

DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION  
**ACTIVITY REPORT: On-site Inspection**

P102872950

<b>FACILITY:</b> Corteva Agriscience LLC		<b>SRN / ID:</b> P1028
<b>LOCATION:</b> 701 Washington Street, MIDLAND		<b>DISTRICT:</b> Bay City
<b>CITY:</b> MIDLAND		<b>COUNTY:</b> MIDLAND
<b>CONTACT:</b> Jacqueline Duby , Environmental Group Leader & Specialist		<b>ACTIVITY DATE:</b> 07/31/2024
<b>STAFF:</b> Nathanael Gentle	<b>COMPLIANCE STATUS:</b> Compliance	<b>SOURCE CLASS:</b> MEGASITE
<b>SUBJECT:</b> EU12b Scheduled Onsite Inspection		
<b>RESOLVED COMPLAINTS:</b>		

On July 31, 2024, AQD staff conducted a scheduled onsite inspection of the emission unit identified as EU12b at Corteva Agriscience, LLC, SRN P1028. AQD staff included Nathanael Gentle, Environmental Quality Analyst, and Gina McCann, Bay City District Supervisor. The purpose of the inspection was to determine compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; Michigan Department of Environment Great Lakes and Energy, Air Quality Division (AQD) Administrative Rules and Renewable Operating Permit, MI-ROP-P1028-2022d. At the time of inspection, the facility was found to be in compliance.

## Facility Description and History

Corteva Agriscience, LLC is a megasite located at 701 Washington Street, Midland, Midland County, Michigan 48667. The stationary source consists of Corteva Agriscience LLC (Corteva) (SRN P1028), Clean Harbors Industrial Services (Clean Harbors) (P1028), DDP Specialty Electronic Materials US, Inc. (DDP) (SRN P1027), Nutrition & Biosciences USA 1, LLC (N&B) (P1027), The Dow Chemical Company (Dow Chemical) (SRN: A4033), Dow Silicones (SRN: A4043), and Trinseo, LLC (Trinseo) (SRN: P1025). During the July 31, 2024, inspection, compliance was evaluated for EU12b.

The EU12b 2,4-D process unit is a phenoxy herbicide manufacturing plant. Equipment in the process includes reactors, distillation/fractionation columns, separators, storage tanks/silos and related equipment. The manufacturing equipment is located in 948 Building. Process vents are treated by the VS-1011/T-1010 scrubbing system and then by either the THROX located in 963 Building or the 948 carbon adsorber system. The 948 carbon adsorber system is also used as a backup control device for the 2,4-D salt herbicide process located in 959 Building (EU03).

EU12b is subject to the requirements of 40 CFR Part 63, Subparts A, EEEE, and MMM. Processes subject to Subpart MMM are also subject to the equipment leak provisions of 40 CFR Part 63, Subpart H, also known as the HON.

## Compliance Evaluation

Perchloroethylene is delivered to process via tank truck and unloaded as needed. Staff report deliveries occur approximately 7 times per year. The permittee shall not start unloading perchloroethylene from any tank truck unless the afterburner (THROX) is installed, maintained, and operated in a satisfactory manner, S.C. III.2. Program controls are in place to prevent the unloading of perchloroethylene to commence unless the 963THROX is operational, and emissions are venting to the 963THROX. Verification of the program logic was completed during the onsite inspection. Permissions are in place preventing the program controls to be changed. To change the programming, staff report the changes would need to go through the engineer, process control technician and a staff member in charge of coding. In the event the 963THROX were to go down while perchloroethylene was being unloaded, staff report the diaphragm pump would auto shut-off and the transfer valve would close, ceasing perchloroethylene unloading. In

addition to program controls, staff review unload records monthly to verify if perchloroethylene unloading occurred that the 963THROX was operational and emissions were vented to the control device.

Emissions from EU12b are controlled by a caustic scrubber system. The system is a two-stage scrubber system consisting of a venturi scrubber (VS-1011) and a packed tower scrubber (T-1010) in series. Satisfactory operation of the caustic scrubber system shall include maintaining the minimum flow rate through each stage of the scrubber system that complies with the operating parameters established for the scrubber system under 40 CFR Part 63, Subpart MMM. Emissions from the water recycle tanks (V 905, V 4305E, and V 4305W) and emissions from V-1010 liquid neutralization are not subject to this requirement, S.C.IV.2.

