United States Environmental Protection Agency
Region 10, Office of Air, Waste and Toxics
AWT-107
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101

Permit Number: R10NT502501
Issued: September 17, 2014
AFS Plant ID Number: 16011E0005

Non-Title V Air Quality Operating Permit

This permit is issued in accordance with the provisions of the Federal Air Rules for Reservations (FARR), 40 CFR § 49.139, and applicable rules and regulations to

Mickelsen Construction, Inc.

for operations in accordance with the conditions in this permit at the following location:

Fort Hall Reservation
1908 Tank Farm Road
Pocatello, ID 83204

Local Individual Responsible for Compliance:

Delwyn Mickelsen
Mickelsen Construction, Inc.
1908 Tank Farm Road
Pocatello, Idaho 83204
Phone: 208-684-3803
Fax: 208-684-5058
Email: dlmmcc@gmail.com

A technical support document that describes the bases for conditions contained in this permit is also available.

Kate Kelly, Director
Office of Air, Waste and Toxics
U.S. Environmental Protection Agency, Region 10

9/17/2014
Date

1. General Conditions

1.1. For purposes of this permit, the permitted source consists of the following equipment and/or activities:

Emissions Unit #	Emissions Unit Description	Emissions Unit Controls
1	**Aggregate Crushed Stone Processing Operations:** Recycled Asphalt Pavement Impacter Crusher (Terex Pegson 4242SR Specification, 300 tons per hour rated capacity), Primary Crushing (Nordberg HP 300 Cone Crusher, 300 tons per hour rated capacity, and Kodiac 300 Cone Crusher, 300 tons per hour rated capacity), Secondary Crushing (Trio TC 24x 36, 200 tons per hour rated capacity), Tertiary Crushing (Trio Jaw Crusher, 700 tons per hour rated capacity)	None
2	**Aggregate Handling:** Aggregate transfer from crusher to surge piles; Aggregate transfer from surge piles to stock piles; and Aggregate transfer from stock piles to HMA bins.	None
3	**Aggregate Wind Erosion:** Wind erosion of all exposed areas including piles	None
4	**Aggregate Truck and Loader Traffic:** Road dust caused by truck and loader traffic on paved and unpaved roads.	None
5	**HMA Drum Mixer:** Portable Alis Chalmers Model #4780146850 9 x 36 Parallel Flow Drum Mixer/Dryer, 400 ton per hour rated capacity, Recycled Asphalt Pavement (RAP) Capability, fueled with propane or natural gas fuel only, 129 MMBtu per hour burner rated capacity.	Wet Scrubber System: Barber Green Venturi Wet Wash and discharge pond*
6	**Asphalt Tank Heater:** Fueled with No. 2 Diesel or propane only; 1.8 MMBtu/hour burner rated capacity.	None
7	**Storage Tanks:** **(1) Liquid Asphalt Cement Storage Tank:** 20,000 gallon capacity; heated (see tank heater) **(2) Liquid Asphalt Cement Storage Tank:** 15,000 gallon capacity; heated (see tank heater) **(3) No.2 Diesel Storage Tank:** 8,000 gallon capacity to supply asphalt tank heater	None
8	**Asphalt Aggregate Handling:** via trucks, loader and conveyors; to and from piles and to drum dryer; includes RAP and concrete rubble	None
9	**Asphalt Silo Filling:** via conveyor from drum dryer	None
10	**Asphalt Truck Loading and Fumes:** HMA truck load-out from silos and fumes from loaded truck bed while in plant	None
11	**Asphalt Traffic:** Trucks for loading and delivery of HMA product and truck delivering liquid asphalt to the HMA plant.	None
12	**Impacter Diesel Engine:** Terex Pegson 4242SR Specification, 325 horsepower, 17.14 gallons of diesel combusted per hour, fueled with No. 2 diesel fuel only	None

* All emissions controls relied upon in estimating air emissions are listed.

1.2. Mickelsen Constuction, Inc. (permittee) shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Air Act.

1.3. Compliance with the terms of this permit does not relieve or exempt the permittee from compliance with other applicable Clean Air Act requirements or other applicable federal requirements, tribal, state or local laws or regulations.

1.4. At such time as this source or modification becomes a major stationary source or major modification solely by virtue of a relaxation in any of Conditions 2.1 through 2.8, then the requirements of 40 CFR 52.21(j) through (s) shall apply to the source or modification as though construction had not yet commenced on the source or modification.

1.5. At all times, including periods of startup, shutdown, maintenance and malfunction, the permittee shall, to the extent practicable, maintain and operate each emissions unit, including any associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions and considering the manufacturer's recommended operating procedures. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to EPA, which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.

2. Emissions Limits and Work Practice Requirements

2.1. Permitted Source Carbon Monoxide (CO) Emissions Limit. Source-wide CO emissions shall not exceed 80 tons per year as determined on a rolling 12-month basis by calculating the emissions (tons) for each month and adding the emissions (tons) calculated for the previous 11 months. Monthly CO emissions shall be determined by multiplying appropriate emissions factors (lb/unit) by the actual monthly operation/production rates (units/month) and dividing by 2000 lb/ton.

2.2. Permitted Source Particulate Matter (PM) Emissions Limit. Source-wide PM emissions shall not exceed 200 tons per year as determined on a rolling 12-month basis by calculating the emissions (tons) for each month and adding the emissions (tons) calculated for the previous 11 months. Monthly PM emissions shall be determined by multiplying appropriate emissions factors (lb/unit) by the actual monthly operation/production rates (units/month) and dividing by 2000 lb/ton.

2.3. Permitted Source Particulate Matter < 10 micrometers (PM10) Emissions Limit. Source-wide PM10 emissions shall not exceed 80 tons per year as determined on a rolling 12-month basis by calculating the emissions (tons) for each month and adding the emissions (tons) calculated for the previous 11 months. Monthly PM10 emissions shall be determined by multiplying appropriate emissions factors (lb/unit) by the actual monthly operation/production rates (units/month) and dividing by 2000 lb/ton.

2.4. Permitted Source Particulate Matter < 2.5 micrometers (PM2.5) Emissions Limit. Source-wide PM2.5 emissions shall not exceed 80 tons per year as determined on a rolling 12-month basis by calculating the emissions (tons) for each month and adding the emissions (tons) calculated for the previous 11 months. Monthly PM2.5 emissions shall be determined by multiplying appropriate emissions factors (lb/unit) by the actual monthly operation/production rates (units/month) and dividing by 2000 lb/ton.

2.5. Hot Mix Asphalt Production Limitation. Production of hot mix asphalt shall not exceed 300,000 tons per year as determined on a rolling 12-month basis by calculating the tons of hot mix asphalt

produced each month and adding the tons of hot mix asphalt produced for the previous 11 months.

2.6. Raw Materials Throughput Limitation. Maximum raw materials throughput shall not exceed 500,000 tons of rock, concrete rubble, or recycled asphalt pavement (or any combination of the three) per year as determined on a rolling 12-month basis by calculating the tons of raw material throughput each month and adding the tons of raw material throughput for the previous 11 months.

2.7. Impacter Diesel Engine: Operation of the Impacter Diesel Engine shall not exceed 34,280 gallons of diesel fuel combusted per year as determined on a rolling 12-month basis by calculating the gallons of diesel fuel combusted for each month and adding the gallons of diesel fuel combusted for the previous 11 months.

2.8. Fuel Limitation. The permittee shall be limited to combusting only propane or natural gas fuel in the asphalt drum dryer, only No. 2 diesel fuel Impacter diesel engine, and only No. 2 diesel and propane fuel in the asphalt tank heater.

2.9. Good Operation. All fuel burning equipment and the drum dryer wet scrubber system control device shall be maintained in good operating condition. The drum dryer exhaust shall be routed to the wet scrubber system control device at all times. The drum dryer wet scrubber system control device shall be operated at all times that the drum dryer operates.

3. Monitoring and Recordkeeping Requirements

3.1. Visible Emissions Monitoring and Recordkeeping. The permittee shall monitor and record visible emissions of particulate matter as described in Conditions 3.2 through 3.5.

3.2. Once each day, the permittee shall visually survey the drum dryer wet scrubber stack for the presence of visible emissions of particulate matter.

3.2.1. The observer conducting the visual survey must be trained and knowledgeable regarding the effects of background contrast, ambient lighting, observer position relative to lighting and wind, and the presence of uncombined water on the visibility of emissions (see 40 CFR part 60, Appendix A, Test Method 22).

3.2.2. For the surveys, the observer shall select a position that enables a clear view of the emissions point to be surveyed, that is at least 15 feet, but not more than 0.25 miles, from the emissions point, and where the sunlight is not shining directly in the observer's eyes.

3.2.3. The observer shall observe emissions from the emissions point for at least 15 seconds.

3.2.4. Any visible emissions of particulate matter other than uncombined water shall be recorded as a positive reading associated with the emissions unit.

3.2.5. Surveys shall be conducted while the drum dryer is operating and during daylight hours.

3.3. If the survey conducted under Condition 3.2 identifies any visible emissions of particulate matter, the permittee shall:

3.3.1. Immediately upon conclusion of the visual observation in Condition 3.2, investigate the source and reason for the presence of visible emissions; and

3.3.2. As soon as practicable, take appropriate corrective action.

3.4. If the corrective actions undertaken pursuant to Condition 3.3.2 do not eliminate the visible emissions, the permittee shall within 24 hours of the initial survey conduct a visible emissions observation of the emissions source in question for thirty minutes using EPA Test Method 9 (see 40 CFR part 60, Appendix A).

3.5. The permittee shall maintain records of the following:

3.5.1. Details of each visual survey and visible emissions observation, including date, time, observer and results;

3.5.2. Date, time and type of any investigation conducted pursuant to Condition 3.3.1;

3.5.3. Findings of the investigation, including the reasons for the presence of visible emissions;

3.5.4. Date, time and type of corrective actions taken pursuant to Condition 3.3.2;

3.5.5. Complete documentation of any Method 9 visible emissions observations conducted pursuant to Condition 3.4.

3.6. Wet Scrubber System Inspection and Recordkeeping. At least once each year during which the permitted source operates, the permittee shall inspect and keep records of the physical condition of the wet scrubber system internals.

3.7. Particulate Matter Emissions Testing. Unless the permittee has performed an emissions test within 180 days before issuance of this permit that is considered acceptable by EPA, the permittee shall measure particulate matter emissions from the drum dryer wet scrubber stack while burning propane or natural gas fuel using EPA Test Method 5 (see 40 CFR part 60, Appendix A) within 60 days but not later than 180 days after issuance of this permit.

3.7.1. The permittee shall provide EPA at least 30 days prior notice of any performance test, except as otherwise specified in this permit, to afford EPA the opportunity to have an observer present. If after the 30 days notice for the initially scheduled performance test, there is a delay in conducting the scheduled performance test, the permittee shall notify EPA as soon as possible of any delay in the original test date, either by providing at least 7 days prior notice of the rescheduled date of the performance test, or by arranging a rescheduled date with EPA by mutual agreement.

3.7.2. The permittee shall submit to EPA a source test plan 30 days prior to any required testing that includes and addresses the following elements:

3.7.2.1. Purpose and scope of testing;
3.7.2.2. Source description, including a description of the operating scenarios and mode of operation during testing and including fuel sampling and analysis procedures;
3.7.2.3. Schedule/dates of testing;
3.7.2.4. Process data to be collected during the test and reported with the results, including source-specific data identified in the emissions unit section of this permit;
3.7.2.5. Sampling and analysis procedures, specifically requesting approval for any proposed alternatives to the reference test methods, and addressing minimum test length (e.g., one hour, 8 hours, 24 hours, etc.) and minimum sample volume;
3.7.2.6. Sampling location description and compliance with the reference test methods;
3.7.2.7. Analysis procedures and laboratory identification;

3.7.2.8. Quality assurance plan;
3.7.2.9. Calibration procedures and frequency;
3.7.2.10. Sample recovery and field documentation;
3.7.2.11. Chain of custody procedures;
3.7.2.12. Quality assurance/quality control project flow chart;
3.7.2.13. Data processing and reporting;
3.7.2.14. Description of data handling and quality control procedures; and
3.7.2.15. Report content and timing.

3.7.3. Unless EPA determines in writing that other operating conditions are representative of normal operations or unless specified in the emissions unit sections of this permit, the source shall be operated at a capacity of at least 90% but no more than 100% of maximum during all tests.

3.7.4. Facilities for performing and observing the emissions testing shall be provided that meet the requirements of 40 CFR 60.8(e) and EPA Test Method 1 (40 CFR Part 60, Appendix A).

3.7.5. During the source test, the permittee shall measure the visible emissions from the baghouse stack for the duration of each particulate matter test run using the EPA Test Method 9 (see 40 CFR part 60, Appendix A).

3.7.6. During the source test, the permittee shall record the operation and production parameters listed in Condition 3.8.1, 3.8.2, 3.8.6 and 3.8.7.

3.7.7. During or within 2 hours prior to the start of a source test, only regular operating staff may adjust the processes or emissions control devices. Any operating adjustments made during a source test, that are a result of consultation during the tests with source testing personnel, equipment vendors, or consultants, may render the source test invalid. If the emissions test method yields measured pollutant concentration values at an oxygen concentration other than specified in the emissions standard, the permittee shall correct the measured pollutant concentration to the oxygen concentration specified in the emissions standard by using the following equation:

$$PC_X = PC_m \times \frac{(20.9-X)}{(20.9-Y)}$$

Where:
PC_X = Pollutant concentration at X percent;
PC_m = Pollutant concentration as measured;
X = The oxygen concentration specified in the standard; and
Y = The measured average volumetric oxygen concentration.

3.7.8. Each source test shall consist of at least three (3) valid test runs with results presented as the arithmetic average of all valid test runs and in the terms of any applicable emissions limit(s).

3.8. Operation and Production Records. The permittee shall track and record the source's operation and production such that source-wide emissions can be calculated on a daily, monthly and 12-month rolling basis. Records shall include, but not be limited to:

3.8.1. Daily hot mix asphalt production (tons);

3.8.2. Daily rock or gravel extracted on-site (tons), daily rock, concrete rubble and recycled asphalt pavement (RAP) received at this facility from off-site sources (tons), daily crushed aggregate produced on-site (tons) by type (i.e., rock, concrete rubble and RAP);

3.8.3. Daily amount of propane (gallons) or natural gas (cubic feet) combusted by the asphalt drum dryer;

3.8.4. Daily amount of No. 2 diesel fuel (gallons) combusted by the asphalt tank heater and Impacter diesel engine;

3.8.5. Sulfur content (%) of the No. 2 diesel fuel combusted;

3.8.6. Pressure drop (inches) across the wet scrubber system and total water flow (gallons per minute) to the wet scrubber system and recorded at least once per day while operating;

3.8.7. Documentation of any time periods when the drum dryer is producing hot mix asphalt and the wet scrubber system is not fully operational, the wet scrubber system is not in good operating condition, or the drum dryer exhaust is not being routed to the wet scrubber system; and

3.8.8. Daily water and dust suppressant usage for roads, aggregate crushing, and material handling including type and application technique, amount and frequency.

3.9. Equipment Installation. The permittee shall install, calibrate, maintain and operate equipment or systems for recording the operation and production records required by this permit.

3.10. Emissions Calculations. Within 20 days after each month, the permittee shall calculate and record the source-wide monthly amounts (tons/month) and the rolling 12-month total amounts (tons/year) of CO, PM, PM10 and PM2.5 emissions, hot mix asphalt produced, and raw materials (stone, concrete rubble, and recycled asphalt pavement) throughput using the calculation techniques required in Condition 2. At the same time, the permittee shall calculate and record the source-wide monthly amounts (gallons/month) and the rolling 12-month total amounts (gallons/year) of diesel fuel combusted in the Impacter Diesel Engine using the calculation technique required in Condition 2.

3.11. Records Retention. Copies of all required records of emissions calculations and parameters used to calculate emissions, monitoring records, notifications and reports required by this permit shall be kept with the asphalt plant for a period of five years and shall be made available to the EPA upon request.

