

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

ACTIVITY REPORT: Scheduled Inspection

P076852478

FACILITY: Velsicol Chemical Corporation Superfund Site		SRN / ID: P0768
LOCATION: 324 North Street, SAINT LOUIS		DISTRICT: Lansing
CITY: SAINT LOUIS		COUNTY: GRATIOT
CONTACT: Scott Pratt, Project Manager		ACTIVITY DATE: 02/05/2020
STAFF: Michelle Luplow	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MINOR
SUBJECT: Announced, scheduled compliance inspection to determine compliance with SRD #1-19SA.		
RESOLVED COMPLAINTS:		

Inspected by: Michelle Luplow

Remediation activities contacts:

Scott Pratt, Project Manager, Jacobs (scott.pratt@jacobs.com)
Matt Baltusis, EGLE RRD Superfund Section (baltusism@michigan.gov)
Thomas Alcamo, EPA Region V (alcamo.thomas@epa.gov)

Purpose

Conduct an announced, scheduled compliance inspection of the Velsicol Chemical Corporation Superfund Nonaqueous phase liquid/ 1,2-dibromo-3-chloropropane (NAPL/DBCP) Area 2 site to determine compliance with Substantive Requirements Document (SRD) No. 1-19SA for the insitu thermal treatment system (ISTT) with associated thermal oxidizer, wet scrubber, and activated carbon units.

The conditions included in the SRD are those which would be included if this project were regulated under the Air Pollution Control Rules. Superfund sites are primarily enforceable pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and an air permit is not required under CERCLA for removal or remedial actions conducted entirely on-site; however, CERCLA allows for a state to enforce any federal or state standard, requirement, criteria or limitation to which the remedial action is required to conform, and the AQD has determined that the requirements within the SRD are necessary in order for this remediation project to comply with NREPA, Article II, Chapter 1.

Facility Background/Regulatory Discussion

The Velsicol Chemical Corporation (formerly Michigan Chemical Corporation) historically produced the chemicals PBB, a fire retardant, and DDT, a pesticide, resulting in contamination of the soils and groundwater within and surrounding the Velsicol site.

The EPA and EGLE are jointly performing remediation of the soils and groundwater in stages. Area 1 was the first phase of remediation and completed in 2018, Area 2 is the second phase of remediation and currently covered under SRD No 1-19SA. The third phase will likely involve the remediation of the Velsicol Burn Pit, a satellite disposal area for wastes and residues from the Velsicol Plant site, which is considered a separate Superfund site. Remediation of Area 1 was conducted under SRD # 1-16SB issued June 14, 2018. The original SRD, # 1-16SA was issued June 26, 2017, but was updated per request from Thomas Alcamo, EPA, who requested that rather than replacing carbon canisters when "breakthrough" of a concentration of 20% or more of the influent into the first canister occurred, the carbon canisters be replaced when a VOC concentration of 1,000 $\mu\text{g}/\text{m}^3$ is detected between the first and second canister. EPA demonstrated that if emissions from the system stayed at a maximum of 1,000 $\mu\text{g}/\text{m}^3$, the Velsicol site would be emitting a maximum of 0.025 tpy VOC if they operated 24 hours per day, 365 days per year, and at maximum flow rate. The AQD LDO and Permits Section determined that this was acceptable, and therefore the Testing/Sampling conditions were revised to require replacement of the carbon if breakthrough occurs at 1,000 $\mu\text{g}/\text{m}^3$ VOC. Those revised conditions have been incorporated into SRD 1-19SA for Area 2 compliance.

ISTT involves heating the subsurface soil and groundwater via a series of electrically powered heaters. The heat volatilizes the contaminants, the vapors of which are captured and treated via a Thermal Oxidizer (TO), acid gas scrubber, and vapor-phase granular activated carbon (VGAC), to polish the exhaust from the thermal oxidizer system before discharging to atmosphere. There is also wastewater discharge from this process that is regulated under the EGLE Water Resources Division. It takes 120 days of heating for the sub-surface soils to reach

temperature, before the soils are maintained at temperature for 90 days for treatment. There will be an additional 3 weeks of post-treatment with no additional heat transferred to the ground.

Jacobs (project management team) began injecting heat into the soil on October 1, 2019.

