

Inspection Report: Mid-West Industrial Chemical Company Clean Air Act Stationary Source

Facility Name: Mid-West Industrial Chemical Company

Inspection Date: July 10, 2023

Facility Address: 1509 Sublette Avenue, St. Louis, MO

ICIS-Air #: MO0000002951001077

Federal Facility: No

NCI: Creating Clean Air for Communities

Facility size: Major Source

Activity: Partial Compliance Evaluation

State Referral: No

EJ: Yes

NAICS code: 325520 Adhesive Manufacturing

Lead Inspector: Steve Rapp, ERG Inspector, 339-364-4264

Asst. Inspector: Elizabeth Hubbard, ERG Inspector Trainee, 919-468-7894

State Inspector: Miranda Cason, Missouri Department of Natural Resources (MoDNR)

Facility Contact: Robert McKendry, Jr., President

1. Plant Description:

The facility's 2022 Operating Permit, number OP062022-004, says, "Mid-West Industrial Chemical is an industrial adhesive manufacturer located in St. Louis City. The installation blends dry resins, produces resin solutions in solvents, manufactures latex emulsions, and grinds rubber. The installation is a minor source of all pollutants but requested a Part 70 operating permit for business reasons. It wishes to remain a minor source for HAPs even if production increases and have accepted a voluntary 10/25 HAP limit. It is not a named source and fugitive emissions are not counted towards potential-to-emit."

Figure 1: Satellite image of Mid-West Industrial Chemicals facility in St. Louis, MO.



2. Facility Entry:

The representatives of the United States Environmental Protection Agency (“EPA”), Steve Rapp and Elizabeth Hubbard from Eastern Research Group, Inc. (“ERG”), arrived at the Mid-West Industrial Chemical Company facility at 1509 Sublette Avenue, in St. Louis, MO, (“Mid-West”, or “the facility”), at approximately 8:45 am. Shortly after, the representative from the Missouri Department of Natural Resources (“MoDNR”), Miranda Cason, arrived. The ERG and state representatives (“the inspectors”) were directed to the administration building where they were greeted by: Robert McKendry, Jr., President of Mid-West. At approximately 9:00 am, the inspectors and Mr. McKendry met in a conference room for the opening conference. The inspectors presented their identification credentials and provided an overview and scope of the inspection. The inspectors explained that ERG worked as contractors to conduct facility inspections for EPA. They provided a copy of EPA’s “Small Business Resources Information Sheet.”

The inspectors explained to Mr. McKendry that EPA would provide Mid-West with an inspection report in approximately 60 days. They explained that the report would be available to the public through the Freedom of Information Act, and therefore, if the company wanted to claim any notes or digital images as confidential business information (CBI), they could do so today or within 10 days following the inspection. They provided Mr. McKendry with the EPA’s confidentiality notice form. Mr. McKendry signed the form. See Appendix B.

3. Opening Conference/Technical Discussion:

The inspectors explained that they were at the facility to conduct a routine Clean Air Act (“CAA”) inspection that was part of a national initiative to look at facilities located close to residential neighborhoods, including a focus on volatile organic compounds (“VOCs”) and hazardous air pollutants (“HAPs”). The inspectors explained that during the facility walkthrough, they would take digital images of the facility’s processes and emission points using a digital point and shoot camera, as well as an optical gas imaging, forward looking infrared (“FLIR”) video camera, model GF320, that were not intrinsically safe. They requested that the facility representatives inform them of any areas where there could be a potentially explosive atmosphere. Mr. McKendry explained that the facility was not currently making any batches and it should not be a concern to take digital images. He said that his son, Robert McKendry III, (“Rob McKendry”) would provide the inspectors with a facility tour.

The inspectors asked for background information about Mid-West and the facility. Mr. McKendry explained that the facility currently had 9 employees and was operating Monday through Friday, 8:00 am to 4:30 pm. He said that the company was family-owned and was approximately 100 years old (five generations) and Mid-West Industrial Chemical Company had been at the facility since 1941. Mr. McKendry described the general operation as follows: The company’s main products were synthetic and natural rubbers, resins, additives, and adhesives, many under the brand name, “Vangrip.” Historically, the primary customers were shoe manufacturers. Mid-West produced both solvent-based and water-based products using natural and synthetic latex. He said that they mixed and blended materials but did not react chemicals. They stored bulk solvents outdoors in fixed roof tanks, with capacities ranging from 4,300 to 10,500 gallons, and some materials indoors that needed to be heated to remain in liquid form. They shipped products in a variety of containers but mostly in drums and five-gallon cans.

The inspectors asked questions related to the facility's 2022 operating permit, the associated Statement of Basis ("SOB"), Emission Inventory Questionnaire ("EIQ"), and Annual HAP and VOC Emissions Reports. The following is a summary of the discussion.