4. Reporting Requirements

4.1. Notification of Deviations. The permittee shall notify the EPA:

4.1.1. By telephone (describing the situation) within 24 hours and in writing within 10 days of determining that the drum dryer is producing hot mix asphalt and the wet scrubber system is not fully operational, the wet scrubber system is not in good operating condition, or the drum dryer exhaust is not being routed to the wet scrubber system; and

4.1.2. In writing (describing the exceedance) within 10 days of determining that the rolling 12-month total emissions, calculated pursuant to Condition 3.10, exceed an emissions, production, or operational limits in Condition 2.

4.2. Emissions Test Report. The permittee shall submit to the EPA emissions testing reports within 60 days of completing any emission test required by this permit along with items required to be recorded in Condition 3.7.

4.3. Annual and Final Emissions Report. Annually, within 45 days after the end of each calendar year in which the permitted source operated, the permittee shall submit to the EPA a report that includes the monthly and rolling 12-month total emissions required by Condition 3.10 for the reporting period including all assumptions and calculations used. The final report shall only include monthly and rolling 12-month total emissions, and amounts of hot mix asphalt produced, raw material throughput, and fuel combusted in Impacter Diesel Engine including all assumptions and calculations, not previously reported in an annual report.

4.4. Mailing Addresses and Telephone Numbers. All original notifications and reports shall be sent to the EPA at the address below and all telephone notifications shall be made to the telephone number below. A copy of each notification required in Condition 4.1 and each emissions report required in Condition 4.3 that does not contain confidential business information shall be sent to the Tribal Environmental Contact at the address below.

4.5. EPA Mailing Address. All submittals, notifications and reports to the EPA shall be sent to:

Original Documents go to the EPA at:

Tribal Air Permits Coordinator
U.S. EPA – Region 10, AWT-150
1200 Sixth Avenue, Suite 900
Seattle, WA 98101

For telephone notifications:
Call (206) 555-1331
(mention the "FARR")

Copies go to Tribal Contact at:

Air Quality Program Manager
Shoshone-Bannock Tribes
Fort Hall Reservation
P.O. Box 306
Fort Hall, Idaho 83203

United States Environmental Protection Agency
Region 10, Office of Air, Waste and Toxics
AWT-107
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101

Permit Number: R10NT502501
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Technical Support Document
Non-Title V Air Quality Operating Permit

Permit Writer: Bryan Holtrop

Mickelsen Construction, Inc.

Purpose of Owner-Requested Synthetic Minor Source Air Quality Operating Permit And Technical Support Document

Title 40 Code of Federal Regulations Section 49.139 establishes a permitting program to provide for the establishment of Federally-enforceable requirements for air pollution sources located within Indian reservations in Idaho, Oregon and Washington. The owner or operator of an air pollution source who wishes to obtain a Federally-enforceable limitation on the source's actual emissions or potential to emit must submit an application to the Regional Administrator requesting such limitation. The United States Environmental Protection Agency (EPA) then develops the permit via a public process. The permit remains in effect until it is modified, revoked or terminated by the EPA in writing.

This document, the technical support document, fulfils the requirement of 40 CFR § 49.139(c)(3) by describing the proposed limitation and its effect on the actual emissions and/or potential to emit of the air pollution source. Unlike the Operating Permit, this Technical Support Document is not legally enforceable. The permittee is obligated to follow the terms of the permit. Any errors or omissions in the summaries provided here do not excuse the permittee from the requirements of the permit.

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Appendix A – Emission Inventory showing potential to emit calculations based on production and operational limits contained in the permit.

1. EPA Authority to Issue Synthetic Minor Source Permits

On April 8, 2005 the United States Environmental Protection Agency (EPA) adopted regulations (70 FR 18074) codified at 40 CFR Parts 9 and 49, establishing Federal Implementation Plans under the Clean Air Act for Indian reservations in Idaho, Oregon and Washington. One Federal Implementation Plan, commonly referred to as the Federal Air Rules for Reservations (FARR), put in place basic air quality regulations to protect health and welfare on Indian reservations located in the Pacific Northwest. This permit has been developed pursuant to 40 CFR § 49.139 which creates a non-Title V permitting program for establishing Federally-enforceable requirements for air pollution sources on Indian reservations.

2. Project Description

2.1 Background

Some sources have the potential to emit one or more pollutants in major source amounts, but have actual emissions that are below the major source thresholds. These sources are called ‘‘synthetic minor sources’’ and the term means a source that otherwise has the potential to emit regulated NSR pollutants in amounts that are at or above those for major sources in certain applicable federal air quality programs, but has taken a restriction so that its potential to emit is less than such amounts for major sources. Such restrictions must be enforceable as a practicable manner.

Four federal air quality programs exist that apply to primarily major sources of air pollution: Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NNSR) construction permits; Title V operating permits; and Maximum Achievable Control Technology (MACT) standards. The definition of “major source” is slightly different in each program, but is generally based on the amount of pollutants emitted by a source. A source that would otherwise be major can avoid these programs by voluntarily limiting emissions of the regulated pollutants to less than the thresholds for applicability in each program.

2.2 Request Description

On February 14, 2011, EPA Region 10 received an application from Mickelsen Construction Company, Inc. requesting emission limits be established for their plant on the Fort Hall Reservation, to avoid being subject to the PSD, NNSR and Title V permitting programs. The applicant has indicated that their facility’s potential to emit is less than the MACT thresholds. EPA issued a synthetic minor permit to Mickelsen on September 23, 2013.

On January 15, 2014, the EPA received from Mickelsen a request to replace the drum dryer in the asphalt production process and add a crusher as part of the aggregate crushing operation in order to crush recycled asphalt pavement (RAP) and use it as aggregate in producing hot mix asphalt at the facility. As a result, EPA is including production and operational limits in Mickelsen’s existing air quality operating permit to assure the allowable annual emissions limits are enforceable as a practical matter. Mickelsen submitted its certified application as required by 40 CFR 49.139(d)(3) requesting these changes on July 23, 2014.

3. Facility Information

3.1 Ownership & Location

The hot mix asphalt plant and aggregate handling and crushing activities are owned and operated by Mickelsen Construction, Inc. (Mickelsen or permittee). This synthetic minor source permit establishes emission limits on the operation of Mickelsen's facility on the Fort Hall Reservation in Idaho.

3.2 Facility Description

Mickelsen is a stationary hot mix asphalt (HMA) plant and aggregate handling and crushing plant which produces aggregate and hot mix asphalt.

Mickelsen operates the following process for producing aggregate: Raw material is excavated out of the gravel source wall with a front end loader. It is then transported to the feeder in the first crusher jaw. From there the material is broken down to a more workable size and transported on a conveyor to a 6 x 20 screen. The material is separated by size and transported by conveyor to the HP 300 cone for final sizing. From the cone, the material is transported by conveyor to separate stock piles, depending on the size of the rock, to be picked up by a second front-end loader and stockpiled in designated piles in the bottom of the pit for sales and for use in the production of hot mix asphalt on-site at Mickelsen's facility.

During the process of moving and crushing gravel, the permittee uses a 10,000-gallon water tank from which water is pumped to all transfer points to control dust emissions. Dust on the haul roads is controlled by a water truck that keeps the road wet. The tanks are filled from Mickelsen's water supply source.

Mickelsen supplies material to local contractors and state entities as well as the Shoshone Bannock Transportation Department. After the gravel has been processed and stockpiled, it is available for pick up by the above-listed entities. Mickelsen loads the customers' vehicles by obtaining a light-weight on the truck at the scale house, loading with desired material using a front-end loader, and obtaining a heavy-weight at the scale house.

Mickelsen follows the following process for producing asphalt: The loader picks up coarse and fine aggregate from the stockpiles and transports it to the cold aggregate bins. From these bins, aggregate is transported by conveyor to the belt-scale conveyor, which then transfers it to the drum mixer and dryer. There, the gravel is heated and oil is injected. The drum mixer and dryer is connected to the wet scrubber system and is a physical and operational limitation on the capacity of the source to emit a pollutant. From the drum mixer, the hot-mix asphalt is dumped into the drag conveyor which moves the finished product to the silo bin. At the silo bin, the material is weighed and loaded into trucks.

The parallel-flow drum dryer and mixer is heated by burners fueled by propane. Hot-mix asphalt liquid is stored in above-ground storage tanks and kept in a liquid state using a burner fueled by No. 2 diesel. All fuels are stored in above-ground tanks. Electrical power is provided by a connection to the local grid. The facility Standard Industrial Classification code is 2951, Asphalt Paving Mixtures and Blocks. The drum dryer emissions are controlled by a wet scrubber system.

The synthetic minor source air quality permit identifies and describes the emission units and emission controls for the Mickelsen plant.

3.3 Local Air Quality

Mickelsen has requested this permit for its operations on the Fort Hall Reservation. This reservation is currently unclassifiable or attains the national ambient air quality standards for all criteria pollutants except particulate matter less than or equal to 10 micrometers in diameter (PM10). An area is unclassifiable when there is insufficient monitoring data. Areas of the country where air pollution levels exceed the national ambient air quality standards are designated "nonattainment." The Fort Hall Reservation is currently designated as nonattainment for PM10. Note that PSD applies only in attainment and unclassifiable areas and NNSR applies in nonattainment areas. Ambient air quality designations are presented in 40 CFR Part 81.

4. Regulatory Analysis and Permit Content

4.1 Evaluation of Request

The Clean Air Act requires all major sources to obtain a PSD and/or NNSR permit to construct and Title V permit to operate. Major sources of hazardous air pollutants (HAP) are also subject to the MACT program. The definition of "major" and the criteria for qualifying as a major source are slightly different for each of the three programs. HMA plants that have the potential to emit (PTE) 250 tons per year or more are subject to PSD. Sources that have the potential to emit 10 tons per year or more of any individual HAP or 25 tons per year or more of any combination of HAPs emitted (including fugitive emissions) are subject to the MACT program. Sources that have the potential to emit 100 tons per year or more or that are major for PSD, NNSR or MACT purposes, are subject to Title V. PTE is based on the source's maximum capacity operating 8760 hours per year and only considers emission controls or limits that are enforceable. Source categories subject to a New Source Performance Standard (NSPS) that was promulgated as of August 7, 1980, must include fugitive emissions when determining major source status. NSPS Subpart I, originally promulgated in 1973, applies to HMA plants, so fugitive emissions must be counted when determining major source status for HMA plants.

Since the permittee's drum dryer was constructed in 1988 (after the applicability date of June 11, 1973) this HMA plant is subject to subpart I. The subpart I standard includes a particulate matter emission limit of 0.04 grains per dry standard cubic foot of exhaust. The standard also requires a source test upon startup. This particulate matter emission limit was also used to evaluate potential to emit estimates in the emission inventory.

Based on EPA's calculations, Mickelsen's facility has the potential to emit more than the PSD or Title V major source thresholds of 250 tpy and 100 tpy respectively of particulate matter (PM), particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$), and carbon monoxide (CO). Greenhouse gas (GHG) emissions are predicted to be less than the Title V threshold of 100,000 tpy on a carbon dioxide equivalent (CO2e) basis. Lead emissions are predicted to be well below the Title V and MACT applicability thresholds. HAP (total and individual) emissions are predicted to be well below the Title V and MACT applicability thresholds. Without enforceable emission limits, Mickelsen's operation would be subject to Title V and any potential or operational changes at the facility would potentially be subject to PSD and NNSR.

The emission estimates considered each applicable emission limit paired with the fuel type that can be used by the equipment to determine the worst-case emissions that are allowed, assuming full-time operation at full capacity. Note that individual HAP PTE estimates were based on propane fuel burned in the drum mixer for any single HAP. Source-wide HAP PTE was a summation of the emission units' total HAP PTE. PTE was also limited by applicable NSPS and FARR emission limits when the limits resulted

in lower emissions than available emission estimation techniques predicted. The permittee can use the site-specific PM data to develop an emission factor for use when reporting actual emissions.

To avoid being subject to Title V, PSD and NNSR, the permittee requested PTE limits (called synthetic minor limits) be created in a synthetic minor source air quality operating permit. To make the PTE limits practicably enforceable a limit on the total amount of hot mix asphalt produced and a limit on the total amount of raw materials (i.e., rock, concrete rubble, or recycled asphalt) processed is also included in this air quality permit. See Appendix A for emission inventory details showing that these production and operational limits will restrict emissions to levels below the PTE limits. The permittee anticipates only seasonal operations, resulting in production that is below the potential production used in the emission estimates. At the lower production rate and using propane fuel in the drum dryer, the permittee is confident that its actual emissions will be well below the emission limits requested. Actual emissions will be determined using actual production rates, fuels and control efficiencies. If better emission factors (e.g. developed by testing the emissions from this source) are available that better reflect actual emissions, then those factors should be used. The permit will limit emissions, production and operations on a rolling 12-month basis to:

- Not more than 200 tpy for PM (avoids PSD);
- Not more than 80 tpy for CO, PM10, and PM2.5 (avoids Title V for all listed pollutants, and NNSR for PM10);
- Not more than 300,000 tons of hot mix asphalt produced;
- Not more than 500,000 tons of raw materials processed including rock, concrete rubble, and recycled asphalt pavement (or any combination of the three)

A majority of the PM emissions from this plant are expected to be fugitive emissions from truck and loader traffic associated with the rock crushing and handling operations. These PM emission estimates do not take into account any unenforceable emission reductions techniques that the permittee might use under the fugitive dust control plan (e.g. road watering) to comply with the fugitive dust or visible emission requirements that may apply. Techniques exist for quantifying emission reductions due to road watering. If the permittee relies upon controls to lower actual emissions, the EPA will require adequate documentation of the emission reduction techniques and applicable operational parameters that the quantification techniques employ. The permittee should discuss the use of such techniques with the EPA before using them for calculation, compliance and reporting purposes.

The emission inventory in Appendix A includes rock crushing and handling emission units because the permittee has indicated to the EPA that operation of these types of emission units occur in support of the HMA plant. As a result, Mickelsen's rock handling and crushing operation must be considered part of the HMA plant. Accordingly, the permittee will be required to account for the emissions from the rock handling and crushing operation, along with the HMA plant, to document compliance with the emission limits in this permit.

4.2 Other Federal Requirements

As part of EPA Region 10's direct federal implementation and oversight responsibilities, EPA Region 10 has a trust responsibility to each of the federally recognized Indian tribes within the Pacific Northwest and Alaska. The trust responsibility stems from various legal authorities including the U.S. Constitution, Treaties, statutes, executive orders, and historical relations with Indian tribes. In general terms, the EPA is charged with considering the interest of tribes in planning and decision making processes. Each office within the EPA is mandated to establish procedures for regular and meaningful consultation and collaboration with Indian tribal governments in the development of EPA decisions that have tribal implications.

EPA Region 10's Office of Air, Waste and Toxics has contacted the Shoshone-Bannock Tribes to invite consultation on the Mickelsen synthetic minor source permit application.

Endangered Species Act (ESA) – The EPA is obligated under ESA, Section 7, 16 U.S.C. §1531, to consider the impact that a federal project may have on listed species or critical habitats. The EPA considers ESA issues in the context of permitting decisions on a case-by-case basis. Based on the fact that the permit contains voluntarily-requested emission limits to an existing operation, it is the EPA's conclusion that the issuance of this permit will not affect a listed species or critical habitat. Therefore, no additional requirements will be added to this permit for ESA reasons. The EPA's no effect determination concludes the EPA's obligations under Section 7 of the ESA. (See Endangered Species Consultation Handbook: Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species ACT, FWS and NMFS, March 1998, at Figure 1).

National Environmental Policy Act (NEPA) Review – Under Section 793(c) of the Energy Supply and Environmental Coordination Act of 1974, no action taken under the Clean Air Act shall be deemed a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969. This permit is an action taken under regulations implementing the Clean Air Act and is therefore exempt from NEPA.

National Historic Preservation Act (NHPA) – This project involves establishing limits on air emissions. No part of the facility will be physically altered directly as a result of this permit. Consequently, no adverse effects are expected, and further review under NHPA is not indicated.

Environmental Justice (EJ) – Under Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, signed on February 11, 1994, the EPA is directed, to the greatest extent practicable and permitted by law, to make achieving environmental justice (EJ) part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States.

Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental and commercial operations or policies. Meaningful involvement means that people have an opportunity to participate in decisions about activities that may affect their environment and/or health; the public's contribution can influence the regulatory agency's decision; their concerns will be considered in the decision making process; and the decision makers seek out and facilitate the involvement of those potentially affected. The EPA's goal is to provide an environment where all people enjoy the same degree of protection from environmental and health hazards and equal access to the decision-making process to maintain a healthy environment in which to live, learn, and work.

As part of the permit issuance process, the EPA solicits and considers public input prior to final decision-making consistent with the FARR's Rule for Non-Title V Operating Permits – 40 CFR § 49.139. See Section 5.2 of this TSD for further details.

The EPA uses census tract data to help determine whether minority populations and low-income populations reside in an area to be impacted by a proposed permitting action. The EPA transposes onto maps the EJ indicators for people of color and poverty to help illustrate the project's physical proximity to EJ communities. For the benefit of communities living on Indian Reservations in the Pacific Northwest,

maps displaying EJ indicators for people of color and poverty are available at the following EPA Region 10 website: http://yosemite.epa.gov/R10/ocrej.nsf/environmental+justice/maps.

The proposed permit action does not authorize Mickelsen to generate new or additional air emissions, and as a result does not authorize new air quality impacts. The EPA has no information to suggest that issuance of this synthetic minor source permit will result in a disproportionately high and adverse human health or environmental effect upon minority populations and low-income populations.

4.3 Permit Conditions

The permit establishes PTE limits as well as monitoring, recordkeeping and reporting requirements necessary to assure compliance with the limits. The permit is organized into 4 sections as follow:

1. General Conditions
2. Emission Limits and Work Practice Requirements
3. Monitoring and Recordkeeping Requirements
4. Reporting Requirements

An explanation of each condition in the permit follows:

Permit Section 1, General Conditions

Permit Condition 1.1 identifies the emission units authorized to operate at the facility consistent with the representations made by the permittee in the permit application.

Permit Condition 1.2 requires the permittee to comply with all the conditions within the permit. This permit only creates owner-requested synthetic minor limits and the requirements necessary to assure that these limits are enforceable federally and as a practical matter, which provides credible assurance that otherwise major sources are not avoiding applicable requirements of the Clean Air Act. It does not contain other Clean Air Act requirements to which the facility is or may be subject, such as the Federal Air Rules for Reservations; New Source Performance Standards, 40 CFR Part 60, and National Emissions Standards for Hazardous Air Pollutants, 40 CFR Part 61 and 63.

Permit Condition 1.3 states compliance with the terms of this permit in no way relieves or exempts the permittee from compliance with other applicable Clean Air Act requirements or of any other applicable federal, tribal, state, or local law or regulation.

Permit Condition 1.4 addresses a provision (40 CFR § 52.21(r)(4)) of the PSD regulations regarding emission limits established to avoid PSD requirements. If in the future, the permittee obtains a relaxation of the limits in Permit Condition 2.1 through 2.8, and the facility construction addressed in this permit action is later found to be a new major stationary source solely due to the relaxation of the emission limit, then the PSD provisions of 40 CFR § 52.21(j) through (s) would apply to this facility as though the initial facility construction had never taken place. This could result in the imposition of Best Available Control Technology. Consequently, if in the future, any relaxation to the limits in Permit Conditions 2.1 through 2.8 is being contemplated, it is recommended that the permittee thoroughly evaluate any potential PSD applicability.

Permit Condition 1.5 requires the permittee to maintain and operate all emission units and associated control equipment in a manner to minimize air emissions at all times.

Permit Section 2, Emission Limits and Work Practice Standards

Permit Conditions 2.1 to 2.4 limit the PTE of the facility to 80% of the major source thresholds for PSD (PM), NNSR (PM10) and Title V (CO, PM10, and PM2.5). The thresholds for each program are 250 tpy for PSD and 100 tpy for NNSR and Title V. The synthetic minor source permit limits effectively restrict emissions for PSD and NNSR purposes with the exception of PM which is no longer considered a regulated pollutant for Title V applicability purposes (which is the reason the limit is 200 tpy). These synthetic minor limits allow the permittee to be treated as a minor source for air permitting purposes. Each limit is written as a rolling 12-month total where each month, actual emissions must be totaled for the last 12 months to determine compliance with the ton per year limit. Emission factors are relied upon for calculating actual emissions.

Limiting emissions to a value less than the major source threshold levels are necessary to account for the unknown uncertainty in the calculations employed when determining actual emissions generated by this source. Limiting these "calculated emissions" to a fraction of the threshold level helps assure that actual emissions remain below the major source threshold level. According to the Clean Air Act Stationary Source Compliance Monitoring Strategy, synthetic minor sources with PTE limits at 80 to 100% of the major source thresholds will be inspected on a once every five year frequency. Setting the limits within that range will help to ensure adequate compliance assurance.

Permit Condition 2.5 limits the facility to producing no more than 300,000 tons of hot mix asphalt (HMA) per year on a rolling 12-month total. Asphalt drum mixer/dryers represent the largest source of emissions in the HMA production process. Since emission factors for asphalt mixer/dryers in AP-42, Chapter 11.1 for HMA plants are based on the amount of tons of asphalt produced, limiting the annual production of the hot mix asphalt will effectively limit the emissions from all of the emissions units including the drum dryer involved in the production of hot mix asphalt. Limiting the amount of fuel used in the dryer/mixer is not necessary as those emissions are reflected in the drum dryer emissions factor. This owner-requested production limit also assures that the emission limits in Conditions 2.1 through 2.4 are enforceable as a practical matter and the facility maintains its synthetic minor permitting status.

Permit Condition 2.6 limits the facility from processing no more than 500,000 tons of raw materials per year on a rolling 12-month total. Raw materials are limited to rock, concrete rubble, or recycled asphalt pavement (RAP) or any combination of the three. Aggregate crushing represents the largest source of emissions from the aggregate crushing and handling activities. Since emission factors for crushing aggregate in AP-42, Chapter 11.19.2 are based on the amount of tons of raw materials processed, limiting the annual throughput of the process will effectively limit the emissions from the facility's aggregate crushing and crushing activities. This owner-requested operational limit also assures that the emission limits in Conditions 2.1 through 2.4 are enforceable as a practical matter and the facility maintains its synthetic minor source permitting status.

Permit Condition 2.7 limits the facility from operating the Impacter diesel engine to combusting no more than 34,280 gallons of diesel fuel per year on a rolling 12-month total. This owner-requested operational limit also assures that the facility emissions limits in Conditions 2.1 through 2.4 are enforceable as a practical matter and the facility maintains its synthetic minor source permitting status.

Permit Condition 2.8 requires that, consistent with the application submitted, the permittee limit fuels combusted in the asphalt drum dryer to only propane or natural gas fuel, in the impacter diesel engine to only No. 2 diesel fuel, and in the asphalt heater to only No. 2 diesel or propane. Use of a different fuel could require additional permit requirements.

Permit Condition 2.9 requires good operation of the fuel burning equipment (drum dryer and tank heater) and the drum dryer wet scrubber system. Good operation generally implies proper operation and good maintenance of equipment - burner tuning, wet scrubber inspection and replacement, or sediment clean-out of wet scrubber discharge ponds as needed. The emission factors relied upon in this permit are assumed to reflect good operation, so good maintenance and operation of the equipment is necessary to ensure the factors are representative of actual operations. This permit condition also requires the wet scrubber system to be operated at all times the drum dryer is operated.

Permit Section 3, Monitoring and Recordkeeping Requirements

Permit Conditions 3.1 to 3.5 Visible Emission Monitoring and Recordkeeping - These conditions require a daily survey (a plant walkthrough) for visible emissions, from the drum dryer wet scrubber system stack, as well as specific follow-up steps (investigation, corrective action, RM9 observation and additional recordkeeping and reporting) if visible emissions are observed. If observed visible emissions cannot be eliminated within 24 hours, a RM9 opacity observation must be performed. Records of all surveys and observations are required to be kept for a period of five years. This requirement will help ensure that emissions do not exceed the limits created by this permit.

Permit Condition 3.6 Wet Scrubber System Inspection and Recordkeeping - This permit condition requires an annual internal inspection of the wet scrubber system to check for wear, corrosion and degradation, sediment (solids) level in discharge ponds, or other relevant factors that could impair the performance of the unit. Again, the requirement to inspect and appropriately maintain the wet scrubber system is believed to be necessary to ensure the emission factors used in the monthly compliance evaluation represent actual operations.

Permit Condition 3.7 Particulate Matter Emission Testing - Compliance is determined using production data and emissions factors and the emission factors are reliable only if the permittee complies with the emission limits and assumptions upon which the emission factors are based. The permittee must test the drum dryer baghouse exhaust to confirm compliance with the NSPS and FARR particulate matter emission limits. If Mickelsen performs an emission test within 180 days before permit issuance while propane or natural gas and EPA accepts the earlier test, they will not have to perform the test required in Permit Condition 3.7. Test-related requirements generally found in EPA-issued permits have been added to this permit condition including test plan, notification, simultaneous visible emission observation, data reduction and parameter recording. Test reporting is required in Permit Condition 4.2.

Permit Condition 3.8 Operations and Production Records - The permittee must track and record the operations and production of the plant, including aggregate handling and crushing equipment aggregated with this asphalt plant, such that facility-wide emissions can be reliably calculated on a monthly and 12-month basis and for troubleshooting compliance concerns. Records shall include all information necessary to perform emission calculations as required by Permit Condition 3.10. Emission estimation techniques, and the data needed, are described in detail in Appendix A to this TSD. Most of the data (production, fuel usage, wet scrubber system pressure drop and liquid flow-rate, and fugitive dust controls) must be recorded each day. Other data, such as fuel sulfur, must be documented for each fuel load or through actual measurements to represent what is being burned at any time. Pursuant to Permit Condition 2.9, the drum dryer exhaust is required to be routed to the wet scrubber system at all times and the wet scrubber system must be kept in good operational condition. Permit Condition 3.6 requires the wet scrubber system internals to be inspected annually. The permittee must document any period of operation when (1) the drum dryer exhaust is not routed to the wet scrubber system and (2) the wet scrubber system is not in good operation to assure compliance with Permit Condition 2.9.

Permit Condition 3.9 Equipment Installation – Some monitoring requirements will require the permittee to have equipment to indicate the operational parameters that must be recorded. The permittee can also automate some recordkeeping systems to assure data is recorded. For instance, wet scrubber system pressure drop and liquid flow-rate requires pressure reading instrumentation and can be linked to recording equipment. Some combustion devices can also be equipped with fuel usage measurement and recording instrumentation. All records can be manually recorded by plant personnel using the technique (or "system") the permittee determines is appropriate to comply with the permit. If monitoring equipment will be installed and used, this condition requires it to be appropriately calibrated and maintained.

Permit Condition 3.10 Emissions Calculations – Because compliance with the synthetic minor emission limits created in this permit must be determined on a rolling 12-month basis, this condition requires the permittee to confirm compliance with the emission, production, and operational limits in the permit every month. Permittees with EPA-issued permits that contain synthetic minor limits should always collect the necessary data to calculate emissions from its plant. This will allow them to be able to produce accurate emissions calculations for any period of time necessary. If the recordkeeping is routine for the plant personnel, it is also less likely that the source will make recordkeeping errors during the time it needs to report to the EPA.

The emission calculations should be based on the best emission factors available and actual operational and production data. Calculations should be performed as they are described in Appendix A; however, assumptions in Appendix A should be verified as needed and when better information is available, it should be used. For instance, emission factors from site-specific emission testing would likely be more representative than basing emissions on NSPS limits or AP-42. Techniques used for the calculations, including any new assumptions, must be clearly documented and acceptable to the EPA.

Permit Condition 3.11 Records Retention – This requirement, to keep all of the required records on site for a period of five years, makes the permit consistent with other EPA recordkeeping requirements.

Permit Section 4, Reporting Requirements

Permit Condition 4.1 Notification of Deviations – To expedite the time it takes for the EPA to learn that the permittee is having compliance problems, this condition lists the information and timing for notifying the EPA about deviations from permit conditions. Operating circumstances that are of greatest concern (wet scrubber system not operating or functioning improperly) must be reported by telephone within 24 hours of discovery with written follow-up within 10 days. Calculated exceedances of the permit emission, production, and operational limits are required to be reported in writing within 10 days of discovery. Notifications should include a clear, complete explanation of the exceedance or situation that warrants the notification so the EPA understands the severity of the situation.

Permit Condition 4.2 Emission Test Report – The test report, generated by the testing required in Permit Condition 3.7, is required to be reported to EPA within 60 days of testing.

Permit Condition 4.3 Annual Report – If the permittee operated during a given calendar year, the permittee must submit an emission report to the EPA that provides a summary of the operations (dates) and each calculated monthly and 12-month rolling emission total required in Permit Condition 3.10, including any 12-month totals exceeding the permit limits that were previously sent to the EPA under the deviation notification requirement in Permit Condition 4.1. The emission report is due annually by February 15 following any year in which the source operated. If the source operates every year, the source is required to report every year by February 15.

While monthly emissions data might show up in more than one report, each 12-month rolling total should only be reported once. Note that the emission report required by this permit is different than the annual registration report required by 40 CFR 49.138 in the FARR.

Permit Condition 4.4 and 4.5 Mailing Addresses and Telephone Numbers – The telephone number for telephone notifications has been included here. Copies of all notifications and reports must be sent to the Tribal environmental contact listed that represents the reservation on which the source operates.

5. Permit Procedures

5.1 Permit Revisions, Termination and Reissuance

The permittee should contact the EPA if they are considering requesting any revision to the conditions of this permit. The EPA will evaluate the regulatory options available to the permittee and advise them of same.

If the permittee wishes to terminate the permit, a written request must be submitted to the EPA explaining the reasons for the request and, if necessary for continued operation, submitting applications for any Clean Air Act permits or approvals that the permittee avoided by the establishment of the limits contained in this permit.

This permit may be terminated, revised, or revoked and reissued by the EPA for cause. Cause exists to terminate, revise, or revoke and reissue this permit under the following circumstances:

1. This permit contains a material mistake;
2. Inaccurate statements were made in establishing the terms or conditions of this permit;
3. The permittee fails to comply with any condition of this permit; or
4. This permit must be terminated, revised, or reopened and reissued to assure compliance with Clean Air Act requirements.

5.2 Public Notice and Comment

As required under 40 CFR § 49.139(c), the draft operating permit will be publicly noticed and made available for public comment as follows:

1. Make available for public inspection a copy of the draft operating permit prepared by the EPA, the technical support document for the draft permit, the application, and all supporting materials including at least one location in the area affected by the air pollution source (see 40 CFR 49.139(c)(5)(i));
2. Publish public notice for this draft permit of the availability of the draft permit and supporting materials and of the opportunity to comment in a newspaper of general circulation (see 40 CFR 49.139(c)(5)(ii));
3. Provide copies of the notice to the owners or operators of the air pollution source, the Tribal governing body, and the Tribal environmental organizations as well as Idaho Department of Environmental Quality (see 40 CFR 49.139(c)(5)(iii)); and
4. Provide for a 30-day period for submittal of public comments, starting upon the date of publication of the notice (see 40 CFR 49.139(c)(5)(iv)).

As required in 40 CFR 49.139(c)(5)(iv) and (c)(6), the EPA will address any public comments in preparing a final permit and technical support document and will document a response to each comment explaining whether any changes to the permit resulted and the reason the change was or was not made.

As required in 40 CFR 49.139(c)(7), the EPA will send the final permit and technical support document to each person who provided comments on the draft permit to operate and the EPA will make available the final permit and technical support document at all of the locations where the draft permit was made available.

For this permit, a notice was published in the Idaho State Journal and Sho-Ban News and a 30-day period for public comment was made available. The public comment period ended on September 5, 2014. The only comments received during this time was from the permittee. The permittee requested corrections to some of the information provided in the emission unit description column in Permit Condition 1.1. These corrections were made to the permit.

