



**Environmental Health Department  
Air Quality Program  
Interoffice Memorandum**

**Tim M. Keller, Mayor**

<b>To:</b>	Permit File
<b>From:</b>	Carina G. Munoz-Dyer
<b>Subject:</b>	<b>***DRAFT*** Permit Application #3448</b>
<b>Date:</b>	Start: March 7, 2022 End: March 31, 2022
<b>Permit Description:</b>	New Permit for a Hot Mix Asphalt Plant with a maximum production of 300 tph and 700,000 tpy

<b>Facility Name:</b>	<b>Star Paving South Broadway HMA</b>	<b>UTM Coordinates, East:</b>	347775
<b>Facility Address:</b>	West of South Broadway Boulevard, Tracts B, C and D Plat of Unit I Lands of B G and W Partnership in Albuquerque, New Mexico	<b>North:</b>	3869750  Zone 13 NAD 83
<b>Facility ID:</b>	FA0008841	<b>Record ID:</b>	PR0011215

**Proposal**

The applicant is requesting a new construction permit to install a 300-ton-per-hour (tph) hot mix asphalt (HMA) plant with a maximum annual production of 700,000 tons per year. The normal hours of operation of the HMA plant will be between 7:00 A.M. and 5:00 P.M. during December and January, five days per week, 45 weeks per year. However, the maximum operating schedule could be 24 hours per day and 7 days a week during the months of February through November, and only daylight hours during the months of December and January. The HMA plant will consist of the following:

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1) Four cold aggregate storage piles;</li> <li>2) One Recycled Asphalt Pavement (RAP) storage pile;</li> <li>3) Four cold aggregate feed bins;</li> <li>4) One cold aggregate scalping screen</li> <li>5) One RAP feed bin;</li> <li>6) One RAP scalping screen;</li> <li>7) One drum dryer/ mixer;</li> </ol> | <ol style="list-style-type: none"> <li>8) One drum dryer/ mixer baghouse;</li> <li>9) Two asphalt storage silos;</li> <li>10) Two asphalt cement storage tanks;</li> <li>11) One asphalt cement oil heater;</li> <li>12) One burner fuel tank;</li> <li>13) One Evotherm® tank; and</li> <li>14) Seven conveyors</li> </ol> |
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## Permitting History

Permit Number	Issuance Date	Permit Type	Brief Description
3448	Not Applicable	New	New Permit for a 300-tph hot mix asphalt plant

## Regulatory Applicability

The following regulations apply to this facility.

### New Mexico Administrative Code (NMAC) Regulations

Citation	Regulation
<b>20.11.2</b>	<b>Permit Fees</b>
<b>20.11.2.18.C</b>	<b>Ton-per-year application review fees for stationary sources that require permits pursuant to 20.11.41 NMAC or other board regulation, and whose applicability is based on the source's pound per hour or ton per year emissions:</b>
(3)	proposed sources with a proposed allowable emission rate equal to or greater than 25 tons per year and less than 50 tons per year: \$3,554.00
*	<i>The fees above have been adjusted for the Consumer Price Index on January 1, 2021.</i>
<b>20.11.2.18.D</b>	<b>Federal program review fees due in addition to the stationary source permit application review fees:</b>
	A person with a stationary source that is required by 20.11.41 to apply for a permit and pay a review fee pursuant to Subsection B or Subsection C of 20.11.2.18 NMAC shall also pay the federal program review fee for each applicable federal program standard or review listed in Paragraphs (1) through (5) of Subsection D of 20.11.2.18 NMAC:
(1)	for review of each 40 CFR 60 standard: \$1,185.00
<b>20.11.2.21</b>	<b>Annual Emissions Fees and Rate for Stationary Sources</b>
<b>B.</b>	Permitted source: Sources issued a permit pursuant to 20.11.41 NMAC, 20.11.42 NMAC, 20.11.60 NMAC, 20.11.61 NMAC or other board regulation, shall pay a minimum annual emission fee of \$376.00 or \$54.00 per ton, whichever is greater. The annual emission fee shall be calculated as required by Subsection C of 20.11.2.13 NMAC
<b>F.</b>	Beginning January 1, 2011, and every January 1 thereafter, an increase based on the consumer price index shall be added to the annual emission fee and rates required by 20.11.2.21 NMAC. The annual emission fees and rates pursuant to 20.11.2.21 NMAC shall be adjusted by an amount equal to the increase in the consumer price index for the immediately preceding year.
	<i>The Annual Emission Fees were adjusted for the Consumer Price Index on January 1, 2022.</i>

Air contaminant	NOx* TPY	CO* TPY	VOC* TPY	SO2* TPY	PM10* TPY	H2S* TPY	HAP* TPY
<b>Totals</b>	<b>20</b>	<b>47</b>	<b>18</b>	<b>21</b>	<b>11</b>	<b>0</b>	<b>4</b>
<b>Total = 121 tpy</b>							
<i>*Note: The total emissions on this table are for billable use only. These are NOT the allowable annual emissions for the facility.</i>							

Citation	Regulation
<b>20.11.5</b>	<b>Visible Air Contaminants</b>
<b>20.11.5.12</b>	<b>General Stationary Sources</b>
	No person owning or operating any stationary source, not otherwise addressed in this Part, shall cause or allow visible air contaminant emissions that exceed an opacity of 20 percent, 6-minute time-averaged.
<b>20.11.8</b>	<b>Ambient Air Quality Standards</b>
<b>20.11.8.6</b>	To adopt local ambient air quality standards that are identical to the federal National Primary and Secondary Ambient Air Quality Standards codified at 40 CFR Part 50, and to adopt applicable state Ambient Air Quality Standards codified at 20.2.3 NMAC
<b>20.11.40</b>	<b>Source Registration</b>
<b>20.11.40.2</b>	This Part is applicable to any stationary source located in Bernalillo County.
<b>20.11.40.6</b>	By January 1, 1974, any person owning or operating any commercial or industrial stationary source, which emits more than two thousand pounds of any air contaminant per year or any amount of a hazardous air pollutant, must obtain a Registration Certificate for the source from the Director. Any person owning or operating any commercial or industrial stationary source constructed after September 1, 1973, and meeting the emission requirements of this section, must obtain a Registration Certificate for the source from the Director within one hundred and eighty days after the initial startup date of the source.
<b>20.11.41</b>	<b>Construction Permits</b>
<b>20.11.41.2.B</b>	<b>Emission thresholds that require a construction permit before commencing construction, modification or operation of a stationary source subject to 20.11.41 NMAC:</b>
	(1) If a person proposes to construct or operate a new stationary source that will emit one or more regulated air contaminants for which a federal, state or board ambient air quality standard exists and if the source will emit, when calculated at the contaminant's potential emission rate, 10 pounds per hour or more or 25 tons per year or more of any single regulated air contaminant, then the person shall apply for and obtain a construction permit as required by 20.11.41 NMAC before the person commences construction or operation of the source
<b>20.11.49.13.A</b>	<b>Applicable to any source:</b>
	(1) whose operation results in an emission of a regulated air pollutant, including a fugitive emission, in excess of the quantity, rate, opacity or concentration specified by an air quality regulation or permit condition; or

Citation	Regulation
(2)	subject to the requirements of 20.11.47 NMAC, Emissions Inventory Requirements, 20.11.41 NMAC, Construction Permits, 20.11.42 NMAC, Operating Permits, 20.11.61 NMAC, Prevention of Significant Deterioration, or 20.11.60 NMAC, Permitting In Nonattainment Areas.
<b>20.11.63</b>	<b>New Source Performance Standards</b>
<b>20.11.63.11</b>	<b>Incorporation of federal standards</b>
	Federal Standard at 40 CFR Part 60, Subpart I for Hot Mix Asphalt Plants. The unit was constructed after June 11, 1973.
<b>20.11.90</b>	<b>Source Surveillance; Administration, Enforcement, Inspection</b>
<b>20.11.90.2</b>	<b>Scope</b>
<b>A.</b>	<b>20.11.90 is applicable to any source within the Bernalillo County.</b>
<b>20.11.90.13</b>	<b>Source Surveillance</b>
<b>A.</b>	The owner or operator of any stationary source of an air contaminant shall, upon notification by the director, maintain records of the nature and amounts of emissions, to which an air quality control emission regulation applies, from the source and any other information as may be deemed necessary by the director to determine whether the source is in compliance with applicable regulations.
<b>E.</b>	The director shall establish a periodic visual surveillance system to detect and investigate apparent violations of visible emission limitations and such complaints relating to apparent violations of the regulations as may occur.
<b>20.11.90.14</b>	<b>Administration and Enforcement</b>
<b>A.</b>	Upon request of the director, the person responsible for the emission of air contaminants for which limits are established by the rules codified under Title 20, Environmental Protection, Chapter 11, Albuquerque - Bernalillo County Air Quality Control Board, of the New Mexico Administrative Code, shall provide such facilities, utilities, and openings exclusive of instrument and sensing devices, as may be necessary for the proper determination of the nature, extent, quantity and degree of such air contaminants. Such facilities may be either temporary or permanent at the discretion of the person responsible for their provisions; and shall be suitable for determination consistent with emission limits established in these rules.

