary Conveyor/Stacker
    - MC Mobile Conveyor/Stacker
    - TD Truck Dump
11. Enter the dust control method applied during load-in or load-out using the following codes:
    - CA Crusting Agent
    - FE Full Enclosure
    - ST Stacking Tube
    - OT Other _____ (please specify)
    - WS Water Spray
    - MD Minimize Drop Height
    - NO None

HMA PLANT MATERIAL STORAGE & HANDLING AFFECTED SOURCE SHEET

Source Identification Number[1]	B4	B5	B5A	B5B	B6	B6A
Material Stored[2]	Aggregates				RAP	
Maximum Yearly Throughput (tons/year)[3]	500,000 for B1-B5B combined				125,000 combined	
Typical Moisture Content (%)[4]	3-7				3	
Average % of Material Passing Through 200 Mesh Sieve[5]	1-6				1	
Maximum Stockpile Base Area (ft^2)[6]						
Maximum Stockpile Height (ft)[7]						
Maximum Storage Capacity (tons)[8]	20	20	20	20	20	20
Dust Control Method Applied to Storage[9]	PE	PE	PE	PE	PE	PE
Method of Material Load-in to Bin or Stockpile[10]	FE	FE	FE	FE	FE	FE
Dust Control Method Applied During Load-in[11]	MD	MD	MD	MD	CA	CA
Method of Material Load-out from Bin or Stockpile[10]	SS	SS	SS	SS	SS	SS
Dust Control Method Applied During Load-out[11]	PE	PE	PE	PE	FE+CA	FE+CA

1. Enter the appropriate Source Identification Number for each storage activity using the following codes. For example, if the facility utilizes four open stockpiles and one storage silo, the Source Identification Numbers should be OS-1, OS-2, OS-3, and OS-4; and BS-1, respectively.
   - OS Open Stockpile
   - E3 Enclosure (three-sided enclosure)
   - BS Bin or Storage Silo (full enclosure)
   - SB Storage Building (full enclosure)
   - SF Stockpiles with wind fences
   - OT Other _____ (please specify)
2. Describe the type of material stored or stockpiled.
3. Enter the maximum yearly storage throughput for each storage activity.
4. Enter the average percent moisture content of the stored material.
5. Enter the average percent of material that will pass through a 200 mesh sieve.
6. For stockpiles, enter the maximum stockpile base area.
7. For stockpiles, enter the maximum stockpile height.
8. Enter the maximum storage capacity for each storage activity in tons (e.g. silo capacity, maximum stockpile size, etc.).
9. Enter the dust control method applied to storage activity using the following codes:
   - CA Crusting Agent
   - WS Water Spray
   - FE Full Enclosure
   - NO None
   - OT Other _____ (please specify)
10. Enter the method of load-in or load-out to/from stockpiles or bins using the following codes:
   - FE Front Endloader
   - SS Stationary Conveyor/Stacker
   - ST Stacking Tube
   - MC Mobile Conveyor/Stacker
   - CS Clamshell
   - TD Truck Dump
   - OT Other _____ (please specify)
11. Enter the dust control method applied during load-in or load-out using the following codes:
   - CA Crusting Agent
   - WS Water Spray
   - FE Full Enclosure
   - MD Minimize Drop Height
   - ST Stacking Tube
   - NO None
   - OT Other _____ (please specify)

HMA PLANT MATERIAL STORAGE & HANDLING AFFECTED SOURCE SHEET

Source Identification Number[1]	BS1	BS2	BS3	H1		
Material Stored[2]	HMA			Aggregates		
Maximum Yearly Throughput (tons/year)[3]	500,000			500,000		
Typical Moisture Content (%)[4]				3-7		
Average % of Material Passing Through 200 Mesh Sieve[5]				1-6		
Maximum Stockpile Base Area (ft^2)[6]						
Maximum Stockpile Height (ft)[7]						
Maximum Storage Capacity (tons)[8]	200	200	200	200		
Dust Control Method Applied to Storage[9]	FE	FE	FE	PE		
Method of Material Load-in to Bin or Stockpile[10]	SS	SS	SS	CS		
Dust Control Method Applied During Load-in[11]	PE	PE	PE	MD		
Method of Material Load-out from Bin or Stockpile[10]	Chute	Chute	Chute	SS		
Dust Control Method Applied During Load-out[11]	PE	PE	PE	PE		

1. Enter the appropriate Source Identification Number for each storage activity using the following codes. For example, if the facility utilizes four open stockpiles and one storage silo, the Source Identification Numbers should be OS-1, OS-2, OS-3, and OS-4; and BS-1, respectively.
   OS Open Stockpile E3 Enclosure (three-sided enclosure)
   BS Bin or Storage Silo (full enclosure) SB Storage Building (full enclosure)
   SF Stockpiles with wind fences OT Other _____ (please specify)
2. Describe the type of material stored or stockpiled.
3. Enter the maximum yearly storage throughput for each storage activity.
4. Enter the average percent moisture content of the stored material.
5. Enter the average percent of material that will pass through a 200 mesh sieve.
6. For stockpiles, enter the maximum stockpile base area.
7. For stockpiles, enter the maximum stockpile height.
8. Enter the maximum storage capacity for each storage activity in tons (e.g. silo capacity, maximum stockpile size, etc.).
9. Enter the dust control method applied to storage activity using the following codes:
   CA Crusting Agent WS Water Spray
   FE Full Enclosure NO None
   OT Other _____ (please specify)
10. Enter the method of load-in or load-out to/from stockpiles or bins using the following codes:
   FE Front Endloader SS Stationary Conveyor/Stacker
   ST Stacking Tube MC Mobile Conveyor/Stacker
   CS Clamshell TD Truck Dump
   OT Other Chute (please specify)
11. Enter the dust control method applied during load-in or load-out using the following codes:
   CA Crusting Agent WS Water Spray
   FE Full Enclosure MD Minimize Drop Height
   ST Stacking Tube NO None
   OT Other _____ (please specify)

HMA PLANT FUGITIVE DUST CONTROL SYSTEM
AFFECTED SOURCE SHEET

Fugitive Dust Control System Data	Fugitive Dust Control Method [1]	WS
	Design Water Flow Rate (gpm) [2]	7.1 or 28.3 (depending on nozzle size)
	Chemical Additive [3]	N/A
	Water/Additive Mix Ratio [4]	N/A
	Amount (gal/yd) [5]	~0.3
	Frequency of Application [6]	As needed to control
	Haulroad Surface [7]	Gravel
	Work/Storage Area Surface [8]	Gravel
	Haulroad Length [9]	0.25 mile (round-trip)
	Number of Vehicles per day [10]	444
	Number of Wheels per Vehicle [11]	Varies – see Attachment N
	Weight of Vehicle (tons) [12]	Varies – see Attachment N

1.Enter the fugitive dust control method(s) using the following codes:
WT Water Truck WS Fixed Water Sprays
UW Underbody Truck Wash RS Rumble Strips
OT Other _____ (please specify)
2. Enter the design water flow rate for the water truck or fixed water sprays in gallons per minute.
3. Enter manufacturer and type, specification or grade of chemical additive.
4. Enter the water/chemical additive mix ratio.
5. Enter the amount of water or water/chemical additive mix to be applied to haulroads, storage and work areas in gallons per square yard.
6. Enter the frequency of application of water/chemical additive mix to haulroads, storage and work areas during periods of dry weather.
7. Enter the type of haulroad, work and storage area surface (asphalt pavement, concrete, dirt, coarse gravel, reddog, etc.).
8. Enter the approximate length of haulroad(s) in miles or feet. List appropriate units.
9. Enter the maximum daily vehicle traffic (trucks per day).
10. Enter the maximum number of wheels per vehicle.
11. Enter the mean vehicle weight in tons.
12. Complete a separate HMA Plant Fugitive Dust Control System Data sheet for each fugitive dust control system.

Provide a written description of the hot mix asphalt plant's fugitive dust control system below:

Fugitive emissions occur during load-in and load-out of materials to the stockpiles, aggregate feed bins, and RAP bin, as well on the storage area and haulroad due to vehicle traffic. During load-in and load-out of the aggregate stockpiles and feed bins, minimization of drop height is used to control fugitives.

Load-in to the RAP bin is controlled by the inherent crusting quality of the asphalt associated with RAP. Load-out is controlled not only by the inherent crusting agent, but also by partial enclosures.

A dust suppression system made up fixed water sprays is used to control fugitive emissions from the vehicle traffic in the storage area and on the haulroad.

HMA PLANT ASPHALT HEATER AFFECTED SOURCE SHEET

Source Identification Number[1]	Maximum Fuel Use[2]	Fuel Type[3]	Hours of Operation (hrs/yr)[4]
AH1	1,350 scf/h	PNG	8,760*

* Hours of operation for asphalt heater are higher than the hours of operation for the asphalt plant to allow asphaltic cement and emulsion to stay warm during hours when the plant is not operational.

1. Enter the appropriate Source Identification Number for each asphaltic cement tank heater located at the hot mix asphalt plant. Asphaltic cement tank heaters should be designated AH-1, AH-2, etc.
2. Enter the maximum fuel use in standard cubic foot per hour (natural gas) or gallons per hour (fuel oil). List appropriate units.
3. Enter the Fuel Type using the following codes:
   PNG Pipeline Quality Natural Gas #2FO Number 2 Fuel Oil UO Used Oil
4. Enter the maximum hours of operation each year.

HMA PLANT STORAGE TANK AFFECTED SOURCE SHEET

Source Identification Number[1]	Content[2]	Length[3] (ft)	Dia[4] (ft)	Volume[5] (gallons)	Throughput[6] (gal/yr)	Orientation[7]	Liquid Height[8] (ft)
T1	Asphaltic Cement	43	11.7	35,000	6,000,000*	VERT	~29
T2	#2 FO/ Diesel	22	12.5	20,000	2,000,000	VERT	~15
T3	UO	24	12.5	22,000	2,000,000	VERT	~16
T4	Asphaltic Cement	38	11.7	30,000	6,000,000*	VERT	~25
T5	Asphaltic Emulsion	21	6.5	5,000	125,000	HORZ	~4.25

*Annual throughput of T1 and T4 combined.

1.Enter the appropriate Source Identification Number for each storage tank located at the hot mix asphalt plant. Storage tanks should be designated T-1, T-2, T-3, etc.
2.Enter storage tank content (#2 fuel oil, asphaltic cement, water, etc.)
3.Enter storage tank length in feet.
4.Enter storage tank diameter in feet.
5. Enter storage tank volume in gallons. Storage tank volume may be calculated using the following mathematical relationship:
   (length of tank) X (area conversion) X (tank diameter)^2 X (liquid volume conversion) or,
   (L_{tank} ft) X (3.14/4) X (d^2_{tank} ft^2) X (7.48 gallons/ft^3)
6. Enter storage tank throughput in gallons per year.
7. Enter storage tank orientation using the following codes:
   VERT Vertical Tank HORZ Horizontal Tank
8. Enter storage tank average liquid height in feet.
9. Storage tank emissions may be calculated using TANKS emission calculation program.

CRUSHING AND SCREENING AFFECTED SOURCE SHEET

Source Identification Number[1]		S1	S6	CR1		
Type of Crusher or Screen[2]		Scalping Screen	Scalping Screen	Mill Crusher		
Make, Model No., Serial No.[3]		ASTEC	ASTEC	ASTEC		
Date of Construction, Reconstruction, or Modification (Month/Year)[4]		2001	2001	2001		
Maximum Throughput[5]	tons/hour	400	100	100		
	tons/year	500,000	125,000	125,000		
Material sized from/to:[6]		2" x 0"	½" x 0"	2" x 0"/ ½" x 0"		
Average Moisture Content (%)[7]		3-7	2	2		
Control Device ID Number[8]		NA	NA	NA		
Baghouse Stack Parameters[9]	height (ft)					
	diameter (ft)					
	volume (ACFM)					
	exit temp (°F)					
	UTM Coordinates					
Maximum Operating Schedule[10]	hours/day	24	24	24		
	days/year	240	240	240		
	hours/year	5760	5760	5760		

1. Enter the appropriate Source Identification Number for each crusher and screen. For example, in the case of an operation which incorporates multiple crushers, the crushers should be designated CR-1, CR-2, CR-3 etc. beginning with the breaker or primary crusher. Multiple screens should be designated S-1, S-2, S-3 etc.
2. Describe types of crushers and screens using the following codes:

HM	Hammermill	SS	Stationary Screen	DR	Double Roll Crusher
SD	Single Deck Screen	BM	Ball Mill	DD	Double-Deck Screen
RB	Rotary Breaker	TD	Triple Deck Screen	JC	Jaw Crusher
GC	Gyratory Crusher	OT	Other		

3. Enter the make, model number, and serial number of the crusher/screen.
4. Enter the date that each crusher and screen was constructed, reconstructed, or modified.
5. Enter the maximum throughput for each crusher and screen in tons per hour and tons per year.
6. Describe the nominal material size reduction (e.g. +2"/ -⅜").
7. Enter the average percent moisture content of the material processed.
8. Enter the appropriate Control Device Identification Number for each crusher and screen. Refer to Table A - *Control Device Listing* and *Control Device Identification Number Instructions* in the *Reference Document* for Control Device ID prefixes and numbering.
9. Enter the appropriate stack parameters if a baghouse control device is used.
10. Enter the maximum operating schedule for each crusher and screen in hours per day, days per year and hours per year.

CONVEYING AFFECTED SOURCE SHEET

Source Identification Number[1]	Date of Construction, Reconstruction, or Modification (Month/Year)[2]	Type of Material Handled[3]	Size of Material Handled[4]	Maximum Material Transfer Rate[5]		Average Moisture Content (%)[6]	Control Device[7]
				tons/hour	tons/year		
C1	2001	Aggregates	2" x 0"	400	500,000	3-7	N
C2	2001	Aggregates	2" x 0"	400	500,000	3-7	N
C3	2001	Aggregates	2" x 0"	400	500,000	3-7	N
RS1	2001	Aggregates	2" x 0"	400	500,000	3-7	N
C5	2001	Aggregates	2" x 0"	400	500,000	3-7	N
RS2	2001	Aggregates	2" x 0"	400	500,000	3-7	N
RS5	2013	Aggregates	2" x 0"	400	500,000	3-7	N
C4	2001	Aggregates	2" x 0"	400	500,000	3-7	N
RS3	2001	Aggregates	2" x 0"	400	500,000	3-7	N
C6	2001	Aggregates	2" x 0"	400	500,000	3-7	N
RS4	2001	Aggregates	2" x 0"	400	500,000	3-7	N
UC1	2001	Aggregates	2" x 0"	400	500,000	3-7	N
UC2	2001	Aggregates	2" x 0"	400	500,000	3-7	N
UC3	2001	Aggregates	2" x 0"	400	500,000	3-7	N
UC4	2001	Aggregates	2" x 0"	400	500,000	3-7	N
UC5	2001	Aggregates	2" x 0"	400	500,000	3-7	N

1. Enter the appropriate Source Identification Number for each conveyor using the following codes. For example, multiple belt conveyors should be designated BC-1, BC-2, BC-3 etc. Transfer points are considered emission points, not sources, and should not be included in the *Conveying Affected Source Sheet*. Transfer Point Identification Numbers shall be assigned in the *Emission Calculation Sheet*.
   BC Belt Conveyor BE Bucket Elevator DL Drag-link Conveyor
   PS Pneumatic System SC Screw Conveyor VC Vibrating Conveyor
   OT Other
2. Enter the date that each crusher and screen was constructed, reconstructed, or modified.
3. Enter the type of material being handled - Raw Coal (RC) Sized Coal (SC) Clean Coal (CC) Refuse (R) Other (O)
4. Enter the nominal size of the material being conveyed (e.g. clean coal - ¾" x 0). If more than one material is handled by the listed conveyor, list each material and enter the appropriate data for each material.
5. Enter the maximum material transfer rate for each conveyor in tons per hour and tons per year.
6. Enter the average percent moisture content of the conveyed material.
7. Enter the control device for the conveyor. PE - Partial Enclosure (example 3/4 hoop), FE - Full Enclosure, N – None,

CONVEYING AFFECTED SOURCE SHEET

Source Identification Number[1]	Date of Construction, Reconstruction, or Modification (Month/Year)[2]	Type of Material Handled[3]	Size of Material Handled[4]	Maximum Material Transfer Rate[5]		Average Moisture Content (%)[6]	Control Device[7]
				tons/hour	tons/year		
UC5A	2001	Aggregates	2" x 0"	400	500,000	3-7	PE
UC5B	2001	Aggregates	2" x 0"	400	500,000	3-7	PE
UC6	2001	Aggregates	2" x 0"	400	500,000	3-7	N
UC7A	2001	RAP	2" x 0"	100	500,000	3	PE+CA
UC7B	2013	RAP	2" x 0"	100	125,000	3	PE+CA
UC7	2001	RAP	2" x 0"	100	125,000	3	CA
UC7C	2001	RAP	2" x 0"	100	125,000	3	CA
UC8	2001	RAP	2" x 0"	100	125,000	3	N
UC9	2001	RAP	2" x 0"	100	500,000	3	N
UC11	2001	Aggregates	2" x 0"	400	500,000	3-7	N
DL1	2001	HMA	NA	400	500,000	NA	FE
DL2	2001	HMA	NA	400	500,000	NA	FE
DL3	2001	HMA	NA	400	500,000	NA	FE
SC1	2013	Baghouse Dust	-0"	40	50,000	1	FE

1. Enter the appropriate Source Identification Number for each conveyor using the following codes. For example, multiple belt conveyors should be designated BC-1, BC-2, BC-3 etc. Transfer points are considered emission points, not sources, and should not be included in the *Conveying Affected Source Sheet*. Transfer Point Identification Numbers shall be assigned in the *Emission Calculation Sheet*.
   BC Belt Conveyor BE Bucket Elevator DL Drag-link Conveyor
   PS Pneumatic System SC Screw Conveyor VC Vibrating Conveyor
   OT Other
2. Enter the date that each crusher and screen was constructed, reconstructed, or modified.
3. Enter the type of material being handled - Raw Coal (RC) Sized Coal (SC) Clean Coal (CC) Refuse (R) Other (O)
4. Enter the nominal size of the material being conveyed (e.g. clean coal - ¾" x 0). If more than one material is handled by the listed conveyor, list each material and enter the appropriate data for each material.
5. Enter the maximum material transfer rate for each conveyor in tons per hour and tons per year.
6. Enter the average percent moisture content of the conveyed material.
7. Enter the control device for the conveyor. PE - Partial Enclosure (example 3/4 hoop), FE - Full Enclosure, N – None,

ENGINE DATA SHEET

Source Identification Number[1]		CE1(3E)					
Engine Manufacturer and Model		Komatsu PC750-6 SAA6D140E					
Manufacturer's Rated bhp/rpm		444 HP at 1,800 rpm					
Source Status[2]		ES					
Date Installed/Modified/Removed (Month/Year)[3]		2000					
Engine Manufactured/Reconstruction Date[4]		NA					
Is this a Certified Stationary Compression Ignition Engine according to 40CFR60 Subpart IIII? (Yes or No)[5]		No					
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart JJJJ? (Yes or No)[6]		No					
Engine, Fuel and Combustion Data	Engine Type[7]	Compression Ignition					
	APCD Type[8]	N					
	Fuel Type[9]	#2 FO					
	H_2S (gr/100 scf)	NA					
	Operating bhp/rpm	444 HP @1,800 rpm					
	BSFC (Btu/bhp-hr)	NA					
	Fuel throughput (ft^3/hr)	11 gal/hr					
	Fuel throughput ($MMft^3$/yr)	63,360 gal/yr					
	Operation (hrs/yr)	5,760					
Reference[10]	Potential Emissions[11]	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
AP	NO_X	6.47	18.63				
AP	CO	1.39*	4.00*				
AP	VOC	0.53	1.53				
AP	SO_2	0.43	1.24				
AP	PM_{10}	0.45	1.30				
AP	Formaldehyde	0.0017	0.0049				
*Engine is subject to CFR63, Subpart ZZZZ. Emissions testing, after the installation of a catalyst, proved the engine meets the requirements for the rule with reduction of CO by at least 70%. The emissions test is attached to this application as an Appendix. The CO emissions shown here are pre-catalyst installation.							

1. Enter the appropriate Source Identification Number for each reciprocating internal combustion compressor/generator engine located at the facility. Multiple compressor engines should be designated CE-1, CE-2, CE-3 etc. Emergency 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 compression 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	0.80	0.36
s =	Silt content of road surface material (%)		
p =	Number of days per year with precipitation >0.01 in.		

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	Trucks	10-18	29	NA	0.06	10	6,945	WS	7S
2	Endloaders	4	34	NA	0.25	67	83,334	WS	7S
3									
4									
5									
6									
7									

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

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

Where:

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

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/PM2.5			
	Uncontrolled		Controlled		Uncontrolled		Controlled	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
1	4.01	1.39	1.00	0.35	1.18/0.12	0.41/0.04	0.30/0.03	0.10/0.01
2	122.78	76.35	30.70	19.09	36.18/3.69	22.50/2.29	9.05/0.92	5.63/0.57
3								
4								
5								
6								
7								
TOTALS	126.79	77.74	31.70	19.44	37.36/3.81	22.91/2.33	9.35/0.95	5.73/0.58

FUGITIVE EMISSIONS FROM PAVED HAULROADS

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

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

Item Number	Description	Mean Vehicle Weight (tons)	Miles per Trip	Maximum Trips per Hour	Maximum Trips per Year	Control Device ID Number	Control Efficiency (%)
1	Trucks	28.72	0.25	37	37,234	WS	7S
2							
3							
4							
5							
6							
7							

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

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

Where:

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

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

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

SUMMARY OF PAVED HAULROAD EMISSIONS

Item No.	Uncontrolled		Controlled	
	lb/hr	TPY	lb/hr	TPY
1	18.50/3.70/0.93	9.31/1.86/0.47	4.63/0.93/0.23	2.33/0.47/0.12
2				
3				
4				
5				
6				
7				
8				
TOTALS	18.50/3.70/0.93	9.31/1.86/0.47	4.63/0.93/0.23	2.33/0.47/0.12

MATERIAL STORAGE & HANDLING
AFFECTED SOURCE SHEET
FRAP SYSTEM

Source Identification Number[1]	F-H1					
Material Stored[2]	Raw RAP					
Maximum Yearly Throughput (tons/year)[3]	125,000					
Typical Moisture Content (%)[4]	7.5					
Average % of Material Passing Through 200 Mesh Sieve[5]	7.5					
Maximum Stockpile Base Area (ft^2)[6]						
Maximum Stockpile Height (ft)[7]						
Maximum Storage Capacity (tons)[8]	25					
Dust Control Method Applied to Storage[9]	PE					
Method of Material Load-in to Bin or Stockpile[10]	FE					
Dust Control Method Applied During Load-in[11]	MD					
Method of Material Load-out from Bin or Stockpile[10]	SS					
Dust Control Method Applied During Load-out[11]	FE					

1. Enter the appropriate Source Identification Number for each storage activity using the following codes. For example, if the facility utilizes four open stockpiles and one storage silo, the Source Identification Numbers should be OS-1, OS-2, OS-3, and OS-4; and BS-1, respectively.
   - OS Open Stockpile
   - BS Bin or Storage Silo (full enclosure)
   - SF Stockpiles with wind fences
   - E3 Enclosure (three-sided enclosure)
   - SB Storage Building (full enclosure)
   - OT Other _____ (please specify)
2. Describe the type of material stored or stockpiled.
3. Enter the maximum yearly storage throughput for each storage activity.
4. Enter the average percent moisture content of the stored material.
5. Enter the average percent of material that will pass through a 200 mesh sieve.
6. For stockpiles, enter the maximum stockpile base area.
7. For stockpiles, enter the maximum stockpile height.
8. Enter the maximum storage capacity for each storage activity in tons (e.g. silo capacity, maximum stockpile size, etc.).
9. Enter the dust control method applied to storage activity using the following codes:
   - CA Crusting Agent
   - FE Full Enclosure
   - OT Other _____ (please specify)
   - WS Water Spray
   - NO None
10. Enter the method of load-in or load-out to/from stockpiles or bins using the following codes:
    - FE Front Endloader
    - ST Stacking Tube
    - CS Clamshell
    - OT Other _____ (Please specify)
    - SS Stationary Conveyor/Stacker
    - MC Mobile Conveyor/Stacker
    - TD Truck Dump
11. Enter the dust control method applied during load-in or load-out using the following codes:
    - CA Crusting Agent
    - FE Full Enclosure
    - ST Stacking Tube
    - OT Other (please specify)
    - WS Water Spray
    - MD Minimize Drop Height
    - NO None

CRUSHING AND SCREENING AFFECTED SOURCE SHEET

Source Identification Number[1]		F-CR1	F-S1			
Type of Crusher or Screen[2]		HSI	DD			
Make, Model No., Serial No.[3]		KPI-JCI 3136	PEP Vari-Vibe			
Date of Construction, Reconstruction, or Modification (Month/Year)[4]		2014*	2014*	*Initial usage was in 2014. This is a portable system that is used at this site then moved to other sites as needed.		
Maximum Throughput[5]	tons/hour	75	200			
	tons/year	67,500	125,000			
Material sized from/to:[6]		+4"/-4"	-1/2"			
Average Moisture Content (%)[7]		7.5	7.5			
Control Device ID Number[8]						
Baghouse Stack Parameters[9]	height (ft)					
	diameter (ft)					
	volume (ACFM)					
	exit temp (°F)					
	UTM Coordinates					
Maximum Operating Schedule[10]	hours/day	12	12			
	days/year	52	52			
	hours/year	625	625			

1. Enter the appropriate Source Identification Number for each crusher and screen. For example, in the case of an operation which incorporates multiple crushers, the crushers should be designated CR-1, CR-2, CR-3 etc. beginning with the breaker or primary crusher. Multiple screens should be designated S-1, S-2, S-3 etc.
2. Describe types of crushers and screens using the following codes:

HM	Hammermill	SS	Stationary Screen	DR	Double Roll Crusher
SD	Single Deck Screen	BM	Ball Mill	DD	Double-Deck Screen
RB	Rotary Breaker	TD	Triple Deck Screen	JC	Jaw Crusher
GC	Gyratory Crusher	OT	Other	HSI	Horizontal Shaft Impactor

3. Enter the make, model number, and serial number of the crusher/screen.
4. Enter the date that each crusher and screen was constructed, reconstructed, or modified.
5. Enter the maximum throughput for each crusher and screen in tons per hour and tons per year.
6. Describe the nominal material size reduction (e.g. +2"/ -⅜").
7. Enter the average percent moisture content of the material processed.
8. Enter the appropriate Control Device Identification Number for each crusher and screen. Refer to Table A - *Control Device Listing* and *Control Device Identification Number Instructions* in the *Reference Document* for Control Device ID prefixes and numbering.
9. Enter the appropriate stack parameters if a baghouse control device is used.
10. Enter the maximum operating schedule for each crusher and screen in hours per day, days per year and hours per year.

