

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

A403363537

<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> Vanessa Smith , Environmental Improvement Manager		<b>ACTIVITY DATE:</b> 06/28/2022
<b>STAFF:</b> Kathy Brewer	<b>COMPLIANCE STATUS:</b> Non Compliance	<b>SOURCE CLASS:</b> MEGASITE
<b>SUBJECT:</b> EU82 on site inspection. SC VI.2.a bypass hours exceeded. VN will be sent.		
<b>RESOLVED COMPLAINTS:</b>		

**Dow on site Contact : Vanessa Smith, Jim Alger**

Equipment in the 588 building is used to produce both vinyl benzyl chloride (VBC) and benzocyclobutene (BCB). The EU82 process vessels and material handling vents exhaust to the 963 THROX (see SRN P1027 ROP) or to atmosphere (SV82001 or SV82002). The operations control room is located in the 845 building.

EU82 is subject to the MON (40 CFR Part 63, Subpart FFFF) and to OLD (40 CFR Part 63, Subpart EEEE). By virtue of being subject to Subpart FFFF, this emission unit is also subject to the equipment leak provisions of 40 CFR Part 63, Subpart H.

This emission unit was permitted in PTI 4-04.

MAERS emissions reported for 2021 were 20 lbs VOC.

The inspection included an overview of the process, emission generating activities, vent header valving to stacks, emission controls, stack locations, waste handling, production records, and monitoring for process steps and venting status.

The facility was determined to not be in compliance with limits on bypassing to SV82002 during VBC production in June 2021. A Violation Notice will be sent for exceeding bypass hours.

#### Records reviewed

ROP Semi annual Deviation Reports - Sept 2021, March 2022

MON MACT 588 Semi Annual compliance report - Sept 2021

PTI # 4-04 Air permit application

MAERS 2021 emissions report

July 2021, January 2022, March 2022 (attached)

- VBC and BCB operating records
- SV82002 bypass venting hours
- 963 THROX operating temperatures
- EU82 vent to 963 THROX vent status

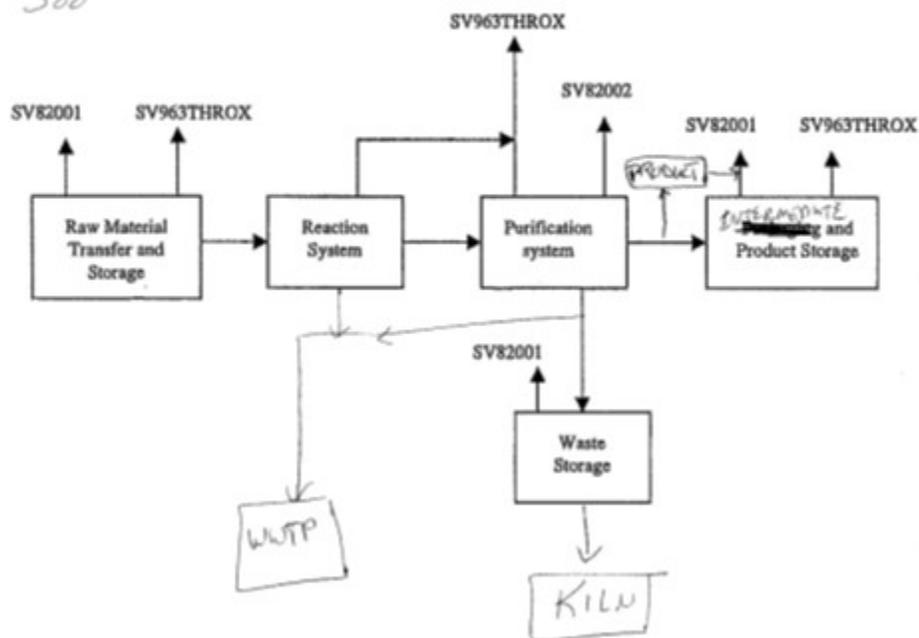
#### Description

The VBC and the BCB process use the same reaction and purification equipment so only VBC or BCB are in production at any time. Raw material is delivered by truck trailer and transferred by high line to tank storage. The continuous process in the 588 building undergoes reaction steps. Reacted material is purified and can be stored as an intermediate in tank storage or becomes final product.

