

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

A403364121

<b>FACILITY:</b> The Dow Chemical Company U.S.A., Midland		<b>SRN / ID:</b> A4033
<b>LOCATION:</b> 1790 Building, MIDLAND		<b>DISTRICT:</b> Bay City
<b>CITY:</b> MIDLAND		<b>COUNTY:</b> MIDLAND
<b>CONTACT:</b> Rebekah Meyerholt , Environmental Specialist		<b>ACTIVITY DATE:</b> 08/15/2022
<b>STAFF:</b> Kathy Brewer	<b>COMPLIANCE STATUS:</b> Compliance	<b>SOURCE CLASS:</b> MEGASITE
<b>SUBJECT:</b> EUC3 on site and records review inspection portion of FCE (2022-2027) DRAFT Report		
<b>RESOLVED COMPLAINTS:</b>		

**EUC3 Dow Chemical A4033 Virtual Pre- Inspection August 1 and August 15, 2022 on site.**

**Dow Chemical contact: Becky Meyerholt**

**EUC3 was permitted by PTI #129-06. The PTI was for the wastewater sludge drying process located in 1005 Building that includes sludge feed tank, filter process, dryer, venturi scrubber, packed tower absorber, and two silos for dried solids storage . The processes were previously permitted in PTI 615-95 to 613-95C series.**

**The process is subject to the requirements of 40 CFR Part 63, Subparts A and DD (National Emission Standards for Hazardous Air Pollutants from off-site Waste Recovery Operations. Dow staff verified that EUC3 is not subject to 40 CFR Part 63 Subparts F, G, H, and I.**

**Dow has also determined that EUC3 is not subject to 40 CFR Part 64 Compliance Assurance Monitoring.**

**In the most recent PTI application Dow claimed the WWTP Primary and Secondary sludge feeds and aerobic digestion process feeds sent to the filter press feed tank are exempt per Rule 285(m). Tertiary ("T-Pond") solids have been sent to the filter process and drier in the past but not for more than 5 years. The T-Pond solids processing is also claimed to be exempt per Rule 285(m).**

**Emissions for 2021 reported to MAERS were**

Pollutant	Amount
VOC	95 Tons
PM10	190 lbs
CO	520 lbs
NOx	2000 lbs
SO2	620 lbs
Ammonia	2 Tons

**The MAERS description of EUC3 is "The wastewater treatment process in the environmental operations plant with treatment ponds and related equipment. Included secondary emissions from the wastewater treatment using TOXCHEM modeling tool. Majority of WWTP operations are grandfathered."**

During the virtual inspection August 1, 2022 the process, solids sampling, control devices and emission calculations were reviewed. During the August 15, 2022 on site visit the WWTP process, solids handling, WWTP solids press, solids dryer, and ROP required emission control and metering devices, vents, and real time process screens were viewed.

At the time of the inspection the facility appeared to be in compliance with the requirements of the EUC3 ROP conditions.