## Federal Applicability

Citation	Regulation	Does it apply to the Facility and/ or Equipment? Y/N (List units)
<b>40 CFR 60</b>	<b>Standards of Performance for New Stationary Sources</b>	Yes. Units #13 - #17
<i>Subpart A</i>	<i>General Provisions</i>	
<b>§60.1</b>	<b>Applicability</b>	
(a)	Except as provided in subparts B and C, the provisions of this part apply to the owner or operator of any stationary source which contains an affected facility, the construction or modification of which is commenced after the date of publication in this part of any standard (or, if earlier, the date of publication of any proposed standard) applicable to that facility	
<b>§60.8</b>	<b>Performance tests</b>	
(a)	... within 60 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup of such facility, or at such other times specified by this part, and at such other times as may be required by the Administrator under section 114 of the Act, the owner or operator of such facility shall conduct performance test(s) and furnish the Administrator a written report of the results of such performance test(s).	Units #13 and #13b
<b>§60.11</b>	<b>Compliance with standards and maintenance requirements</b>	
(d)	At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.	All units that do not have manufacturer's specifications
(e)	(1) For the purpose of demonstrating initial compliance, opacity observations shall be conducted concurrently with the initial performance test required in § 60.8 unless one of the following conditions apply. If no performance test under § 60.8 is required, then opacity observations shall be conducted within 60 days after achieving the maximum production rate at which the affected facility will be operated but no later than 180 days after initial startup of the facility. If visibility or other conditions prevent the opacity observations from being conducted	Units #13 – #17

Citation	Regulation	Does it apply to the Facility and/ or Equipment? Y/N (List units)
	<p>concurrently with the initial performance test required under § 60.8, the source owner or operator shall reschedule the opacity observations as soon after the initial performance test as possible, but not later than 30 days thereafter, and shall advise the Administrator of the rescheduled date. In these cases, the 30-day prior notification to the Administrator required in § 60.7(a)(6) shall be waived. The rescheduled opacity observations shall be conducted (to the extent possible) under the same operating conditions that existed during the initial performance test conducted under § 60.8. The visible emissions observer shall determine whether visibility or other conditions prevent the opacity observations from being made concurrently with the initial performance test in accordance with procedures contained in Method 9 of appendix B of this part. Opacity readings of portions of plumes which contain condensed, uncombined water vapor shall not be used for purposes of determining compliance with opacity standards. The owner or operator of an affected facility shall make available, upon request by the Administrator, such records as may be necessary to determine the conditions under which the visual observations were made and shall provide evidence indicating proof of current visible observer emission certification. Except as provided in paragraph (e)(5) of this section, the results of continuous monitoring by transmissometer which indicate that the opacity at the time visual observations were made was not in excess of the standard are probative but not conclusive evidence of the actual opacity of an emission, provided that the source shall meet the burden of proving that the instrument used meets (at the time of the alleged violation) Performance Specification 1 in appendix B of this part, has been properly maintained and (at the time of the alleged violation) that the resulting data have not been altered in any way.</p>	
<p><b>Subpart I</b> <b>§60.90(a)</b></p>	<p><b><i>Standards of Performance for Hot Mix Asphalt Facilities</i></b></p> <p>The affected facility to which the provisions of this subpart apply is each hot mix asphalt facility. For the purpose of this subpart, a hot mix asphalt facility is comprised only of any combination of the following: dryers; systems for screening, handling, storing, and weighing hot aggregate; systems for loading, transferring, and storing mineral filler, systems for mixing hot mix asphalt; and the loading, transfer, and storage systems associated with emission control systems.</p>	<p>Units #13 -1#7</p>

Citation	Regulation	Does it apply to the Facility and/ or Equipment? Y/N (List units)
(b)	Any facility under paragraph (a) of this section that commences construction or modification after June 11, 1973, is subject to the requirements of this subpart.	
<b>§60.92</b>	Standards for particulate matter	
	(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall discharge or cause the discharge into the atmosphere from any affected facility any gases which:	Units #13 and #13b
	(1) Contain particulate matter in excess of 90 mg/dscm (0.04 gr/dscf). (2) Exhibit 20 percent opacity, or greater.	
<b>§60.93</b>	Test methods and procedures	
	(a) In conducting the performance tests required in § 60.8, the owner or operator shall use as reference methods and procedures the test methods in appendix A of this part or other methods and procedures as specified in this section, except as provided in § 60.8(b). (b) The owner or operator shall determine compliance with the particulate matter standards in § 60.92 as follows: (1) Method 5 shall be used to determine the particulate matter concentration. The sampling time and sample volume for each run shall be at least 60 minutes and 0.90 dscm (31.8 dscf). (2) Method 9 and the procedures in § 60.11 shall be used to determine opacity.	Units #13 - #17
<p><b>→ Star Paving is subject to NSPS Subpart I because it consists of storage piles, loading and unloading bins, screens, conveyors for hot aggregate and mixing of hot mix asphalt. Only the units handling hot aggregate are subject to this subpart</b></p>		
<b>40 CFR 60 Subpart OOO</b>	Standards of Performance for Non-metallic Mineral Processing Plants	No
	According to §60.670 Subpart OOO applies to crushers and grinding mills of hot mix asphalt facilities that reduce the size of nonmetallic minerals embedded in recycled asphalt pavement and subsequent affected facilities up to, but not including, the first storage silo or bin.	
<p><b>→ Star Paving is not subject to NSPS Subpart OOO because it will not have crushers or grinding mills to reduce particles of recycled asphalt pavement (RAP).</b></p>		
<b>40 CFR 279</b>	Standards for Management of Used Oil	Yes Unit #13

Citation	Regulation	Does it apply to the Facility and/ or Equipment? Y/N (List units)
<b>Subpart B</b>	Applicability	
<b>§279.10(a)</b>	Used oil. EPA presumes that used oil is to be recycled unless a used oil handler disposes of used oil, or sends used oil for disposal. Except as provided in § 279.11, the regulations of this part apply to used oil, and to materials identified in this section as being subject to regulation as used oil, whether or not the used oil or material exhibits any characteristics of hazardous waste identified in subpart C of part 261 of this chapter.	
<b>§279.11</b>	Used oil burned for energy recovery, and any fuel produced from used oil by processing, blending, or other treatment, is subject to regulation under this part unless it is shown not to exceed any of the allowable levels of the constituents and properties shown in Table 1 of the subpart. Once used oil that is to be burned for energy recovery has been shown not to exceed any allowable level and the person making that showing complies with §§ 279.72, 279.73, and 279.74(b), the used oil is no longer subject to this part.	

## Actions Taken

10/27/2021	Received application
11/29/2021	Application ruled administratively complete
12/06/2022	Sent/ posted Public Notice by Department on the application
12/06/2021	Received email from Jennifer Owen-White, U.S. Fish and Wildlife. Asking for a map of the site
12/07/2021	Comment Period Start Date
	Program responded to Ms. Owen-White's email
12/17/2021	Received request for a public information hearing from Marla Painter, President of the Mountain View Community Action
12/23/2021	Received request for a public information hearing from Ms. Nora Garcia, President of the Mountain View Neighborhood Association
01/05/2022	Received email from Ms. Ramona Montoya, with Environment Department of the Pueblo of Isleta, requesting the technical documents
01/05/2022	Received letter from Gov. Abeita with the Pueblo of Isleta requesting a public information hearing and additional time to submit comments on the technical review of the application.
01/06/2022	Comment Period End Date
02/16/2022	Department sent response to Pueblo of Isleta
03/24/2022	Published notice of public information hearing in the Albuquerque Journal and information uploaded to the Program's website



	Notice of public information hearing sent to NA/NCs, those who submitted comment including Pueblo of Isleta, and the applicant
03/25/2022	Notice of public information hearing was mailed by certified mail to the Pueblo of Isleta
03/26/2022	Notice of public information hearing was sent to interested individuals in the Program's signup list.
04/13/2022	Air dispersion model review completed
04/15/2022	Sent Notice on the availability of technical analysis
04/16/2022	Technical Analysis Comment Start Date
	<b>PENDING ANY FUTURE ITEMS/ ACTIONS</b>

## Specific Conditions for this Facility

### FACILITY WIDE SPECIFIC CONDITIONS

#### THROUGHPUTS

##### Annual Throughput based on a 12-month rolling total

HMA Plant:

- A total of 700,000 tons per year based on a 12-month rolling total
- 3,000 tons per day during the months of December and January
- 3,300 tons per day during the months of February, March and November
- 4,200 tons per day during the months of April, May, September and October; and
- 5,400 tons per day during the months of June through August

##### Hourly Throughput

Hot Mix Asphalt (HMA) Plant:

300 tons per hour (tph) production rate.

