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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2895
Plant ID No.:	045-00143
Applicant:	Moore Concrete Pumping, Inc.
Facility Name:	Logan Facility
Location:	Logan County
NAICS Code:	327320
Application Type:	Construction
Received Date:	August 15, 2011
Engineer Assigned:	Mindy Hendrickson
Fee Amount:	$2,000
Date Received:	($500 August 5, 2011); ($500 August 17, 2011); ($1,000 August 18, 2011)
Complete Date:	October 12, 2011
Applicant Ad Date:	August 17, 2011
Newspaper:	*The Logan Banner*
UTM's:	Easting: 408.126 km Northing: 4190.808 km Zone: 17
Description:	Applicant proposes the construction of a portable volumetric grout plant with a maximum production rate of 60 cubic yards per hour and 68,040 cubic yards per year. The plant will operate at a maximum of 1,134 hours per year. The portable facility will be temporarily located at the Logan Wal-Mart facility and will be relocated for future projects.

DESCRIPTION OF PROCESS

Moore Concrete Pumping, Inc. (Moore Concrete) is proposing the construction and operation of a portable volumetric grout plant for a project at the Logan Wal-Mart, Logan County. The temporary volumetric grout plant will utilize fly ash, sand, cement, and water to produce a pumpable grout mixture. Up to 100 tons of both fly ash and sand will be supplied by truck to two (2) separate storage piles. This will provide enough material for a two (2) day supply. Both the fly ash and sand storage piles will be located on a cement-paved area and surrounded on three (3) sides by straw bales. The moisture content of the fly ash will range from 15% to 20%, and the sand moisture is estimated at 6%. The storage piles will be tarped when not in use and will be sprayed with water if visible fugitive dust emissions are generated or if the materials appear too dry. A front-end loader will move the fly ash and sand from the storage piles to the designated half of the divided feed hopper. The travel distance between the storage piles and the hopper will range from 100 to 140 feet.

A tanker truck will supply dry cement pneumatically through a fully enclosed pipeline to a Belgrade 200-barrel, low profile cement silo. The silo is equipped with an integral Belle Style dust house with 99.99% control efficiency. The silo has alarms to automatically shut off the flow of cement if the silo reaches a high level. The alarm and shut-off reduce the potential for silo over-pressure. Cement leaves the silo through a volumetric feeder and is then transferred via a totally enclosed system at a rate of up to seven (7) tons per hour to an inclined auger mixer.

Meanwhile, the fly ash and sand mixture is transferred from the feed hopper onto a conveyor belt and the materials are routed to the auger mixer which completes the grout mixing. The grout exits the auger mixer and is transferred by a grout pump through a pipeline to the delivery point. Water sprays will be utilized on haulroads, stockpiles, and work areas as needed.

Moore Concrete will utilize two (2) diesel-fired engines . The Deutz BF6L913 78 kW / 125 hp diesel-fired engine (CE-1) is a 1988 model. The Cummings B3.9-125 93 kW / 105 hp diesel-fired engine (CE-2) is a 2005 model.

The maximum operating capacity for this mixing plant is 60 cubic yards per hour of grout, or 540 cubic yards per 9-hour day. The estimated maximum quantities of material needed to produce 540 cubic yards per day of grout volume are 7 tons of cement, 60 tons of fly ash, and 60 tons of sand. The facility will operate a maximum of 1,134 hours per year.

See the following table for description, maximum throughput, control equipment, and maximum storage for all permitted equipment at the Logan facility:

Table 1: Equipment summary

Equipment ID No.	Description	Year Installed	Maximum Capacity		Control Equipment
Equipment					
CM1	Elkin Stationary Grout Mixer	2012	60 yds^3/ hr	68,040 yds^3 / yr	APCD-1
CE-1	Deutz BF6L913 78 kW diesel engine (1988)	2012	105 hp /		
CE-2	Cummings B3.9-125 93 kW diesel engine	2012	125 hp /		
APCD-1	Baghouse – Belgrade 150 Air Powered	2012			
Storage			**Storage**	**Maximum**	
OS-1	Open Stockpile – Fly Ash		100 tons	68,040 tons / yr	WS, PE
OS-2	Open Stockpile – Sand		100 tons	68,040 tons / yr	WS, PE
BS-1	Storage Silo – Cement	2012	50 tons	7,938 tons / yr	APCD-1
BS-2	Divided Feed Hopper – Fly Ash and Sand	2012	2 tons	136,080 tons / yr	

SITE INSPECTION

A pre-construction site inspection was performed by John Moneypenny of the Compliance and Enforcement section on October 13, 2011. He spoke with Mark Balcar of Moore Concrete. The proposed location is in a small area on the back corner of Wal-Mart. There will be limited space for the stockpile area. There are other businesses within 300 feet. When Moore Concrete originally thought they would be applying for a general permit registration, they did begin to get 300 foot waivers signed. However, these waivers are not required for a Rule 13 Construction permit.