6. Abbreviations and Acronyms

AFS	Aerometric Information Retrieval System Facility Subset
CFR	Code of Federal Regulations
CO	Carbon monoxide
EJ	Environmental Justice
EPA	United States Environmental Protection Agency (also U.S. EPA)
ESA	Endangered Species Act
FARR	Federal Air Rules for Reservations
FR	Federal Register
HAP	Hazardous air pollutant (plural: HAPs)
HMA	Hot mix asphalt
MACT	Maximum Achievable Control Technology (Title 40 CFR Part 63)
NESHAP	National Emission Standards for Hazardous Air Pollutants (Title 40 CFR Parts 61 & 63)
NHPA	National Historical Preservation Act
NOx	Nitrogen oxides
NNSR	Nonattainment New Source Review
NSPS	New Source Performance Standards (40 CFR Part 60)
PM	Particulate matter
PM10	Particulate matter $\leq$ 10 micrometers
PM2.5	Particulate matter $\leq$ 2.5 micrometers
PSD	Prevention of Significant Deterioration (40 CFR Part 52)
PTE	Potential to emit
RAP	Recycled asphalt pavement
SO2	Sulfur dioxide
Title V	Title V of the Clean Air Act
TPY	Tons per year
TSD	Technical Support Document
VOC	Volatile organic compound

Appendix A

Limited PTE Emission Inventory

Mickelsen Construction, Inc.

Technical Support Document
Synthetic Minor Source Air Quality Operating Permit
R10NT502501

Summary of Total Limited Potential Criteria Air Pollutant Emissions

Limited Potential to Emit, (tons per year)

Aggregate Crushing and Handling Activities based on throughput limit of 500,000 tons of raw materials processed per year

	EU1	EU2	EU3	EU4	
	Aggregate Crushers	Aggregate Handling	Aggregate Wind Erosion	Aggregate Traffic	**Total**
Carbon Monoxide (CO)	0	0	0	0	0
Lead (Pb)	0	0	0	0	0
Nitrogen Oxides (NOx)	0	0	0	0	0
Particulate Matter (PM)	108	12	0	12	132
Particulate Matter ≤ 10 (PM10)	30	6	0	3	40
Particulate Matter ≤ 2.5 (PM2.5)	30	1	0	0	32
Sulfur Dioxide (SO2)	0	0	0	0	0
Volatile Organic Compounds (VOC)	0	0	0	0	0
Greenhouse Gases (CO_2e)	0	0	0	0	0

Hot Mix Asphalt Plant (Point and Fugitive Sources) based on production limit of 300,000 tons of hot mix asphalt produced per year

	EU5	EU6	EU7	EU8	EU9	EU10	EU11	EU12	
	Drum Dryer (Point Source)	Asphalt Tank Heater (Point Source)	Storage Tanks (Point Sources)	Aggregate Handling (Fugitive Source)	Silo Filing (Point Source)	Asphalt Truck Loading & Fumes (Point Source)	Traffic (Fugitive Source)	Impacter Diesel Engine (Point Source)	**Total**
Carbon Monoxide (CO)	20	0	0	0	0	2	0	2	23
Lead (Pb)	0	0	0	0	0	0	0	0	0
Nitrogen Oxides (NOx)	4	0	0	0	0	0	0	10	14
Particulate Matter (PM)	11	0	0	3	0	1	1	1	16
Particulate Matter ≤ 10 (PM10)	14	0	0	1	0	1	0	1	17
Particulate Matter ≤ 2.5 (PM2.5)	14	0	0	0	0	1	0	1	17
Sulfur Dioxide (SO2)	1	0	0	0	0	0	0	1	2
Volatile Organic Compounds (VOC)	5	0	0	0	2	1	0	0	7
Greenhouse Gases (CO_2e)	6,582	851	0	0	0	0	0	1,118	8,550

Total Source Limited Potential To Emit

	Total
Carbon Monoxide (CO)	**23**
Lead (Pb)	0
Nitrogen Oxides (NOx)	14
Particulate Matter (PM)	**148**
Particulates Matter ≤ 10 (PM10)	**57**
Particulate Matter ≤ 2.5 (PM2.5)	**48**
Sulfur Dioxide (SO2)	2
Volatile Organic Compounds (VOC)	7
Greenhouse Gases (CO_2e)	8,550

Total Source PTE Emission Limits

Carbon Monoxide (CO)	80	tpy, based on emission limit in FARR Non-Title V permit
Lead (Pb)	N/A	
Nitrogen Oxides (NOx)	N/A	
Particulate Matter (PM)	200	tpy, based on emission limit in FARR Non-Title V permit
Particulate Matter < 10 (PM10)	80	tpy, based on emission limit in FARR Non-Title V permit
Fine Particulates < 2.5 (PM2.5)	80	tpy, based on emission limit in FARR Non-Title V permit
Sulfur Dioxide (SO2)	N/A	
Volatile Organic Compounds (VOC)	N/A	
Greenhouse Gases (GHGs)	N/A	

Note: The "Total Source Potential To Emit" table sums the values in the 2 tables above titled "Aggregate Handling and Crushing Activities" and "Hot Mix Asphalt".

Summary of Total Limited Potential Hazardous Air Pollutant (HAP) Emissions

Limited Potential to Emit, (tons per year) based on 300,000 tons of HMA produced and 500,000 tons of raw material processed on a rolling 12-month basis

Total Source

Inorganics	EU 5 Drum Dryer	EU 6 Asphalt Tank Heater	EU 7 Storage Tanks	EU 9 Silo Filling	EU 10 Truck Loading & Fumes	EU 12 Impacter Diesel Engine	PTE Single HAP Plantwide Totals (tpy)
Antimony Compounds	2.70E-05	0.00E+00				0.00E+00	2.70E-05
Arsenic Compounds (incl arsine)	8.40E-05	2.03E-08				4.00E-06	8.80E-05
Beryllium Compounds	0.00E+00	1.52E-08				3.00E-06	3.02E-06
Cadmium Compounds	6.15E-05	1.52E-08				3.00E-06	6.45E-05
Chromium Compounds (incl hexavalent)	8.25E-04	1.52E-08				3.00E-06	8.28E-04
Cobalt Compounds	3.90E-06	0.00E+00				0.00E+00	3.90E-06
Lead Compounds (not elemental lead)	9.30E-05	4.56E-08				9.00E-06	1.02E-04
Manganese Compounds	1.16E-03	3.04E-08				6.00E-06	1.16E-03
Mercury Compounds	3.60E-05	1.52E-08				3.00E-06	3.90E-05
Nickel Compounds	9.45E-03	1.52E-08				3.00E-06	9.45E-03
Phophorus Compounds	4.20E-03	0.00E+00				0.00E+00	4.20E-03
Selenium Compounds	5.25E-05	1.18E-04				1.50E-05	1.86E-04
Organics							0.00E+00
Acetaldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.67E-04	7.67E-04
Acrolein	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.25E-05	9.25E-05
Benzene	5.85E-02	1.08E-06	2.04E-03	5.85E-04	8.58E-05	9.33E-04	6.21E-02
Bromomethane (methyl bromide)	0.00E+00	0.00E+00	3.13E-04	8.96E-05	1.58E-05	0.00E+00	4.18E-04
1,3-Butadiene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.91E-05	3.91E-05
Carbon Disulfide	0.00E+00	0.00E+00	1.02E-03	2.92E-04	2.15E-05	0.00E+00	1.33E-03
Chloroethane (ethyl chloride)	0.00E+00	0.00E+00	2.55E-04	7.31E-05	3.47E-07	0.00E+00	3.29E-04
Chloromethane (methyl chloride)	0.00E+00	0.00E+00	1.47E-03	4.20E-04	2.48E-05	0.00E+00	1.91E-03
Cumene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dichlorobenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.82E-04	0.00E+00	1.82E-04
Dioxin (2,3,7,8 tetrachlorodibenzo-p-dioxin)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	3.60E-02	3.22E-07	2.42E-03	6.95E-04	4.62E-04	0.00E+00	3.96E-02
Formaldehyde	4.65E-01	3.09E-04	4.40E-02	1.26E-02	1.45E-04	1.18E-03	5.23E-01
Furans (all PCDF)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane (incl n-Hexane)	1.38E-01	0.00E+00	6.38E-03	1.83E-03	2.48E-04	0.00E+00	1.46E-01
Hydrochloric Acid (hydrogen chloride or HCL)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Isooctane (2,2,4-trimethylpentane)	6.00E-03	0.00E+00	1.98E-05	5.67E-06	2.97E-06	0.00E+00	6.03E-03
Methyl Chloride (chloromethane)	0.00E+00	0.00E+00	1.72E-05	4.94E-06	0.00E+00	0.00E+00	2.22E-05
Methyl Chloroform (1,1,1-trichloroethane)	7.20E-03	1.20E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.20E-03
Methyl tert-Butyl Ether (MTBE)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene[1] (also a POM)	1.35E-02	5.73E-06	0.00E+00	6.93E-04	2.06E-03	8.48E-05	1.63E-02
Phenol	0.00E+00	0.00E+00	0.00E+00	4.49E-04	1.95E-03	0.00E+00	2.40E-03
Polycyclic Organic Matter* (incl naphthalene)	2.81E-02	1.67E-05	0.00E+00	4.35E-03	2.06E-03	1.68E-04	3.47E-02
Propionaldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Quinone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Styrene	0.00E+00	0.00E+00	3.45E-04	9.87E-05	1.21E-05	0.00E+00	4.55E-04
Tetrachloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.27E-05	0.00E+00	1.27E-05
Toluene	2.25E-02	3.14E-05	3.96E-03	1.13E-03	3.47E-04	4.09E-04	2.84E-02
Xylene (incl isomers and mixtures)	3.00E-02	5.52E-07	1.64E-02	4.70E-03	8.09E-04	2.85E-04	5.22E-02

	EU 5 Drum Dryer	EU 6 Asphalt Tank Heater	EU 7 Storage Tanks	EU 9 Silo Filling	EU 10 Truck Loading & Fumes	EU 12 Impacter Diesel Engine
Emission Unit HAP Totals	0.807	0.000	0.079	0.027	0.006	9.278E-03

Plantwide Combination HAPs Total	0.929	tons per year	
Highest Plantwide Single HAP	0.523	tons per year	(Formaldehyde)

Plantwide Limited PTE Limits

Plantwide Combination HAPs Total	N/A	
Plantwide Single HAP Total	N/A	

Notes:

1. Emission-Unit HAP Totals will not equal the sum of individual pollutants
2. Isomers of xylene (m-, p-, o-) are grouped as Xylenes for applicability even though the individual isomers are each listed HAPs
3. Emission units not shown are not known to emit HAPs

Summary of Total Lmited Potential Greenhouse Gases (GHGs) Emissions

Limited Potential to Emit, (tons per year)

Emissions Unit: **#5 and #6 Emission Units**

Global Warming Potential:

CO_2	1
N_2O	298
CH_4	25

Firing Rate:

Drum Mixer Burner Capacity	129	MMBtu/hr	(provided by applicant)
Asphalt Tank Heater	1.8	MMBtu/hr	(provided by applicant)
Impacter Diesel Engine	17.14	gallons/hr	(provided by applicant)
Production Limit:	300,000	tons of HMA produced per year	
Throughput Limit:	500,000	tons of raw material processed per year	

Unit ID	Description	Maximum Annual Capacity		Emission Factors[1,2] CO_2	Emission Factors[1,2] N_2O	Emission Factors[1,2] CH_4	Potential to Emit (tpy) CO_2	Potential to Emit (tpy) N_2O	Potential to Emit (tpy) CH_4	Potential to Emit (tpy) CO_2e
5	Drum Dryer (Propane)	1,063,187	gallons	61.46	6.E-04	3.E-03	6,555	0.06	0.32	6,582
5	Drum Dryer (Natural Gas)	93,932,039	scf	53.02	1.00E-04	1.00E-03	5,644	0.01	0.11	5,649
6	Asphalt Tank Heater (#2 Diesel)	114,261	gallons	73.96	6.E-04	3.E-03	848	0.01	0.03	851
12	Impacter Diesel Engine (#2 Diesel)	150,146	gallons	73.96	6.E-04	3.E-03	1,114	0.01	0.05	1,118
The following emission units have no known emissions of GHG:										
1	Aggregate Crusher									
2	Aggregate Handling									
3	Aggregate Wind Erosion									
4	Aggregate Traffic									
7	Asphalt Storage Tanks									
8	Asphalt Aggregate Handling and Screen									
9	Asphalt Silo Handling									
10	Asphalt Truck Loading & Fumes									
11	Asphalt Traffic									

Note: Maximum Annual Capacity based on a similar HMA facility, Pioneer, Inc.

Limited PTE from combustion sources: 8,550

Physical Data and Conversions Used

453.59	g/lb	
2,000	lbs/ton	
0.091	MMBtu/gallon	Heat content of propane (Part 98, Subpart C, Table C1)
1.03E-03	MMBtu/scf	Heat content of natural gas fuel (Part 98, Subpart C, Table C1)
0.138	MMBtu/gallon	Heat content of diesel (Part 98, Subpart C, Table C1)

Footnotes/Assumptions

1 Emission factors are in units of kg/MMBtu

2 Emission factors are from 40 CFR Part 98 Subpart C, Tables C-1 and C-2

Default CO2 emission factor for propane	62.87	40 CFR Part 98, Table C-1
Default CO2 emission factor for natural gas	53.02	40 CFR Part 98, Table C-1
Default CO2 emission factor for distillate fuel oil #2	73.96	40 CFR Part 98, Table C-1
Default N_2O emission factor (kg N_2O/mmBtu) for propane	6.E-04	40 CFR Part 98, Table C-2
Default N_2O emission factor (kg N_2O/mmBtu) for natural gas	1.00E-04	40 CFR Part 98, Table C-2
Default N_2O emission factor (kg N_2O/mmBtu) for distillate fuel oil #2	6.E-04	40 CFR Part 98, Table C-2
Default CH_4emission factor (kg CH_4/mmBtu) for propane	3.E-03	40 CFR Part 98, Table C-2
Default CH_4emission factor (kg CH_4/mmBtu) for natural gas	1.00E-03	40 CFR Part 98, Table C-2
Default CH_4emission factor (kg CH_4/mmBtu) for distillate fuel oil #2	3.E-03	40 CFR Part 98, Table C-2

Calculation of Propane Usage based on Drum Dryer Production Limit of 500,000 tons per year

PTE Production of Drum Dryer

400 tons HMA per hour x 8760 hours per year 3,504,000 tons of HMA per year

PTE Propane Fuel Usage of Drum Dryer

= (129 MMBtu per hour / 0.091 MMBtu per gallon) x 8760 hours per year = 12,418,022 gallons of propane per year

Limited PTE Propane Fuel Usage based on 500,000 tons of HMA per year

= (300,000 tons of HMA per year / 3,504,000 tons of HMA per year) x 12,418,022 gallons of propane per year

= 1,063,187 gallons of propane per year

Calculation of Natural Gas Usage based on Drum Dryer Production Limit of 500,000 tons per year

PTE Natural Gas Fuel Usage of Drum Dryer

=(129 MMBtu per hour / 0.00103 MMBtu per scf) x 8760 hour 1,097,126,214 scf of natural gas per year

Limited PTE Natural Gas Fuel Usage based on 500,000 tons of HMA per year

=(300,000 tons of HMA per year / 3,504,000 tons of HMA per year) x 1,097,126,214 scf of natural gas per year

=93,932,039 scf of natural gas per year

Criteria Air Pollutant Emission Inventory

Emission Unit: **#1 Aggregate Crushed Stone Processing Operations**
Description: Mineral PM is formed due to physical attrition of the stone during crushing, screening, conveying, loading, and unloading
Control: No Control
Capacity: 400 tons per hour (maximum hourly plant)
Operation: 8760 hours/year
Throughput Limit: 500,000 tons of raw materials processed per year (rock, concrete rubble, or recycled asph

Limited Potential to Emit, (tons per year)

CO	
Lead	
NOx	
PM	107.90
PM10	30.43
PM2.5	30.43
SO2	
VOC	

Activity Description	Occurences	PM		PM10		PM2.5	
		EF	PTE TPY	EF	PTE TPY	EF	PTE TPY
Conveyeror transfer point	7	3.00E-03	5.25	1.10E-03	1.93	1.10E-03	1.93
Screening	2	2.50E-02	12.50	8.70E-03	4.35	8.70E-03	4.35
Fines screening	1	3.00E-01	75.00	7.20E-02	18.00	7.20E-02	18.00
Truck unloading	1	1.60E-05	4.00E-03	1.60E-05	0.00	1.60E-05	0.00
Primary crushing	3	5.40E-03	4.05	2.40E-03	1.80	2.40E-03	1.80
Tertiary crushing	1	5.40E-03	1.35	2.40E-03	0.60	2.40E-03	0.60
Fines crushing	1	3.90E-02	9.75	1.50E-02	3.75	1.50E-02	3.75
TOTAL PTE TPY			107.90		30.43		30.43

Estimation Explanations

Emission factor (EF) units are lb/ton stone processed

Basis for all EF: AP-42, 08/04, Section 11.19.2, Table 11.19.2-2 (lb/Ton)

Note: 1. Tertiary crushing EFs utilized to estimate maximum possible emissions from primary crushing.
2. PM10 truck unloading EF utilized to estimate PM2.5 truck unloading emissions.
3. All EFs reflect AP-42 controlled emissions factors given that sources operating within an Indian reservation must limit PM as required by 49.124(d) and 49.126(d) & (e).

