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

A404339734

FACILITY: Dow Corning - Midland Plant		**SRN / ID:** A4043
LOCATION: 3901 S Saginaw Rd, MIDLAND		**DISTRICT:** Saginaw Bay
CITY: MIDLAND		**COUNTY:** MIDLAND
CONTACT: Kayla Peacock ,		**ACTIVITY DATE:** 05/09/2017
STAFF: Kathy Brewer	**COMPLIANCE STATUS:** Compliant	**SOURCE CLASS:** MEGASITE
SUBJECT: FG304VENTRECOVERY, 508-01, 502-07		
RESOLVED COMPLAINTS:		

May 9, 2017 On site inspection FG304VENTRECOVERY, EU502-07, EU508-01

Kayla Peacock, Dow Chemical
Mike Gruber, Mi Ops Silicone Plant Dow Chemical/Dow Corning
Kathy Brewer, Saginaw Bay AQD MDEQ

Attachments
May, September 2016, and March 2017 HX-1 – 2044 and HX-2 – 2044 Vent temps, HX-10642 Water flow, and Benzene absorber tempatures
Example emission calculations from 4-25-2013 stack test at 304 vent recovery
Operating parameters during 4-25-2013 stack test at 304 vent recovery

Onsite review
304 Vent recovery process flow diagram
EU502-07 Operator control room screens vent control
EU508-01 Operator control screens vent control

File review
Annual and semi annual deviation ROP deviation reports
MON MACT periodic compliance reports Nov 2015 – Dec 2016
MON MACT NOCSR Nov Nov 2015 – Dec 2016
40 CFR Part 63 subpart EEEE (OLD MACT) Periodic report
April 25, 2013 emission test report
508-01 CAM plans
Jan – Dec 2016 CAM reports
PTI 185-07 MDEQ AQD Permit Eval forms
PTI 84-08 to 84-08b MDEQ AQD Permit Eval forms

FG304VENTRECOVERY: Compliant

Description
The 304 vent recovery system receives process exhaust from EU502-07 and EU508-01. The most recent PTIs issued for thi flexible group are 84-08b for EU508-01, and 185-07b for EU502-07. The emissions from FGBULKMOVE are now included ir EU502-07 permitted emissions. The EU502-01 no longer has emissions vented to FG304VENTRECOVERY as the distillation activities previously in EU502-01 were incorporated into EU508-01. EU502-01 was inspected separately on May 24, 2017. EURULE290 activity from electric stills production activity at EU502-02 also vents to FG304VENTRECOVERY. Emissions fro FG304VENTRECOVERY are further controled by FGTHROX, FGSITESCRUBBER, or FG337SCRUBBER.

The condensers are CAM subject devices for VOC. The CAM plan on record for "EU508-01" applies to the FG304VENTREC condensers HX-1 2044 and HX-2 2044.

EU502-07 shares FG304VENTRECOVERY with EU508-01 that is subject to 40 CFR Part 63 Subpart FFFF (MON MACT).

The inspection included a review of process flows and emission control devices, on site record review, process control o area, facility areas with processes emitting to FG304ventrecovery, and, ROP required monitoring devices. During the ins no non compliance issues were found.

The CAM plan lists the 337 Scrubber for 508-01 as CAM subject for VOCs. Neither the EU508-01 or the FG337SCRUBB conditions cite the flow on the 337scrubbers as CAM subject.

EMISSIONS LIMTS and OPERATIONAL RESTRICTIONS

Pollutant	ROP limit	Compliance method	During May 9, 2017 inspection	Records review highest temp	Date	Compliance Method	Test result
VOC	30.0 pph; 22.5 tpy	SC III.1 Condenser exit gas temp less than -76 C except as allowed in FGSITEBLOWER	-101 C	-80.43 C	March 2017	SC V.1 Verify VOC and Benzene emission rates from FG304VENTRECOVERY	14.52 pph
Benzene	0.46 pph	SC III.1 Condenser exit gas temp less than -76 C except as allowed in FGSITEBLOWER	-101 C	-80.43 C	March 2017	SC V.1 Verify VOC and Benzene emission rates from FG304VENTRECOVERY	0.01 pph

The ROP does not specify any material limits or design/equipment limits

TESTING
An emission test was required to be performed no later than August 30, 2013. An emission test was comp on April 23, 2013 and test report submitted on June 16, 2013. Compliance with the emission limits for EU304VENTRECOVERY were confirmed during the emission test. Example calculations from the emissior are attached.

Reporting
No excursions, exceedances, or CAM monitor downtime were reported in the CAM semi annual reports.

