Attachment 3

U.S. Mineral Products (Isolatek) Discussion

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U.S. Mineral Products (Isolatek - Source ID: 069-00021)

The Indiana Department of Environmental Management (IDEM) excluded U.S. Mineral Products (USM) d/b/a Isolatek International, a mineral wool manufacturer near Huntington, Indiana in Huntington County, from its January 7, 2016 list of affected sources to be characterized under the Data Requirements Rule (DRR). Per the thresholds established within the DRR, USM's most current reported sulfur dioxide (SO_2) emissions were well below levels required for the rule to be applicable. However, United States Environmental Protection Agency (U.S. EPA) identified USM as an additional source to be characterized in its March 25, 2016 response to IDEM.

Indiana strongly objects to the inclusion of USM as an affected source under the DRR. The DRR defines applicable sources as stationary sources that had actual SO_2 emissions in 2014 of 2,000 tons or more, or have been identified by IDEM or U.S. EPA "as requiring further air quality characterization." (40 CFR § 51.1202). Indiana did not include USM on its list of sources subject to the DRR because its reported actual SO_2 emissions in 2014 were 164 tons, less than one tenth of the DRR threshold of 2,000 tons or more. According to U.S. EPA's calculations (based on an informal in-house 2007 stack test), USM's actual annual emissions would have been "approximately 444 tons of SO_2" in 2014. U.S. EPA also determined that 2014 was an abnormally low year for production and estimated 800 tons of SO_2 per year during normal production years, which is still less than half the DRR emission threshold. USM has seen a downturn since 2013 in its wool production (approximately 40,000 tons/year could be considered a prior normal), with a slight bounce back to 28,000 to 30,000 tons per year production over the last few years. This is still much lower than historic production, but should be considered the current normal production at the facility based upon current economic factors with the economy.

USM has operated the same equipment at its Huntington facility since 1982. In its March 25, 2016, letter, U.S. EPA indicated an emission factor of 21.6 lb SO_2 per ton of melt was appropriate for the USM cupola emissions. USM has historically used an emission factor of 8 lbs/ton based upon U.S. EPA's Compilation of Air Pollutant Emission Factors, AP-42.[1] As a result of a Clean Air Act (CAA) §114 information request, USM submitted to U.S. EPA, a summary sheet from stack tests previously conducted which included some engineering studies from 2007 and several pages from the 2007 study report for in-house testing of particulate matter (PM), nitrogen oxides (NO_x) and SO_2 at the facility. That study included an informational emission test for SO_2 for the cupola that was only performed in the downdraft ducts. The results were reported in the summary sheet and in the study report. USM does not consider 21.6 lbs/ton

[1] An emission factor of 0.2 lbs/hr was used from 2000 through 2005 as a result of an error in the data used for the annual emission calculation. When the correction was made in 2005, IDEM advised USM that it was not necessary to correct the prior emission statements.

to be a valid SO_2 emission factor due to problems with the cupola operation at the time of the informal test. It should be noted that IDEM did not review or approve of an SO_2 stack test protocol in 2007 for USM and had no compliance inspector present at the informal SO_2 test. According to production records available for the time period on and around the stack testing days in December 2007, the following may be concluded as summarized by USM:

On Dec 17th, the first day of the testing, both cupolas were idled in the morning for a period exceeding 2 hours each due to an electrical problem with a charge hoist. In addition, #1 cupola idled for 3 hours directly preceding the hoist issue due to a spinner motor failure. Typically, following an idle period of time, the cupola operating conditions take some time (could easily be several hours) to stabilize. Thus, the testing period started with less than normal conditions.