Criteria Air Pollutant Emission Inventory

Emission Unit: **#2 Aggregate Handling**

Description: a. Aggregate transfer from on-site raw materials (rock, concrete rubble, recycled asphalt pavement) source to crusher (1 transfer)
b. Aggregate transfer from conveyors to 9 surge piles (9 transfers)
c. Aggregate transfer from 9 surge piles to 9 stock piles (9 transfers)
d. Aggregate transfer from stock piles 4 cold bins (4 transfers)
Total Transfers = 1+9+9+4= 23 transfers

Control:	none	
Capacity:	400	tons/hour
Operation:	8760	hours/year
Throughput Limit:	500,000	tons of raw materials processed per year

Limited Potential to Emit, (tons per year)

	23 transfers	
	EF	PTE TPY
CO		
Lead		
NOx		
PM	0.0021	12.2
PM10	0.0010	5.8
PM2.5	0.0002	0.9
SO2		
VOC		

Note: Emissions are multiplied by 23 to account for all 23 transfers

Estimation Explanations

Emission factor (EF) units are lb/ton of aggregate handled

PM factor: AP-42, 11/06, Section 13.2.4, Equation 1 for each drop operation
Emission factor=k(0.0032)(U/5)^1.3/(M/2)^1.4

	U, mean wind speed:	15	mph, average wind speed AP-42, 11/06, Section 13.2.4, page 4
	M, material moisture content:	3	%, conservative estimate based on EPA's Emission Inventory Improvement Program range of 3 - 7%
PM factor:	k, particle size multiplier:	0.74	from AP-42, 11/06, Section 13.2.4, page 4
PM10 factor:	k, particle size multiplier:	0.35	from AP-42, 11/06, Section 13.2.4, page 4
PM2.5 factor:	k, particle size multiplier:	0.053	from AP-42, 11/06, Section 13.2.4, page 4

Criteria Air Pollutant Emission Inventory

Emission Unit: **#3 Aggregate Wind Erosion**

Description:	Wind erosion of all exposed areas including piles	
Control:	none	
Capacity:	300	tons/hour
Operation:	8760	hours/year
PTE Throughput:	2628000	tons of raw material per year (capacity in tons/hr x operation in hours/yr)
	50538.4615	tons/pile (assumes a 1 week supply is available on site so divide total yearly amount by 52)
	962637.363	ft3 per pile, assumes aggregate density is 105 lb/cu ft
Pile height:	50	feet
Pile width:	200	feet
Pile length:	96.3	feet
Pile Footprint:	19,253	ft2
	0.44	acres, assumes 43560 ft2/acre
Throughput Limit:	500,000	tons of raw materials processed per year

Limited Potential to Emit, (tons per year)

	Wind erosion	
	EF (ton per acre-yr)	PTE TPY
CO		
Lead		
NOx		
PM	3.8E-01	9.4E-02
PM10	1.8E-01	4.4E-02
PM2.5	2.7E-02	6.6E-03
SO2		
VOC		

Estimation Explanations

Emission factor (EF) units are tons/acre per year

Stockpile size calculated based on maximum capacity, operating 8760 hr/yr

PM factor: 0.38 tons per acre based on AP-42, 10/98, Section 11.9, Table 11.9-4 for wind erosion of exposed areas

PM10 factor: Engineering estimate - 47% of PM factor from ratio of transfer particle size multipliers (0.35/0.74) in AP-42,13.2.4,11/06

PM2.5 factor: Engineering estimate - 7% of PM factor from ratio of transfer particle size multipliers (0.053/0.74) in AP-42,13.2.4,11/06

Criteria Air Pollutant Emission Inventory

2628000

Emission Unit: **#4 Truck and Loader Traffic**
Description: Road dust caused by truck and loader traffic
Control: none
Crusher Capacity: 300 tons per hour
HMA Loading Capacity: 400 tons per hour
Operation: 8,760 hours/year
Throughput Limit: 500,000 tons of raw material processed per year

Data below based on similar Aggregate Handling and Crushing facility, Pioneer Asphalt, Inc.

a. Truck delivery of fragmented stone: (300 tons/hr)

mean weight (empty):	17	tons
mean weight (loaded):	49.5	tons
W, mean weight (average):	33.25	tons
tons per trip:	32.5	tons
number of trips per year	11538	

paved road round trip distance traveled at plant while delivering fragmented stone to crusher:	0.15	miles	unpaved road round trip distance traveled at plant while delivering fragmented stone to crusher:	0.15	miles
vehicle miles traveled paved road:	1731	miles	vehicle miles traveled unpaved road:	1731	miles

b. Truck delivery of crushed stone: (100 tons/hr)

mean weight (empty):	17	tons
mean weight (loaded):	49.5	tons
W, mean weight (average):	33.25	tons
tons per trip:	32.5	tons
number of trips per year	3846	

paved road round trip distance traveled at plant while delivering fragmented stone to crusher:	0.15	miles	unpaved road round trip distance traveled at plant while delivering fragmented stone to crusher:	0.15	miles
vehicle miles traveled paved road:	576.9	miles	vehicle miles traveled unpaved road:	576.9	miles

c. Loader for delivering aggregate product from surge piles to stockpiles: (400 tons/hr)

mean weight (empty):	34	tons
mean weight (loaded):	40	tons
W, mean weight (average):	37	tons
tons per trip:	6	tons
number of trips per year	83333	

paved round trip distance traveled between crusher surge pile and stockpiles:	0	miles	unpaved round trip distance traveled between crusher surge pile and stockpiles:	0.04	miles
vehicle miles traveled unpaved road:	0	miles	vehicle miles traveled unpaved road:	3333.32	

d. Loader for delivering aggregate product from stockpiles to HMA cold bins: (400 tons/hr)

mean weight (empty):	34	tons
mean weight (loaded):	40	tons
W, mean weight (average):	37	tons
tons per trip:	6	tons
number of trips per year	83333	

paved round trip distance traveled between stockpile and feed bins:	0	miles	unpaved round trip distance traveled between stockpile and feed bins:	0.04	miles
vehicle miles traveled unpaved road:	0	miles	vehicle miles traveled unpaved road:	3333.32	miles

Limited Potential to Emit, (tons per year)

	Truck delivery of fragmented stone - paved road		Truck delivery of fragmented stone - unpaved road		Truck delivery of crushed stone - paved road		Truck delivery of crushed stone - unpaved road		Loader delivering product to stockpiles - unpaved road		Loader delivering product to HMA - unpaved road		Total Limited PTE TPY
	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY	
CO													
Lead													
NOx													
PM	0.23	0.20	5.74	4.97	0.23	0.20	5.74	4.97	7.92	13.20	7.92	13.20	11.75
PM10	0.05	0.04	1.46	1.27	0.05	0.04	1.46	1.27	2.18	3.64	2.18	3.64	3.26
PM2.5	0.01	0.01	0.15	0.13	0.01	0.01	0.15	0.13	0.22	0.36	0.22	0.36	0.33
SO2													
VOC													

Estimation Explanations

Emission factor (EF) units are lb/miles and the total PTE emissions are multiplied by 33 percent to reflect the 500,000 throughput limit as a percentage of the PTE total throughput of which is 1,533,000 tons of rock cushed and aggregate produced at the facility.
175 tons of rock crushed per hour x 8760 hours per year = 1,533,000 tons of aggregate per year
500,000 tons of aggregate per year / 1,533,000 tons of aggregated per year = 0.326 = approximately 33 percent

Unpaved Roads.

Predictive Emission Equations used to calculate Emission Factors from AP-42 11/06, Section 13.2.2, Equation 1a

PM factor: E=k*(s/12)^a*(W/3)^b(365-P)/365

W =		mean vehicle weight (tons) - see source data above
P =	90	average number of days in a calendar year during which at least 0.01 inches of precipitation is Pocatello, Idaho preciptation data 11/06 AP42, Figure 13.2.2-1
s =	4.8	surface material silt content (%), estimate based on AP-42 Table 13.2.2-1 for a plant road at a sand and gravel processing facility. This factor employed for trucks.

	s =	7.1	surface material silt content (%), estimate based on AP-42 Table 13.2.2-1 for a material storage area at a sand and gravel processing facility. This factor employed for loader.
	k =	4.9	empirical constant
	a=	0.7	empirical constant
	b =	0.45	empirical constant
PM10 factor:	Same as for PM emission factor, except that		
	k =	1.50	empirical constant
	a =	0.9	empirical constant
	b =	0.45	empirical constant
PM2.5 factor:	Same as for PM emission factor, except that		
	k =	0.15	empirical constant
	a =	0.9	empirical constant
	b =	0.45	empirical constant

Emission factor (EF) units are lb/miles

Paved Roads

Predictive Emission Equations used to calculate Emission Factors from AP-42 01/11, Section 13.2.1.3, Equation 2

PM factor:	E=[k*(sL)^0.91*(W)^1.02)][1-P/(4*365)]		
	W =		mean vehicle weight (tons) - see source data above
	P =	90	average number of days in a calendar year during which at least 0.01 inches of precipitation is observed, Pocatello, Idaho preciptation data 11/06 AP42, Figure 13.2.2-1
	k =	0.011	lb/VMT, empirical constant, for PM30, Table 13.2.1-1
	sL =	0.6	silt loading (g/m2), based on AP-42 Table 13.2.1-2 ubiquitous baseline value for paved roads experiencing less than 500 trips per day (conservative assumption as value increases with increasing number of daily trips)
For PM10:	k =	0.0022	empirical constant, for PM10, Table 13.2.1-1
For PM2.5:	k =	0.00054	empirical constant, for PM2.5, Table 13.2.1-1

Criteria Air Pollutant Emission Inventory

Emission Unit: **#5 Asphalt Drum Dryer**
Description: Hot Mix Asphalt Plant Drum Dryer - Portable Alis Chalmers Model #4780146850 9 x 36 Parallel Flow
Control: Wet Scrubber
Fuel: Propane or Natural Gas
Firing Rate: 129 MMBtu/hr (Genco FP-129 Burner)
Capacity: 400 tons of hot mix asphalt per hour
Operation: 8760 hours per year
PTE Production: 3,504,000 tons of hot mix asphalt per year
Production Limit 300,000 tons of HMA produced per year

Limited Potential to Emit, (tons per year)

Drum Dryer	natural gas/propane	
	EF	PTE TPY
CO	0.13	19.5
Lead	6.2E-07	9.3E-05
NOx	0.026	3.9
PM (filterable)	0.074	11.1
PM10 (total)	0.093	14.0
PM2.5 (total)	0.093	14.0
SO2	0.009	1.3
VOC	0.032	4.8

Estimation Explanations

Emission factor (EF) units are lb/ton HMA product.
Propane and Natural Gas emission factors are considered to be similar

CO factor: AP-42, 3/04, Hot Mix Asphalt Plants, Table 11.1-7 -- natural gas-fired.
- Assume emissions resulting from combustion of natural gas are similar to emissions resulting from combustion of propane.

Lead factor: AP-42, 3/04, Hot Mix Asphalt Plants, Table 11.1-12 -- propane with fabric filter employed to meet NSPS PM limit.

NOx factor: AP-42, 3/04, Hot Mix Asphalt Plants, Table 11.1-7 -- natural gas-fired dryer.
- Assume emissions resulting from combustion of natural gas are similar to emissions resulting from combustion of propane.

PM, PM10 factor: EF based on NSPS Subpart I limit and actual operating data from Mickelsen's drum dryer/mixer that employs a wet scrubber.
Operating data was based on July 9, 1996 test report provided by Mickelsen Construction. See 40 CFR 60.92.

EF = (gr/dscf) / (7000 gr/lb) * (dscf/min) * (60 min/hr) / (tph HMA)

Pioneer Sept. 2, 2010 stack test =	RUN 1	RUN 2	RUN 3	
NSPS PM Limit =	0.04	0.04	0.04	gr/dscf
stack flow during test =	52148	31971	32888	dscf/min
production during test =	181.2	181.2	181.2	ton/hr HMA
NSPS-based emission factor =	0.099	0.060	0.062	lb/ton HMA

Average NSPS-based EF = 0.074 lb/ton HMA

- Conservatively assume that all filterable PM is also filterable PM10.
- PM10 value does include condensable PM of 0.0194 condensable per AP-42 dated 3/04 Table 11.1-3--controlled total PM10 for propane

Note: NSPS limit is more stringent than FARR PM limit of 0.1 gr/dscf, so NSPS will be used to calculate PTE.

PM2.5 factor: EF based on NSPS Subpart I limit and actual operating data from Pioneer's recently installed drum mixer that employs a fabric filter.
Operating data was based on July 9, 1996 test report provided by Mickelsen Construction. See 40 CFR 60.92.

Average NSPS-based EF = 0.074 lb/ton HMA

- Conservatively assume that all PM10 is also PM2.5.
- PM2.5 value does include condensable PM, conservatively assume all PM10 is also PM2.5

SO2 factor: Option 1 reflects the PTE of the emission unit. The fuel sulfur content emission limitation considered in Option 1 is more stringent than the process source stack emission limit considered in Option 2.

Option 1: EF based on FARR propane fuel sulfur limit of 1.1 grams per dscm and physical capacity of emission unit.
See 40 CFR 49.130(d)(8).

EF = (S limit g/dscm) * (2.205 lb/1000 g) * (m3/35.31 ft3) * (vaporization ft3/gal) * (max burner firing rate gal/hr) * (2 lb SO2/lb S) / (tph HMA)

FARR gaseous fuel S limit =	1.1	g/m3	
vaporization of liquid propane =	36.38	ft3/gal at 60F	
max propane firing rate =	693	gal/hr	Based on heat input capacity of 64 MMBtu/hr.
SO2 fraction not staying in HMA =	0.5	See AP-42 3/2004, Table 11.1-5.	
max HMA production rate =	400	ton/hr	

propane emission factor = 0.009 lb/ton HMA

Option 2: EF based on FARR process source stack SO2 limit (40 CFR 49.129(d)(2)) of 500 ppm and actual test data as follows:

EF = (ppm) * (1.66E-7 lb/dscf / ppm) * (dscf/min) * (60 min/hr) / (tph HMA)

Pioneer Sept. 2, 2010 stack test =	RUN 1	RUN 2	RUN 3	
FARR SO2 limit =	500	500	500	ppm
measured flow rate =	52148	31971	32888	dscf/min
production during test =	181.2	181.2	181.2	ton/hr HMA
emission factor =	1.433	0.879	0.904	lb/ton HMA

Worst-case FARR-based emission factor = 1.433 lb/ton HMA

VOC factor: AP-42 3/04, Hot Mix Asphalt Plants, Table 11.1-8 -- natural gas-fired.
- Assume emissions resulting from combustion of natural gas are similar to emissions resulting from combustion of propane.