The inspectors noted that permit condition PW001 limited HAP emissions to 10 tons per year (TPY) of any single HAP and 25 TPY of the combination of all HAPs emitted from the facility. They noted that the SOB contained a statement that, "It is not a named source and fugitive emissions are not counted towards potential-to-emit." The inspectors asked if the facility included a calculation of fugitive emissions in its compliance calculations. Mr. McKendry indicated that fugitives were not included in the calculations because they were "small amounts." He further noted that Mid-West uses an emission factor for the overall coating production process, rather than separate estimates of components of the process.

The inspectors noted that the SOB in the 2011 permit stated that 40 C.F.R. Part 63, Subpart HHHHH would apply, but the facility took limits on individual and total annual HAP emissions. Further, the SOB states that Mid-West submitted an initial notification for the regulation because it blends materials to produce adhesives; however, prior to the compliance date, they obtained a voluntary condition to limit HAPs below the major source thresholds in their previous operating permit. The facility representatives noted that although the facility is no longer major for HAPs, they maintain the major source operating permit for flexibility. The inspectors explained that because the facility relies on emissions calculations to demonstrate compliance with the HAP limits, the basis of those calculations is relevant as the compliance monitoring technique.

The inspectors asked about the use of Attachment E of the permit to determine compliance with condition PW001. They noted that Attachment E contains a formula which includes an emission factor from EPA's document "Compilation of Emission Factors," Chapter 6.4, ("AP-42"), specifically the uncontrolled emission factor of 30 pounds of VOC per ton of paint produced ("# VOC/ton paint produced"). They pointed out, however, that the formula in the permit appears to contain at least one error. Namely, the formula is missing the number "2000" in the denominator of the term for converting pounds VOC to tons VOC. Additionally, it appears that the formula contains a discount factor of the percent VOC in a product divided by 100 ("%VOC/100") that is not part of EPA's AP-42 factor. The inspectors asked if Mid-West used the formula as written in its calculations. Mr. McKendry showed the inspectors the basic formulas Mid-West used and it appeared that Mid-West included the correct term for converting pounds to tons but also included the discount factor of %VOC/100. See photos DSCN9540.JPG to DSCN9542.JPG. The inspectors noted that multiplying by the %VOC/100 could lead to under-reporting of emissions in the facility's EIQ and could lead to an incorrect compliance calculation under permit condition PW001.

Further, the inspectors explained that EPA does not recommend the use of AP-42 emission factors for demonstrating compliance because such factors represent industry-wide averages, which means that if tested, approximately half the facilities would have emissions higher than the factor.¹ Therefore, measured site-specific information is recommended. Additionally, they pointed out that the factor of 30

¹ <https://www.epa.gov/sites/default/files/2021-01/documents/ap42-enforcementalert.pdf>

#VOC/ton of paint produced used to estimate VOC and HAP emissions from the overall paint production process did not account for variability from facility to facility regarding methods and types of equipment used in production, or variation in the types of solvents stored, mixed, processed, and loaded/unloaded. The inspectors took photographs of several pages related to Mid-West's 2022 EIQ. See photos DSCN9543.JPG to DSCN9650.JPG.

The inspectors noted that the SOB to the 2017 operating permit states that the facility used trichloroethylene as well as 1,1,1-trichloroethane and asked what these chemicals were used for at the facility. Mr. McKendry and Rob McKendry ("the facility representatives") explained that they had switched to acetone for most products which historically used these chemicals but still used approximately five gallons per year of 1,1,1-trichloroethane as part of a mixture. They said they do not have a halogenated solvent degreaser at the facility.

The inspectors noted that the 2017 SOB states that 40 C.F.R. Part 63, Subpart VVVVVV, the National Emission Standards for Hazardous Air Pollutants ("NESHAPs") for chemical manufacturing at area sources, Subpart BBBBBB, the NESHAP for area sources in the chemical preparations industry, and Subpart CCCCCC, the NESHAP for area sources in paints and allied products manufacturing, do not apply because the facility does not use any of the HAPs targeted by those regulations, such as (but not limited to): 1,3-butadiene; 1,3-dichloropropene; Acetaldehyde; Chloroform; Ethylene dichloride; Hexachlorobenzene; Methylene chloride; Quinoline; Arsenic compounds; Cadmium compounds; Chromium compounds; Lead compounds; Manganese compounds; Nickel compounds; Hydrazine; Benzene; etc.² The inspectors asked to see the Safety Data Sheets ("SDS") for raw materials used at the facility. The inspectors reviewed approximately a dozen random SDS but there were approximately six feet of notebooks containing both historic and current SDS. They did not note any of the target HAPs in the SDS reviewed. The facility representatives said that there could be small amounts of benzene in some raw materials like toluene and xylene as contaminants. They explained that Mid-West had used methylene chloride until the 1990s but no longer used it in its products.

The inspectors asked about the 2017 operating permit, Permit Condition 1, which required monthly visible emissions (VE) observations using EPA's reference method 22 (RM22) of the baghouse that controls emissions from the rubber grinder. They noted that the requirement did not appear to be included in the 2022 operating permit. The facility representatives said that the rubber grinder was used infrequently but turned it on when Mid-West did monthly VE observations. Mr. McKendry explained that they only ground rubber for one customer who needed a special formula of adhesive for repairing its conveyor belts. But, other than the one customer, the rubber used by Mid-West was ground off-site. The inspectors reviewed several months of records of VE observations, including from March, April, May, June, and July 2023, all of which indicated "No visible emissions."

