

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

B666056030

FACILITY: Norbrook Plating, Inc.		SRN / ID: B6660
LOCATION: 11400 E Nine Mile Rd, WARREN		DISTRICT: Warren
CITY: WARREN		COUNTY: MACOMB
CONTACT: Abby VanGheluwe , General Manager		ACTIVITY DATE: 10/14/2020
STAFF: Adam Bogнар	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: MINOR
SUBJECT: Scheduled Inspection		
RESOLVED COMPLAINTS:		

On October 14, 2020, I, Adam Bogнар, Environmental Engineer with the Michigan Department of Environment, Great Lakes, and Energy– Air Quality Division (EGLE-AQD) conducted a scheduled inspection of Norbrook Plating (the “facility”), located at 11400 Nine Mile Rd, Warren, MI. The purpose of this inspection was to determine the facility’s compliance status 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 (EGLE-AQD) rules; Permit to Install Nos. 584-86A, 238-99, 239-99, 240-99, 266-04; and 40 CFR Part 63 Subpart N – National Emissions Standards for Chromium Emissions From Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks (Chrome NESHAP).

Additionally, this inspection was conducted to further investigate complaint No. C-20-04160 filed with the EGLE-AQD on August 11, 2020. The complainant stated that a “hazy-smoke plume” is entering the surrounding community originating from Norbrook Plating. The complainant stated that there is no odor or fallout associated with this plume, however; they are concerned about potential health risks associated with it. The complainant further stated that some of the stacks on the facility do not appear to be operating with some stacks lying flat on the roof.

I was able to verify the complainant’s statements during two complaint investigations: One on August 14, 2020 and another on September 10, 2020. During the warm months of the year, Norbrook Plating often operates with their bay door open in the back. I observed a mist wafting out of this bay door during both investigations. I also noticed that some of the stacks on top of Norbrook Plating appeared to be laying sideways and flat on the roof. I did not immediately perform an unannounced on-site inspection of Norbrook Plating due to the ongoing Covid-19 pandemic. See complaint report CA_B666055189 for more details of these investigations.

I arrived at Norbrook Plating at around 10 am. I met with Ms. Abby VanGheluwe, General Manager (586-755-4110, abby@norbrookplating.com). I identified myself and stated the purpose for the inspection. Ms. VanGheluwe gave me a tour of the facility. Due to the ongoing Covid-19 pandemic, all records were requested from Norbrook Plating Digitally. I did not review records while on-site at Norbrook Plating. I requested records from January 1, 2020 to October 1, 2020. Ms. Abby VanGheluwe provided me the records I requested on October 16, 2020. These records can be accessed on the AQD shared drive at the following address:

S:\Air Quality Division\STAFF\Bognar, Adam\Inspection Documents\Norbrook Plating FY2021

Norbrook Plating has three plating lines: A chrome line, a nickel line, and a copper line. In total the lines consist of approximately 60 tanks. Most of these tanks are water rinse tanks

between process tanks. Various plating chemicals are used at the facility including hydrochloric acid, sulfuric acid, phosphoric acid, nitric acid, ammonia, chromic acid, caustic soda, and sodium bisulfide. Only aluminum and steel parts are plated. Plastic parts are not plated at this facility. Parts are plated for various industries including automotive, marine, and motorcycle applications.

Parts are generally plated in layers. Copper plating often goes directly onto the part followed by nickel plating then chrome plating. Sometimes an extra nickel-plating layer is applied before the copper plating. Nitric acid etching (PTI 240-99) is done only for aluminum parts as a pre-plating process. Hydrochloric acid pickling (PTI 238-99) is done only for steel parts as a pre-plating process. Parts are finished and cleaned with detergent solution using two dip tanks.