Facility activities that vent to atmosphere through SV82001 include Niederman arms used at tote loading and other stations. The vent to SV82001 is equipped with a blower.

Depending on characteristics, waste material is sent to the on site WWTP or stored in a vessel until sent to the EU32INCINERATOR.

VBC + BCB Process Block Flow Diagram



In the control room in the 845 building, the trailer offloading and vapor recovery system operating and valve status, the process step status, and, the instantaneous readings for valve status of vents to 963 THROX and SVG82002 were viewed.

The purification step is the only process activity that vents to SVG82002. Bypass time venting to the SVG82002 stack is determined by tracking hours process is in the purification step for VBC and for BCB and hours the valve to SVG82002 is open to atmosphere.

The hours that the purification step is venting to SVG82002 (DI\_0329) is subtracted from the total operating hours of the purification step to obtain the emissions vented to 963 THROX from the purification step.

The V-927 surge tank receives venting from EU82 vents and is located after process activity and material handling but prior to the knock out pot before 963 THROX. The site does not have direct access to the 963 THROX operating parameters listed in FG963THOX of DDPs ROP but it can determine if the 963 THROX is receiving the vent from the knock out pot.

### I. EMISSION LIMITS

The ROP does not contain any EU82 specific emission limits. The PTI #4-04 permit application did provide an estimate of emissions including TACs and VOCs. The control factor applied to emissions going to 963 THROX is 0.999.

### II. MATERIAL LIMITS

The facility showed individual month production values and provided the following 12 month values. Records reviewed indicate compliance with the production limits.

Process	production July 2021	production Jan 2022	production Mar 2022
SC II.1. Vinyl Benzly chloride VBC (limit Maximum production of 2,160,000 pounds- 12 month rolling)	301,001 lbs	532, 305 lbs	615,606 lbs
SC II.2. Benzo-cyclobutene BCB (limit Maximum production of 1,200,000 pounds- 12 month rolling)	0 lbs	0 lbs	0 lbs

### III. PROCESS/OPERATIONAL RESTRICTION(S)

The ROP does not contain any EU82 specific process/operational limits.

#### IV. DESIGN/EQUIPMENT PARAMETERS

Records reviewed indicate compliance with the operating conditions when venting to the 963 THROX control device. Records reviewed of bypass hours to SV82002 for July 2021, January 2022, and March 2022 indicate compliance. However, a reported deviation indicated bypass hours were exceeded in June 2021 after a valve was not valve was not closed post maintenance activities. At the time the facility did not appear to maintain a running record that verifies SV82002 vent status during purification step hours and compares to remaining bypass hours for VBC or BCB in the month. The facility stated that programming updates to restrict venting once maximum hours are reached will occur.

The facility provided the following operating information.

Process	AI/DI	July 2021 3 PM -5PM	Jan 2022 6 AM – 8AM	Mar 2022 9 PM -11PM	6/28/2022 status
SC IV.1. 963 THROX temperature	Monitored & provided by SRN P1027 (DDP)	>790 C	>785 C	>780 C	
SC IV.1. Vent valve to 963 THROX open/closed	963 THROX pulling from knock out pot (B171_TD_0186)	open	open	open	open
SC IV.1. VBC operation status	(B171_DC_1000)  (B171_SSTEP_0010)	operating	operating	operating	Not operating
SC VI.1. BCB operation status	(B171_DC_2000)	Not operating	Not operating	Not operating	operating
SC VI. 2. Vent to SV82002	(B1711_DI_0329)	closed	closed	closed	closed

