

October 22, 2024

Rachel Benaway
Michigan Department of Environment, Great Lakes, and Energy
Air Quality Division
401 Ketchum Street, Suite B
Bay City, MI 48708-5430

Subject: Hemlock Semiconductor Operations LLC response to EGLE Air Compliance Violation Notice

Dear Ms. Benaway:

This letter is provided in response to the air violation notice emailed to Hemlock Semiconductor Operations LLC (HSC) on October 3, 2024.

As part of the semiannual Renewable Operating Permit (ROP) reporting requirement covering periods January to June 2024, HSC disclosed two air deviations. As requested in the violation notice, please find the details to these events below. These details include: dates the violation occurred; an explanation of the causes and duration of the violation; whether the violation is ongoing; a summary of the actions that have been taken and are proposed to be taken to correct the violation and the dates by which these actions will take place; and what steps are being taken to prevent a reoccurrence.

FGRULE290: Violation of special condition I.1 and Michigan Air Pollution Control Rule 336.1290(2)(a)(i) by exceeding the Rule 290 emission limit of 500 lbs/month for noncarcinogenic materials.

- the dates the violation occurred;
 - January 16, 2024
- an explanation of the causes and duration of the violation;
 - An extensive root cause investigation identified that a plug valve on a pump discharge was installed in the incorrect orientation during the preparation stage for a planned maintenance activity. While the valve was initially effective at isolating, eventually it failed, releasing 3,500 pounds of silicon tetrachloride (STC) from 9:07 AM (confirmed release report) until 10:24 AM (leak isolated and stopped). Because STC converts to hydrogen chloride (HCl) gas when in contact with air, the amount of

HCl calculated to have been released was 2697 pounds. This amount was initially reported as 475 pounds HCl on a written follow up report two days after the incident, which was called into PEAS and the EPA on the day of the event, and at the time was believed to be the correct volume.

Contributing factors to this incorrect installation include unclear procedures, confusing indicators on the valve, lack of training, and failure of installation oversight to recognize the error.

- whether the violation is ongoing;
 - No, the leak was stopped as soon as possible.
- a summary of the actions that have been taken and are proposed to be taken to correct the violation and the dates by which these actions will take place;
 - Operations isolated the leak on the same day as the release. End of event.
- what steps are being taken to prevent a reoccurrence.
 - Update procedure to improve clarity.
 - Assess current installs to identify areas of risk and to develop plans for correction.
 - Develop training on critical aspects of valves that is currently lacking.
 - Update internal checklist to aid in closing the current gap.
 - Work with valve vendors to discuss this failure and identify what applications are most appropriate for vented and non-vented plug valves.
 - Improve valve selection process to consider strengths and limitations of different valve types, targeting installation of inherently safe valves to minimize risk of using unidirectional valves.

EUS11ETCH: Violation of special condition III.1 and IV.1 by allowing the scrubber fluid pH to drop below 7.

- the dates the violation occurred;
 - April 26, 2024
- an explanation of the causes and duration of the violation;
 - After further investigation, it was determined that the coarse caustic pump, which aids in supplying sodium hydroxide to the scrubber in order to control pH, failed on April 26, causing the pH to fall below 7. The pH fluctuated in and out of compliance for a total of 425 minutes. The scrubber itself did not malfunction, but rather the supply of caustic provided by ancillary equipment could not be delivered. The scrubber did not recognize the insufficient dosing as a malfunction and therefore the etch bench did not shut down, which it is programmed to do if the scrubber is not functioning as it should. The pump was replaced on April 27, during which the process was not running. A cracked flange associated with the pump was replaced on April 28, and was originally noted as the cause of the deviation, reported in the

January – June 2024 Semiannual ROP report. When the process was back up and running again on May 2, there were no issues noted and we were back above the appropriate pH.

- *As referenced in the violation notice, EUS11ETCH did have an air deviation in March 2023 when the caustic supply tubing slipped from the supply tote.*
- whether the violation is ongoing;
 - No, the matter was corrected as soon as the caustic pump was replaced and we were able to validate success when the process restarted on May 2.
- a summary of the actions that have been taken and are proposed to be taken to correct the violation and the dates by which these actions will take place;
 - The caustic pump was replaced on April 27.
- what steps are being taken to prevent a reoccurrence:
 - HSC engineering is programming an interlock on the Programmable Logic Controller (PLC) that will halt operation of the etch bench when the scrubber pH, as tied to the recirculation line, drops below 7 for 15 minutes, physically preventing operations from running the etch bench while the pH is below 7.
 - *As referenced in the violation notice, the steps HSC claimed to be taking to address the March 2023 deviation included programming Spotfire, HSC's internal data tracking software, to include email alerts to prevent missed reporting (complete, not relevant to this event); reviewing procedures with operations which would include ROP compliance parameters (completed, but this administrative control has now been found to be ineffective and will now be addressed with an interlock to eliminate the possibility of missed alarms); and evaluate the ability to program preemptive alerts and/or interlocks into the PLC (this was evaluated at the time and not implemented as the tubing issue was seen as a fluke occurrence and it was not recognized that the supply interruption to the scrubber would not be recognized as a malfunction by the scrubber-related programming)*

If you have any questions about this submission, please contact Alyssa Beebe at 989-301-5280.

Sincerely,



Alyssa Beebe
Environmental Professional
Hemlock Semiconductor Operations LLC

cc: Leanne Bishop, EHS&S Manager, HSC
Jenine Camilleri, Enforcement Unit Supervisor, EGLE AQD