CONVEYING AFFECTED SOURCE SHEET

Source Identification Number[1]	Date of Construction, Reconstruction, or Modification (Month/Year)[2]	Type of Material Handled[3]	Size of Material Handled[4]	Maximum Material Transfer Rate[5]		Average Moisture Content (%)[6]	Control Device[7]
				tons/hour	tons/year		
F-BC1	2015	RAP	+4”	200	125,000	7.5	PE
F-BC2	2015	RAP	+4”	75	46,875	7.5	N
F-BC3	2015	FRAP	-4” to +1/2”	200	125,000	7.5	N
F-BC4	2015	FRAP	-1/2”	200	125,000	7.5	N
F-RS1	2015	FRAP	-4” to 0”	200	125,000	7.5	N

1. Enter the appropriate Source Identification Number for each conveyor using the following codes. For example, multiple belt conveyors should be designated BC-1, BC-2, BC-3 etc. Transfer points are considered emission points, not sources, and should not be included in the *Conveying Affected Source Sheet*. Transfer Point Identification Numbers shall be assigned in the *Emission Calculation Sheet*.
   BC Belt Conveyor BE Bucket Elevator DL Drag-link Conveyor
   PS Pneumatic System SC Screw Conveyor VC Vibrating Conveyor
   OT Other
2. Enter the date that each crusher and screen was constructed, reconstructed, or modified.
3. Enter the type of material being handled - Raw Coal (RC) Sized Coal (SC) Clean Coal (CC) Refuse (R) Other (O)
4. Enter the nominal size of the material being conveyed (e.g. clean coal - ¾" x 0). If more than one material is handled by the listed conveyor, list each material and enter the appropriate data for each material.
5. Enter the maximum material transfer rate for each conveyor in tons per hour and tons per year.
6. Enter the average percent moisture content of the conveyed material.
7. Enter the control device for the conveyor. PE - Partial Enclosure (example 3/4 hoop), FE - Full Enclosure, N – None

ENGINE DATA SHEET

Source Identification Number[1]		F-ENG1*				
Engine Manufacturer and Model		John Deere 6068HFC93A				
Manufacturer's Rated bhp/rpm		173 hp @ 2,400 rpm				
Source Status[2]		MS				
Date Installed/Modified/Removed (Month/Year)[3]		01/2015				
Engine Manufactured/Reconstruction Date[4]		05/17/2013				
Is this a Certified Stationary Compression Ignition Engine according to 40CFR60 Subpart IIII? (Yes or No)[5]		Yes, but not applicable				
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart JJJJ? (Yes or No)[6]		No				
Engine, Fuel and Combustion Data	Engine Type[7]	Compression Ignition				
	APCD Type[8]	N				
	Fuel Type[9]	#2 FO				
	H_2S (gr/100 scf)	Not applicable				
	Operating bhp/rpm	172 hp @ 2,400 rpm				
	BSFC (Btu/bhp-hr)	Not available				
	Fuel throughput (ft^3/hr)	9.28 gal/hr				
	Fuel throughput ($MMft^3$/yr)	5,800 gal/yr				
	Operation (hrs/yr)	625				
Reference[10]	Potential Emissions[11]	lbs/hr	tons/yr	lbs/hr	tons/yr	
*This engine is a non-road which excludes it from the PTE and 40CFR60, Subpart IIII and 40CFR63, Subpart ZZZZ regulations.						

1. Enter the appropriate Source Identification Number for each reciprocating internal combustion compressor/generator engine located at the facility. Multiple compressor engines should be designated CE-1, CE-2, CE-3 etc. Emergency 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 compression 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	0.80	0.36
s =	Silt content of road surface material (%)		
p =	Number of days per year with precipitation >0.01 in.		

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	Front Endloaders	4	31	NA	0.14	33	20,833	HR-WS	70
2									
3									
4									
5									
6									
7									

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

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

Where:

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

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	34.20	10.69	10.26	3.21	10.09/1.01	3.15/0.32	3.03/0.30	0.95/0.10
2								
3								
4								
5								
6								
7								
TOTALS	34.20	10.69	10.26	3.21	10.09/1.01	3.15/0.32	3.03/0.30	0.95/0.10

PORTABLE CRUSHING AND SCREENING SYSTEM
Affected Source Sheet
Source Specific Emissions Data: Solid Materials Sizing, Handling and Storage Facilities
Required Information Regarding
Dust Control Equipment Measures

1. If water or chemical sprays are to be used on conveyors, transfer points, stockpiles, etc... for dust control, the location of all spray bars or spray systems should be shown on the plot plans and/or line drawings. The following information should be provided for each spray system:

   a. Design water flow through spray bar
   b. Type and amount of chemicals used and the mix ratio of chemical to water used at the sprays.
   c. Methods employed to winterize sprays (e.g. keep sprays from freezing and becoming inoperable during cold weather)

Not Applicable

2. A detailed written description should be submitted of dust control measures/programs that will be employed on haul roads and in areas of vehicle activity around material stockpiled. The haulways and areas to be treated should be shown by shading or similar description on the plant plan. The following points should be specifically addressed:

   a. Equipment (e.g. water trucks, fixed spray bars, wheel and truck underbody washers, etc...) that will be used in this dust control program.
   b. Frequency of application of water and chemical to roads and stockpile areas during dry periods.
   c. Amount of chemical suppressants to be used, if applicable, in pounds or gallons per square yard of surface to be treated.
   d. Type of haulroad or haulway surface(s) that will be maintained (e.g. coarse gravel, reddog, etc...)
   e. Approximate maximum length of haulroads (miles or feet).
   f. Maximum daily truck traffic on haulroads (number of trucks).

Not Applicable

3. If full or partial enclosures are to be used to minimize dust entrainment, a drawing of each such enclosure should be submitted (for example at truck dump bins, breakers, conveyor transfer points).

4. If particulate control devices such as baghouses or scrubbers are to be used, complete an appropriate Air Pollution Control Device Sheet and furnish a drawing showing details of enclosures and ductwork associated with these control systems.

AFFECTED SOURCE SHEET

Source Specific Emissions Data: Solid Materials Sizing, Handling, and Storage Facilities

Plot Plan(s) and Line Drawing(s)

a. Finish the plot plan(s) of the plant area which contains sufficient detail to show the scaled layout of the equipment involved in each materials handling system (e.g. conveyors, transfer points, crushers, screens, bins, stockpiles, truck dump bins, etc...). Show equipment or buildings described in other sections of this application on the plot plan as appropriate. The guidelines for Plot Plans should be followed to the extent possible.

b. Furnish the line drawing(s) or schematic(s) showing each component or facet of each materials handling system (e.g. conveyors, transfer points, stockpiles, crushers, screens, bins etc...). Show process equipment described in other sections of this application as needed for clarity.

c. On the line drawing(s) or schematic(s) furnished in accordance with item (b) assign an ID number to each conveyor, transfer point (including truck, barge and rail car loading/unloading etc...), storage structure, stockpile, crusher, and screening unit. If any equipment is shown on the line drawing(s) which was described in other sections of this application, use the ID numbers assigned to the equipment in those other sections and indicate equipment name or type (e.g. rotary dryer, vertical kiln etc...)

d. To the extent possible, note the numbers assigned for equipment and storage facilities as per item (c) on the Plot Plans(s).

e. The assigned ID numbers for equipment and transfer points must be used to complete Tables 1, 2, and 3 following.

Table 1: Affected Storage Activity

ID Number	OS1	P-B1			
Affected Source Name	Open Stockpiling	B1			
Type Storage[1]	OS	Bin			
Material Stored	RAP	RAP			
Typical Moisture Content (%)	3	3			
Avg % of material passing 200 mesh sieve	4	4			
Maximum Total Yearly Throughput in storage (tons)	125,000	125,000			
Maximum Quantity of Material in Storage[2] (tons)	50,000	20			
Maximum Stockpile Base Area (sq. ft.)	111,600	NA			
Maximum Stockpile height (ft)	25	NA			
Type dust controls during storage[3]	N	PE			
Method of material load-in to bin or stockpile[4]	SS	FE			
Type dust controls during load-in[5]	MD	MD			
Method of material load-out to bin or stockpile[4]	FE	Feeder			
Type dust controls during load-out[5]	N	PE			

Table 2: Conveying and Transfer

ID Number	Type Conveyor or Transfer Point[6]	Material Handled [(Note nominal size of material transferred][7]	Material Conveying or Transfer Rate		Type Dust Control Measures[5]	Approximate Material Moisture Content (%)
			Maximum TPH	Maximum MM TPY		
Conveyor Belts						
P-C1	BC	+4" to -1/2"	150	187,500	N	3
P-C2	BC	+4" to -1/2"	100	62,500	N	3
P-C3	BC	+4" to -1/2"	100	62,500	N	3
P-C4	BC	+4" to -1/2"	100	125,000	N	3
P-C5	BC	+4" to -1/2"	100	125,000	N	3
Transfer Points						
P-TP1	OTH1	+4"/-4"	100	125,000	MD	3
P-TP2	OTH2	+4"/-4"	100	125,000	PE	3
P-TP3	OTH5	+4"/-4"	150	187,500	N	3
P-TP4	OTH4	+4"/-4"	100	62,500	PE	3
P-TP5	OTH5	+4"/-4"	100	62,500	N	3
P-TP6	OTH4	+4"/-4"	100	62,500	PE	3
P-TP7	01	+4"/-4"	100	62,500	N	3
P-TP8	OTH4	+4"/-4"	100	125,000	PE	3
P-TP9	OTH3	+4"/-4"	100	125,000	N	3
P-TP10	OTH4	+4"/-4"	100	125,000	PE	3
P-TP11	OTH3	+4"/-4"	100	125,000	N	3
OTH1 Excavator/Endloader to Hopper			03 Belt Conveyor to Hopper or Bin			
OTH2 Hopper to Crusher or Belt			10 Excavator to Truck or Other Stockpile			
OTH3 Conveyor to Stockpile						
OTH4 Crusher/Screen to Belt Conveyor						
OTH5 Belt Conveyor to Crusher/Screen						

Table 3: Crushing and Screening

ID Number		P-CR1	P-SCR1		
Type Crusher or Screen[8]		Crusher	Double Deck		
Material Sized		RAP	RAP		
Maximum Material Throughput	Tons/hour	100	150		
	Tons/year	62,500	187,500		
Material sized from/to:[9]		+4"/-4"	+4"/-4"		
Typical moisture content as crushed or screened (%)		3	3		
Type dust control		FE	PE		
Stack Parameters	height (ft)	NA	NA		
	diameter (ft)	NA	NA		
	Volume (ACFM)	NA	NA		
	Temp (°F)	NA	NA		
Maximum Operating Schedule	hour/day	24	24		
	day/year	365	365		
	hour/year	2,100	2,100		
Approximate Percentage of Operation from:	Jan-Mar	25%	25%		
	April-June	25%	25%		
	July-Sept	25%	25%		
	Oct-Dec	25%	25%		
Maximum Particulate Emissions	lb/hour	PM/PM10/PM2.5 0.04/0.02/0.01	PM/PM10/PM2.5 1.88/0.66/0.13		
	Ton/year	PM/PM10/PM2.5 0.02/0.01/0.01	PM/PM10/PM2.5 1.17/0.41/0.08		

Describe method of determining emissions and dust control efficiencies (if by test on a similar unit provide report, if by emission factor reference emission factors):

1 Type Storage - Code as follows: (Capacity of each bin, building or enclosure)

OS - Open Stockpile
B - Bin or Storage Silo (full enclosure)
SB - Storage Building (full enclosure)
E- Enclosure (walls but no top)
SWF- Stockpiles with wind fences
OTH- Other - Specify in footnote or attachment

2. Give maximum and average quantity of material in storage at any given time (e.g. silo capacity, stockpile size, etc...)

3. TYPE DUST CONTROLS DURING STORAGE
If storage is by other than by bin or full enclosure Code as follows:

N - None
WS- Water Sprays
C- Spraying with chemical surfactant
OTH- Other - Specify in footnote or attachment

4. METHOD OF PLACING MATERIAL ONTO STOCKPILE OR INTO BINS OR LOADING OUT FROM STOCKPILES OR BINS - Code as follows:

C- Clamshell
TD- Truck Dumping
FE-Front Endloader
ST-Stacking Tubes
MS- Mobile Conveyor - Stacker
SS- Stationary Conveyor - Stacker
P- Pneumatic Conveyor - Stacker
FC- Fixed Height Chute from bins
TC- Telescoping Chute from bins
UC- Under-pole or under-bin reclaim conveyor
RC- Reclaim Conveyor (rake or bucket reclaim conveyor reclaiming from surface of stockpile)
OTH- Other - Describe in a footnote or attachment

5. TYPE DUST CONTROLS - Code as follows:

N– None
WS- Water Sprays
WSA- Water Sprays with Wetting Agents
CS- Chemical Dust Suppressant (sprays, etc...)
FE-Full Enclosures
PE- Partial Enclosures
MD- Minimization of material drop height
EM- Enclosure and evacuation to mechanical collector
EB- Enclosure and evacuation to baghouse
ES- Enclosure and evacuation to scrubber
OTH- Other - describe in footnote or attachment

6. TYPE CONVEYOR OR TRANSFER POINT - Code as follows:

Conveyors

BC- Belt Conveyor
VC- Vibrating Conveyor
SC- Screw Conveyor
DL-Drag-link conveyor
BE- Bucket Elevator
PS- Pneumatic System
OTH- Other describe in footnote or attachment

Transfer Points

01- Conveyor to Conveyor
02- Conveyor to Bucket Elevator
03- Conveyor to Hopper or Bin
04- Bucket Elevator to Hopper or Bin
05- Pneumatic conveyor to bin
06- Truck Dumping onto ground
07- Truck Dumping into hopper
08- Loading trucks through stationary chute
09- Loading trucks through telescoping chute
10- Loading Trucks by endloader
11- Railcar unloading-side or bottom dumping
12- Railcar unloading-rotary unloader
13- Railcar loading /unloading by pneumatic system
14- Railcar loading through stationary source
15- Railcar loading through telescopic chute
16- Railcar loading by front end-loader
17- Railcar loading by railcar
18- Barge loading/unloading by clamshell
19- Barge unloading - bucket ladder unloader
20- Barge unloading - from a fixed-height conveyor or stationary chute
21- Barge loading - variable height conveyor or telescoping chute
22- Other - describe in footnote or attachment

7. If more than one material is handled by the listed conveyor or transfer point list each material and furnish the requested data in the table for each material.

8. Describe type of unit such as hammermill, ball mill, double-deck (DD) screen, double roll (DR) crusher, etc….

9. Describe nominal size reduction, example +2” / -3/8

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	See calculations for input into equation.	
s =	Silt content of road surface material (%)		
p =	Number of days per year with precipitation >0.01 in.		

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	Front Endloaders	4	31	NA	0.14	17	20,833	HR-WS	70
2									
3									
4									
5									
6									
7									

Source: *AP-42 Fifth Edition – 13.2.2 Unpaved Roads, 12/03*
$E = [k \times (s/12)^a \times (W/3)^b] * [(365 - p) \div 365]$ =lb/Vehicle Mile Traveled (VMT)
Where:

		PM	PM-10
k =	Particle size multiplier	See calculations for input into equation.	
s =	Silt content of road surface material (%)		
W =	Mean vehicle weight (tons)		
p =	Number of days per year with precipitation >0.01 in.		

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/PM2.5			
	Uncontrolled		Controlled		Uncontrolled		Controlled	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
1	17.10	10.69	5.13	3.21	5.05/0.50	3.15/0.32	1.52/0.15	0.95/0.10
2								
3								
4								
5								
6								
7								
TOTALS	17.10	10.69	5.13	3.21	5.05/0.50	3.15/0.32	1.52/0.15	0.95/0.10

ENGINE DATA SHEET

Source Identification Number[1]		P-ENG1*					
Engine Manufacturer and Model		Caterpillar 3412					
Manufacturer's Rated bhp/rpm		917/1,836					
Source Status[2]		NS					
Date Installed/Modified/Removed (Month/Year)[3]		2017					
Engine Manufactured/Reconstruction Date[4]		1989					
Is this a Certified Stationary Compression Ignition Engine according to 40CFR60 Subpart IIII? (Yes or No)[5]		No*					
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart JJJJ? (Yes or No)[6]		No					
Engine, Fuel and Combustion Data	Engine Type[7]	4-Stroke					
	APCD Type[8]	A/F					
	Fuel Type[9]	2FO					
	H_2S (gr/100 scf)	NA					
	Operating bhp/rpm	917/1,836					
	BSFC (Btu/bhp-hr)	NA					
	Fuel throughput (ft^3/hr)	47.5 gal/hr					
	Fuel throughput ($MMft^3$/yr)	NA					
	Operation (hrs/yr)	120					
Reference[10]	Potential Emissions[11]	lbs/hr	tons/yr				
*This engine is non-road which excludes it from the PTE and 40CFR60, Subpart IIII and 40CFR63, Subpart ZZZZ regulations.							

1. Enter the appropriate Source Identification Number for each reciprocating internal combustion compressor/generator engine located at the facility. Multiple compressor engines should be designated CE-1, CE-2, CE-3 etc. Emergency 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 compression 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 N

SUPPORTING EMISSIONS CALCULATIONS

West Virginia Paving, Inc.
HMA Plant #30

Potesta & Associates
Project No. 0101-16-0318-030

By: AM
Date: 02/26/2018

Checked by : PEW
Date: 02/26/2018

	PTE HMA PLANT #30				PTE Poratable FRAP System				PTE Portable Crushing and Screening			
	Uncontrolled		Controlled		Uncontrolled		Controlled		Uncontrolled		Controlled	
Emission Type	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
TSP	5,448.25	3403.78	84.93	54.54	40.29	12.6	11.93	3.74	24.30	15.11	9.66	6.12
PM10	1,268.89	793.75	26.40	17.86	12.48	3.89	3.78	1.19	8.03	4.98	3.45	2.20
PM2.5	297.19	186.84	4.53	4.05	1.47	0.46	0.43	0.15	0.99	0.68	0.45	0.35
VOC	34.38	22.74	34.38	22.74								
SO2	23.63	15.74	23.63	15.74								
NOx	28.61	32.97	28.61	32.97								
CO	55.92	38.5	55.92	38.5								
HCl	0.08	0.05	0.08	0.05								
Acetaldehyde	0.52	0.33	0.52	0.33								
Benzene	0.17	0.11	0.17	0.11								
Ethylbenzene	0.11	0.07	0.11	0.07								
Toluene	1.18	0.74	1.18	0.74								
Xylene	0.14	0.09	0.14	0.09								
1,3-Butadiene	0.0001	0.0003	0.0001	0.0003								
Formaldehyde	1.38	0.87	1.38	0.87								
Acrolein	0.0001	0.0003	0.0001	0.0003								
Naphthalene	0.0001	0.0003	0.0001	0.0003								
PAH HAPs	0.35	0.22	0.35	0.22								
Total VOC HAPs	4.44	2.80	4.44	2.80								
Metal HAPs	0.05	0.03	0.05	0.03								
Total HAPs	4.49	2.83	4.49	2.83								

Total PTE

	Uncontrolled		Controlled	
Emission Type	lb/hr	tons/yr	lb/hr	tons/yr
TSP	5,512.84	3431.49	106.52	64.40
PM10	1,289.41	802.62	33.63	21.25
PM2.5	299.65	187.98	5.41	4.55
VOC	34.38	22.74	34.38	22.74
SO2	23.63	15.74	23.63	15.74
NOx	28.61	32.97	28.61	32.97
CO	55.92	38.50	55.92	38.50
HCl	0.08	0.05	0.08	0.05
Acetaldehyde	0.52	0.33	0.52	0.33
Benzene	0.17	0.11	0.17	0.11
Ethylbenzene	0.11	0.07	0.11	0.07
Toluene	1.18	0.74	1.18	0.74
Xylene	0.14	0.09	0.14	0.09
1,3-Butadiene	0.0001	0.0003	0.0001	0.0003
Formaldehyde	1.38	0.87	1.38	0.87
Acrolein	0.0001	0.0003	0.0001	0.0003
Naphthalene	0.0001	0.0003	0.0001	0.0003
PAH HAPs	0.35	0.22	0.35	0.22
Total VOC HAPs	4.44	2.80	4.44	2.80
Metal HAPs	0.05	0.03	0.05	0.03
Total HAPs	4.49	2.83	4.49	2.83

Fugitive Emissions

		Uncontrolled		Controlled	
Emission Type		lb/hr	tons/yr	lb/hr	tons/yr
Main Plant	TSP	145.55	88.18	36.59	22.90
	PM10	41.18	25.31	10.40	6.74
	PM2.5	4.76	2.89	1.20	0.79
FRAP	TSP	34.2	10.69	10.26	3.21
	PM10	10.09	3.15	3.03	0.95
	PM2.5	1.01	0.32	0.3	0.1
Crushing & Screening	TSP	17.21	11.16	5.24	3.68
	PM10	5.10	3.37	1.57	1.17
	PM2.5	0.51	0.36	0.16	0.14

Total Fugitives

TSP	196.96	110.03	52.09	29.79
PM10	56.37	31.83	15.00	8.86
PM2.5	6.28	3.57	1.66	1.03

MAIN PLANT

West Virginia Paving, Inc.
Dunbar Plant #30

Potesta & Associates, Inc.
Project No. 0101-16-0318-030

By: LKB
Date: 07/26/13

Checked By: PEW
Date: 08/01/13

PTE

	Point Source [1]				Fugitive [2]			
	Uncontrolled		Controlled		Uncontrolled		Controlled	
Emission Type	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
TSP	5,302.70	3,315.60	48.34	31.64	145.55	88.18	36.59	22.90
PM_{10}	1,227.71	768.44	15.99	11.12	41.18	25.31	10.40	6.74
$PM_{2.5}$	292.43	183.95	3.33	3.26	4.76	2.89	1.20	0.79
VOC	34.38	22.74	34.38	22.74	Not Applicable			
SO_2	23.63	15.74	23.63	15.74				
NO_x	28.61	32.97	28.61	32.97				
CO	55.92	38.50	55.92	38.50				
HCl	0.08	0.05	0.08	0.05				
Acetaldehyde	0.521	0.333	0.521	0.333				
Benzene	0.168	0.109	0.168	0.109				
Ethylbenzene	0.112	0.068	0.112	0.068				
Toluene	1.176	0.742	1.176	0.742				
Xylene	0.138	0.087	0.138	0.087				
Formaldehyde	1.378	0.870	1.378	0.870				
PAH HAPs	0.35	0.22	0.35	0.22				
Total VOC HAPs[3]	4.44	2.80	4.44	2.80				
Metal HAPs	0.05	0.03	0.05	0.03				
Total HAPs	4.49	2.83	4.49	2.83				

	Facility Total			
	Uncontrolled		Controlled	
Emission Type	lb/hr	tons/yr	lb/hr	tons/yr
TSP	5,448.25	3,403.78	84.93	54.54
PM_{10}	1,268.89	793.75	26.40	17.86
$PM_{2.5}$	297.19	186.84	4.53	4.05
VOC	34.38	22.74	34.38	22.74
SO_2	23.63	15.74	23.63	15.74
NO_x	28.61	32.97	28.61	32.97
CO	55.92	38.50	55.92	38.50
HCl	0.08	0.05	0.08	0.05
Acetaldehyde	0.52	0.33	0.52	0.33
Benzene	0.17	0.11	0.17	0.11
Ethylbenzene	0.11	0.07	0.11	0.07
Toluene	1.18	0.74	1.18	0.74
Xylene	0.14	0.09	0.14	0.09
Formaldehyde	1.38	0.87	1.38	0.87
PAH HAPs	0.35	0.22	0.35	0.22
Total VOC HAPs3	4.44	2.80	4.44	2.80
Metal HAPs	0.05	0.03	0.05	0.03
Total HAPs	4.49	2.83	4.49	2.83

[1] Point source emissions include transfer points, drum mixer, and tanks.