Aggregate

177 tph production rate when RAP is added to the mix, or  
282 tph production rate when no RAP is allowed in the mix.

Recycled Asphalt Plant (RAP):

Up to 105 tons per hour (tph) production rate

The HMA process is authorized to conduct the following activities:

Utilize virgin aggregate, RAP, Evotherm, and asphalt cement;

Transport aggregate, RAP, Evotherm, and asphalt cement on and off site by haul truck; and

Transport hot mix asphalt off site by truck.

##### Conditions based on the air dispersion modeling submitted with the application:

A fence or other type of barrier shall be installed and maintained to restrict access to the property;

The Facility is subject to restricted operating hours based on air dispersion modeling to demonstrate compliance with the National Ambient Air Quality Standards and New Mexico Ambient Air Quality Standards for NO<sub>2</sub>, CO, SO<sub>2</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>, H<sub>2</sub>S and Pb.

Emission Unit #1 – Aggregate Storage Piles (4), and Emission Unit #7 - RAP Storage Pile (1) shall be located as follows (please refer to Figure 1 in Appendix A):

- At least 270 feet south from the north boundary of the site;
- At least 325 feet north from the south boundary of the site;
- At least 600 feet west from the east boundary of the site (west of the Unpaved Aggregate, Asphalt Cement and RAP Haul Road -UPO-), and
- At least 200 feet east from the west boundary of the site

Unit 13b – Baghouse for Emission Unit #13 – Drum Dryer/ Mixer must be located at least 392 feet from all the boundaries of the site as depicted in Figure 1 of Appendix A.

The stack parameters of Unit 13b – Baghouse shall consist of the following:

- A height of at least 21.3 feet;
- A diameter of no more than 4.2 feet; and
- An exit velocity of at least 73.49 feet per second (ft/sec)

Truck traffic at the facility is permitted only on the haul roads as shown in Figures 2 of Appendix A, and as included in the air dispersion modeling submitted in the application.

Unpaved haul roads must be covered with millings (base course) and surfactants must be applied on a quarterly basis to demonstrate compliance with the permitted haul road emissions from the facility.

RAP/Aggregate/Asphalt Cement truck traffic is restricted to the Unpaved Aggregate, Asphalt Cement and RAP haul road (UPO), Haul Road In (PVI), and Haul Road Out (POV). as shown in Figure 2 in Appendix A.

**Hours of Operation**

HMA Plant:

- Operate 10.5 hours in the month of January from 7AM to 5:30PM
- Operate continuously (24 hours per der day) in February through November; and
- Operate 10 hours per day in the month of December from 7AM to 5PM

**Operating Scenarios**

None

**→ Include Monitoring and Recordkeeping Requirements**

**EQUIPMENT SPECIFIC CONDITIONS**

<b>Units #1 and #7 Storage Piles</b>	Cold Aggregate Storage Piles and RAP Storage Piles shall be watered frequently to control fugitive dust emissions from the facility;
<b>→</b>	<b>Include Monitoring and Recordkeeping Requirements</b>
<b>Units #3, #4, #5, #9, #10 and #11 Material Handling,</b>	The following emission units must be equipped with water sprays to control emissions and demonstrate compliance with the permitted emissions in Table 2b-i: 1) Emission Unit #3 – Feed Bin Unloading Conveyor, and 2) Emission Unit #9 – RAP Bin Unloading Conveyor
	The following emission units must be equipped with water sprays and/ or roofed-enclosures to control the emissions and demonstrate compliance with the permitted emission in Table 2b-i: 1) Emission Unit #4 – Scalping Screen 2) Emission Unit #5 – Scalping Screen Unloading Conveyor

	<ol style="list-style-type: none"> <li>3) Emission Unit #6 – Conveyor Transfer to Slinger Conveyor</li> <li>4) Emission Unit #10 – RAP Screen, and</li> <li>5) Emission Unit #11 – RAP Screen Recycle Unloading Conveyor</li> <li>6) Emission Unit #12 – RAP Transfer Conveyor</li> </ol>
	<p><b><i>Monitoring and Recordkeeping Conditions</i></b></p>
	<ul style="list-style-type: none"> <li>• If the units are equipped with enclosures, the permittee must make sure the enclosures are kept in good condition to avoid any leaks</li> <li>• If the units are equipped with water sprays, the permittee must conduct daily inspections to make sure the water sprays are working properly.</li> <li>• The permittee must keep records of the daily inspections</li> </ul>
<p><b>Units #13 and #13b Drum Dryer/ Mixer and Baghouse</b></p>	<p>Per 60.92(a)(1) and (2), the facility shall not discharge or cause the discharge into the atmosphere from any affected facility any gases which:</p> <ol style="list-style-type: none"> <li>(1) Contain particulate matter in excess of 90 mg/dscm (0.04 gr/dscf).</li> <li>(2) Exhibit 20 percent opacity, or greater.</li> </ol>
	<p>Conduct a performance test and an opacity test within 60 days after achieving the maximum production rate, but no later than 180 days after initial startup of the facility in accordance with §60.8(a) to demonstrate compliance with the particulate matter standards in accordance with 40 CFR Part 60, Subpart I.</p> <ol style="list-style-type: none"> <li>1) The performance test shall not contain particulate matter in excess of 90 mg/dscm (0.04 gr/dscf) as stated in §60.92(a)(1), and the test method and procedures listed in §60.93(a) and (b)(1); and.</li> <li>2) The opacity test cannot exceed 20 percent opacity according to §60.92(a)(2), and the test method and procedures listed in §60.63(a) and (b)(2).</li> </ol>
	<p>The Unit #13b – Baghouse for Unit #13 – Drum Dryer/ Mixer shall have a differential pressure gauge that measures the pressure between the inlet and outlet of the baghouse.</p>
	<p>Unit #13 – Drum Dryer/ Mixer shall be shut down in the event of a malfunction of the baghouse which causes the differential pressure to go outside of operating range as determined through compliance testing or manufacturer specifications, and repairs shall be made to the affected equipment. The HMA Drum/ Dryer Mixer shall not restart operations until the capture and control equipment for Unit #13 is fully functional.</p>
	<p><b><i>Monitoring Conditions:</i></b></p>
	<p>The permittee must monitor Units #13 and #13b as described below while the HMA plant is operating. Monitoring shall be conducted to confirm proper operation of the Drum Dryer/ Mixer Baghouse:</p> <ul style="list-style-type: none"> <li>• During operation, the Mixer Baghouse differential pressure shall be monitored at once every hour, at a minimum, during daylight operations; and it shall be monitored continuously during night-time. This is to show that airflow is being maintained in compliance with the manufacturer’s specifications;</li> <li>• Operations shall cease immediately if the pressure drop is not within the manufacturer's specified normal operating range or the range correlating with opacity tests demonstrating compliance with the 40 CFR 60, NSPS I opacity limits. Operations shall not re-commence until the cause of the deviation is determined and rectified;</li> </ul>

