

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

A404359306

<b>FACILITY:</b> Dow Silicones Corporation		<b>SRN / ID:</b> A4043
<b>LOCATION:</b> 3901 S Saginaw Rd, MIDLAND		<b>DISTRICT:</b> Bay City
<b>CITY:</b> MIDLAND		<b>COUNTY:</b> MIDLAND
<b>CONTACT:</b> Amanda Karapas , Air Specialist		<b>ACTIVITY DATE:</b> 08/11/2021
<b>STAFF:</b> Gina McCann	<b>COMPLIANCE STATUS:</b> Compliance	<b>SOURCE CLASS:</b> MEGASITE
<b>SUBJECT:</b> EU356-01, EU356-02, EU356-03 and FGHCLMACT		
<b>RESOLVED COMPLAINTS:</b>		

**DOW Silicones/MDEQ-AQD staff present during the inspection:**

- Gina McCann (MDEQ-AQD, Senior Environmental Quality Analyst)
- Amanda Karapas (Air Specialist, DOW Silicones)
- Steven Rausch (Environmental Specialist, The DOW Chemical Company)
- Arianna Lopez, (Production Engineer for 316 Building, DOW Silicones)

Records reviewed as part of the inspection were:

- ROP Annual report for 2020
- ROP Semi-Annual report for reporting period 7/1/2020-12/31/2020 CFR Part 63 Subpart NNNNN semi-annual report for reporting period 7/1/2020-12/31/2020
- 40 CFR Part 63 Subpart NNNNN reports for reporting periods:
  - 7/1/2020-12/31/2020
  - 1/1/2021-6/30/2021

The primary purpose of the Dual Pressure Distillation Process (DPD) is to convert aqueous (32%) HCl to Anhydrous HCl that is sent to unit 311 for further purification. The control room for DPD is housed in the 316 building and accepts streams from emission units of from the following subsets: 356, 325, 502, 340 and 311. EU356-01 and EU356-02 are subject to the HCl MACT, 40 CFR Part 63 Subpart NNNNN, while producing liquid HCl at a concentration of 30 weight percent or greater during normal operations. At the time of the inspection the plant was in compliance with PTIs 29-07C and 29-07D.

**EU356-01**

This emission unit is permitted under PTI 29-07D. During this permitting emission units EU356-02, EU356-03 and FGHCLMACT were unintentionally not pulled forward from PTI 29-07C. Therefore, PTI 29-07C and PTI 29-07D were both left active to cover all emission units. As of 8-16-2021, two ROP modifications have been submitted to incorporate all active permit conditions into the ROP.

EU356-01 is controlled by a packed bed scrubber (24388) and a venturi scrubber (24386).

This emission unit is a hydrochloric acid (HCl) production plant with a packed bed scrubber (24388) and venturi scrubber (24386), capable of producing both anhydrous and aqueous HCl. Production and storage of liquid HCl product at a concentration of 30 weight percent or greater during normal operations is subject to the requirements of the Hydrochloric Acid Production NESHAP, 40 CFR Part 63, Subpart NNNNN. Columns 24350 and 24370 and vessels 24358, 24360, and 24362 are only used to produce anhydrous HCl. Absorbers 24387 and 26018 are only used to produce aqueous HCl. Tanks 24345 and 24346 and the packed bed and venturi scrubbers are used during production of both anhydrous and aqueous HCl.

**Special condition IV.1.** restricts operation of anhydrous HCl in EU356-01 unless a packed bed scrubber (24388) is installed, maintained, and operated in a satisfactory manner. Satisfactory operation includes maintaining a minimum liquid flow rate of 1,012 lb/hr (pph) in the packed bed scrubber or the minimum flow rate determined during performance testing acceptable to the AQD District Supervisor. During the inspection the liquid flow rate was 2,500 pph and a low alarm was set at 1,000 pph. I reviewed data from August 1, 2020 through August 11, 2021. During this time period the plant appeared to be in compliance with this requirement.

