west virginia department of environmental protection

Division of Air Quality
601 57th Street, SE
Charleston, WV 25304-2345
Phone: 304 926 0475 • Fax: 304 926 0479

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

ENGINEERING EVALUATION/FACT SHEET

B ACKGROUND INFORMATION

Application No.:	R13-2145C
Plant ID No.:	065-00001
Applicant:	U.S. Silica Company
Facility Name:	Berkeley Springs Plant
Location:	Berkeley Springs
NAICS Code:	212322
Application Type:	Modification
Received Date:	August 2, 2012
Engineer Assigned:	Edward S. Andrews, P.E.
Fee Amount:	$2000.00
Date Received:	August 28, 2012
Complete Date:	August 28, 2012
Due Date:	November 27, 2012
Applicant Ad Date:	August 15, 2012
Newspaper:	*The Morgan Messenger*
UTM's:	Easting: 739.6 km Northing: 4,393.5 km Zone: 17
Description:	U.S. Silica Company proposed to replace the existing Q-Rok load out system with a new system, which will include two new bucket elevators.

DESCRIPTION OF PROCESS

The proposed changes affect the existing Q-Rok load-out spouts and silos #13, #14, #17, #18. U.S. Silica Company (USS) proposing to replace the two existing loading spouts with two bucket elevators and one loading spout. This change would result in a decrease in loading capacity from a total of 300 TPH to 150 TPH.

The current system has the four storage silos feeding two loading spouts with a maximum design loading rate of 300 TPH of finished product. This proposal calls for the two new bucket elevators (Silos #13 & #17 feeding Elevator BE01 and Silos #14 & #18 feeding Elevator BE02). These two elevators would then feed the finished product to the DSH Load out spout at a

maximum design rate of 150 TPH. This new system will only allow one elevator to be operated at a time, which reduces the load out capacity to 150 TPH. Basically one elevator can feed the load out spout. Both elevators will be vented to the existing dust collector which is a Torit M/N 2DFA-155. No other changes to the facility were proposed.

The main reason for the use of the bucket elevators is to meet the minimum drop elevation for the dust suppression hopper (DSH) system for the load out spout. The DSH system use a surge hopper design to allow the free air that is entrained in the material flowing to the spout to be release. Thus, the DSH system should minimizing fugitive emissions generator from the loading operating without the use of add on control devices.

SITE INSPECTION

On September 21, 2011, Mr. Joseph Kreger, an Environmental Resource Specialist assigned to the agency's Eastern Panhandle Regional Office, conducted an targeted inspected of the facility. Mr. Kreger founded the facility to be operating within compliance of their Title V Operating Permit.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The applicant used uncontrolled emission factors for transfer points published in AP-42 Chapter 11.19 to estimate fugitive emissions from the DSH loading spout. For the bucket elevators, USS used the particulate matter (PM) standard for process vents in Subpart OOO of Part 60. It is not acceptable to use an emission standard limit to estimate the actual potential from an emission source.

Q-ROK is the product being transferred by these new elevators, which is unground silica (AKA sand). In June of 2006, EPA revised emission factors published in Chapter 11.12 of AP-42, Concrete Batching. In the typical concrete batching process, industrial sand is used and handled, which usually requires a belt conveyor or bucket elevator to elevate the sand into a holding/storage silo. This chapter lists PM and particulate matter less than ten microns (PM_{10}) without controls. Using the PM_{10} factor (0.00099 lb/ton of sand), the potential to emit from the elevator would be 0.15 pounds per hour before controls.

Assuming a hundred percent of the PM loading is captured and vented to the existing dust collector, the PM_{10} emission rate from the elevator would be 0.002 lb per hour, which equates to a grain loading of 0.0004 grains per standard cubic foot. This estimate was based on a removal efficiency of 99% for PM_{10}. Using the same approach with the PM emission factor from Table 11.12-2 of AP-42, the PM rate from the bucket elevator was estimated to be 0.003 pounds per hour, which equates to a controlled outlet concentration of 0.0008 grains per standard cubic foot.

The proposed loading spout is a dust suppression hopper (DSH) system. The DSH System is installed under a feed point where it can be suspended above the target and kept at operating level. A small degree of natural agitation as the hopper is filled helps exclude air from the material (sand) being transferred. At the point of loading, or transferal, the DSH system concentrates the discharge of sand as a solid column through free air into any target repositories, which are trucks for the Berkeley Springs Plant.

USS assumed a fugitive control efficiency of 98% for the use of the DSH system. The applicant's approach estimated PM_{10} emission rate of 0.003 lb per hour of fugitives from the loading spout. Using the controlled transfer point emission factor of Table 11.19.2-2, the fugitive PM_{10} rate from the spout was 0.007 lb per hour. There are a few things to keep in mind about these two estimates. One is that both estimates are based on emission factors with an Emission Factor Rating of 'D', which means that the factor is based on data from tests using a generally unacceptable method. Second, there is no available data supporting the proposed control efficiency for the DSH System. The writer believes that the fugitive potential of the DSH System loading spout to be between 0.003 to 0.007 lb of PM_{10} per hour.

USS does not propose any annual restrictions or through-put limits for this change. Thus, annual PM and PM_{10} emissions are expected to be 0.1 and 0.04 tons per year (TPY) respectively. Overall, USS predicts that this change with result in a decrease in PM_{10} potential by 0.57 TPY. Vehicle traffic at the facility is not expected to change as a result of this proposed modification. Therefore, no emissions (road dust) due to vehicle traffic on the applicant's haul roads were estimated.