#### Site Records Review

**EU32 Incinerator March 2022, June 2022, and Aug 15, 2022**

- Vent status
- Kiln Temperature
- SCC Temperature

**Venturi scrubber March 2022, June 2022, and Aug 15, 2022**

- gpm liquid flow, meter calibration

**Packed Tower absorber (scrubber) March 2022, June 2022, and Aug 15, 2022**

- gpm liquid flow, meter calibration
- 12 month rolling venting hours

**2<sup>nd</sup> Quarter 2022 1005 Building WWTP pressed solids sampling report**

**October 2021, March 2022, June 2022 emission calculations**

#### AQD File Review

**MAERS emissions**

**ROP Semi annual Deviation reports September 2021, March 2022**

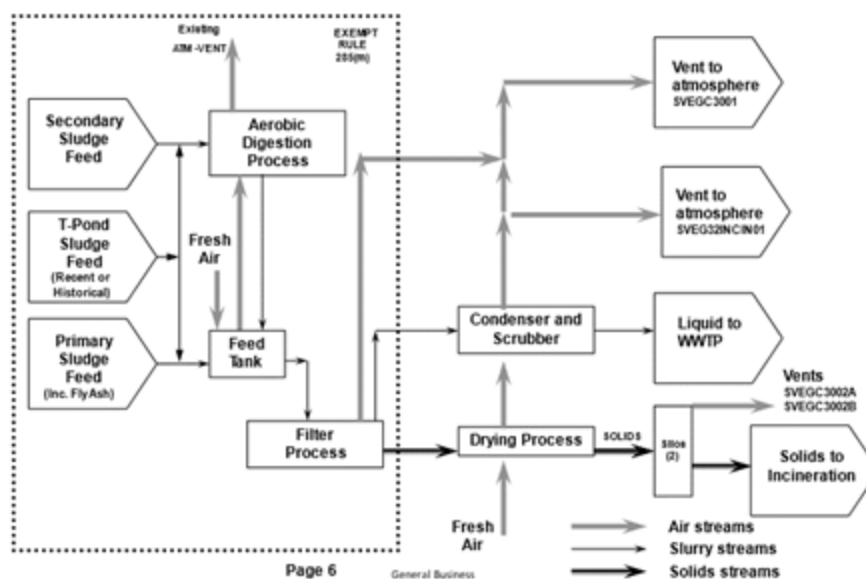
**MACT Reports Subpart OSWRO September 2021, March 2022**

**Permit EVAL forms for PTI 129-06 and 615-95 to 615-95C series**

#### **Description:**

The wastewater treatment plant is utilized to treat wastewater from Dow iPark manufacturing and support activities, stormwater, and groundwater remediation. No sanitary sewage is sent to the on site wastewater treatment system. An aerobic digestion process vents to the atmosphere. Sludge from the wastewater system sludge feed tank is sent to a filter press followed by a belt press prior to drying. The sludge dryer vents to a venturi scrubber and packed tower absorber. Process vents from the dryer, venturi scrubber, and absorber normally vent to vent header 1 that exhausts to EU32INCINERATOR.

The dried solids are transferred to one of two silos prior to incineration in EU32INCINERATOR. Emissions from transfer of dried solids into a silo are vented to one of two fabric filter dust collectors. The transfer of solids from the two silos to the EU32INCINERATOR complex is not part of EUC3.



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### Permit exemption history summary

The WWTP solids handling operations pre belt sludge presses utilize exemption for an air permit in R336.1285(m) for wastewater treatment equipment. The Dow WWTP and WWTP solids handling process has had several PTIs associated with it. A review of PTI application summary information for PTIs 615-95 thru 6195C and 129-06 was done. Portions of the WWTP and solids handling equipment and emission control equipment has changed since 1995.

In 2000 as part of the PTI 615-95A application review AQD staff looked to the AQD Operational Memorandum #6 – Procedure for determining an emission unit and the potential applicability of the 40 CFR Part 61 Subpart E NESHAP for Mercury definition of an emission unit for guidance.

Appendix B of Operational Memorandum #6 includes the following as one of the examples of emission units: “A sewage treatment plant excluding the sewage sludge incinerators or a sludge dryer.”

The 40 CFR Part 61 Subpart E NESHAP for Mercury definition of an emission unit was not applicable because the sludge dryer is a steam jacket vessel, not a heating the sludge to a temperature above 65C directly with combustion gases.

In 2004 PTI 615-95C was issued for EUC3. During the PTI application review AQD District staff wondered whether some of the equipment in the WWTP should have received a PTI Because much equipment had been reconstructed or changed since the original PTI (new hazardous waste incinerator, new sludge drying equipment and solids handling management). In addition to sludge from the Dow WWTP serving site wide process wastewater stream treatment, the facility was sending T-Pond solids to the sludge drying process and the T-Pond solids were known sources of dioxin, furans, and other TACs.