**Special condition IV.2.** restricts operation of aqueous HCl in EU356-01 unless a packed bed scrubber is installed, maintained, and operated in a satisfactory manner. Satisfactory operation includes maintaining a minimum liquid flow rate of 1,012 pph in the packed bed scrubber or the minimum flow rate determined during the most recent performance testing conducted for FGHCLMACT. The most recent testing conducted was performed on July 28, 2020. When producing aqueous HCl at a feed rate above 1554 pph, the water flow rate required for scrubber 24388 will be a minimum of 4647 pph. I confirmed this from the recent semi-annual HCL MACT report received on March 15, 2021. I reviewed data from August 1, 2020 through August 11, 2021. There were no instances of the plant producing aqueous HCl at a feed rate above 1554 pph and the liquid flow rate to scrubber 24388 below 4647 pph.

**SC IV.3.** restricts production of anhydrous HCl in EU356-01 unless the venturi scrubber (24386) is operated within the following parameters:

Operating mode	Requirement
a)	Anhydrous HCl flow to the absorbers is 2500 lb/hr or flow rate determined during performance testing acceptable to the AQD District Supervisor.
b)	Anhydrous HCl flow to the absorbers is greater than 2500 lb/hr or flow rate determined during performance testing acceptable to the AQD District Supervisor.

I reviewed data from August 1, 2020 through August 11, 2021. During this time period anhydrous HCl flow to absorber 24387 did not exceed 2,500 pph. Venturi scrubber 24386 maintained a minimum liquid flow rate of 9 gallons per minute or more during this time. At the time of the

inspection the flow to the absorbers was 497 pph with the liquid flow rate of 18.9 gpm to the scrubber.

### Compliance Reporting

*One deviation was reported in the annual ROP deviation report.*

- *Emissions at EU356-01 exceeded the 12 ppmv limit in the HCL MACT during testing. The plant was performing a range finding exercise and the limit was exceeded. As an immediate corrective action, the feed rate to the scrubber was increased to get below the 12 ppmv.*

### EU356-02

- Controlled by a packed bed scrubber (24401)

This emission unit consists of a rail car unloading station No. 9E with packed bed scrubber (24401) capable of either loading rail cars with aqueous HCl or unloading aqueous HCl from rail cars. Loading rail cars with liquid HCl product at a concentration of 30 weight percent or greater during normal operations is subject to the requirements of the Hydrochloric Acid Production NESHAP, 40 CFR Part 63, Subpart NNNNN. During the inspection we discussed how this station seems to be preferred over EU356-03. No particular reasoning was given for the preference.

Special condition IV.1 restricts operation of EU356-02 unless scrubber 24401 maintains a minimum liquid flow rate of 2,500 pph. During the inspection the emission unit was not in operation. The low alarm was set at 3,250 lbs/hr and the liquid flow rate was 3980 pph.

I reviewed flowrates for scrubber 24401 (flow transmitter tag, FT28376B) for the time period, August 1, 2020 through August 11, 2021. The liquid flow rate is recorded on a continuous basis, as defined as an instantaneous data point recorded at least once every 15 minutes, whenever EU356-02 operates. There were several dates during the reviewed time period where flowrates appeared not above the required minimum of 2,500 pph during times of operation. In a subsequent email dated September 15, 2021 additional information was provided regarding the valve position and the water flow. The way the PI (data collection system) averages the information, the average appears that the control valve was open 50% with not enough water flow to the scrubber but in actuality that is not what happened in the field. Minute by minute data was provided to show that when the water flow was decreasing the control valve was closing. The plant was in compliance with this requirement at the time of the inspection.

### Compliance Reporting

*No deviations were reported in the 2020 annual ROP deviation report.*

### EU356-03

- Controlled by a packed bed scrubber (24344)

Rail car unloading station No. 10E with packed bed scrubber (24344) capable of unloading aqueous HCl from rail cars.

Special condition IV.1 restricts operation of EU356-03 unless scrubber 24344 maintains a minimum liquid flow rate of 2,500 pph. During the inspection the emission unit was not in operation. The low alarm was set at 3,250 pph.