[2] Fugitive emissions include vehicular traffic and open stockpiles.

[3] Total VOC Haps include PAH HAPs

By: LKB
Date: 07/26/13

Checked By: PEW
Date: 08/01/13

MATERIALS HANDLING

Defining transfer point empirical expression variables, where:

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

e =	?	lb/ton
k for TSP =	0.74	dimensionless
k for PM_{10}	0.35	dimensionless
k for $PM_{2.5}$	0.053	dimensionless
U =	10	mean wind speed, mph
M =	3.0	material moisture content, %

Calculating transfer point emission factor for TSP:
e = 0.0033 lb/ton
Calculating transfer point emission factor for PM_{10}:
e = 0.0016 lb/ton
Calculating transfer point emission factor for $PM_{2.5}$:
e = 0.0002 lb/ton
Emission factor calculation taken from AP-42 Section 13.2.4 Aggregate Handling and Storage Piles

Production rate:	400	tph	500,000	tpy
RAP rate	100	tph	125,000	tpy

TSP Emissions Rounding = 2

ID	Description	Transfer Capacities		e (U)	Control Device		Emissions Uncontrolled		Emissions Controlled	
		tons/hour	tons/year	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
TP1	Barge to HI	400	500,000	0.0033	MD	0	1.32	0.83	1.32	0.83
TP2	HI to C1	400	500,000	0.0033	PE	50	1.32	0.83	0.66	0.42
TP3	C1 to C2 or C4	400	500,000	0.0033	PE	50	1.32	0.83	0.66	0.42
TP4	C2 to C3	400	500,000	0.0033	PE	50	1.32	0.83	0.66	0.42
TP5	C3 to RS1	400	500,000	0.0033	PE	50	1.32	0.83	0.66	0.42
TP6	RS1 to OS1-OS6 or C5	400	500,000	0.0033	MD	0	1.32	0.83	1.32	0.83
TP6A	C5 to RS2	400	500,000	0.0033	PE	50	1.32	0.83	0.66	0.42
TP7	RS2 to OS1-OS6 or RS5	400	500,000	0.0033	MD	0	1.32	0.83	1.32	0.83
TP7A	RS5 to OS1-OS6	400	500,000	0.0033	MD	0	1.32	0.83	1.32	0.83
TP9*	C4 to RS3	400	500,000	0.0033	PE	50			0.00	0.00
TP10*	RS3 to OS7-OS8 or C6	400	500,000	0.0033	MD	0			0.00	0.00
TP10A*	C6 to RS4	400	500,000	0.0033	PE	50			0.00	0.00
TP11*	RS4 to OS7-OS8	400	500,000	0.0033	MD	0			0.00	0.00
TP12****	Truck to OS9	180	125,000	0.0033	CA	75	0.59	0.21	0.15	0.05
TP13	FE to B1-B5B	400	500,000	0.0033	MD	0	1.32	0.83	1.32	0.83
TP14	B1 to UC1	400	500,000	0.0033	PE	50	1.32	0.83	0.66	0.42
TP15*	B2 to UC2	400	500,000	0.0033	PE	50			0.00	0.00
TP16*	B3 to UC3	400	500,000	0.0033	PE	50			0.00	0.00
TP17*	B4 to UC4	400	500,000	0.0033	PE	50			0.00	0.00
TP18*	B5 to UC5	400	500,000	0.0033	PE	50			0.00	0.00
TP18A*	B5A to UC5A	400	500,000	0.0033	PE	50			0.00	0.00
TP18B*	B5B to UC5B	400	500,000	0.0033	PE	50			0.00	0.00
TP19	UC1 to UC6	400	500,000	0.0033	PE	50	1.32	0.83	0.66	0.42
TP20*	UC2 to UC6	400	500,000	0.0033	PE	50			0.00	0.00
TP21*	UC3 to UC6	400	500,000	0.0033	PE	50			0.00	0.00
TP22*	UC4 to UC6	400	500,000	0.0033	PE	50			0.00	0.00
TP23*	UC5 to UC6	400	500,000	0.0033	PE	50			0.00	0.00
TP23A*	UC5A to UC6	400	500,000	0.0033	PE	50			0.00	0.00
TP23B*	UC5B to UC6	400	500,000	0.0033	PE	50			0.00	0.00
TP24	UC6 to S1	400	500,000	0.0033	N	0	1.32	0.83	1.32	0.83
TP24A	S1 to Ground	40	50,000	0.0033	PE	50	0.13	0.08	0.07	0.04
TP24B	S1 to UC11	400	500,000	0.0033	PE	50	1.32	0.83	0.66	0.42
TP24C	UC11 to CFDM1	400	500,000	0.0033	FE	80	1.32	0.83	0.27	0.17
TP29	FE to B6 or B6A	100	125,000	0.0033	CA	75	0.33	0.21	0.09	0.06
TP29A	B6 to UC7A	100	125,000	0.0033	FE+CA	80	0.33	0.21	0.07	0.05
TP29B	B6A to UC7B	100	125,000	0.0033	FE+CA	80	0.33	0.21	0.07	0.05

MATERIALS HANDLING

TP30	UC7A or UC7B to UC7	100	125,000	0.0033	PE+CA	75	0.33	0.21	0.09	0.06
TP30A	UC7 to UC7C	100	125,000	0.0033	WS+CA	75	0.33	0.21	0.09	0.06
TP31	UC7C to S6	100	125,000	0.0033	PE+CA	75	0.33	0.21	0.09	0.06
TP32	S6 to UC8	100	125,000	0.0033	FE	80	0.33	0.21	0.07	0.05
TP33	UC8 to CFDM1	100	125,000	0.0033	FE	80	0.33	0.21	0.07	0.05
TP34**	S6 Deck1 and S6 Deck 2 to UC9	100	62,500	0.0033	PE	50	0.33	0.10	0.17	0.05
TP35**	UC9 to CR1	100	62,500	0.0033	FE	80	0.33	0.10	0.07	0.02
TP36**	CR1 to UC7C	100	62,500	0.0033	FE	80	0.33	0.10	0.07	0.02
TP37	CFDM1 to DL1	See "HMA Loading" worksheet								
TP38	DL1 to BS1 or DL2	See "HMA Loading" worksheet								
TP39	DL2 to BS2 or DL3	See "HMA Loading" worksheet								
TP40	DL3 to BS3	See "HMA Loading" worksheet								
TP41	BS1-BS3 to Trucks	See "HMA Loading" worksheet								
TP42***	APCD2 to SC1	40	50,000	0.0033	FE	80	0.13	0.08	0.03	0.02
TP43***	SC1 to CFDM1	40	50,000	0.0033	FE	80	0.13	0.08	0.03	0.02
						Sub-total	**24.41**	**14.88**	**14.70**	**9.17**

* Calculations for these emissions points omitted because maximum throughput is through one feed system or a combination thereof.

**Assumes an annual maximum of 50% oversized material running through RAP crusher circuit.

*** Assumes a maximum rate of 1 % baghouse dust re-introduction.

****Based on a maximum of 10 RAP trucks per hour

Note that some mixes do not contain RAP, therefore the maximum aggregate processing rate was retained for emissions calculations.

PM_{10} Emissions

ID	Description	Transfer Capacities		e (U)	Control Device		Emissions Uncontrolled		Emissions Controlled	
		tons/hour	tons/year	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
TP1	Barge to HI	400	500,000	0.0016	MD	0	0.64	0.40	0.64	0.40
TP2	HI to C1	400	500,000	0.0016	PE	50	0.64	0.40	0.32	0.20
TP3	C1 to C2 or C4	400	500,000	0.0016	PE	50	0.64	0.40	0.32	0.20
TP4	C2 to C3	400	500,000	0.0016	PE	50	0.64	0.40	0.32	0.20
TP5	C3 to RS1	400	500,000	0.0016	PE	50	0.64	0.40	0.32	0.20
TP6	RS1 to OS1-OS6 or C5	400	500,000	0.0016	MD	0	0.64	0.40	0.64	0.40
TP6A	C5 to RS2	400	500,000	0.0016	PE	50	0.64	0.40	0.32	0.20
TP7	RS2 to OS1-OS6 or RS5	400	500,000	0.0016	MD	0	0.64	0.40	0.64	0.40
TP7A	RS5 to OS1-OS6	400	500,000	0.0016	MD	0	0.64	0.40	0.64	0.40
TP9*	C4 to RS3	400	500,000	0.0016	PE	0			0.00	0.00
TP10*	RS3 to OS7-OS8 or C6	400	500,000	0.0016	MD	0			0.00	0.00
TP10A*	C6 to RS4	400	500,000	0.0016	PE	50			0.00	0.00
TP11*	RS4 to OS7-OS8	400	500,000	0.0016	MD	0			0.00	0.00
TP12****	Truck to OS9	180	125,000	0.0016	CA	75	0.29	0.10	0.07	0.03
TP13	FE to B1-B5B	400	500,000	0.0016	MD	0	0.64	0.40	0.64	0.40
TP14	B1 to UC1	400	500,000	0.0016	PE	50	0.64	0.40	0.32	0.20
TP15*	B2 to UC2	400	500,000	0.0016	PE	50			0.00	0.00
TP16*	B3 to UC3	400	500,000	0.0016	PE	50			0.00	0.00
TP17*	B4 to UC4	400	500,000	0.0016	PE	50			0.00	0.00
TP18*	B5 to UC5	400	500,000	0.0016	PE	50			0.00	0.00
TP18A*	B5A to UC5A	400	500,000	0.0016	PE	50			0.00	0.00
TP18B*	B5B to UC5B	400	500,000	0.0016	PE	50			0.00	0.00
TP19	UC1 to UC6	400	500,000	0.0016	PE	50	0.64	0.40	0.32	0.20
TP20*	UC2 to UC6	400	500,000	0.0016	PE	50			0.00	0.00
TP21*	UC3 to UC6	400	500,000	0.0016	PE	50			0.00	0.00
TP22*	UC4 to UC6	400	500,000	0.0016	PE	50			0.00	0.00
TP23*	UC5 to UC6	400	500,000	0.0016	PE	50			0.00	0.00
TP23A*	UC5A to UC6	400	500,000	0.0016	PE	50			0.00	0.00
TP23B*	UC5B to UC6	400	500,000	0.0016	PE	50			0.00	0.00
TP24	UC6 to S1	400	500,000	0.0016	N	0	0.64	0.40	0.64	0.40
TP24A	S1 to Ground	40	50,000	0.0016	PE	50	0.06	0.04	0.03	0.02
TP24B	S1 to UC11	400	500,000	0.0016	PE	50	0.64	0.40	0.32	0.20
TP24C	UC11 to CFDM1	400	500,000	0.0016	FE	80	0.64	0.40	0.13	0.08
TP29	FE to B6 or B6A	100	125,000	0.0016	CA	75	0.16	0.10	0.04	0.03
TP29A	B6 to UC7A	100	125,000	0.0016	FE+CA	80	0.16	0.10	0.04	0.02
TP29B	B6A to UC7B	100	125,000	0.0016	FE+CA	80	0.16	0.10	0.04	0.02
TP30	UC7A or UC7B to UC7	100	125,000	0.0016	PE+CA	75	0.16	0.10	0.04	0.03

By: LKB
Date: 07/26/13

Checked By: PEW
Date: 08/01/13

MATERIALS HANDLING

TP30A	UC7 to UC7C	100	125,000	0.0016	WS+CA	75	0.16	0.10	0.04	0.03
TP31	UC7C to S6	100	187,500	0.0016	PE+CA	75	0.16	0.15	0.04	0.04
TP32	S6 to UC8	100	125,000	0.0016	FE	80	0.16	0.10	0.04	0.02
TP33	UC8 to CFDM1	100	125,000	0.0016	FE	80	0.16	0.10	0.04	0.02
TP34**	S6 Deck1 and S6 Deck 2 to UC9	100	62,500	0.0016	PE	50	0.16	0.05	0.08	0.03
TP35**	UC9 to CR1	100	62,500	0.0016	FE	80	0.16	0.05	0.04	0.01
TP36**	CR1 to UC7C	100	62,500	0.0016	FE	80	0.16	0.05	0.04	0.01
TP37	CFDM1 to DL1	See "HMA Loading" worksheet								
TP38	DL1 to BS1 or DL2	See "HMA Loading" worksheet								
TP39	DL2 to BS2 or DL3	See "HMA Loading" worksheet								
TP40	DL3 to BS3	See "HMA Loading" worksheet								
TP41	BS1-BS3 to Trucks	See "HMA Loading" worksheet								
TP42***	APCD2 to SC1	40	50,000	0.0016	FE	80	0.06	0.04	0.02	0.01
TP43***	SC1 to CFDM1	40	50,000	0.0016	FE	80	0.06	0.04	0.02	0.01
						Sub-total	**11.83**	**7.22**	**7.15**	**4.41**

* Calculations for these emissions points omitted because maximum throughput is through one feed system or a combination thereof.

**Assumes an annual maximum of 50% oversized material running through RAP crusher circuit.

*** Assumes a maximum rate of 1 % baghouse dust re-introduction.

****Based on a maximum of 10 RAP trucks per hour

Note that some mixes do not contain RAP, therefore the maximum aggregate processing rate was retained for emissions calculations.

$PM_{2.5}$ Emissions

ID	Description	Transfer Capacities		e (U)	Control Device		Emissions Uncontrolled		Emissions Controlled	
		tons/hour	tons/year	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
TP1	Barge to HI	400	500,000	0.0002	MD	50	0.08	0.05	0.04	0.03
TP2	HI to C1	400	500,000	0.0002	PE	50	0.08	0.05	0.04	0.03
TP3	C1 to C2 or C4	400	500,000	0.0002	PE	50	0.08	0.05	0.04	0.03
TP4	C2 to C3	400	500,000	0.0002	PE	50	0.08	0.05	0.04	0.03
TP5	C3 to RS1	400	500,000	0.0002	PE	50	0.08	0.05	0.04	0.03
TP6	RS1 to OS1-OS6 or C5	400	500,000	0.0002	MD	0	0.08	0.05	0.08	0.05
TP6A	C5 to RS2	400	500,000	0.0002	PE	50	0.08	0.05	0.04	0.03
TP7	RS2 to OS1-OS6 or RS5	400	500,000	0.0002	MD	0	0.08	0.05	0.08	0.05
TP7A	RS5 to OS1-OS6	400	500,000	0.0002	MD	0	0.08	0.05	0.08	0.05
TP9*	C4 to RS3	400	500,000	0.0002	PE	0			0.00	0.00
TP10*	RS3 to OS7-OS8 or C6	400	500,000	0.0002	MD	0			0.00	0.00
TP10A*	C6 to RS4	400	500,000	0.0002	PE	50			0.00	0.00
TP11*	RS4 to OS7-OS8	400	500,000	0.0002	MD	0			0.00	0.00
TP12****	Truck to OS9	180	125,000	0.0002	CA	75	0.04	0.01	0.01	0.01
TP13	FE to B1-B5B	400	500,000	0.0002	MD	0	0.08	0.05	0.08	0.05
TP14	B1 to UC1	400	500,000	0.0002	PE	50	0.08	0.05	0.04	0.03
TP15*	B2 to UC2	400	500,000	0.0002	PE	50			0.00	0.00
TP16*	B3 to UC3	400	500,000	0.0002	PE	50			0.00	0.00
TP17*	B4 to UC4	400	500,000	0.0002	PE	50			0.00	0.00
TP18*	B5 to UC5	400	500,000	0.0002	PE	50			0.00	0.00
TP18A*	B5A to UC5A	400	500,000	0.0002	PE	50			0.00	0.00
TP18B*	B5B to UC5B	400	500,000	0.0002	PE	50			0.00	0.00
TP19	UC1 to UC6	400	500,000	0.0002	PE	50	0.08	0.05	0.04	0.03
TP20*	UC2 to UC6	400	500,000	0.0002	PE	50			0.00	0.00
TP21*	UC3 to UC6	400	500,000	0.0002	PE	50			0.00	0.00
TP22*	UC4 to UC6	400	500,000	0.0002	PE	50			0.00	0.00
TP23*	UC5 to UC6	400	500,000	0.0002	PE	50			0.00	0.00
TP23A*	UC5A to UC6	400	500,000	0.0002	PE	50			0.00	0.00
TP23B*	UC5B to UC6	400	500,000	0.0002	PE	50			0.00	0.00
TP24	UC6 to S1	400	500,000	0.0002	N	0	0.08	0.05	0.08	0.05
TP24A	S1 to Ground	40	50,000	0.0002	PE	50	0.01	0.01	0.01	0.01
TP24B	S1 to UC11	400	500,000	0.0002	PE	50	0.08	0.05	0.04	0.03
TP24C	UC11 to CFDM1	400	500,000	0.0002	FE	80	0.08	0.05	0.02	0.01
TP29	FE to B6 or B6A	100	125,000	0.0002	CA	75	0.02	0.02	0.01	0.01
TP29A	B6 to UC7A	100	125,000	0.0002	FE+CA	80	0.02	0.02	0.01	0.01
TP29B	B6A to UC7B	100	125,000	0.0002	FE+CA	80	0.02	0.02	0.01	0.01
TP30	UC7A or UC7B to UC7	100	125,000	0.0002	PE+CA	75	0.02	0.02	0.01	0.01
TP30A	UC7 to UC7C	100	125,000	0.0002	WS+CA	75	0.02	0.02	0.01	0.01
TP31	UC7C to S6	100	187,500	0.0002	PE+CA	75	0.02	0.02	0.01	0.01

By: LKB
Date: 07/26/13

Checked By: PEW
Date: 08/01/13

MATERIALS HANDLING

TP32	S6 to UC8	100	125,000	0.0002	FE	80	0.02	0.02	0.01	0.01
TP33	UC8 to CFDM1	100	125,000	0.0002	FE	80	0.02	0.02	0.01	0.01
TP34**	S6 Deck1 and S6 Deck 2 to UC9	100	62,500	0.0002	PE	50	0.02	0.01	0.01	0.01
TP35**	UC9 to CR1	100	62,500	0.0002	FE	80	0.02	0.01	0.01	0.01
TP36**	CR1 to UC7C	100	62,500	0.0002	FE	80	0.02	0.01	0.01	0.01
TP37	CFDM1 to DL1	See "HMA Loading" worksheet								
TP38	DL1 to BS1 or DL2	See "HMA Loading" worksheet								
TP39	DL2 to BS2 or DL3	See "HMA Loading" worksheet								
TP40	DL3 to BS3	See "HMA Loading" worksheet								
TP41	BS1-BS3 to Trucks	See "HMA Loading" worksheet								
TP42***	APCD2 to SC1	40	50,000	0.0002	FE	80	0.01	0.01	0.01	0.01
TP43***	SC1 to CFDM1	40	50,000	0.0002	FE	80	0.01	0.01	0.01	0.01
						Sub-total	**1.49**	**0.98**	**0.93**	**0.68**

* Calculations for these emissions points omitted because maximum throughput is through one feed system or a combination thereof.

**Assumes an annual maximum of 50% oversized material running through RAP crusher circuit.

*** Assumes a maximum rate of 1 % baghouse dust re-introduction.

****Based on a maximum of 10 RAP trucks per hour

Note that some mixes do not contain RAP, therefore the maximum aggregate processing rate was retained for emissions calculations.

West Virginia Paving, Inc.
Dunbar Plant #30

Potesta & Associates, Inc.
Project No. 0101-16-0318-030

By: LKB
Date: 07/26/13

Checked By: PEW
Date: 08/01/13

Emission Factors (lbs/ton)

	PM	PM10	Source
Primary Crushing	0.002	0.001	DAQ G40-C Emissions Worksheet
Secondary & Tertiary Crushing	0.0054	0.0024	DAQ G40-C Emissions Worksheet
Screening	0.025	0.0087	DAQ G40-C Emissions Worksheet

Totals for Crushing and Screening

PM				PM10				PM2.5			
Uncontrolled		Controlled		Uncontrolled		Controlled		Uncontrolled		Controlled	
(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)
12.70	**8.65**	**6.29**	**4.31**	**4.45**	**3.03**	**2.20**	**1.51**	**0.91**	**0.63**	**0.46**	**0.31**

Crushing and Screening

Crusher Emissions

Crusher Identification	Crusher Type	ID	Throughput		Control Type	Contol Efficiency	PM				PM10				PM2.5[1]			
							Uncontrolled		Controlled		Uncontrolled		Controlled		Uncontrolled		Controlled	
			(ton/hr)	(tons/yr)		(%)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)
RAP Crusher	Mill crusher	CR1	100	62,500	FE	80	0.20	0.06	0.04	0.01	0.10	0.03	0.02	0.01	0.02	0.01	0.01	0.01
						Totals:	**0.20**	**0.06**	**0.04**	**0.01**	**0.10**	**0.03**	**0.02**	**0.01**	**0.02**	**0.01**	**0.01**	**0.01**

Screen Emissions

Screen Identification	Screen Type	ID	Throughput		Control Type	Contol Efficiency	PM				PM10				PM2.5[1]			
							Uncontrolled		Controlled		Uncontrolled		Controlled		Uncontrolled		Controlled	
			(ton/hr)	(tons/yr)		(%)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)
Aggregates Screen	Scalping	S1	400	500,000	PE	50	10.00	6.25	5.00	3.13	3.48	2.18	1.74	1.09	0.71	0.45	0.36	0.22
RAP Screen	Scalping 2-deck	S6	100	187,500	PE	50	2.50	2.34	1.25	1.17	0.87	0.82	0.44	0.41	0.18	0.17	0.09	0.08
						Totals:	**12.50**	**8.59**	**6.25**	**4.30**	**4.35**	**3.00**	**2.18**	**1.50**	**0.89**	**0.62**	**0.45**	**0.30**

(1)- PM2.5 equal to PM/14:
Partlicle size multipliers (k) AP42 Section 13.2.4-4 (11/06):

PM	PM10	PM2.5
0.74	0.35	0.053
Conversion Factor	2.1	14

West Virginia Paving, Inc.
Dunbar Plant #30

Potesta & Associates, Inc.
Project No. 0101-16-0318-030

By: LKB
Date: 07/26/13

Checked By: PEW
Date: 08/01/13

DRUM MIX ASPHALT PLANT COUNTER FLOW DRUM MIXER

Production Rate: 400 tons/hr
500,000 tons/year Rounding to 2

Criteria Pollutants

Emission Type	Emission Factor [1] (lb/ton of HMA)	Uncontrolled Emissions [4] lb/hr	Uncontrolled Emissions [4] tons/yr	Control Efficiency %	Controlled Emissions lb/hr	Controlled Emissions tons/yr
TSP	0.0658	5,264	3,290	99.5	26.32	16.45
PM_{10}	0.0151	1,211	757	99.5	6.05	3.78
$PM_{2.5}$	0.0036	290	181	99.5	1.45	0.90
VOC	0.032	12.80	8.00	0	12.80	8.00
SO_2	0.058	23.20	14.50	0	23.20	14.50
NO_x	0.055	22.00	13.75	0	22.00	13.75
CO	0.13	52.00	32.50	0	52.00	32.50
HCl	0.00021	0.08	0.05	0	0.08	0.05

Calculate PM/PM10 Emission Factor - 40CFR60, Subpart I Allowable Limit.[5]

0.04	grains[2]	X	76,718	cubic feet BH flow[3]	X	60	minutes	X
1	dscf		1	minute		1	hour	
1	lb	X	1	hour		=	0.0658	lb
7000	grains		400	tons of HMA throughput			1	ton

PM10 is 23% of TSP PM2.5 is 5.5% of TSP

Hazardous Air Pollutants - Controlled and Uncontrolled Emissions will be the same.

