



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-2340D (*After-the-Fact*)
Plant ID No.: 073-00020
Applicant: Kelly Paving, Inc.
Facility Name: St. Marys Plant #14
Location: St. Marys, Pleasants County
NAICS Code: 324121
Application Type: Modification
Received Date: November 12, 2015
Engineer Assigned: Thornton E. Martin Jr.
Fee Amount: \$2,000.00
Date Received: November 17, 2015
Complete Date: December 16, 2015
Applicant Ad Date: November 21, 2015
Newspaper: *Pleasants County Leader*
UTM's: Easting: 488.850 km Northing: 4365.991 km Zone: 17
Description: Applicant proposes to add conveyors and a RAP crusher after-the-fact. The equipment was installed in June 2014 and are currently operating.

PROCESS DESCRIPTION

The facility can operate as a batch plant or a drum mix plant. The facility cannot operate in both modes simultaneously; the plant operates as either batch mix or drum mix depending on the customer orders.

Aggregates (limestone, sand and RAP) are trucked or barged to the site and stored in open stockpile OS1/N (TP1/MDH). Aggregates from stockpile OS1/N are transferred by a front endloader to cold feed bins B1/PE through B6/PE (TP2/MD). The aggregates from B1/PE drop to belt conveyor BC1/N; B2/PE to BC2/N; B3/PE to BC4/N; B4/PE to BC4/N; B5/PE to BC5/N and B6/PE to BC6/N (TP3/N). BC1/N through BC6/N transfer to BC7/N (TP4/N) to screen S1/PW (TP5/N). Oversize material S1/PE goes to the ground (TP6A/N); pass through material transfers to belt conveyor BC8/N (TP6/N) which conveys the aggregates to the dryer AP1/BH1 [E-BH1] (TP7/N). Hot aggregate is transferred by the aggregate elevator EL1/BH1[E-BH1] to either the batch tower BT1/BH1[E-BH1] or to the mixer drum MD1/BH1[E-BH1] (TP15/FE).

RAP from stockpile OS1/N is transferred by front endloader to RAP bin B7/PE or B8/PE

(TP8/MDH). B8/PE. B7/PE drop material to screen S2/PW (TP9/N) then to belt conveyor BC9/N (TP10/N) to the batch tower BT1/BH1[E-BH1] (TP11/PE). Oversized material from S2 transfers to belt conveyor BC11 (TP10A/N). B8/PE drops material to screen S3/PW (TP12/N) then to belt conveyor BC10/N (TP13/N) to the mixer drum MD1/BH1[E-BH1] (TP14/PE). Oversized material from S3 transfers to belt conveyor BC11 (TP13A/N).

HMA from BT1/BH1[E-BH1] transfers to either truck (TP16/PE) or the hopper B9/PE (TP17/PE) to slat conveyor SLC1/FE (TP18/PE). HMA from MD1/BH1 [E-BH1] to hopper H1 (TP17/PE) to slat conveyor SLC1/FE (TP18/PE). SLC1/N transfers HMA to silo BS1/FE or BS2/FE (TP19/FE) then to truck (TP20/PE).

Emissions from AP1, BT1 and MD1 are vented to the baghouse BH1[E-BH1]. Particulate matter collected in the bottom of BH1 is removed via a screw conveyor SC1/FE (TP21/FE) that returns the material to the process (TP22/FE) where it becomes part of the product.

See the following tables for description, maximum throughput, control equipment, and maximum storage for all permitted equipment at the St. Marys facility:

Table 1: Equipment Summary (R13-2340D)