Directions in the application: From Logan, take Rt. 73W to Rt. 119. Turn right onto JB Ellis Branch Rd/George Kostas Dr.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Fugitive emissions include particulate emissions from paved haulroads, stockpiles, and work areas. Water sprays will be utilized on these areas as necessary to minimize particulate emissions. Water from an adjacent heated building will be supplied as needed for winterization. Straw bales will be placed on three (3) sides of both the fly ash and the sand storage piles. The piles will be covered with tarps when not in use.

The transfer of cement to the silo will be fully enclosed with usage of an integral baghouse. The Belgrade 150 baghouse is integral to the Belgrade 200-Barrel, low profile cement silo. When the cement silo is in operation, the baghouse will control particulate matter emissions with an efficiency of 99.99%. At the end of each batch that is pneumatically delivered to the cement silo, an air powered vibrator allows for cleaning of the bags for 5 to 10 minutes .

Two (2) diesel-fired engines will be utilized as power sources at the facility. The Deutz BF6L913 78 kW / 125 hp diesel-fired engine (CE-1) is a 1988 model. The Cummings B3.9-125 93 kW / 105 hp diesel-fired engine (CE-2) is a 2005 model. Each engine will operate a maximum of 1,134 hours per year. The brake specific fuel consumption used in calculating emissions is 7,000 Btu/hp-hr of diesel fuel.

The facility will produce a maximum of 60 cubic yards per hour and 68,040 cubic yards per year of grout product and will operate at a maximum of 1,134 hours per year. Emission factors were obtained from the following: AP-42 Section 11.12, Table 11.2-2 for pneumatic transfers; AP-42 Section 13.2.1 for paved haulroads; AP-42 Section 13.2.4 for material handling; EPA-450/3-88-008, pg. 4-17 (Control of Open Fugitive Dust Sources) for stockpiles; and AP-42 Section 3.3 Tables 3.3-1 and 3.3-2 for the engines. Emission calculations were performed by David Larson of Civil & Environmental Consultants, Inc. on behalf of Moore Concrete.

The maximum controlled emissions for Moore Concrete's Logan facility are summarized in the following tables:

Table 2: Grout production emissions summary

Emission Source	Controlled PM Emissions		Controlled PM_{10} Emissions	
	lb/hour	TPY	lb/hour	TPY
Fugitive Emissions				
Stockpile Emissions	0.028	0.016	0.014	0.008
Paved Haulroad Emissions	1.143	0.649	0.229	0.130
Fugitive Emissions Total	*1.171*	*0.664*	*0.243*	*0.138*
Point Source Emissions				
Material Handling Emissions	0.215	0.122	0.102	0.058
Cement Silo Emissions	0.007	0.004	0.003	0.002
Point Source Emissions Total (PTE)	*0.222*	*0.126*	*0.105*	*0.060*
EMISSIONS TOTAL	**1.393**	**0.790**	**0.348**	**0.198**

Table 3: Engine emissions summary

Source ID	Pollutant*	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions** (tpy)
CE-1	Nitrogen Oxides	3.26	1.846
	Carbon Monoxide	0.70	0.398
	Sulfur Dioxide	0.22	0.122
	Total Particulate Matter	0.23	0.131
	Volatile Organic Compounds	0.26	0.147
	Benzene	0.000686	0.000389
	Toluene	0.000301	0.000170
	Xylenes	0.000209	0.000119
	Formaldehyde	0.000867	0.000492
	Acetaldehyde	0.000564	0.000320
	Total Haps***	0.00285	0.00161
CE-2	Nitrogen Oxides	3.88	2.197
	Carbon Monoxide	0.84	0.473
	Sulfur Dioxide	0.26	0.145
	Total Particulate Matter	0.28	0.156
	Volatile Organic Compounds	0.31	0.175
	Benzene	0.000816	0.000463
	Toluene	0.000358	0.000203
	Xylenes	0.000249	0.000141
	Formaldehyde	0.00103	0.000585
	Acetaldehyde	0.000671	0.000381
	Total HAPs***	0.00339	0.00192
TOTAL	Nitrogen Oxides	7.14	4.043
	Carbon Monoxide	1.54	0.871
	Sulfur Dioxide	0.48	0.267
	Total Particulate Matter	0.51	0.287
	Volatile Organic Compounds	0.57	0.434
	Benzene	0.001502	0.000852
	Toluene	0.000659	0.000373
	Xylenes	0.000458	0.000260
	Formaldehyde	0.001897	0.001077
	Acetaldehyde	0.001235	0.0000701
	Total HAPs***	0.00624	0.00354