	<ul style="list-style-type: none"> <li>• EPA Method 9 Opacity tests shall be conducted according to the requirements of 40 CFR 60, Subpart I and Appendix A;</li> <li>• At least once each calendar week, the Permittee shall conduct a EPA Method 9 Opacity test on the Mixer Baghouse to verify that the Mixer Baghouse is not damaged, that the stack(s) is/are secured, that emissions are routed to the Baghouse, and that compliance with 40 CFR 60, NSPS I opacity limits is demonstrated; Concurrently during any visible emissions monitoring of the Mixer Baghouse, differential pressure shall be monitored every 1 minute, at a minimum;</li> <li>• Operations shall cease immediately if the pressure drop is not within the manufacturer's specified normal operating range or the range correlating with opacity tests demonstrating compliance with the 40 CFR 60, NSPS I opacity limits. Operations shall not re-commence until the cause of the deviation is determined and rectified;</li> <li>• Monitor once per calendar week the inspection of the Mixer Baghouse of the interior and exterior of the fabric/cartridge filters for evidence of leaking, damaged and/or missing filters and take appropriate corrective actions to restore filters to proper operation before resuming normal operations; and,</li> <li>• Inspect and replace filter bags according to the manufacturer's documentation or more frequently as indicated by the weekly Mixer Baghouse inspections.</li> <li>• The permittee must inspect and maintain Unit #13b – Baghouse according to the manufacturer's maintenance plan. The inspection and maintenance manual must include at least the following best practices for baghouses inspections and maintenance requirement to ensure that the baghouse operates in good condition and to demonstrate compliance with the controlled emissions from the Unit #13 – Drum Dyer/ Mixer.</li> </ul>
→	<b><i>Include Recordkeeping Conditions for both units (#13 and #13b)</i></b>
	Unit #13 – Drum Dryer/ Mixer is allowed to burn either on-specification used oil meeting the specifications listed in 40 CFR § 279.11 or pipeline quality natural gas as the fuel
	<p><b><i>Monitoring and Recordkeeping Conditions:</i></b></p> <p>The permittee must monitor and maintain records of the used fuel oil delivered to the facility to be used in Unit #13. At a minimum, the records must include the following:</p> <ul style="list-style-type: none"> <li>• All fuel delivery manifests shall be retained and must state the type of fuel delivered; and</li> <li>• Analysis or certification from the transporter, demonstrating that each shipment of used oils meets the fuel specification of §279.11, or</li> <li>• An annual certification from each supplier, indicating that all shipments of used oil will meet the fuel specification of §279.11.</li> </ul>
<p><b>Units #14 and #15 Drum Unloading and Asphalt Silo Loading</b></p>	<p>The application did not include any special condition to calculate the controlled emissions.</p> <p>The controlled emissions are based the annual throughput; therefore, monitoring and recordkeeping of the hour and annual productions rates, will demonstrate compliance with the hourly and annual emissions from these two units.</p>

<b>Unit #16 Asphalt Heater</b>	<p>Unit #16 is authorized to burn propane or low sulfur diesel.</p> <ul style="list-style-type: none"> <li>The permittee shall keep records of when Unit 16 operates with diesel and records to demonstrate the use of only ultra-low sulfur diesel.</li> </ul>
<b>Unit #18 Haul Roads</b>	<p>Based on the application, the emissions were calculated on the number of trucks on the haul road, which is a direct result of the throughput for each type of material and the distance travelled.</p> <p>Therefore, if the permittee demonstrates compliance with the hourly and annual throughputs, they will be in compliance with the haul road emissions.</p> <p>However, the Facility is limited to:</p> <ul style="list-style-type: none"> <li>A maximum 24 trucks per hour, of which only 12 trucks per hour are permitted to transport asphalt.</li> <li>All haul roads are one lane traffic. Trucks are allowed to travel in one direction on a roadway at any given time.</li> <li>Compliance with the National and State Ambient Air Quality Standards from the haul roads was also based on the proposed location of the paved and unpaved roads. Therefore, the hauls roads at the facility shall be constructed as depicted in Figure 2 of the permit.</li> <li>RAP/Aggregate/Asphalt Cement truck traffic is restricted to the Unpaved Aggregate, Asphalt Cement and RAP haul road (UPO), Haul Road In (PVI), and Haul Road Out (POV). as shown in Figure 2 in Appendix A.</li> </ul>
<b>→</b>	<b><i>Include Monitoring and Recordkeeping Conditions</i></b>
<b>Paved Roads</b>	<p>Paved roads must be cleaned up from any spillage and track out as necessary to minimize fugitive emissions and prevent material leaving the property.</p> <p><b><i>Recordkeeping</i></b></p> <p>Maintain records of when the facility cleans out spillage and track out.</p>
<b>Unpaved Roads</b>	<p>Controlled emissions included a 90% control efficiency from base course and surfactants. Therefore, the applicant must cover the haul roads with a base course, such as asphalt millings, and apply surfactants on a quarterly basis to minimize emissions from the unpaved haul roads and demonstrate compliance with the hourly and annual emissions from the haul roads.</p> <p><b><i>Monitoring and recordkeeping</i></b></p> <p>Monitor and maintain records of the application on surfactants on a quarterly basis.</p>
<b>Other Emission Units</b>	<p>The remaining units, except for Emission Unit #18 – Haul Roads, shall not cause or allow fugitive emissions that exceed 20 percent opacity, six (6) minute time-averaged. Opacity shall be determined using Method 9. This condition is pursuant to 20.11.5.12 and 20.11.5.15 NMAC.</p>
<b>Compliance Tests</b>	<p>Unit #13</p> <ul style="list-style-type: none"> <li>Initial compliance tests shall be conducted in order to demonstrate compliance with the standard for particulate matter of any gas pursuant to 40 CFR 60, Subpart I §60.92(a)(1), and the standard for opacity pursuant to 40 CFR 60, Subpart I §60.92(a)(2). Initial compliance tests of Unit #13 – Drum Dryer/</li> </ul>

	<p>Mixer and Unit #13b - Baghouse shall be conducted utilizing used oil within the timeframes specified in Condition 2.F.</p> <ul style="list-style-type: none"> <li>Initial compliance tests shall also be conducted in order to demonstrate compliance of the lb/hr emission limits for NOX and CO stated in Condition 2. Initial compliance tests of Unit #13 – Drum Dryer/ Mixer and Unit #13b - Baghouse shall be conducted utilizing used oil within the timeframes specified in Condition 2.F.</li> <li>Annual compliance tests have been imposed on Units #13 and #13b to demonstrate compliance with the standard for particulate matter of any gas pursuant to 40 CFR 60, Subpart I §60.92(a)(1), and the standard for opacity pursuant to 40 CFR 60, Subpart I §60.92(a)(2).</li> <li>Annual compliance tests of Units #13 and #13b shall be conducted utilizing used oil as the fuel. Compliance tests shall be conducted in accordance with EPA methods contained in Appendix A of 40 CFR, Part 60, unless otherwise approved by the Program.</li> </ul>
<b>Opacity</b>	<b>All remaining units, except for Unit #18: 20% Opacity based on 20.11.5.12 NMAC</b>
<b>Other Assumptions</b>	<p>The facility has the option to operate with 59% Aggregate and 35% RAP, but it is also requesting to operate without RAP, which will result in a production with 94% Aggregate. The total controlled emissions were calculated with both scenarios and the most conservative was used to calculate the annual emissions from the entire facility.</p> <p>The controlled annual emissions for all equipment except Unit #16 – Asphalt Heater were calculated based on a limited annual production of 700,000 tons per year. The annual emissions from Unit #16 were based on 8760 hours per year.</p> <p>The H<sub>2</sub>S Emissions from Unit #13 – Drum Dryer/ Mixer, Unit #13b – Drum Unloading, Unit #15 – Silo Unloading were calculated using the emission factors from the North Carolina Spreadsheet for Asphalt Plants, which is available at: <a href="https://deq.nc.gov/about/divisions/air-quality/air-quality-permitting/emission-estimation-spreadsheets">https://deq.nc.gov/about/divisions/air-quality/air-quality-permitting/emission-estimation-spreadsheets</a>. The annual emissions were based on the hours of operation per year as a result of the limited annual throughput (700,000 tons per year / 300 tons per hour = 2333.33 hrs/year)</p> <p>The hourly and annual number of trucks with RAP is the same as without RAP. Therefore, from all emissions from haul roads were calculated assuming the plant is operating with 35% RAP.</p> <p>The controlled emissions from Unit #13 – Drum Dryer/ Mixer were estimated using the emission factors for used oil, which are the most conservative values.</p>

**TOTAL ESTIMATED CONTROLLED EMISSIONS**

**Controlled Emissions with RAP**

Unit	NOx		CO		VOCs		SO2		PM10		PM2.5	
	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
1 Cold Agg Sto Piles									0.395	0.461	0.060	0.070
2 Feed Bin Load									0.395	0.461	0.060	0.070
3 Feed Bin Unl Conveyor									0.008	0.009	0.002	0.003
4 Scalp Screen									0.131	0.153	0.009	0.010
5 Scalp Screen Unl Conv									0.008	0.009	0.002	0.003
6 Conv Transfer to Slinger Conv									0.008	0.009	0.002	0.003
7 RAP Sto Piles									0.070	0.082	0.011	0.012
8 RAP Bin Loading									0.070	0.082	0.011	0.012
9 RAP Bin Unl Conveyor									0.005	0.006	0.001	0.002
10 RAP Screen									0.078	0.091	0.005	0.006
11 RAP Screen Recycle Unl Conv									0.005	0.006	0.001	0.002
12 RAP Transfer Conv									0.005	0.006	0.001	0.002
13 Drum Dryer/ Mixer	16.500	19.250	39.000	45.500	9.600	11.200	17.400	20.300	6.900	8.050	6.900	8.050
14 Drum Mixer Unloading	0.000	0.000	0.354	0.413	3.656	4.265	0.000	0.000	0.176	0.205	0.176	0.205
15 Asphalt Silo Unloading	0.000	0.000	0.405	0.472	1.248	1.456	0.000	0.000	0.157	0.183	0.157	0.183
16 Asphalt Heater	0.220	0.964	0.098	0.431	0.013	0.057	0.078	0.342	0.022	0.096	0.022	0.096
17 Asphalt Cement Sto Tanks (2)					0.048	0.210						
18 Haul Road Traffic									1.012	1.021	0.136	0.141
19 Yard	0.000	0.000	0.106	0.123	0.330	0.385	0.000	0.000	0.000	0.000	0.000	0.000
<b>TOTAL</b>	<b>16.720</b>	<b>20.214</b>	<b>39.963</b>	<b>46.939</b>	<b>14.895</b>	<b>17.573</b>	<b>17.478</b>	<b>20.642</b>	<b>9.445</b>	<b>10.930</b>	<b>7.556</b>	<b>8.869</b>

