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Evaluation Memo

Application Number: PD15-023
Facility ID Number: 039-00654
Name of Applicant: Enviromine, Inc.
Name of Facility: Nitro Storage Facility
Location of Facility: Nitro, Putnam County
Latitude/Longitude: 38.44476/-81.83001
Application Type: Permit Determination
Submission Date: March 2, 2015
Complete Date: March 2, 2015
Due Date: April 13, 2015
Engineer: Joe Kessler

Background Information

On October 8, 2014 Enviromine, Inc. (Enviromine), submitted a Permit Determination Form (PDF) for a permanent chemical storage facility located in Nitro, Putnam County, WV (note that the facility was incorrectly given a Kanawha County ID of "039"). On October 20, 2014, a "no decision" determination (PD14-123) was made concerning the facility. The submitted PDF did not include enough information to determine if the facility was defined as a "stationary source" pursuant to Section 2.24 of 45CSR13 and, therefore, a permit be required. On March 2, 2015, a new PDF was submitted for the Nitro Storage Facility.

Statutory Authority of the DAQ

The statutory authority of the of the DAQ is given under the Air Pollution Control Act (APCA) - West Virginia Code §22-5-1, et. seq. Based on the language under §22-5-1, et. seq., the DAQ, in making "stationary source" determinations under 45CSR13, does not take into

consideration non-air quality issues such as nuisance potential (noise, sight line obstruction, traffic) or non-air quality environmental impacts.

Description of Process

Enviromine has operated an existing chemical storage facility at the Nitro location since August, 2014. Chemicals are delivered to the facility in tank trucks, totes (approximately 300 gallon fully sealed cube-like plastic containers, and 55 gallon plastic drums. Tank trucks are emptied into the appropriate aboveground storage tanks in the secondary containment area. There are ten (10) tanks: two (2) of which contain Sodium Hydroxide solution, one (1) that contains Calcium Chloride, one (1) Acetic Acid, four containing EnviroFloc CF-1 and two (2) that currently hold water. Each of the tanks may have the contents switched to another chemical that is currently stored in a tank. Additionally, the two tanks that contain water may hold any of the other chemicals in tanks without changing the throughput of each chemical. However, only the chemicals currently stored in tanks on-site are expected to be used in the future. No blending occurs in the storage tanks, however, chemicals are diluted with water. During truck load-out, some mixing off chemicals may occur in the tank trucks. Only the Acetic Acid solution (10-45% as delivered) is considered a VOL and has the potential to emit VOCs as stored. The facility has two (2) truck loadouts with the capability to load at approximately 100 gallons/minute (gpm). However, due to piping restraints, only one Acetic Acid truck can be loaded at a time.

Most totes that are delivered are then shipped in totes without being opened. Some totes, however, are opened and the chemicals combined with other materials in the tank trucks (manually with a 5 gallon bucket) according to customer specifications. Additionally, some partially-filled totes may be combined with other totes of the same chemical to make a new full tote. Any emissions that may result from tote-to-tote transfer is considered negligible. However, the materials Freeze Free 510-DS and Freeze Free 510 contain some propane-1, 2, 3-triol (glycerine), which is a VOC. Because glycerine is present in a number of the chemicals and is loaded into tank trucks as noted above, Glycerine loadout emission was included in the calculations. Drums that are stored at the facility are not opened and shipped out while still in drums.

No 4-methylcyclohexanemethanol (MCHM) is stored or processed at the facility. A complete list of materials, their method of storage, and a worst-case throughput are included in the PDF.

Additionally, there are several natural gas fired heaters at the site that have a total aggregate Maximum Design Heat Input (MDHI) of 0.668 mmBtu/hr. These units have the potential to produce emissions of both VOCs and other pollutants that are the products of combustion.

Air Emissions and Calculation Methodologies

Enviromine submitted an emissions estimate for the facility based on a reasonable worst-case operating scenario (related to the potential air emissions). The following will discuss the air emissions and methodology of Enviromine's emissions estimate for each source and any revisions to such made by the writer.

Natural Gas Combustion

The potential emissions from the 0.668 mmBtu/hr of natural gas-fired heaters were based on the emission factors provided for natural gas combustion as given in AP-42 Section 1.4. (AP-42 is a database of emission factors maintained by USEPA). Hourly emissions were based on the MDHI of the units and annual emissions were based on an annual operation of 8,760 hours. A natural gas heat content value of 1,000 Btu/ft³ was used in the calculations.