S. Pratt said there are 7 air monitoring stations that have been placed throughout the property in response to residents' concerns. The stations monitor for 13 VOCs and DDT.

Inspection

I arrived at the Velsicol site at approximately 9:30 a.m. on February 5, 2020 and met with Scott Pratt, Project Manager. I was informed at the inspection that the wellfield was shut in (by closing of the block valve) and therefore no vapor treatment was being conducted because Jacobs is working on replacing the east bank VGAC (vapor-phase granular activated carbon) vessels. See malfunction abatement plan (MAP) discussion under Process/Operational Restrictions for further details on this replacement and the events that caused this replacement. S. Pratt said the wellfield is being held at 84°C (below the boiling point of water) to ensure that vapors don't escape from the ground and emit directly to ambient air. During active contaminant recovery and treatment the wellfield is held above 100°C. Although vapors were not actively being collected from the wellfield, Scott Pratt, Jacobs Project Manager, said that the thermal oxidizer (TO) is still running, using ambient air to keep it hot in order to reduced stress in the TO refractory due to temperature swings.

EUREMEDIATION

This SRD is for the soil and groundwater remediation, the exhaust stream of which is cooled, and the moisture knocked out, prior to being treated by a staged treatment system: thermal oxidizer to the caustic acid scrubber to the 2 dual-stage activated carbon systems. The TO is used to destroy vapor phase air contaminants. The exhaust from the TO is then sent to an acid gas scrubber to remove any acid gases that may have resulted in the oxidation of halogenated air contaminants. The exhaust from the scrubber is then sent to a series of VGAC vessels to capture any pesticides and PCBs. Although not required by the SRD, Jacobs tests the midfluent between the two activated carbon canisters to check for the presence of any pesticides or PCBs as a service to the surrounding residents. To-date S. Pratt said they have not detected either of these pollutants at the VGAC system midfluent. Heating of the soils for this system started October 1, 2019.

During the inspection we briefly discussed the possibility of Jacobs diverting the wellfield gas stream to the VGAC vessels prior to sending the stream to the thermal oxidizer when making plans for Phase 2 of Area 2. Also there will be some consideration to postpone the next phase of the project until March 2021 to ensure that the winterization issues experienced during this treatment phase will not be encountered again. Further discussions will be had when working on the SRD for the next phase of treatment.

S. Pratt said, during the inspection, that they are approximately 1 month away from reaching 100C. From that point they will run for a minimum of 90 days and then evaluate whether 95% reduction (2 ppm via photoionization detector) from the maximum concentration of contaminants has been met to determine whether this phase of remediation is complete.

Emission Limits, Monitoring/Recordkeeping, and Reporting

Velsicol is limited to 0.03 tpy VOC per 12-month rolling time period, as determined at the end of each calendar month. Records to demonstrate compliance with this limit include monitoring and recording the flow rate and the total VOC concentration of the effluent stream of the first stage activated carbon canister (midfluent) on a weekly basis. The Environmental Protection Agency is required to report monthly and 12-month rolling VOC emissions, which includes flow rate and total VOC concentration of the effluent stream of the midfluent, 30 days following the end of the month in which the data was collected. October – December 2019 reports have all been submitted late: The October report was received December 2019, and the November and December reports were received in February 2020. I reminded T. Alcamo, who is responsible for submitting the reports, that all reports must be submitted within 30 days of the end of the calendar month in which the data was recorded. January's report is due March 1, 2020.

The October – December reports indicate compliance with the 0.03 tpy 12-month rolling limit, at 0.0012 tons at the end of December 2019.

I requested the lab analysis data for the week of October 3, 2019, the first week that the equipment had been operating, and also asked that they provide me with records of the breakdown of each contaminant found in the gas stream for October – December 2019. These records were provided to me electronically. I reviewed the lab

gas stream for October – December 2019. These records were provided to me electronically. I reviewed the lab analysis data for October 3, 2019 sampling and confirmed that all detected VOCs were reported internally in their contaminant spreadsheet and that the total quantity reported was correctly translated to their monthly reports. All was verified to be accurate and complete, including the calculations to determine weekly and monthly VOC emissions. Attached are all spreadsheets used for verification.

