

**ALLEGHENY COUNTY HEALTH DEPARTMENT
AIR QUALITY PROGRAM**

March 3, 2015

SUBJECT: **The Lane Construction Corporation,
McKees Rocks Plant**
Foot of Robb Street
McKees Rocks, PA 15136
Allegheny County

Minor Source Operating Permit No. 0071

TO: Sandra L. Etzel
Chief Engineer

FROM: Michael Dorman
Air Quality Engineer

FACILITY DESCRIPTION:

The Lane Construction Corporation McKees Rocks Facility (Lane – McKees Rocks) contains a 300 ton per hour parallel flow hot mix asphalt plant, a liquid asphalt heater, two (2) liquid asphalt tanks one @ 20,000 gal and one @ 30,000 gal), one (1) 500 gallon diesel fuel tank, two (2) 300ton, heated asphalt silos with a drag conveyor, one (1) 50 ton dust silo that collects baghouse dust for recycling and associated aggregate storage piles.

This facility is a synthetic minor source of sulfur dioxide (SO₂) and nitrogen oxides (NO_x) and a minor source of particulate matter (PM), particulate matter < 10 microns in diameter (PM-10), particulate matter < 2.5 microns in diameter (PM-2.5), carbon monoxide (CO), volatile organic compounds (VOCs) and hazardous air pollutants (HAPs) as defined in §2101.20 of Article XXI.

PERMIT APPLICATION COMPONENTS:

1. Operating Permit application #0071, received August 19, 2013.
2. Additional Operating Permit information, received September 12, 2013.
3. E-mail received August 28, 2013.
4. E-mail received August 30, 2013.
5. E-mail received September 3, 2013.
6. E-mail received October 15, 2013.
7. E-mail received October 16, 2013.
8. E-mail received October 28, 2013.
9. E-mail received October 1, 2013.
10. E-mail received November 4, 2013.
11. E-mail received November 11, 2013.
12. E-mail received December 4, 2013.
13. Telephone conversation January 4, 2012.
14. Telephone conversation December 4, 2013.
15. Comments received October 22, 2014

EMISSION SOURCES:

Emissions Sources

I.D.	SOURCE DESCRIPTION	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK I.D.
P001	PVM-10x Drum Dryer with Hauck Astec Burner	Baghouse	300 tons/hr	Asphalt Materials	S001
P002	Two (2) Liquid Asphalt Tanks with Heatec Tank Heater	None	One 20,000 gal One 30,000 gal	Natural Gas and No.2 Fuel Oil	S001
P003	Two (2) Asphalt Silos with Drag Conveyor	None	300 tons each	Asphalt	S002
P004	Aggregate Stockpiles	Watering	231,000 tons	Aggregate and Recycled Asphalt	None
D001	No. 2 Fuel Oil Tank	None	500 gal	No. 2 Fuel Oil	None
D002	Dust Silo	None	50 tons	Baghouse Dust	None
F001	Roads and Vehicles	Watering	NA	NA	None

METHOD OF DEMONSTRATING COMPLIANCE:

Compliance with the emission standards set forth in this permit will be demonstrated by performance testing for PM, PM-10, PM-2.5, SO₂, NO_x, CO, VOCs and HAPs. See Synthetic Minor Source Operating Permit No. 0071 for the specific conditions for determining compliance with the applicable requirements. Compliance with the short-term (lb/hr) limits must be maintained at all times, including startup and shutdown. Any emissions due to startup, shutdown, or malfunction are included in facility's total annual emissions.

REGULATORY APPLICABILITY:

1. **Article XXI Requirements for Issuance:**

The requirements of Article XXI, Part C for the issuance of operating permits have been met for this facility. Article XXI, Part D, Part E and Part H will have the necessary sections addressed individually.

2. **BACT Analysis:**

Operating Permit Application No. 0071 does not contain a BACT analysis because none is required for an operating permit.

3. **Testing Requirements:**

The permittee shall conduct testing of the facility for PM, PM-10, PM-2.5, NO_x, CO and VOCs at least once every 5 years. The Department reserves the right to require additional testing if necessary in the future to assure compliance with the terms and conditions of this Synthetic Minor Source Operating Permit.

4. **Applicable New Source Performance Standards (NSPS):**

The installation is subject to 40 CFR Part 60 Subpart I - *Standards of Performance for Hot Mix Asphalt Facilities*. The requirements for this Part and Subpart are included in the Synthetic Minor Operating Permit.

5. **Non-Applicable New Source Performance Standards (NSPS):**

No storage tanks at this site meet the applicability requirements of 40 CFR Part 60, Subpart Kb – *Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels)*

for which Construction, Reconstruction, or Modification Commenced After July 23, 1984. The fuel tank on site has a capacity below the applicability threshold of 75 cubic meters (19,812.9 gal).