Storage Tanks

As noted in Enviromine's process description, the only Volatile Organic Liquid (VOL) stored in tanks at the facility is Acetic Acid. Emissions from the Acetic Acid storage tank was calculated using the TANKS 4.09d program (working/standing losses) as provided under AP-42, Section 7. The total emissions from each fixed roof storage tank are the combination of the calculated "standing loss" and "working loss." The standing loss refers to the loss of vapors as a result of tank vapor space breathing (resulting from temperature and pressure differences) that occurs continuously when the tank is storing liquid. The working loss refers to the loss of vapors as a result of continuous tank filling or emptying operations. Standing losses are independent of storage tank throughput while working losses are dependent on throughput.

To produce a reasonable maximum worst-case emissions estimate from the Acetic Acid storage tank (as stored in solution of 10-45%), Enviromine based the tank throughput 500,000 gallons per year which represents, according to Enviromine, an amount beyond which is a maximum theoretical throughput for this facility. Hourly standing losses were based on the annual emissions divided by 8,760 hours (appropriate, as standing losses occur continuously without regard to filling or emptying of the tank). Hourly working losses were based on 82 hours of year of turnovers (very conservative estimate of continual filling and emptying).

Enviromine did not provide a worst-case daily emission estimate from the storage tanks. The writer calculated the worst-case daily emission rate using the hourly emission rate (calculated as described above) multiplied by 24.

Truck Loadouts

Enviromine calculated load-out emissions from the Acetic Acid Tank and the manual Glycerin loading based on Equation (1) of AP-42 Section 5.2-1. In this equation, Enviromine used properties specific to the liquids loaded (vapor pressures, constituent compound fractions) and to the method of loading: top "splash loading." Maximum hourly emissions of both Acetic Acid (10% solution) and Glycerine were based on the facility's maximum loading rate of approximately 100 gpm. Annual loadout emissions were based on loading out a 5,700,000 gallons of Acetic Acid and 275,000 gallons of Glycerine per year. Daily emissions from the loadout operations were calculated by the writer by multiplying the hourly emissions by 24.

Hazardous Air Pollutants.

Hazardous Air Pollutants (HAPs) are, with some revision since, 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. Enviromine identified

HAPs as present in two (2) materials handled at the facility: EnviroFloc CF-36 and CF-36X (acrylamide @ less than 0.3%), and Glycerin (methanol @ 0.1%). As this material is delivered and stored in totes, any emissions from use of these materials is considered negligible. However, to be very conservative, and for simplicity, the author assumed that 1% of all VOC emissions from the storage tanks and loadouts were HAPs in the permit determination analysis.

Summary

Based on the above emissions calculations methodology, the reasonable maximum uncontrolled emissions from the facility are given in Attachment A: Table 1.

Determination of Permit Applicability

Pursuant to §45-13-5.1, “[n]o person shall cause, suffer, allow or permit the construction . . . and operation of any stationary source to be commenced without . . . obtaining a permit to construct.” The definition of “stationary source” is given under Section 2.24 of the 45CSR13 and includes four applicability tests under 2.24(a) through 2.24(d). Each applicability test with respect to the facility will be discussed below.

§45-13-2.24(a)

Section 2.24(a) states any facility that “is subject to any substantive requirement of an emission control rule promulgated by the Secretary” is defined as a stationary source. “Emission control rules promulgated by the Secretary” include state air quality regulations and, through 45CSR15, 45CSR16, and 45CSR34, all Federal National Emissions Standards of Hazardous Air Pollutants (NESHAPs), National New Source Performance Standards (NSPS), and Maximum Achievable Control Technology (MACT) rules. The following will discuss each potentially applicable rule and any substantive requirement that may apply to the facility.

45CSR2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers

Each heater has been determined to meet the definition of a “fuel burning unit” under 45CSR2 (“producing heat or power by indirect heat transfer”) and are, therefore, subject to the applicable requirements therein. However, pursuant to the exemption given under §45-2-11, as the MDHI of the heaters are each less than 10 mmBtu/hr, the units are not subject to sections 4, 5, 6, 8 and 9 of 45CSR2. The only remaining substantive requirement is under Section 3.1 - Visible Emissions Standards. Pursuant to 45CSR2, Section 3.1, the heaters are each subject to an opacity limit of 10%. Proper maintenance and operation of the heaters should keep the opacity of the units well below 10% during normal operations.

Section 3.1 of 45CSR2 is not considered a “substantive” requirement for purposes of §45-13-2.24(a).

45CSR4: To Prevent And Control The Discharge Of Air Pollutants Into The Open Air Which Causes Or Contributes To an Objectionable Odor Or Odors

The potentiality of odor issues from a facility is not used as the basis for defining the facility as a “stationary source” under §45-13-2.24(a).

