DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

A404347171

FACILITY: Dow Silicones Corporation		**SRN / ID:** A4043
LOCATION: 3901 S Saginaw Rd, MIDLAND		**DISTRICT:** Saginaw Bay
CITY: MIDLAND		**COUNTY:** MIDLAND
CONTACT: Jennifer Kraut , Air Specialist		**ACTIVITY DATE:** 12/06/2018
STAFF: Gina McCann	**COMPLIANCE STATUS:**	**SOURCE CLASS:** MEGASITE
SUBJECT: Inspection of EU356-01, EU356-02, EU356-03, FGHCLMACT and EU311-01.		
RESOLVED COMPLAINTS:		

Inspection Date: 12/6/2018
Inspection Started: 8:30
Inspection Ended: 11:30

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

- **Gina McCann (MDEQ-AQD, Senior Environmental Quality Analyst)**
- **Jennifer Kraut (Air Specialist, DOW Silicones)**
- **Mike Gruber (EHS Specialist, DOW MiOps)**
- **Chris Dinh, (Production Engineer for 316 Building, DOW Silicones)**
- **Corey Forfinski (Technical Advisor for 316 Building, DOW Silicones)**

Records reviewed as part of the inspection were:

- **ROP Annual report for 2017**
- **ROP Semi-Annual report for reporting period 1/1/2018-6/30/2018**
- **40 CFR Part 63 Subpart NNNNN semi-annual report for reporting period 1/1/2018-6/30/2018**
- **40 CFR Part 64 CAM excursion/exceedance report for 1/1/2018-6/30/2018**
- **Permit evaluation for PTI 1-08 and 29-07B**

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.

EU356-01

- **Controlled by a packed bed scrubber (24388)**

Hydrochloric Acid (HCl) production plant with a packed bed scrubber (24388), capable of producing either anhydrous HCl or 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.

Special condition IV.1 restricts operation of EU356-01 unless scrubber 24388 maintains a minimum liquid flow rate of 1,000 pounds per hour (lbs/hr). During the inspection the liquid flow rate was 2,500 lbs/hr and a low alarm was set at 1,000 lbs/hr.

I reviewed flowrates for scrubber 24388 for the time period, May 1, 2018 through October 31, 2018. 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 EU356-01 operates. Flowrates were above the required minimum of 1,000 lbs/hr during times of operation.

During records review I also viewed 15-minute average flowrates for scrubber 24388 for October 30th, 2018. All were above the required minimum of 1,000 lbs/hr during times of operation.

Compliance Reporting

The First Semi-Annual 2018 ROP report detailed two deviations discovered on May 1, 2018. FGHCLMACT.

It was determined that influent liquid flow rate hourly averages were not being calculated correctly on scrubbers 24388 and 24401 in accordance with 63.9025(a)(4)-(a)(5) of 40 CFR Part 63 Subpart NNNNN. A 15-minute average influent liquid flow rate was being calculated instead for both scrubbers, which was more stringent than the MACT requirements. The facility corrected the discrepancy and started calculating the hourly averages and daily averages as required by the monitoring requirements in 63.9025(a)(1)-(a)(5).

Once through water was not being used for the 24388 scrubber in accordance with 40 CFR Part 63 Subpart NNNNN 63.8(f)(1-5) and 63.9070(c)(3). Recycle water from venturi scrubber 24386 was being used instead of once through fresh water. On May 30, 2018, plant personnel switched back to fresh water.

No deviations were reported in 2017.

The HCl MACT Periodic Reports, January through June 2018 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 4,380 hours. Changes were made to the CMS site-specific monitoring plan and were attached to the First Semi-Annual HCl MACT report.

Special condition VIII requires the exhaust gases from the stacks listed in the table below to be discharged unobstructed vertically upwards to the ambient air unless otherwise noted

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SV356-001	4[1]	103[1]	R 336.1225

During the inspection, it was noted that the stack was not vented unobstructed vertically upwards. Instead the end of the stack was curled over. This seemed to be the facility's practice due to the nature of the materials within the stacks, mixing with precipitation may be unwanted. A PTI application is required to change this condition to match actual construction.

EU356-02

- Controlled by a packed bed scrubber (24401)

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.

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

I reviewed flowrates for scrubber 24401 for the time period, May 1, 2018 through October 31, 2018. 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. Flowrates were above the required minimum of 2,500 lbs/hr during times of operation.

Compliance Reporting

The First Semi-Annual 2018 ROP report detailed two deviations discovered on May 1, 2018. FGHCLMACT.

It was determined that influent liquid flow rate hourly averages were not being calculated correctly on scrubbers 24388 and 24401 in accordance with 63.9025(a)(4)-(a)(5) of 40 CFR Part 63 Subpart NNNNN. A 15-minute average influent liquid flow rate was being calculated instead for both scrubbers, which was more stringent than the MACT requirements. The facility corrected the discrepancy and started calculating the hourly averages and daily averages as required by the monitoring requirements in 63.9025(a)(1)-(a)(5).

No deviations were reported in 2017.