On Dec 18th, during the period of the testing for SO_2 data collection, #1 cupola went through a period of increased coke consumption and reduced melt rate. Both indicators were showing a variation from standard coke consumption and melt rate in the 10% - 20% order of magnitude. USM standard coke consumption is expected to be at ~320 – 340 lbs / ton of charge and the avg. melt rate at ~4.2 tons / hr. At the time of the stack test USM recorded an avg. of 360 – 380 lbs of coke / charge and a melt rate of ~3.9 tons / hr respectively. These variations are considered significant and clearly not normal operations. Those conditions are related and indicate that the operator was attempting to overcome the slower melt rate by adding additional coke to the charge. Based upon the increased coke consumption and slower melt rate, general operating conditions at the time of testing are best described as poor. The raw material receivers from that period of time indicate a higher than normal moisture content in received coke (10%-15% vs. standard of <7%) explaining the need for additional BTUs with every charge to evaporate the excess moisture. The low moisture content of coke is a critical factor to the cupola performance. During the period of time in 2007 around when the testing was performed, the USM coke supplier was struggling to provide a product with acceptable quality. The coke quality issues were caused by operational issues at the source. USM had no viable, alternative supply options at the time.

In order to resolve the emission factor issue, in 2016, USM conducted an engineering study of the cupola emissions. This consisted of an informational emission test that included SO_2 measured in the baghouse. That test indicated an SO_2 emission factor range of 9.22 to 9.36 lbs/ton. The results of the 2016 test confirm that the emission factor from AP-42 is appropriate to use for the USM mineral wool cupola operation. Additionally, the 164 tons of SO_2 reported as actual emissions for USM should be considered valid for DRR purposes. This is significantly lower than what U.S. EPA is attempting to rely upon in its analysis.

U.S. EPA identified the 2,000 ton threshold as an important indicator of the need for prioritized air quality characterization under the DRR. U.S. EPA set the threshold at a level "that prioritizes the resources that will be devoted to characterizing air quality near SO_2 sources nationally." (80

FR 51061). That threshold is already on "the lower end of the range of thresholds" of sources that have the potential to contribute to violations of the National Ambient Air Quality Standard (NAAQS) (80 FR 51061). Furthermore, that threshold "strikes a reasonable balance between the need to characterize air quality near sources that have a higher likelihood of contributing to a NAAQS violation and the analytical burden on air agencies." (80 FR 51061). U.S. EPA did not characterize the 2,000 ton threshold as an arbitrary number, but rather as an indicator of sources warranting prioritization of state and federal resources.

Because USM's actual SO_2 emissions and total potential-to-emit SO_2 emissions remain well below the 2,000 ton applicability threshold, it is unreasonable to place it among the sources that should be prioritized to determine if it contributes to violations of the NAAQS. Including sources with actual SO_2 emissions of less than one-tenth the 2,000 ton threshold represents a misapplication of the intent of the DRR to prioritize sources and resources. Indiana believes that this reinterpretation of the DRR inappropriately broadens the scope and purpose of this phase of the DRR. There are numerous sources across the United States that fall into a similar category as USM. In Indiana alone, there are thirty five (35) sources with reported actual emissions between that of USM and the 2,000 ton threshold. Among these is a manufacturer of mineral wool, with very similar operational characteristics, with reported actual emissions greater than that of USM, and sources located in densely populated areas with as much as ten times the reported emissions of USM, which happens to be located in a sparsely populated rural area. Based on familiarity with how the dispersion model handles certain operations, it is safe to assume that some of these sources would clearly pose a greater threat to the NAAQS and human health than USM. Therefore, U.S. EPA's identification of USM is clearly arbitrary and capricious.

Due to the time constraints that U.S. EPA has placed on states to implement the DRR, broadening the applicability of the DRR's phased approach thwarts the rule's intent to prioritize state and federal resources. IDEM does not question whether the DRR provides states or U.S. EPA the authority to identify sources with actual emissions below the 2,000 ton threshold as requiring further air quality characterization. However, if this is done, it should be done consistently and not arbitrarily. U.S. EPA did not use a systematic approach to identify sources below 2,000 tons that have the greatest probability to pose a risk to exceeding the NAAQS and threaten human health. Therefore, IDEM disagrees that USM should be arbitrarily subjected to further characterization under the DRR.

