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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3387
Plant ID No.:	009-00045
Applicant:	Sal Chemical
Facility Name:	Weirton
Location:	Weirton
NAICS Code:	424690
Application Type:	Construction
Received Date:	October 17, 2017
Engineer Assigned:	Mike Egnor
Fee Amount:	$1,000
Date Received:	October 20, 2017
Complete Date:	December 8, 2017
Due Date:	March 8, 2018
Applicant Ad Date:	November 24, 2017
Newspaper:	The Brooke County Review
UTM's:	Easting: 531.81 Northing: 4,471.52 Zone: 17

Description: An after the fact construction permit for a bulk chemical terminal facility (circa 1965) that also manufactures soda ash briquettes of different blends as well as a wide variety of liquid and dry phosphate blends.

The emissions permitted as a result of this construction permit include 0.10 lbs/hr and 0.44 TPY of total VOC's, 0.12 lbs/hr and 0.53 TPY of total HAP's, and 0.01 lbs/hr and 0.02 TPY of total PM.

DESCRIPTION OF PROCESS

The Process Description is divided into three parts; Bulk liquid material transfer, Class 3 liquid material transfer, and manufacturing of dry materials.

Detailed Process Flow Description for Bulk Liquid Materials

Aluminum Sulfate
Caustic Soda (Sodium Hydroxide)
Ferric Chloride 38%
Ferrous Chloride
Hyper-Ion 1090
Hydrochloric Acid 20° 31%(1)
Hydrofluoric Acid 49%(1)
Hydrofluosilicic Acid 23%
Methanol(1)(2)
PAX-XL 8
Phosphoric Acid 75%
Sodium Bisulfite
Sodium Hypochlorite 15%
Sulfuric Acid 66° 93%

(1) Hazardous Air Pollutants (HAPs)
(2) Volatile Organic Compounds (VOCs)

* Bulk tanker trucks back into the offloading pad adjacent to Building #5 and unload product pneumatically into dedicated two inch (2") lines which transfer the product into dedicated Aboveground Storage Tanks (ASTs). Offloading connections at this point are either 2" to 4 bolt flange or 2" to PVC quick connects.

* Methanol – Bulk tanker trucks back into the offloading pad adjacent to Building #5 and unload via pump into a dedicated Aboveground Storage Tank (AST) via a dedicated three inch (3") quick connect.

* Sodium Hypochlorite – Bulk tanker trucks back into the offloading pad adjacent to Building #5 and unload 16% strength product pneumatically through a two inch (2") quick connect fitting through a dedicated dilution machine. Once the product is diluted to 12.5 to 13.5%, the material flows into one (1) of two (2) dedicated Hypo Aboveground Storage Tanks (ASTs).

* From ASTs – All material is gravity fed to a filling station in Building #4 (Liquid Building). At the filling station, various containers (i.e., 5, 15, 30, & 55 gallon drums and 275/330 gallon IBCs) are filled via a two inch (2") chemical hose. Once filled, the containers are sealed and prepped for DOT shipment. There are two (2) filling stations, one (1) for Methanol and one (1) for all other products.

Detailed Process Flow Description for Class 3 Liquid Materials

Diesel Fuel
Ethylene Glycol Ether EB(1)(2)

Isopropyl Alcohol[2]
Methyl Ethyl Ketone[2]
Methyl Isobutyl Ketone[1][2]
Mineral Spirits Stoddard[1][2]
PM Acetate
Propylene Glycol Monomethyl Ether Acetate[1][2]
Solvent 100[1][2]
Xylene[1][2]
[1] Hazardous Air Pollutants (HAPs)
[2] Volatile Organic Compounds (VOCs)

* All Class 3 liquid materials are drummed directly from a supplier dropped tanker. No Aboveground Storage Tanks (ASTs) are utilized for any of these products. Supplier dropped tanker is positioned on the offloading pad adjacent to Building #5 and hooked to a dedicated solvent line via a two inch (2") quick connect.

* From the supplier dropped tanker, the Class 3 liquids are gravity fed to the solvent drumming area located under Building #4's canopy area where the material is drummed into various containers (i.e., 5, & 55 gallon drums or 330 gallon IBCs) via a two inch (2") hose.

* Diesel Fuel – Diesel Fuel supplier (J.Allen Fuel or Riley Petroleum) will fill through a three inch (3") quick connect. SAL Chemical drivers will fuel up their power units through a standard fuel pump nozzle. This product is NOT repackaged at SAL Chemical.