Equipment ID No.	Description	Installation / Modification Date	Type and Date of Change	Maximum Capacity		Control Equipment ¹
				TPH	TPY	
Equipment						
MD1	Mixer Drum	2013	No Change	250	450,000	BH
AP1	Dryer	Existing	No Change	250	450,000	BH
EL1	Aggregate Elevator	2005	No Change	250	450,000	BH
BT1	Batch Tower (hot screens, mixer)	2005	No Change	250	450,000	BH
CR1	In-line RAP Crusher	2014	New	65	180,000	FE
S1	Aggregate Screen	2005	No Change	250	450,000	PW
S2	RAP Screen	2005	No Change	65	112,500	PW
S3	RAP Screen	2013	No Change	65		PW
H1	Asphalt Heater --	2005	No Change	2,000 scfh	140 gph	N
Conveyors						
BC1	Belt Conveyor	Existing	No Change	250	450,000	N
BC2	Belt Conveyor	Existing	No Change	250	450,000	N
BC3	Belt Conveyor (ID originally Stockpile)	Existing	No Change	250	450,000	N
BC4	Belt Conveyor	2005	No Change	250	450,000	N
BC5	Belt Conveyor	2013	No Change	250	450,000	N
BC6	Belt Conveyor	2013	No Change	250	450,000	N
BC7	Belt Conveyor (formerly BC1)	2005	No Change	250	450,000	N
BC8	Belt Conveyor (formerly BC2)	2005	No Change	250	450,000	N
BC9	Belt Conveyor (formerly BC4)	2005	No Change	65	112,500	N
BC10	Belt Conveyor	2013	No Change	65	112,500	N
BC11	Belt Conveyor	2014	New	65	180,000	N
BC12	Belt Conveyor	2014	New	65	180,000	N
BC13	Belt Conveyor	2014	New	65	180,000	N
SLC1	Slat Conveyor (Hot Mix Asphalt)	2005	No Change	250	450,000	FE
SC1	Screw Conveyor (baghouse dust)	2005	No Change	10	12,500	FE
Storage						
OS1	Aggregate/Limestone/Slag/Sand/RAP	2013	No Change	25,000 tons	450,000	N
TK1	Storage Tank – Asphalt Cement	2005	No Change	30,000 gal	6,000,000	FE
TK2	Storage Tank – Asphalt Cement	2005	No Change	18,500 gal		FE

Equipment ID No.	Description	Installation / Modification Date	Type and Date of Change	Maximum Capacity		Control Equipment ¹
				TPH	TPY	
TK3	Storage Tank – Fuel	2005	No Change	12,000 gal	1,500,000	FE
TK4	Storage Tank – Fuel	2005	No Change	10,000 gal		FE
B1	Aggregate Bin	Existing	No Change	30 tons	450,000	PE
B2	Aggregate Bin	Existing	No Change	30 tons		PE
B3	Aggregate Bin	Existing	No Change	30 tons		PE
B4	Aggregate Bin	Existing	No Change	30 tons		PE
B5	Aggregate Bin	2013	No Change	30 tons		PE
B6	Aggregate Bin	2013	No Change	30 tons		PE
B7	RAP Bin	2005	No Change	15 tons	125,000	PE
B8	RAP Bin	2013	No Change	15 tons		PE
B9	Slide Hopper HMA	2005	No Change	250	450,000	PE
BS1	HMA Silo (ID originally Fines Silo,	2005	No Change	100 tons	450,000	FE
BS2	HMA Silo	2005	No Change	100 tons		FE

¹ FE - Full Enclosure; PE - Partial Enclosure; BH - Baghouse; PW - Partial Enclosure w/water spray; N - None

SITE INSPECTION

Douglas Hammell of the Compliance and Enforcement section performed targeted, un-announced partial on-site inspection on September 23, 2015. The facility received a status code of 30 - In Compliance. As this facility is on the inspections list and the application is after-the-fact, the writer deemed that a site visit was not necessary at this time.

Directions given in application: North on WV Route 2 from St. Marys, past Collin Anderson Center, through Raven Rock, site is between Route 2 and the Ohio River near the mouth of Riggs Run.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emission calculations for this facility were performed by Potesta & Associates, Inc. (Consultant) and reviewed by the writer for completeness and accuracy. AP-42 Section 13.2.4 (Miscellaneous Sources: Aggregate Handling and Storage Piles) was used to obtain emission factors for material handling transfer points. The WVDAQ G10-D Emissions Spreadsheet was utilized to calculate the stockpile emissions. The Emission Factor Equation from AP-42 Section 13.2.2 Unpaved Roads (November 2006) was used to calculate emissions for Unpaved Haulroads.

Proposed change to plant emissions are summarized in the following table 2a:

Table 2a: Proposed change to criteria pollutant emissions (R13-2340D)

Source	Particulate Matter		Particulate Matter-10		Particulate Matter-2.5	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Total	2.02	2.58	1.46	1.63	0.26	0.28

Current plant emissions are summarized in the following tables 3a and 3b:

Table 3a: Current criteria pollutant emissions (R13-2340C)

Source	Particulate Matter		Particulate Matter-10		Particulate Matter-2.5		Volatile Organic Compounds		Sulfur Dioxide		Nitrogen Oxides		Carbon Monoxide	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Total	32.84	32.81	9.60	9.74	1.79	3.14	20.10	17.25	26.08	32.14	30.20	27.60	101.72	91.61

Table 3b: Current hazardous/toxic pollutant emissions (R13-2340C)