Criteria Air Pollutant Emission Inventory

Emission Unit: **#6 Asphalt Storage Tank Heater**
Description: Asphalt heater
Control: none
Fuel: #2 Diesel
Capacity: 1.800 mmBtu/hr (provided by applicant)
Operation: 8,760 hours/year
Production Limit: 1,419 MMBtu/year (based on #2 Diesel and 300,000 tons of HMA/year)

Limited Potential to Emit, (tons per year)

	#2 Diesel	
	EF	PTE TPY
CO	1.2	0.01
Lead	9.00E-06	4.56E-08
NOx	20	0.10
PM	27.570	0.14
PM10	2.3	0.01
PM2.5	2.3	0.01
SO2	71	0.36
VOC	0.2	0.001

Estimation Explanations

Emission factor (EF) units are lb/1000 gallon oil
Worst-case PTE is diesel fuel taking into consideration the most stringent emission limits that exist

Liquid Fuel conversion factor = 140 mmBTU/1000 gal from AP42, App A

CO factor: For diesel: AP-42, 3/04, Table 11.1-13, hot oil system fired with #2 diesel

Lead factor: For diesel: AP-42, 5/10, Table 1.3-10, distillate oil fired boilers <100mmbtu

NOx factor: For diesel: AP-42, 5/10, Table 1.3-1, boilers <100mmbtu

PM factor: Option 1 for #2 diesel: EF based on PM emission limits in FARR (40 CFR 49.125) = 0.1 grains/dscf at 7% O2
EF = (emission limit) / (7000 gr/lb) * (dscf-out/mmBtu-in) * (mmBtu/1000 gal fuel oil) = lb/mgal fuel oil
FARR PM Limit = 0.1 gr/dscf (tested at 0.039 gr/dscf and 0.0007 gr/dscf counting front and back half respectively)
Stack flow conversion factor 9190 dscf/mmBtu from 40 CFR 60 App A, Table 19-2 at 0% O2
FARR-based EF = 27.57 lb/1000 gal fuel oil
Option 2 for diesel: AP-42, 5/10, Table 1.3-1, boilers <100mmbtu
EF = 9.19(S)+3.22
S= 0.5 % sulfur from FARR 40 CFR 49.130(d)(4)
EF = 7.815 lb/1000gal
For diesel: PM factor will be based on FARR limit, even though actual emissions are predicted to be much less

PM10 factor: For diesel: AP-42, 5/10, Table 1.3-2 #2 fuel oil combustion
EF= PM10 = filterable PM10 and condensable particulate matter (CPM)
CPM= 1.3 lb/1000gal fuel oil
filterable PM10= 1 lb/1000gal fuel oil
EF= 2.3 lb/1000gal fuel oil

PM2.5 factor: For diesel: PM10 is assumed to be PM2.5, AP-42, 5/10, Table 1.3-2 #2 fuel oil combustion, so use same EF

SO2 factor: Option 1 for diesel: EF based on FARR fuel % sulfur limit and AP-42
EF = 142S AP-42 5/10, Table 1.3-1, boilers<100mmbtu
S = 0.5 % sulfur from FARR 40 CFR 49.130(d)(4)
EF = 71 lb/1000 gal fuel oil
Option 2 for diesel: EF based on FARR 500 ppm stack SO2 limit
EF = (ppm) * (1.66E-7 lb/dscf / ppm) * (dscf/mmbtu) * (21-O2RM20) / (21-O2limit) * 140 mmBTU/1000gal
SO2 limit = 500 ppm @ 7%O2 from FARR 40 CFR 49.129(d)(1)
fuel oil f-factor from RM19 = 9190.0 dscf/mmBtu from 40 CFR 60 App A, Table 19-2 at 0% O2
EF = 160.18 lb/1000gal fuel oil
For diesel: SO2 EF will be based on AP-42 and FARR fuel sulfur limit because it is more strict than FARR stack SO2 limit

VOC factor: For diesel: AP-42, 5/10, Table 1.3-3, industrial boilers, NMTOC

Criteria Air Pollutant Emission Inventory

Emission Unit: **#7 Storage Tanks**

Description: Three tanks are used to store asphalt liquids
Tank 1 - Storage of liquid asphalt
Tank 2 - Storage of liquid asphalt
Tank 3 - Storage of #2 Diesel

Production Limit: 300,000 tons of HMA produced per year

Parameter	Tank 1	Tank 2	Tank 3	Units
Liquid:	Asphalt	Asphalt	#2 Diesel	
Control:	none	none	none	
Capacity:	20,000	15,000	8,000	gallons
Operation:	2,201,143	1,650,857	264,407	EPA-calculated gallons per year throughput
TOC Emissions	72.38	54.29	0.95	lbs/yr TOC - Applicant did not provide data. Values based on EPA-calculated emissions

Limited Potential to Emit, (tons per year)

	Tank 1 - Asphalt		Tank 2 - asphalt		Tank 3 - asphalt		Total
	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY	PTE TPY
CO	0.097	3.5E-03	0.097	2.6E-03	0.097	4.6E-05	6.2E-03
Lead							
NOx							
PM							
PM10							
PM2.5							
SO2							
VOC	1	3.62E-02	1	2.71E-02	1	4.7E-04	6.4E-02

Estimation Explanations

Emission factors (EF) units in table are fraction (%/100) of Total Organic Compound (TOC) emissions from computer program

TOC Emissions: Tanks Computer Program (see AP-42, 7.1 (11/06)), lbs/yr; see application for computer program input details
EPA adjusted Tanks Computer Program output to reflect EPA-calculated annual liquid throughput as reflected in table below:

Parameter	Tank 1	Tank 2	Tank 3	Units
Modeled Operation:	2,313,000	2,313,000	631,971	Applicant did not provide modeled emissions. EPA used modeled emissions calculated for another hot mix asphalt plant (see Columbia Ready Mix, R10NT501700).
Limited PTE Operation:	2,201,143	1,650,857	264,407	gallons per year throughput as calculated by EPA and presented below
Ratio of PTE Operation to Modeled Operation:	0.95	0.71	0.42	
Modeled TOC Emissions:	76.06	76.06	2.26	lbs/yr TOC - based on EPA calculated emissions from another hot mix asphalt plant (see Columbia Ready Mix, Inc, R10NT501700).
Limited PTE TOC	72.38	54.29	0.95	lbs/yr TOC - based on EPA calculated emissions from another hot mix asphalt plant (see Columbia Ready Mix, Inc, R10NT501700).

PTE Annual Asphalt Liquid Throughput:

Asphalt is assumed to be 5.5% wt of final HMA product and 8.57 lb/gal; so, gallons/ton of asphalt = (5.5/100)/(8.57 lb/gal)*(2000 lb/ton) = 12.84 gal/ton
Maximum HMA production = 300,000 tpy HMA; using (12.84 gpt)*(300,000 tpy) = 3,852,000 gal/yr liquid asphalt
Per application, Tanks 1 and 2 are used to process the total liquid asphalt throughput of 3,852,000 gallons/year calculated above.

VOC factor: For tank 1, 2 and 3 EF from AP-42, 3/04, table 11.1-16
CO factor: AP-42, 3/04, Page 11.1-9; multiply factor by TOC emissions

Asphalt Tank Heater #2 Diesel Fuel Usage = 1.8 MMBtu per hour / 0.138 MMBtu per gallon x 8760 hours per year= 114,261 gallons per year
Impacter Diesel Engine - 17.14 gallons per hour x 8,760 hours per year = 150,146 gallons per year
Total #2 Diesel Fuel Usage = 114,261 + 150,146 = 264,407 gallons of #2 Diesel per year

Criteria Air Pollutant Emission Inventory

Emission Unit: **#8 Aggregate Handling**
Description: a. Aggregate transfer from piles to storage bins (drop into bins)
b. Aggregate transfer from storage bins to conveyor belt (drop onto belt)
c. Aggregate transfer from conveyor belt to dryer (drop into dryer)
Control: none
Capacity: 400 tons/hour
Operation: 8760 hours/year
Production Limit: 300,000 tons of hot mix asphalt produced per year

Limited Potential to Emit, (tons per year)

	5 transfers	
	EF	PTE TPY
CO		
Lead		
NOx		
PM	0.0056	2.5
PM10	0.0026	1.2
PM2.5	0.0004	0.2
SO2		
VOC		

Note: Emissions are multiplied by five to account for all five transfers

Estimation Explanations

Emission factor (EF) units are lb/ton of aggregate handled

PM factor: AP-42, 11/06, Section 13.2.4, Equation 1 for each drop operation

Emission factor=k(0.0032)(U/5)^1.3/(M/2)^1.4

	U, mean wind speed:	15	mph, maximum wind speed per AP-42, 11/06, Section 13.2.4, Equation 1
	M, material moisture content:	3	%, conservative estimate based on EPA's Emission Inventory Improvement Program range of 3 - 7%
PM factor:	k, particle size multiplier:	0.74	from AP-42 <30um
PM10 factor:	k, particle size multiplier:	0.35	from AP-42 <10um
PM2.5 factor:	k, particle size multiplier:	0.053	from AP-42 <2.5

Criteria Air Pollutant Emission Inventory

Emission Unit: **#9 Silo Filling**

Description: Loading of hot-mix asphalt mix (HMA mix) into Silo
Control: none
Capacity: 400 tons/hour
Operation: 8760 hours/year
Production Limit: 300,000 tons of hot mix asphalt produced per year

Limited Potential to Emit, (tons per year)

	Silo filling	
	EF	PTE TPY
CO	1.18E-03	0.18
Lead		0
NOx		0
PM	5.86E-04	0.09
PM10	5.86E-04	0.09
PM2.5	5.86E-04	0.09
SO2		0
VOC	1.22E-02	1.83

Estimation Explanations

Emission factor (EF) units are lb/ton of HMA handled
Predictive Emission Equations used to calculate Emission Factors from AP-42 3/04, Table 11.1-14

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

PM,PM10 factor: $PM10\ EF = 0.000332 + 0.00105(-V)e^{((0.0251)(T+460)-20.43)}$

- Conservatively assume that all PM is also PM10.
- Value does include condensable PM

PM2.5 factor: $PM2.5\ EF = 0.000332 + 0.00105(-V)e^{((0.0251)(T+460)-20.43)}$

- Conservatively assume that all PM is also PM2.5.
- Value does include condensable PM

VOC factor: $VOC\ EF = 0.0504(-V)e^{((0.0251)(T+460)-20.43)}$ (100% of TOC measured as propane, per AP42, Table 11.1-16)

V = asphalt volatility = -0.5 AP-42 default value
T = HMA mix temperature = 325 ^{O}F, AP-42 default value

Criteria Air Pollutant Emission Inventory

Emission Unit: **#10 Truck Loading & Fumes**
Description: a Load-out of hot-mix asphalt mix (HMA mix) from silo to asphalt trucks
b Fumes from HMA in loaded asphalt trucks while in plant
Control: none
Capacity: 400 tons hot mix asphalt/hour
Operation: 8760 hours/year
Production Limit: 300,000 tons of hot mix asphalt produced per year

Limited Potential to Emit, (tons per year)

	Silo loadout		Truck fumes		Total
	EF	PTE TPY	EF	PTE TPY	PTE TPY
CO	9.75E-03	1.46	3.52E-04	0.05	1.51
Lead					
NOx					
PM	7.34E-03	1.1			1.10
PM10	7.34E-03	1.1			1.10
PM2.5	7.34E-03	1.1			1.10
SO2					
VOC	3.91E-03	0.59	1.03E-03	0.16	0.75

Estimation Explanations
Emission factor (EF) units are lb/ton of HMA handled

a Silo Loadout

Predictive Emission Equations used to calculate Emission Factors from AP-42 3/04, Table 11.1-14

CO factor: $0.00558(-V)e^{((0.0251)(T+460)-20.43)}$

PM10 factor: $0.000181+0.0041(-V)e^{((0.0251)(T+460)-20.43)}$

- Conservatively assume that all PM is also PM10.
- Value does include condensable PM pursuant

PM2.5 factor: $0.000181+0.0041(-V)e^{((0.0251)(T+460)-20.43)}$

- Conservatively assume that all PM is also PM2.5.
- Value does not include condensable PM pursuant to EPA's May 16, 2008 final rulemaking.

VOC factor: $0.94[0.0172(-V)e^{((0.0251)(T+460)-20.43)}]$ (94% of TOC measured as propane, per AP42, Table 11.1-16)

TOC = $0.0172(-V)e^{((0.0251)(T+460)-20.43)}$ AP42, Table 11.1-16

V = asphalt volatility = -0.5 AP-42 default value

T = HMA mix temperature = 325 ˘F, AP-42 default value

b Truck-load emissions (while in plant for approximately 8 minutes)

Emission factors from AP42, 11.1.2.5

TOC = 0.0011 lb/ton

CO factor: (32% of TOC measured as propane)

VOC factor: (94% of TOC measured as propane per AP42, Table 11.1-16)

Criteria Air Pollutant Emission Inventory

Emission Unit: **#11 Asphalt Truck and Loader Traffic**
Description: Road dust caused by asphalt truck and loader traffic
Control: none
Capacity: 400 tons per hour (plant)
Operation: 8760 hours/year
Production Limit: 300,000 tons of hot mix asphalt produced per year

a. Truck delivery of liquid asphalt cement to HMA plant:

mean weight (empty):	20	tons
mean weight (loaded):	53	tons
W, mean weight (average):	37	tons
tons per trip:	33	tons
percent HMA that is liquid asphalt:	6	%
number of trips per year	544	

paved road round trip distance traveled at plant to unload raw material:	0.25	miles	unpaved road round trip distance traveled at plant to unload raw material:	0.15	miles
vehicle miles traveled paved road:	136	miles	vehicle miles traveled unpaved road:	82	miles

b. HMA truck for loading and delivery of HMA product:

mean weight (empty):	14	tons
mean weight (loaded):	31	tons
W, mean weight (average):	23	tons
tons per trip:	17	tons
number of trips per year	17647	

paved road round trip distance traveled at plant to load and deliver product to customers:	0.25	miles	unpaved road round trip distance plant to load and deliver product to customers:	0.1	miles
vehicle miles traveled paved road:	4412	miles	vehicle miles traveled unpaved road:	1765	miles

Limited Potential to Emit, (tons per year)

	asphalt truck-paved road		asphalt truck-unpaved		HMA truck-paved road		HMA truck-unpaved road		Total
	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY	PTE TPY
CO									
Lead									
NOx									
PM	0.26	0.02	6.00	0.24	0.16	0.34	4.83	4.26	0.73
PM10	0.05	0.00	0.45	0.02	0.03	0.07	0.45	0.40	0.07
PM2.5	0.01	0.00	0.15	0.01	0.01	0.02	0.12	0.11	0.02
SO2									
VOC									

Estimation Explanations
Emission factor (EF) units are lb/miles.