**Controlled Emissions without RAP**

Unit		NOx		CO		VOCs		SO2		PM10		PM2.5	
		lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
1	Cold Agg Sto Piles									0.630	0.735	0.095	0.111
2	Feed Bin Load									0.630	0.735	0.095	0.111
3	Feed Bin Unl Conveyor									0.013	0.015	0.004	0.004
4	Scalp Screen									0.209	0.243	0.014	0.016
5	Scalp Screen Unl Conv									0.013	0.015	0.004	0.004
6	Conv Transfer to Slinger Conv									0.013	0.015	0.004	0.004
7	RAP Sto Piles									0.000	0.000	0.000	0.000
8	RAP Bin Loading									0.000	0.000	0.000	0.000
9	RAP Bin Unl Conveyor									0.000	0.000	0.000	0.000
10	RAP Screen									0.000	0.000	0.000	0.000
11	RAP Screen Recycle Unl Conv									0.000	0.000	0.000	0.000
12	RAP Transfer Conv									0.000	0.000	0.000	0.000
13	Drum Dryer/ Mixer	16.500	19.250	39.000	45.500	9.600	11.200	17.400	20.300	6.900	8.050	6.900	8.050
14	Drum Mixer Unloading	0.000	0.000	0.354	0.413	3.656	4.265	0.000	0.000	0.176	0.205	0.176	0.205
15	Asphalt Silo Unloading	0.000	0.000	0.405	0.472	1.248	1.456	0.000	0.000	0.157	0.183	0.157	0.183
16	Asphalt Heater	0.220	0.964	0.098	0.431	0.013	0.057	0.078	0.342	0.022	0.096	0.022	0.096
17	Asphalt Cement Sto Tanks (2)	0.000	0.000	0.000	0.000	0.048	0.210	0.000	0.000	0.000	0.000	0.000	0.000
18	Haul Road Traffic	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.012	1.021	0.136	0.141
19	Yard	0.000	0.000	0.106	0.123	0.330	0.385	0.000	0.000	0.000	0.000	0.000	0.000
<b>TOTAL</b>		<b>16.720</b>	<b>20.214</b>	<b>39.963</b>	<b>46.939</b>	<b>14.895</b>	<b>17.573</b>	<b>17.478</b>	<b>20.642</b>	<b>9.774</b>	<b>11.313</b>	<b>7.606</b>	<b>8.927</b>



### H2S and HAP Emissions

Unit	H2S		HAPs		
	<i>lbs/hr</i>	<i>tpy</i>	<i>lbs/hr</i>	<i>tpy</i>	
1	Cold Agg Sto Piles				
2	Feed Bin Load				
3	Feed Bin Unl Conveyor				
4	Scalp Screen				
5	Scalp Screen Unl Conv				
6	Conv Transfer to Slinger Conv				
7	RAP Sto Piles				
8	RAP Bin Loading				
9	RAP Bin Unl Conveyor				
10	RAP Screen				
11	RAP Screen Recycle Unl Conv				
12	RAP Transfer Conv				
13	Drum Dryer/ Mixer	0.01554	0.01813	3.14472	3.66884
14	Drum Mixer Unloading	0.000438	0.000511		
15	Asphalt Silo Unloading	0.000438	0.000511		
16	Asphalt Heater			0.000815	0.003571
17	Asphalt Cement Sto Tanks (2)				
18	Haul Road Traffic				
19	Yard				
<b>TOTAL</b>		<b>0.016</b>	<b>0.019</b>	<b>3.146</b>	<b>3.672</b>

## CALCULATIONS

### Material handling controlled emissions

The facility has the option to operate with 59% Aggregate and 35% RAP, but it is also requesting to operate without RAP, which will result in a production with 94% Aggregate. Emissions were calculated with both scenarios and the most conservative was used to calculate the hourly and annual emissions from the entire facility.

- The controlled hourly emissions from Units 1, 2, 7 and 8 were calculated based on *EPA AP-42 13.2.4 – Aggregate Handling and Storage Piles*, where the Emission Factor (EF) was calculated based on Equation 1 in lbs/ ton provided in Section 13.2.4.3 – Predictive Emission Factor Equations and the k factor for the particle size. The EF formula and k values are as follows:

$$EF = k(0.0032) \times \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

k, PM10	0.35
k, PM2.5	0.053

- The controlled hourly emissions from Units 3, 4, 5, 6, 9, 10, 11, and 12 were calculated with the emission factors provided in *EPA AP-42, 11.19.2 – Crushed Stone Processing and Pulverized Mineral Processing*.
- The controlled annual emissions were calculated based on a limited annual production of 700,000 tons per year.

### Controlled Emission with RAP

Throughput	with RAP	
	tons/ year	tons/ hour
Asphalt TOTAL	700,000	300
Aggregate, 59%	413000	177
RAP, 35%	245000	105
Asphalt Cement, 6%	42000	18

Throughput	without RAP	
	tons/ year	tons/ hour
Asphalt TOTAL	700,000	300
Aggregate, 94%	658000	282
RAP,0%	0	0
Asphalt Cement, 6%	42000	18

Other Assumptions:

- Units 7 and 8 have a 70% reduction due to the type of material

### Controlled Material Handling Emissions with RAP

No.	Unit Description	Process Rate tons/hr	Emission Factor		Emissions w/ RAP			
			PM <sub>10</sub> lbs/ton	PM <sub>2.5</sub> lbs/ton	<i>EF lbs/ton * Process Rate tons/hr = lbs/hr</i>			
					<i>EF lb/ton * Process Rate tons/yr * 1ton/2000lbs = tpy</i>			
					PM <sub>10</sub> lbs/hr	PM <sub>10</sub> tpy	PM <sub>2.5</sub> lbs/hr	PM <sub>2.5</sub> tpy
1	Cold Aggregate Piles	177	0.0022326	0.0003381	0.3952	0.4610	0.0598	0.0698
2	Feed Bind loading	177	0.0022326	0.0003381	0.3952	0.4610	0.0598	0.0698
3	Agg Feed Bin Unl Conveyor	177	0.000046	0.000013	0.0081	0.0095	0.0023	0.0027
4	Agg Scalping Screen	177	0.00074	0.00005	0.1310	0.1528	0.0089	0.0103
5	Agg Scalping Screen Conveyor	177	0.000046	0.000013	0.0081	0.0095	0.0023	0.0027
6	Agg Conveyor Transfer	177	0.000046	0.000013	0.0081	0.0095	0.0023	0.0027
7	RAP Storage Pile	105	0.00067	0.00010	0.0703	0.0820	0.0106	0.0124
8	RAP Bin Loading	105	0.00067	0.00010	0.0703	0.0820	0.0106	0.0124
9	RAP Bin Unloading Conveyor	105	0.000046	0.000013	0.0048	0.0056	0.0014	0.0016
10	RAP Screen	105	0.00074	0.00005	0.0777	0.0907	0.0053	0.0061
11	RAP Screen Recycle Unl Conveyor	105	0.000046	0.000013	0.0048	0.0056	0.0014	0.0016
12	RAP Transfer Conveyor	105	0.000046	0.000013	0.0048	0.0056	0.0014	0.0016