The copper, nickel, and chrome processes consist of the following series of tanks:

Copper (Cu) process

2 cleaning tanks → 1 rinse water tank → 2 HCl tanks → 2 rinse water tanks → electrolytic Cu strike → 2 rinse tanks → one 5% acid etch tank → 3 electrolytic copper tanks → one copper drag-out rinse tank → 3 copper rinse tanks → copper parts are buffed → copper strike tank → 2 rinse tanks → 1 rack strip

Nickel (Ni) process

2 cleaner tanks → 1 rinse tank → 1 Cu strike tank → 2 rinse tanks → alkaline cleaner → 2 rinse tanks → 1 cyanide activator → 2 rinse tanks → 2 rinse tanks → one of two semi bright nickel tanks → bright Ni tank → Duruni Ni → 3 rinse tanks

Chrome (Cr+6) Process

1 chrome pre-dip → one chromic acid tank (chrome plating activator) → electrolytic chrome tank → chrome drag-out tank → 3 rinse tanks.

Decorative Chrome Plating Tank (PTI No. 584-86A)

Hexavalent chromium is used in the chrome electroplating tank. Norbrook Plating utilizes three different control technologies to reduce emissions that arise from the chromium electroplating. 1 - A wetting agent based fume suppressant is used to comply with 40 CFR 63.342 (d)(3). 2 - An emulsifier is added to develop a foam blanket over the tank during active electrolysis. 3 - A rooftop fiber bed mist eliminator is installed to capture emissions prior to atmospheric release.

The wetting agent is added in 500 ml doses nearly every day. The emulsifier is added as needed to maintain complete foam coverage. The fiber bed mist eliminator is inspected quarterly by a contractor and the baffles are washed down once per week. Baffle wash goes to an on-site water treatment system. The fiber bed mist eliminator is not used for compliance with the chrome NESHAP, therefore Norbrook is not required to conduct performance testing.

PFAS stands for “(per or poly) fluorinated alkylated substances” These substances include both:

- PFOS: Perfluorooctanesulfonic acid
- PFSA: Polyfluorosulfonic Acid

In a previous inspection on December 1, 2017, Norbrook plating was using a surfactant that contained PFAS. The substance listed on the MSDS is “Polyfluorosulfonic Acid” (PFSA). I explained to the previous manager, Mr, Ken Otto, that although the use of PFSA in

particular is not a violation of AQD rules or the chrome NESHAP, these compounds (PFAS) are the focus of a department wide initiative to identify sources of PFAS in the environment. I discussed my concern with Mr. Otto and he agreed to change his formulation to a "PF-free" surfactant. As of December 5th, 2017, Norbrook Plating is no longer using a PFAS based surfactant.

Special Condition 1: States that the permittee shall not operate the chrome tank unless the chemical fume suppressant is applied in quantities and at a frequency to ensure the surface tension of the chrome tank does not exceed 45 dynes/cm. This permit limit is out of date. According to the updated Chrome NESHAP, surface tension must be kept below 40 dynes/cm. I communicated this information to Ms. VanGheluwe via email on October 22, 2020.

Based on the records I reviewed, surface tension is maintained below 40 dynes/cm. I did not notice any instance of an exceedance of 40 dynes/cm in the records that I reviewed. Beginning in December 2019, Norbrook Plating began sending their chrome bath samples to MacDermid Laboratories for surface tension analysis and other analyses. Previously, Kenco Supply was used for chrome bath analysis. The chrome bath analysis report from Kenco Supply on November 22, 2019 showed a surface tension of 33 dynes/cm. The MacDermid reports from April 2020 and September 2020 showed surface tension readings of 29.63 dynes/cm and 29.2 dynes/cm, respectively.

Special Condition 2: States that Norbrook Plating shall submit an approvable operation and maintenance plan to the AQD within 30 days of the date this permit was issued. Norbrook submitted and maintains an operation and maintenance plan pursuant to 40 CFR 63.342 (f) (3)(i). The 2005 revision of the operation and maintenance plan is included in the Norbrook AQD file. Ms. VanGheluwe stated that the fiber bed mist eliminator is inspected quarterly for signs of wear; however, the operation and maintenance plan states that the fiber bed mist eliminator is inspected monthly for signs of wear.

I informed Ms. VanGheluwe that quarterly inspections are acceptable for this type of control device since that is what is required by the Chrome NESHAP, but the operation and maintenance manual needs to reflect this frequency. I asked Ms. VanGheluwe to revise the operation and maintenance manual to show the actual monitoring frequency. Additionally, I asked her to make sure the plan includes all of the information required by R336.1911 (Rule 911). I sent her a list of the minimum information that must be included for the operation and maintenance plan to comply with Rule 911. AQD will be working with Norbrook Plating to ensure that an updated operation and maintenance plan is submitted.