The inspectors noted that in the 2020 EIQ, the facility indicated it used "engineering judgment" to calculate its HAP emissions for the Paint Manufacture – General Mixing and Handling category and asked for additional explanation of how HAP emissions are calculated for both the EIQ and determining compliance with the HAP limits in the permit. Mr. McKendry explained that Mid-West tracked purchases

² See § 63.11494, § 63.11588, and § 63.11607.

of raw materials and quantities of products made and shipped to customers. He said that they used the AP-42 emission factor of 30 #VOC/ton of product produced to calculate VOCs and tracked the amount of HAP added in a product using the formulas they use in each product's recipe from the facility's "SNAP" program. The inspectors noted that Mid-West's formulas for estimating HAP appeared to include a ratio of HAP used per product to VOC emitted per ton of product. However, they noted the spreadsheet was complex and would require further review to understand how the various calculations related to the reported numbers.

The inspectors asked how the working and breathing losses were determined for the solvent storage tanks. The inspectors noted that the 2006 operating permit, Permit Condition PW003, required conservation vents to be set at 0.2 kPa which seemed relatively very low and could result in HAP and VOC emissions venting to the atmosphere, often in response to daily fluctuations in ambient temperature. The facility representatives did not know what the current conservation vent settings were. They explained that they did not estimate losses separately from the filling and storage of materials in the tanks because they used the 30 #VOC/ton product emission factor that covered the overall coating manufacturing process. For inventory purposes, they tracked total usage of the solvents. He also noted that the tanks were filled from the bottom.

4. Facility Tour/Walkthrough:

At approximately 10:45 am, Rob McKendry led the inspectors on a tour of the facility. They started at the raw material storage building, then proceeded to the outdoor solvent storage tank area, the solvent-based adhesive production building, the flammable material storage area, the water-based and latex adhesive production areas, material heating equipment area, the process steam boiler room, and the rubber grinding area, including the associated dust control device. See photos DSCN9551.JPG to DSCN9598.JPG.

At the solvent-based adhesive building, the inspectors observed that adhesive was being transferred from a mixing vessel to five-gallon cans. See photo DSCN9563.JPG and DSCN9564.JPG. There were no new batches of materials being mixed at that time. However, the inspectors noted a solvent smell in the room. They observed that there was piping from the solvent storage tanks to the mixing room and, although the valves on the pipes were closed, the lines were open-ended (i.e., not capped). See photo DSCN9567.JPG. They observed several of the hatches to the mixing vessels had lids that did not seal due to a buildup of material on the tanks and the underside of the lids. Similarly, they observed a buildup of material in drums and on equipment in the room. See photos DSCN9565.JPG through DSCN9573.JPG. Additionally, they observed a vent from the solvent-based adhesive room with a blower that exhausted to the back of the roof behind the building. See photo DSCN9573.JPG.

During the walk through the remainder of the facility, the inspectors did not note any solvent odors in any of the other work areas, including raw material storage, water-based and latex adhesive production, material heating, flammable material storage, or outdoor solvent storage tanks. However, the inspectors did not observe any batches of adhesives being produced at that time. At the rubber grinding area, Rob McKendry turned on the baghouse and showed the inspectors the area where Mid-West conducted VE observations. The inspectors did not observe any VE, although no rubber was being ground at that time.

At approximately 12:00 pm, the inspectors and facility representatives returned to the conference room.

5. Closing Conference:

The inspectors thanked the facility representatives for their time and cooperation during the inspection.

The inspectors summarized questions and concerns raised during the inspection.

- The location of the solvent storage tanks outdoors raised questions regarding the pressure settings at which the vents open to the atmosphere, as well as the frequency the condition of the vents was checked.
- Possible errors in the emissions calculation formula in the operating permit, the use of the AP-42 emissions factor, and the complexity of Mid-West's emissions calculation spreadsheets raised questions and potential concerns regarding the accuracy of the calculations of HAP emissions from the facility.

They provided the facility representatives with a Notice of Preliminary Findings form and explained that EPA may follow up with additional questions.

The inspectors did not take any copies of documents.

At approximately 12:30 pm, the inspectors departed from the facility.

6. Appendices

- A. Digital Image Log
- B. Confidentiality Notice Form
- C. Notice of Preliminary Findings Form

Inspection Report Sign-Off

Lead Inspector's Name: Steven Rapp, ERG

X **Steve Rapp** Digitally signed by
Steve Rapp
Date: 2023.08.28
14:03:47 -0400

Lead Inspector

Assisting Inspector's Name: Elizabeth Hubbard, ERG

X **Elizabeth
Hubbard** Digitally signed by
Elizabeth Hubbard
Date: 2023.08.28
14:16:33 -0400

Assisting Inspector

Supervisor's Name: Tracey Casburn, Air Branch Chief, ECAD

X _____

Supervisor