No deviations were reported in the ROP Annual and Semiannual Deviation reports

EU508-01: Compliant

Description
Phenyltrichlorosilane and diphenyldichlorosilane recovery process, including reactors, columns, condensers, tanks, and equipment. Included in this emission unit is the phenylchlorosilane distillation process, which is defined in the conditi this emission unit. This permit covers all PINTO vents associated with these processes. EU508-01 includes a 60 thousanc benzene storage tank (i.e., tank T-60). Note: all equipment from EU304-03, EU308-02, and EU308-03 has been incorporat EU508-01 and these three emission units no longer exist. This emission unit is subject to the requirements of 40 (Subparts A, J, and V and of 40 CFR 63, Subparts A, EEEE, and FFFF.

The CAM plan on record for" EU508-01" applies to the FG304VENTRECOVERY condensers HX-1 2044 and HX-2 2044. The E 01 ROP conditions do not contain any CAM references.

The most recent PTI for this emission unit is PTI No. 84-08B.

EMISSIONS
Emissions from EU508-01 are limited to the following:

Pollutant	ROP limit	Compliance method	Equipment parameter	Operational limit
Benzene	3.5 pph	SC VI.3, Hours operated while FG304VENTRECOVERY not routed to FGTHROX SC VI.4 Hours phenylchlorosilane distillation process operated with condenser 10642 control only	SC IV.4, operate 508-01 <1,500 hours/12 month rolling while not going to FGTHROX, SC IV.5 operate phenylchlorosilane distillation process for <800 hours/12 month rolling w/condenser 10642 control only	SC III.1, exit gas temperate from the benzene absorber (2043) shall not exceed 10 degrees C SC III.2, liquid flow rate of condenser no. HX-10642 shall not be less than 5 gallons per minute
Dichlorosilane	4.0 pph	SC VI.3 Hours operated while FG304VENTRECOVERY not routed to FGTHROX SC VI.4 Hours phenylchlorosilane distillation process operated with condenser 10642 only	SC IV.4, operate 508-01 <1,500 hours/12 month rolling while not going to FGTHROX, SC IV.5 operate phenylchlorosilane distillation process for <800 hours/12 month rolling w/condenser 10642 control only	SC III.1, exit gas temperate from the benzene absorber (2043) shall not exceed 10 degrees C SC III.2, liquid flow rate of condenser no. HX-10642 shall not be less than 5 gallons per minute

MATERIAL LIMITS
There were no material limits in the ROP for EU508-01

OPERATIONAL RESTRICTIONS
The ROP required records for operational restrictions compliance were reviewed for May 2016, September and March 2017.

Operational limit	Absorber Exhaust gas temp during inspection	Recorded highest exhaust gas absorber temp s	Date	Condenser HX-10642 flow during inspection	Record review lowest condenser HX-10642 flow	Date
SC III.1, exit gas temperate from the benzene absorber (2043) shall not exceed 10 degrees C	-19 C	1.23 C	March 2017	NA	NA	NA
SC III.2, liquid flow rate of condenser no. HX-10642 shall not be less than 5 gallons per minute	NA	NA	NA	43 gpm	42.5 gpm6	Sept 2016

The benzene absorber listed in the ROP is no longer used for HX-10642 emission control. The SV516-002 remains as an emergency only bypass.

EQUIPMENT PARAMETERS
The ROP required records for equipment parameter compliance were reviewed for May 2016, September 2(and March 2017

Operational limit	Recorded Max hours	Date
SC IV.4, operate 508-01 <1,500 hours/12 month rolling while not going to FGTHROX, SC IV.5 operate phenylchlorosilane distillation process for <800 hours/12 month rolling w/condenser 10642 control only	0	March 2017

TESTING/SAMPLING
The current ROP does not contain any specific testing requirements for EU508-01. In April 2013 emission testing on the 304 VENT RECOVERY was conducted for VOCs and lb/hour rates determined for VOC and Benzene.

Reporting
No excursions, exceedances, or CAM monitor downtime were reported in the CAM semi annual reports.

No deviations were reported in the ROP Annual and Semiannual Deviation reports

No deviations or SSM instances were reported in the 40 CFR Part 63 Subpart EEEE semi annual report

One MON MACT deviation for MCPU -022 was reported but it was for process unit in in building 515.

EU502-07: Compliant

This emission unit consists of two sets of related equipment with different emission profiles and different vent control The Trichlorosilanes (TCS) distillation equipment and the bulk move operations for TCS, silicon tetrachloride (ST dichlorosilane (DCS).