Each scrubber is equipped with a liquid flow rate monitor, S.C.IV.1. Staff report flow rate monitors are recalibrated annually pursuant to 40 CFR Part 63, Subpart MMM. The most recent calibration was conducted during the process turn around period in September 2023. A minimum flow rate is established for each scrubber. VS-1011 has minimum flow rate of 60 gpm. T-1010 has a minimum flow rate of 14 gpm. Minimum flow rates were determined as part of one-time performance testing conducted pursuant to 40 CFR Part 63, Subpart MMM in December 2015.

System controls are in place to ensure the two-stage scrubber system is operating properly. Each scrubber is equipped with a low alarm and a low-low alarm. VS-1011 has a liquid flow rate setpoint of 100 gpm. The scrubber has a low alarm set-point of 75 gpm and a low-low alarm set-point of 60 gpm. T-1010 has a liquid flow rate setpoint of 18 gpm. The scrubber has a low alarm setpoint of 16 gpm and a low-low alarm set-point of 14 gpm. Staff report that if a low flow alarm were to sound, operators would take immediate action to investigate and reestablish flow rates. If the low-low alarm were to sound program logic is in place to take control and increase the flow rate. If necessary, operators would stop vent feeds and shut down the process until flow rates were restored.

The permittee shall monitor and record, on a continuous basis, the liquid flow rate for each stage of the caustic scrubber system (VS-1011 and T-1010) in accordance with the requirements of FGPESTICIDES, S.C.VI.1. Records of scrubber flow rate data were provided and reviewed for the most recent 12-month period. Scrubber flow rate data is automatically logged by the process control system. Once a month, staff transfer the flow rate data into an excel spreadsheet. The data consists of scrubber flow rates at 5-minute intervals. Staff use the data to calculate the 24-hour average. As part of internal review, staff review the data to ensure the 24-hour average for each day of the month is at or above the minimum flow rate. If a deviation were to occur, staff report the deviation would be reported in a deviation report. Appropriate records appear to be maintained. During the period of records reviewed, scrubber flow rates were verified to be operated at or above the minimum flow rate 24-hour average during operation of EU12b.

At the time of inspection, the liquid flow rate readout of VS-1011 on the operator screen was observed to be 99.9 gpm. The device id on the operator screen was 680. VS-1011 was visually verified to be equipped with a liquid flow rate monitor with a corresponding device id tag. Readout on the liquid flow indicator was observed to be 99.1 gpm.

The liquid flow rate readout of T-1010 on the operator screen was observed to be 18.0 gpm, at the time of inspection. The device id on the operator screen was 600. T-1010 was visually verified to be equipped with a liquid flow rate monitor with a corresponding device id tag. Readout on the liquid flow indicator was observed to be 18.03 gpm.

The permittee shall not operate equipment that causes emissions from the process vents in EU12b unless either the afterburner (THROX) or the carbon adsorber system is installed, maintained, and operated in a satisfactory manner, S.C.IV.3. Emissions from EU12b are controlled by either the 963THROX or the carbon adsorber system. Valve systems are in place to ensure process emissions go to one of the control devices.

The 963THROX is the primary control for EU12b. The 963THROX is owned and operated by DDP Specialty Electronic Materials US, Inc. (DDP) (SRN P1027). In the event the 963THROX is unavailable or not operating properly, process vents are automatically redirected to the carbon adsorber system for control.

Satisfactory operation of the 963THROX shall be determined according to the requirements of FG963THROX (SRN P1027) and FGPESTICIDES and includes attaining at least 99.9 percent destruction of organic compounds exhausted to the device. The permittee shall implement and maintain a plan identifying the operating parameters for FG963THROX that shall be obtained from the operator or owner of FG963THROX. All operating parameter data in the plan for FG963THROX shall be obtained within 30 days of the end of the month to which it pertains. If the plan fails to provide adequate information to demonstrate 99.9% destruction of organic compounds, the permittee shall amend the plan, S.C.VI.5. A copy of the EU12b Control Device Plan was provided and reviewed. The plan was most recently updated in January 2023 following performance testing conducted on the 963THROX on October 19, 2022. Operating parameters of the 963THROX identified to be monitored in the EU12b Control Device Plan include the following, TTU exit gas temperature, combustion air flow, scrubber flow, scrubber pH, 963 upstream vent valve position, and 963 downstream vent valve position. Operating parameters at which the 963THROX must be operated in order to meet the 99.9% destruction efficiency were determined by stack testing. As previously mentioned, 963THROX is owned and operated by DDP. Proper operation in accordance with FG963THROX and ensuring 99.9 percent destruction of organic compounds is maintained by DDP staff. Corteva staff report in the event the 963THROX were not operating properly, the vent pathway to the 963THROX is automatically closed and emissions are redirected the carbon adsorber system for control. At the time of inspection, vent streams for EU12b were being sent to 963THROX for control.

