EPA United States Environmental Protection Agency

Region 6 - Enforcement & Compliance Assurance Division

INSPECTION REPORT

Inspection Date(s):	02/12/2024	
Media Program:	Air	
Regulatory Program(s)	Title V, NESHAP	
Company Name:	**BASF TotalEnergies Petrochemical, LLC**	
Facility Name:	C4 Olefins Complex; Ethylene/Propylene Cracker and Cogeneration	
Facility Physical Location:	7501 Gulfway Drive	
(city, state, zip code)	Port Arthur, TX 77642	
Mailing address:	PO Box 2506	
(city, state, zip code)	Port Arthur, TX 77643	
County/Parish:	Jefferson	
Facility Phone Number	409-960-5237	
Facility Contact:	Angela Hodgkinson	EHSS Manager
	Angela.hodgkinson@basf.com	
FRS Number:	110006134691	
Identification/Permit Number:	RN100216977; Permits O-2551, O-2639	
Media Identifier Number:	48-245-00182	
NAICS:	325110	

Personnel participating in inspection:		
Sarah Frey	EPA Region 6 ECDAT	Physical Scientist
Colleen McCarthy	EPA Region 6 ECDAT	Life Scientist
Ken McPherson	EPA Region 6 ECDAT	Life Scientist
Ben Rosenthal	EPA Region 6 ECDAT	Physical Scientist
Dan Heins	EPA OECA AED	Environmental Scientist
Phil Myers	EPA NEIC	Mechanical Engineer
Conor Goulding	EPA NEIC	Physical Scientist
Angela Hodgkinson	BASF	EHSS Manager
John Lycan	BASF	VP of Operations
Clint Chambless	BASF	Operations Excellence Leader
Connor Fry	BASF	Operations Compliance Specialist
David Smalley	BASF	Environmental Specialist
Austin Alexander	BASF	Environmental Specialist

EPA Lead Inspector Signature/Date	SARAH FREY Digitally signed by SARAH FREY Date: 2024.04.22 17:39:12 -05'00'	
	Sarah Frey	Date
Supervisor Signature/Date	JAMES LEATHERS Digitally signed by JAMES LEATHERS Date: 2024.04.23 13:07:31 -05'00'	
	James Leathers	Date

Section I – INTRODUCTION

PURPOSE OF THE INSPECTION

EPA inspectors Sarah Frey (Region 6), Colleen McCarthy (Region 6), Ken McPherson (Region 6), Ben Rosenthal (Region 6), and Dan Heins (EPA Office of Enforcement & Compliance Assurance - Air Enforcement Division "AED"), accompanied by Philip Myers and Conor Goulding (National Enforcement Investigations center, "NEIC"), arrived at the BASF TotalEnergies Petrochemical ("BTP" or the "Facility") in Port Arthur, Texas at 8:30 am on February 12, 2024, for an unannounced inspection. We met with John Lycan/Vice President of Operations, Angela Hodgkinson/Environmental Health, Safety, & Security Manager, Austin Alexander/Environmental Specialist, David Smalley/Environmental Specialist, Clint Chambless/Operations Excellence Leader, Connor Fry/Operations Compliance Specialist, Kevin Carl, Wendel Langley, and others. Credentials were presented to Mr. Lycan and Ms. Hodgkinson and we informed them that this was an EPA inspection to evaluate potential sources of excess emissions using EPA's Geospatial Measurement of Air Pollution ("GMAP") vehicle and evaluate compliance with the facility's Title V Air Permit and the Clean Air Act. The scope of the inspection is a partial evaluation ("PCE"). This inspection occurred as part of a multi-scale monitoring project in the Beaumont-Port Arthur area. Videos taken during the inspection can be found in Appendix 1. The sign-in sheet for the opening conference is attached as Appendix 2.

FACILITY DESCRIPTION

BTP is a petrochemical manufacturing facility that began operations in 2001 and operates under multiple permits. The Ethylene/Propylene Cracker and Cogeneration units operate under Permit Number O-2551 expiring July 25, 2024. The C4 Olefins Complex operates under Permit Number O-2629 expiring June 22, 2027.

The Facility has around 280 employees and 200 contractors on site. The Facility produces ethylene, propylene, benzene, toluene, and other chemicals which are exported via pipeline or transferred to TotalEnergies Port Arthur Refinery. Butane/butene, heavy and light naptha, ethane, and propane are received via hard piping.

