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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3356
Plant ID No.:	035-00063
Applicant:	Pullins Excavating, Inc. (Pullins)
Facility Name:	Ravenswood Facility
Location:	Jackson County, WV
NAICS Code:	21231 - Stone Mining and Quarrying
Application Type:	Temporary
Received Date:	January 20, 2017
Engineer Assigned:	John Legg
Fee Amount:	$1,500.00
Date Received:	January 20, 2017
Complete Date:	January 26, 2017 (Date Legal Advertisement Ran.)
Due Date:	March 14, 2017 (45 Days from when Legal Advertisement Ran.)
Applicant Ad Date:	January 26, 2017
Newspaper:	Jackson Newspapers
UTM's:	Easting: 433.563 km Northing: 4,311.207 km Zone: 17N
Description:	Install a portable temporary screen and screen engine to process the remaining limestone/sandstone at 105 Sycamore Street, Ravenswood, WV 26164.

DESCRIPTION OF PROCESS

Pullins is proposing to install temporary screening equipment to process limestone/sandstone left at a site by the previous owner/operator.

Screen

The portable screen (Finlay 540 or comparable) will be unloaded and set up so that it is operational. An endloader will load the limestone/sandstone material remaining at the site onto the screen. The screened stone/product will to be used for construction purposes. Based on the permit application, approximately 10,000 tons of material will be screened at a maximum rate of 165 ton/hr. The job is estimated to take as little as 61 hours to complete.

Specific information about the screening operation is given below in Tables 1 and 2.

Screen Engine

An diesel engine (TMP-ENG1) is used to power the portable screen. Specific information about the engine is given below in Table 1.

Table 1: Emission Units Table for Pullins Temporary Screening Operation.

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Constructed	Design Capacity	Type & Date of Change	Control Device
TMP-TP1	TMP-TP1	Hopper/Feeder	2009	165 ton/hr	2017 Temporary	Partical Enclosure
TMP-SC1	TMP-TP2	Finlay 540 Screen	2009	165 ton/hr	2017 Temporary	CS/PW
TMP-ENG1	TMP-ENG1	Deutz 4 Cylinder, Tier 4, 3a Certified Engine	2012	70 hp (52.2 kW)	2017 Temporary	None
TMP-BC1	TMP-TP3	Belt Conveyor	2009	165 ton/hr	2017 Temporary	Water Sprays
TMP-TP4	TMP-TP4	Belt Conveyor into Trucks	2009	165 ton/hr	2017 Temporary	Water Sprays

Table 2: Transfer Point Information for R13-3356, Pullins Excavating, Inc.

Transfer Point ID No.	Transfer Point Description	Maximum Transfer Rate		Control Device (1)	Control Efficiency %
		tph	tpy		
TMP - TP1	Hopper/Feeder	165	10,000	PE	80
TMP-TP2	Screen	165	10,000	CS-PW	80
TMP-TP3	Belt Conveyor	165	10,000	TC-PW	80
TMP-TP4	Loading Point from Conveyor to Trucks	165	10,000	PE	80

(1) PE = Partial Enclosure; CS-PW = Partial Enclosure with Water Spray; TC-PW = Partial Enclosure with Water Spray.

SITE INSPECTION

The writer did not inspect the site because:

- DAQ Enforcement is familiar with the site.
- No crushing will be permitted, only screening.
- Hourly and annual particulate matter emission rates for the proposed facility are low.
- Only 10,000 tons of material will be screened, and
- The operation is not expected be there for any length of time, 60.6 hrs based on the maximum screen processing rate of 165 ton/hr.

According to Pullins' consultant, Ms. Patty McCormick, the previous company who controlled the site was Martin Marietta Materials, Inc. DAQ Enforcement personnel confirmed that Martin Marietta was indeed the previous owner of the site and that the site was used as a gravel storage yard. It was not inspected by DAQ, however, because PM emissions were thought to be too small to merit an inspection. Mike Kolb, DAQ Enforcement inspector, remembers the site because it is adjacent to the Cardinal Concrete Plant (035-000411) which he inspected on March 26, 2015.

Directions to the facility as given in the permit application (12A):

> From US Rout 33 take County Route 68 (Washington Street) in Ravenswood. From Route 68, make a left on Sycamore Street. Existing site on right and end of road at Cardinal Concrete Facility.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The writer reviewed the emission calculations and found them to be acceptable. PM and PM10 emissions are based on AP-42 factors and were calculated for material handling, screening, and transfer using a spreadsheet developed by the DAQ.

Particulate (PM & PM10) Emissions

PM and PM10 emissions are summarized in Tables 3 and 4 given below.

Table 3: Uncontrolled PM & PM10 Emissions for R13-3356, Pullins Excavating, Inc.

