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

A404350504

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:** 08/28/2019
STAFF: Gina McCann	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MEGASITE
SUBJECT: FG337SCRUBBERS and EU515-01		
RESOLVED COMPLAINTS:		

Inspection Date: 8/28/2019
Inspection Started: 8:30
Inspection Ended: 14:00

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

- **Gina McCann (EGLE-AQD, Senior Environmental Quality Analyst)**
- **Jennifer Kraut (Air Specialist, DOW Silicones)**
- **Matt Weber (Production Engineer for 515 Building, DOW Silicones)**
- **Maria Allen (Production Engineer for 515 Building, DOW Silicones)**
- **Scott Stachowiak (325 Building Engineer and FG337SCRUBBERS, DOW Silicones)**

Records reviewed as part of the inspection were:

- **ROP Annual report for 2018**
- **40 CFR Part 64 CAM excursion/exceedance report for 2018**
- **40 CFR Part 63 Subpart FFFF, MON MACT periodic report for 2018**

EU515-01

- **Packed tower scrubber (10530). This CAM subject device for VOC.**
- **Glycol condensers (10453, 10541). This is a CAM subject device for VOC.**
- **Service water condensers (HX-10657). This is a CAM subject device for VOC.**
- **Bag filters (22979, 22981)**
- **THROX**
- **Site scrubbers**

EU515-01 is a Grignard process for production of chlorosilanes and related materials. The emission unit includes reactors, distillation, filtration, drying, vacuum system, condensers, hoppers, dust collectors, scrubber, and related equipment. EU515-01 is subject to the requirements of 40 CFR Part 60, Subpart Kb, 40 CFR Part 61, Subparts A, J, and V, 40 CFR Part 63, Subpart FFFF, and 40 CFR Part 64. The most recent PTI for this emission unit is PTI No. 812-91C.

Special condition (SC) I.2. restricts VOC emission, based on a 12-month rolling time period as determined at the end of each calendar month, to less than 61.23 ton per year (tpy). SC VI.7. is the associated monitoring and recordkeeping condition that requires the plant to calculate the VOC emission rate from EU515-01 monthly, for the preceding 12-month rolling time period, using a method acceptable to the AQD District Supervisor. I reviewed emissions records for the time period January 1, 2018 through August 1, 2018. VOC emissions for the 12-month rolling time period ending June 2019 were 0.055 tpy.

SC III.1. restricts the exit air temperature of packed tower scrubber 10530 to less than -5°C, while the scrubber exhaust is not routed to the THROX. An exceedance of this temperature is an excursion and the permittee shall restore operation of scrubber 10530 to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing

emissions. SC VI.2. is the associated monitoring and recordkeeping requirement to monitor and record, on a continuous basis, the exit air temperature of toluene scrubber 10530 while the scrubber is operating, and the exhaust is not routed to the THROX. I reviewed records for the time period January 1, 2018 through August 26th, 2019. During this time period the exit air temperature of packed tower scrubber 10530 was below -5C while the scrubber was not routed to the THROX.

SC III.2. restricts the liquid flow rate of condenser HX-10657 to 100 gallons per minute (gpm) or more while the scrubber exhaust is not routed to the THROX. If the liquid flow rate is less than 100 gpm the plant shall implement corrective action and maintain a record of action taken to prevent reoccurrence. Condenser HX-10657 is a CAM subject device for VOCs and flow less than 100 gpm is considered an excursion. SC VI.2. is the associated monitoring and recordkeeping requirement to monitor and record, on a continuous basis, the liquid flow rate of condenser HX-10657, while the THROX is shut down or experiencing a malfunction. I reviewed records for the time period January 1, 2018 through August 26th, 2019. During this time period the liquid flow rate of condenser HX-10657 was greater than 100 gpm when not venting to the THROX.