The HCl MACT Periodic Reports, January through June 2018 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 4,380 hours. Changes were made to the CMS site-specific monitoring plan and were attached to the First Semi-Annual HCl MACT 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 pounds per hour (lbs/hr). During the inspection the emission unit was not in operation. The low alarm was set at 3,250 lbs/hr.

I reviewed flowrates for scrubber 24344 for the time period, May 1, 2018 through October 31, 2018. 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 EU356-03 operates. Flowrates were above the required minimum of 2,500 lbs/hr during times of operation.

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. No leaks were identified during the last annual LDAR inspection.

Special condition III.2 of FGMACT 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 2018 First Semi-annual HCl MACT periodic reports, reporting period January through June 2018. 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 AQD received the required test plan on 7/19/2018. AQD approved the plan in a letter dated 8/14/2018. The test was performed on 10/30/2018. The test results had not, yet, been received by the district office by the time of this inspection.

Observations at the time of the test were as follows:

Time of Observation	Anhydrous HCl to 24387 absorber	24387 absorber water flow	Water flow to scrubber 24388
11:17	1533 pph	2963 pph	1002 pph
12:30	1571 pph	3097 pph	1015 pph
13:15	1545 pph	2970 pph	1010 pph
13:45	1554 pph	2983 pph	1018 pph

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

Condition no. V.2 of table FGHCLMACT requires periodic performance tests while producing liquid HCl product at a concentration of 30 weight percent or greater during normal operations in equipment in FGHCLMACT, 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 facility conducted a performance test on October 30th, 2018. The test results had not, yet, been received by the district office at the time of this inspection. The prior stack test was performed on October 21, 2013. Test results indicated compliance.

Condition no. V.3 of table FGHCLMACT requires, for an emission stream from an HCl transfer operation in FGHCLMACT 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 is 12 ppmv HCl and 20 ppmv Cl_2. The most recent, available, stack test results from the stack test performed on October 21, 2013, indicated compliance.

Special condition VI.1 of FGHCLMACT, 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 FGHCLMACT. The AQD confirmed this record is being kept.

Special condition VI.2 of FGHCLMACT, 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 rated 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.

Prior to the inspection, I requested a copy of the daily flow rate records for scrubber nos. 24388 and 24401 for the operating time period October 1, 2017 through October 31, 2018. Flows were within the appropriate ranges for the period of time reviewed.

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 FGHCLMACT, 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 9/17/2018. This report covered the reporting period of 1/01/2018-6/30/2018.

Compliance Reporting
The First Semi-Annual 2018 ROP report detailed two deviations discovered on May 1, 2018.

FGHCLMACT

It was determined that influent liquid flow rate hourly averages were not being calculated correctly on scrubbers 24388 and 24401 in accordance with 63.9025(a)(4)-(a)(5) of 40 CFR Part 63 Subpart NNNNN. A 15-minute average influent liquid flow rate was being calculated instead for both scrubbers, which was more stringent than the MACT requirements. The facility corrected the discrepancy and started calculating the hourly averages and daily averages as required by the monitoring requirements in 63.9025(a)(1)-(a)(5).

Once through water was not being used for the 24388 scrubber in accordance with 40 CFR Part 63 Subpart NNNNN 63.8(f)(1-5) and 63.9070(c)(3). Recycle water from venturi scrubber 24386 was being used instead of once through fresh water. On May 30, 2018, plant personnel switched back to fresh water. In a follow up email, dated December 18, 2018, more information was requested on what operating discipline was added and when the plant started using the recycle water from scrubber 24386. Plant personnel's response is below.

"For scrubber 24388, language was added to the DCS (Distributive Control System) screen alerting operators to the fact that only industrial grade water or once through fresh water can be used with

this scrubber. For scrubber 24401, piping is such that they can only use fresh water for this scrubber. Also, the plant switched back to fresh water on May 30, 2018. The plant started using recycled water from scrubber 24386 in 2008."

No deviations were reported in 2017.

The HCl MACT Periodic Reports, January through June 2018 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 4,380 hours. Changes were made to the CMS site-specific monitoring plan and were attached to the First Semi-Annual HCl MACT report.

EU311-01

- **Controlled by:**
  - **Absorbers (2810 and 24101). These are CAM subject devices for Hydrogen Chloride (HCl) and Methyl Chloride (MeCl)**
  - **Packed bed scrubber (2812 and 24102). These are CAM subject devices for Hydrogen Chloride (HCl) and Methyl Chloride (MeCl)**

The control room for DPD is housed in the 316 building and accepts streams from emission units from the following subsets: 356, 325, 502, 340 and 311.

HCl/MeCl recovery process including scrubbers, tanks, columns, vaporizer, absorber, compressor, and related equipment. Several processes at the on-site vent to this recovery process. This emission unit is subject to the requirement of 40 CFR Part 63 Subpart FFFF and Subpart EEEE. EU311-01 is a CAM subject emission unit subject to the requirements of 40 CFR Part 64.