The installation is not subject to 40 CFR Part 60 Subpart OOO - *Standards of Performance for Nonmetallic Mineral Processing Plants*. The basis for this exemption is 40 CFR §60.670(b) which exempts this facility from 40 CFR Part 60 Subpart OOO because it is subject to 40 CFR Part 60 Subpart I.

6. Applicable NESHAP and MACT Standards:

No NESHAP or MACT Standards are applicable to this facility.

7. New Source Review/Prevention of Significant Deterioration (NSR/PSD):

Neither New Source Review nor Prevention of Significant Deterioration (NSR/PSD) applies to this facility because it is a synthetic minor source.

8. Risk Management Plan; CAA Section 112(r):

The facility is not required to have a risk management plan at this time because none of the regulated chemicals exceed the thresholds in the regulation.

9. Greenhouse Gas Reporting (40 CFR Part 98):

Greenhouse gases (GHGs) from this facility come from the combustion units. Only two (2) of the six GHG categories apply: CO₂, and CH₄ (methane). Based on the calculation methodology in 40 CFR Part 98, §98.33(a)(1), potential emissions of CO₂e are 20,304.32 tpy. This is less than the 100,000 tpy major source threshold; therefore the facility is not considered a major source of GHG emissions. See below.

CO₂e emissions are based on the emission factor for CO₂ found in AP-42.

Drum Plant:

CO₂: $(33 \text{ lb/ton} \times 300 \text{ tons/hr} \times 2400 \text{ hr/yr}) \div 2000 \text{ lb/ton} = \mathbf{11,880 \text{ tons/yr CO}_2}$

Methane: $(0.012 \text{ lb/ton} \times 300 \text{ tons/hr} \times 2400 \text{ hr/yr}) \div 2000 \text{ lb/ton} = 4.32 \text{ tons/yr methane}$

$4.32 \text{ ton/yr methane} \times 21 \text{ global warming potential} = \mathbf{90.72 \text{ tons CO}_2\text{e}}$

Asphalt Cement Tank Heater:

$1,000,000 \text{ Btu/hr} \div 1050 \text{ Btu/ft}^3 = 952.38 \text{ ft}^3/\text{hr}$

CO₂: $(120,000 \text{ lbs/1,000,000 cf} \times 952.38 \text{ ft}^3/\text{hr} \times 2400 \text{ hr/yr}) \div 2000 \text{ lb/ton} = \mathbf{137.14 \text{ tons/yr CO}_2}$

Methane: $(2.3 \text{ lbs/1,000,000 cf} \times 952.38 \text{ ft}^3/\text{hr} \times 2400 \text{ hr/yr}) \div 2000 = 0.00263 \text{ tons/yr methane}$

$0.00263 \text{ ton/yr methane} \times 21 \text{ global warming potential} = 0.06312 \text{ tons CO}_2\text{e round to } \mathbf{0.06 \text{ tons CO}_2\text{e}}$

$11,880 \text{ tons/yr} + 90.72 \text{ tons/yr} \times 137.14 \text{ tons/yr} \times 0.06 \text{ tons/yr} = \mathbf{12,107.92 \text{ tons/yr CO}_2}$

The potential CO₂e emissions, from this source, are under the 25,000 metric ton applicability threshold for the reporting rule. Should the facility exceed 25,000 metric tons of CO₂e in any 12-month period, the facility would have to submit reports in accordance with 40 CFR Part 98.

EMISSION CALCULATIONS

PARALLEL FLOW ASPHALT DRUM MIX PLANT WITH HAUCK ECO-STAR ESII-115 BURNER

PM calculations are based on a baghouse emission limit of 0.01 grains per dscf. SO₂, NO_x, CO and VOC emissions are based on stack test results. The pounds per ton stack test emissions rates were multiplied by the maximum production rate of 300 tons per hour to calculate potential to emit. A Note: 20 percent was added to the stack test emissions rates, with the exception of NO_x, to account for the variance in stack test emissions.

PM/PM10/PM2.5:

$0.01 \text{ gr/cf} \times 65,000 \text{ cf/min} \times 60 \text{ min/hr} \times 1 \text{ lb/7,000 gr} = \mathbf{5.57 \text{ lb/hr}}$

$(5.57 \text{ lb/hr} \times 2400 \text{ hr/yr}) \div 2000 \text{ lb/ton} = \mathbf{6.68 \text{ tons/yr}}$

SO₂: Calculation based on October 17, 2002 stack test results

$0.137 \text{ lb/ton} \times 300 \text{ tons/hr} = 41.1 \text{ lb/hr}$

$41.1 \text{ lb/hr} \times 1.2 = \mathbf{49.32 \text{ lb/hr}}$

$$(49.32 \text{ lb/hr} \times 2400 \text{ hr/yr}) \div 2000 \text{ lb/ton} = 59.184 \text{ lb/hr round to } \mathbf{59.18 \text{ tons/yr}}$$