Changes to the WWTP process had also been made. The file information indicates Dow and AQD District staff would address the PTI for reconstructed or new equipment separately.

The PTI 129-06 application defines the EUC3 emission unit as including Rule 201 exempt equipment per Rule R336.1285(m) to include the sludge feed tank and belt press and filtrate tank and defines the “process” as the wastewater sludge drying process.

PTI application related information also indicates that the emissions from the “wet” portion of the sludge handling activities that are claimed as exempt are expected to have low emissions.

After AQD staff review of PTI history and current vent configuration it was determined that the EU32INCINERATOR vent should be added to the Stack/Vent list for EUC3.

**I. EMISSIONS**

Emissions for October 2021, March 2022, and June 2022 were reviewed. Compliance with particulate matter lbs/hour and lbs/1000 lbs gas emissions are based on engineering assumptions.

Parameter	October 2021	March 2022	June 2022
VOC 8 tpy 12 month rolling	1.35 tons	1.36 tons	1.34 tons

The 129-06 PTI added 45 categorical based TAC emission limits for periods when the process is venting to the scrubber. The following TAC emissions were reviewed.

Parameter	October 2021	March 2022	June 2022
Which Cat 1 – 3 w/annual avg time emitted	N/A all emissions sent to kiln	None	None
Which Cat 4-5 w/annual avg time emitted See image 1005 screening level for categories to explain some basis on how we know which chemicals are in which category	N/A all emissions sent to kiln	Bis(2-ethylhexyl)phthalate 0.61 lb/hr	Benzene 0.0003 lb/month
Which Cat 6-7 w/annual avg emitted	N/A all emissions sent to kiln	Chlorobenzene 1.5 lb/hr	Chlorobenzene 0.0003 lb/month

The screening levels for the categorical pollutants are reviewed and updated periodically.

Original Code	Compound	CAS Number	SL (ug/m3)	Basis	IRSL	Method	Max LB Hr	Avg LB Hr	SL limit (peak)	CAS limit (peak lb/hr)	Notes (12/10 review)	Notes (10/18 review)	Review
176	158	1,2-Dibromo-3-chloropropane	96-12-8	0.0001	annual	IRSL	8260	0.04042	0.00253	0.0002	0.0004	MDEQ database	No change
177	140	4-tert-Butylphenol	98-54-4	0.14	annual	ITSL	8270	0.00843	0.00134	1.1	1.1	ITSL calculated from LD50	No change
178	141	Nitrobenzene	98-95-3	9	annual	ITSL	8270	0.0035	0.0004	11.3	0.11	No impact to category	No change
179	141	Nitrobenzene	98-95-3	0.025	annual	IRSL	8270	0.0035	0.0004	0.11	0.11	No impact to category	No change

Emissions reported in MAERS for EUC3 are only reported for the hours that they are exhausted from the Scrubber.

**II. Material limits**

The ROP does not list any specified material limits.

**III. Process/Operational limits**

A MAP was required by the PTI #126-06. The MAP was removed from the ROP at some point. The ROP is in the reissuance process and the MAP requirement is being added back into the ROP as part of the reissuance process.

The process is limited to venting directly from the packed tower scrubber  $\leq 1752$  hours per 12 month rolling time period. Operating records reviewed are summarized below. Example operation screen shots for March 15, June 17, and August 15, 2022, are attached.

Parameter	October 2021	March 15, 2022	June 17, 2022	August 15, 2022
SC III.1.Hours packed tower absorber vent to atmosphere V1500/2500 while solids transfer (1752 limit annually)	0 hrs vented to atm	76 hrs for month, 514 hrs 12 month rolling	3 hrs for month, 515 hrs 12 month rolling	433 hrs 12 month rolling

**IV.Design and Equipment Parameters**

Records reviewed are summarized below. Operation screens for the time periods are attached. When the vent to the EU32 incinerator is open, EUC3 is exhausting to the EU32 incinerator.