Source	Acetaldehyde		Benzene		Ethylbenzene		Toluene		Xylene		Formaldehyd	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Total	0.33	0.29	0.11	0.10	0.56	0.51	0.78	0.70	0.73	0.65	0.68	0.61

Total proposed plant emissions are summarized in the following tables 4a and 4b:

Table 4a: Total proposed criteria pollutant emissions (R13-2340D)

Source	Particulate Matter		Particulate Matter-10		Particulate Matter-2.5		Volatile Organic Compounds		Sulfur Dioxide		Nitrogen Oxides		Carbon Monoxide	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Total	34.86	35.39	11.06	11.37	2.04	3.42	20.10	17.25	26.08	32.14	30.20	27.60	101.72	91.61

Table 4b: Total proposed hazardous/toxic pollutant emissions (R13-2340D)

Source	Acetaldehyde		Benzene		Ethylbenzene		Toluene		Xylene		Formaldehyd	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Total	0.33	0.29	0.11	0.10	0.56	0.51	0.78	0.70	0.73	0.65	0.68	0.61

REGULATORY APPLICABILITY

NESHAPS and PSD have no applicability to the proposed facility. The proposed modification of a hot mix asphalt plant is subject to the following state and federal rules:

45CSR2 *To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers*

The purpose of this rule is to establish limitations for smoke and particulate matter which are discharged from fuel burning units. Per this rule, Section 2.14 defines an indirect heat exchanger as a device that combusts any fuel and produces steam or heats water or any other heat transfer medium. Section 2.10 defines a fuel burning unit as any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or

other combustible material for the primary purpose of producing heat or power by indirect heat transfer. The facility is exempt from sections 4, 5, 6, 8, and 9 because the asphalt heater (2 MMBtu/hr) is below 10 MMBtu/hr. The facility will be subject to the opacity requirements in this rule, which is 10% opacity based on a six minute block average.

45CSR3 To Prevent and Control Air Pollution from the Operation of Hot Mix Asphalt Plants

The purpose of this rule is to establish emission limitations for hot mix asphalt plants and the plant property. The facility is subject to this rule because it meets the definition of Hot Mix Asphalt Plant as found in Section 2.14. The facility must meet visible emission limits of 40% opacity during start-up or shutdown and 20% opacity during operations of any fuel burning equipment. The facility shall be operated and maintained in a manner as to prevent emission of particulate matter from any point other than a stack outlet. The facility will utilize water sprays, partial enclosures, full enclosures, and baghouses to minimize particulate emissions.

45CSR7 To Prevent and Control Particulate Matter Air Pollution from Manufacturing Processes and Associate Operations

The purpose of this rule is to prevent and control particulate matter air pollution from manufacturing processes and associated operations. The facility is subject to the requirements of this rule because it meets the definition of "Manufacturing Process" found in Section 2.20 of this rule.; Subsection 3.7 – no visible emissions from any storage structure pursuant to subsection 5.1 which is required to have an enclosure; Subsection 4.1 – PM emissions shall not exceed those under Table 45-7A (see paragraph below); Subsection 5.1 – manufacturing process and storage structures must be equipped with a system to minimize emissions (BH control emissions from the drum mixer MD1, the Dryer AP1, the Aggregate Elevator EL1 and the Batch Tower BT1); Subsection 5.2 – minimize PM emissions from haulroads and plant premises (water sprays will be utilized to control these emissions).

According to Table 45-7A, for a type 'a' source with a maximum process weight rate of 500,000 lb/hr, the maximum allowable emission rate is approximately 50 lb/hr of particulate matter. The proposed maximum emission rate at the facility is 34.86 lb/hr of particulate matter according to calculated emissions in permit application R13-2340C.

45CSR10 To Prevent and Control Air Pollution from Emissions of Sulfur Oxides

The purpose of this rule is to prevent and control air pollution from the emission of sulfur oxides. Per this rule, Section 2.9 defines an indirect heat exchanger as a device that combusts any fuel and produces steam or heats water or any other heat transfer medium. Section 2.8 defines a fuel burning unit as any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer. This facility is exempt from sections 3 and 6 because the liquid asphalt heater (2 MMBtu/hr) is below 10 MMBtu/hr. According to section 4.1., sulfur dioxide concentrations must fall below 2,000 parts per million by volume.