Emission Type	Emission Factor [6] (lb/ton of HMA)	Emissions lb/hr	Emissions tons/yr
Non-PAH HAPs			
Acetaldehyde	0.0013	0.52	0.33
Benzene	0.00039	0.16	0.10
Ethylbenzene	0.00024	0.10	0.06
Formaldehyde	0.0031	1.24	0.78
Toluene	0.0029	1.16	0.73
Xylene	0.0002	0.08	0.05
Non-PAH HAPs Total [7]	0.0095	3.80	2.38
PAH HAPs Total [7]	0.00088	0.35	0.22
	Total VOC HAPs	4.15	2.60

Metals Emissions

Emission Type	Emission Factor [8] lb/ton HMA	Emissions lb/hr	Emissions tons/yr
Antimony	1.80E-07	0.0001	0.0001
Arsenic	5.60E-07	0.0002	0.0001
Barium	5.80E-06	0.0023	0.0015
Cadmium	4.10E-07	0.0002	0.0001
Cobalt	2.60E-08	0.0001	0.0001
Copper	3.10E-06	0.0012	0.0008
Chromium	5.50E-06	0.0022	0.0014
Hexavalent Chromium	4.50E-07	0.0002	0.0002
Lead	1.50E-05	0.0060	0.0038
Manganese	7.70E-06	0.0031	0.0019
Mercury	2.60E-06	0.0010	0.0007
Nickel	6.30E-05	0.0252	0.0158
Phosphorus	2.80E-05	0.0112	0.0070
Silver	4.80E-07	0.0002	0.0001
Selenium	3.50E-07	0.0001	0.0001
Thallium	4.10E-09	0.0001	0.0001
Zinc	6.10E-05	0.0244	0.0153
	HAP Metals	0.0495	0.0312
	Total Metals	0.0778	0.0491

Rounding to 4

	lb/hr	tons/yr
VOC HAPs	4.15	2.60
Metal HAPs	0.0495	0.0312
Total HAPs	**4.20**	**2.63**

1. AP42 Emission factors for CO, NOx, and SO2 Table 11.1-7; for VOC Table11.1-8 (maximum VOC emission factor used). Controlled emission factor for TSP calculated above.
2. Emission limit from 40CFR60 Subpart I. Note the calculated EF falls within the range shown in AP42 Table 11.1-1P.
3. Manufacturers information.
4. Uncontrolled emissions for PM/PM10/PM2.5 are back calculated from the controlled emissions
5. Table EF for PM10 and PM2.5 are calculated based on Table 11.1-4 Particle Size Distribution.
6. Emission factors taken from AP-42 Table11.1-10. Highest value between natural gas, No.2 fuel, and waste oil fired dryers shown.
7. Includes HAPs not shown in the table. Highest value between natural gas, No.2 fuel, and waste oil fired dryers shown.
8. AP42 Table 11.1-12.

By: LKB
Date: 07/26/13

Checked By: PEW
Date: 08/01/13

SILO FILLING

Emission Factor (EF) Calculations for silo filling from AP42 Table 11.1-14 (March, 2004).

V = -0.5 asphalt volatility
T = 325 degrees Fahrenheit HMA mix temperature

TSP Emission Factor: $EF = 0.000332 + 0.00105 (-V) e^{((0.0251)(T+460)-20.43)}$

TSP EF = 0.000586 lb/ton

PM_{10} Emission Factor is 23% of TSP Table 11.1-4 Particle Size Distribution

PM_{10} EF = 0.000135 lb/ton

$PM_{2.5}$ Emission Factor is 5.5% of TSP Table 11.1-4 Particle Size Distribution

PM_{10} EF = 0.000032 lb/ton

VOC Emission Factor: $VOC\ EF = TOC\ EF = 0.0504 (-V) e^{((0.0251)(T+460)-20.43)}$
(VOC EF = TOC EF from AP42 Table 11.1-16, footnote a.)

VOC EF = 0.012187 lb/ton

CO Emission Factor: $CO\ EF = 0.00488 (-V) e^{((0.0251)(T+460)-20.43)}$

CO EF = 0.001180 lb/ton

AP42 Table 11.1-16 referenced for HAP emission factors and calculated according to footnote a.

Rounding to 3
or 2

Emission Type	ID	Number of Transfers	Transfer Capacities		EF	Control Device		Emissions			
								Uncontrolled		Controlled	
			tons/hour	tons/year	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
TSP	TP37-TP40	4	400	500,000	0.000586	PE	50	0.92	0.60	0.46	0.30
PM_{10}	TP37-TP40	4	400	500,000	0.000135	PE	50	0.20	0.12	0.10	0.06
$PM_{2.5}$	TP37-TP40	4	400	500,000	0.000032	PE	50	0.04	0.04	0.02	0.02
VOC	TP37-TP40	4	400	500,000	0.012187	N	0	19.48	12.20	19.48	12.20
CO	TP37-TP40	4	400	500,000	0.001180	N	0	1.88	1.16	1.88	1.16
Hazardous Air Pollutants (HAPs)											
Benzene	TP37-TP40	4	400	500,000	0.000004	N	0	0.006	0.004	0.006	0.004
Ethylbenzene	TP37-TP40	4	400	500,000	0.000005	N	0	0.007	0.005	0.007	0.005
Toluene	TP37-TP40	4	400	500,000	0.000008	N	0	0.012	0.008	0.012	0.008
Xylene	TP37-TP40	4	400	500,000	0.000031	N	0	0.050	0.031	0.050	0.031
Formaldehyde	TP37-TP40	4	400	500,000	0.000084	N	0	0.135	0.084	0.135	0.084
Total HAPs	TP37-TP40	4	400	500,000	0.000158	N	0	0.253	0.158	0.253	0.158

By: LKB
Date: 07/26/13

Checked By: PEW
Date: 08/01/13

PLANT LOADOUT

Emission Factor (EF) Calculations for loadout from AP11.1-14 (March, 2004).

V = -0.5 asphalt volatility
T = 325 degrees Fahrenheit HMA mix temperature

TSP Emission Factor: $EF = 0.000181 + 0.00141 (-V) e^{((0.0251)(T+460)-20.43)}$

TSP EF = 0.000522 lb/ton

PM_{10} Emission Factor is 23% of TSP Table 11.1-4 Particle Size Distribution

PM_{10} EF = 0.000120 lb/ton

$PM_{2.5}$ Emismission Factor is 5.5% of TSP Table 11.1-4 Particle Size Distribution

$PM_{2.5}$ EF = 0.000029 lb/ton

VOC Emission Factor: $VOC\ EF = 0.94 * TOC\ EF = 0.94 * (0.0172 (-V) e^{((0.0251)(T+460)-20.43)})$

TOC EF = 0.00416 lb/ton
VOC EF = 0.00391 lb/ton

CO Emission Factor: $C0\ EF = 0.00558 (-V) e^{((0.0251)(T+460)-20.43)}$

CO EF = 0.00135 lb/ton

AP42 Table 11.1-16 referenced for HAP emission factors and calculated according to footnote a.

Rounding to 3
or 2

Emission Type	ID	Number of Transfers	Transfer Capacities tons/hour	Transfer Capacities tons/year	EF lb/T	Control Device Type	Control Device Effic(%)	Emissions Uncontrolled (lb/hr)	Emissions Uncontrolled (tpy)	Emissions Controlled (lb/hr)	Emissions Controlled (tpy)
TSP	TP41	1	400	500,000	0.000522	PE	50	0.21	0.13	0.11	0.07
PM_{10}	TP41	1	400	500,000	0.000120	PE	50	0.05	0.03	0.03	0.02
$PM_{2.5}$	TP41	1	400	500,000	0.000029	PE	50	0.01	0.01	0.01	0.01
VOC	TP41	1	400	500,000	0.003909	N	0	1.56	0.98	1.56	0.98
CO	TP41	1	400	500,000	0.001349	N	0	0.54	0.34	0.54	0.34
HAPS											
Benzene	TP41	1	400	500,000	0.000002	N	0	0.001	0.001	0.001	0.001
Ethylbenzene	TP41	1	400	500,000	0.000012	N	0	0.005	0.003	0.005	0.003
Toluene	TP41	1	400	500,000	0.000009	N	0	0.003	0.002	0.003	0.002
Xylene	TP41	1	400	500,000	0.000020	N	0	0.008	0.005	0.008	0.005
Formaldehyde	TP41	1	400	500,000	0.000004	N	0	0.001	0.001	0.001	0.001
Total HAPs	TP41	1	400	500,000	0.000062	N	0	0.025	0.016	0.025	0.016

TOTALS FOR SILO FILLING AND LOADOUT

Emission Type	Emissions Uncontrolled (lb/hr)	Emissions Uncontrolled (tpy)	Emissions Controlled (lb/hr)	Emissions Controlled (tpy)
TSP	1.13	0.73	0.57	0.37
PM_{10}	0.25	0.15	0.13	0.08
$PM_{2.5}$	0.05	0.05	0.03	0.03
VOC	21.04	13.18	21.04	13.18
CO	2.42	1.50	2.42	1.50
HAPS				
Benzene	0.007	0.005	0.007	0.005
Ethylbenzene	0.012	0.008	0.012	0.008
Toluene	0.015	0.010	0.015	0.010
Xylene	0.058	0.036	0.058	0.036
Formaldehyde	0.136	0.085	0.136	0.085
Total HAPs	0.278	0.174	0.278	0.174

ASPHALT HEATER AH1

Natural Gas Use			
1,350 scf/hr[2]	=	0.00135 10^6 scf/hr	
11,826,000 scf/yr	=	11.826 10^6 scf/yr	
Operating Hours =	8,760	hrs/yr[3]	

Emission Type	EF[(a)] lb/10^6 scf	Emissions lb/hr	Emissions tons/year
CO	84	0.11	0.50
NO_X	100	0.14	0.59
$PM_{2.5}$[(1)]	7.6	0.01	0.04
PM_{10}[(1)]	7.6	0.01	0.04
PM	7.6	0.01	0.04
SO_2	0.6	0.001	0.004
VOC	5.5	0.01	0.03
Lead	0.0005	0.000001	0.000003

References:
a. Emission factors from AP-42, Tables 1.4-1 and 1.4-2, Natural Gas Combustion, 7/98.

Note:
1. It is assumed that PM10 and PM2.5 are equal to PM.
2. Information supplied by client.
3. Hours of operation for asphalt heater are higher than the hours of operation for the asphalt plant to allow asphaltic cement and emulsion to stay warm during hours when the plant is not operational.

By: LKB
Date: 07/26/13

Checked By: PEW
Date: 08/01/13

ASPHALT HEATER AH1 - Continued

Natural Gas Use =	0.00135	10^6 scf/hr
	11.826	10^6 scf/yr

CAS No.	Hazardous Air Pollutants	EF[(a)] lb/10^6 scf	Emissions lb/hr	Emissions tons/year
91-57-6	2-Methylnaphthalene	2.40E-05	3.24E-08	1.42E-07
56-49-5	3-Methylchloranthrene	1.80E-06	2.43E-09	1.06E-08
57-97-6	7,12-Dimethylbenz(a)anthracene	1.60E-05	2.16E-08	9.46E-08
83-32-9	Acenaphthene	1.80E-06	2.43E-09	1.06E-08
203-96-8	Acenaphthylene	1.80E-06	2.43E-09	1.06E-08
120-12-7	Anthracene	2.40E-06	3.24E-09	1.42E-08
56-55-3	Benz(a)anthracene	1.80E-06	2.43E-09	1.06E-08
71-43-2	Benzene	2.10E-03	2.84E-06	1.24E-05
50-32-8	Benzo(a)pyrene	1.20E-06	1.62E-09	7.10E-09
205-99-2	Benzo(b)fluoranthene	1.80E-06	2.43E-09	1.06E-08
191-24-2	Benzo(g,h,i)perylene	1.20E-06	1.62E-09	7.10E-09
205-82-3	Benzo(k)fluoranthene	1.80E-06	2.43E-09	1.06E-08
218-01-9	Chrysene	1.80E-06	2.43E-09	1.06E-08
53-70-3	Dibenzo(a,h)anthracene	1.20E-06	1.62E-09	7.10E-09
25321-22-6	Dichlorobenzene	1.20E-03	1.62E-06	7.10E-06
206-44-0	Fluoranthene	3.00E-06	4.05E-09	1.77E-08
86-73-7	Fluorene	2.80E-06	3.78E-09	1.66E-08
50-00-0	Formaldehyde	7.50E-02	1.01E-04	4.43E-04
110-54-3	Hexane	1.80E+00	2.43E-03	1.06E-02
193-39-5	Indeno(1,2,3-cd)pyrene	1.80E-06	2.43E-09	1.06E-08
91-20-3	Naphthalene	6.10E-04	8.24E-07	3.61E-06
85-01-8	Phenanathrene	1.70E-05	2.30E-08	1.01E-07
129-00-0	Pyrene	5.00E-06	6.75E-09	2.96E-08
108-88-3	Toluene	3.40E-03	4.59E-06	2.01E-05
7440-38-2	Arsenic	2.00E-04	2.70E-07	1.18E-06
7440-41-7	Beryllium	1.20E-05	1.62E-08	7.10E-08
7440-43-9	Cadmium	1.10E-03	1.49E-06	6.50E-06
7440-47-3	Chromium	1.40E-03	1.89E-06	8.28E-06
7440-48-4	Cobalt	8.40E-05	1.13E-07	4.97E-07
7439-96-5	Manganese	3.80E-04	5.13E-07	2.25E-06
7439-97-6	Mercury	2.60E-04	3.51E-07	1.54E-06
7440-02-0	Nickel	2.10E-03	2.84E-06	1.24E-05
7782-49-2	Selenium	2.40E-05	3.24E-08	1.42E-07
		VOC HAPs Subtotal	2.54E-03	1.11E-02
		Metal HAPs Subtotal	7.51E-06	3.29E-05
		Total HAPs	2.55E-03	1.12E-02

References:
AP42 Table 1.4-3 and Table 1.4-4.

By: LKB
Date: 07/26/13

Checked By: PEW
Date: 08/01/13

Vehicle Activity

Material transported and estimated vehicle usage.

	Product Trucks	RAP Trucks	Asphaltic Cement Trucks*	Asphaltic Emulsion Trucks**	No. 2 Fuel Oil Trucks	Used Oil Trucks	Total/Mean Trucks	Endloaders
TPH	400	180	24	22	3	3	610	400
TPY	500,000	125,000	30,000	537	17,280	17,280	689,560	500,000
Load Weight (tons)	18	18	52	52	18.5	17.5	19	6
Vehicle Weight (tons)	20	20	12	12	12	12	N/A	31
Vehicles Per Hour	23	10	1	1	1	1	37	67
Vehicles Per Year	27,778	6,945	577	11	935	988	37,234	83,334
Mean Vehicle Weight (tons)	29	29	38	38	21.25	20.75	28.72	34
Gallons per hour	NA	NA	NA	NA	744	744	NA	NA
Unpaved round-trip travel (ft)	0	312	0	0	0	0	NA	1,320
Paved round-trip travel (ft)	1,320	1,320	1,320	1,320	1,320	1,320	NA	0

* Based on 6% of total production.
** Based on a maxiumum of one 5,000 gallon truck per day and maximum annual throughput of 125,000 gallons/yr.

Roundup to = 0 Assuming no partial loads. Annual hours of operation = 5,760 Client

Unpaved Haulroads

Emission Factor Equation from AP-42 Section 13.2.2, Unpaved Roads (December 2003):

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

	TSP	PM10	PM2.5		
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_{truck} =	28.72	28.72	28.72	tons, mean vehicle weight	
$W_{endloader}$ =	34	34	34	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	no. days/year with at least 0.01in of rain	
e_{truck} =	6.79	2.00	0.20	lb/VMT	
$e_{endloader}$ =	7.33	2.16	0.22	lb/VMT	Rounding to 2

Trucks

Pollutant	No. of Vehicles		Miles Per Trip	Control Device		Emissions			
						Uncontrolled		Controlled	
	Per Hour	Per Year	(mi)	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
TSP	10	6,945	0.06	WS	75	4.01	1.39	1.00	0.35
PM_{10}	10	6,945	0.06	WS	75	1.18	0.41	0.30	0.10
$PM_{2.5}$	10	6,945	0.06	WS	75	0.12	0.04	0.03	0.01

Endloaders

Pollutant	No. of Vehicles		Miles Per Trip	Control Device		Emissions			
						Uncontrolled		Controlled	
	Per Hour	Per Year	(mi)	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
TSP	67	83,334	0.25	WS	75	122.78	76.35	30.70	19.09
PM_{10}	67	83,334	0.25	WS	75	36.18	22.50	9.05	5.63
PM2.5	67	83,334	0.25	WS	75	3.69	2.29	0.92	0.57

Summary of Haulroad Emissions

Pollutant	Uncontrolled Emissions		Controlled Emissions	
	(lb/hr)	(TPY)	(lb/hr)	(TPY)
TSP	126.79	77.74	31.70	19.44
PM_{10}	37.36	22.91	9.35	5.73
$PM_{2.5}$	3.81	2.33	0.95	0.58

Paved Haulroads

Paved Haulroads

PM

Source	Number of Trucks/Hour	Number of Trucks/Year	Miles Per Trip	Emission Factor [1] (lb/VMT)	Uncontrolled TSP (lb/hr)	Uncontrolled TSP (tpy)	Control Device	Control Efficiency (%)	Controlled TSP (lb/hr)	Controlled TSP (tpy)
Trucks	37	37,234	0.25	2.00	18.50	9.31	WS	75	4.63	2.33

PM10

Source	Number of Trucks/Hour	Number of Trucks/Year	Miles Per Trip	Emission Factor [1] (lb/VMT)	Uncontrolled PM10 (lb/hr)	Uncontrolled PM10 (tpy)	Control Device	Control Efficiency (%)	Controlled PM10 (lb/hr)	Controlled PM10 (tpy)
Trucks	37	37,234	0.25	0.40	3.70	1.86	WS	75	0.93	0.47

PM2.5

Source	Number of Trucks/Hour	Number of Trucks/Year	Miles Per Trip	Emission Factor [1] (lb/VMT)	Uncontrolled PM2.5 (lb/hr)	Uncontrolled PM2.5 (tpy)	Control Device	Control Efficiency (%)	Controlled PM2.5 (lb/hr)	Controlled PM2.5 (tpy)
Trucks	37	37,234	0.25	0.10	0.93	0.47	WS	75	0.23	0.12

Emission Factors[1]

	TSP	PM_{10}	$PM_{2.5}$	
k =	0.011	0.0022	0.00054	dimensionless, particle size multiplier
sL =	8	8	8	surface material silt content (g/m^2)
W_{truck} =	28.72	28.72	29	tons, mean vehicle weight
P =	157	157	157	no. days/year with 0.01 in of rain
N =	365	365	365	days/year
e =	2.00	0.40	0.10	lb/VMT truck

Road

Length (ft) =	1,320	maximum distance used as conservative estimate
Length (mi) =	0.25	
Total Hauled (tpy) =	689,560	
Load Weight (tons) =	19	
Trucks Per Year =	37,234	
Total Hauled (tph) =	610	
Load Weight (tons) =	19	
Trucks Per Hour =	37	
Empty Truck Weight (tons) =	NA	
Loaded Truck Weight (tons) =	NA	
Average Truck Weight (tons) =	28.72	

E = [k * (sL)^0.91 * (W)^1.02] * (1 - (P/4*N) = lb / Vehicle Mile Traveled (VMT)
1. AP42, 13.2.1.

Summary of Paved Haulroad Emissions

Pollutant	Emissions			
	Uncontrolled		Controlled	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)
PM	18.50	9.31	4.63	2.33
PM_{10}	3.70	1.86	0.93	0.47
PM2.5	0.93	0.47	0.23	0.12

By: LKB
Date: 07/26/13

Checked By: PEW
Date: 08/01/13

STOCKPILES

Reference: AP-42 Section 11.2.3, Fugitive Emissions (May, 1983), Equation #2

$E = 1.7 (s/1.5) ((365-p)/235) (f/15)$

$E =$	?	Emissions factor, pound per day per acre, (lb/day/acre)
$s =$	1	Silt content of material (%)
$s_{sand} =$	6	Silt content of material (%)
$p =$	157	number of days with at least 0.254 mm (0.01 in.) of precipitation per year
$f =$	15	Time wind speed exceeds 12 mph (%)

$e =$	1.003	lb/day/acre for aggregates and RAP	Rounding to 3
$e_{sand} =$	6.019	lb/day/acre for sand	

Stockpile ID	Stockpile Material	Base Area (acres)	Control Device	Control Eff. (%)	Uncontrolled Emissions lb/hr	Uncontrolled Emissions tpy	Controlled Emissions lb/hr	Controlled Emissions tpy
OS1 and OS6	Sand	0.459	N	0	0.115	0.504	0.115	0.504
OS2-OS5, OS7, OS8	Aggregates	1.480	N	0	0.062	0.271	0.062	0.271
OS9	RAP	1.928	N	0	0.081	0.353	0.081	0.353
				Total PM:	**0.258**	**1.128**	**0.258**	**1.128**
				Total PM_{10}*:	**0.123**	**0.537**	**0.123**	**0.537**
				Total $PM_{2.5}$*:	**0.020**	**0.090**	**0.020**	**0.090**

* PM10 = TSP/2.1; PM2.5 = PM/14.

TANKS

ID	Material Stored	Capacity gallons	Throughput gallons	VOC Emissions lb/hr	VOC Emissions ton/yr
T1	Asphaltic cement	35,000	6,000,000	Negligible	Negligible
T4	Asphaltic cement	30,000		Negligible	Negligible
T2	#2 FO/Diesel	20,000	2,000,000	Negligible	Negligible
T3	UO	22,000	2,000,000	Negligible	Negligible
T5	Asphaltic emulsion	5,000	125,000	Negligible	Negligible
			Total VOC:	Negligible	Negligible

The throughput of asphaltic cement is a combined total for T1 and T4.
The emissions from the tanks are negligible due to the low volatilization of liquid.

By: LKB
Date: 07/26/13

Checked By: PEW
Date: 08/01/13

Clamshell
Komatsu PC750-6 Compression Engine (CE1) Manfuctured 2000

Fuel Usage	11	gallons/hour	Client
	63,360	gallons/year	Calculated
	7.2	lbs/gal Diesel Fuel	Constant
Assumed Heating Value of Diesel Fuel:	133,332	Btu/gallon	Constant
Maximum Horsepower:	444	hp	Client
BSFC	NA	lb/hp-hr	
HP/hr ×	2,547	= Btu(1)	Constant
Maximum Fuel Input:	1.47	MMBtu/hour	Calculated
	0.75	kW/hp	Constant
Engine Power	331.09	kW	Calculated
	453.59	gram/lb	Constant

Hours Per Year = 5,760

Regulated Pollutant	Emission Factor (lb/MMBtu)	Emission Factor (g/kW-hr)	Hourly Emissions (lbs/hour)	Annual Emissions (tons/year)
NO_X	4.41		6.47	18.63
CO	0.95		1.39	4.00
SO_X	0.29		0.43	1.24
$PM/PM_{10}/PM_{2.5}$	0.31		0.45	1.30
TOC (VOC)	0.36		0.53	1.53

Hazardous Air Pollutants (HAPS)				
Benzene	9.33E-04		0.0014	0.0040
Toluene	4.09E-04		0.0006	0.0017
Xylenes	2.85E-04		0.0004	0.0012
1,3-Butadiene	3.91E-05		0.0001	0.0003
Formaldehyde	1.18E-03		0.0017	0.0049
Acetaldehyde	7.67E-04		0.0011	0.0032
Acrolein	9.25E-05		0.0001	0.0003
Naphthalene	8.48E-05		0.0001	0.0003
Total HAPS			0.0055	0.0160

Notes:
Emission factors from AP-42 Table 3.3-1(Criteria Pollutants) Table 3.3-2 (HAPS) unless noted.
1. Field Engineer's Manual Table 3-13.
2. BSFC = fuel flow (pounds/hr) / horsepower

By: LKB
Date: 07/26/13

Checked By: PEW
Date: 08/01/13

Summary of CO2e Emissions

The facility has three (3) combustion sources: Counter Flow Drum Mixer (CFDM1), Asphalt Heater (AH1), and Clamshell compression engine (CE1). CDFM1 is capable of combusting natural gas, No. 2 fuel oil or used oil. AH1 is capable of burning natural gas. The clamshell engine burns No. 2 fuel. The calculations for the emissions summarized below are shown on worksheets that follow.

Facility Emissions

Emission Unit	CO2e (metric tons)	CO2 (short tons)	Exceed 25,000 metric tons CO2e?	Short tons/metric ton
CFDM1 (NG)	15,922	17,550.38		1.1023
AH1 (NG)	645	711.21		
CFDM1 (2FO)	20,482	22,576.96		
ENG1 (2FO)	649	715.24		
CFDM1 (UO)	20,047	22,098.06		
Worst Case	**21,776**	**24,003**	**NO**	

NG = natural gas
2FO = No. 2 fuel oil
UO = Used oil

By: LKB
Date: 07/26/13

Checked By: PEW
Date: 08/01/13

CO2e Emissions from Natural Gas - CFDM1 Burner

Potential Emissions (Metric Tons)				
Fuel Type	CO2	CH4	N2O	
Natural Gas	15,906.00	0.30	0.03	
100 yr GWP*	1	21	310	**Total CO2e**
CO2e	15,906.00	6.30	9.30	**15,922**

CFDM1 Burner	
600,000	btu/ton of asphalt
500,000	tons /year asphalt
300,000,000,000	btu/year
1,028	btu/scf
291,828,794	scf of natural gas burned per year

*Global Warming Potentials (GWP) Referenced from 40CFR§98 Subpart A Table A-1

CO2 = 1 x10-3*mass of fuel*HHV*EF (Eq. C-2a)
CH4 or N2O = 1 x10-3*mass of fuel*HHV*EF (Eq. C-9a)

Natural Gas Combustion

1.00E-03	conversion factor from kilograms to metric tons	
291,828,794	cubic feet of natural gas burned annually	
1.028E-03	HHV MMBtu/scf	natural gas high heating value (HHV) from Table C-1
53.02	kg CO2/MMBtu	natural gas emission factor from Table C-1
1.00E-03	kg CH4/MMBtu	natural gas emission factor from Table C-2
1.00E-04	kg N2O/MMBtu	natural gas emission factor from Table C-2

Equations, HHV, and emission factors from 40CFR§98 Subpart C unless otherwise noted.