The most recent PTI for this emission unit is 185-07b

TCS distillation equipment, "Distillation Vents", purify crude TCS into various grades (electronic-, chemical-, and plant-gr TCS product as well as chemical-grade silicon tetrachloride. Bulk Move Vents operations include loading and unloa storage tanks, railcars, and semi-trailers primarily at the 502 Buildiong in support of the distillation operations.

Distillation Vents emission controls typically consist of the 304 Vent Recovery System followed by the dry vent tank at System. The dry vent tank is either sent to the THROX System burner or diverted to the Site Scrubber System. Bulk Mo emission control typically is the Site Scrubber System. However there alternative emission control paths are citec Design/Equipment Parameters in the ROP for both operations.

The emissions are tracked and reported based on the activity and the control device that emissions are vented to. The and control device status based emissions are summed for monthly totals.

EMISSIONS
Emissions from EU508-01 are limited to the following:

Pollutant	ROP limit	Compliance method	Equipment parameter	Material Limit
Trichlorosilane & tetrachlorosilane	6.0 tpy	SC VI.2 calculate and record 12-month rolling	SC IV.1, monitor and record when the Bulk	SC II.1 permittee shall not route mo

combined		time period emissions from the Distillation Vents	Move Vents are operating, the mass flow rate of the vapor from the Bulk Move Vents to the Site Scrubber System on a continuous basis	than 1,000 pounds of material per hou based on a one-hour average, from the Bulk Move Vents to the Site Scrubber System SC II.2 permittee shall not route mo than 600 pounds o material per hour, based on an annu average, from the Bulk Move Vents t the Site Scrubber System

Design/Equipment Parameters
The following control efficiency and devices are required by the ROP conditions

Equipment	First Emission Control	Required Control Efficiency	Second Emission Control	Required Control Efficiency
a. Distillation Vents	i. 304 Vent Recovery System followed by	88%-99%*	1. THROX System or	99.9%
			2. Site Scrubber System or	99.4%
			3. 337 Spray Scrubbers	99.4%
	ii. Or 325 Vent recovery System followed by	99.9%	1. THROX System or	99.9%
			2. Site Scrubber System or	99.4%
			3. 337 Venturi Scrubbers	99.4%
b. Bulk Move Vents	i. Site Scrubber System	99.4%	NA	
	ii. Or 304 Vent Recovery System followed by	88%-99%*	1. THROX System or	99.9%
			2. Site Scrubber System or	99.4%
			3. 337 Spray Scrubbers	99.4%
	iii. Or 325 Vent recovery System followed by	99.9%	1. THROX System or	99.9%
			2. Site Scrubber System or	99.4%
			3. 337 Venturi Scrubbers	99.4%
* Control efficiency depends on the chlorosilane – 96% for trichlorosilane, 99% for silicon tetrachloride, and 88% for dichlorosilane				

Records review indicate that the vent streams from the equipment were exhausted to the control devices l above. A device to monitor the mass flow rate to the Site Scrubber was installed and operating properly d the inspection.

TESTING/SAMPLING
The current ROP does not contain any specific testing requirements for EU502-07. In April 2013 emission testing on the 304 VENT RECOVERY was conducted for VOCs and lb/hour rate determined for VOC and Benzene.

MONITORING/RECORDKEEPING
The ROP required monitoring and records were reviewed for May 2016, September 2016, and March 2017. flow is metered after the 304 Vent and prior to the Site Scrubber (device 37450).

ROP LIMIT	Bulk Vent mass flow during inspection	Record review highest mass flow	Date	Record review highest t Trichlorosilane & tetrachlorosilane combined emissions	Date
SC II.1 permittee shall not route more than 1,000 pounds of material per hour, based on a one-hour average, from the Bulk Move Vents to the Site Scrubber System	305 lbs/hour	387.7 lbs/hour(	March 1, 2017	NA	NA
SC II.2 permittee shall not route more than 600 pounds of material per hour, based on an annual average, from the Bulk Move Vents to the Site Scrubber System	NA	224.72 lbs/hour	July 2016	NA	NA
SC VI.2 Trichlorosilane & tetrachlorosilane combined 12-month rolling emissions from the Distillation Vents	6.0 tpy	NA	NA	1261 lbs (0.63 ton)	May 2016

Reporting
No excursions, exceedances, or CAM monitor downtime were reported in the CAM semi annual reports.

No deviations were reported in the ROP Annual and Semiannual Deviation reports

NAME [signature] DATE 6/5/2017 SUPERVISOR C. Hare