SC III.3. and III.4. requires the pressure drop across bag filter 22979 and 22981 to maintain between 0.5 inches of water and 75 inches of water, when venting to the atmosphere. SC VI.2. is the associated monitoring and recordkeeping requirement to monitor and record, on an continuous basis, the pressure drop across bag filters 22979 and 22981. The plant does not utilize the flexibility of venting the bag filters to atmosphere. They do maintain records of pressure drop for both bag filters to satisfy this requirement. I reviewed records for the time period January 1, 2018 through August 26th, 2019. During this time period the bag filters maintained the pressure drops on the bag filters within the permitted values.

SC III.5. restricts the main coolant supply temperature for condensers 10453 and 10541 to less than -5C, while the condensers exhaust is not routed to the THROX. Condensers 10453 and 10541 are glycol condensers that are CAM subject devices for VOCs. An excursion is an exceedance of -5C for the main coolant supply. SC VI.2. is the associated monitoring and recordkeeping requirement to monitor and record, on a continuous basis, the main coolant supply temperature for condensers 10453 and 10541, while the condensers are operating, and the exhaust is not routed to the THROX. I reviewed records for the time period January 1, 2018 through August 26th, 2019. During this time period there were several apparent exceedances in the main coolant supply temperature above -5C. However, further investigation into each occurrence showed that exceedances were either during periods when the THROX was in operation or the process was not running. For the reviewed time period, the average temperature on the main coolant supply for condensers 10453 and 10541 were -20C.

To provide a reasonable assurance of compliance with the applicable permit conditions, SC III.6. requires the plant to calibrate the temperature gauge for scrubber 10530 and condensers 10453 and 10541, as well as the liquid flow indicator for condensers 10453 and 10541. The requirement to calibrate the liquid flow indicator of condensers 10453 and 10541 appears to be a mistake. Condensers 10453 and 10541 are required to monitor the main coolant supply temperature. Condenser HX-10657 is required to monitor the liquid flow rate and therefore should have the requirement to calibrate the liquid flow indicator. A note was made to make this change during the next renewal. The plant does maintain calibration records for the liquid flow indicator on condenser 10657. During the inspection, the plant provided the last two, annual calibrations for the temperature gauges for scrubbers 10530, 10453 and 10541 and for the liquid flow indicator on condenser 10657.

SC IV.1. under Design/Equipment Parameters restricts operation of the equipment in EU515-01 unless the emissions are routed to the THROX, except as allowed by SC IV.2 IV.3, and IV.4. Currently, the plant

begins shutdown process, which takes 12-20 hours to safely shutdown, because FGSITESCRUBBERS are not an approved MON control device and neither are local controls. This PTI was issued prior to the facility becoming subject to the MON MACT, 40 CFR Part 63 Subpart FFFF and therefore does not reflect the requirements to control organic hazardous air pollutants. Ideally, the PTI should be revised.

SC IV.2. allow the plant to dry magnesium chloride for up to 336 hours per 12-month rolling time period, as determined at the end of each calendar month, while toluene scrubber 10530 is not installed and operating properly and the THROX is shut down or experiencing a malfunction, however the condensers 10453 and 10541 and the site scrubbers are required to be installed, maintained, and operated in a satisfactory manner. SC VI.4. is the associated monitoring and recordkeeping requirement that requires the plant to maintain, for each month, the number of hours of drying without the toluene scrubber 10530 and the THROX and the total number of hours of operation of the reactors, for the 12-month rolling time period. The plant does not utilize this flexibility. The 12-month rolling hours, for the time period ending June 2019, were zero and the records are attached to this report.

SC IV.3. allows the plant to operate the reactors; filters 421, 422, and 423; all distillation columns; all raw/crude material tanks; and all dryers up to 336 hours, per 12-month rolling time period, as determined at the end of each calendar month. SC VI.5. is the associated monitoring and recordkeeping requirement that requires the plant to maintain, for each month, the number of hours of operation of the reactors, filters 421, 422, and 423, all distillation columns, and all raw/crude material tanks without toluene scrubber 10530 and the THROX and the total number of hours of operation of the reactors, filters 421, 422, and 423, all distillation columns, and all raw/crude material tanks without toluene scrubber 10530 and the THROX, for the 12-month rolling time period. The plant does not utilize this flexibility. The 12-month rolling hours, for the time period ending June 2019, were zero and the records are attached to this report.

