



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-2886
Plant ID No.: 051-00002
Applicant: PPG Industries, Inc.
Facility Name: Natrium Facility
Location: New Martinsville, Marshall County
NAICS Code: 2812
Application Type: Modification
Received Date: May 10, 2011
Engineer Assigned: Laura Jennings
Fee Amount: \$1,000.00
Date Received: May 12, 2011 and August 11, 2011
Complete Date: June 6, 2011
Due Date: November 10, 2011
Applicant Ad Date: May 12, 2011
Newspaper: *Moundsville Daily Echo*
UTM's: Easting: 512.70 km Northing: 4399.60 km Zone: 17
Description: To modify the existing metal cells regeneration system to add a new storage tank and to modify an existing tank. Both tanks will be routed to a new scrubber.

DESCRIPTION OF PROCESS

The purpose of the metals cells is to remove metals from sodium hydroxide by the process of electrolysis in order to meet customer specifications. Periodically, the metal cells must be regenerated to remove accumulated metals from inside of the metal cells. During the regeneration process hydrochloric acid is utilized to dissolve the accumulate metals.

Currently, spent acid from the regeneration process is utilized in the plant pH neutralization system. The modified system will provide more storage capacity for the spent acid stream generated from the metals cells and will enhance mixing of the concentrated acid in the pH neutralization system. As part of the pH neutralization system, two large collection tanks are utilized to collect plant process waste waters for treatment prior to discharge through NPDES permitted Outlet 009.

Modifications to the system will include the installation of a new tank and water scrubber, as well modification of an existing tank and will also be routed to the new scrubber.

Emission Units Table:

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed / Modified	Design Capacity	Type and date of change	Control Device
V042	E998	Metals Cells Spent Acid Tank	2011	7,350 gal	new	SC162
V027	E998	Metal Cells Acid Tank	2011	1600 gal	new	SC162
Control Device	Emission Point ID	Control Device Description		Year Installed / Modified	Control Efficiency	
SC162	E998	Metal Cells Tanks Scrubber		2011 (new)	99.9%	

SITE INSPECTION

The writer and Denton Mc Derment from DAQ’s Title V permitting group met with Erika Baldauff and Thomas Horan from PPG. We received an overview presentation about PPG Industries, the Natrium site, and the Chlor-Alkali & Derivatives processes conducted at the site.

Erika provided a driving tour of the site following the presentation. We then met with the supervisor of the Caustic Department and received a more detailed presentation of the Caustic Department along with a walking tour of the department that included the Metal Cells Regeneration System and the proposed changes that are the subject of permit application R13-2886.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The emission increase due to the modification of the metal cells regeneration system is based on the maximum amount of hydrochloric acid that will be used for regenerating the metals cells at the maximum strength of 36% hydrochloric acid. Actual operation of the system will include the addition of condensate to the 36% acid stream that will reduce the strength of the acid. Using the maximum acid strength provides a conservative emission calculation. The regeneration process, on average, will only occur once per week. Approximately 1,500 gallons of acid will be utilized per regeneration.

The scrubber system design was modeled using Aspen Modeler with data from Perry’s Chemical Engineering Handbook and Dalton’s law to determine the operating parameters

to yield a 99.9% reduction efficiency.

Worst case conditions were modeled and the point on the temperature curve that was the hardest to scrub (96°F) was used in the design evaluation. The minimum required water flow rate to the scrubber is 3 gpm.

Additional Maximum Potential Emissions					
Emission Point	Emission Units	HCl Uncontrolled Emissions		HCl Controlled Emissions (99.9% reduction efficiency)	
		pph	ppy	pph	ppy
E998	Metal Cells Acid Tank (V027)	15.39	567.57	0.0154	0.57
	Metal Cells Spent Acid Tank (V042)	57.98	1956.82	0.058	1.96
Total Emissions Increase				0.08	2.53

REGULATORY APPLICABILITY

45CSR7 TO PREVENT AND CONTROL PARTICULATE MATTER AIR POLLUTION FROM MANUFACTURING PROCESSES AND ASSOCIATED OPERATIONS

PPG will be in compliance with 45CSR7-4.2. Based on the information provided in the application, Hydrochloric Acid will not be emitted in excess of 210 milligrams per dry cubic meter at standard conditions which is the maximum allowable quantity provided in Table 45-7B for source operations installed after July 1, 1970.

45CSR13 PERMITS FOR CONSTRUCTION, MODIFICATION, RELOCATION AND OPERATION OF STATIONARY SOURCES OF AIR POLLUTANTS, NOTIFICATION REQUIREMENTS, ADMINISTRATIVE UPDATES, TEMPORARY PERMITS, GENERAL PERMITS, PERMISSION TO COMMENCE CONSTRUCTION, AND PROCEDURES FOR EVALUATION

The metal cells regeneration system is located in the Caustic Department. This department does not currently have an associated R-13 permit; however, there are two storage tanks [V023, V024] and associated scrubber [SC019] that are listed in the Title V permit and have R30 permit

requirements.

The addition of the V027 Metal Cells Acid Tank meets the definition of a stationary source because it is subject to a substantive requirement of an emission control rule promulgated by the Secretary (45CSR7).

45CSR30 REQUIREMENTS FOR OPERATING PERMITS

PPG is subject to 45CSR30. The Title V permit number associated with the Caustic Department is R30-05100002-2006. The applicant submitted a combined R13 and R30 permit application.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Hydrochloric acid

Hydrochloric acid has many uses. It is used in the production of chlorides, fertilizers, and dyes, in electroplating, and in the photographic, textile, and rubber industries. Hydrochloric acid is corrosive to the eyes, skin, and mucous membranes. Acute (short-term) inhalation exposure may cause eye, nose, and respiratory tract irritation and inflammation and pulmonary edema in humans. Acute oral exposure may cause corrosion of the mucous membranes, esophagus, and stomach and dermal contact may produce severe burns, ulceration, and scarring in humans. Chronic (long-term) occupational exposure to hydrochloric acid has been reported to cause gastritis, chronic bronchitis, dermatitis, and photosensitization in workers. Prolonged exposure to low concentrations may also cause dental discoloration and erosion. EPA has not classified hydrochloric acid for carcinogenicity.

AIR QUALITY IMPACT ANALYSIS

This PPG application does not meet the definition of a major modification to an existing major stationary source according to 45CSR14 and therefore, no air modeling is required.

MONITORING OF OPERATIONS

PPG Proposed:
Acid Tanks Scrubber (SC162)
Monitor and record inlet water flow rate to the scrubber

CHANGES TO PERMIT

This is a new permit.

RECOMMENDATION TO DIRECTOR

It is recommended that permit R13-2886 be granted to PPG Industries, Natrium Facility located in Marshall County, WV. Based on the information provided in the application along with any supplemental information provided, the applicant by following the permit requirements will be in compliance with all applicable state and federal regulations.

Laura Jennings
Permit Engineer

Date