By: LKB
Date: 07/26/13

Checked By: PEW
Date: 08/01/13

CO2e Emissions from Natural Gas - AH1

AH1
11,826,000 scf of natural gas burned per year

Potential Emissions (Metric Tons)				
Fuel Type	CO2	CH4	N2O	
Natural Gas	644.57	0.01	0.00	
100 yr GWP*	1	21	310	**Total CO2e**
CO2e	644.57	0.26	0.38	**645**

*Global Warming Potentials (GWP) Referenced from 40CFR§98 Subpart A Table A-1

CO2 = 1 x10-3*mass of fuel*HHV*EF (Eq. C-2a)
CH4 or N2O = 1 x10-3*mass of fuel*HHV*EF (Eq. C-9a)

Natural Gas Combustion

1.00E-03	conversion factor from kilograms to metric tons	
11,826,000	cubic feet of natural gas burned annually	
1.028E-03	HHV MMBtu/scf	natural gas high heating value (HHV) from Table C-1
53.02	kg CO2/MMBtu	natural gas emission factor from Table C-1
1.00E-03	kg CH4/MMBtu	natural gas emission factor from Table C-2
1.00E-04	kg N2O/MMBtu	natural gas emission factor from Table C-2

Equations, HHV, and emission factors from 40CFR§98 Subpart C unless otherwise noted.

By: LKB
Date: 07/26/13

Checked By: PEW
Date: 08/01/13

CO2e Emissions from No. 2 Fuel Oil Combustion - CFDM1 Burner

Potential Emissions (Metric Tons)				
Fuel Type	CO2	CH4	N2O	
No. 2 Fuel	20,412.96	0.83	0.17	
100 yr GWP*	1	21	310	**Total CO2e**
CO2e	20,412.96	17.39	51.34	**20,482**

CDFM1 - Burner
2,000,000 gallons No. 2 fuel oil burned per year

*Global Warming Potentials (GWP) Referenced from 40CFR§98 Subpart A Table A-1

CO2 = 1 x10-3*mass of fuel*HHV*EF (Eq. C-2a)
CH4 or N2O = 1 x10-3*mass of fuel*HHV*EF (Eq. C-9a)

No. 2 Fuel Oil Combustion

1.00E-03	conversion factor from kilograms to metric tons	
2,000,000	gallons of No. 2 fuel oil burned	
0.138	HHV MMBtu/gal	No. 2 fuel oil high heating value (HHV) from Table C-1
73.96	kg CO2/MMBtu	No. 2 fuel oil emission factor from Table C-1
3.00E-03	kg CH4/MMBtu	No. 2 fuel oil emission factor from Table C-2
6.00E-04	kg N2O/MMBtu	No. 2 fuel oil emission factor from Table C-2

Equations, HHV, and emission factors from 40CFR§98 Subpart C unless otherwise noted.

By: LKB
Date: 07/26/13

Checked By: PEW
Date: 08/01/13

CO2e Emissions from Diesel Fuel Combustion - CE1

CE1
63,360 gallons No. 2 fuel oil burned per year

Potential Emissions (Metric Tons)				
Fuel Type	CO2	CH4	N2O	
No. 2 Fuel	646.68	0.03	0.01	
100 yr GWP*	1	21	310	**Total CO2e**
CO2e	646.68	0.55	1.63	**649**

*Global Warming Potentials (GWP) Referenced from 40CFR§98 Subpart A Table A-1

CO2 = 1 x10-3*mass of fuel*HHV*EF (Eq. C-2a)
CH4 or N2O = 1 x10-3*mass of fuel*HHV*EF (Eq. C-9a)

No. 2 Fuel Oil Combustion

1.00E-03	conversion factor from kilograms to metric tons	
63,360	gallons of No. 2 fuel oil burned	
0.138	HHV MMBtu/gal	No. 2 fuel oil high heating value (HHV) from Table C-1
73.96	kg CO2/MMBtu	No. 2 fuel oil emission factor from Table C-1
3.00E-03	kg CH4/MMBtu	No. 2 fuel oil emission factor from Table C-2
6.00E-04	kg N2O/MMBtu	No. 2 fuel oil emission factor from Table C-2

Equations, HHV, and emission factors from 40CFR§98 Subpart C unless otherwise noted.

By: LKB
Date: 07/26/13

Checked By: PEW
Date: 08/01/13

CO2e Emissions from Used Oil Combustion - CFDM1 Burner

Potential Emissions (Metric Tons)				
Fuel Type	CO2	CH4	N2O	
Used Oil	19,980.00	0.81	0.16	
100 yr GWP*	1	21	310	**Total CO2e**
CO2e	19,980.00	17.01	50.22	**20,047**

CDFM1 Burner
2,000,000 gallons of used oil burned per year

*Global Warming Potentials (GWP) Referenced from 40CFR§98 Subpart A Table A-1

CO2 = 1 x10-3*mass of fuel*HHV*EF (Eq. C-2a)
CH4 or N2O = 1 x10-3*mass of fuel*HHV*EF (Eq. C-9a)

Used Oil Combustion

1.00E-03	conversion factor from kilograms to metric tons	
2,000,000	gallons of used oil burned annually	
0.135	HHV MMBtu/gal	used oil high heating value (HHV) from Table C-1
74.00	kg CO2/MMBtu	used oil emission factor from Table C-1
3.00E-03	kg CH4/MMBtu	used oil emission factor from Table C-2
6.00E-04	kg N2O/MMBtu	used oil emission factor from Table C-2

Equations, HHV, and emission factors from 40CFR§98 Subpart C unless otherwise noted.

FRAP SYSTEM

By: MAF
Date: 8/5/2014

Checked By:LKB
Date:8/7/2014

FRAP PTE WITHOUT ENGINE

	Point Source [1]				Fugitive [2]			
	Uncontrolled		Controlled		Uncontrolled		Controlled	
Emission Type	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PM	6.09	1.91	1.67	0.53	34.20	10.69	10.26	3.21
PM_{10}	2.39	0.74	0.75	0.24	10.09	3.15	3.03	0.95
$PM_{2.5}$	0.46	0.14	0.13	0.05	1.01	0.32	0.30	0.10
VOC	0	0	0	0				
SO_2	0	0	0	0				
NO_x	0	0	0	0				
CO	0	0	0	0				
HCl								
Acetaldehyde	0	0	0	0				
Benzene	0	0	0	0				
Ethylbenzene								
Toluene	0	0	0	0				
Xylene	0	0	0	0				
Formaldehyde	0	0	0	0				
Total HAPs	0	0	0	0				

	Facility Total			
	Uncontrolled		Controlled	
Emission Type	lb/hr	tons/yr	lb/hr	tons/yr
PM	40.29	12.60	11.93	3.74
PM_{10}	12.48	3.89	3.78	1.19
$PM_{2.5}$	1.47	0.46	0.43	0.15
VOC	0	0	0	0
SO_2	0	0	0	0
NO_x	0	0	0	0
CO	0	0	0	0
HCl				
Acetaldehyde	0	0	0	0
Benzene	0	0	0	0
Ethylbenzene	0	0	0	0
Toluene	0	0	0	0
Xylene	0	0	0	0
Formaldehyde	0	0	0	0
Total HAPs	0	0	0	0

[1] Point source emissions include materials handling, and crushing and screening.

[2] Fugitive emissions include vehicular traffic.

By: MAF
Date: 8/5/2014

Checked By:LKB
Date:8/7/2014

FRAP PTE WITH ENGINE

	Point Source [1]				Fugitive [2]			
	Uncontrolled		Controlled		Uncontrolled		Controlled	
Emission Type	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PM	6.49	2.04	2.07	0.66	34.20	10.69	10.26	3.21
PM_{10}	2.79	0.87	1.15	0.37	10.09	3.15	3.03	0.95
$PM_{2.5}$	0.86	0.27	0.53	0.18	1.01	0.32	0.30	0.10
VOC	0.46	0.14	0.46	0.14				
SO_2	0.37	0.12	0.37	0.12				
NO_x	5.65	1.77	5.65	1.77				
CO	1.22	0.38	1.22	0.38				
HCl								
Acetaldehyde	0.0010	0.0003	0.0010	0.0003				
Benzene	0.0012	0.0004	0.0012	0.0004				
Ethylbenzene								
Toluene	0.0005	0.0002	0.0005	0.0002				
Xylene	0.0004	0.0001	0.0004	0.0001				
Formaldehyde	0.0015	0.0005	0.0015	0.0005				
Total HAPs	0.005	0.002	0.005	0.002				

	Facility Total			
	Uncontrolled		Controlled	
Emission Type	lb/hr	tons/yr	lb/hr	tons/yr
PM	40.69	12.73	12.33	3.87
PM_{10}	12.88	4.02	4.18	1.32
$PM_{2.5}$	1.87	0.59	0.83	0.28
VOC	0.46	0.14	0.46	0.14
SO_2	0.37	0.12	0.37	0.12
NO_x	5.65	1.77	5.65	1.77
CO	1.22	0.38	1.22	0.38
HCl				
Acetaldehyde	0.0010	0.0003	0.0010	0.0003
Benzene	0.0012	0.0004	0.0012	0.0004
Ethylbenzene	0.0000	0.0000	0.0000	0.0000
Toluene	0.0005	0.0002	0.0005	0.0002
Xylene	0.0004	0.0001	0.0004	0.0001
Formaldehyde	0.0015	0.0005	0.0015	0.0005
Total HAPs	0.005	0.002	0.005	0.002

[1] Point source emissions include materials handling, and crushing and screening.

[2] Fugitive emissions include vehicular traffic.

By: MAF
Date: 8/5/2014

Checked By:LKB
Date:8/7/2014

TRANSFER POINTS - PORTABLE FRAP SYSTEM

Defining transfer point empirical expression variables, where: INPUT

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

e =	?	lb/ton
k for PM =	0.74	dimensionless
k for PM_{10}	0.35	dimensionless
k for $PM_{2.5}$	0.053	dimensionless
U =	7	mean wind speed, mph
$M_{aggregates}$ =	3.0	material moisture content, %
M_{RAP} =	7.5	material moisture content, %

Calculating transfer point emission factor for PM:

$e_{aggregates}$ =	0.0021	lb/ton
M_{RAP} =	0.0006	lb/ton

Calculating transfer point emission factor for PM_{10}:

$e_{aggregates}$ =	0.0010	lb/ton
M_{RAP} =	0.0003	lb/ton

Calculating transfer point emission factor for $PM_{2.5}$:

$e_{aggregates}$ =	0.0001	lb/ton
M_{RAP} =	4.13E-05	lb/ton

Notes:
Emission factor calculation and mean wind speed were taken from WVDEP General Permit G40-C Emissions Calculation Spreadsheet, May 6, 2011.
Control efficiencies taken from WVDEP General Permit G40-c, Instruction and Forms, May 6, 2011, except for crusting agents.
Crusting Agent (CA) control efficiency taken from *Preferred and Alternative Methods for Estimating Air Emissions from Hot-Mix Asphalt Plants* , *Final Report* , July 1996, Prepared for USEPA's Emission Inventory Improvement Program.

FRAP Production rate: 200 tph 125,000 tpy

PM Emissions Rounding = 2

ID	Description	Transfer Capacities		e (U)	Control Device		Emissions Uncontrolled		Emissions Controlled	
		tons/hour	tons/year	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
F-TP1	FE to F-HI	200	125,000	0.0006	MD	0	0.12	0.04	0.12	0.04
F-TP2	F-HI to F-BC1	200	125,000	0.0006	FE	80	0.12	0.04	0.02	0.01
F-TP3	F-BC1 to F-S1	200	125,000	0.0006	PE	50	0.12	0.04	0.06	0.02
F-TP4	F-S1 to F-BC2	75	46,875	0.0006	FE	80	0.05	0.01	0.01	0.00
F-TP5	F-BC2 to F-CR1	75	46,875	0.0006	FE	80	0.00	0.00	0.00	0.00
F-TP6	F-BC2 to OS6	75	46,875	0.0006	N	0	0.00	0.00	0.00	0.00
F-TP7	F-CR1 to F-BC1	75	46,875	0.0006	FE	80	0.05	0.01	0.01	0.00
F-TP8	F-SI to F-BC3	200	125,000	0.0006	PE	50	0.00	0.00	0.00	0.00
F-TP9	F-BC3 to OS9A or F-RS1	200	125,000	0.0006	MD	0	0.12	0.04	0.12	0.04
F-TP10	F-S1 to F-BC4	200	125,000	0.0006	PE	50	0.12	0.04	0.06	0.02
F-TP11	F-BC4 to OS9B or F-RS1	200	125,000	0.0006	MD	0	0.12	0.04	0.12	0.04
F-TP12	F-RS1 to OS9A or OS9B	200	125,000	0.0006	MD	0	0.12	0.04	0.12	0.04
						Sub-total	**0.94**	**0.30**	**0.64**	**0.21**

By: MAF
Date: 8/5/2014

Checked By:LKB
Date:8/7/2014

TRANSFER POINTS - PORTABLE FRAP SYSTEM

PM_{10} Emissions

Rounding = 3

ID	Description	Transfer Capacities		e (U)	Control Device		Emissions Uncontrolled		Emissions Controlled	
		tons/hour	tons/year	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
F-TP1	FE to F-HI	200	125,000	0.0003	MD	0	0.060	0.019	0.060	0.019
F-TP2	F-HI to F-BC1	200	125,000	0.0003	FE	80	0.060	0.019	0.012	0.004
F-TP3	F-BC1 to F-S1	200	125,000	0.0003	PE	50	0.060	0.019	0.030	0.010
F-TP4	F-S1 to F-BC2	75	46,875	0.0003	FE	80	0.023	0.007	0.005	0.001
F-TP5	F-BC2 to F-CR1	75	46,875	0.0003	FE	80	0.023	0.007	0.005	0.001
F-TP6	F-BC2 to OS6	75	46,875	0.0003	N	0	0.023	0.007	0.023	0.007
F-TP7	F-CR1 to F-BC1	75	46,875	0.0003	FE	80	0.023	0.007	0.005	0.001
F-TP8	F-SI to F-BC3	200	125,000	0.0003	PE	50	0.060	0.019	0.030	0.010
F-TP9	F-BC3 to OS9A or F-RS1	200	125,000	0.0003	MD	0	0.060	0.019	0.060	0.019
F-TP10	F-S1 to F-BC4	200	125,000	0.0003	PE	50	0.060	0.019	0.030	0.010
F-TP11	F-BC4 to OS9B or F-RS1	200	125,000	0.0003	MD	0	0.060	0.019	0.060	0.019
F-TP12	F-RS1 to OS9A or OS9B	200	125,000	0.0003	MD	0	0.060	0.019	0.060	0.019
						Sub-total	**0.57**	**0.18**	**0.38**	**0.12**

$PM_{2.5}$ Emissions

Rounding = 4

ID	Description	Transfer Capacities		e (U)	Control Device		Emissions Uncontrolled		Emissions Controlled	
		tons/hour	tons/year	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
F-TP1	FE to F-HI	200	125000	4.13E-05	MD	0	0.008	0.003	0.008	0.003
F-TP2	F-HI to F-BC1	200	125000	4.13E-05	FE	80	0.008	0.003	0.002	0.0005
F-TP3	F-BC1 to F-S1	200	125000	4.13E-05	PE	50	0.008	0.003	0.004	0.001
F-TP4	F-S1 to F-BC2	75	46875	4.13E-05	FE	80	0.003	0.001	0.001	0.0002
F-TP5	F-BC2 to F-CR1	75	46875	4.13E-05	FE	80	0.003	0.001	0.001	0.0002
F-TP6	F-BC2 to OS6	75	46875	4.13E-05	N	0	0.003	0.001	0.003	0.001
F-TP7	F-CR1 to F-BC1	75	46875	4.13E-05	FE	80	0.003	0.001	0.001	0.000
F-TP8	F-SI to F-BC3	200	125000	4.13E-05	PE	50	0.008	0.003	0.004	0.001
F-TP9	F-BC3 to OS9A or F-RS1	200	125000	4.13E-05	MD	0	0.008	0.003	0.008	0.003
F-TP10	F-S1 to F-BC4	200	125000	4.13E-05	PE	50	0.008	0.003	0.004	0.001
F-TP11	F-BC4 to OS9B or F-RS1	200	125000	4.13E-05	MD	0	0.008	0.003	0.008	0.003
F-TP12	F-RS1 to OS9A or OS9B	200	125000	4.13E-05	MD	0	0.008	0.003	0.008	0.003
						Sub-total	**0.08**	**0.02**	**0.05**	**0.02**

By: MAF
Date: 8/5/2014

Checked By:LKB
Date:8/7/2014

CRUSHING AND SCREENING

Emission Factors

	PM	PM10
Primary Crushing	0.002	0.001
Secondary & Tertiary Crushing	0.0054	0.0024
Screening	0.025	0.0087

Emission factors taken from DAQ G40-C Emissions Worksheet.

PM2.5 equal to PM/14:

Partlicle size multipliers (k) AP42 Section 13.2.4-4 (11/06):

	PM	PM10	PM2.5
	0.74	0.35	0.053
Conversion Factor		2.1	14

Crusher Emissions

Crusher Identification	Crusher Type	ID	Throughput (ton/hr)	Throughput (tons/yr)	Control Type	Contol Efficiency (%)	Pollutant	Uncontrolled (lb/hr)	Uncontrolled (tons/yr)	Controlled (lb/hr)	Controlled (tons/yr)
FRAP Crusher	Primary	F-CR1	75	46,875	FE	80	PM	0.15	0.05	0.03	0.01
							PM10	0.08	0.02	0.02	0.01
							PM2.5	0.02	0.01	0.01	0.01

Screen Emissions

Screen Identification	Screen Type	ID	Throughput (ton/hr)	Throughput (tons/yr)	Control Type	Contol Efficiency (%)	Pollutant	Uncontrolled (lb/hr)	Uncontrolled (tons/yr)	Controlled (lb/hr)	Controlled (tons/yr)
FRAP Screen	Double Deck	F-S1	200	125,000	FE	80	PM	5.00	1.56	1.00	0.31
							PM10	1.74	0.54	0.35	0.11
							PM2.5	0.36	0.11	0.07	0.02

Totals for Crushing and Screening

Pollutant	Uncontrolled (lb/hr)	Uncontrolled (tons/yr)	Controlled (lb/hr)	Controlled (tons/yr)
PM	5.15	1.61	1.03	0.32
PM10	1.82	0.56	0.37	0.12
PM2.5	0.38	0.12	0.08	0.03

By: MAF
Date: 8/5/2014

Checked By:LKB
Date:8/7/2014

ENGINE EMISSIONS
Portable FRAP System Engine (F-ENG1)
(NON-ROAD ENGINE - NOT INCLUDED IN PTE)

Fuel Usage	9.28	gallons/hour	CARB Certificate
	5,800	gallons/year	Calculated
Assumed Heating Value of Diesel Fuel:	138,000	Btu/gallon	HHV from 40 CFR 98, Table C-1
Maximum Horsepower:	173	hp	Manufacturer
Maximum Fuel Input:	1.28	MMBtu/hour	Calculated

Hours Per Year = 625

Regulated Pollutant	Emission Factor (lb/MMBtu)	Emission Factor (g/kW-hr)	Hourly Emissions (lbs/hour)	Annual Emissions (tons/year)
NO_X	4.41		5.65	1.77
CO	0.95		1.22	0.38
SO_X	0.29		0.37	0.12
$PM/PM_{10}/PM_{2.5}$	0.31		0.40	0.13
TOC (VOC)	0.36		0.46	0.14

Hazardous Air Pollutants (HAPS)				
Benzene	9.33E-04		0.0012	0.0004
Toluene	4.09E-04		0.0005	0.0002
Xylenes	2.85E-04		0.0004	0.0001
1,3-Butadiene	3.91E-05		0.0001	0.00003
Formaldehyde	1.18E-03		0.0015	0.0005
Acetaldehyde	7.67E-04		0.001	0.0003
Acrolein	9.25E-05		0.0001	0.0000
Naphthalene	8.48E-05		0.0001	0.0000
Total HAPS			0.0049	0.002

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

By: MAF
Date: 8/5/2014

Checked By:LKB
Date:8/7/2014

VEHICLE ACTIVITY

Emission factor equation:

$E = k(s/12)^a (W/3)^b((365-p)/365)$

From *AP-42 Fifth Edition* , Section 13.2.2, Fugitive Sources

	PM	PM10	PM2.5	
E =	?	?	?	lb/VMT
k =	4.9	1.5	0.15	particle size multiplier
a =	0.7	0.9	0.9	constant
b =	0.45	0.45	0.45	constant
s =	10	10	10	% silt in road surface
$W_{endloader}$ =	34	34	34	mean vehicle weight
p =	157	157	157	# days with 0.01" rain
$E_{endloader}$ =	**7.33**	**2.16**	**0.22**	lb/VMT

Annual Production (tpy) 125,000
Hourly Production (tph) 200

	Vehicle Wt	Load Wt
Endloaders	31	6

Rounding to = 2

Vehicular Traffic ID	Miles/Trip	Number of Trips/Hour	Number of Trips/Year	Control Device Type	Control Device Effic(%)	TSP Emissions Uncontrolled (lb/hr)	Uncontrolled (tpy)	Controlled (lb/hr)	Controlled (tpy)
Endloaders	0.14	33	20,833	HR-WS	70	34.20	10.69	10.26	3.21
						34.20	**10.69**	**10.26**	**3.21**

Vehicular Traffic ID	Miles/Trip (miles)	Number of Trips/Hour (trips/hour)	Number of Trips/Year (trips/year)	Control Device Type	Control Device Effic(%)	PM10 Emissions Uncontrolled (lb/hr)	Uncontrolled (tpy)	Controlled (lb/hr)	Controlled (tpy)
Endloaders	0.14	33	20,833	HR-WS	70	10.09	3.15	3.03	0.95
						10.09	**3.15**	**3.03**	**0.95**

Vehicular Traffic ID	Miles/Trip (miles)	Number of Trips/Hour (trips/hour)	Number of Trips/Year (trips/year)	Control Device Type	Control Device Effic(%)	PM2.5 Emissions Uncontrolled (lb/hr)	Uncontrolled (tpy)	Controlled (lb/hr)	Controlled (tpy)
Endloaders	0.14	33	20,833	HR-WS	70	1.01	0.32	0.30	0.10
						1.01	**0.32**	**0.30**	**0.10**

PORTABLE CRUSHING AND SCREENING SYSTEM

	Point Source Emissions				Fugitive Emissions			
	Uncontrolled		Controlled		Uncontrolled		Controlled	
Emission Type	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PM	7.09	3.95	4.42	2.44	17.21	11.16	5.24	3.68
PM_{10}	2.93	1.61	1.88	1.03	5.10	3.37	1.57	1.17
$PM_{2.5}$	0.48	0.32	0.29	0.21	0.51	0.36	0.16	0.14

Total Proposed PTE

	Uncontrolled		Controlled	
Emissions Type	lb/hr	tons/yr	lb/hr	tons/yr
PM	24.30	15.11	9.66	6.12
PM_{10}	8.03	4.98	3.45	2.20
$PM_{2.5}$	0.99	0.68	0.45	0.35

Emissions for Caterpillar Engine 3412 [1]

	Uncontrolled		Controlled	
Emissions Type	lb/hr	tons/yr	lb/hr	tons/yr
NO_X	28.70	30.14	28.70	30.14
CO	6.18	6.49	6.18	6.49
SO_X	1.89	1.98	1.89	1.98
$PM/PM_{10}/PM_{2.5}$	2.02	2.12	2.02	2.12
TOC (VOC)	2.34	2.46	2.34	2.46
Hazardous Air Pollutants (HAPS)				
Benzene	0.0061	0.0064	0.0061	0.0064
Toluene	0.0027	0.0028	0.0027	0.0028
Xylenes	0.0019	0.0020	0.0019	0.0020
1,3-Butadiene	0.0003	0.0004	0.0003	0.0004
Formaldehyde	0.0077	0.0081	0.0077	0.0081
Acetaldehyde	0.0050	0.0053	0.0050	0.0053
Acrolein	0.0006	0.0007	0.0006	0.0007
Naphthalene	0.0006	0.0007	0.0006	0.0007
Total HAPS	0.025	0.026	0.025	0.026

1. This engine is non-road which excludes its emissions from the PTE.

By: AM & PEW
Date: 02/26/2018

Checked by: PEW
Date: 02/26/2018

Materials Handling

Defining transfer point empirical expression variables, where:

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

e =	?	lb/ton
k for TSP =	0.74	dimensionless
k for PM_{10}=	0.35	dimensionless
k for $PM_{2.5}$=	0.053	dimensionless
U =	10	mean wind speed, mph
M_{RAP}=	3	material moisture content, %

Calculating transfer point emission factor for TSP:

e_{RAP} = 0.0033 lb/ton

Calculating transfer point emission factor for PM_{10}:

e_{RAP} = 0.0016 lb/ton

Calculating transfer point emission factor for $PM_{2.5}$:

e_{RAP} = 0.0002 lb/ton

Emission factor calculation taken from AP-42 Section 13.2.4
Aggregate Handling and Storage Piles

Materials Handling
PM Emissions

Rounding = 2

ID	Transfer Capacities		e (U)	Control Device		Emissions Uncontrolled		Emissions Controlled	
	tons/hour	tons/year	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
P-TP1	100	125,000	0.0033	MD	0	0.33	0.21	0.33	0.21
P-TP2	100	125,000	0.0033	PE	50	0.33	0.21	0.17	0.11
P-TP3	150	187,500	0.0033	N	0	0.50	0.31	0.50	0.31
P-TP4	100	62,500	0.0033	PE	50	0.33	0.10	0.17	0.05
P-TP5	100	62,500	0.0033	N	0	0.33	0.10	0.33	0.10
P-TP6	100	62,500	0.0033	PE	50	0.33	0.10	0.17	0.05
P-TP7	100	62,500	0.0033	N	0	0.33	0.10	0.33	0.10
P-TP8	100	125,000	0.0033	PE	50	0.33	0.21	0.17	0.11
P-TP9	100	125,000	0.0033	N	0	0.33	0.21	0.33	0.21
P-TP10	0	0	0.0033	PE	50	0.00	0.00	0.00	0.00
P-TP11	0	0	0.0033	N	0	0.00	0.00	0.00	0.00
					Total	3.14	1.55	2.50	1.25

* Assumes a maximum of 50% of RAP is crushed and recycled through the screen.