* All other individual HAPs are less than 1×10^{-4} pounds per hour and less than 1×10^{-4} tons per year.
** Based on maximum of 1,134 hours of operation per year.
*** All HAPs, including those less than 1×10^{-4} pounds per hour and tons per year.

Table 4: Total Facility Emissions Summary

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tons/yr)
Total Particulate Matter	1.91	1.08
Particulate Matter Less Than 10 Microns	0.86	0.49
Volatile Organic Compounds	0.57	0.44
Carbon Monoxide	1.54	0.88
Nitrogen Oxides	7.14	4.05
Sulfur Dioxide	0.48	0.27
Total HAPs	0.00624	0.00354

REGULATORY APPLICABILITY

NESHAPS and PSD have no applicability to the proposed facility. The proposed construction of a volumetric grout plant is subject to the following state and federal rules:

45CSR7 To Prevent and Control Particulate Matter Air Pollution From Manufacturing Processes and Associated 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 45CSR7 because it meets the definition of "Manufacturing Process" found in subsection 45CSR7.2.20. The facility will need to be in compliance with Subsection 3.1 -- no greater than 20% opacity (opacity monitoring, recordkeeping, and reporting requirements are included in permit 13-2895), Subsection 3.7 -- no visible emissions from any storage structure pursuant to subsection 5.1 which is required to have a full enclosure and be equipped with a control device (cement storage silo BS-1 is enclosed and controlled by the integrated baghouse APCD-1), Subsection 4.1 – PM emissions shall not exceed those allowed under Table 45-7A (see paragraph below), Subsection 5.1 – manufacturing process and storage structures must be equipped with a system to minimize emissions (a fully integrated baghouse APCD-1 controls emissions from the cement storage silo BS-1 and the stationary grout mixer CM-1), Subsection 5.2 – minimize PM emissions from haulroads and plant premises (Access roads are fully paved. Roads, stockpiles, and work areas will be sprayed with water obtained from an adjacent heated building when needed for dust control) when the particulate matter control methods and devices proposed within application 13-2895 are in operation.

According to Table 45-7A, for a type 'a' source with a maximum process weight rate of 32,400 lb/hour, the maximum allowable emission rate is approximately 23.5 lb/hour of particulate matter. The maximum emission rate at the proposed facility is 1.91 lb/hour of particulate matter according to calculated emissions in permit application R13-2895.

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 purpose of this rule is to set forth the procedures for stationary source reporting, and the criteria for obtaining a permit to construct and operate a new stationary source which is not a major stationary source, to modify a non-major stationary source, to make modifications which are not major modifications to an existing major stationary source and to relocate non-major stationary sources within the state of West Virginia.

A general permit is not applicable at the facility because of the proposed use of diesel fired engines. The applicant is applying for a Rule 13 construction permit for their proposed Logan site. 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 following the terms and conditions set forth in permit R13-2895. The permittee published their Class I legal ad on August 17, 2011 in The Logan Banner and they have submitted an application fee of $2,000.00 to the DAQ. Because it has been determined the facility is not subject to any NSPS, the $1,000 NSPS portion of the application fee will be refunded.

45CSR22 Air Quality Management Fee Program

This rule establishes a program to collect fees for certificates to operate and for permits to construct, modify or relocate sources of air pollution. Funds collected from these fees will be used to supplement the Director's budget for the purpose of maintaining an effective air quality management program. An Application for a Certificate to Operate (CTO) will be enclosed with the permit at time of issuance as this will be a new construction.

The proposed construction of a volumetric grout plant will NOT be subject to the following state and federal rules:

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

This rule establishes emission 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 engines proposed in this application are not indirect heat exchanges nor are they fuel burning units as defined in this rule.

45CSR16 Standards of Performance for New Stationary Sources Pursuant to 40 CFR Part 60

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). There are no current standards of performances for new stationary sources that apply to this facility.

45CSR17 To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Matter

The purpose of this rule is to prevent and control particulate matter air pollution from materials handling, preparation, storage and other sources of fugitive particulate matter. Because the facility is subject to 45CSR7, it is exempt from this rule per section 6.1.