	Uncontrolled PM		Uncontrolled PM_{10}	
	lb/hr	tpy (1)	lb/hr	tpy (1)
Screen (TMP-SC1)	4.13	0.13	1.44	0.04
Transfer Points	1.37	0.04	0.65	0.02
Total	**5.50**	**0.17**	**2.08**	**0.06**

(1) Back calculated from application & determined to equal approximately 60.6 hr/yr of operation (≈10,000 ton of stone/material processed at 165 ton/hr for 60.6 hrs).

Table 4: Controlled PM & PM10 Emissions for R13-3356, Pullins Excavating, Inc.

	Controlled PM (2)		Controlled PM_{10} (2)	
	lb/hr	tpy (1)	lb/hr	tpy (1)
Screen (TMP-SC1)	0.83	0.03	0.29	0.01
Transfer Points	0.27	0.01	0.13	0.00
Total	**1.10**	**0.03**	**0.42**	**0.01**

(1) Back calculated from application & determined to equal approximately 60.6 hr/yr of operation.

(2) Control Efficiency = 80% (partial enclosure with water spray). See Table 2, above.

Screen Engine Emissions

The screen engine is a 2012 year, 70 hp (52.2 kW) Deutz 4 cylinder Tier 4/Stage 3a certified engine. The application contained no information on the diesel fuel consumption rate for the screen engine. The writer calculated a fuel consumption rate of 3.64 gallons for the 70 hp engine using information taken from a similar permit:

> R13-3073T has a screen and crusher with a combined horsepower of 405 hp and combined diesel consumption rate 21.06 gal/hr. The writer ratio-ed the fuel consumption rate to the horsepower of the screen and crusher, and then multiplied by 70 horsepower to arrived at a 3.64 fuel consumption rate for the screen engine.

Using the 3.64 diesel consumption rate calculated above, the writer calculated criteria pollutant emissions from the screen engine using emission factors from AP-24, Table 3.3-1. for diesel uncontrolled industrial engines.

Equipment	SO2		Nox		CO		VOC		PM	
	lb/hr	tpy (1)	lb/hr	tpy (1)	lb/hr	tpy (1)	lb/hr	tpy (1)	lb/hr	tpy (1)
Screen Engine	0.15	0.0045	2.23	0.068	0.48	0.0146	0.18	0.0054	0.31	0.0048
(1) Based on operating 60.6 hrs and at a stone processing rate of 165ton/hr for a total stone processing rate of 10,000 ton.										

REGULATORY APPLICABILITY

The following state and federal regulations were reviewed for applicability to the facility:

STATE RULES

45CSR7 To Prevent and Control Particulate Matter Air Pollution From Manufacturing Processes and Associated Operations

The main requirement of 45CSR7 is the process weight rate based PM stack emission rate in section 4 of the rule. As can be see in the table below the sources meet this requirement.

	Estimated Uncontrolled PM Emissions (lb/hr)	Rule 7 Limit (1) (lb/hr)
Screen	5.50 (2)	40.9
(1) Type 'a' source processing 330,000 lb/hr (165 ton/hr). (2) Estimated uncontrolled PM Emissions for Screening and Transfer Points.		

The facility is subject to section 3's twenty (20) percent opacity limit on all process source operations and must have a plan to minimize fugitive emissions. Pullins proposes to meet these requirements through the use of water sprays and enclosures.

The facility is also subject to the fugitive particulate matter control systems requirement of section 5.1 of 45CSR7.

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

Pullins submitted an permit application and paid a $1,500.00 application fee (both on January 20, 2017); ran a legal advertisement (in the Jackson Newspapers on January 26, 2017); and emailed a copy of the newspaper affidavit to the DAQ (on January 30,2017), at which time the application was deemed to be complete.

FEDERAL RULES

40 CFR 60
Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

The screen engine is subject to 40 CFR 60 Subpart IIII.

The screen engine is a 2012 year, 70 hp (52.2 kW) Deutz 4 cylinder Tier 4/Stage 3a certified engine. Since the engine is a non emergency 2007 or later engine with a per cylinder displacement of less than 10 Liters and a maximum power of less than 3,000 hp, the main requirement of the rule is to purchase an engine that meets the requirements of 40 CFR 60.4201. For the screen engine, 60.4201 refers to 40 CFR 1039.102. The screen engine is an Interim Tier 4 certified engine (Table 3 of 40 CFR 1039.102; 37 < kW < 56). The emissions standards to which the engine is certified are given in the table below (all standards in g/kw-hr).

	NOx (g/kw-hr)	NMHC+NO_x (g/kw-hr)	CO (g/kw-hr)	PM (g/kw-hr)	NMHC (g/kw-hr)
Screen Engine	--	4.7	5.0	0.30* (Option #1)	--
* The writer selected Option #1 which is more liberal that Option #2(PM standard set at 0.03) because no information was specified in application.					