Unpaved Roads.
Predictive Emission Equations used to calculate Emission Factors from AP-42 11/06, Section 13.2.2, Equation 1a
PM factor: E=k*(s/12)^a*(W/3)^b(365-P)/365

	W =		mean vehicle weight (tons) - see source data above
	P =	90	average number of days in a calendar year during which at least 0.01 inches of precipitation is observed, Pocatello, ID, AP-42 11/06, Figure 13.2.2-1
	s =	4.8	surface material silt content (%), estimate based on AP-42 Table 13.2.2-1 for a plant road at a sand and gravel processing facility
For PM:	k =	4.9	empirical constant
	a =	0.7	empirical constant
	b =	0.45	empirical constant
For PM10:	k =	1.50	empirical constant
	a =	0.9	empirical constant
	b =	0.45	empirical constant
For PM2.5:	k =	0.15	empirical constant
	a =	0.9	empirical constant
	b =	0.45	empirical constant

Emission factor (EF) units are lb/miles
Paved Roads
Predictive Emission Equations used to calculate Emission Factors from AP-42 11/06, Section 13.2.1.3, Equation 1
PM factor: E=[k*(sL)^0.91*(W)^1.02)][1-P/(4*365)]

	W =		mean vehicle weight (tons) - see source data above
	P =	90	average number of days in a calendar year during which at least 0.01 inches of precipitation is observed, Pocatello, ID, AP-42 11/06, Figure 13.2.2-1
	sL =	0.6	silt loading (g/m2), based on AP-42 Table 13.2.1-3 ubiquitous baseline value for paved roads experiencing less than 500 trips per day (conservative assumption as value increases with increasing number of daily trips)
For PM:	k =	0.011	lb/VMT, empirical constant, for PM30, Table 13.2.1-1
For PM10:	k =	0.0022	empirical constant, for PM10, Table 13.2.1-1
For PM2.5:	k =	0.00054	empirical constant, for PM2.5, Table 13.2.1-1

Criteria Air Pollutant Emission Inventory

Emission Unit: **#12 Impacter Diesel Engine**
Description: Terex Pegson 4242SR, manufactured in 2006
Control: unknown
Fuel: #2 Diesel
Crushing Capacity: 700 tons of recycled asphalt pavement per hour
Fuel Capacity: 17.14 gallons of #2 Diesel per hour
Fuel Limit: 34,280 gallons/year of #2 Diesel
Fuel Heating Value: 0.138 MMBtu/gallon heating value of #2 Diesel

Limited Potential to Emit, (tons per year)

	Diesel Engine	
Pollutant	EF (lbs/MMBtu)	PTE TPY
CO	0.95	2.2
Lead	9.0E-06	2.1E-05
NOx	4.41	10.4
PM	0.310	0.7
PM10	0.310	0.7
PM2.5	0.310	0.7
SO2	0.518	1.2
VOC	0.35	0.8

Estimation Explanations

Emission factor (EF) units are lbs/MMBtu of fuel fired

CO factor: AP-42 10/96, Table 3.3-1 Diesel fuel (Vendor Performance Data indicates 1.79 lbs of CO per hour)

Lead factor: AP-42 9/98, Table 1.3-10 - this assumes the lead emissions from internal and external combustion will be similar

NOx factor: AP-42 10/96, Table 3.3-1 Diesel fuel (Vendor Performance Data indicates 2.4 pounds of NOx per hour)

PM factor: All PM assumed to be PM10 (Vendor Performance Data indicates 0.09 pounds of PM per hour)

PM10 factor: AP-42 10/96, Table 3.3-1 Diesel fuel, PM10

PM2.5 factor: AP-42 10/96, Table 3.3-1 Diesel fuel, All PM2.5 assumed to be PM10

SO2 factor: Option 1: EF based on FARR fuel % sulfur limit

EF = S / 100 / (heat content) x ($1x10^6$) x (2 lb SO2) / (1 lb S)

fuel oil heat content =	19,300	btu/lb, AP-42 10/96, Table 3.3-1, footnote c
S =	0.5	% sulfur from FARR 40 CFR 49.130(d)(4)
EF =	0.518	lb/mmBTU fuel oil

Option 2: EF based on FARR 500 ppm stack limit

EF = (ppm) * (1.66E-7 lb/dscf / ppm) * (21-O2RM19) / (21-O2limit) * (dscf/mmbtu)

SO2 limit =	500	ppm @ 7%O2 from FARR 40 CFR 49.129(d)(1)
fuel oil f-factor from RM19 =	9190.0	dscf/mmBtu from 40 CFR 60 App A, Table 19-2 at 0% O2
O2 assumed in RM19 =	0	%
FARR limit O2 =	7	%
EF =	1.14	lb/mmBTU fuel oil

SO2 EF will be based on the FARR fuel sulfur limit because it is more strict than FARR stack SO2 limit

VOC factor: AP-42 10/96, Table 3.4-1 Diesel fuel as TOC

Hazardous Air Pollutant Emission Inventory

Emission Unit: **#5 Asphalt Drum Dryer**
Description: Hot Mix Asphalt Plant Drum Dryer - Portable Alis Chalmers Model #4780146850 9 x 36 Parallel Flow
Control: 32x9 Venturi Wet Wash, 18,000 gallon discharge pond
Fuel: Propane or Natural Gas (Genco FP-129 Burner which rated at 129 MMBtu per hour)
Capacity: 400 tph hot mix asphalt
Operation: 8760 hours/year
Production Limit: 300,000 tons of HMA per year

Limited Potential to Emit, (tons per year)

	Natural Gas	
Inorganics	EF	PTE TPY
Antimony Compounds	1.80E-07	2.70E-05
Arsenic Compounds (incl arsine)	5.60E-07	8.40E-05
Beryllium Compounds	0.00E+00	0.00E+00
Cadmium Compounds	4.10E-07	6.15E-05
Chromium Compounds (incl hexavalent)	5.50E-06	8.25E-04
Cobalt Compounds	2.60E-08	3.90E-06
Lead Compounds (not elemental lead)	6.20E-07	9.30E-05
Manganese Compounds	7.70E-06	1.16E-03
Mercury Compounds	2.40E-07	3.60E-05
Nickel Compounds	6.30E-05	9.45E-03
Phophorus Compounds	2.80E-05	4.20E-03
Selenium Compounds	3.50E-07	5.25E-05
Organics		
Acetaldehyde	-	
Acrolein	-	
Benzene	3.90E-04	5.85E-02
Bromomethane (methyl bromide)	-	
1,3-Butadiene	-	
Carbon Disulfide	-	
Chloroethane (ethyl chloride)	-	
Chloromethane (methyl chloride)	-	
Dichlorobenzene	-	
Cumene	-	
Dioxin (2,3,7,8 tetrachlorodibenzo-p-dioxin)	-	
Ethyl Benzene	2.40E-04	3.60E-02
Formaldehyde	3.10E-03	4.65E-01
Furans (all PCDF)	-	
Hexane (includes n-Hexane)	9.20E-04	1.38E-01
Hydrochloric Acid (hydrogen chloride or HCL)	-	
Isooctane (2,2,4-trimethylpentane)	4.00E-05	6.00E-03
Methyl Chloride (chloromethane)	-	
Methyl Chloroform (1,1,1-trichloroethane)	4.80E-05	7.20E-03
Methyl tert-Butyl Ether (MTBE)	-	
Naphthalene (also a POM)	9.00E-05	1.35E-02
Phenol	-	
Polycyclic Organic Matter* (incl naphthalene)	1.87E-04	2.81E-02
Propionaldehyde	-	
Quinone	-	
Styrene	-	
Tetrachloroethane	-	
Toluene	1.50E-04	2.25E-02
Xylenes (inlc isomers and mixtures)	2.00E-04	3.00E-02
HAP Total		8.07E-01

	Natural Gas	
***Polycyclic Organic Matter**	EF	PTE TPY
Acenaphthene	1.40E-06	2.10E-04
Acenaphthylene	8.60E-06	1.29E-03
Anthracene	2.20E-07	3.30E-05
Benzo(a)anthracene	2.10E-07	3.15E-05
Benzo(b)fluoranthene	1.00E-07	1.50E-05
Benzo(k)fluoranthene	4.10E-08	6.15E-06
Benzo(g,h,i)perylene	4.00E-08	6.00E-06
Benzo(a)pyrene	9.80E-09	1.47E-06
Benzo(e)pyrene	1.10E-07	1.65E-05
Chrysene	1.80E-07	2.70E-05
Dioxins (Total PCDD; incl 2,3,7,8 TCDD)	-	
Fluoranthene	6.10E-07	1.07E-03
Fluorene	3.80E-06	6.66E-03
Furans (all PCDF)	-	
Indeno(1,2,3-cd)pyrene	7.00E-09	1.05E-06
2-Methylnaphthalene	7.40E-05	1.11E-02
Naphthalene (also individual HAP)	9.00E-05	1.35E-02
Perylene	8.80E-09	1.32E-06
Phenanthrene	7.60E-06	1.14E-03
Pyrene	5.40E-07	8.10E-05
POM Subtotal	1.87E-04	3.52E-02

Estimation Explanations

Emission factor (EF) units are lb/ton HMA with fabric filter as a control. Mickelsen uses a wet scrubber which may be less effective controlling HAP emissions.
Propane emission factors are not provided in AP-42 for drum dryers
To avoid double-counting, "HAP Total" does not count naphthalene, dioxin (HAP) or furans separately because they are accounted for in "POM Subtotal"
Chromium EF: Chromium EF is assumed to include separately reported hexavalent chromium EF in AP-42
All other inorganics EF: AP-42, 3/04, Table 11.1-12 for natural gas or propane-fired dryer with fabric filter
Naphthalene EF: AP-42, 3/04, Table 11.1-10 for natural gas with fabric filter (is a HAP & POM)
POM EF: AP-42, 3/04, Table 11.1-10 for natural gas with fabric filter (includes naphthalene, dioxin & furans)
All other organics EF: AP-42, 3/04, Table 11.1-10 for natural gas with fabric filter

Hazardous Air Pollutant Emission Inventory

Emission Unit: **#6 Asphalt Tank Heater**
Description: Asphalt heater
Control: none
Fuel: #2 Diesel
Capacity: 1.800 MMBtu/hr (provided by applicant)
Operation: 8760 hours/year
Fuel Throughput: 1,419 MMBtu/year based on #2 Diesel and 300,000 tons of HMA per year or 9% or PTE production

Limited Potential to Emit, (tons per year)

Inorganics	#2 Diesel	
	EF	PTE TPY
Antimony Compounds	-	
Arsenic Compounds (incl arsine)	4.00E-06	2.03E-08
Beryllium Compounds	3.00E-06	1.52E-08
Cadmium Compounds	3.00E-06	1.52E-08
Chromium Compounds (incl hexavalent)	3.00E-06	1.52E-08
Cobalt Compounds	-	
Lead Compounds (not elemental lead)	9.00E-06	4.56E-08
Manganese Compounds	6.00E-06	3.04E-08
Mercury Compounds	3.00E-06	1.52E-08
Nickel Compounds	3.00E-06	1.52E-08
Phophorus Compounds	-	
Selenium Compounds	1.50E-05	1.18E-04
Organics		
Acetaldehyde	-	
Acrolein	-	
Benzene	2.14E-04	1.08E-06
Bromomethane (methyl bromide)	-	
1,3-Butadiene	-	
Carbon Disulfide	-	
Chloroethane (ethyl chloride)	-	
Chloromethane (methyl chloride)	-	
Cumene	-	
Dichlorobenzene	-	
Dioxin (2,3,7,8 tetrachlorodibenzo-p-dioxin)	-	
Ethyl Benzene	6.36E-05	3.22E-07
Formaldehyde	6.10E-02	3.09E-04
Furans (all PCDF)	-	
Hexane (incl n-Hexane)	-	
Hydrochloric Acid (hydrogen chloride)	-	
Isooctane (2,2,4-trimethylpentane)	-	
Methyl Chloride (chloromethane)	-	
Methyl Chloroform (1,1,1-trichloroethane)	2.36E-04	1.20E-06
Methyl tert-Butyl Ether (MTBE)	-	
Naphthalene (also a POM)	1.13E-03	5.73E-06
Phenol	-	
Polycyclic Organic Matter* (incl naphthalene)	3.30E-03	1.67E-05
Propionaldehyde	-	
Quinone	-	
Styrene	-	
Tetrachloroethane	-	
Toluene	6.20E-03	3.14E-05
Xylene (incl isomers and mixtures)	1.09E-04	5.52E-07
HAP Total		4.79E-04

*Polycyclic Organic Matter	#2 Diesel	
	EF	PTE TPY
Acenaphthene	2.11E-05	1.07E-07
Acenaphthylene	2.53E-07	1.28E-09
Anthracene	1.22E-06	6.18E-09
Benzo(a)anthracene	4.01E-06	2.03E-08
Benzo(b)fluoranthene	1.48E-06	7.50E-09
Benzo(k)fluoranthene	1.48E-06	7.50E-09
Benzo(g,h,i)perylene	2.26E-06	1.15E-08
Benzo(a)pyrene	-	
Benzo(e)pyrene	-	
Chrysene	2.38E-06	1.21E-08
Dibenzo(a,h)anthracene	1.67E-06	8.46E-09
7,12-Dimethylbenz(a)anthracene	-	
Dioxins (Total PCDD; incl 2,3,7,8 TCDD)	-	
Fluoranthene	4.84E-06	2.45E-08
Fluorene	4.46E-06	2.26E-08
Furans (all PCDF)	-	
Indeno(1,2,3-cd)pyrene	2.14E-06	1.08E-08
3-Methylcloranthrene	-	
2-Methylnaphthalene	-	
Naphthalene (also individual HAP)	1.13E-03	5.73E-06
Perylene	-	
Phenanthrene	1.05E-05	5.32E-08
Pyrene	4.25E-06	2.15E-08
POM Subtotal	1.19E-03	6.04E-06

Estimation Explanations

Emission factor (EF) units are lb/1000 gallon oil and lb/mmscf natural gas
Worst-case PTE is the higher emitting of the fuel options
Liquid fuel conversion factor = 140 mmBTU/1000 gal from AP42, App A

Inorganics EF: For diesel: AP-42 5/10, Table 1.3-10 for diesel, distillate oil, lb/mmbtu

Organics and POM:	For diesel: AP-42 5/10, Table 1.3-8 and 1.3-9 for diesel, distillate oil, lb/mgal
	Higher POM value from Table 1.3-8 used instead of sum of POM values in Table 1.3-9
Formaldehyde	For diesel: AP-42 5/10, Table 1.3-8 for diesel, distillate oil, lb/mgal

Hazardous Air Pollutant Emission Inventory

Emission Unit: **#7 Asphalt Storage Tanks**
Description: Three tanks are used to store asphalt liquids
Tank 1 - Storage of liquid asphalt
Tank 2 - Storage of liquid asphalt
Tank 3 - Storage of #2 Diesel
Production Limit: 300,000 tons of HMA produced per year

Parameter	Tank 1	Tank 2	Tank 3	Units
Liquid:	Asphalt	Asphalt	#2 Diesel	
Control:	none	none	none	
Capacity:	20,000	15,000	8,000	gallons
Operation:	2,201,143	1,650,857	264,407	EPA-calculated gallons per year throughput
TOC Emissions	72.38	54.29	0.95	lbs/yr TOC - Applicant did not provide data. Values based on EPA-calculated emissions

Limited Potential to Emit, (tons per year)

	(Tank 1) Asphalt		(Tank 2) asphalt		(Tank 3) #2 Diesel		Total
Organics	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY	PTE TPY
Acetaldehyde							
Acrolein							
Benzene	0.032	1.16E-03	0.032	8.69E-04	0.032	1.51E-05	2.04E-03
Bromomethane (methyl bromide)	0.0049	1.77E-04	0.0049	1.33E-04	0.0049	2.32E-06	3.13E-04
1,3-Butadiene							
Carbon Disulfide	0.016	5.79E-04	0.016	4.34E-04	0.016	7.56E-06	1.02E-03
Chloroethane (ethyl chloride)	0.004	1.45E-04	0.004	1.09E-04	0.004	1.89E-06	2.55E-04
Chloromethane (methyl chloride)	0.023	8.32E-04	0.023	6.24E-04	0.023	1.09E-05	1.47E-03
Cumene							
Dichlorobenzene							
Dioxin (2,3,7,8 tetrachlorodibenzo-p-dioxin)							
Ethyl Benzene	0.038	1.38E-03	0.038	1.03E-03	0.038	1.80E-05	2.42E-03
Formaldehyde	0.69	2.50E-02	0.69	1.87E-02	0.69	3.26E-04	4.40E-02
Furans (all PCDF)							
Hexane (incl n-Hexane)	0.1	3.62E-03	0.1	2.71E-03	0.1	4.73E-05	6.38E-03
Hydrochloric Acid (hydrogen chloride)							
Isooctane (2,2,4-trimethylpentane)	0.00031	1.12E-05	0.00031	8.41E-06	0.00031	1.47E-07	1.98E-05
Methyl Chloride (chloromethane)	0.00027	9.77E-06	0.00027	7.33E-06	0.00027	1.28E-07	1.72E-05
Methyl Chloroform (1,1,1-trichloroethane)							
Methyl tert-Butyl Ether (MTBE)							
Naphthalene* (also a POM)							
Phenol							
Polycyclic Organic Matter* (incl naphthalene)							
Propionaldehyde							
Quinone							
Styrene	0.0054	1.95E-04	0.0054	1.47E-04	0.0054	2.55E-06	3.45E-04
Tetrachloroethane							
Toluene	0.062	2.24E-03	0.062	1.68E-03	0.062	2.93E-05	3.96E-03
Xylene (incl isomers and mixtures)	0.257	9.30E-03	0.257	6.98E-03	0.257	1.22E-04	1.64E-02
HAP Total		4.46E-02		3.35E-02		5.83E-04	7.87E-02

Estimation Explanations
Emission factor (EF) units are % of organic PM for POM and phenol and fraction (%/100) of TOC for all other organics
TOC Emissions: Tanks Computer Program (see AP-42, 7.1 (11/06)), lbs/yr; see Columbia Ready Mix Inc., application for computer program input deta
EPA adjusted Tanks Computer Program output to reflect EPA-calculated annual liquid throughput as reflected in table below:

Parameter	Tank 1	Tank 2	Tank 3	Units
Modeled Operation:	2,313,000	2,313,000	631,971	Applicant did not provide modeled emissions. EPA used modeled emissions calculated for another hot mix asphalt plant (see Columbia Ready Mix, R10NT501700).
Limited PTE Operation:	2,201,143	1,650,857	264,407	gallons per year throughput as calculated by EPA and presented below
Ratio of PTE Operation to Modeled Operation:	0.95	0.71	0.42	
Modeled TOC Emissions:	76.06	76.06	2.26	lbs/yr TOC - based on EPA calculated emissions from another hot mix asphalt plant (see Columbia Ready Mix, Inc, R10NT501700).
Limited PTE TOC Emissions:	72.38	54.29	0.95	lbs/yr TOC - based on EPA calculated emissions from another hot mix asphalt plant (see Columbia Ready Mix, Inc, R10NT501700).