SO₂: Alternate SO₂ calculation method based on AP-42. This method is used to determine how much coal may be burn per 12-month rolling period such that the SO₂ emissions do not exceed the major source threshold. A factor of 1.15 is included in the calculation due to variability of AP-42 data. Data comes from AP-42 Chapter 1.1

COAL:

Parameters:

The drum burner is rated at 90.00MMBtu/hr

The maximum coal to natural gas ratio is 90% coal and 10% natural gas

This is equivalent to 3.09 tons/hour of coal and 8571.46 cubic feet of gas/hr based a Btu value of bituminous coal is 26.2 MMBtu/ton and a Btu value of natural gas used at this site is 1,050 Btu/cubic foot

Maximum potential coal usage per 12-month rolling period is:

$$3.09 \text{ tph coal} \times 2400 \text{ hr/yr} = 7416 \text{ tpy coal}$$

For this permit, the maximum sulfur value of the coal is limited to 2.0%

The sulfur emission factor used is 38S (in pounds per ton of coal combusted) where S is the percent sulfur in the coal.

The SO₂ emission limit for this permit will be ± 90 tpy to avoid the risk of emissions at the major source level.

$$(38 \text{ lbs/ton} \times 2\% S) \times 3.09 \text{ tons/hr coal } 1.15 = \mathbf{270.07 \text{ lbs/hr } SO_2}$$

$$(270.07 \text{ lb/hr} \times 2400 \text{ hr/yr}) \div 2000 \text{ lb/ton} = \mathbf{324.08 \text{ tons/yr } SO_2}$$

The number above makes this facility a major source based on a maximum coal usage of 7,416 tons/yr.

To calculate the amount of coal usage resulting in emissions of 90 tpy of SO₂ use the following equations:

$$(3.09 \text{ tph coal}/x) = (324.08 \text{ tpy } SO_2/90 \text{ TPY } SO_2)$$

$$x = (3.09 \text{ tph coal} \times 90)/324.08 = \mathbf{0.86 \text{ tons/hr coal for } 90.2 \text{ tpy } SO_2}$$

$$0.86 \text{ tph coal} \times 2400 \text{ hr/yr} = \mathbf{2,064 \text{ tons/yr coal}}$$

Confirmation Check

$$(38 \text{ lbs/ton} \times 2\% S) \times 0.86 \text{ tons/hr coal } 1.15 = \mathbf{75.164 \text{ lbs/hr } SO_2}$$

$$(75.164 \text{ lb/hr} \times 2400 \text{ hr/yr}) \div 2000 \text{ lb/ton} = \mathbf{90.2 \text{ tons/yr } SO_2}$$

NATURAL GAS:

The SO₂ emissions for natural gas are based on the emission factors in Table 11.1-7 of AP-42

$$0.0034 \text{ lb/ton} \times 300 \text{ tph} \times 1.15 = \mathbf{1.173 \text{ lb/hr } SO_2}$$

$$(1.173 \text{ lb/hr} \times 2400 \text{ hr/yr}) \div 2000 \text{ lb/ton} = \mathbf{1.41 \text{ tons/yr } SO_2}$$

Total SO₂ emitted per year:

$$90.2 \text{ tpy } SO_2 (\text{coal}) + 1.41 \text{ tpy } SO_2 (\text{NG}) = \mathbf{91.61 \text{ tpy } SO_2}$$

HCl: and HF

Emission factors

HCl: 1.2 lb/ton

HF: 0.15 lb/ton

2,064 tpy of coal consumed

HCl

$$(2064 \text{ tpy} \times 1.2 \text{ lb/ton}) \div 2,000 \text{ lb/ton} = 1.24 \text{ tpy}$$

$$HF(2064 \text{ tpy} \times 0.15 \text{ lb/ton}) \div 2,000 \text{ lb/ton} = 0.15 \text{ tpy}$$

NO_x:

$$0.249 \text{ lb/ton} \times 300 \text{ tons/hr} = \mathbf{74.7 \text{ lb/hr}}$$

$$(74.7 \text{ lb/hr} \times 2400 \text{ hr/yr}) \div 2000 \text{ lb/ton} = \mathbf{89.64 \text{ tons/yr}}$$

CO

$$0.061 \text{ lb/ton} \times 300 \text{ tons/hr} = 18.3 \text{ lb/hr}$$

$$18.3 \times 1.20 = \mathbf{21.96 \text{ lb/hr}}$$
$$(21.96 \text{ lb/hr} \times 2400 \text{ hr/yr}) \div 2000 \text{ lb/ton} = \mathbf{26.35 \text{ tons/yr}}$$