SC IV.4. allows the plant to operate the reactors; filters 421, 422, and 423; all distillation columns; all raw/crude material tanks; and all dryers for up to 1,600 hours, per 12-month rolling time period, including the 336 hours allowed in SC IV.2. and IV.3., while the THROX is shut down or experiencing a malfunction. During operation without the THROX, the permittee shall not operate the listed equipment in EU515-01 unless condensers 10453 and 10541, toluene scrubber 10530, and the site scrubbers are installed, maintained, and operated in a satisfactory manner. SC VI.6. is the associated monitoring and recordkeeping requirement to maintain records, for each month, the number of hours of operation of the reactors, filters 421, 422, and 423, all distillation columns, all raw/crude material tanks, and all dryers without the THROX and for the 12-month rolling time period, as determined at the end of each calendar month, the total number of hours of operation the reactors, filters 421, 422, and 423, all distillation columns, all raw/crude material tanks, and all dryers without the THROX. I reviewed records from July 2018 through June 2019. The 12-month rolling hours, for the time period ending June 2019 was 35.550.

SC IV.5. restricts operation of the ether purification column while the THROX is shut down or experiencing a malfunction unless the service water condenser HX-10657 is installed, maintained, and operated in a satisfactory manner. During the inspection service water condenser HX-10657 was not in operation, because the process was being controlled by the THROX. I reviewed records for the time period January 1, 2018 through August 26th, 2019. During this time period the liquid flow rate of condenser HX-10657 was greater than 100 gpm when not venting to the THROX. It appears that the plant is meeting this requirement.

SC IV.6. restricts operation of 614 tank, while producing hexadiene, unless the emissions from the 614 tank are controlled by condenser 10541 and toluene scrubber 10530 in series. According to a September 19, 2019 email from J. Kraut, the plant not longer produces hexadiene, although tank 614 is used to store hexadiene. The tank vents to the toluene scrubber 10530 and THROX. Since THROX is considered

equivalent or better control, this change is exempt. Nonetheless, the plant should consider revising PTI 812-91C to reflect current operating conditions.

SC VI.3. requires the plant to maintain a record of tank 612 dimensions and an analysis showing its capacity is required to comply with the Federal Standards of Performance for New Stationary Sources as specified in 40 CFR Part 60, Subpart Kb, Section 60.116(a) and (b). Tank 612 is not subject to 40 CFR Part 60, Subpart Kb. Section 60.110b(b) states this subpart does not apply to storage vessels with a capacity greater than or equal to 75 m^3 (19,813 gallons) but less than 151 m^3 (39,890 gallons) storing a liquid with a maximum true vapor pressure less than 15.0 kPa (2.18 psia). The capacity of tank 612 is 20,000 gallons, and the true vapor pressure of the material it stores (monochlorobenzene) is 0.3 psia. Since tank 612 has a capacity between 19,813 gallons and 39,890 gallons and stores a liquid with a maximum true vapor pressure less than 2.18 psia, tank 612 is not subject to 40 CFR Part 60, Subpart Kb. However, tanks 613, 614 and 618 are subject to 40 CFR Part 60, Subpart Kb. Each of these tanks are subject because their capacity is 20,000 gallons and the true vapor pressure of the material they store, is greater than 2.18 psia. Each of these tanks are controlled by FGTHROX. During the next ROP renewal these tanks should have requirements pursuant to 40 CFR Part 60, Subpart Kb added for completeness and accuracy of the permit.

Special Conditions VI.9, VI.10 and VI.11, are related to Compliance Assurance Monitoring (CAM). The language in these conditions needs to be revised. Adding language to clarify excursions are times when, "not routed to the THROX" as specified in associated process/operational restriction conditions III.1, III.2. and III.5.