### Controlled Material Handling Emissions without RAP

No.	Unit Description	Process Rate tons/hr	Emission Factor		Emissions w/o RAP			
			PM <sub>10</sub> lbs/ton	PM <sub>2.5</sub> lbs/ton	<i>EF lbs/ton * Process Rate tons/hr = lbs/hr</i>			
					<i>EF lb/ton * Process Rate tons/yr * 1ton/2000lbs = tpy</i>			
					PM <sub>10</sub> lbs/hr	PM <sub>10</sub> tpy	PM <sub>2.5</sub> lbs/hr	PM <sub>2.5</sub> tpy
1	Cold Aggregate Piles	282	0.0022326	0.0003381	0.6296	0.7345	0.0953	0.1112
2	Feed Bind loading	282	0.0022326	0.0003381	0.6296	0.7345	0.0953	0.1112
3	Agg Feed Bin Unl Conveyor	282	0.000046	0.000013	0.0130	0.0151	0.0037	0.0043
4	Agg Scalping Screen	282	0.00074	0.00005	0.2087	0.2435	0.0141	0.0165
5	Agg Scalping Screen Conveyor	282	0.000046	0.000013	0.0130	0.0151	0.0037	0.0043
6	Agg Conveyor Transfer	282	0.000046	0.000013	0.0130	0.0151	0.0037	0.0043
7	RAP Storage Pile	0	0.00067	0.00010	0.0000	0.0000	0.0000	0.0000
8	RAP Bin Loading	0	0.00067	0.00010	0.0000	0.0000	0.0000	0.0000
9	RAP Bin Unloading Conveyor	0	0.000046	0.000013	0.0000	0.0000	0.0000	0.0000
10	RAP Screen	0	0.00074	0.00005	0.0000	0.0000	0.0000	0.0000
11	RAP Screen Recycle Unl Conveyor	0	0.000046	0.000013	0.0000	0.0000	0.0000	0.0000
12	RAP Transfer Conveyor	0	0.000046	0.000013	0.0000	0.0000	0.0000	0.0000

## Haul Road Emissions

The haul road emissions from paved and unpaved roads were based on the number of trucks and vehicle miles travelled for each type of road (paved and unpaved) and the trucks per hour or per year. The trucks per hour and year are a direct result of the hourly and annual throughputs. The emissions also take into account the emission factor for unpaved and paved roads, which are calculated according to AP-42.

### Number of Trucks

#### *Input Information:*

The load capacity for each truck is 25 tons

The number of trucks were calculated based on the following throughputs:

#### **Throughput with RAP**

Throughputs	tpy	tph
Asphalt TOTAL	700,000	300
Aggregate, 59%	413000	177
RAP, 35%	245000	105
Asphalt Cement, 6%	42000	18

#### **Throughput without RAP**

Throughputs	tpy	tph
Asphalt TOTAL	700,000	300
Aggregate, 94%	658000	282
RAP, 0%	0	0
Asphalt Cement, 6%	42000	18

Equations:

$$\text{Throughput, tph} * \text{load capacity, tons/load} = \text{trucks per hour}$$

$$\text{trucks per hour} * 8760 \text{ hrs/year} = \text{unc trucks/year}$$

$$\text{Throughput, cont tpy} * \text{load capacity, tons/load} = \text{cont trucks per year}$$

Material	with RAP	Uncont	Cont
	per hour		
Asphalt	12	105120	28000
Aggregate	7.08	62020.8	16520
RAP	4.2	36792	9800
Asphalt Cement	0.72	6307.2	1680
<b>Total</b>	<b>24</b>	<b>210240</b>	<b>56000</b>

Material	w/o RAP	Uncont	Cont
	per hour	per year	
Asphalt	12	105120	28000
Aggregate	11.28	98812.8	26320
RAP	0	0	0
Asphalt Cement	0.72	6307.2	1680
<b>Total</b>	24	210240	56000

The hourly and annual number of trucks with RAP is the same as without RAP. Therefore, all the emissions from haul roads are calculated assuming the plant is operating with 35% RAP.

### Paved Road Emissions, based on AP42 13.2.1

Emission Factors Calculations and Input Data

$$E_{\text{ext}} = \frac{[k(sL)^{0.91} * (w)^{1.02}]}{[k(sL)^{0.91} * (w)^{1.02}] * [1 - (P/4N)]}$$

sL: 0.6 g/m<sup>2</sup>

P: 60 days

N: 365 days in averaging period

w: 27.5 tons

#### Emission Factors, lbs/ VMT

	PM10	PM2.5
<b>k, lbs/VMT</b>	0.0022	0.00054
<b>E<sub>ext</sub> =</b>	0.038943488	0.009558856
<b>E =</b>	0.040612495	0.009968521

Paved Vehicle Miles Traveled

The vehicle miles travelled (VMT) are based on the road length of the road as provided in the application.

Controlled VMT for Paved Roads are:

*Paved Miles, mi/vehicle \* total trucks/hour = miles/hr*

*Cont. trucks/year \* VMT Paved/Truck =*

*Cont. VMT/year*

VMT per Vehicle	meters	miles	VMT/ hour	VMT/ year
Paved In	270.4	0.16777064	4.026	9395.156
Paved Out	124	0.07705022	1.849	4318.812

The controlled emissions from paved haul roads are:

<b>Pollutant Controlled Emissions</b>				
<i>Calculations:</i>	<i>VMT/hr * E lbs/VMT = lbs/hr</i>			
	<i>Cont VMT / Year * E<sub>ext</sub> lbs/VMT * 1ton / 2000 lbs= tpy</i>			
<b>Paved Road Direction</b>	<b>PM<sub>10</sub></b>		<b>PM<sub>2.5</sub></b>	
	<b>lbs/hr</b>	<b>tpy</b>	<b>lbs/hr</b>	<b>tpy</b>
<b>Paved In</b>	0.16352602	0.18294007	0.0401382	0.04490347
<b>Paved Out</b>	0.07510084	0.08401692	0.01843384	0.02062233
<b>Total</b>	0.23862686	0.26695699	0.05857205	0.06552581

**Unpaved Road Emissions are based on AP-42, 13.2.2**

Emission Factors Calculations and Input Data

- E = k [(s/12)<sup>a</sup> \* (W/3)<sup>b</sup>]
- E<sub>ext</sub> = E \* [(365-P)/365]
- E: EF lbs/VMT
- s: 4.8 %
- W: 27.5 tons
- P: 60 number of days with at least 0.01in of precipitation

	<b>PM10</b>	<b>PM2.5</b>
K, lbs/VMT:	1.5	0.15
a:	0.9	0.9
b:	0.45	0.45
E =	1.7821	0.1782
E <sub>ext</sub> =	1.4892	0.1489

**Unpaved Vehicle Miles Traveled**

The vehicle miles travelled (VMT) are based on the road length of the road as provided in the application.

**VMT for Unpaved Roads are:**

The vehicle miles travelled (VMT) are based on the road length of the unpaved roads and the type of material handling as provided in the application.

<b>VMT per Vehicle</b>	<b>meters</b>	<b>miles</b>
Asphalt	227.4	0.14130016
Aggregate	354.9	0.220525184
RAP	354.9	0.220525184
Asphalt Cement	354.9	0.220525184

The controlled emissions from unpaved haul roads are:

Equations:

$$90\% \text{ CE unpaved road from surfactants and base course}$$

$$(VMT/truck * E \text{ lbs/VMT}) * Trucks/hr * (100-CE/100) = \text{lbs/hr}$$

$$\text{lbs/hr} * \text{Plant hours/year} * (365-P/365) * 1 \text{ ton} / 2000 \text{ lbs} = \text{tpy}$$

	PM <sub>10</sub>		PM <sub>2.5</sub>	
	lbs/hr	tpy	lbs/hr	tpy
Asphalt	0.302179	0.29459	0.030218	0.029459
Aggregate	0.278248	0.27126	0.027825	0.027126
RAP	0.165062	0.160917	0.016506	0.016092
Asphalt Cement	0.028296	0.027586	0.00283	0.002759
<b>Total Unpaved</b>	<b>0.77379</b>	<b>0.75435</b>	<b>0.07738</b>	<b>0.07544</b>

**Haul Roads Total (Paved + Unpaved) Controlled Emissions:**

*%CE unpaved road from surfactants and base  
90course*

	PM <sub>10</sub>		PM <sub>2.5</sub>	
	lbs/hr	tpy	lbs/hr	tpy
<b>Unpaved Road</b>	<b>0.773786</b>	<b>0.754353</b>	<b>0.077379</b>	<b>0.075435</b>
<b>Paved Road</b>	<b>0.238627</b>	<b>0.266957</b>	<b>0.058572</b>	<b>0.065526</b>
<b>TOTAL CON</b>	<b>1.01241</b>	<b>1.02131</b>	<b>0.13595</b>	<b>0.14096</b>

## Drum Dryer/ Mixer, Drum Unloading, Silo Unloading and Yard Emissions

The NO<sub>x</sub>, CO, VOCs, SO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> emissions were based on AP42, 11.1 – Hot Mix Asphalt Plants

The following emission factors were used in calculating the controlled emissions of Unit #13 – Drum Dryer/ Mixer, Unit #14 – Drum Unloading, Unit #15 – Silo Unloading, and Unit #19 – Yard.

The controlled emissions from Unit #13 – Drum Dryer/ Mixer were estimated using the emission factors for waste oil in AP4211.1, which are the most conservative values. However, Unit #13 is allowed to operate with on-specification used oil or pipeline quality natural gas.