I reviewed flowrates for scrubber 24344 for the time period, August 1, 2020 through August 9, 2021. The unit did not operate during this time period.

**Compliance Reporting**

*No deviations were reported in the 2020 annual ROP deviation report.*

**FGHCLMACT**

40 CFR Part 63 Subpart NNNNN covers the HCl production facility which is the collection of unit operations and equipment associated with the production of liquid HCl product at a concentration of 30 weight percent or greater during normal operations that is located at, or is part of, a major source of hazardous air pollutant emissions.

Special condition III.1 of FGHCLMACT requires the facility to submit a leak detection and repair (LDAR) plan for HCLMACT. Revisions to the LDAR plan were submitted with the 2018 First Semi-annual HCl MACT periodic reports, reporting period January through June 2018. The revision date on the plan is August 1, 2018. According to the LDAR plan all equipment in HCl service will be inspected on an annual basis, except as specified. The inspection will consist of an audio, visual, and olfactory (AVO) inspection of each piece of equipment.

Special condition III.2 of FGHCLMACT requires the facility to submit to the AQD Supervisor, with the Notification of Compliance, (NOCS), a monitoring plan for FGHCLMACT, as required by 40 CFR 63.9025. Following the submittal of the monitoring plan, the permittee shall not produce liquid HCl product at a concentration of 30 weight percent or greater during normal operations in FGHCLMACT unless the monitoring plan is implemented and maintained. I reviewed the 2021 First Semi-annual HCl MACT periodic reports, reporting period January through June 2021. The Site-Specific Monitoring Plan had a revision date of August 10, 2018.

Special conditions IV.1, IV.2, and IV.3 apply while producing liquid HCl product at a concentration of 30 weight percent or greater during normal operation in FGHCLMACT.

Special condition IV.1 requires, while producing liquid HCl product at a concentration of 30 weight percent or greater during normal operations in FGHCLMACT, the facility shall equip and maintain scrubber no. 24388 and scrubber no. 24401 with the equipment listed below:

- a. For each scrubber, a device to monitor the liquid flow rate to the packed bed;
- b. For each scrubber, a device to monitor the scrubber effluent pH, unless an alternative is approved pursuant to 40 CFR 63.8(f).

See discussion above in EU356-01 and EU356-02 regarding compliance with this requirement.

Special conditions IV.2 and IV.3 restrict the production of liquid HCl product at a concentration of 30 weight percent or greater during normal operations in FGHCLMACT unless scrubbers 24388 and 24401 are installed, maintained, and operated in a satisfactory manner. Satisfactory operation includes maintaining the liquid flow rate to the scrubbers within the ranges identified in the monitoring plan. The limits are stated in the NOCSR.

See discussion above in EU356-01 and EU356-02 regarding compliance with this requirement.

Special condition V.1 states within 180 days after initial startup of production of liquid HCl product at a concentration of 30 weight percent or greater during normal operations in equipment in FGHCLMACT, the permittee shall verify HCl emission rates from FGHCLMACT, by testing at owner's expense, in accordance with the HCl MACT. No less than 30 days prior to testing, the facility shall submit a complete test plan to

the AQD Technical Programs Unit (TPU) and District Office. The AQD must approve the final plan prior to testing and a complete report of the test results to the AQD-TPU and the District Office within 60 days following the last date of the test.

The test was performed on 10/30/2018. The test results from the initial test were:

<b>Results</b>	<b>Limit</b>
<b>HCl= 6 ppmv</b>	<b>12 ppmv</b>
<b>Cl<sub>2</sub>= &lt;1 ppmv</b>	<b>20 ppmv</b>

A complete performance test observation, report was filed under the date of October 30, 2018.