Detailed Process Flow Description for Dry Materials
Calcium Chloride Flake – Dowflake
Calcium Chloride Pellet – Peladow
Potassium Chloride
Salt
Soda Ash Dense
Soda Ash Light

* Bagging Operations (all products except Salt) – Railcars are positioned over the bagging pit in Building #3. The railcar bottom hopper, normally around 28"x32", is opened and material gravity feeds into a 5'x10' receiving hopper. From this hopper, product is packaged into 50 pound (50Lb) bags via a four inch (4") spout.

* Bulk Bagging Operations (Soda Ash Light, Salt, Calcium Chloride Flake) – Railcar or bulk-pneumatic truck will bottom drop material onto a trans-loader. The trans-loader belt transfers the material a short distance where the material is bulkbagged into 48"x48"x52" supersacs.

* Briquetting Operations (Soda Ash Dense) – The railcar bottom hopper is sealed to a pull/push smoot pneumatic conveying system and blown into a 100,000 pound (100,000 lb) capacity silo. Once in the silo, this material will be fed into our briquetting manufacturing process via a closed helix transfer system.

SITE INSPECTION

This facility was last inspected by Douglas Hammell on November 29, 2016. The results of the inspection indicated that the facility may be subject to an NSR Permit.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

For pollutants other than particulate matter, the facility application used US EPA's AP-42 factors and Tanks 4.0.9d based upon 2016 operations at the facility. There are no pollution controls for these emission points. Emissions are summarized in the table below:

Emission Point ID	Emission Unit ID	Pollutant	Lbs/hr	TPY
1E	1S	HF[1]	0.01	0.02
2E	2S	HCL[1]	0.08	0.33
3E	3S	Methanol[1,2]	0.03	0.13
4E	4S	Isopropyl Alcohol[2]	0.02	0.07
5E	5S	Propylene Glycol Monomethyl Ether Acetate[1,2]	< 0.01	< 0.01
6E	6S	MEK[2]	0.05	0.19
7E	7S	MIBK[1,2]	0.01	0.05
8E	8S	MS Stoddard[1,2]	< 0.01	0.01
9E	9S	Solvent 100[1,2]	< 0.01	0.01
10E	10S	m-Xylene[1,2]	0.01	0.02
Total VOC's			0.10	0.44
Individual HAP's				
HF			0.01	0.02
HCL			0.08	0.33
Methanol			0.03	0.13
Propylene Glycol Monomethyl Ether Acetate			< 0.01	< 0.01
MIBK			0.01	0.05
Cumene			< 0.01	< 0.01
Ethylbenzene			< 0.01	< 0.01
Xylene			0.01	0.02
Total HAP's			0.12	0.53

[1] – HAP

[2] - VOC

For particulate matter, the facility has identified a manufacturing process where they produce soda ash briquettes with blends that have aluminum sulfate, caustic soda, and potassium permanganate. Railcars with these materials are brought on site, where they are transferred to a trans-loader with 100% seal. The material then travels through a push/pull cyclone transfer system to a storage silo. The silo is equipped with a 99% efficiency rated, 16 bag baghouse. The materials are then sent indoors to a briquette machine to make various blends and then sent to packaging. There is a 95% efficiency listed dust collection system in the briquetting and packaging area. The facility listed a maximum transfer rate of 680 TPY of materials for this process.

The facility used X to calculate particulate matter emissions from transfer point emissions. The emissions of particulate matter from the company were listed as 0.01 lbs/hr and 0.04 TPY uncontrolled, and 0.01 lbs/hr and 0.02 TPY controlled.

REGULATORY APPLICABILITY

Rule 7 – CONTROL OF PARTICULATE MATTER AIR POLLUTION FROM MANUFACTURING PROCESSES AND ASSOCIATED OPERATIONS

The blending of aluminum sulfate, caustic soda, and potassium permanganate in the manufacturing of briquettes meets the Rule 7 definition of "Manufacturing Process" as given in 45CSR§7-2.20. As the materials are physically blended together, they meet the source operation type of a physical change. 45CSR§7-4.1 limits the amount of particulate matter emitted during source operations in excess of the amounts specified in Table 45-7A. 680 tons per year converts to 155 lbs/hr. For a Type a source, this results in a particulate matter limit of 0.18 lbs/hr. As the emissions of PM listed in the application are 0.01 lbs/hr and 0.02 TPY, compliance with these limits will show compliance with the Rule 7 limit. These limits are given in Condition 4.1.3.