Special Condition 3: States that the permittee shall not operate the chrome tank unless the mist eliminator is installed, maintained, and operating properly. A fiber bed mist eliminator is installed. Washdown of the fiber elements occurs once per week. The unit is inspected quarterly for signs of wear on the fiber beds, spray nozzles, duct work, drain lines, fan motor, and to check for fan vibration.

I climbed to the roof where the mist eliminator is installed, however; I did not feel comfortable walking across the roof to get a closer look. The normal maintenance person was not available to show us the mist eliminator. The blower that pulls air through this device appeared to be running. The unit appeared to be functioning properly based on the information I was able to obtain during this inspection. There are no moving parts on this control device other than the blower.

Special Condition 4: States that the permittee shall monitor the surface tension of the chrome bath every 4 hours, except as allowed in 40 CFR 63.343(c)(5). Since there have been no bath changes or instances of non-compliance, stalagmometer measurements are taken at least once every 40 hours of operating time.

Ms. VanGheluwe showed me calculations indicating that these readings are performed at least every 40 hours of chrome tank operating time. A chrome sample was sent to MacDermid for surface tension analysis at least once every 40 hours of plating time for the period I reviewed. Plating volume has been relatively low in 2020. The chrome tank is only operated 2-3 days per week. Going forward Norbrook Plating plans to do surface tension readings monthly.

Special Condition 5: Requires the permittee to maintain records of the date, time, and amount of each fume suppressant addition to the chrome tank. These records are maintained. Norbrook Plating adds 500 ml of surfactant and approximately 100 ml of foam agent each day the chrome tank is used.

The chemical fume suppressant (foam blanket) is not required since Norbrook Plating complies with the Chrome NESHAP by maintaining surface tension below 40 dynes/cm in the chrome bath. Foam thickness is not measured, additional chemical fume suppressant is added if an operator notices incomplete foam coverage.

Special Condition 6: States that the permittee shall monitor and record both emissions and operating/maintenance information as required by the Chrome NESHAP. Emissions information is not kept since a stack test is not required. Norbrook Plating complies with the Chrome NESHAP by maintaining surface tension below 40 dynes/cm measured by a stalagmometer. MacDermid currently maintains the stalagmometer operating procedure. If Norbrook Plating decides to begin using their own stalagmometer readings, Norbrook will be required to maintain a stalagmometer operating procedure on-site.

Special Condition 7: States that the permittee shall maintain records of inspection required to comply with applicable work practice standards of the Chrome NESHAP (40 CFR 63.342 (f)). Since a stalagmometer is used to comply with the Chrome NESHAP, the only required operation and maintenance practice is to "follow manufacturers recommendations" while using the stalagmometer. Norbrook Plating appears to comply with this requirement.

Special Condition 8: Specifies stack requirements. The stack appeared to meet permit requirements. Stack was exhausted vertically unobstructed to the ambient air. An "Ongoing Compliance Status Report" was completed for the most recent operating year in accordance with the reporting requirements of the Chrome NESHAP.

Nitric Strip Tank with Wet Scrubber (PTI No. 266-04)

Norbrook operates a single 185-gallon nitric strip tank. This is used only for etching aluminum pieces. Steel pieces would quickly corrode if subjected to this tank environment. Emissions from the tank are vented to a packed bed scrubber with a recirculating caustic solution.

Special Condition 1.1: States that the permittee shall operate the nitric strip tank at ambient temperature at all times. Ms. VanGheluwe stated that the tank is not heated. I did not notice any signs that the tank was heated. A 2007 report addressed to the MDEQ (now EGLE) from consultant Integrated Environmental, Inc. states that the tank is operated at ambient temperatures.

Special Condition 1.2: States that the permittee shall not operate the nitric strip tank unless the wet scrubber is installed, maintained, and operated in a satisfactory manner. The wet scrubber was operating during the inspection. The scrubber liquor is normally maintained at a pH of above 6 (according to the record sheet) by using a pump and process controller to make necessary additions of caustic.