Unit		NO <sub>x</sub>	CO	VOC	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
		lb/ton	lb/ton	lb/ton	lb/ton	lb/ton	lb/ton
13	Drum Dryer/ Mixer	0.0550	0.1300	0.0320	0.0580	0.0230	0.0230
	<i>AP 42 Table</i>	<i>11.1-7</i>	<i>11.1-7</i>	<i>11.1-8</i>	<i>11.1-7</i>	<i>11.1-3 Fabric Filter</i>	
14	Drum Unloading		0.001180	0.012187		0.000586	0.000586
	<i>AP 42 Table</i>	<i>11.1-14, Silo Filling</i>					
15	Silo Unloading (loadout)		0.001349	0.004159		0.000522	0.000522
	<i>AP 42 Table</i>	<i>11.1.14 Plant Loadout</i>					
19	Yard		0.000352	0.0011			
	<i>AP 42 11.1</i>	<i>VOC = 0.0011 lb/ton and CO = 0.0011 *0.32 as stated in AP 42, Section 11.1.2.5, last paragraph on page 11.1-9</i>					

The emission factors for Unit #14 – Drum Unloading, and Unit #15 – Silo Unloading were based on the formulas provided in Table 11.1-14, which are the following:

### Silo Loadout

$$\text{PM EF, lb/ton: } 0.000181 + 0.00141 (-V)e^{[(0.0251)(T + 460)] - 20.43}$$

$$\text{TOC EF, lb/ton: } 0.0172(-V)e^{[(0.0251)T + 460)] - 20.43}$$

$$\text{CO, EF, lb/ton: } 0.00558(-V)e^{[(0.0251)(T + 460)] - 20.43}$$



**Drum Unloading/ Silo Loading**

PM EF, lb/ton:	$0.000332 + 0.00105 (-V)e^{(((0.0251)(T + 460)) - 20.43)}$
TOC EF, lb/ton:	$0.0504(-V)e^{(((0.0251)(T + 460)) - 20.43)}$
CO, EF, lb/ton:	$0.00488(-V)e^{(((0.0251)(T + 460)) - 20.43)}$

The following input data was used in the Silo Loadout and Drum Unloading/ Silo Loading Equations:

Throughput:	300 tph
Controlled annual throughput:	700,000 tpy
V, Volatility:	-0.5
T, temperature:	325°F
Controlled Hours:	2333.33 hrs/year (=700,000 tons per year / 300 tons per hour)

The controlled emissions from Unit #13 – Drum Dryer/ Mixer, Unit #14 – Drum Unloading, Unit #15 – Silo Unloading, and Unit #19 – Yard are the following:

Equations:

$$lbs/hr = EF (lb/ton) * Hourly Throughput (tons/ hr)$$

$$tons/ year = Hourly Emission Rate (lbs/hr) * Controlled Hours/ Year * 1 ton/ 2000 lbs$$

Unit No.	Unit	NOx		CO		VOC		SO2		PM10		PM2.5	
		lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
13	Drum Dryer/ Mixer	16.500	19.250	39.000	45.500	9.600	11.200	17.400	20.300	6.900	8.050	6.900	8.050
14	Drum Unloading			0.354	0.413	3.656	4.265			0.176	0.205	0.176	0.205
15	Asphalt Silo Unloading			0.405	0.472	1.248	1.456			0.157	0.183	0.157	0.183
19	Yard			0.106	0.123	0.330	0.385						

## H<sub>2</sub>S Emissions

The H<sub>2</sub>S Emissions from Unit #13 – Drum Dryer/ Mixer, Emission Unit #14 – Drum Unloading, Unit #15 – Silo Unloading were calculated using the emission factors from the North Carolina Spreadsheet for Asphalt Plants, which is available at: <https://deq.nc.gov/about/divisions/air-quality/air-quality-permitting/emission-estimation-spreadsheets>. The annual emissions were based on the hours of operation per year as a result of the limited annual throughput (700,000 tons per year / 300 tons per hour = 2333.33 hrs/year).

Equations:

$$\text{Hourly emissions, lbs/ hr} = \text{Process Rate, tons/ hr} * \text{EF lb/ ton}$$

$$\text{Annual emissions, tons/ yr} = \text{hourly emissions, lbs/ hr} * \text{cont. hours/ yr} * 1 \text{ ton/ 2000 lbs}$$

Unit No.	Unit Description	Process Rate	EF	H <sub>2</sub> S	
		tons/ hr	lb/ ton	lbs/ hr	tons/ yr
13, 13b	Drum Dryer. Mixer and Baghouse	300	0.0000518	0.01554	0.01813
14	Drum Mixer Unloading	300	0.00000146	0.000438	0.000511
15	Asphalt Silo Unloading	300	0.00000146	0.000438	0.000511
<b>Total H<sub>2</sub>S controlled emissions</b>			0.00005472	0.016416	0.019152

## HAP Emissions

The HAP Emissions from Unit #13 – Drum Dryer/ Mixer were calculated using the emission factors from AP-42, Section 11.1, Table 11.1-10 for waste oil-fired dryer with fabric filter and the emission factors from AP-42, Section 11.1, Table 11.1-12.

### HAP Emissions for Unit #13 – Drum Dryer/ Mixer

Input Information:

Average Hourly Production Rate:	300 tons per hour
Yearly Production Rate:	700000 tons per year
Type of Fuel:	Used Fuel Oil

Equations:

$$\text{Hourly Emissions, lbs/ hr} = \text{EF, lbs/ ton} * \text{hourly Throughput, tons/ hr}$$

$$\text{Annual Emissions, tons/ yr} = \text{EF lbs/ ton} * \text{annual throughput, tons/ yr} * 1 \text{ ton/ 2000 lbs}$$

Non-PAH HAPs	CAS#	Emission Factor (lbs/ton)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
Acetaldehyde	75-07-0	1.30E-03	0.39	0.455

Non-PAH HAPs	CAS#	Emission Factor (lbs/ton)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
Acrolein	107-02-8	2.60E-05	0.0078	0.0091
Benzene	71-43-2	3.90E-04	0.117	0.1365
Ethylbenzene	100-41-4	2.40E-04	0.072	0.084
Formaldehyde	50-00-0	3.10E-03	0.93	1.085
Hexane	110-54-3	9.20E-04	0.276	0.322
Isooctane	540-84-1	4.00E-05	0.012	0.014
Methyl Ethyl Ketone	78-93-3	2.00E-05	0.006	0.007
Propionaldehyde	123-38-6	1.30E-04	0.039	0.0455
Quinone	106-51-4	1.60E-04	0.048	0.056
Methyl chloroform	71-55-6	4.80E-05	0.0144	0.0168
Toluene	108-88-3	2.90E-03	0.87	1.015
Xylene	1330-20-7	2.00E-04	0.06	0.07
<b>Total Non-PAH HAPs</b>			<b>2.8422</b>	<b>3.3159</b>

PAH HAPs	CAS#	Emission Factor (lbs/ton)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
2-Methylnaphthalene	91-57-6	1.70E-04	0.051	0.0595
Acenaphthene	83-32-9	1.40E-06	0.00042	0.00049
Acenaphthylene	208-96-8	2.20E-05	0.0066	0.0077
Anthracene	120-12-7	3.10E-06	0.00093	0.001085
Benzo(a)anthracene	56-55-3	2.10E-07	0.000063	0.000074
Benzo(a)pyrene	50-32-8	9.80E-09	0.000003	0.000003
Benzo(b)fluoranthene	205-99-2	1.00E-07	0.00003	0.000035
Benzo(b)pyrene	192-97-2	1.10E-07	0.000033	0.000039
Benzo(g,h,i)perylene	191-24-2	4.00E-08	0.000012	0.000014
Benzo(k)fluoranthene	207-08-9	4.10E-08	0.000012	0.000014
Chrysene	218-01-9	1.80E-07	0.000054	0.000063
Fluoranthene	206-44-0	6.10E-07	0.000183	0.000214
Fluorene	86-73-7	1.10E-05	0.0033	0.00385
Indeno(1,2,3-cd)pyrene	193-39-5	7.00E-09	0.000002	0.000002
Naphthalene	91-20-3	6.50E-04	0.195	0.2275
Perylene	198-55-0	8.80E-09	0.000003	0.000003
Phenanthrene	85-01-8	2.30E-05	0.0069	0.00805
Pyrene	129-00-0	3.00E-06	0.0009	0.00105
<b>Total PAH HAPs</b>			<b>0.265445</b>	<b>0.309686</b>