Materials Handling
PM_{10} Emissions

ID	Transfer Capacities		e (U)	Control Device		Emissions Uncontrolled		Emissions Controlled	
	tons/hour	tons/year	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
P-TP1	100	125,000	0.0016	MD	0	0.16	0.10	0.16	0.10
P-TP2	100	125,000	0.0016	PE	50	0.16	0.10	0.08	0.05
P-TP3	150	187,500	0.0016	N	0	0.24	0.15	0.24	0.15
P-TP4	100	62,500	0.0016	PE	50	0.16	0.05	0.08	0.03
P-TP5	100	62,500	0.0016	N	0	0.16	0.05	0.16	0.05
P-TP6	100	62,500	0.0016	PE	50	0.16	0.05	0.08	0.03
P-TP7	100	62,500	0.0016	N	0	0.16	0.05	0.16	0.05
P-TP8	100	125,000	0.0016	PE	50	0.16	0.10	0.08	0.05
P-TP9	100	125,000	0.0016	N	0	0.16	0.10	0.16	0.10
P-TP10	0	0	0.0016	PE	50	0.00	0.00	0.00	0.00
P-TP11	0	0	0.0016	N	0	0.00	0.00	0.00	0.00
					Total	1.52	0.75	1.20	0.61

* Assumes a maximum of 50% of RAP is crushed and recycled through the screen.

Materials Handling
$PM_{2.5}$ Emissions

ID	Transfer Capacities		e (U)	Control Device		Emissions Uncontrolled		Emissions Controlled	
	tons/hour	tons/year	lb/T	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
P-TP1	100	125,000	0.0002	MD	0	0.02	0.02	0.02	0.02
P-TP2	100	125,000	0.0002	PE	50	0.02	0.02	0.01	0.01
P-TP3	150	187,500	0.0002	N	0	0.03	0.02	0.03	0.02
P-TP4	100	62,500	0.0002	PE	50	0.02	0.01	0.01	0.01
P-TP5	100	62,500	0.0002	N	0	0.02	0.01	0.02	0.01
P-TP6	100	62,500	0.0002	PE	50	0.02	0.01	0.01	0.01
P-TP7	100	62,500	0.0002	N	0	0.02	0.01	0.02	0.01
P-TP8	100	125,000	0.0002	PE	50	0.02	0.02	0.01	0.01
P-TP9	100	125,000	0.0002	N	0	0.02	0.02	0.02	0.02
P-TP10	0	0	0.0002	PE	50	0.00	0.00	0.00	0.00
P-TP11	0	0	0.0002	N	0	0.00	0.00	0.00	0.00
					Total	0.19	0.14	0.15	0.12

* Assumes a maximum of 50% of RAP is crushed and recycled through the screen.

West Virginia Paving, Inc.
Portable Crushing and Screening

Potesta & Associates, Inc.
Project No. 0101-16-0318-030

By: AM & PEW
Date: 02/26/2018

Checked by: PEW
Date: 02/26/2018

Crushing and Screening

Emission Factors (lb/ton)

	PM	PM10	Source
Primary Crushing	0.002	0.001	DAQ G40-C Emissions Worksheet
Secondary & Tertiary Crushing	0.0054	0.0024	DAQ G40-C Emissions Worksheet
Screening	0.025	0.0087	DAQ G40-C Emissions Worksheet

Crusher Emissions
PM Emissions

PM Crusher Identification	Crusher Type	ID	Throughput (ton/hr)	Throughput (tons/yr)	Control Type	Contol Efficiency (%)	Uncontrolled (lb/hr)	Uncontrolled (tons/yr)	Controlled (lb/hr)	Controlled (tons/yr)
RAP Crusher	Primary	P-CR1	100	62,500	FE	80	0.20	0.06	0.04	0.02
						Totals:	0.20	0.06	0.04	0.02

PM10 Emissions

Crusher Identification	Crusher Type	ID	Throughput (ton/hr)	Throughput (tons/yr)	Control Type	Contol Efficiency (%)	Uncontrolled (lb/hr)	Uncontrolled (tons/yr)	Controlled (lb/hr)	Controlled (tons/yr)
RAP Crusher	Primary	P-CR1	100	62,500	FE	80	0.10	0.04	0.02	0.01
						Totals	0.10	0.04	0.02	0.01

PM2.5 Emission

Crusher Identification	Crusher Type	ID	Throughput (ton/hr)	Throughput (tons/yr)	Control Type	Contol Efficiency (%)	Uncontrolled (lb/hr)	Uncontrolled (tons/yr)	Controlled (lb/hr)	Controlled (tons/yr)
RAP Crusher	Primary	P-CR1	100	62,500	FE	80	0.02	0.01	0.01	0.01
						Totals	0.02	0.01	0.01	0.01

Screen Emissions
PM Emissions

Screen Identification	Screen Type	ID	Throughput (ton/hr)	Throughput (tons/yr)	Control Type	Contol Efficiency (%)	Uncontrolled (lb/hr)	Uncontrolled (tons/yr)	Controlled (lb/hr)	Controlled (tons/yr)
RAP Screen	Double Deck	P-SCR1	150	187,500	PE	50	3.75	2.34	1.88	1.17
						Totals:	3.75	2.34	1.88	1.17

PM10 Emissions

Screen Identification	Screen Type	ID	Throughput (ton/hr)	Throughput (tons/yr)	Control Type	Contol Efficiency (%)	Uncontrolled (lb/hr)	Uncontrolled (tons/yr)	Controlled (lb/hr)	Controlled (tons/yr)
RAP Screen	Double Deck	P-SCR1	150	187,500	PE	50	1.31	0.82	0.66	0.41
						Totals:	1.31	0.82	0.66	0.41

PM2.5 Emissions

Screen Identification	Screen Type	ID	Throughput (ton/hr)	Throughput (tons/yr)	Control Type	Contol Efficiency (%)	Uncontrolled (lb/hr)	Uncontrolled (tons/yr)	Controlled (lb/hr)	Controlled (tons/yr)
RAP Screen	Double Deck	P-SCR1	150	187,500	PE	50	0.27	0.17	0.13	0.08
						Totals:	0.27	0.17	0.13	0.08

Totals for Crushing and Screening

PM				PM10				PM2.5			
Uncontrolled		Controlled		Uncontrolled		Controlled		Uncontrolled		Controlled	
(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)
3.95	2.40	1.92	1.19	1.41	0.86	0.68	0.42	0.29	0.18	0.14	0.09

(1)- PM2.5 equal to PM/14:
Partlicle size multipliers (k) AP42 Section 13.2.4-4 (11/06):

PM	PM10	PM2.5
0.74	0.35	0.053
Conversion Factor	2.1	14

By: AM & PEW
Date: 02/26/2018

Checked by: PEW
Date: 02/26/2018

Stockpiles

Reference: AP-42 Section 11.2.3, Fugitive Emissions (May, 1983), Equation #2

$E = 1.7 (s/1.5) ((365-p)/235) (f/15)$

$E =$	?	Emissions factor, pound per day per acre, (lb/day/acre)		
$s_{agg} =$	1	Silt content of material (%)		
$p =$	157	number of days with at least 0.254 mm (0.01 in.) of precipitation per year		
$f =$	15	Time wind speed exceeds 12 mph (%)		
$e_{agg} =$	1.003	lb/day/acre for aggregates and RAP	Rounding to	3

Stockpile ID	Stockpile Material	Base Area (acres)	Control Device	Control Eff. (%)	Uncontrolled Emissions lb/hr	Uncontrolled Emissions tpy	Controlled Emissions lb/hr	Controlled Emissions tpy
OS1	RAP	2.56	N	0	0.11	0.47	0.11	0.47
				PM	0.11	0.47	0.11	0.47
				PM_{10}*	0.05	0.22	0.05	0.22
				$PM_{2.5}$*	0.01	0.04	0.01	0.04

* PM10 = PM/2.1; PM2.5 = PM/14.

By: AM & PEW
Date: 02/26/2018

Checked by: PEW
Date: 02/26/2018

VEHICLE ACTIVITY

Emission factor equation:

$E = k(s/12)^a (W/3)^b((365-p)/365)$

From *AP-42 Fifth Edition* , Section 13.2.2, Fugitive Sources

	PM	PM10	PM2.5	
E =	?	?	?	lb/VMT
k =	4.9	1.5	0.15	particle size multiplier
a =	0.7	0.9	0.9	constant
b =	0.45	0.45	0.45	constant
s =	10	10	10	% silt in road surface
$W_{endloader}$ =	34	34	34	mean vehicle weight
p =	157	157	157	# days with 0.01" rain
				0
				0
$E_{endloader}$ =	**7.33**	**2.16**	**0.22**	lb/VMT

Annual Production (tpy) 125,000
Hourly Production (tph) 100

	Vehicle Wt	Load Wt
Endloaders	31	6

Rounding to = 2

Vehicular Traffic ID	Miles/Trip[1]	Number of Trips/Hour	Number of Trips/Year	Control Device Type	Control Device Effic(%)	TSP Emissions Uncontrolled (lb/hr)	TSP Emissions Uncontrolled (tpy)	TSP Emissions Controlled (lb/hr)	TSP Emissions Controlled (tpy)
Endloaders	0.14	17	20,833	HR-WS	70	17.10	10.69	5.13	3.21
						17.10	**10.69**	**5.13**	**3.21**

Vehicular Traffic ID	Miles/Trip (miles)	Number of Trips/Hour (trips/hour)	Number of Trips/Year (trips/year)	Control Device Type	Control Device Effic(%)	PM10 Emissions Uncontrolled (lb/hr)	PM10 Emissions Uncontrolled (tpy)	PM10 Emissions Controlled (lb/hr)	PM10 Emissions Controlled (tpy)
Endloaders	0.14	17	20,833	HR-WS	70	5.05	3.15	1.52	0.95
						5.05	**3.15**	**1.52**	**0.95**

Vehicular Traffic ID	Miles/Trip (miles)	Number of Trips/Hour (trips/hour)	Number of Trips/Year (trips/year)	Control Device Type	Control Device Effic(%)	PM2.5 Emissions Uncontrolled (lb/hr)	PM2.5 Emissions Uncontrolled (tpy)	PM2.5 Emissions Controlled (lb/hr)	PM2.5 Emissions Controlled (tpy)
Endloaders	0.14	17	20,833	HR-WS	70	0.50	0.32	0.15	0.10
Notes						**0.50**	**0.32**	**0.15**	**0.10**

1. Miles/trip from Dunbar FRAP

By: AM & PEW
Date: 02/26/2018

Checked by: PEW
Date: 02/26/2018

Caterpillar 3412 (P-ENG1) Manufactured 1989 (NON-ROAD ENGINE - NOT INCLUDED IN PTE)

Fuel Usage =	47.5	gallons/hour	Client
	99,750	gallons/year	Calculated
	7.2	lbs/gal Diesel Fuel	Constant
Assumed HeatingValue of Diesel Fuel[2] =	137,000	Btu/gallon	Constant
Maximum Horsepower =	917	hp	Client
Maximum Fuel Input =	6.51	MMBtu/hour	Calculated

Hours Per Year = 2,100

Regulated Pollutant	Emission Factor (lb/MMBtu)[1]	Hourly Emissions (lbs/hour)	Annual Emissions (tons/year)
NO_X	4.41	28.70	30.14
CO	0.95	6.18	6.49
SO_X	0.29	1.89	1.98
$PM/PM_{10}/PM_{2.5}$	0.31	2.02	2.12
TOC (VOC)	0.36	2.34	2.46
Hazardous Air Pollutants (HAPS)			
Benzene	9.33E-04	0.0061	0.0064
Toluene	4.09E-04	0.0027	0.0028
Xylenes	2.85E-04	0.0019	0.0020
1,3-Butadiene	3.91E-05	0.0003	0.0004
Formaldehyde	1.18E-03	0.0077	0.0081
Acetaldehyde	7.67E-04	0.005	0.0053
Acrolein	9.25E-05	0.0006	0.0007
Naphthalene	8.48E-05	0.0006	0.0007
Total HAPS		0.025	0.026

Notes:
1. Emission factors from AP-42 Table 3.3-1(Criteria Pollutants) Table 3.3-2 (HAPS) unless noted.
2. Heating value of diesel fuel from AP-42 Appendix A.

ATTACHMENT O

MONITORING, RECORDKEEPING, REPORTING, TESTING PLANS

ATTACHMENT O - MONITORING/RECORDKEEPING/ REPORTING/TESTING PLANS

West Virginia Paving, Inc. plans to follow the monitoring, recordkeeping, reporting, and testing required by the issued permit.

ATTACHMENT P

PUBLIC NOTICE

ATTACHMENT P
CLASS I LEGAL ADVERTISEMENT

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that West Virginia Paving, Inc. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Regulation 13 Permit Application for a Hot Mix Asphalt plant located on Charles Avenue in Dunbar, Kanawha County, West Virginia. The latitude and longitude coordinates are: 38.36903 N and -81.760667 E.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be: PM of 64.40 tons per year (tpy) including fugitive emissions of 29.79 tpy, PM10 of 21.25 tpy including fugitive emissions of 8.86 tpy, PM2.5 of 4.55 tpy including fugitive emissions of 1.03 tpy, VOC of 22.74 tons, SO_2 of 15.74 tpy, NO_x of 32.97 tpy, CO of 38.50 tpy, Acetaldehyde of 0.33 tpy, Benzene of 0.11 tpy, Ethylbenzene of 0.068 tpy, Toluene of 0.09 tpy, Xylene of 0.09 tpy, 1,3-Butadiene of 0.0003 tpy, Formaldehyde of 0.87 tpy, Acrolein of 0.0003 tpy, and Naphthalene of 0.0003 tpy.

The facility will begin operation under the modified permit on or about December 1, 2013. 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 DATE) day of March, 2018.

By: West Virginia Paving, Inc.
Robert Brookover
Vice President
PO Box 544
Dunbar, West Virginia 25064

APPENDIX

ENGINE STACK TEST

FINAL REPORT

CARBON MONOXIDE EMISSION TESTING

KOMATSU CLAMSHELL (SOURCE ID CE1)
WVDEP PERMIT NO. G20-B187B

WEST VIRGINIA PAVING, INC. DUNBAR ASPHALT
DUNBAR, WEST VIRGINIA

LEMOS LABS, LLC PROJECT 0557

TEST DATE: October 19, 2017

PREPARED BY
ALEX KEFFALAS
GENERAL MANAGER

LEMOS LABS, LLC

329 PILLOW STREET
BUTLER, PENNSYLVANIA 16001

CERTIFICATION OF DATA ACCURACY

I, the undersigned, hereby certify that, based on the information and belief formed after reasonable inquiry, all information in the attached report, representing the period beginning October 19, 2017 and ending October 19, 2017, and any supporting documents appended hereto, is true, accurate and complete.

Test Team Supervisor

Alex Keffalas
General Manager

10-19-17
Date

Source Representative

Bob Brookover
President, West Virginia Paving, Inc.

Date

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1.0 EXECUTIVE SUMMARY

West Virginia Paving, Inc. Dunbar Asphalt contracted Lemos Labs, LLC to conduct carbon monoxide (CO) reduction evaluation for the Komatsu Clamshell engine catalyst (Source ID CE1) located at the West Virginia Paving, Inc. Dunbar Asphalt Plant #30. Sampling was conducted to meet certain conditions of the WVDEP Permit No. G20-B187B. Three one-hour runs were conducted simultaneously at the inlet and outlet of the catalyst while fired with diesel fuel. Sampling and analyses was conducted using the principles of U.S. Environmental Protection Agency (EPA) methods specified in 40 CFR, Part 60, Appendix A.

The testing was conducted while the source was operated at a maximum routine rate.

The results demonstrated compliance with the WVDEP permit limits. Table 1 presents the test results summary of the emissions.

TABLE 1

WEST VIRGINIA PAVING INC. DUNBAR ASPHALT PLANT #30
DUNBAR, WEST VIRGINIA

KOMATSU CLAMSHELL (SOURCE ID CE1)
PERMIT NO. G20-B187B

October 19, 2017

TEST RESULTS SUMMARY

Parameter	Average	Compliance Limit	Compliance Determination
Carbon Monoxide Emissions: ppmvd @ 15% O_2	42.4	49	in-compliance
Carbon Monoxide Reduction: percent	89	70	in-compliance

2.0 SCOPE AND OBJECTIVES

The scope of this project was to determine CO reduction across the Komatsu Clamshell engine catalyst (Source ID CE1) while firing with diesel fuel using approved reference sampling methods. The sampling was conducted to demonstrate compliance with certain conditions of the WVDEP Permit No. G20-B187B.

As per the Permit, the results of the tests were intended to demonstrate that the source would reduce CO emissions by at least 70%. The tests are also intended to demonstrate that the source will not exceed 49 ppmvd CO at 15% O_2 while fired with diesel fuel. Three runs were conducted simultaneously at the inlet and outlet of the catalyst and the average of the three runs constituted the test.

The following parameters were determined at a minimum for three test runs:

- Gas Analysis — CO_2 and O_2 % by volume
- CO Emissions — ppmvd @ 15% O_2

CO_2	carbon dioxide
O_2	oxygen
ppmvd	parts per million volume dry
ppmvd @15% O_2	parts per million volume dry corrected to 15 percent oxygen

The field-sampling program was performed on October 19, 2017. The Lemos Labs test personnel consisted of Messrs. Alex Keffalas (On-Site Supervisor) and Ms. Alexandra Garsteck (Trailer Operator). The process data was collected by West Virginia Paving, Inc. Dunbar Asphalt Plant #30.

Contacts:

Lemos Labs, LLC contact: Alex Keffalas
Lemos Labs, LLC
329 Pillow Street
Butler, Pennsylvania 16001

Telephone: (724) 519-2936
Facsimile: (724) 519-2317

West Virginia Paving, Inc.
Dunbar Asphalt Contact: Trey Mattox
West Virginia Paving, Inc. Dunbar Asphalt Plant #30
2950 Charles Avenue
Dunbar, West Virginia

Telephone: (304)-720-2422

3.0 PROCESS DESCRIPTION

The 99 Komatsu PC 750 excavator on pedestal with 26' droop nose stick with 4.25 cubic yard clam shell bucket. Direct connected pre-emissions power source is a 6 cylinder 4 cycle water cooled direct injection with turbocharger and after cooler with a 6" direct stack out of engine bay 444hp at 1800rpm with a max torque 0f2100 at 1350 rpm. The engine on said machine was checked and worked on by Rish Equipment prior to emissions testing Dec. 2016, with new injectors and overhead on engine being performed. The results of this work were that engine was running at optimal performance per Komatsu Specifications.

The Komatsu PC 750 has one (1) primary function which is to unload barges from river delivery of Material (aggregate).

The stack diagram for the Komatsu Clamshell is included in Figure 1.

4.0 PROCEDURES

4.1 FIELD WORK

4.1.1 Field Data Sheets

Copies of all field data sheets are included in Appendix A.

4.1.2 Emission Testing Station

The sampling locations are in the duct before and after the catalyst. The inlet and outlet sampling locations are directly before and after the catalyst, respectively. The sampling locations do not meet the two and half-diameter criterion of Section 11.1.1 of Method 1 of 40 CFR part 60, appendix A-1. Therefore, a stratification test was conducted and sampling points were selected according to Section 8.1.2 of EPA Method 7E of 40 CFR part 60, appendix A-4. A drawing of the sampling location is included in Figure 1.

A stratification test was conducted at each stack sampling location during the first run. The source met the stratification criteria for O_2 for each location, therefore the sampling probe was positioned at a single point in the gas stream for the remainder of the testing.

4.1.3 Determination of Carbon Dioxide and Oxygen

Oxygen (O_2) was continuously measured during each test period for the calculation of dry molecular weight using EPA Method 3A - Gas Determination of Oxygen and Carbon Dioxide Concentration in Emissions From Stationary Sources. The O_2 data was collected simultaneously with the emission data.

4.1.4 Determination of Carbon Monoxide Emissions

The principles of EPA Method 10 - Determination of Carbon Monoxide Emissions From Stationary Sources was used for this test program. A gas sample was continuously and simultaneously extracted from the inlet stack and outlet stack and a portion of the sample was conveyed to an analyzer. The analyzer measured the CO concentration using the principles of gas filter correlation.

4.1.5 Process Data

During the testing, the process data was monitored and recorded at the end of every run and is provided in the final report. The process data was given to us by West Virginia Paving, Inc. Dunbar Asphalt Plant #30.

4.1.6 Summary of Test Parameters and Methods

The compliance emissions test was performed for the parameters listed in Table 3. All test methods proposed for this compliance test conform to Title 40, Code of Federal Regulations, Part 60. No variations were conducted. The test methods followed the current reference methods.

TABLE 3

TEST PARAMETERS AND METHODS

Parameter	EPA Method #	Sampling and Analytical Procedure	Variations
O_2, CO_2	3A	Determination of Oxygen and Carbon Dioxide Concentrations in Emissions from Stationary Sources	None
CO	10	Determination of Carbon Monoxide Emissions from Stationary Sources	None

4.2 CALCULATIONS

Emission calculations were completed using a computer spreadsheet format. The results of the pertinent parameter is detailed on the spreadsheet for each sampling run. An actual calculation of a run is included in Appendix C.

4.3 FIELD EQUIPMENT CALIBRATIONS

The following field equipment calibration data is included in Appendix D:

- Analyzers; and
- Calibration gas certificates.

5.0 SUMMARY OF RESULTS

Table 2 present a summary of emission results.

The CO loading concentrations ranged from 298.0 to 317.4 ppmvd and the average was 307.0 ppmvd. The CO loading concentrations at 15% O_2 ranged from 382.2 to 402.1 ppmvd and the average was 395.1 ppmvd.

The CO emissions concentrations ranged from 28.8 to 41.5 ppmvd and the average was 34.5 ppmvd. The CO emissions concentrations at 15% O_2 ranged from 34.6 to 51.9 ppmvd and the average was 42.4 ppmvd.

The CO reduction ranged from 87 to 91 percent and the average was 89 percent.