There are currently no Materials Limits for EUREMEDIATION.

Process/Operational Restrictions

A malfunction abatement plan (MAP) is required to be submitted at least 30 days prior to startup of EUREMEDIATION and shall include a complete preventative maintenance program, identification of the source and air-cleaning device operating variables to be monitored to detect a malfunction or failure, and a description of the corrective procedures or operational changes that shall be taken in the event of a malfunction. Startup of EUREMEDIATION occurred October 1, 2019, which required Jacobs to submit a MAP by September 1, 2019. The MAP was submitted to the AQD on December 20, 2019. I have reviewed the MAP and it contains all information required in the SRD.

However, a malfunction occurred on January 22, 2020 and again on January 30, 2020 which caused the VGAC material to be discharged out of the treated vapor emission point during these upsets. S. Pratt confirmed that the VGAC emitted from the discharge point stayed on Velsicol's property and did not reach any residential areas for both malfunction events. He stated that the cause for the first malfunction was the result of insufficient winterization procedures in place to ensure none of the VGAC system components froze. The second malfunction was attributed to the quality of activated carbon used and the condition of the VGAC vessels: activated carbon usually contains a mixture of carbon fines and carbon pellets; Jacobs found a disproportionate amount of fines in the east bank VGAC system. From this finding, in addition to finding that there was degradation to the screen which physically supports the carbon in the vessel, Jacobs determined that the two 5,000 lb VGAC vessels for the east bank needed to be replaced. During the inspection, Jacobs was in the process of replacing the activated carbon in the east bank VGAC system with 2 new 8,000 lb VGAC units. These vessels will be the primary VGAC treatment vessels. S. Pratt sent an email detailing these activities and stated that the corrective measures for this system were completed on February 6, 2020, at which time vapor treatment activities were restarted and resumed without incident. See attached email from S. Pratt for further details on the malfunction events and the corrective actions taken. An amended MAP is required to be submitted by March 9, 2020 to address the malfunctions that occurred on January 22nd and January 30th and include the changes made to the VGAC system.

S. Pratt said that all VGAC vessels and their water lines are insulated now to prevent freezing.

Design/Equipment Parameters & Monitoring/Recordkeeping

The thermal oxidizer is required to be operated in a satisfactory manner, which includes maintaining a minimum temperature of 1750°F, a 60-minute average combustion chamber temperature of 1800°F (based on instantaneous block average readings collected at least every 15 minutes), and a device of which should be installed, calibrated and maintained to monitor and record the temperature at least once every 15 minutes.

I requested that S. Pratt provide me with temperature data records for the October 1, 2019 – December 31, 2019. S. Pratt said that the data is recorded every 5 minutes. I reviewed the data and found that initially temperature data points were recorded every minute, but after October 21, 2019 temperature data was recorded every 5 minutes, meeting the requirements for the data recording requirement. Attached are examples of the 60-minute block average data for October 2, 2019.

All data were reviewed and I verified that for all times when the thermal oxidizer was operating, the 60-minute block average was above 1800°F, except for those periods described below. The lowest data point was 1792°F, which is still above the minimum temperature requirement of 1750°F.

There was a period of approximately 18 hours on October 21, 2019 where thermal oxidizer temperature data was not recorded, in addition to approximately 9 hours without data recorded on December 1, 2019 and a half hour without data around midnight on December 1, 2019. The 18-hour incident was due to a failure in the data logging firmware. Jacobs worked with the PLC firmware supplier to update their firmware. The December 1, 2019 event was caused by power loss to the facility. At that time the thermal oxidizer was shut down and the wellfield block valve was closed. After the inspection I spoke to S. Pratt on the phone who said that for these occurrences when data wasn't being electronically recorded, they had staff onsite sitting at the computer workstation that monitors the thermal oxidizer temperature, and watching to ensure that the temperature never

dropped below the permitted limits. I requested that during these periods of data logging interruption, they begin to hand-record the thermal oxidizer temperature every 15 minutes to ensure that the data is still being continuously recorded while they are monitoring the temperature. S. Pratt agreed and stated they would update the MAP to reflect that this will be the resolution for periods where data logging is interrupted. There were multiple periods throughout October – December 2019 where the thermal oxidizer was shutdown and thus the wellfield block valve was closed (thus, no treatment occurring during these periods). This includes the following days and associated downtimes:

10/5/19 – 1.5 hours
 10/8/19 – 2 hours
 10/13/19 – 1.5 hours
 10/19/19 – 1 hour
 10/21/19 – 2 periods, 1 hour and ½ hour
 10/24/19 – 7 hours
 11/7/19 – 1 hour 20 mins
 11/16/19 - 15 minutes
 11/22/19 – 5 minutes
 12/28/19 – 11 hours
 12/30/19 - 4.5 hours

S. Pratt said the thermal oxidizer downtime was a function of various maintenance activities or alarms that needed to be responded to. He said it was not a function of a drop in temperature below the permitted temperature limit that caused any of the thermal oxidizer shut downs. For example, the thermal oxidizer was shut down on 10/22/19 for thermal oxidizer instrument calibration. Treatment stopped during all activities where service or maintenance needed to be conducted on the thermal oxidizer. The SRD allows Jacobs to send all recovered vapors directly to the thermal oxidizer when it is down, but Jacobs has not yet instituted this practice. Rather, they have ceased treatment operations until the thermal oxidizer is back online and operating properly.

The SRD also requires that the caustic scrubber be satisfactorily operated between 6.0 and 8.0, and that the pH be continuously monitored and recorded (a data point at least once every 15 minutes). As with the thermal oxidizer combustion temperature, Jacobs was recording pH data at 1-minute increments, until October 21, 2019, where they then began recording the scrubber pH in 5-minute increments.

I reviewed all data points and found that the pH was within the operating range for all periods, except for during the periods where the wellfield block valve was closed, and therefore there was no flow to the control devices; the pH during some of these periods was out of operating range, exceeding the 8.0 maximum; S. Pratt said that the reason the pH will increase during periods of thermal oxidizer shutdown, when the wellfield block valve is closed, is because there are no acid gasses running through the scrubber to keep the pH within the proper range, thus the pH will increase for a period of time before the system corrects itself.

S. Pratt said the pH of the scrubber solution is calibrated several times per week using pH calibration solutions.

Table 1 contains process information I recorded during the inspection. As previously stated, active treatment of the vapors was not being conducted because of the issue with the VGAC vessels. The wellfield block valve was closed. Some parameters were out of range because the system was not being operated. The scrubber conductivity, moisture separator, duct heater outlet temperature and GAC inlet flow are all parameters that Jacobs has established in their MAP in order to ensure that the system is functioning properly.

Table 1. Process Operating Parameters 2/5/2020

	Temperature (RTO above 1750°F)	pH (6-8)	Spent scrubber Conductivity (100 mS)	Moisture Separator (90-100F)	Duct Heater Outlet Temp (115-125F)	GAC Inlet flow (1000 – 1500 scfm)
RTO	1814					
		7.0	1.6			

Caustic Scrubber						
GAC				62.7 – not operating, not pulling heat	33.1°F (ambient)	NA – Not treating wellfield vapors

Testing/Sampling & Monitoring/Recordkeeping

Breakthrough of the first carbon canister in the dual-stage activated carbon system is required to be tested at least once per week. Breakthrough is defined as a concentration of $1,000 \mu\text{g}/\text{m}^3$ or more. If breakthrough is detected, the permittee is required to switch to the other activated carbon system, replace the carbon in the first canister, and reverse the operating order of the vessels. Records of each carbon change are required to be kept; however, S. Pratt said there have been no carbon changes since operations began. The weekly effluent stream concentration from the first stage carbon canister is also required to be kept. Within the monthly VOC emissions reporting which EPA submits to EGLE, are the weekly carbon "midfluent" concentration data in mg/m^3 .

Converting the data to $\mu\text{g}/\text{m}^3$, the highest midfluent concentration was $405 \mu\text{g}/\text{m}^3$ during the week of December 4, 2019. These records provide further demonstration that the carbon of the first stage was not required to be replaced from October – December 2019.

Compliance statement: Velsicol Chemical Corporation Superfund site is in compliance with SRD # 1-19SA at this time.

NAME Michelle Lynn

DATE 2/26/2020

SUPERVISOR D.M.