Parameter	AI/DO/Identifier	March 15, 2022	June 17, 2022	Aug 15, 2022 instantaneous
EUC3 dryer operating status	W1472_Run	Running	Running	Running
SC III.1.Hours packed tower absorber vent to atmosphere ( 1752 limit annually)	T1431StackYrRollingHrs	514	515	433 (see image title 8_15 1005 hours)
SC IV.1Venturi scrubber flow rate ( 250 gpm min)	FT44626	All >320 gpm	All >320 gpm	All >320 gpm (see image title 8_15 1005 hours)
SC IV.2 Packed tower scrubber flow rate (200 gpm)	FT44602	All >200 gpm	4 short duration drops to just <200 gpm, spike to ~ 250 gpm.Remainer >200 gpm. June 16 start at <100 gpm	All >200 gpm (See image titled 8_15 1005 flows)

SC IV.3 alarm level venturi scrubber (270-250)	T143J1430VenturiFLAlm	Ok (i.e. alarm didn't ring)	Ok (i.e. alarm didn't ring)	Ok (i.e. alarm didn't ring)
SC IV.4 alarm level packed tower scrubber (210-200)	T1431FlowIAlm	Ok (i.e. alarm didn't ring)	Ok (i.e. alarm didn't ring)	Ok (i.e. alarm didn't ring)
EU32 vent valve position	ABV24516	Closed then opened (See image titled 3_15 venting)	Open (See image titled 6_17 venting)	Open (See image titled 8_15 1005 to kiln)
EU32 kiln temp (761 C min)	TT27003_V_Med	Zero to 600 C during a start up. (See image titled 3_15 Kiln temp)	All >760 C for Kiln, >950 C for SCC (See image titled 6_17 Kiln temp)	See image titled 8_15 Kiln temp
EU32 SCC temp (960 C min)	TT27101_V_Med			

#### V. Testing/Sampling

The facility conducts sampling of the 1005 Building pressed solids prior to drying. The second quarter sampling report for samples taken May 25, 2022 was reviewed.

The following methods and protocol were used to determine concentrations of analytes in the pressed solids.

8270C	Semivolatile Organic Compounds (GC/MS)	SW846
8151A	Herbicides (GC)	SW846
9056	Anions, Ion Chromatography	SW846
6020	Metals (ICP/MS)	SW846
7471A	Mercury (CVAA)	SW846
7196A	Chromium, Hexavalent	SW846
9056A	Anions, Ion Chromatography	SW846
Moisture	Percent Moisture	EPA

3050B	Preparation, Metals	SW846
3060A	Alkaline Digestion (Chromium, Hexavalent)	SW846
3540C	Soxhlet Extraction	SW846
5050	Bomb Preparation Method for Solid Waste	SW846
7471A	Preparation, Mercury	SW846
8151A	Extraction (Herbicides)	SW846
DI	Leach Deionized Water Leaching Procedure	ASTM

The current ROP language does not contain the requirement to follow the 1005 Building sludge sampling plan required by PTI 129-06. PTI 129-06 required quarterly testing to determine VOC concentrations of gases leaving the packed tower scrubber per a AQD approved test plan. The requirement will be returned to the Special Conditions for EUC3 as part of the ROP reissuance process.

The 1005 Building sludge sampling plan should be updated to clarify how the analytical results are used for emission calculations when less than the MDL is reported.

**VI. Monitoring/Recordkeeping**

SC VI.1., 2., 3. & 4. Monitoring and recording of liquid flow rates and low flow alarms was done as required. Low flow alarm levels and most recent flow calibration dates are below:

Meter	Low flow alarm level setpoint	Calibration date for meter
SC IV.3 Venturi scrubber flow rate (250 gpm min)	210 gpm	9/29/2021
SC IV.4 Packed tower scrubber flow rate (200 gpm)	270 gpm	9/29/2021

SC VI.7 The facility tracks and records daily hours of discharge directly from the packed tower scrubber to the atmosphere as required by the ROP.