TABLES

TABLE 1

WEST VIRGINIA PAVING INC. DUNBAR ASPHALT PLANT #30
DUNBAR, WEST VIRGINIA

KOMATSU CLAMSHELL (SOURCE ID CE1)
PERMIT NO. G20-B187B

October 19, 2017

TEST RESULTS SUMMARY

Parameter	Average	Compliance Limit	Compliance Determination
Carbon Monoxide Emissions: ppmvd @ 15% O_2	42.4	49	in-compliance
Carbon Monoxide Reduction: percent	89	70	in-compliance

TABLE 2

WEST VIRGINIA PAVING INC. DUNBAR ASPHALT PLANT #30
DUNBAR, WEST VIRGINIA
KOMATSU CLAMSHELL (SOURCE ID CE1)

LEMOS LABS PROJECT 0557

October 19, 2017

SUMMARY OF EMISSIONS AND TESTING PARAMETERS

Parameter	Run 1	Run 2	Run 3	Average
Oxygen content, % by volume Inlet	16.3	16.4	16.2	**16.3**
Oxygen content, % by volume Outlet	16.0	16.2	16.1	**16.1**
Carbon Monoxide Loading:				
ppmvd	298.0	305.8	317.4	**307.0**
ppmvd @ 15% O_2	382.2	401.1	402.1	**395.1**
Carbon Monoxide Emissions:				
ppmvd	28.8	41.5	33.1	**34.5**
ppmvd @ 15% O_2	34.6	51.9	40.8	**42.4**
Carbon Monoxide Reduction:				
percent	91	87	90	**89**

TABLE 3

TEST PARAMETERS AND METHODS

Parameter	EPA Method #	Sampling and Analytical Procedure	Variations
O_2, CO_2	3A	Determination of Oxygen and Carbon Dioxide Concentrations in Emissions from Stationary Sources	None
CO	10	Determination of Carbon Monoxide Emissions from Stationary Sources	None

FIGURES

FIGURE 1

West Virginia Paving
Komatsu Clamshell
Dunbar, West Virginia

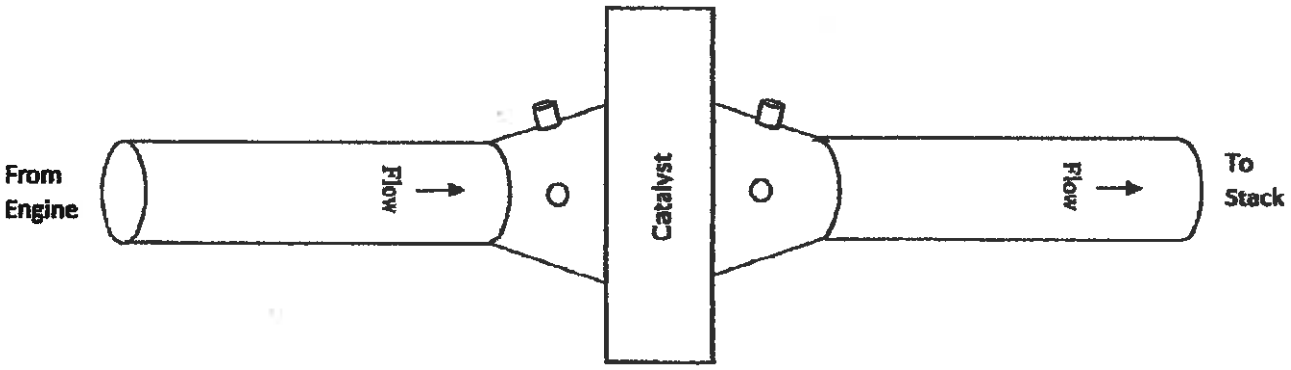
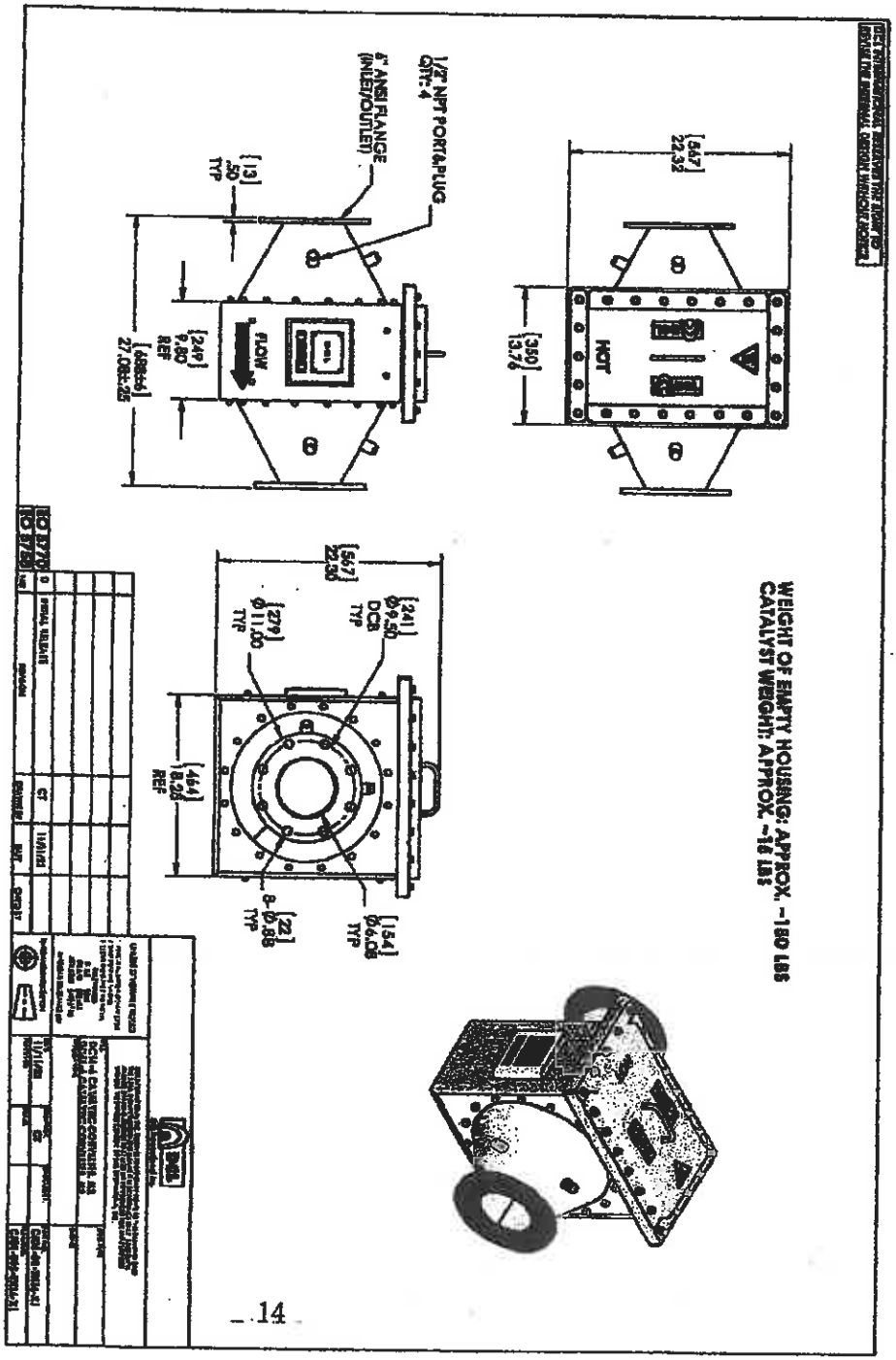


FIGURE 2

West Virginia Paving
Catalyst Schematic
Dunbar, West Virginia



APPENDIX A

FIELD DATA SHEETS

LEMOS LABS, LLC
Average Values Report
for Reference Method

WEST VIRGINIA PAVING INC. DUNBAR ASPHALT PLANT #30
DUNBAR, WEST VIRGINIA
KOMATSU CLAMSHELL (SOURCE ID CE1)
LEMOS LABS, LLC PROJECT 0557

Run 1
Minute Data
Compliance

Date	Time	O_2 % INLET	CO PPM INLET	O_2 % OUTLET	CO PPM OUTLET
10/19/2017	18:13:08	16.1	279.0	15.8	23.4
10/19/2017	18:14:08	16.1	278.8	15.8	23.4
10/19/2017	18:15:08	16.1	277.7	15.8	23.4
10/19/2017	18:16:08	16.0	290.0	15.8	25.5
10/19/2017	18:17:08	16.0	292.5	15.8	25.9
10/19/2017	18:18:08	16.0	281.9	15.8	24.3
10/19/2017	18:19:08	16.0	284.7	15.8	24.8
10/19/2017	18:20:08	16.0	290.2	15.8	25.7
10/19/2017	18:21:08	16.0	284.7	15.8	24.8
10/19/2017	18:22:08	16.1	280.6	15.8	24.5
10/19/2017	18:23:08	16.1	289.9	15.8	25.8
10/19/2017	18:24:08	16.1	290.8	15.8	25.9
10/19/2017	18:25:08	16.1	282.9	15.8	24.8
10/19/2017	18:26:08	16.1	284.9	15.8	25.2
10/19/2017	18:27:08	16.1	291.8	15.8	26.6
10/19/2017	18:28:08	16.1	293.1	15.8	26.9
10/19/2017	18:29:08	16.1	292.7	15.8	26.6
10/19/2017	18:30:08	16.1	290.6	15.8	26.9
10/19/2017	18:31:08	16.1	295.3	15.8	27.6
10/19/2017	18:32:08	16.1	297.1	15.8	28.1
10/19/2017	18:33:08	16.1	296.2	15.8	27.9
10/19/2017	18:34:08	16.1	300.3	15.8	28.8
10/19/2017	18:35:08	16.1	302.5	15.8	29.3
10/19/2017	18:36:08	16.1	302.0	15.8	29.4
10/19/2017	18:37:08	16.1	299.1	15.8	29.0
10/19/2017	18:38:08	16.1	298.6	15.8	28.8
10/19/2017	18:39:08	16.1	302.3	15.8	29.4
10/19/2017	18:40:08	16.1	303.4	15.8	29.8
10/19/2017	18:41:08	16.1	303.0	15.8	29.9
10/19/2017	18:42:08	16.1	300.1	15.8	29.4
10/19/2017	18:43:08	16.1	299.8	15.8	29.4
10/19/2017	18:44:08	16.0	304.2	15.8	30.3
10/19/2017	18:45:08	16.1	302.8	15.7	30.0
10/19/2017	18:46:08	16.0	294.5	15.7	28.5
10/19/2017	18:47:08	16.0	291.2	15.8	28.1
10/19/2017	18:48:08	16.0	298.6	15.8	29.1
10/19/2017	18:49:08	16.0	303.1	15.8	30.1
10/19/2017	18:50:08	16.0	301.3	15.8	29.8
10/19/2017	18:51:08	16.0	300.9	15.8	30.1
10/19/2017	18:52:08	16.1	304.2	15.8	30.7
10/19/2017	18:53:08	16.1	308.5	15.8	31.6
10/19/2017	18:54:08	16.0	304.9	15.8	30.9
10/19/2017	18:55:08	16.1	301.0	15.8	30.4
10/19/2017	18:56:08	16.0	306.6	15.8	31.5
10/19/2017	18:57:08	16.0	307.4	15.8	32.0
10/19/2017	18:58:08	16.1	305.6	15.8	31.3
10/19/2017	18:59:08	16.0	297.6	15.8	29.7
10/19/2017	19:00:08	16.1	298.3	15.8	29.7
10/19/2017	19:01:08	16.0	303.0	15.8	30.9
10/19/2017	19:02:08	16.0	305.7	15.8	31.9
10/19/2017	19:03:08	16.0	306.9	15.8	32.4
10/19/2017	19:04:08	16.1	308.2	15.8	32.8
10/19/2017	19:05:08	16.1	307.3	15.8	33.0
10/19/2017	19:06:08	16.1	304.5	15.7	32.4
10/19/2017	19:07:08	16.0	305.0	15.8	32.5
10/19/2017	19:08:08	16.0	307.0	15.8	33.0
10/19/2017	19:09:08	16.0	309.5	15.8	33.6
10/19/2017	19:10:08	16.0	305.7	15.8	32.3
10/19/2017	19:11:08	16.0	296.5	15.8	30.7
10/19/2017	19:12:08	16.0	300.0	15.8	31.6
Averages		**16.1**	**297.4**	**15.8**	**28.9**
Average Drift Corrected		**16.3**	**298.0**	**16.0**	**28.8**

LEMOS LABS, LLC
Average Values Report
for Reference Method

WEST VIRGINIA PAVING INC. DUNBAR ASPHALT PLANT #30
DUNBAR, WEST VIRGINIA
KOMATSU CLAMSHELL (SOURCE ID CE1)
LEMOS LABS, LLC PROJECT 0557

Run 2
Minute Data
Compliance

Date	Time	O_2 % INLET	CO PPM INLET	O_2 % OUTLET	CO PPM OUTLET
10/19/2017	19:50:52	16.1	316.7	15.9	43.1
10/19/2017	19:51:52	16.1	312.6	15.9	42.5
10/19/2017	19:52:52	16.1	309.1	15.9	41.4
10/19/2017	19:53:52	16.1	303.1	15.9	39.4
10/19/2017	19:54:52	16.1	300.9	15.9	38.9
10/19/2017	19:55:52	16.1	304.2	15.9	39.7
10/19/2017	19:56:52	16.1	300.9	15.9	38.7
10/19/2017	19:57:52	16.1	300.7	15.9	38.8
10/19/2017	19:58:52	16.1	301.1	15.9	39.0
10/19/2017	19:59:52	16.1	306.5	15.9	40.7
10/19/2017	20:00:52	16.1	304.4	15.9	39.7
10/19/2017	20:01:52	16.1	299.1	15.9	38.8
10/19/2017	20:02:52	16.1	300.5	15.9	39.2
10/19/2017	20:03:52	16.1	302.4	15.9	39.6
10/19/2017	20:04:52	16.1	304.8	15.9	40.2
10/19/2017	20:05:52	16.1	308.3	15.9	41.4
10/19/2017	20:06:52	16.1	312.1	15.9	42.6
10/19/2017	20:07:52	16.1	310.0	15.9	42.3
10/19/2017	20:08:52	16.1	299.3	15.9	39.7
10/19/2017	20:09:52	16.1	304.4	15.9	41.1
10/19/2017	20:10:52	16.1	303.0	15.9	40.4
10/19/2017	20:11:52	16.1	297.3	15.9	39.3
10/19/2017	20:12:52	16.1	299.2	15.9	39.3
10/19/2017	20:13:52	16.1	298.6	15.9	39.0
10/19/2017	20:14:52	16.1	299.8	15.9	39.2
10/19/2017	20:15:52	16.1	298.3	15.9	38.9
10/19/2017	20:16:52	16.1	299.6	15.9	39.7
10/19/2017	20:17:52	16.1	303.5	15.9	40.8
10/19/2017	20:18:52	16.1	303.4	15.9	40.9
10/19/2017	20:19:52	16.1	302.1	15.9	41.2
10/19/2017	20:20:52	16.1	304.7	15.9	41.9
10/19/2017	20:21:52	16.1	303.9	15.9	41.7
10/19/2017	20:22:52	16.1	303.5	15.9	41.7
10/19/2017	20:23:52	16.1	303.6	15.9	42.2
10/19/2017	20:24:52	16.1	305.8	15.9	42.7
10/19/2017	20:25:52	16.1	304.8	15.9	42.6
10/19/2017	20:26:52	16.2	307.1	15.9	43.4
10/19/2017	20:27:52	16.2	305.7	15.9	42.9
10/19/2017	20:28:52	16.2	302.4	15.9	42.2
10/19/2017	20:29:52	16.2	298.1	15.9	40.7
10/19/2017	20:30:52	16.1	298.5	15.9	40.2
10/19/2017	20:31:52	16.1	298.4	15.9	40.5
10/19/2017	20:32:52	16.1	297.9	15.9	40.7
10/19/2017	20:33:52	16.1	307.8	15.9	43.5
10/19/2017	20:34:53	16.1	310.7	15.9	44.8
10/19/2017	20:35:52	16.1	309.4	15.9	44.3
10/19/2017	20:36:52	16.2	309.1	15.9	44.3
10/19/2017	20:37:52	16.2	305.9	15.9	43.5
10/19/2017	20:38:53	16.2	301.7	15.9	42.8
10/19/2017	20:39:53	16.2	300.5	15.9	42.2
10/19/2017	20:40:53	16.1	301.9	15.9	42.2
10/19/2017	20:41:53	16.1	300.2	15.9	41.9
10/19/2017	20:42:53	16.1	301.9	15.9	42.6
10/19/2017	20:43:53	16.1	306.5	15.9	44.3
10/19/2017	20:44:53	16.1	303.0	15.9	43.8
10/19/2017	20:45:53	16.1	304.9	15.9	44.7
10/19/2017	20:46:53	16.1	309.3	15.9	45.6
10/19/2017	20:47:53	16.1	311.4	15.9	47.0
10/19/2017	20:48:53	16.2	315.2	15.9	47.7
10/19/2017	20:49:53	16.2	312.6	15.9	47.4
Averages		**16.1**	**304.2**	**15.9**	**41.7**
Average Drift Corrected		**16.4**	**305.8**	**16.2**	**41.5**

LEMOS LABS, LLC
Average Values Report
for Reference Method

WEST VIRGINIA PAVING INC. DUNBAR ASPHALT PLANT #30
DUNBAR, WEST VIRGINIA
KOMATSU CLAMSHELL (SOURCE ID CE1)
LEMOS LABS, LLC PROJECT 0567

Run 3
Minute Data
Compliance

Date	Time	O_2 % INLET	CO PPM INLET	O_2 % OUTLET	CO PPM OUTLET
10/19/2017	21:06:32	15.8	297.9	15.8	35.2
10/19/2017	21:07:32	15.7	298.9	15.8	34.8
10/19/2017	21:08:32	15.8	300.9	15.8	33.4
10/19/2017	21:09:32	15.9	300.1	15.8	32.4
10/19/2017	21:10:32	16.0	304.7	15.8	32.4
10/19/2017	21:11:32	16.0	306.0	15.8	32.8
10/19/2017	21:12:32	16.0	308.1	15.8	32.7
10/19/2017	21:13:32	16.0	309.0	15.9	32.1
10/19/2017	21:14:32	16.0	308.2	15.9	31.7
10/19/2017	21:15:32	16.1	309.0	15.9	31.8
10/19/2017	21:16:32	16.1	310.0	15.8	31.9
10/19/2017	21:17:32	16.1	306.3	15.8	31.5
10/19/2017	21:18:32	16.0	308.0	15.8	31.3
10/19/2017	21:19:32	16.0	307.8	15.8	31.2
10/19/2017	21:20:32	16.0	311.1	15.8	31.7
10/19/2017	21:21:32	16.1	311.0	15.8	31.9
10/19/2017	21:22:32	16.1	311.6	15.9	32.2
10/19/2017	21:23:32	16.1	313.1	15.9	32.4
10/19/2017	21:24:32	16.1	311.9	15.9	32.3
10/19/2017	21:25:32	16.1	311.7	15.9	32.1
10/19/2017	21:26:32	16.1	313.1	15.9	32.5
10/19/2017	21:27:32	16.1	315.2	15.9	32.8
10/19/2017	21:28:32	16.1	315.5	15.9	33.0
10/19/2017	21:29:32	16.1	316.1	15.8	33.3
10/19/2017	21:30:32	16.1	314.7	15.8	33.1
10/19/2017	21:31:32	16.1	313.7	15.8	33.1
10/19/2017	21:32:32	16.1	313.5	15.9	33.1
10/19/2017	21:33:32	16.1	313.3	15.9	32.8
10/19/2017	21:34:32	16.1	314.0	15.9	33.1
10/19/2017	21:35:32	16.1	315.1	15.9	33.1
10/19/2017	21:36:32	16.1	312.7	15.9	32.9
10/19/2017	21:37:32	16.1	312.7	15.8	32.8
10/19/2017	21:38:32	16.1	312.9	15.8	32.7
10/19/2017	21:39:32	16.1	313.2	15.8	32.9
10/19/2017	21:40:32	16.1	315.1	15.8	33.2
10/19/2017	21:41:32	16.1	314.1	15.8	32.9
10/19/2017	21:42:32	16.1	313.8	15.9	33.0
10/19/2017	21:43:32	16.1	315.2	15.9	33.3
10/19/2017	21:44:32	16.1	312.7	15.9	32.9
10/19/2017	21:45:32	16.1	313.8	15.9	33.1
10/19/2017	21:46:32	16.1	312.8	15.9	32.9
10/19/2017	21:47:32	16.1	313.1	15.9	33.0
10/19/2017	21:48:32	16.1	313.5	15.8	33.1
10/19/2017	21:49:32	16.1	313.5	15.8	33.2
10/19/2017	21:50:32	16.1	315.1	15.9	33.5
10/19/2017	21:51:32	16.1	315.7	15.9	33.8
10/19/2017	21:52:32	16.1	318.4	15.9	34.4
10/19/2017	21:53:32	16.1	318.2	15.9	34.4
10/19/2017	21:54:32	16.1	316.9	15.9	34.3
10/19/2017	21:55:32	16.1	317.4	15.9	34.1
10/19/2017	21:56:32	16.1	317.2	15.9	34.0
10/19/2017	21:57:32	16.1	316.5	15.8	33.8
10/19/2017	21:58:32	16.1	317.6	15.8	34.1
10/19/2017	21:59:32	16.1	316.3	15.8	33.9
10/19/2017	22:00:32	16.1	317.2	15.9	33.9
10/19/2017	22:01:32	16.1	316.5	15.9	33.8
10/19/2017	22:02:32	16.1	318.5	15.9	34.1
10/19/2017	22:03:32	16.1	317.4	15.9	34.3
10/19/2017	22:04:32	16.1	318.1	15.9	34.4
10/19/2017	22:05:32	16.1	317.8	15.8	34.5
Averages		**16.0**	**312.6**	**15.8**	**33.1**
Average Drift Corrected		**16.2**	**317.4**	**16.1**	**33.1**

APPENDIX B

PROCESS DATA

WEST VIRGINIA PAVING, INC. DUNBAR ASPHALT PLANT #30
KOMATSU CLAMSHELL (SOURCE ID CE1)

PROCESS DATA
October 19, 2017

	Time	Load	Engine Speed	No. 2 Fuel Oil consumed
		%	rpm	gal/hr
Run 1	1813-1913	90	1780	8.6
Run 2	1950-2050	90	1780	5.4
Run 3	2106-2206	90	1780	5.9
Three-Run Average		**90**	**1780**	**6.6**

UW Paving 0557 10-19-17

Komatsu Clamshell Engine

Process Data Field Notes

run 1: 6:13 - 7:13 (90%, 1780 rpm, 8.6 gal/hr)

run 2: 7:50 - 8:50 (90%, 1780 rpm, 5.4 gal/hr)

run 3: 9:06 - 10:06 (90%, 1780 rpm, 5.9 gal/hr)

APPENDIX C

CALCULATIONS

WEST VIRGINIA PAVING INC. DUNBAR ASPHALT PLANT #30
DUNBAR, WEST VIRGINIA
KOMATSU CLAMSHELL (SOURCE ID CE1)

LEMOS LABS PROJECT 0557

October 19, 2017

CARBON MONOXIDE EMISSIONS

SYMBOL	DESCRIPTION	RUN 1	RUN 2	RUN 3	AVERAGE
O_2in	O_2 in stack gas, % Inlet	16.3	16.4	16.2	16.3
O_2out	O_2 in stack gas, % Outlet	16.0	16.2	16.1	16.1
cCOin	Carbon monoxide concentration, ppmvd Inlet	298.0	305.8	317.4	307.0
cCOout	Carbon monoxide concentration, ppmvd Outlet	28.8	41.5	33.1	34.5
	CARBON MONOXIDE LOADING SUMMARY				
Csin (a)	Carbon monoxide concentration, ppmvd, Inlet	298.0	305.8	317.4	307.0
Csin (b)	Carbon monoxide concentration, ppmvd @ 15% O_2, Inlet	382.2	401.1	402.1	395.1
	CARBON MONOXIDE EMISSION SUMMARY				
Csout (a)	Carbon monoxide concentration, ppmvd, Outlet	28.8	41.5	33.1	34.5
Csout (b)	Carbon monoxide concentration, ppmvd @ 15% O_2, Outlet	34.6	51.9	40.8	42.4
	CARBON MONOXIDE REDUCTION				
Cred	Carbon monoxide reduction, %	91	87	90	89

LEMOS LABS, LLC
CALCULATIONS RUN 1

WEST VIRGINIA PAVING INC. DUNBAR ASPHALT PLANT #30
DUNBAR, WEST VIRGINIA
KOMATSU CLAMSHELL (SOURCE ID CE1)

LEMOS LABS PROJECT 0557

Computed by AG

Cs(b)in CO @ 15% O_2= (cCO *ppmvd inlet*)((20.9-15)/(20.9-O2 *%inlet*))
Cs(b)in CO @ 15% O_2= (298.0)((20.9-15)/(20.9-16.3))

Cs(b)in CO =	382.2 ppmvd @15% O_2

Cs(b)out CO @ 15% O_2= (cCO *ppmvd outlet*)((20.9-15)/(20.9-O2 *%outlet*))
Cs(b)out CO @ 15% O_2= (28.84)((20.9-15)/(20.9-16.0))

Cs(b)out CO =	34.6 ppmvd @15% O_2

CO red = 100(Cs(b)in *ppmvd@15%O2*- Cs(b)out *ppmvd@15%O2*)/(Cs(b)in *ppmvd@15%O2*)
CO red = 100(382.2-34.6)/(382.2)