Process	Bypass hours July 2021	Bypass hours Jan 2022	Bypass hours Mar 2022	6/28/2022 status
SC IV.2.a. VBC venting to SV82002  (limit 186/month)	1	0.15	0	Not operating
SC VI.2.b. BCB venting to SV82002  (limit 387/month)	0	0	0	Not venting to bypass, valve closed

The site reviewed the January 2022 bypass hours in more detail to describe what monitoring and recorded values are used to determine the bypass hours. The site tracks the B171\_DC-1000 operating/not operating status of VBC. The B171\_D1\_039 tracks bypass vent valve open/closed. The distillation/purification step is the process activity that can vent to SV82002. It is not clear how the purification/distillation operating hours and the venting to SV82002 times are compared for an ongoing monthly hours venting compliance evaluation.

Review of the ROP Deviation reports found that in June 2021 EU82 exceeded the permit allowed bypass hours to vent SV82002 during VBC production. I have requested that the site provide additional information to clarify how the operators are informed of bypass hours and if alarms alert operators of the need to initiate corrective action as the permitted bypass hours are approached or exceeded for VBC or BCB production runs.

On July 7, 2022 the site confirmed that the VBC distillation step was operating and venting in excess of the allowed 186 hours/month. A Violation Notice will be sent.

#### V. TESTING/SAMPLING

The ROP does not contain any EU82 specific testing or sampling. The emission unit is subject to any MON MACT testing requirements.

#### VI. MONITORING/RECORDKEEPING

Records reviewed indicate compliance with the production record keeping requirements and for tracking hours of 963 THROX bypass.

The facility does not appear to have an ongoing record that verifies SV82002 vent status during purification step hours and compares to remaining bypass hours in the month.

The records reviewed show short periods when the vent from EU82 to 963 THROX is closed. According to Dow the valve to the 963 THROX can periodically close when 963 THROX operations balance their feeds into their burner. The EU82 facility is able to continue running when the valve is periodically closed for short periods of time.

During the on site inspection we viewed the following monitoring in in the field and/or Control room:

Location	PI21/site ID if applicable	Status/reading
Header vent valve to 963 THROX - Process & tanks vent to V-927 surge tank then to 963 THROX	DI_304	Open BCB process operating
Dow knockout pot to 963 THROX (valve V-21001)	(B171_TD_0186)	open
Purification vent to atm (SV82002)	(B171_DI_0329)	closed
Process operating status	(B171_DC_2000)	BCB running, In rxn step, not distilling/purification
SV82001		
Tanks venting to 963 Throx		
Niederman station venting to SV82001 example ( tote loading stations		

Raw material Trailer loading/unloading		
--	--	--

## REPORTING

The facility submitted required ROP and MON MACT Annual and Semi-annual reporting. A review of the Semi annual ROP Deviation report found that between June 18 – 29, 2021 the facility had exceeded the permit allowed 186 hours venting to SV82002 while in VBC production. The facility will provide additional information on corrective actions taken including alerts and production controls to prevent excess venting.

I requested that the site also review the MON MACT requirements to see if it is appropriate to update the NOC for the distillation step of the EU82 activities. The 588 MON MACT Semi-annual compliance report Section B.II states there were no operating limit exceedances.

The 588 MON MACT Semi-annual reports also indicate the MCPU associated with 588 building do not use COMS for compliance purposes. If the 963 THROX temperature is used for MON MACT compliance the site should evaluate if the 963 THROX temperature should be identified as a COMS for the 588 MCPU.

## VII. STACK/VENT RESTRICTION(S)

The following stacks were observed during the inspection and appeared to meet the permit requirements:

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Description
1. SV82001	20	55	Common header to atmosphere
2. SV82002	2	65	Purification step bypass vent
3. SV963THROX	24	80	SRN P1027 FG963THROX stack receiving EU82 process and material handling exhaust

*Kathy Brewer*

NAME \_\_\_\_\_

DATE 7/8/2022

SUPERVISOR

*Chris Lane*

\_\_\_\_\_