SC VI.8. The facility calculated and recorded 12 month rolling VOC emissions monthly as required by the ROP.

Monthly Data		Stack Sample Data														
Month	Time Venting to Atmosphere (hr)	Total Volume Processed (Mgal)	Average % Solids	Av. Run Rate for reporting month lb/day	Av. Run Rate for reporting month lb/hr	Date of test	Average Volume Processed during test (Mgal)	Average % Solids over test	Av. Run Rate for stack test lb/day	VOC vent rate from latest stack sample lb/hr	VOC vent rate used for calculations	RR <sub>vent</sub>	VOC Emissions (lb per year)	VOC Emissions (Tons per year)	12 - Month Rolling Total (Tons)	hrs Venting to Atmos. Rolling 12month total
April-22	1	0.0	4.68	1	0	2-22-2022	52842		52842		6.2	0.000	0	0.00	1.35	506.00
May-22	14	20.9	5.01	14984	624	2-23-2022	52842		52842		6.2	0.284	25	0.01	1.36	520.00
June-22	3	0.0	4.76	88	4	2-23-2022	52842		52842		6.2	0.002	0	0.00	1.34	515.00

SC VI.9 & 10. The facility monitored and recorded the composition of the solids exiting the belt press, before the solids enter the dryer, at least once per calendar year as required by the ROP.

WWTP solids are sampled quarterly. Emissions in pounds per month are determined by tracking the pounds of WWTP solids dried per month and applying established emission factor. If the WWTP solids analytical report result for a parameter is reported as less than the method detection limit, the facility will use zero for the pollutant concentration.

Other emission generating activities and the associated calculated emissions are added.

SC VI.11. The facility calculated the emission rate of each toxic air contaminant from the portions of the wastewater sludge drying process exhausted through the packed tower absorber monthly, within 30 days of the end of each calendar month as required by the ROP.

#### VII.Stack/Vent Restrictions

After AQD staff review of PTI history and current vent configuration it was determined that the EU32INCINERATOR vent should be added to the Stack/Vent list for EUC3. The PTI#129-06 included EU32INCINERATOR as a control device used 80% or greater of time.

The following vent information was confirmed during the inspection.

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Description
1. SVEGC3001A	18	95	Wet WWTP sludge treatment process vent to atmosphere uncontrolled
2. SVEGC3002A		75	one of two fabric filter dust collectors receiving exhaust from transfer of dried solids into a silo
3. SVEGC3002B		75	one of two fabric filter dust collectors receiving exhaust from transfer of dried solids into a silo
4. SVEG32INCIN01	54 <sup>2</sup>	200 <sup>2</sup>	EU32 Hazardous waste incinerator stack

There is also venting to atmosphere directly from the Aerobic digestion process and feed tank to filter process. The wet filter process vents to atmosphere uncontrolled through SVGC3001.

Annual and Semi Annual Title 5 Deviation report review Sept 2021, March 2022, Sept 2022

No deviations associated with EUC3

OSWRO MACT DD reports Sept 2021, 2022,

No excursions, exceedances, monitoring downtime or leaks associated with EUC3.

The following control device information was provided

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Control	Device ID	Used for MACT DD compliance (yes/no)
EU32INCINERATOR	NA	Not for EU3
Venturi scrubber	J-1430	No
Packed tower scrubber	T-1431	No
Silo V-1500 fabric filter	V-1500	No
Silo V-2500 fabric filter	V-2500	No

In MACT DD reports, Dow assumes EU3 operates 24 hours/day 365 days/year. No CEMS is used for MACT DD so percent operating hours is not used for a monitoring system performance or excess emission standard compliance determination.

MACT DD NOCS states volatile organic HAP reported as being <500 PPMV for off-site material received at wastewater treatment plant.

NAME  DATE 10/17/2022 SUPERVISOR 