During this inspection, the digital pH display showed that the pH was 5. An operator stated that the pH is normally around 7 or above. Later in the inspection the pH was 13.6. An operator stated that the caustic drum had run out that morning causing the pH to drop. The operator replaced the empty drum with a new drum so that the pump could draw additional caustic into the scrubber. When the operator put the new drum in place, he manually added caustic to the scrubber liquor, causing the pH to spike to 13.6. A report from 2007 addressed to the MDEQ (now EGLE) from Integrated Environmental, Inc. states that the scrubber is "maintained at a pH of approximately 9.5".

The caustic scrubber was not maintained and operated in a satisfactory manner. Norbrook Plating allowed the caustic soda to run out causing the pH to fall below acceptable operating values. The pH was 5 during this inspection which is below both the Integrated Environmental value (9.5) and the company's own record sheet value (6). A violation notice was sent to Norbrook Plating in November 2020 to address this issue.

During the inspection, the scrubber liquor flow rate was 4.8 gallons per minute. The record sheet provided by Norbrook plating states that the flow should be "greater than 10.5 GPM". The records show that the flow is normally at 12 GPM each day. The Integrated Environmental report does not state what the normal operating flow rate should be.

The pressure drop gauge for the scrubber showed a pressure of 0.2" of water during the inspection. The record sheet states that the pressure should be kept below 10" of water.

Norbrook Plating maintains an operation and maintenance plan for this scrubber. This plan does not include what the acceptable values are for pH, flow rate, and pressure drop. As part of the response to the violation notice, I asked Ms. VanGheluwe to modify the plan to include the acceptable ranges for these parameters. Additionally, I asked Ms. VanGheluwe to include a work practice that will prevent the caustic from running out. AQD is working with Norbrook Plating to get a revised operation and maintenance plan for both the caustic scrubber and chrome scrubber.

Special Condition 1.3: States that the permittee shall install, calibrate, maintain, and operate in a satisfactory manner, devices to monitor the pressure drop and liquid flow rate on a continuous basis for the wet scrubber. A rotameter is present to measure the scrubber liquor flow rate. A pH meter keeps track of the alkalinity. A pressure gauge is present to monitor the pressure drop through the system.

Special Condition 1.4: Requires the permittee to keep records of pressure drop and liquid flow rate for the wet scrubber once per day. These records are maintained. An operator manually records these values daily on a printed record sheet near the tank.

Special Condition 1.5: Requires the permittee to maintain records of production throughput and addition of make-up materials to the tank on a monthly basis. These records are maintained. An operator records each addition of parts to the strip tank on a record sheet near the tank.

Special Condition 1.6: Requires the stack be discharged unobstructed vertically upwards to the ambient air. The stack appeared to comply with permit parameters.

2 Nitric Etch Tanks (PTI No. 240-99)

Special Condition 1: Requires the permittee to keep records of production records, including loads processed per shift and addition of makeup materials for the nitric acid etch tanks. Production records are maintained. There are no periodic adds made to this tank. The entire contents of the tank were last replaced on August 14, 2020.

Special Condition 2: Specifies stack requirements. The stack appeared to comply with permit parameters.

Hydrochloric Acid Tank (PTI No. 238-99)

Special Condition 1.1: Requires the permittee to keep records of production records, including loads processed per shift and addition of makeup materials for the hydrochloric acid tank. Production records are maintained. There are no periodic adds made for this tank. The entire contents of this tank were last replaced on June 20, 2020.

Special Condition 1.2a: Specifies stack requirements. The stack appeared to comply with permit parameters.

3 Copper Acid Tanks (PTI No. 239-99)

Special Condition 1: Requires the permittee to keep records of production records, including loads processed per shift and addition of makeup materials for the copper acid tanks. Production records are maintained. The tank is exhausted to mist eliminator baffles which are washed weekly.

Special Condition 2: Specifies stack requirements. The stack appeared to comply with permit parameters.

Other Metal Treatment Tanks

Norbrook operates several nickel and copper electroplating tanks, cleaning tanks (soapy water), and light acid tanks (5% HCl). These tanks appear to be exempt from Rule 201 requirements pursuant to Rule 285 (2)(r). These tanks are vented to the general in-plant environment. A wetting agent is periodically added to the nickel tanks. The SDS indicates that the wetting agent does not contain PFAS.