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

The proposed Modification is subject to the requirements of 45CSR13 because it will result in the potential to discharge less than six (6) pounds per hour and ten (10) tons per year of a regulated air pollutant (PM and PM₁₀) and will involve the construction of equipment subject to NSPS, Subparts I and OOO. The facility is subject to the following sections of this rule: reporting requirements, requirements for modifications of stationary sources, demonstrating compliance with stationary sources, public review procedures, and permit application fees. The facility will demonstrate compliance by following all the applicable rules and regulations that apply to the facility. They will also follow the terms and conditions set forth in permit R13-2340D. The applicant published a Class I legal advertisement in the *Pleasants County Leader* on November 21, 2015 and submitted an application fee of \$1,000.00 as well as the \$1,000.00 NSPS fee.

45CSR16 *Standards of Performance for New Stationary Sources*

This rule establishes and adopts standards of performance for new stationary sources promulgated by the United States Environmental Protection Agency pursuant to section 111(b) of the federal Clean Air Act, as amended (CAA). The facility is subject to 40CFR60 Subparts I and OOO.

45CSR30 *Requirements for Operating Permits*

The facility's potential to emit will be 4.24 tpy of a regulated air pollutant (PM₁₀), not including fugitive emissions, which is less than the 45CSR30 threshold of 100 tpy for a major source. However, the facility is subject to 40 CFR 60 Subpart Y. Therefore, the facility is still subject to 45CSR30 and classified as a Title V deferred non-major source.

40CFR60 *Subpart I: Standards of Performance for Hot Mix Asphalt Facilities*

The facility is subject to this Subpart because it meets the definition of "hot mix asphalt facility" as defined in 60.91(a) – hot mix asphalt facility means any facility used to manufacture hot mix asphalt by heating and drying aggregate and mixing with asphalt cements and consisting 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.

40CFR60 *Subpart OOO: Standards of Performance for Nonmetallic Minerals Processing Plant*

In addition to nonmetallic minerals processing plants, provisions of this subpart also apply to crushers and grinding mills at 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 are subject to the provisions of this subpart. The facility shall be in compliance with 60.672 (b) no greater than 7% opacity from any transfer point on belt conveyors or from any other affected facility (as

defined in 60.670 and 60.671) and no greater than 12% opacity from any crusher when the particulate matter control methods and devices (all control methods shown in equipment table) proposed within application R13-2340D are in operation.

The proposed modification of Kelly Paving, Inc.' existing hot mix asphalt plant is not subject to the following state and federal rules:

45CSR14 Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration

The facility will have the potential to emit 9.58 TPY of a regulated air pollutant (PM), not including fugitive emissions, which is less than the 45CSR14 threshold of 250 TPY. This facility is not listed in Table 2, and so fugitive emissions are not included when determining source applicability. Therefore, the proposed Modification is not subject to the requirements set forth within 45CSR14.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Acetaldehyde:

Acetaldehyde is mainly used as an intermediate in the synthesis of other chemicals. It is ubiquitous in the environment and may be formed in the body from the breakdown of ethanol. Acute (short-term) exposure to acetaldehyde results in effects including irritation of the eyes, skin, and respiratory tract. Symptoms of chronic (long-term) intoxication of acetaldehyde resemble those of alcoholism. Acetaldehyde is considered a probable human carcinogen (Group B2) based on inadequate human cancer studies and animal studies that have shown nasal tumors in rats and laryngeal tumors in hamsters.

Benzene:

Benzene is found in the air from emissions from burning coal and oil, gasoline service stations, and motor vehicle exhaust. Acute (short-term) inhalation exposure of humans to benzene may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness. Chronic (long-term) inhalation exposure has caused various disorders in the blood, including reduced numbers of red blood cells and aplastic anemia, in occupational settings. Reproductive effects have been reported for women exposed by inhalation to high levels, and adverse effects on the developing fetus have been observed in animal tests. Increased incidence of leukemia (cancer of the tissues that form white blood cells) have been observed in humans occupationally exposed to benzene. EPA has classified benzene as a Group A, human carcinogen.

Ethyl Benzene:

Ethyl benzene is mainly used in the manufacturing of styrene. Acute (short-term) exposure to ethyl benzene in humans results in respiratory effects, such as throat irritation and chest constriction, irritation of the eyes, and neurological effects, such as dizziness. Chronic (long-term) exposure to ethyl benzene by inhalation in humans has shown conflicting results regarding its effects on the blood. Animal studies have reported effects on the blood, liver, and kidneys from chronic inhalation exposure to ethyl benzene. Limited information is available on the carcinogenic effects of ethyl benzene in humans. In a study by the National Toxicology Program (NTP), exposure to ethyl benzene by inhalation resulted in an increased incidence of kidney and testicular tumors in rats, and lung and liver tumors in mice. EPA has classified ethyl benzene as a Group D, not classifiable as to human carcinogenicity.