Operating parameter data for 963THROX for each month is provided at the end of the month to Corteva by DDP in 15-minute intervals. The data is compiled by Corteva staff into a spreadsheet as 24-hour daily averages and reviewed each month. If there are instances in the data in which operating parameter values are not within the specified ranges, Corteva staff verify EU12b vents to 963THROX were in the closed position during those periods. Records of 963THROX 24-hour daily average operating parameter data were requested and reviewed for August 2023, November 2023, January 2024, and April 2024, S.C.VI.5. Appropriate records are being maintained. During the period of records reviewed, emissions were verified to be sent to 963THROX when the control device was operational only.

During periods when the 963THROX is unavailable for emissions control, Process vents in EU12b are sent to a carbon adsorber system for control. The carbon adsorber system consists of 3 carbon beds in parallel. Satisfactory operation of the EU12b carbon adsorber system shall be determined according to the requirements of FGPESTICIDES and includes attaining at least 98 percent removal of organic compounds exhausted to the device, S.C.III.1. The carbon bed adsorption system is a small control device pursuant to the Pesticide MACT. A small control device is defined in 40 CFR 63.1361 as a control device that controls process vents, and the total HAP emissions into the control device from all sources are less than 10 tons of HAP per year. 40 CFR 63.1365 states the controlled emissions for each process vent that is controlled using a small control device, except for a condenser, shall be determined by using the design evaluation described in paragraph (c)(3)(i)(A) of this section, or by conducting a performance test in accordance with paragraph (c)(3)(ii) of this section. Corteva staff report the controlled emissions of the carbon adsorption system were determined by using design evaluation. The design evaluation determined under worst case emissions for the carbon adsorption system, 98% removal of organic compounds is achieved with changing the carbon beds every 24 hours of venting. A new design evaluation would be conducted if changes to the process were to be made.

The vent valve position of the line to the carbon adsorption system is continuously monitored, S.C. VI.3. Records of the vent valve position were requested and reviewed for the most recent 12-month period. Records were provided in a graph format. The graph displays two values for the vent position, open and

closed. The records reviewed demonstrated the valve position of the line to the carbon adsorption system is continuously monitored and recorded. Staff report the valve position data is pulled once a month and transferred to an emissions calculation spreadsheet.

Each carbon bed in the carbon adsorption system is equipped with a timer that counts the time, in minutes, that the individual carbon bed is online. The timer is used to track when a carbon bed must be changed. Carbon beds are manually changed out by onsite operators. The system will alarm at 1380 minutes and again at 1425 minutes, if the carbon bed has still not been changed. During the onsite inspection the online minutes for the carbon beds were observed. Two of the carbon beds were observed to be at 0 minutes. The third was observed to be at 1160 minutes.

Special Condition III.3. stipulates the permittee shall not exhaust process vents in EU12b to the carbon adsorber system for more than 744 hours per 12-month rolling time period. Staff report the system automatically logs the time in which the carbon adsorbers are used each day. Once a month, staff pull the data from the system and input it into a spreadsheet which calculates the monthly and 12-month rolling hours. Staff then review the data. If the 12-month rolling value were to be approaching the limit, plant staff would be notified. Records of the monthly and 12-month rolling time period number of hours that process vents from EU12b exhausted to the carbon adsorber system were provided and reviewed for the period of July 2023 to July 2024. During the period of records reviewed, the 12-month rolling hours ranged from 10.0 hours to 12.2 hours per 12-month rolling time period, well below the limit of 744 hours per 12-month rolling time period.

An emission limit of 10 lb/year VOC on a 12-month rolling time period is in place for EU12b, S.C.I.1. Staff calculate the emissions from EU12b using an emissions calculation spreadsheet. The spreadsheet utilizes emission factors and the number of hours each month EU12b was vented to 963THROX vs the carbon adsorption system to determine the monthly emissions. Staff report emission factors were determined based on worst case emissions from the process. In the event changes were to occur to the process, emission factors would be reevaluated. Staff report emissions factors were most recently evaluated during the re-permitting of EU12b in 2021. The re-permitting was to increase the number of hours in which the emission unit could be vented to the carbon adsorption system.