The copper and nickel electroplating tanks appear to be subject to 40 CFR Part 63 - National Emissions Standards for Hazardous Air Pollutants: Area Source Standards for Plating and Polishing Operations (NESHAP WWWWWW). The AQD has not taken delegation of 40 CFR Part 63 Subpart WWWWWW (6W) standards therefore compliance was not evaluated. I informed Ms. VanGheluwe that Norbrook Plating is subject to NESHAP WWWWWW.

Buffing

There are five buffing stations used to buff parts before and after plating. These buffing stations are in a separate room from the plating processes in accordance with housekeeping practices of the Chrome NESHAP. One of the stations is only used to buff chrome from already plated parts and is located in a different room than the other four buffing stations. All of these buffing stations are exhausted through a cyclone dust collector and out through a stack on top of the building.

According to Ms. VanGheluwe, all of these buffing stations and blowers have been in place and operational since approximately 1950. There is not existing documentation showing when these machines were purchased. The buffing machines and cyclone dust collector appear to be that old. Buffing equipment at Norbrook Plating appears to have been installed prior to the effective date of the Michigan Air Pollution Control Rules, August 15, 1967, and therefore is not required to have a permit to install pursuant to Rule 201. I informed Ms. VanGheluwe that any new buffing processes or replacements to these buffing units would result in Norbrook Plating becoming subject to permitting requirements in Rule 201 unless the process meets an exemption. I explained that there is currently an exemption for buffing processes that requires installation of a fabric filter style dust collector for any buffing emissions ventilated outdoors.

Boilers

Norbrook operates one natural gas fired boiler for process heating. It is a Burnham Boiler Model 4FL-345-50-0-OP with a maximum heat input of 2.8 million BTU/hr. There is a backup natural gas fired boiler present that is even smaller. Both these boilers appear to be exempt from Rule 201 requirements pursuant to Rule 282 (2)(b) because they have a heat input less than 50MM BTU. The boilers are not subject to 40 CFR 60, Subpart Dc for Small Industrial-Commercial-Institutional Steam Generating Units because they have a maximum heat input less than 10 million BTU/hr.

Stacks

The complainant stated that some of the stacks on top of Norbrook Plating appeared to be in disrepair. I decided it would be worthwhile to climb to the roof to take a closer look at the stacks. There is one stack that is laying flat on the roof which appears to be exhausting towards the neighborhood behind Norbrook Plating. Ms. VanGheluwe stated that this stack is an inlet for a blower. Ms. VanGheluwe stated that this stack is on schedule to be repaired and put back in place before winter 2020. Two of the stacks have rain caps which belong to both the process boiler and backup boiler. AQD regulations do not appear to restrict rain-cap usage on these types of boilers. The remainder of the stacks appeared to be exhausted vertically unobstructed.

Mist

The complainant also mentioned a “hazy-smoke plume” is entering the surrounding community originating from Norbrook Plating. I observed that the mist is primarily coming from the heated tanks which contain an aqueous based alkaline cleaner. A lesser amount of mist is also released from the Nickel plating tanks. These tanks are not ventilated outdoors, and the mist is released into the general in plant environment.

This is likely the same mist which can be observed coming out of the bay door behind Norbrook Plating. All of the plating tanks at Norbrook Plating have the potential to emit visible vapor depending on ambient temperature/humidity. The majority of this vapor is water, but it also may contain some amount of plating chemicals. The mist does not have a strong odor associated with it and does not appear to have an opacity over 20%.

I explained to Ms. VanGheluwe that we received a complaint about a haze coming from the rear bay doors. I informed her that if we continue to receive complaints about the haze, AQD may issue a violation notice for Rule 901.

I left the facility at around 11:30 am.

Compliance Determination

Norbrook Plating Inc. is not operating in compliance with Rule 910 and Permit to Install No. 266-04, Special Condition 1.2.

Norbrook Plating operated the nitric acid strip tank while the packed bed scrubber was not functioning properly. A VN was sent to Norbrook Plating in November 2020 seeking compliance with PTI No. 266-04 and Rule 910.

NAME Adam BognerDATE 11/25/2020SUPERVISOR K. Kelly