45CSR4 is “designed to prevent and control the discharge of pollutants into the open air which causes or contributes to an objectionable odor or odors.” The rule does not contain any quantified odor thresholds. §45-4-2.6 defines an objectionable odor in the following manner:

[I]n addition to odors generally recognized as being objectionable, an odor shall be deemed objectionable when in the opinion of a duly authorized representative of the Director, based upon his investigations or his investigations and complaints, such odor is objectionable.

An objectionable odor must be determined by the DAQ in the course of an inspection or investigation. If, in the course of an inspection or investigation, the DAQ determines that the a facility is causing or contributing to an objectionable odor, the DAQ will take the actions as required under 45CSR4.

45CSR10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides (non-applicability)

45CSR10 has requirements limiting SO₂ emissions from “fuel burning units,” limiting in-stack SO₂ concentrations of “manufacturing processes,” and limiting H₂S concentrations in process gas streams. The only potential applicability of 45CSR10 to the Enviromine facility is the limitations on fuel burning units. The heaters have each been determined to meet the definition of a “fuel burning unit” under 45CSR10. However, pursuant to the exemption given under §45-10-10.1, as the MDHI of each heater is less than 10 mmBtu/hr, the units are not subject to the limitations on fuel burning units under 45CSR10.

Subpart Kb—Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984

Pursuant to §60.110b, 40 CFR 60, Subpart Kb applies to “each storage vessel with a capacity greater than or equal to 75 m³ (19,813 gallons), that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984.” However Subpart Kb does not apply to “storage vessels with a . . . capacity greater than or equal to 75 m³ but less than 151 m³ [39,890 gallons] storing a liquid with a maximum true vapor pressure less than 15.0 kPa.” The Enviromine facility does not include any tanks over 19,813 gallons.

§45-13-2.24(b)

Section 2.24(b) states any facility that “[d]ischarges or has the potential to discharge more than six (6) pounds per hour and ten (10) tons per year, or has the potential to discharge more than 144 pounds per calendar day, of any regulated air pollutant” is defined as a stationary source. Based on DAQ procedures and policies, “potential to discharge” is calculated without any control devices

and at a facility's reasonably maximum operating conditions. In the case of the Enviromine facility, this requires calculating the heaters hourly and annual emissions based on the MDHI and operation of 8,760 hours/year and the use of reasonably maximum material throughputs to calculate the storage tank and loadout emissions. Using this methodology, the facility-wide emissions under Attachment A: Table 1 were calculated to be less than those that would define the facility as a "stationary source" under §45-13-2.24(b).

§45-13-2.24(c)

Section 2.24(c) states any facility that "[d]ischarges or has the potential to discharge more than two (2) pounds per hour or five (5) tons per year of hazardous air pollutants considered on an aggregated basis" is defined as a stationary source. Using the same methodology as described above in calculating emission rates under 2.24(b), the facility-wide HAP emissions under Attachment A: Table 1 were calculated to be less than those that would define the facility as a "stationary source" under §45-13-2.24(c).

§45-13-2.24(d)

Section 2.24(d) states any facility that "[d]ischarges or has the potential to discharge any air pollutant(s) listed in Table 45-13A in the amounts shown in Table 45-13A or greater." Table 45-13A of 45CSR13 lists chemicals generally referred to as Toxic Air Pollutants (TAPs). Enviromine did not identify any TAP containing materials handled at the Enviromine facility.

Summary and Recommendation

Based on the information provided by Enviromine and on information from the C/E Section, I recommend the issuance of a "no permit needed" letter to Enviromine, LLC for the Nitro Storage Facility located in Nitro, Putnam County, WV based on the following:

- The facility is not subject to a substantive requirement of an emission control rule promulgated by the Secretary; or
- The facility-wide uncontrolled emissions, as based on reasonably maximum parameters and using very conservative calculation methodologies, are less, on a pollutant-by pollutant basis, of the amounts that would define the facility as a "stationary source" under §45-13-2.24(b), 2.24(c), or 2.24(d).



Joe Kessler, PE
Engineer

3/19/15

Date

Attachment A

PD15-023

Enviroimine: Nitro (039-00654)

Table 1: Facility-Wide Emissions Summary

Source	CO		NO _x		PM _{2.5} /PM ₁₀ /PM		SO ₂		VOCs		HAPs	
	(lb/hr)	(lb/day)	(lb/hr)	(lb/day)	(lb/hr)	(lb/day)	(lb/hr)	(lb/day)	(lb/hr)	(lb/day)	(lb/hr)	(lb/day)
Heaters	0.06	1.44	0.10	2.40	0.01	0.24	0.001	0.02	0.004	0.09	0.002	0.05
Storage Tanks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Loadout	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Totals	0.06	1.44	0.10	2.40	0.01	0.24	0.00	0.02	0.00	1.28	0.01	0.31
										1.98	0.02	0.52
										47.57	0.69	0.02