45CSR30 Requirements for Operating Permits

The facility's potential to emit will be 4.04 TPY of a regulated air pollutant (NOx), which is less than the 45CSR30 threshold of 100 TPY for a major source.

40CFR60 Subpart IIII
Standard of Performance for Stationary Compression Ignition Internal Combustion Engines

The requirements of Subpart IIII are NOT applicable to the proposed facility as defined in section §60.4200 (a)(2). The model year for the Deutz BF6L913 78 kW Diesel-fired Engine [CE-1] is 1988 and for the Cummings B3.9-125 93 kW Diesel-fired Engine [CE-2] is 2005. For the purpose of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator. An engine may be subject to this subpart if it was ordered (constructed) after July 11, 2005 AND manufactured after April 1, 2006. Even though the construction permit will be dated 2012, this is not the construction date of the engines as defined in this subpart. Therefore, the facility is not subject to Subpart IIII.

40CFR60 Subpart OOO
Standards of Performance for Nonmetallic Mineral Plants

The provisions of this subpart are applicable to affected facilities in fixed or portable nonmetallic mineral processing plants. Nonmetallic mineral processing plants are defined by this rule as any combination of equipment that is used to crush or grind any nonmetallic mineral wherever located, including lime plants, power plants, steel mills, asphalt concrete plants, portland cement plants, or any other facility processing nonmetallic minerals except as provided in §60.670 (b) and (c). The facility does not crush or grind the aggregate in the process. Therefore, this rule does not apply.

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.

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 location of this facility and the limit of the proposed construction. This facility will be located in Logan County, WV, which is not designated as non-attainment for PM2.5 (particulate matter less than 2.5 microns in diameter). The facility is a minor source and not subject to 45CSR14.

MONITORING OF OPERATIONS

Maximum volumetric grout production throughput, operation hours, and visible emissions will be monitored –

4.2.1. For the purpose of determining compliance with maximum throughput limits set forth in 4.1.1., the permittee shall monitor grout production and maintain certified daily records. An example form is included as Appendix A. Such records shall be retained onsite by the permittee for at least five (5) years. Certified records shall be made available to the Director or his duly authorized representative upon request.

4.2.2. For the purpose of determining compliance with maximum operation time set forth in 4.1.2., the permittee shall monitor operation hours and maintain certified daily records. An example form is included as Appendix A. Such records shall be retained onsite by the permittee for at least five (5) years. Certified records shall be made available to the Director or his duly authorized representative upon request.

4.2.3. For the purpose of determining compliance with the maximum fuel usage limits set forth in 4.1.3., the permittee shall maintain monthly diesel fuel records for the 105hp Deutz Engine (CE-1) and the 125hp Cummings Engine (CE-2) utilizing the form identified as Appendix C.

4.2.4. For the purpose of determining compliance with the opacity limits of 45CSR§7, the permittee shall conduct visible emission checks and / or opacity monitoring and recordkeeping for all emission sources subject to an opacity limit.

a. The visible emission check shall determine the presence or absence of visible emissions. At a minimum, the observer must be trained and knowledgeable regarding the effects of background contrast, ambient lighting, observer position relative to lighting, wind, and the presence of uncombined water (condensing water vapor) on the visibility of emissions. This training may be obtained from written materials found in the References 1 and 2 from 40CFR Part 60, Appendix A, Method 22 or from the lecture portion of the 40CFR Part 60, Appendix A, Method 9 certification course.

b. Visible emission checks shall be conducted at least once per calendar month with a maximum of forty-five (45) days between consecutive readings. These checks shall be performed at each source (stack, transfer point, fugitive emission source, etc.) for a sufficient time interval, but no less than one (1) minute, to determine if any visible emissions are present. Visible emission checks shall be performed during periods of normal facility operation and appropriate weather conditions.

c. If visible emissions are present at a source(s) for three (3) consecutive monthly checks, the permittee shall conduct an opacity reading at that source(s) using the procedures and requirements of Method 9 as soon as practicable, but within seventy-two (72) hours of the final visual emission check. A Method 9 observation at a source(s) restarts the count of the number of consecutive readings with the presence of visible emissions.

RECOMMENDATION TO DIRECTOR

The information contained in the permit application R13-2895 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 Moore Concrete Pumping, Inc. for the construction of a volumetric grout facility located in Logan, Logan County, West Virginia, is hereby recommended.

Mindy Hendrickson
Permit Writer

February 22, 2011

Date