Condition no. V.2 of table FGHCMACT requires periodic performance tests while producing liquid HCl product at a concentration of 30 weight percent or greater during normal operations in equipment in FGHCMACT, as required in 40 CFR 63.9015. According to 63.9015(a), all applicable performance tests according to the procedures in 63.9020 on the earlier of your title V operating permit renewal or within 5 years of issuance of your title V permit. The most recent stack test was conducted on July 28, 2020. The test results were as follows:

<b>Results</b>	<b>Limit</b>
<b>HCl= 11 ppmv</b>	<b>12 ppmv</b>
<b>Cl<sub>2</sub>= 2 ppmv</b>	<b>20 ppmv</b>

Test results indicated compliance.

Condition no. V.3 of table FGHCMACT requires, for an emission stream from an HCl transfer operation in FGHCMACT that meets the requirements of 40 CFR 63.9020(c), the facility may submit a design evaluation to the AQD in lieu of any performance test required by condition nos. V.1 or 2. The design evaluation shall meet the requirements of 40 CFR 63.9020(c). The design evaluation shall be submitted to the AQD District Supervisor no later than the date by which the performance test is required to be completed. The AQD received a design evaluation for scrubber no. 24401 (EU356-02) on 1/10/14. The design evaluation using Aspen Plus Modeling software, and the model resulted in greater than 99% control efficiency for HCl.

Table 1 of the HCl MACT limits HCl emissions for an emission stream from an HCl process vent at a new source to 12 ppmv HCl and 20 ppmv Cl<sub>2</sub>. The most recent, available, stack test results from the stack test performed on July 28, 2020, indicated compliance.

Special condition VI.1 of FGHLMACT, requires records to be kept of the time periods during which liquid HCl product at a concentration of 30 weight percent or greater during normal operations is produced in equipment in FGHLMACT. The AQD confirmed this record is being kept.

Special condition VI.2 of FGHLMACT, requires monitoring and record on a daily basis, all of the following operating parameters:

The daily average liquid flow rate to the packed bed

The daily average scrubber effluent pH for both scrubber no. 24388 and scrubber no. 24401, unless an alternative is approved pursuant to 40 CFR 63.8(f).

On February 6, 2014 the facility submitted to the U.S. EPA an alternative monitoring plan. Specifically, the request was to approve the removal of scrubber effluent pH monitoring and allow only monitoring of the liquid flow rate of the water in scrubbers #24388 and #24401. EPA approved the alternative monitoring plan on March 20, 2014, under the condition that under the Title V permit is rewritten to include that the facility will use "once through" water in scrubber #24388 and #24401 to comply with the HCl MACT. During the inspection I confirmed that industrial grade (IG), city grade water, is used to comply with the once through water in scrubbers #24388 and #24401. According to plant personnel, scrubber 24401 piping is such that they can only use fresh water for this scrubber. During the walk through portion of the inspection, plant staff identified the indicator on operators' screens showing fresh water can only be used for this scrubber.

Special condition VII.1 requires, no later than seven calendar days after start-up of production of liquid HCl product at a concentration of 30 weight percent or greater during normal operations in equipment in FGHLMACT, the permittee shall notify the AQD District Supervisor in writing of the start-up date. The notification was sent on 5/2/13 and the AQD received the required notification on 5/6/13.

Per the requirements of 63.9050, the AQD received the semi-annual compliance report for the HCl MACT on 8/19/2021. This report covered the reporting period of 1/01/2021-6/30/2021.

### Compliance Reporting

***One deviation was reported in the annual ROP deviation report.***

- *Emissions at EU356-01 exceeded the 12 ppmv limit in the HCL MACT during testing. The plant was performing a range finding exercise and the limit was exceeded. As an immediate corrective action, the feed rate to the scrubber was increased to get below the 12 ppmv.*

### FGHLMACT

*The HCl MACT Periodic Reports, January through June 2021 reporting period, reported no deviations from any emission limitations. No exceedances of a parameter occurred during this reporting period. The Continuous Monitoring Systems (CMS) was operative during the entire reporting period and there*

were no periods during which the CMS were out-of-control. Total process operating time was 2,269 hours. No changes were made to the CMS site-specific monitoring plan.

NAME 

DATE 9/16/2021

SUPERVISOR 