Special condition I.2. limits EU311-01 to less than 4.0 ton per year (tpy) of HCl emissions and special condition I.5 limits EU311-01 to less than 2.5 tpy of MeCl emissions, based on a 12-month rolling time period as determined at the end of each calendar month. During the inspection I requested 12-month rolling records of HCl and MeCl for the time period November 2017 through October 2018.

Pollutant	Limit (tpy)	Actual Emissions (tpy)
HCl	4.0	0.004
MeCl	2.5	0.15

***Actual emissions are based on the 12-month rolling period from November 2017 through October 2018.**

Special condition III.1 requires the facility to implement corrective action if the liquid flow rate of the absorber (2810) is less than 4.0 gallons per minute. Record of the corrective action shall be maintained including any action taken to prevent a reoccurrence. An excursion is a liquid flow rate less than 4.0 gallons per minute defined in this condition or demonstrated during testing. Upon detecting an excursion of the liquid flow rate limit, the permittee shall restore operation of the absorber (2810) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions.

I reviewed the 2017 annual CAM reports and the first semi-annual CAM report for the reporting period January 1, 2018 through June 30, 2018. No excursions were reported for EU311-01 for the reviewed time periods.

Special condition III.2 requires the facility to implement corrective action if the liquid flow rate of the packed bed scrubber (2812) is less than 2.4 gallons per minute. Record of the corrective action shall be maintained including any action taken to prevent a reoccurrence. An excursion is a liquid flow rate less than 2.4 gallons per minute defined in this condition or demonstrated during testing. Upon detecting an excursion of the liquid flow rate limit, the permittee shall restore operation of the packed bed scrubber (2812) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions.

I reviewed the 2017 annual CAM reports and the first semi-annual CAM report for the reporting period January 1, 2018 through June 30, 2018. No excursions were reported for EU311-01 for the reviewed time periods.

Special condition III.3 requires the facility to implement corrective action if the liquid flow rate of the absorber 24101 is less than 2.5 gallons per minute. Record of the corrective action shall be maintained including any action taken to prevent a reoccurrence. An excursion is a liquid flow rate less than 2.5 gallons per minute defined in this condition or demonstrated during testing. Upon detecting an excursion of the liquid flow rate limit, the permittee shall restore operation of the absorber (24101) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions.

I reviewed the 2017 annual CAM reports and the first semi-annual CAM report for the reporting period January 1, 2018 through June 30, 2018. No excursions were reported for EU311-01 for the reviewed time periods.

Special condition III.4 requires the facility to implement corrective action if the liquid flow rate of the packed bed scrubber 24102 is less than 1.0 gallons per minute. Record of the corrective action shall be maintained including any action taken to prevent a reoccurrence. An excursion is a liquid flow rate less than 1.0 gallons per minute as defined in this condition or demonstrated during testing. Upon detecting an excursion of the liquid flow rate limit, the permittee shall restore operation of the packed bed scrubber 24102 to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions.

I reviewed the 2017 annual CAM reports and the first semi-annual CAM report for the reporting period January 1, 2018 through June 30, 2018. No excursions were reported for EU311-01 for the reviewed time periods.

Special condition III.7 restricts operation of EU311-01, when in vent down maintenance mode, to less than 120 hours per year. I reviewed differential pressure for distillation columns 2890 and 24195 for the time period December 30, 2017 through December 6, 2018. Maintenance vent down mode did not occur during this time period.

Special condition III.9 requires the facility to calibrate the liquid flow indicator for absorbers 2810 and 24101 and scrubbers 2812 and 24102 according to manufacturer's recommendations. Calibration records were requested during records review. Occurrence of calibrations is listed below.

Absorber Number	Date of Calibration
2810	5/10/2018
2812	5/10/2018
24101	9/20/2018
24102	9/20/2018

Special condition VI.1. requires monitoring and recordkeeping, on a continuous basis, the liquid flow rate of the absorbers (2810 and 24101) and packed bed scrubbers (2812 and 24102) with instrumentation acceptable to the AQD. For the purposes of this condition, "on a continuous basis" is defined as an instantaneous data point recorded at least once every 15 minutes. At the time of the inspection the following values were observed:

Operational Parameter	Operational Restriction (gpm)	Observed Value (gpm)	Alarm Set Point (gpm)
Absorber 2810	>4.0	4.5	4.0
Packed Bed Scrubber2812	>2.4	2.6	2.4
Absorber 24101	>2.5	3.5	2.5
Packed Bed Scrubber 24102	>1.0	2.0	1.0

I reviewed records of liquid flow rate of the absorbers (2810 and 24101) and packed bed scrubbers (2812 and 24102) for December 5, 2018. Liquid flow rates were within the appropriate operating range.

Special conditions VI.3. VI.4. and VI.5 pertain to recordkeeping required if an excursion were to occur. As addressed earlier, I reviewed the 2017 annual CAM reports and the first semi-annual CAM report for the reporting period January 1, 2018 through June 30, 2018. No excursions were reported for EU311-01 for the reviewed time periods.

NAME Kelsie R McCann DATE 12/18/18 SUPERVISOR C. Hare