Table 1: U.S. Mineral Products (Isolatek) 2016 Stack Test Data

Table 1. Measured & Calculated Data-Melters' Process Line EU#1 & EU#2 CE#1 Baghouse

Summary of Stack Gas Parameters and Test Results
50668.0003
Isolatek

Baghouse
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	RUN NUMBER	*1-O2*	*2-O2*	*O2*
	RUN DATE	*4/26/2016*	*4/26/2016*	*Average*
	RUN START	*11:30*	*12:50*	
	RUN STOP	*12:18*	*13:48*	
	MEASURED DATA			
P_{static}	Stack Static Pressure, Inches H_2O	0.00	0.00	**0.00**
y	Meter Box Correction Factor	0.976	0.976	**0.976**
P_{bar}	Barometric Pressure, Inches Hg	29.95	29.95	**29.95**
V_m	Sample Volume, ft^3	48.165	49.453	**48.809**
$Dp^{1/2}$	Average Square Root Dp, $(in.\ H_2O)^{1/2}$	1.0948	1.1172	**1.106**
DH	Avg Meter Orifice Pressure, In. H_2O	3.271	3.402	**3.336**
T_m	Average Meter Temperature, °F	86.3	86.5	**86.4**
T_s	Average Stack Temperature, °F	230.3	231.3	**230.8**
V_{lc}	Condensate Collected, ml	16.0	13.0	**14.50**
CO_2	Carbon Dioxide content, % by volume	0.0	0.0	**0.00**
O_2	Oxygen content, % by volume	20.8	20.8	**20.8**
N_2	Nitrogen content, % by volume	79.2	79.2	**79.2**
C_p	Pitot Tube Coefficient	0.84	0.84	**0.84**
	Circular Stack? 1=Y,0=N:	1	1	
As	Diameter or Dimensions, Inches:	37.00	37.00	**37.00**
Q	Sample Run Duration, minutes	48	48	**48**
D_n	Nozzle Diameter, Inches	0.238	0.238	**0.238**
	CALCULATED DATA			
A_n	Nozzle Area, ft^2	0.000309	0.000309	**0.000309**
$V_{m(std)}$	Standard Meter Volume, ft^3	45.82	47.05	**46.44**
$V_{m(std)}$	Standard Meter Volume, m^3	1.298	1.332	**1.315**
Q_m	Average Sampling Rate, dscfm	0.955	0.980	**0.967**
P_s	Stack Pressure, Inches Hg	29.95	29.95	**29.95**
B_{ws}	Moisture, % by volume	1.6	1.3	**1.5**
$B_{ws(sat)}$	Moisture (at saturation), % by volume	142.1	145.0	**143.6**
V_{wstd}	Standard Water Vapor Volume, ft^3	0.753	0.612	**0.683**
$1-B_{ws}$	Dry Mole Fraction	0.984	0.987	**0.985**
M_d	Molecular Weight (d.b.), lb/lb-mole	28.83	28.83	**28.83**
M_s	Molecular Weight (w.b.), lb/lb-mole	28.66	28.69	**28.67**
V_s	Stack Gas Velocity, ft/s	70.5	72.0	**71.2**
A	Stack Area, ft^2	7.5	7.5	**7.5**
Q_a	Stack Gas Volumetric flow, acfm	31,587	32,238	**31,912**
Q_s	Stack Gas Volumetric flow, dscfm	23,786	24,320	**24,053**
Q_s	Stack Gas Volumetric flow, dscmm	674	689	**681**
I	Isokinetic Sampling Ratio, %	97.0	97.4	**97.2**

Table 2. PM, NO_x, CO, & SO_2 Emissions Test Results- Melters' Process Line EU#1 & EU#2 CE#1 Baghouse

Summary of Stack Gas Parameters and Test Results
50668.0003
Isolatek
US EPA Test Method 5 (PM), 6C (SO2), 7E(Nox), 10 (CO), 15/16 (H2S/COS), & 26A (HCL/HF)
Baghouse
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	RUN NUMBER	*1-O2*	*2-O2*	*O2*
	RUN DATE	*4/26/2016*	*4/26/2016*	*Average*
	RUN START	*11:30*	*12:50*	
	RUN STOP	*12:18*	*13:48*	
	EMISSIONS DATA			
	Throughput (tons/hr)	10.135	9.564	9.85
	Sulfur Dioxide			
SO_2	Concentration PPM Dry	393.67	368.85	381.26
E SO_2	Emission Rate, lb/hr	93.40	89.48	91.44
E SO_2	Emission Rate, lb/ton	9.22	9.36	9.29

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