The C4 Olefins complex is controlled by the High-Pressure Flare (EPN P-7) and the Low-Pressure Flare (EPN P-6). The Ethylene/Propylene Cracker and Cogeneration units are controlled by a thermal oxidizer (EPN N-19), backup carbon absorption system (EPN N-22), enclosed flare (EPN N-15A), and a backup ground flare (EPN N-15).

The Facility experienced a fire on September 5, 2023, in the pyrolysis gasoline unit resulting in the collapse of a distillation tower. This event is not the primary focus of this inspection.

Section II - OBSERVATIONS

GMAP Survey

The GMAP team began their survey at 9:50 am. The NEIC GMAP was driven by Mr. Goulding and the instruments were operated by Mr. Myers. Facility representatives, Mr. Chambless and Mr. Fry, escorted the GMAP. Inspectors Mr. Heins, Mr. Rosenthal, and Mr. McPherson followed the GMAP in a secondary vehicle. The GMAP drove on all available facility roads measuring air pollutant concentrations downwind

of each of the process areas, if possible. A full report from the GMAP will be issued by NEIC at a later date.

Around 10:45 am the GMAP detected elevated VOCs near Vent Stack Analyzer House 6. Concentrations as high as 1,800 parts per billion ("ppb") volatile organic compounds ("VOC") and 15 ppb benzene were observed. Emissions were observed from a vent using an optical gas imaging camera (Video 1). [AOC 1] Mr. Myers collected an air canister sample at 11:00 am (Air Canister 3114) to be analyzed using ASTM Method D7833 and EPA Method TO-15A. The results of the sampling will be reported by NEIC.

Around noon the GMAP detected elevated VOCs, up to 75 ppb coming from the direction of TotalEnergies Port Arthur Refinery's tank 454.

The site GMAP survey ended at 1:30 pm and the team returned to the conference room.

Region 6 Simultaneous Inspection

At 8:30 am on February 12, 2024, EPA Region 6 inspectors Sarah Frey ("I") and Colleen McCarthy conducted a simultaneous inspection. Mr. Lycan described the plant processes and operations. Ms. Hodgkinson and Mr. Smalley provided documents requested for review.

We discussed operations of the thermal oxidizer and flares, reportable events, leak detection and repair ("LDAR"), carbon absorption systems, and cooling towers.

The thermal oxidizer was installed in the early 2000s and temperature is monitored. The flares are equipped with flow meters and BTU analyzers. Smoke is monitored from the control room and steam flow is controlled manually.

Leak Detection and Repair

We discussed the LDAR program. All visual inspections and Method 21 monitoring are conducted by a third-party, Think Environmental. I inquired about the typical leak rate for components in benzene and toluene service, and Mr. Smalley estimated 0.25%. The pyrolysis gasoline ("Pygas") unit is currently eligible for skip period monitoring for valves, connectors, and flanges and are monitored annually. I reviewed 2023 LDAR reports, and the unit with the highest leak rate was the Olefins Conversion Unit (1.6%).

Cooling Tower Monitoring

We discussed the cooling towers. Per Ms. Hodgkinson, monitoring is conducted monthly using the modified El Paso Method. Leaks are infrequent and she could not recall when the most recent leak occurred. We requested the December 2023 cooling tower monitoring reports.

Carbon Absorption System

The facility is required to use a carbon absorption system ("CAS") when the thermal oxidizer is not operating. The CAS consists of two trains with two 20,000 lbs activated carbon canisters in series. New Source Review ("NSR") Permit 36644 Specific Condition 19 states that the canisters shall be monitored for breakthrough every 8 hours when in use. The instrument is required to be calibrated daily with gas mixtures of less than 1 and 37 parts per million by volume ("ppmv"). Breakthrough is defined as 37

ppmv VOC between the primary and secondary canisters. The permit requires that the flow shall be switched to the other train within 24 hours of detecting breakthrough and replacement of the saturated canister shall be "initiated at once." The intent of the CAS is to prevent the release of VOCs to the atmosphere when the primary control device is experiencing an outage. Canister monitoring log sheets from 2023 were reviewed.