Records of monthly and 12-month rolling emission calculations were reviewed for the period of July 2023 to June 2024. Appropriate calculations appear to be used and appropriate documentation is maintained. During the period of records reviewed, the month with the highest emissions was May 2024 with 0.88 lbs/month of VOC emitted. The 12-month rolling VOC emissions ranged from 4.12 lbs/yr to 4.38 lbs/yr, well below the permitted limit of 10 lb/yr.

Section VIII of EU12b lists stacks and vents associated with EU12b. At the time of inspection, the stack vent diameter and height was visually verified for SV12005 (carbon system atmospheric vent). The other stack vent listed in section VIII. of EU12b is SV963THROX. This stack is located at the 963THROX at DDP. Verification of SV963THROX diameter and height will be completed during the inspection of FG963THROX.

## **MACT Compliance**

Staff report the facility utilizes workbooks for all processes onsite to review for MACT standard applicability and associated requirements. If changes to the process were to occur, applicability and requirements would be reassessed. Annually, staff conduct an internal environmental review of the process to ensure no changes to applicability have occurred.

## **FGPESTICIDES**

This flexible group and its conditions apply to emission units subject to the requirements of 40 CFR Part 63, Subparts A (General Provisions) and MMM (National Emission Standards for Hazardous Air Pollutants for Pesticide Active Ingredient Production). It should be noted that only portions of this flexible group were reviewed in order to verify that EU12b is in compliance with the requirements.

EU12b has a number of Group 1 vents within the process. The Group 1 vents include both batch and continuous vents. No Group 2 vents are associated with the process. Group 1 vents for the process are tracked by facility staff in a Pesticide MACT workbook. Methods for controlling OHAP emissions from group one vents include venting group one process vents to a MACT control device that meets 98% HAP removal or <20 ppmv HAP at the vent outlet. OHAP emissions are controlled by the 963THROX with the carbon bed adsorption system as backup. The 963THROX was demonstrated by performance testing to have an outlet TOC or OHAP concentration of less than or equal to 20 ppmv. The carbon bed adsorption system was demonstrated to reduce the uncontrolled organic HAP emission rate by 98 wt%. This demonstration was done based on a control device design evaluation.

As a process having uncontrolled HCl and chlorine emissions greater than or equal to 6.8 Mg/yr, controls to reduce the HCl and chlorine emissions by greater than or equal to 94% or to an outlet concentration of less than or equal to 20ppmv of HCl and chlorine are in place. Reduction of the HCl and chlorine concentrations is achieved by the VS-1011/T-1010 scrubber system associated with EU12b. Compliance was demonstrated with stack testing in which minimum liquid flow rates were established. The scrubbers are operated at or above the minimum liquid flow rates to ensure proper control. In addition to the VS-1011/T-1010 scrubber system, the 963THROX includes a scrubber for control of HCl and chlorine. Compliance is demonstrated with performance testing. Proper operation and monitoring of the operating conditions of the scrubber associated with the 963THROX is completed by DDP.

No Group 1 storage tanks are associated with EU12b. One Group 2 storage tank is associated with the emission unit, the perchloroethylene storage tank. As a Group 2 storage tank, controls are not required pursuant to MACT Subpart MMM.

As part of the onsite inspection, AQD staff reviewed deviations reported for EU12b during the most recent MACT Subpart MMM deviation report for the period of July 1 – December 31, 2023. Staff stated as part of internal procedures, a reasonable inquiry is conducted monthly by environmental staff, verifying if deviations occurred. If a deviation was noted that was previously unidentified, it would be escalated to the site's environmental specialist for review. Staff report all deviations are investigated to determine the root cause and minimize reoccurrence. Deviations are tracked and reported semiannually in the semi-annual reports.

During the period reviewed, deviations occurred as a result of an unplanned site power outage on 8/10/2023. Production process' were shut down due to the outage. From 11:00 am to 2:15PM relief device monitoring data collection requirements were not met. Continuous monitoring of the relief device on the perchloroethylene storage tank stopped after backup battery power ran out. Staff reported the levels in the tank were recorded before and after the power outage event, allowing staff to verify a pressure relief event did not occur.