<b>HAPs Metals</b>	<b>Emission Factor (lbs/ton)</b>	<b>Emission Rate (lbs/hr)</b>	<b>Emission Rate (tons/yr)</b>
Arsenic	5.60E-07	0.000168	0.000196
Beryllium	0.00E+00	0	0
Cadmium	4.10E-07	0.000123	0.000144
Chromium	5.50E-06	0.00165	0.001925
Cobalt	2.60E-08	0.000008	0.000009
Hexavalent Chromium	4.50E-07	0.000135	0.000158
Lead	1.50E-05	0.0045	0.00525
Manganese	7.70E-06	0.00231	0.002695
Mercury	2.60E-06	0.00078	0.00091
Nickel	6.30E-05	0.0189	0.02205
Phosphorus	2.80E-05	0.0084	0.0098
Selenium	3.50E-07	0.000105	0.000123
	<b>Total HAPs Metals</b>	<b>0.037079</b>	<b>0.04326</b>

## Asphalt Heater

Unit #16 Information:

Fuel Type	Diesel	Propane
Rated Capacity, BTU/ hr:	1,200,000	1,200,000
Heat Rate, BTU/gal:	128,000	91,500
Fuel Usage, gal/hr:	11*	13.1
Uncontrolled, hrs/yr:	8760	8760
Controlled, hrs/yr:	8760	8760
Sulfur, grains/100 scf		15

\*Fuel usage based on manufacturer's information

The emissions from Unit #16 – Asphalt Heater while operating with diesel (The fields in green represent the highest value for each pollutant and those will be used in the controlled emission table for Unit #16 – Asphalt Heater):

Equations:

$$\text{Hourly Emission Rate, lbs/hr} = \text{Emission Factor, (lb/10}^3 \text{ gal)} * \text{Fuel Usage (gal/hr)} / 1000$$

$$\text{Annual Emission Rate, tons/yr} = \text{Hourly Emissions, lbs/hr} * \text{Cont. hours/year} * 1 \text{ ton/2000 lbs}$$

Diesel		NOx		CO		VOCs		SO2		PM10		PM2.5	
*Emission Factor		20	lb/10 <sup>3</sup> gal	5	lb/10 <sup>3</sup> gal	0.34	lb/10 <sup>3</sup> gal	142	* S lb/10 <sup>3</sup> gal	2	lb/10 <sup>3</sup> gal	2	lb/10 <sup>3</sup> gal
Source		AP42. T1.3.-1, Distillate Oil		AP42. T1.3.-1, Distillate Oil		AP42. T1.3.-3, Distillate Oil		AP42. T1.3.-1, Distillate Oil		AP42. T1.3.-1, Distillate Oil		AP42. T1.3.-1, Distillate Oil	
		lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
<b>16</b>	<b>Unc</b>	0.2200	0.9636	0.0550	0.2409	0.0037	0.0164	0.0781	0.3421	0.0220	0.0964	0.0220	0.0964
	<b>Cont</b>	0.2200	0.9636	0.0550	0.2409	0.0037	0.0164	0.0781	0.3421	0.0220	0.0964	0.0220	0.0964

\*Based on the make-up of diesel fuel, EF from Distillate Oil were used to calculate emissions for the heater operating with Diesel Fuel.

The emissions from Unit #16 – Asphalt Heater while operating with propane (The fields in green represent the highest value for each pollutant and those will be used in the controlled emission table for Unit #16 – Asphalt Heater):

Equations:

*Hourly Emission Rate, lbs/ hr = Emission Factor, (lb/ 10<sup>3</sup> gal) \* Fuel Usage (gal / hr) / 1000*

*Annual Emission Rate, tons/ yr = Hourly Emissions, lbs/ hr \* Cont hours/ year \* 1 ton/ 2000 lbs*

Propane Gas		NOx		CO		VOCs		SO2		PM10		PM2.5	
<i>Emission Factor</i>		<i>13</i>	<i>lb/ 10<sup>3</sup> gal</i>	<i>7.5</i>	<i>lb/ 10<sup>3</sup> gal</i>	<i>1</i>	<i>lb/ 10<sup>3</sup> gal</i>	<i>0.1</i>	<i>* S lb/ 10<sup>3</sup> gal</i>	<i>0.7</i>	<i>lb/ 10<sup>3</sup> gal</i>	<i>0.7</i>	<i>lb/ 10<sup>3</sup> gal</i>
<i>Source</i>		<i>AP42, T1.5-1, Propane-Comm</i>		<i>AP42, T1.5-1, Propane-Comm</i>		<i>AP42, T1.5-1, Propane-Comm</i>		<i>AP42, T1.5-1, Propane-Comm</i>		<i>AP42, T1.5-1, Propane-Comm</i>		<i>AP42, T1.5-1, Propane-Comm</i>	
		lbs/hr	ton/yr	lbs/hr	ton/yr	lbs/hr	ton/yr	lbs/hr	ton/yr	lbs/hr	ton/yr	lbs/hr	ton/yr
<b>16</b>	<b>Unc</b>	0.1705	0.7468	0.0984	0.4308	0.0131	0.0574	0.0197	0.0862	0.0092	0.0402	0.0092	0.0402
	<b>Cont</b>	0.1705	0.7468	0.0984	0.4308	0.0131	0.0574	0.0197	0.0862	0.0092	0.0402	0.0092	0.0402

## HAP Emissions

The HAP emissions from Unit #16 – Asphalt Heater were calculated using the worst case emission factor from combusting diesel fuel from AP-42, Section 1.3 Tables 1.3-9, 1.3-8 (formaldehyde) and 1.3-10.

Input Information:

Btu Rating	1,200,000 BTU/ hr
Fuel Usage:	11 gallons/ hr
Yearly Operating Hours:	8760 hours/ year
Type of Fuel:	Diesel
Emission Factors	AP-42 Section 1.3

### HAPs- Organic Compounds:

Equations:

*Hourly Emissions, lbs/ hr = EF, lbs/1000 gal \* Fuel Use, gal/hr*

*Annual Emissions, tons/ yr = Hourly emission, lbs/ hr \* 8760 hrs/ year \* 1 ton/ 2000 lbs*

Organic Compounds	CAS#	Emission Factor (lbs/10 <sup>3</sup> gal)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
Acenaphthene	83-32-9	2.11E-05	0.0000002	0.0000010
Acenaphthylene	208-96-8	2.53E-07	0.0000000	0.0000000
Anthracene	120-12-7	1.22E-06	0.0000000	0.0000001
Benzene	71-43-2	2.14E-04	0.0000024	0.0000103
Benzo(a)anthracene	56-55-3	4.01E-06	0.0000000	0.0000002
Benzo(b,k)fluoranthene	205-99-2	1.48E-06	0.0000000	0.0000001
Benzo(g,h,i)perylene	191-24-2	2.26E-06	0.0000000	0.0000001
Chrysene	218-01-9	2.38E-06	0.0000000	0.0000001
Dibenzo(a,h)anthracene		1.67E-06	0.0000000	0.0000001
Ethylbenzene	100-41-4	6.36E-05	0.0000007	0.0000031
Fluoranthene	206-44-0	4.84E-06	0.0000001	0.0000002
Fluorene	86-73-7	4.47E-06	0.0000000	0.0000002
Formaldehyde	50-00-0	6.10E-02	0.0006710	0.0029390
Indeno(1,2,3-cd)pyrene	193-39-5	2.14E-06	0.0000000	0.0000001
Naphthalene	91-20-3	1.13E-03	0.0000124	0.0000544
Phenanthrene	85-01-8	1.05E-05	0.0000001	0.0000005
Pyrene	129-00-0	4.25E-06	0.0000000	0.0000002
Toluene	108-88-3	6.20E-03	0.0000682	0.0002987
Xylene	1330-20-7	1.09E-04	0.0000012	0.0000053
<b>Total of Organic Compounds</b>			<b>0.0007565</b>	<b>0.0033137</b>

### HAPs Metals:

*Hourly emissions = EF, lbs/ 1x10<sup>12</sup> BTU \* Rated Capacity, BTU/ hr*

*Annual emissions, tons/ yr = Hourly emissions, lbs/ hr \* hours/ year \* 1 ton/ 2000 lbs*

HAPs Metals		Emission Factor (lbs/ 10 <sup>12</sup> Btu)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
Arsenic		4	0.0000048	0.0000210
Beryllium		3	0.0000036	0.0000158
Cadmium		3	0.0000036	0.0000158
Chromium		3	0.0000036	0.0000158
Lead		9	0.0000108	0.0000473
Manganese		6	0.0000072	0.0000315
Mercury		3	0.0000036	0.0000158
Nickel		3	0.0000036	0.0000158
Selenium		15	0.0000180	0.0000788
<b>Total HAPs Metals</b>			<b>0.0000588</b>	<b>0.0002575</b>