PTE Annual Asphalt Throughput:
Asphalt is assumed to be 5.5% wt of final HMA product and 8.57 lb/gal; so, gallons/ton of asphalt = (5.5/100)/(8.57 lb/gal)*(2000 lb/ton) = 12.84 gal/ton
Maximum HMA production = 300,000 tpy HMA; using (12.84 gpt)*(300,000 tpy) = 3,852,000 gal/yr liquid asphalt
Per application, Tanks 1 and 2 are used to process the total liquid asphalt throughput of 3,852,000 gallons/year calculated above.
To avoid double-counting, "HAP Total" does not count naphthalene separately because naphthalene is accounted for in "POM Subtotal"
Xylenes EF: m-, o- and p- isomers are individually listed as HAPs but for applicability purposes, are grouped as Xylenes
All other organics EF: AP-42, 3/04, Table 11.1-16 - (TOC) organic volatile-based speciation percentages
TOC = VOC/100% (AP-42, 3/04, Table 11.1-16)

Maximum Diesel Usage:
Asphalt Tank Heater #2 Diesel Fuel Usage = 1.8 MMBtu per hour / 0.138 MMBtu per gallon x 8760 hours per year= 114,261 gallons per year
Impacter Diesel Engine - 17.14 gallons per hour x 8,760 hours per year = 150,146 gallons per year
Total #2 Diesel Fuel Usage = 114,261 + 150,146 = 264,407 gallons of #2 Diesel per year

Hazardous Air Pollutant Emission Inventory

Emission Unit: **#9 Asphalt Silo Filling**
Description: Loading of hot-mix asphalt mix (HMA mix) into silo
Control: none
Capacity: 400 tph hot mix asphalt (from applicant)
Operation: 8,760 hours/yr
Production Limit: 300,000 tons of HMA per year

Limited Potential to Emit, (tons per year)

Organics	EF	PTE TPY
Acetaldehyde		
Acrolein		
Benzene	0.032	5.85E-04
Bromomethane (methyl bromide)	0.0049	8.96E-05
1,3-Butadiene		
Carbon Disulfide	0.016	2.92E-04
Chloroethane (ethyl chloride)	0.004	7.31E-05
Chloromethane (methyl chloride)	0.023	4.20E-04
Cumene		
Dichlorobenzene		
Dioxin (2,3,7,8 tetrachlorodibenzo-p-dioxin)		
Ethyl Benzene	0.038	6.95E-04
Formaldehyde	0.69	1.26E-02
Furans (all PCDF)		
Hexane (incl n-Hexane)	0.1	1.83E-03
Hydrochloric Acid (hydrogen chloride)		
Isooctane (2,2,4-trimethylpentane)	0.00031	5.67E-06
Methyl Chloride (chloromethane)	0.00027	4.94E-06
Methyl Chloroform (1,1,1-trichloroethane)		
Methyl tert-Butyl Ether (MTBE)		
Naphthalene[1] (also a POM)	1.82	6.93E-04
Phenol	1.18	4.49E-04
Polycyclic Organic Matter* (incl naphthalene)	11.41	4.35E-03
Propionaldehyde		
Quinone		
Styrene	0.0054	9.87E-05
Tetrachloroethane		
Toluene	0.062	1.13E-03
Xylene (incl isomers and mixtures)	0.257	4.70E-03
HAP Total		2.73E-02

***Polycyclic Organic Matter**	EF	PTE TPY
Acenaphthene	0.47	1.79E-04
Acenaphthylene	0.014	5.33E-06
Anthracene	0.13	4.95E-05
Benzo(a)athracene	0.056	2.13E-05
Benzo(e)pyrene	0.0095	3.62E-06
Chrysene	0.21	8.00E-05
Fluoranthene	0.15	5.71E-05
Fluorene	1.01	3.85E-04
2-Methylnaphthalene	5.27	2.01E-03
Naphthalene (also individual HAP)	1.82	6.93E-04
Perylene	0.03	1.14E-05
Phenanthrene	1.8	6.86E-04
Pyrene	0.44	1.68E-04
POM Subtotal	11.41	4.35E-03

Estimation Explanations

Emission factor (EF) units are % of organic PM for POM and phenol and % of TOC for all other organics
To avoid double-counting, "HAP Total" does not count naphthalene separately because naphthalene is accounted for in "POM Subtotal"
Predictive emission factors from AP-42 Tbl 11.1-14 for silo filling

Xylenes EF: m-, o- and p- isomers are individually listed as HAPs but for applicability purposes, are grouped as Xylenes
POM, naphthalene and phenol EF: AP-42, 3/04, Table 11.1-15 - organic particulate-based speciation percentages (%/100 x PM)
All other organics EF: AP-42, 3/04, Table 11.1-16 - (TOC) organic volatile-based speciation percentages (%/100 x TOC)

TOC EF: $0.0504(-V)e^{((0.0251)(T+460)-20.43)}$ lb/ton HMA loaded into silo
Organic PM EF: $0.00105(-V)e^{((0.0251)(T+460)-20.43)}$ lb/ton HMA loaded into silo

V = asphalt volatility = -0.5 AP-42 default value
T = HMA mix temperature = 325 ^{O}F, AP-42 default value
TOC EF = 1.22E-02 lb/ton
TOC emissions = 1.83E+00 tons/year (TOC EF x annual capacity)
Organic PM EF = 2.54E-04 lb/ton
Organic PM emissions = 3.81E-02 tons/year (Organic PM EF x annual capacity)

Hazardous Air Pollutant Emission Inventory

Emission Unit: **#10 Asphalt Truck Loading & Fumes**
Description: a Load-out of hot-mix asphalt mix (HMA mix) from silo to asphalt trucks
b Fumes from loaded asphalt trucks while in plant
Control: none
Capacity: 400 tph hot mix asphalt (from applicant)
Operation: 8,760 hours/yr
Production Limit: 300,000 tons of HMA per year

Limited Potential to Emit, (tons per year)

	Truck loading		Truck-load fumes		Total
Organics	EF	PTE TPY	EF	PTE TPY	PTE TPY
Acetaldehyde					
Acrolein					
Benzene	0.052	3.79E-03	0.052	8.58E-05	0.004
Bromomethane (methyl bromide)	0.0096	7.00E-04	0.0096	1.58E-05	0.001
1,3-Butadiene					
Carbon Disulfide	0.013	9.47E-04	0.013	2.15E-05	0.001
Chloroethane (ethyl chloride)	0.00021	1.53E-05	0.00021	3.47E-07	0.000
Chloromethane (methyl chloride)	0.015	1.09E-03	0.015	2.48E-05	0.001
Dichlorobenzene					
Cumene	0.11	8.02E-03	0.11	1.82E-04	0.008
Dioxin (2,3,7,8 tetrachlorodibenzo-p-dioxin)					
Ethyl Benzene	0.28	2.04E-02	0.28	4.62E-04	0.021
Formaldehyde	0.088	6.41E-03	0.088	1.45E-04	0.007
Furans (all PCDF)					
Hexane (incl n-Hexane)	0.15	1.09E-02	0.15	2.48E-04	0.011
Hydrochloric Acid (hydrogen chloride)					
Isooctane (2,2,4-trimethylpentane)	0.0018	1.31E-04	0.0018	2.97E-06	0.000
Methyl Chloride (chloromethane)					
Methyl Chloroform (1,1,1-trichloroethane)					
Methyl tert-Butyl Ether (MTBE)					
Naphthalene[1] (also a POM)	1.25	6.39E-04	1.25	2.06E-03	0.003
Phenol	1.18	6.03E-04	1.18	1.95E-03	0.003
Polycyclic Organic Matter* (incl naphthalene)	5.93	3.04E-03	1.25	2.06E-03	0.005
Propionaldehyde					
Quinone					
Styrene	0.00732	5.33E-04	0.00732	1.21E-05	0.001
Tetrachloroethane	0.0077	5.61E-04	0.0077	1.27E-05	0.001
Toluene	0.21	1.53E-02	0.21	3.47E-04	0.016
Xylene (incl isomers and mixtures)	0.49	3.57E-02	0.49	8.09E-04	0.037
HAP Total		1.08E-01		6.38E-03	1.15E-01

***Polycyclic Organic Matter**	EF	PTE TPY	EF	PTE TPY
Acenaphthene	0.26	1.33E-04		
Acenaphthylene	0.028	1.43E-05		
Anthracene	0.07	3.58E-05		
Benzo(a)athracene	0.019	9.72E-06		
Benzo(b)fluoranthene	0.0076	3.89E-06		
Benzo(k)fluoranthene	0.0022	1.13E-06		
Benzo(g,h,l)perylene	0.0019	9.72E-07		
Benzo(a)pyrene	0.0023	1.18E-06		
Benzo(e)pyrene	0.0078	3.99E-06		
Chrysene	0.103	5.27E-05		
Dibenzo(a,h)anthracene	0.00037	1.89E-07		
Fluoranthene	0.05	2.56E-05		
Fluorene	0.77	3.94E-04		
Indeno(1,2,3-cd)pyrene	0.00047	2.40E-07		
2-Methylnaphthalene	2.38	1.22E-03		
Naphthalene (also individual HAP)	1.25	6.39E-04	1.25	2.06E-03
Perylene	0.022	1.13E-05		
Phenanthrene	0.81	4.14E-04		
Pyrene	0.15	7.67E-05		
POM Subtotal	5.93	3.04E-03	1.25	2.06E-03

Estimation Explanations

Emission factor (EF) units are % of organic PM for POM and phenol and % of TOC for all other organics

To avoid double-counting, "HAP Total" does not count naphthalene separately because naphthalene is accounted for in "POM Subtotal"

POM, naphthalene and phenol EF: AP-42, 3/04, Table 11.1-15 - organic particulate-based speciation percentages

All other organics EF: AP-42, 3/04, Table 11.1-16 - (TOC) organic volatile-based speciation percentages

Xylenes EF: m-, o- and p- isomers are individually listed as HAPs but for applicability purposes, are grouped as Xylenes

a. Truck loading predictive emission factors from AP-42 Tbl 11.1-14

TOC EF: $0.0172(-V)e^{((0.0251)(T+460)-20.43)}$ lb/ton HMA loaded out

Organic PM EF: $0.00141(-V)e^{((0.0251)(T+460)-20.43)}$ lb/ton HMA loaded out

V = asphalt volatility = -0.5 AP-42 default value

T = HMA mix temperature = 325 ^{O}F, AP-42 default value

TOC EF = 4.16E-03 lb/ton

TOC emissions =	7.29E+00	tons/year (TOC EF x annual capacity)
Organic PM EF =	3.41E-04	lb/ton
Organic PM emissions =	5.11E-02	tons/year (Organic PM EF x annual capacity)

b. Truck-load emission factors from AP42, 11.1.2.5

TOC EF:	1.10E-03	lb/ton HMA hauled by trucks
TOC emissions =	0.17	tons/year (TCO EF x annual capacity)

Hazardous Air Pollutant Emission Inventory

Emission Unit: **#12 Impacter Diesel Generator**
Description: Terex Pegson 4242SR
Control: EPA Tier 3 2005 Certification (provided by applicant)
Fuel: #2 Diesel
Fuel Capacity: 17.140 gallons per hour
Operation: 8760 hours/year
Heating Value Throughputt: 4,731 MMBtu per year based 0.138 MMBtu per gallon of diesel

Limited Potential to Emit, (tons per year)

Inorganics	EF	PTE TPY
Antimony Compounds		
Arsenic Compounds (incl arsine)	4.00E-06	9.46E-06
Beryllium Compounds	3.00E-06	7.10E-06
Cadmium Compounds	3.00E-06	7.10E-06
Chromium Compounds (incl hexavalent)	3.00E-06	7.10E-06
Cobalt Compounds		
Lead Compounds (not elemental lead)	9.00E-06	2.13E-05
Manganese Compounds	6.00E-06	1.42E-05
Mercury Compounds	3.00E-06	7.10E-06
Nickel Compounds	3.00E-06	7.10E-06
Phophorus Compounds		
Selenium Compounds	1.50E-05	3.55E-05
Organics		
Acetaldehyde	7.67E-04	1.81E-03
Acrolein	9.25E-05	2.19E-04
Benzene	9.33E-04	2.21E-03
Bromomethane (methyl bromide)		
1,3-Butadiene	3.91E-05	9.25E-05
Carbon Disulfide		
Chloroethane (ethyl chloride)		
Chloromethane (methyl chloride)		
Dichlorobenzene		
Cumene		
Dioxin (2,3,7,8 tetrachlorodibenzo-p-dioxin)		
Ethyl Benzene		
Formaldehyde	1.18E-03	2.79E-03
Furans (all PCDF)		
Hexane (incl n-Hexane)		
Hydrochloric Acid (hydrogen chloride)		
Isooctane (2,2,4-trimethylpentane)		
Methyl Chloride (chloromethane)		
Methyl Chloroform (1,1,1-trichloroethane)		
Methyl tert-Butyl Ether (MTBE)		
Naphthalene* (also a POM)	8.48E-05	2.01E-04
Phenol		
Polycyclic Organic Matter* (incl naphthalene)	1.68E-04	3.98E-04
Propionaldehyde		
Quinone		
Styrene		
Tetrachloroethane		
Toluene	4.09E-04	9.67E-04
Xylene (incl isomers and mixtures)	2.85E-04	6.74E-04
HAP Total		9.28E-03

***Polycyclic Organic Matter**	EF	PTE TPY
Acenaphthylene	5.06E-06	1.20E-05
Acenaphthene	1.42E-06	3.36E-06
Anthracene	1.87E-06	4.42E-06
Benzo(a)athracene	1.68E-06	3.97E-06
Benzo(b)fluoranthene	9.91E-08	2.34E-07
Benzo(k)fluoranthene	1.55E-07	3.67E-07
Benzo(g,h,I)perylene	4.89E-07	1.16E-06
Benzo(a)pyrene	1.88E-07	4.45E-07
Chrysene	3.53E-07	8.35E-07
Dibenz(a,h)anthracene	5.83E-07	1.38E-06
Fluoranthene	7.61E-06	1.80E-05
Fluorene	2.92E-05	6.91E-05
Indeno(1,2,3-cd)pyrene	3.75E-07	8.87E-07
Napthalene (also individual HAP)	8.48E-05	2.01E-04
Phenanthrene	2.94E-05	6.95E-05
Pyrene	4.78E-06	1.13E-05
POM Subtotal	1.68E-04	3.98E-04

Estimation Explanations
Emission factor (EF) units are lb/mmbtu

To avoid double-counting, "HAP Total" does not count naphthalene separately because naphthalene is accounted for in "POM Subtotal"
Inorganic EF: AP-42 9/98, Table 1.3-10 - this assumes that metal emissions from internal and external combustion are similar
Organics EF: AP42, 10/96, Tbl 3.3-2 EF for Organic Compounds from Uncontrolled Diesel Engines