VOC:

$$0.024 \text{ lb/ton} \times 300 \text{ tons/hr} = 7.2 \text{ lb/hr}$$
$$7.2 \times 1.20 = \mathbf{8.64 \text{ lb/hr}}$$
$$(8.64 \text{ lb/hr} \times 2400 \text{ hr/yr}) \div 2000 \text{ lb/ton} = \mathbf{10.37 \text{ tons/yr}}$$

HAPs:

$$0.0053 \text{ lb/ton} \times 300 \text{ tons/hr} = 1.59 \text{ lb/hr}$$
$$1.59 \times 1.20 = \mathbf{1.83 \text{ lb/hr}}$$
$$(1.83 \text{ lb/hr} \times 2400 \text{ hr/yr}) \div 2000 \text{ lb/ton} = \mathbf{2.64 \text{ tons/yr}}$$

LIQUID ASPHALT TANKS WITH HEATEC HC-200 POWER FLAME BURNER

These calculations are based on emission factors found in Article XXI and AP-42. Note: 15 percent was added to the AP-42 emissions rates to account for the variance in the AP-42 emission factors. The burner is rated at 1.0 MMBtu/hr. The btu rating for the natural gas is 1050 btu/cf.
 $1,000,000 \text{ btu/hr} \div 1050 \text{ btu/scf} = 952.38 \text{ scf/hr}$

PM/PM10/PM2.5:

$$0.008 \text{ lb/1,000,000 Btu} \times 1,000,000 \text{ btu/hr} = \mathbf{0.008 \text{ lb/hr}}$$
$$(0.008 \text{ lb/hr} \times 2400 \text{ hr/yr}) \div 2000 \text{ lb/ton} = \mathbf{0.01 \text{ tons/yr}}$$

SO₂:

$$0.6 \text{ lb/1,000,000 scf} \times 952.38 \text{ scf/hr} = 0.000571 \text{ lb/hr}$$
$$0.000571 \text{ lb/hr} \times 1.15 = 0.000657 \text{ lb/hr} \text{ round to } \mathbf{0.0007 \text{ lb/hr}}$$
$$(0.0007 \text{ lb/hr} \times 2400 \text{ hr/yr}) \div 2000 \text{ lb/ton} = \mathbf{0.0008 \text{ tons/yr}}$$

NO_x:

$$100 \text{ lb/1,000,000 scf} \times 952.38 \text{ scf/hr} = 0.095238 \text{ lb/hr}$$
$$0.095238 \text{ lb/hr} \times 1.15 = 0.109524 \text{ round to } \mathbf{0.11 \text{ lb/hr}}$$
$$(0.11 \text{ lb/hr} \times 2400 \text{ hr/yr}) \div 2000 \text{ lb/ton} = \mathbf{0.13 \text{ tons/yr}}$$

CO:

$$84 \text{ lb/1,000,000 scf} \times 952.38 \text{ scf/hr} = 0.08 \text{ lb/hr}$$
$$0.08 \text{ lb/hr} \times 1.15 = \mathbf{0.092 \text{ lb/hr}}$$
$$(0.092 \text{ lb/hr} \times 2400 \text{ hr/yr}) \div 2000 \text{ lb/ton} = 0.1104 \text{ round to } \mathbf{0.11 \text{ tons/yr}}$$

VOC:

$$5.5 \text{ lb/1,000,000 scf} \times 952.38 \text{ scf/hr} = 0.005238 \text{ lb/hr}$$
$$0.005238 \text{ lb/hr} \times 1.15 = \mathbf{0.006 \text{ lb/hr}}$$
$$(0.006 \text{ lb/hr} \times 2400 \text{ hr/yr}) \div 2000 \text{ lb/ton} = 0.0072 \text{ round to } \mathbf{0.007 \text{ tons/yr}}$$

EMISSIONS SUMMARY:

Emissions Summary for The Lane Construction Corporation

POLLUTANTS	TOTAL NG (tpy[*])
Particulate Matter	6.69
Particulate Matter <10 µm (PM ₁₀)	6.69
Particulate Matter <2.5 µm (PM _{2.5})	6.69
Sulfur Oxides (SO ₂)	91.61
Nitrogen Oxides (NO _x)	89.77
Carbon Monoxide (CO)	26.46
Volatile Organic Compounds (VOCs)	10.38
Hazardous Air Pollutants (HAPs)	2.64
Carbon Dioxide	12,107.92

* A year is defined as any consecutive 12-month period.

RECOMMENDATION:

All applicable Federal, State, and County regulations have been addressed in the permit. Section 2102.04.k of Article XXI does not apply because no Notices of Violation were issued to this facility within the last 18 months. It is recommended that this installation permit for The Lane Construction Corporation – McKees Rocks facility should be approved with the emission limitations and terms and conditions in Minor Source Operating Permit No. 0071.