Engine	CO		NMHC + NOx		PM	
	g/(kW-hr)	lb/hr	g/(kW-hr)	lb/hr	g/(kW-hr)	lb/hr
Screen Engine	5.0	0.57	4.7	0.54	0.30	0.03

The rule also requires the operator of the screen to use diesel fuel which meets the requirements of 40 CFR 80.510(b).

Although the screen engine is not acting as a temporary replacement engine, the whole screening operation itself is temporary. For that reason the writer believes the following passage to be true:

> Per 60.4200(e) Owners and operators of facilities with CI ICE that are acting as temporary replacement units and that are located at a stationary source for less than 1 year and that have been properly certified as meeting the standards that would be applicable to such engine under the appropriate nonroad engine provision, are not required to meet any other provisions under this subpart with regard to such engines.

40 CFR 60
Subpart OOO "Standards of Performance for Nonmetallic Mineral Processing Plants"

The subpart does not apply because there is not crusher(s) associated with Pullins' proposed screening operation.

40 CFR 63,
Subpart ZZZZ "National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combust Engines."

Subpart ZZZZ establishes national emission limitations and operating limitations for HAPs emitted from stationary RICE located at major and area sources of HAP emissions. The subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations.

Pullins' proposed screening operation is classified as an area source of HAP emissions (individual HAP with potential emissions less than or equal to 10 ton/yr; aggregated HAP with potential emissions less than or equal to 25 ton/yr).

The internal combustion engine for the screen engine is classified as an affected source under 40 CFR 63 Subpart ZZZZ. §§63.6590 (c) and (c)(1) state that for engines located at an area source of HAPs, if the source meets the requirements of Subpart IIII than no requirements of Subpart ZZZZ apply to the engine. Thus, the engine is not subject to any requirements of this subpart.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The combustion of diesel fuel result in the formation of very small amounts of Hazardous Air Pollutants (HAP).

AIR QUALITY IMPACT ANALYSIS

Because this is a minor modification as defined in 45CSR14 no modeling was performed.

MONITORING OF OPERATIONS

The permittee shall monitor and record daily the following information:

- The number of hours the screen was in operation.
- The amount of material screened.

The permittee is to report opacity deviations within ten (10) days of their happening.

RECOMMENDATION TO DIRECTOR

Information supplied by Pullins in their application indicates that compliance with all applicable regulations will be achieved. Therefore the writer recommends that the company be granted temporary permit R13-3356 for the screening of the remaining limestone/sandstone material located at 105 Sycamore Street, Ravenswood, Jackson County, WV.

John Legg

John Legg
Permit Writer

3/2/17

March 2, 2017

Table 3.3-1. EMISSION FACTORS FOR UNCONTROLLED GASOLINE AND DIESEL INDUSTRIAL ENGINES[a]

Pollutant	Gasoline Fuel (SCC 2-02-003-01, 2-03-003-01)		Diesel Fuel (SCC 2-02-001-02, 2-03-001-01)		EMISSION FACTOR RATING
	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	
NO_x	0.011	1.63	0.031	4.41	D
CO	6.96 E-03[d]	0.99[d]	6.68 E-03	0.95	D
SO_x	5.91 E-04	0.084	2.05 E-03	0.29	D
PM-10[b]	7.21 E-04	0.10	2.20 E-03	0.31	D
CO_2[c]	1.08	154	1.15	164	B
Aldehydes	4.85 E-04	0.07	4.63 E-04	0.07	D
TOC					
Exhaust	0.015	2.10	2.47 E-03	0.35	D
Evaporative	6.61 E-04	0.09	0.00	0.00	E
Crankcase	4.85 E-03	0.69	4.41 E-05	0.01	E
Refueling	1.08 E-03	0.15	0.00	0.00	E

[a] References 2,5-6,9-14. When necessary, an average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr was used to convert from lb/MMBtu to lb/hp-hr. To convert from lb/hp-hr to kg/kw-hr, multiply by 0.608. To convert from lb/MMBtu to ng/J, multiply by 430. SCC = Source Classification Code. TOC = total organic compounds.

[b] PM-10 = particulate matter less than or equal to 10 μm aerodynamic diameter. All particulate is assumed to be ≤ 1 μm in size.

[c] Assumes 99% conversion of carbon in fuel to CO_2 with 87 weight % carbon in diesel, 86 weight % carbon in gasoline, average BSFC of 7,000 Btu/hp-hr, diesel heating value of 19,300 Btu/lb, and gasoline heating value of 20,300 Btu/lb.

[d] Instead of 0.439 lb/hp-hr (power output) and 62.7 lb/mmBtu (fuel input), the correct emissions factors values are 6.96 E-03 lb/hp-hr (power output) and 0.99 lb/mmBtu (fuel input), respectively. This is an editorial correction. March 24, 2009