During the power outage the carbon bed was in use for 27.2 hours, exceeding the 24-hour usage. The deviation report stated that due to other plant activities and alarms occurring, the 24-hour exceedance was not immediately identified. Staff stated a loss of power procedure for the carbon beds has since been compiled to ensure the hours exceedance does not reoccur if future power outages occur. Additionally, staff report during the outage emissions were held in place and the vent header fan was turned off. Because of these conditions, staff report the carbon bed maintained 98% control efficiency during the hour exceedance.

During the power outage, unplanned emissions were intermittently sent to the VS-1011/T-1010 scrubber when it was not in operation. During this time, it was reported an unplanned depressurization occurred in six different vessels. The vessels slowly depressurized into the vent header until reaching equilibrium. During this time the vent header was open to the carbon bed control device. The process was not in operation and the vent header fan was off. A worst-case emission calculation of 1 lb (VOC and HAPS) was estimated. Staff report the emissions may have stayed in the volume of the vent header and possibly not have been emitted to atmosphere.

In addition to reviewing the MACT Subpart MMM deviation report for the period of July 1 – December 31, 2023, AQD staff reviewed a Rule 912 release notification that was provided for a release that occurred on May 5, 2024. The notification stated a leak was identified in the 948 vent line to the carbon system during a routine line inspection. The leak was the result of a pin hole leak that developed under insulation as a result of corrosion. Corteva reported approximately 3 lbs of perchloroethylene and <1lb of impurities were released. The leak occurred while the 963THROX was down for maintenance, preventing emissions to be redirected there. In response, production was idled to a safe state and the leak was repaired. The leak duration was determined to be from the time of discovery to the time of repair, 90 minutes. The leak is a deviation of the PAI MACT as Group 1 process vents are required to be vented to a MACT control device that meets 98% HAP removal or <20ppmv HAP at the vent outlet. The deviation will be reported in the MACT Subpart MMM deviation report for that time period. Emission amounts during the time period were determined using worst case calculations. Corteva staff stated in response to the leak, section of line in which the leak occurred will be replaced. In addition, the facility has implemented new pipe inspection procedures in which the inspection is based on the hazard of the pipe. Staff report after the leak was repaired, LDAR monitoring of the section was conducted following HON procedures.

### **FGHONFUGITIVES**

This flexible group and its conditions apply to emission units subject to the requirements of 40 CFR Part 63, Subparts A (General Provisions) and H (HON for Equipment Leaks). Only portions of this flexible group were reviewed in order to verify that EU12b is in compliance with the requirements. EU12b is subject to the requirements of 40 CFR Part 63, Subparts A and MMM. Processes subject to Subpart MMM are also subject to the equipment leak provisions of 40 CFR Part 63, Subpart H, also known as the HON.

LDAR monitoring is performed by an onsite contractor and an internal database of all components associated with the emission unit is maintained. The facility utilizes a digital task management system to ensure monitoring is completed in the required timelines. If leaks were to be identified, staff report prompt repairs are made to ensure leaks are corrected within the timelines stipulated by the HON MACT.

### **FGOLD MACT**

This flexible group and its conditions apply to each new, reconstructed, or existing Organic Liquid Distribution (OLD) (non-gasoline) operation that is part of an emission unit subject to the requirements of 40 CFR Part 63, Subpart EEEE. Only portions of this flexible group were reviewed in order to verify that EU12b is in compliance with the requirements.

Unloading of the perchloroethylene storage tank is subject to the OLD MACT, with no controls required. As previously discussed, the facility utilizes workbooks to evaluate applicability and requirements of each MACT standard. Staff report if multiple requirements exist, the most stringent would be implemented.

### **Summary**

On July 31, 2024, AQD staff conducted a scheduled onsite inspection of the emission unit identified as EU12b at Corteva Agriscience, LLC, SRN P1028. Corteva Agriscience, LLC is a megasite located at 701 Washington Street, Midland, Midland County, Michigan 48667. The EU12b 2,4-D process unit is a phenoxy herbicide manufacturing plant located in the 948 building. Equipment in the process includes reactors, distillation/fractionation columns, separators, storage tanks/silos and related equipment. Process vents are treated by the VS-1011/T-1010 scrubbing system and then by either the THROX located in 963 Building or the 948 carbon adsorber system. EU12b is subject to the requirements of 40 CFR Part 63, Subparts A, EEEE, and MMM. Processes subject to Subpart MMM are also subject to the equipment leak provisions of 40 CFR Part 63, Subpart H, also known as the HON. At the time of inspection, the facility was found to be in compliance.

NAME *Nathanael Dente* DATE 9/26/2024 SUPERVISOR *Mike J. [Signature]*