CO Red =	91 %

APPENDIX D

FIELD EQUIPMENT CALIBRATIONS

LEMOS LABS, LLC
Determination of Stratification

WEST VIRGINIA PAVING, INC. DUNBAR ASPHALT PLANT #30
KOMATSU CLAMSHELL (SOURCE ID CE1) - INLET

	Date	Time	O_2 %
	10/19/17	18:13:08	16.1
	10/19/17	18:14:08	16.1
	10/19/17	18:15:08	16.1
	10/19/17	18:16:08	16.0
	10/19/17	18:17:08	16.0
	10/19/17	18:18:08	16.0
	10/19/17	18:19:08	16.0
	10/19/17	18:20:08	16.0
	10/19/17	18:21:08	16.0
	10/19/17	18:22:08	16.1
Average Point 1			16.0
	10/19/17	18:23:08	16.1
	10/19/17	18:24:08	16.1
	10/19/17	18:25:08	16.1
	10/19/17	18:26:08	16.1
	10/19/17	18:27:08	16.1
	10/19/17	18:28:08	16.1
	10/19/17	18:29:08	16.1
	10/19/17	18:30:08	16.1
	10/19/17	18:31:08	16.1
	10/19/17	18:32:08	16.1
Average Point 2			16.1
	10/19/17	18:33:08	16.1
	10/19/17	18:34:08	16.1
	10/19/17	18:35:08	16.1
	10/19/17	18:36:08	16.1
	10/19/17	18:37:08	16.1
	10/19/17	18:38:08	16.1
	10/19/17	18:39:08	16.1
	10/19/17	18:40:08	16.1
	10/19/17	18:41:08	16.1
	10/19/17	18:42:08	16.1
Average Point 3			16.1
	10/19/17	18:43:08	16.1
	10/19/17	18:44:08	16.0
	10/19/17	18:45:08	16.1
	10/19/17	18:46:08	16.0
	10/19/17	18:47:08	16.0
	10/19/17	18:48:08	16.0
	10/19/17	18:49:08	16.0
	10/19/17	18:50:08	16.0
	10/19/17	18:51:08	16.0
	10/19/17	18:52:08	16.1
Average Point 4			16.0
	10/19/17	18:53:08	16.1
	10/19/17	18:54:08	16.0
	10/19/17	18:55:08	16.1
	10/19/17	18:56:08	16.0
	10/19/17	18:57:08	16.0
	10/19/17	18:58:08	16.1
	10/19/17	18:59:08	16.0
	10/19/17	19:00:08	16.1
	10/19/17	19:01:08	16.0
	10/19/17	19:02:08	16.0
Average Point 5			16.0
	10/19/17	19:03:08	16.0
	10/19/17	19:04:08	16.1
	10/19/17	19:05:08	16.1
	10/19/17	19:06:08	16.1
	10/19/17	19:07:08	16.0
	10/19/17	19:08:08	16.0
	10/19/17	19:09:08	16.0
	10/19/17	19:10:08	16.0
	10/19/17	19:11:08	16.0
	10/19/17	19:12:08	16.0
Average Point 6			16.0

LEMOS LABS, LLC

Determination of Stratification
Method 3A

Teledyne
Model T803 O_2 Analyzer Serial # 62

WEST VIRGINIA PAVING, INC. DUNBAR ASPHALT PLANT #30
KOMATSU CLAMSHELL (SOURCE ID CE1) - INLET

October 19, 2017

Point	Value	Difference	Evaluation (5% Allowable Error)
1	16.0	-0.02	Pass
2	16.1	0.03	Pass
3	16.1	0.06	Pass
4	16.0	-0.03	Pass
5	16.0	-0.02	Pass
6	16.0	-0.02	Pass
Mean	16.05		

LEMOS LABS, LLC
Determination of Stratification

WEST VIRGINIA PAVING, INC. DUNBAR ASPHALT PLANT #30
KOMATSU CLAMSHELL (SOURCE ID CE1) - OUTLET

	Date	Time	O_2 %
	10/19/17	18:13:06	15.8
	10/19/17	18:14:06	15.8
	10/19/17	18:15:06	15.8
	10/19/17	18:16:06	15.8
	10/19/17	18:17:06	15.8
	10/19/17	18:18:06	15.8
	10/19/17	18:19:06	15.8
	10/19/17	18:20:06	15.8
	10/19/17	18:21:06	15.8
	10/19/17	18:22:06	15.8
Average Point 1			15.8
	10/19/17	18:23:06	15.8
	10/19/17	18:24:06	15.8
	10/19/17	18:25:06	15.8
	10/19/17	18:26:06	15.8
	10/19/17	18:27:06	15.8
	10/19/17	18:28:06	15.8
	10/19/17	18:29:06	15.8
	10/19/17	18:30:06	15.8
	10/19/17	18:31:06	15.8
	10/19/17	18:32:06	15.8
Average Point 2			15.8
	10/19/17	18:33:06	15.8
	10/19/17	18:34:06	15.8
	10/19/17	18:35:06	15.8
	10/19/17	18:36:06	15.8
	10/19/17	18:37:06	15.8
	10/19/17	18:38:06	15.8
	10/19/17	18:39:06	15.8
	10/19/17	18:40:06	15.8
	10/19/17	18:41:06	15.8
	10/19/17	18:42:06	15.8
Average Point 3			15.8
	10/19/17	18:43:06	15.8
	10/19/17	18:44:06	15.8
	10/19/17	18:45:06	15.7
	10/19/17	18:46:06	15.7
	10/19/17	18:47:06	15.8
	10/19/17	18:48:06	15.8
	10/19/17	18:49:06	15.8
	10/19/17	18:50:06	15.8
	10/19/17	18:51:06	15.8
	10/19/17	18:52:06	15.8
Average Point 4			15.8
	10/19/17	18:53:06	15.8
	10/19/17	18:54:06	15.8
	10/19/17	18:55:06	15.8
	10/19/17	18:56:06	15.8
	10/19/17	18:57:06	15.8
	10/19/17	18:58:06	15.8
	10/19/17	18:59:06	15.8
	10/19/17	19:00:06	15.8
	10/19/17	19:01:06	15.8
	10/19/17	19:02:06	15.8
Average Point 5			15.8
	10/19/17	19:03:06	15.8
	10/19/17	19:04:06	15.8
	10/19/17	19:05:06	15.8
	10/19/17	19:06:06	15.7
	10/19/17	19:07:06	15.8
	10/19/17	19:08:06	15.8
	10/19/17	19:09:06	15.8
	10/19/17	19:10:06	15.8
	10/19/17	19:11:06	15.8
	10/19/17	19:12:06	15.8
Average Point 6			15.8

LEMOS LABS, LLC

Determination of Stratification
Method 3A

Teledyne
Model T803 O_2 Analyzer Serial # 62

WEST VIRGINIA PAVING, INC. DUNBAR ASPHALT PLANT #30
KOMATSU CLAMSHELL (SOURCE ID CE1) - OUTLET

October 19, 2017

Point	Value	Difference	Evaluation (5% Allowable Error)
1	15.8	-0.01	Pass
2	15.8	0.03	Pass
3	15.8	0.04	Pass
4	15.8	-0.12	Pass
5	15.8	0.06	Pass
6	15.8	0.00	Pass
Mean	15.78		

WEST VIRGINIA PAVING INC. DUNBAR ASPHALT PLANT #30
DUNBAR, WEST VIRGINIA
KOMATSU CLAMSHELL (SOURCE ID CE1)
LEMOS LABS, LLC PROJECT 0557

October 19, 2017

O_2 ANALYZER CALIBRATION (INLET)

Analyzer : TELEDYNE T803
Span 0 to 20.1

Pre-test Calibration

Calibration Gas	Calibration Gas Value	Internal Response	Calibration Error	Cylinder	PPM	Component
zero	0.0	0.0	0.00%	CC23095A	----	100% Nitrogen
mid	12.1	11.9	-1.00%	SG9167326BAL	----	5.05% CO2-12.05% O2
high	20.1	20.1	0.00%	CC207966	----	16.99% CO2-20.11% O2
Allowable Error			+/- 2%			

Test Run: 1
Start: 18:13
Stop: 19:12

Actual Concentration 16.1
Corrected Concentration 16.3

Calibration Gas	Internal Response	Pre Run Bias Response	Pre Run Bias Error	Post Run Bias Response	Post Run Bias Error	Drift
zero	0.0	0.0	0.00%	0.0	0.00%	0.00%
mid	11.9	11.9	0.00%	11.9	0.00%	0.00%
Allowable Error			+/- 5%		+/- 5%	+/- 3%

Test Run: 2
Start: 19:50
Stop: 20:49

Actual Concentration 16.1
Corrected Concentration 16.4

Calibration Gas	Internal Response	Pre Run Bias Response	Pre Run Bias Error	Post Run Bias Response	Post Run Bias Error	Drift
zero	0.0	0.0	0.00%	0.0	0.00%	0.00%
mid	11.9	11.9	0.00%	11.9	0.00%	0.00%
Allowable Error			+/- 5%		+/- 5%	+/- 3%

Test Run: 3
Start: 21:06
Stop: 22:05

Actual Concentration 16.0
Corrected Concentration 16.2

Calibration Gas	Internal Response	Pre Run Bias Response	Pre Run Bias Error	Post Run Bias Response	Post Run Bias Error	Drift
zero	0.0	0.0	0.00%	0.0	0.00%	0.00%
mid	11.9	11.9	0.00%	12.0	0.50%	0.50%
Allowable Error			+/- 5%		+/- 5%	+/- 3%

WEST VIRGINIA PAVING INC. DUNBAR ASPHALT PLANT #30
DUNBAR, WEST VIRGINIA
KOMATSU CLAMSHELL (SOURCE ID CE1)
LEMOS LABS, LLC PROJECT 0557

October 19, 2017

CO ANALYZER CALIBRATION (INLET)

Analyzer : TELEDYNE T200H
Span 0 to 591.0

Pre-test Calibration

Calibration Gas	Calibration Gas Value	Internal Response	Calibration Error	Cylinder	PPM	Component
zero	0.0	0.0	0.00%	CC23095A	——	100% Nitrogen
mid	301.2	302.7	0.25%	SX-48245	301.2	CO
high	591.0	591.0	0.00%	CC77991	591.0	CO
Allowable Error			+/- 2%			

Test Run: 1
Start: 18:13
Stop: 19:12

Actual Concentration	Corrected Concentration
297.4	298.0

Calibration Gas	Internal Response	Pre Run Bias Response	Pre Run Bias Error	Post Run Bias Response	Post Run Bias Error	Drift
zero	0.0	-0.4	-0.07%	-0.3	-0.05%	0.02%
mid	302.7	299.7	-0.51%	301.6	-0.19%	0.32%
Allowable Error			+/- 5%		+/- 5%	+/- 3%

Test Run: 2
Start: 19:50
Stop: 20:49

Actual Concentration	Corrected Concentration
304.2	305.8

Calibration Gas	Internal Response	Pre Run Bias Response	Pre Run Bias Error	Post Run Bias Response	Post Run Bias Error	Drift
zero	0.0	-0.3	-0.05%	-0.5	-0.08%	-0.03%
mid	302.7	301.6	-0.19%	297.6	-0.86%	-0.68%
Allowable Error			+/- 5%		+/- 5%	+/- 3%

Test Run: 3
Start: 21:06
Stop: 22:05

Actual Concentration	Corrected Concentration
312.6	317.4

Calibration Gas	Internal Response	Pre Run Bias Response	Pre Run Bias Error	Post Run Bias Response	Post Run Bias Error	Drift
zero	0.0	-0.5	-0.08%	-0.5	-0.08%	0.00%
mid	302.7	297.6	-0.86%	295.8	-1.17%	-0.30%
Allowable Error			+/- 5%		+/- 5%	+/- 3%

WEST VIRGINIA PAVING INC. DUNBAR ASPHALT PLANT #30
DUNBAR, WEST VIRGINIA
KOMATSU CLAMSHELL (SOURCE ID CE1)
LEMOS LABS, LLC PROJECT 0557

October 19, 2017

O_2 ANALYZER CALIBRATION (OUTLET)

Analyzer : TELEDYNE T300M
Span 0 to 20.1

Pre-test Calibration

Calibration Gas	Calibration Gas Value	Internal Response	Calibration Error	Cylinder	PPM	Component
zero	0.0	0.0	0.00%	CC23095A	——	100% Nitrogen
mid	12.1	12.0	-0.50%	SG9167326BAL	——	5.05% CO2-12.05% O2
high	20.1	20.1	0.00%	CC207966	——	16.99% CO2-20.11% O2
Allowable Error			+/- 2%			

Test Run: 1
Start: 18:13
Stop: 19:12

Actual Concentration 15.8
Corrected Concentration 16.0

Calibration Gas	Internal Response	Pre Run Bias Response	Pre Run Bias Error	Post Run Bias Response	Post Run Bias Error	Drift
zero	0.0	0.0	0.00%	0.0	0.00%	0.00%
mid	12.0	12.0	0.00%	11.9	-0.50%	-0.50%
Allowable Error			+/- 5%		+/- 5%	+/- 3%

Test Run: 2
Start: 19:50
Stop: 20:49

Actual Concentration 15.9
Corrected Concentration 16.2

Calibration Gas	Internal Response	Pre Run Bias Response	Pre Run Bias Error	Post Run Bias Response	Post Run Bias Error	Drift
zero	0.0	0.0	0.00%	0.0	0.00%	0.00%
mid	12.0	11.9	-0.50%	11.9	-0.50%	0.00%
Allowable Error			+/- 5%		+/- 5%	+/- 3%

Test Run: 3
Start: 21:06
Stop: 22:05

Actual Concentration 15.8
Corrected Concentration 16.1

Calibration Gas	Internal Response	Pre Run Bias Response	Pre Run Bias Error	Post Run Bias Response	Post Run Bias Error	Drift
zero	0.0	0.0	0.00%	0.0	0.00%	0.00%
mid	12.0	11.9	-0.50%	11.9	-0.50%	0.00%
Allowable Error			+/- 5%		+/- 5%	+/- 3%

WEST VIRGINIA PAVING INC. DUNBAR ASPHALT PLANT #30
DUNBAR, WEST VIRGINIA
KOMATSU CLAMSHELL (SOURCE ID CE1)
LEMOS LABS, LLC PROJECT 0557

October 19, 2017

CO ANALYZER CALIBRATION (OUTLET)

Analyzer : TELEDYNE T300M
Span 0 to 59.9

Pre-test Calibration

Calibration Gas	Calibration Gas Value	Internal Response	Calibration Error	Cylinder	PPM	Component
zero	0.0	0.0	0.00%	CC23095A	------	100% Nitrogen
mid	25.4	25.4	0.00%	CC274851	25.4	CO
high	59.9	59.9	0.00%	SX-38759	59.9	CO
Allowable Error			+/- 2%			

Test Run: 1
Start: 18:13
Stop: 19:12

	Actual Concentration	Corrected Concentration
	28.9	28.8

Calibration Gas	Internal Response	Pre Run Bias Response	Pre Run Bias Error	Post Run Bias Response	Post Run Bias Error	Drift
zero	0.0	-0.2	-0.33%	-0.3	-0.50%	-0.17%
mid	25.4	25.4	0.00%	25.4	0.00%	0.00%
Allowable Error			+/- 5%		+/- 5%	+/- 3%

Test Run: 2
Start: 19:50
Stop: 20:49

	Actual Concentration	Corrected Concentration
	41.7	41.5

Calibration Gas	Internal Response	Pre Run Bias Response	Pre Run Bias Error	Post Run Bias Response	Post Run Bias Error	Drift
zero	0.0	-0.3	-0.50%	-0.3	-0.50%	0.00%
mid	25.4	25.4	0.00%	25.4	0.00%	0.00%
Allowable Error			+/- 5%		+/- 5%	+/- 3%

Test Run: 3
Start: 21:06
Stop: 22:05

	Actual Concentration	Corrected Concentration
	33.1	33.1

Calibration Gas	Internal Response	Pre Run Bias Response	Pre Run Bias Error	Post Run Bias Response	Post Run Bias Error	Drift
zero	0.0	-0.3	-0.50%	-0.2	-0.33%	0.17%
mid	25.4	25.4	0.00%	25.3	-0.17%	-0.17%
Allowable Error			+/- 5%		+/- 5%	+/- 3%

Airgas
an Air Liquide company

Airgas Great Lakes region
Airgas USA, LLC
2009 Bellaire
Royal Oak, MI 48067
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Customer:	OAKWOOD		
Part Number:	E03NI83E15A1086	Reference Number:	32-400806707-1
Cylinder Number:	SG9167326BAL	Cylinder Volume:	148.1 CF
Laboratory:	112 - Royal Oak-32 (SAP) - MI	Cylinder Pressure:	2015 PSIG
PGVP Number:	B62016	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Nov 16, 2016

Expiration Date: Nov 16, 2024

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	5.000 %	5.050 %	G1	+/- 1.0% NIST Traceable	11/16/2016
OXYGEN	12.00 %	12.05 %	G1	+/- 1.0% NIST Traceable	11/16/2016
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	10060112	CC281295	5.027 % CARBON DIOXIDE/NITROGEN	+/-0.4%	Dec 02, 2021
NTRM	09060222	CC263070	9.961 % OXYGEN/NITROGEN	+/- 0.3%	Nov 08, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
E/N 54 Nicolet 6700 CO2	FTIR	Nov 15, 2016
O2 FS, SIEMENS OXYMAT 6 E/N 182	Paramagnetic	Oct 17, 2016

Triad Data Available Upon Request

Approved for Release

Airgas

Airgas USA, LLC
2009 BELLAIRE AVE
ROYAL OAK, MI 48067
248-399-8020
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Customer:	OAKWOOD		
Part Number:	E03NI63E15A0002	Reference Number:	32-400668780-1
Cylinder Number:	CC207966	Cylinder Volume:	157.1 CF
Laboratory:	MIC - Royal Oak-32 (SAP) - MI	Cylinder Pressure:	2015 PSIG
PGVP Number:	B62016	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Feb 10, 2016

Expiration Date: Feb 10, 2024

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	17.00 %	16.99 %	G1	+/- 0.6% NIST Traceable	02/10/2016
OXYGEN	20.00 %	20.11 %	G1	+/- 0.9% NIST Traceable	02/10/2016
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060733	CC413804	16.939 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	May 08, 2019
NTRM	09061422	CC273738	22.63 % OXYGEN/NITROGEN	+/-0.4%	Mar 06, 2019

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
CO2 SIEMENS ULTRAMAT 6 E/N 173	Nondispersive Infrared(NDIR)	Feb 05, 2016
O2 FS, SIEMENS OXYMAT 6 E/N 182	Paramagnetic	Feb 04, 2016

Triad Data Available Upon Request

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI99E15A0170	Reference Number:	54-124523383-1
Cylinder Number:	CC274851	Cylinder Volume:	144.3 CF
Laboratory:	ASG - Chicago - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12015	Valve Outlet:	660
Gas Code:	CO,NO,NOX,BALN	Certification Date:	Nov 23, 2015

Expiration Date: Nov 23, 2023

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	50.00 PPM	50.37 PPM	G1	+/- 0.9% NIST Traceable	11/16/2015, 11/23/2015
CARBON MONOXIDE	25.00 PPM	25.38 PPM	G1	+/- 0.7% NIST Traceable	11/16/2015
NITRIC OXIDE	50.00 PPM	50.37 PPM	G1	+/- 0.9% NIST Traceable	11/16/2015, 11/23/2015
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	09061840	CC282883	24.35 PPM CARBON MONOXIDE/NITROGEN	+/- 0.8%	May 24, 2019
PRM	12312	680179	10.01 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Feb 14, 2012
NTRM	13061007	CC422721	99.86 PPM NITRIC OXIDE/NITROGEN	+/- 0.8%	Nov 19, 2019
GMIS	02072014G2	CC500987	4.845 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Feb 07, 2017

The SRM, PRM or RGM listed above is only in reference to the GMIS used in the assay and not part of the analysis.

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nexus 470 AEP0000428	FTIR	Oct 28, 2015
Nexus 470 AEP0000428	FTIR	Oct 28, 2015
Nexus 470 AEP0000428	FTIR	Oct 28, 2015

Triad Data Available Upon Request

Approved for Release

MATHESON
ask. . .The Gas Professionals™

1650 Enterprise Parkway
Twinsburg, OH 44087
215-648-4000

Certificate of Analysis – EPA Protocol Mixtures

Customer: Matheson Valley
Cylinder Number: SX- 38759
Cylinder Pressure: 1800 psig
Last Analysis Date: 12/1/2016
Expiration Date: 12/1/2024

Protocol: G1
Reference #: 699526
Lot#: 109-98-37718
Part #: G-2692140

[redacted]

Component: Carbon Monoxide

Certified Conc: 59.9 ppm +/- 0.4 ppm

REPLICATE RESPONSES
Date: 12/1/2016
59.9 ppm
59.8 ppm
59.9 ppm

BALANCE GAS: Nitrogen

REFERENCE STANDARDS:

Component:	Carbon Monoxide
SRM #:	NTRM-081315
Sample #:	2E+05
Cylinder #:	ND43277
Concentration:	99.79 ppm

CERTIFICATION INSTRUMENTS

Component:	Carbon Monoxide
Make/Model:	CO Horiba VIA-510 HIGH
Serial Number:	ML0E13T1
Measurement Principle:	NDIR
Last Calibration:	12/1/2016

Notes:

The certification was performed according to EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards May 2012, using procedure G1 and/or G2. U.S EPA Vendor ID Number: D42016, PGVP Participation Date: 01/01/16, PGVP Renewal Date: 01/01/17. The expanded uncertainty listed for each component was calculated at a coverage factor of k=2 and at a level of confidence of 95%.

Analyst: [signature] Date 12/1/2016

MATHESON
ask. . .The Gas Professionals™

1650 Enterprise Parkway
Twinsburg, OH 44087
215-648-4000

Certificate of Analysis – EPA Protocol Mixtures

Customer: Matheson Valley
Cylinder Number: SX- 48245
Cylinder Pressure: 1800 psig
Last Analysis Date: 8/14/2017
Expiration Date: 8/14/2025

Protocol:	Reference #:	Lot#:
G1	715041	109-96-39027

Part #: G 2675073

[redacted]

Component: Carbon Monoxide

Certified Conc: 301.2 ppm +/- 0.9 ppm

REPLICATE RESPONSES
Date: 8/14/2017
301.3 ppm
301.2 ppm
301.2 ppm

BALANCE GAS: Nitrogen

REFERENCE STANDARDS:

Component:	Carbon Monoxide
SRM #:	NTRM-080615
Sample #:	2E+05
Cylinder #:	ND42984
Concentration:	490.7 ppm

CERTIFICATION INSTRUMENTS

Component:	Carbon Monoxide
Make/Model:	CO Horiba VIA-510 HIGH
Serial Number:	ML0E13T1
Measurement Principle:	NDIR
Last Calibration:	8/14/2017

Notes:

The certification was performed according to EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards May 2012, using procedure G1 and/or G2. U.S EPA Vendor ID Number: D42017, PGVP Participation Date: 01/01/17, PGVP Renewal Date: 01/01/18. The expanded uncertainty listed for each component was calculated at a coverage factor of k=2 and at a level of confidence of 95%.

Analyst: [signature] Date 8/23/2017

PRAXAIR

Praxair Distribution Mid-Atlantic
One Steel Road East,
Morrisville, PA 19067
Tel: (800) 638-6360 Fax:(215) 736 5240
PGVP ID: F32017

DocNumber: 000020730

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR PKG STATE COLLEGE
1348 BENNER PIKE
STATE COLLEGE PA 16801

Praxair Order Number: 70253954
Customer P. O. Number:
Customer Reference Number:

Fill Date: 4/11/2017
Part Number: NI CD600E-AS
Lot Number: 304613101703
Cylinder Style & Outlet: AS CGA 350
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date:	4/17/2025		NIST Traceable
Cylinder Number:	CC77991		Analytical Uncertainty:
591	ppm	CARBON MONOXIDE	± 0.5 %
Balance		NITROGEN	

Certification Information: Certification Date: 4/17/2017 Term: 96 Months Expiration Date: 4/17/2025

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data: (R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component: CARBON MONOXIDE

Requested Concentration: 600 ppm
Certified Concentration: 591 ppm
Instrument Used: HORIBA VIA-3000 S/N Y9EY76L8
Analytical Method: NDIR
Last Multipoint Calibration: 3/30/2017

First Analysis Data:						Date:	4/17/2017
Z:	0	R:	648	C:	592	Conc:	592
R:	648	Z:	0	C:	591	Conc:	591
Z:	0	C:	591	R:	648	Conc:	591
UOM:	PPM			Mean Test Assay:			591 PPM

Analyzed by: Megha Patel

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC196815
Ref. Std. Conc: 648 PPM
Ref. Std. Traceable to SRM # : 1680b
SRM Sample # : 2-J-49
SRM Cylinder # : CAL019036

Second Analysis Data:						Date:	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	PPM			Mean Test Assay:			0 PPM

Certified by: Jessica Goodman