On January 5, 2023, the CAS was used from 0819 to 1415. The initial reading was taken at the North Train at 0825 and breakthrough was detected at 49.3 ppmv, six minutes into usage. No monitoring was conducted at the outlet of the secondary canister. The train was switched to the South Train at 1415, when the vent stream was rerouted to the thermal oxidizer. [AOC 2]

On January 26, 2023, the CAS was used from 0729 to 0720 on January 27, 2023. The initial reading was taken at the South Train at 0810 and breakthrough was detected at 199 ppmv, 41 minutes into usage. No monitoring was conducted at the outlet of the secondary canister. No additional monitoring was conducted at the outlet of the primary canister, in 8-hour intervals. The train was switched to the North Train at 0720 on January 27, when the vent stream was rerouted to the thermal oxidizer. [AOC 2]

On April 19, 2023, the CAS was used from 0245 to 0307 on April 20, 2023. The initial reading was taken at the North Train at 0440 and breakthrough was detected at 18,241 ppmv, 115 minutes into usage. No monitoring was conducted at the outlet of the secondary canister. No additional monitoring was conducted at the outlet of the primary canister, in 8-hour intervals. The train was switched to the South Train at 0240 on April 20 and the flow was rerouted to the thermal oxidizer at 0307. No monitoring was conducted after the train was switched to the South Train. [AOC 2]

Ms. McCarthy requested the calibration records for the flame ionization detector used on April 19, 2023. Records show that the instrument was calibrated with 500 and 10,000 ppm gas mixtures instead of the required 1 and 37 ppm. [AOC 3].

The facility operated the CAS from September 5 to October 28, 2023, due to the thermal oxidizer and Pygas unit being offline after an incident. Per Mr. Smalley, the CAS was not accessible due to the incident until September 9, 2023, and no records were available for September 6, 7, or 8. The CAS was monitored three times a day (every 8 hours) from September 9 to September 24. The record for September 17, 2023 was missing a signature for the box labeled "Verification of SAP Notification-written to change spent Train." Beginning on September 25, the CAS was monitored one time per day. According to Mr. Smalley, monitoring was reduced because the Pygas unit was down, and all vent streams were "blocked in."

Facility Tour

At 11:35 am, Mr. Smalley and Mr. Alexander escorted Ms. McCarthy and I on a facility tour. I operated a NEO photoionization detector ("PID") and Ms. McCarthy operated a FLIR GF320 optical gas imaging camera ("FLIR"). We observed the ground flare and enclosed flare from a distance. We walked to the thermal oxidizer and observed the carbon canisters. No emissions were detected with the PID or FLIR.

We walked through the Pygas unit and observed some LDAR leak tags. Component 2918N was discovered to be leaking on November 6, 2023, and a first attempt of repair was conducted on November 8, 2023 with a resulting measurement of 44.7 ppm, according to the tag. We detected up to 5 ppm at the component with the PID.

Near FZV 55008, the PID detected VOC up to 25 ppm. No emissions were observed with the FLIR. We could not identify the source of the VOC, but noted we were near components N2118, N2123, and N2122. We requested the LDAR records for these components.

We discovered a delay of repair tag for component 16547 on the ground, dated June 17, 2023. We requested the LDAR records for the component.

We observed spherical tanks and Tank 9811which is required to be cooled to 29 degrees Fahrenheit. No emissions were observed with the FLIR or detected with the PID.

In the C4 unit, we observed component 35428.4 with a leak tag dated August 21, 2023 (16,152 ppm). First attempt of repair was conducted August 22, 2023 (2,830 ppm). It is unclear if the component was repaired or on delay of repair. We did not detect emissions from the component and requested the LDAR records.

We observed the high-pressure ("HP") and low-pressure ("LP") flares and observed uncombusted hydrocarbons were with the FLIR (Videos 2 and 3). We observed excess steam at the LP flare. According to Mr. Smalley, the LP flare only controls vapors from Tank 9811, and experiences little to no waste gas flow. The HP flare controls vapors from the C4 unit. Due to the excess steam from the LP flare, we could not visibly see the flame. [AOC 4]

We walked through the Cold Unit and observed component 27204 with a delay of repair tag dated December 16, 2021. It appeared to have routine monitoring and the most recent monitoring detected "<10ppm" in January 2024. We did not detect emissions. Mr. Smalley believed the component was isolated. We requested the LDAR records for the component.

We returned to the conference room at 1:05 pm.

Section III – AREAS OF CONCERN

EPA inspectors conducted a closing conference at BASF TotalEnergies Petrochemical at 1:35 pm on February 12, 2024, for the inspection. Mr. Myers and Dr. Frey summarized the facility tour and presented their emissions observations, including the following Areas of Concern. The facility made no claims of confidential business information regarding the videos and documents provided. The Facility was informed that copies of the videos would be made available to them following the inspection. We departed the facility at 2:50 pm.