The outdoor silo is subject to the opacity requirements of 45CSR§7-3.1. As the baghouse (CD-2) is listed as 99% efficient and point source emissions of 0.01 lbs/hr are calculated, the use of the baghouse will show compliance with the opacity limits given in Condition 4.1.5. The permittee will be required to use the baghouse during all times of production. This is given in Condition 4.1.4. Proper operation and efficiency of the baghouse shall be shown by doing annual inspections of the bags once per year. This is given in Condition 4.2.1. The Permittee will keep records of the yearly inspections of the Baghouse (CD-2). This is given in Condition 4.4.6.

Note that there are two other transfer operations where material is taken from the railcar for bagging operations. However, these operations do not involve any blending or other form of manufacturing, so they are not subject to this Rule.

Rule 13 – PERMITS FOR CONSTRUCTION

On June 2, 2017, Sal Chemical (which has been in operation since 1965) submitted a request for a permit determination to the WVDAQ. Page 2 of their permit determination form (PDF) shows hourly VOC emissions of 376 pounds per hour and HAP emissions of 720 pounds per hour. Based on these numbers alone, it was determined by Steven R. Pursley, PE that the facility would exceed the daily PTE trigger of 144 pounds per day found in 45CSR§13-2.24b and thus require a permit. Mr. Pursley sent them a letter dated June 15, 2017 stating that a construction permit would be required under 45CSR13.

The facility submitted the application for R13-3387 for VOC's and HAP's based upon emissions calculated from material transferred in calendar year 2016. These emissions are given in Condition 4.1.1. To show compliance, the facility will be required to keep their throughput levels below those listed in the application. These levels are given in Condition 4.1.2. The facility will be required to keep monthly records of the materials listed, and to calculate their throughputs on a rolling 12-month average. These are given in Conditions 4.4.4 and 4.4.5.

The following rules do not apply to the facility:

40CFR60 Subpart Kb (Standards of Performance for VOC Liquid Storage Vessels)

40CFR60 Subpart Kb does apply to storage vessels with a capacity greater than or equal to 75 cubic meters (19,812.9 gal). None of the tanks listed in the application are greater than 15,000 gallons.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the Sal Chemical Weirton Facility and that are not classified as "criteria pollutants." Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NOx), Ozone, Particulate Matter (PM10 and PM2.5), and Sulfur Dioxide (SO2). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect the public health and welfare. Other pollutants of concern, although designated as non-criteria and without national concentration standards, are regulated through various federal programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) limits promulgated under 40 CFR 61 (NESHAPS) and 40 CFR 63 (MACT). Any potential applicability to these programs were discussed above under REGULATORY APPLICABILITY.

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. The following HAPs are common to this industry. The following table lists each HAP's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

HAPs	Type	Known/Suspected Carcinogen	Classification
Hydrogen Fluoride	Non-VOC	No	Inadequate Data
Hydrogen Chloride	Non-VOC	No	No assessment
Methanol	VOC	No	No assessment
Propylene Glycol Monomethyl Ether Acetate	VOC	No	No assessment
Methyl Isobutyl ketone (MIBK)	VOC	No	Inadequate Data

Cumene	VOC	No	Category D – Not classifiable as to human carcinogenicity
Ethylbenzene	VOC	No	Category D – Not classifiable as to human carcinogenicity
Xylene	VOC	No	Inadequate Data

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health effects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. For a complete discussion of the known health effects of each compound refer to the IRIS database located at *www.epa.gov/iris*.

AIR QUALITY IMPACT ANALYSIS

Modeling was not required of this source because the facility is not subject to 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants) as shown in the table listed in the Regulatory Discussion Section.

MONITORING OF OPERATIONS

Sal Chemical will be required to perform the following monitoring:

- Monitor and record quantity of the chemicals listed in Condition 4.1.2 that were transferred.

Sal Chemical will be required to perform the following recordkeeping:

- Maintain records of the amount of each chemical listed in Condition 4.1.2 that was used.
- Maintain records of the Baghouse (CD-2) inspections.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that Antero meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that Sal Chemical Weirton should be granted a 45CSR13 construction permit for their facility.

_____
Mike Egnor
Engineer

_____
Date