REGULATORY APPLICABLILITY

The existing Q-Rok loading system is subject to Rule 7 and has not been permitted under any Rule 13 Permit at this time. Silica is classified as a non-metallic mineral and the Berkeley Springs Plant processes it. Thus, these changes are affected sources under Subpart OOO – Standard of Performance for Nonmetallic Mineral Processing Plants of Part 60.

40CFR§60.672 and Table 2 of Subpart OOO establishes a PM limit of 0.014 grains per dry standard cubic foot of exhaust from the vent and a visible emission limitation of 7 percent opacity from Stack #6, which is the discharge point of the dust collector controlling the bucket elevators. The loading spout has a visible emission limitation of 7 % opacity per 40 CFR §60.672(b) which refers to Table 3 of Subpart OOO.

These new limitations from Subpart OOO are more stringent that the current applicable limitation of Rule 7, which requires these existing source to be equipped with fugitive PM control systems that reduce the fugitive PM emission to the lowest level that is reasonably achievable (45 CSR §7-5.1.). USS is using a Donaldson Torit DFT 4-48 dust collector (fabric filters) to control emissions from the elevators and the DHS System to minimize visible emission from the loading spout. Under Subpart OOO, USS will be required to conduct compliance

demonstrations to satisfy the testing requirement of §60.672 within 180 days after initial start-up of the new sources.

According to §60.672(c), USS will be required to conduct quarterly visible emission checks of the dust collector as the monitoring requirements of Subpart OOO.

This proposed modification is occurring at a major source as defined in Rule 14 (Prevention of Significant Deterioration). However, the new emissions from this project by itself do not exceed the 10 tons of $PM_{2.5}$, 15 tons of PM_{10}, or 25 tons of PM significance levels. By rule, no further review is required. Morgan County is classified as in attainment for all six criteria pollutants. Therefore, this modification does not require to be reviewed under Rule 19 (Nonattainment New Source Review Program).

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

This particular modification does not constitute the release of any other pollutant other than fine particulate matter ($PM_{2.5}$). As a result, no information concerning the toxicity of non-criteria regulated pollutants was presented in this section.

AIR QUALITY IMPACT ANALYSIS

The writer deemed that an air dispersion modeling study or analysis was not necessary, because the proposed modification does not meet the definition as a major modification of a major source as defined in 45CSR14.

MONITORING OF OPERATIONS

Subpart OOO requires monitoring of visible emission from the fabric fiber bag house (dust collector) be conducted quarterly (§60.674(c)) as an indicator of satisfactory operation of the control device. The actual PM limit is based on the PM concentration over flow rate at standard condition. Thus, it would be very difficult to link parameters such as loading rates or silica throughput to this limit. The applicant will be required to conduct initial performance testing to demonstrate compliance with the PM concentration limit. In addition, the applicant will conduct initial testing and repeat such testing once every five years for demonstrating compliance with the fugitive emission limit (7% opacity).

CHANGES TO PERMIT R13-2145C

Permit R13-2145B covers the five Rotex screens, which are subject to the pre-2008 emission standards of Subpart OOO. R13-2145B has the Subpart OOO concentration, pound per hour and tons per year PM limits for Stack #36, which is the emission point for the Rotex

Screens. The mass rate limits are based on the Subpart OOO concentration limit of 0.022 grains per dry standard cubic foot of exhaust. Thus, the mass limits are redundant and not necessary. Therefore, the mass limits were omitted from the permit.

Section B of the permit cited specific parts of Rule 7 and noted the source is subject to the PM concentration limit of Subpart OOO, which requires the applicant to conduct a performance test. The permit failed to mention the two other emission standards from Subpart OOO that the Rotex Screens are subject, which would make most of the specific Rule 7 citation be less stringent. These more stringent standards are the visible emission limits that corresponds to the PM concentration limit, which limit the opacity from Stack 36 to 7%. Rule 7 would allow 20% opacity from a process source operating (45CSR§7-3.1). The other Subpart OOO limits fugitive emissions to 10% opacity. Rule 7 only requires a source to reduce/control fugitive emissions to the lowest level reasonably achievable (45CSR§7-5.1.). The writer believes that the fugitive emission limit of Table 3 to Subpart OOO is more stringent than Rule 7. Therefore, the writer will recommend that the visible emission and fugitive emission standards of Subpart OOO be incorporated into the permit and the Rule 7 provisions be omitted. The facility's Title V Operating Permit requires USS to conduct weekly visible emission checks to confirm compliance with the Rule 7 limits, which uses Method 22 that identifies if visible emissions are present or not. Thus, it is not necessary to develop a monitoring plan for the existing Rotex Screens.

RECOMMENDATION TO DIRECTOR

The applicant has satisfied the initial notification requirements of Subpart OOO within this application by provided the rated capacity of the existing load out system and replacement equipment as required in 40 CFR §60.676(a)(1). The information provided in the permit application indicates the proposed modification of the facility will meet all the requirements of the application rules and regulations when operated in accordance to the permit application. Therefore, this writer recommends granting U.S. Silica Company a Rule 13 modification permit for their sand processing plant located near Berkeley Springs, WV.

Edward S. Andrews, P.E.
Engineer

September 5, 2012
Date