1) The GMAP measured elevated concentrations of VOC and benzene near Analyzer House 6. Inspectors observed emissions with the FLIR camera. It is unclear if this is a permitted emission point.

2) Inspectors observed multiple instances of rapid breakthrough at the carbon absorption system (EPN N-22) and a consistent practice of not switching CAS trains until the thermal oxidizer is ready to return to service. This practice appears to be resulting in breakthrough of the secondary canister. NSR Permit 36644 Special Condition 19.C does allow 24 hours to switch CAS trains, however the actions taken by the facility may not be following the intent of the requirement to prevent emissions from being released to the atmosphere. NSR Permit 36644 Specific Condition 56 provides requirements for using a CAS for planned MSS activities. It states, "[i]f the VOC concentration on the initial sample downstream of the

first carbon canister following a new polishing canister being put in place is greater than 100 ppmv above background, it shall be assumed that breakthrough occurred while that canister functioned as the final polishing canister and a permit deviation shall be recorded." This assumption could also be applied to EPN N-22.

3) Inspectors observed calibration records from April 19, 2023, that indicate that incorrect concentrations may have been used. A calibration record showed the instrument used for monitoring was calibrated at 500 and 10,000 ppm. NSR Permit 36644 Special Condition 19.B requires:

"The method of VOC sampling and analysis shall be done by Photo-Ionization Detector (PID), Flame Ionization Detector (FID), or a TCEQ approved equivalent. On each day that sampling is required; the instrument shall be calibrated prior to sampling with a certified gas mixture at less than 1 part per million (ppm) ±10 percent and 37 ppmv ±10 percent."

4) Inspectors observed excess steam and uncombusted hydrocarbons at the HP and LP flares. This indicates that the flares may be operating with poor destruction efficiency resulting in excess emissions. 40 C.F.R. 60.11(d) and 63.6(e)(1)(i) requires air pollution control equipment to be operated in a manner consistent with good air pollution control practices for minimizing emissions. NSR Permit 41945 Special Condition 11.A requires the flares to operate with no less than 99% efficiency in disposing of ethylene and propylene and no less than 98% efficiency in disposing of carbon compounds.

Section IV – FOLLOW UP

The following information was received by EPA on after exiting the Facility on February 12, 2024:

- Delay of Repair Records
- Tank Listing
- December 2023 El Paso Monitoring Records
- 2023 Benzene Waste Organic NESHAP Report
- 2023 LDAR Leak Rates and component records
- 2023 Shutdown Dates
- Flaring monitoring records
- 2023 Closed Vent System inspection records

Section V – LIST OF APPENDICES

Appendix 1 –Video Log – 3 FLIR videos taken 2/12/2024
Appendix 2 – Opening conference sign-in sheet

Appendix 1
Video Log

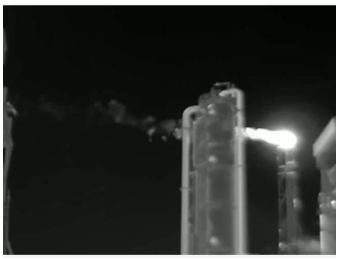
Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Video Log

Location: BASF TotalEnergies Petrochemical – Port Arthur Facility		
City: Port Arthur	Jefferson County	State: Texas

Video 1
Video File Name: FLIR0030.mp4
Date of Video: 02/12/2024
Time of Video: 10:45
Videographer: Ben Rosenthal
Description: Emissions observed from vent at Analyzer House 6.



Video 2
Video File Name: MOV_0373.mp4
Date of Video: 02/12/2024
Time of Video: 12:30
Videographer: Colleen McCarthy
Description: Trailing emissions observed from flares.

Video 3
Video File Name: MOV_0375.mp4
Date of Video: 02/12/2024
Time of Video: 12:50
Videographer: Colleen McCarthy
Description: Excess steam and trailing emissions observed from flares.

Appendix 2
Opening Conference Sign-in Sheet

Inspection Notes:

08:30 Entry into BASF TOTAL ENERGIES PETROCHEMICALS
09:37 Opening Conference
Kenneth R. McPherson, Life Scientist, EPA R6 mcpherson.kenneth@epa.gov
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Sarah Frey EPA Region 6, inspector Frey.sarah@epa.gov
CLINT CHAMBLESS BASF TOTAL ENTERGIES Clinton.chambless@basf.com
10:16 - START GMAP Tour
Connor Fry BASF connor.fry@Basf.com

Initials / Date: KRM 10/2/12/2024