Monitoring Parameters observed during the inspection.

Pollution Control	Process/ Operational Restrictions	Instantaneous Reading	Secure Process Alarm (SPA)	Time
Packed tower scrubber (10530)	<-5C or 23F	-17 C	-10 C	12:34
Glycol condensers (10453)	<-5C or 23F	-23 C	-10 C	12:34
Glycol condensers (10541)	<-5C or 23F	-23 C	-10 C	12:35
Service water condensers (HX-10657)	>100 gpm	0.1 gpm THROX was operating	--	12:37
Bag filters (22979)	0.5-75 " W.C.	30.1 " W.C.	75 " W.C.	12:38
Bag filters (22981)	0.5-75 " W.C.	24.2 " W.C.	75 " W.C.	12:39

Compliance Reporting

- Various dates, EU515-MON

Due to malfunction, a MON process operated briefly without Group 1 control and therefore did not reduce by > or = to 98%. Complied with SSM plan at the time of the event. Approximately 10 pounds released, under emission limits.

- 8/5/2018, EU515-MON (80 minutes)

Estimated emissions were 5 pounds. Emissions diverted to site scrubbers, which is not a MACT control device. Calendar notices sent for planned outage events for THROX so visual reminder in place.

- 11/1/2018, EU515-MON (20 hours)

Operated without Group 1 control. Process diverted from THROX to site scrubbers due to malfunction with the ionizing wet scrubbers on the THROX. Plant followed the SSM plan, according to 63.2450 must comply with the emission limits and work practice standards in Tables 1-7, except during periods of startup, shutdown and malfunction (SSM). 55 pounds lost to atm., but under limits.

FG337SCRUBBERS

- Water Scrubbers9950 and 9960
- FGTHROX (Backup)
- FGSITESCRUBBERS (Backup)

337 spray tower water scrubbers used to remove HCl and chlorosilanes from process exhaust prior to discharge to atmosphere. The 304 vent recovery system vents to the 337 scrubbers. The 337 scrubber receives process exhaust from several emission units on site. The 337 scrubber is comprised of two scrubbers (i.e., scrubbers 9950 and 9960) which typically alternate in operation but can operate in parallel. The 337 scrubber utilizes water from the venturi scrubbers at EU325-01 (TCS vent recovery system) and city water as makeup. **The most recent PTIs for this flexible group are PTI Nos. 131-15 and 185-07B.**

SC III.1. and III.2 restricts discharge of process emission through vent no. SV337-001 and SV337-002 unless they have passed through scrubber 9950 and scrubber 9960, respectively, with a liquid flow rate more than 45 gpm. If the liquid flow rate is less than 45 gpm then the plant shall implement corrective action and maintain a record of action taken to prevent reoccurrence. SC VI.1. is the associated monitoring and recordkeeping requirement to monitor and record, on a continuous basis, the liquid flow rate of scrubber 9950 and 9960. The plant typically alternates operation of 9950 and 9960. This allows for maintenance to be done on the scrubber that is not operating while still maintaining the liquid scrubber flow rate above the required 45 gpm. I reviewed liquid flow rate data from January 1, 2018 through August 27, 2019. During times when the process was operating, one or both of the scrubbers was in operation. The table below shows the observed liquid flow rates during the inspection.

Pollution Control	Process/ Operational Restrictions	Instantaneous Reading	Secure Process Alarm (SPA)	Time
9950 Scrubber	>45gpm	82.86 gpm	45 gpn	13:03
9960 Scrubber	>45gpm	Not operating	45 gpm	13:03

SC VI.2. requires the plant to install and maintain a color camera and monitor system to monitor the visual emissions from the 337 wet scrubber. During the inspection we viewed the monitor for this camera. The plant appears to be meeting this requirement.

Compliance Reporting

No deviations were reported for FG337SCRUBBERS in the 2018 Annual ROP report.

NAME [signature] DATE 9/23/19 SUPERVISOR [signature]