Formaldehyde:

Formaldehyde is used mainly to produce resins used in particle board products and as an intermediate in the synthesis of other chemicals. Exposure to formaldehyde may occur by breathing contaminated indoor air, tobacco smoke, or ambient urban air. Acute (short-term) and chronic (long-term) inhalation exposure to formaldehyde in humans can result in respiratory symptoms, and eye, nose, and throat irritation. Limited human studies have reported an association between formaldehyde exposure and lung and nasopharyngeal cancer. Animal inhalation studies have reported an increased incidence of nasal squamous cell cancer. EPA considers formaldehyde a probable human carcinogen (Group B1).

Toluene:

The acute toxicity of toluene is low. Toluene may cause eye, skin, and respiratory tract irritation. Short-term exposure to high concentrations of toluene (e.g., 600 ppm) may produce fatigue, dizziness, headaches, loss of coordination, nausea, and stupor; 10,000 ppm may cause death from respiratory failure. Ingestion of toluene may cause nausea and vomiting and central nervous system depression. Contact of liquid toluene with the eyes causes temporary irritation. Toluene is a skin irritant and may cause redness and pain when trapped beneath clothing or shoes; prolonged or repeated contact with toluene may result in dry and cracked skin. Because of its odor and irritant effects, toluene is regarded as having good warning properties. The chronic effects of exposure to toluene are much less severe than those of benzene. No carcinogenic effects were reported in animal studies. Equivocal results were obtained in studies to determine developmental effects in animals. Toluene was not observed to be mutagenic in standard studies.

Xylene:

Commercial or mixed xylene usually contains about 40-65% *m*-xylene and up to 20% each of *o*-xylene and *p*-xylene and ethyl benzene. Xylenes are released into the atmosphere as fugitive emissions from industrial sources, from auto exhaust, and through volatilization from their use as solvents. Acute (short-term) inhalation exposure to mixed xylenes in humans results in irritation of the eyes, nose, and throat, gastrointestinal effects, eye irritation, and neurological effects. Chronic (long-term) inhalation exposure of humans to mixed xylenes results primarily in central nervous system (CNS) effects, such as headache, dizziness, fatigue, tremors, and incoordination; respiratory, cardiovascular, and kidney effects have also been reported. EPA has classified mixed xylenes as a Group D, not classifiable as to human carcinogenicity.

AIR QUALITY IMPACT ANALYSIS

Air dispersion modeling was not performed due to the size and proposed location of this facility. This facility will be located in Pleasants County, WV, which is currently designated as in attainment for PM_{2.5} (particulate matter less than 2.5 microns in diameter).

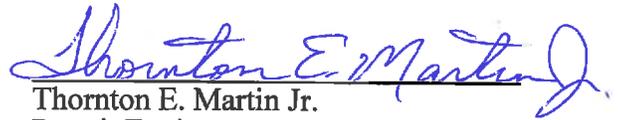
MONITORING OF OPERATIONS

For the purposes of determining compliance with maximum throughput limits, the applicant shall maintain certified daily and monthly records. An example form is included as Appendix A and Appendix B to Permit R13-2340D. Example forms for the Daily Hours of Operation is included as Appendix C to Permit R13-2340D. An example form for the Daily and Yearly Hours of Operation are included as Appendix C and Appendix D to Permit R13-2340D. An example form for the Water Truck Usage is included as Appendix E to Permit R13-2340D. An example form for the Fuel Used In Dryer is included as Appendix F to Permit R13-2340D and an example form for the Sulfur Content of Fuel Oil is included as Appendix G to Permit R13-2340D. The Certification Of Data Accuracy statement shall be completed within fifteen (15) days

of the end of the reporting period. These records shall be maintained on-site for at least five (5) years and be made available to the Director of the Division of Air Quality or his or her duly authorized representative upon request.

RECOMMENDATION TO DIRECTOR

The information contained in the permit application R13-2340D indicates that compliance with all applicable state rules and federal regulations should be achieved when all proposed control methods are in operation. Therefore, the granting of a permit to Kelly Paving, Inc. for the Modification of a hot mix asphalt plant designated as St. Marys Plant #14, in St. Marys, Pleasants County, West Virginia, is hereby recommended.



Thornton E. Martin Jr.
Permit Engineer

December 16, 2015

Date