EPA United States Environmental Protection Agency

Region 6 - Compliance Assurance and Enforcement Division

INSPECTION REPORT

Inspection Date(s):	05/19/2025 to 05/23/2025	
Media Program:	Air	
Regulatory Program(s)	Consent Decree, Civil Action 07-CV-00248-MAC	
Company Name:	TotalEnergies Petrochemicals and Refining USA, Inc.	
Facility Name:	Port Arthur Refinery	
Facility Physical Location:	7600 32nd Street	
(city, state, zip code)	Port Arthur, TX 77642-7901	
Mailing address:	P.O. Box 849	
(city, state, zip code)	Port Arthur, TX 77641-0849	
County/Parish:	Jefferson County	
Facility Phone Number	(409) 963-6800	
Facility Contact:	Sam Breaux	Environmental Superintendent
	Sam.breaux@totalenergies.com	
FRS Number:	110000755200	
Identification/Permit Number:	RN102457520, NSR 46396, PSDTX1073M3 and N044, FOP O1267	
Media Identifier Number:	ICIS-Air TX0000004824500037	
NAICS:	324110	
SIC:	2911	

Personnel participating in inspection:

Prince Nfodzo	US EPA R6 ECDAR	Environmental Engineer
Kim Nguyen	US EPA R6 ECDAR	Environmental Scientist
Nicolas Studebaker	US EPA R6 ECDAR	Physical Scientist
Sam Breaux	TotalEnergies Port Arthur Refinery	Environmental Superintendent
Isaac Bankole	TotalEnergies Port Arthur Refinery	Industrial Performance
Amanda Trammel	TotalEnergies Port Arthur Refinery	Environmental Specialist
Kristopher Beard	TotalEnergies Port Arthur Refinery	Environmental Engineering Advisor
Anthony McLaughlin	TotalEnergies Port Arthur Refinery	Environmental Specialist

EPA Lead Inspector Signature/Date	Nfodzo, Prince — Digitally signed by Nfodzo, Prince Date: 2025.06.27 12:00:22 -05'00'	
	Prince Nfodzo	Date
Supervisor Signature/Date	KAYLA BUCHANAN — Digitally signed by KAYLA BUCHANAN Date: 2025.06.27 13:35:19 -05'00'	
	Kayla Buchanan	Date

Section I – INTRODUCTION

PURPOSE OF THE INSPECTION

EPA Region 6 inspectors Kim Nguyen, Nicolas Studebaker, and I (Prince Nfodzo) arrived at TotalEnergies Petrochemicals and Refining USA, Inc. ("TotalEnergies"), formerly TOTAL Petrochemicals USA, Inc ("TOTAL"), Port Arthur Refinery ("PAR") at 2:20 pm on May 19, 2025, for an announced inspection. We conducted a fenceline survey and did not observe anything of concern. We met with TotalEnergies PAR representatives at 2:45 pm for an opening conference. I presented my credentials to Ms. Connie Howard, Environmental Engineering Advisor, and informed the representatives that this was an EPA inspection to evaluate compliance with the facility's federally issued consent decree (Civil Action Number 07-CV-00248-MAC). The attendees sign-in sheet for the opening conference is included as **Appendix 3.**

The scope of the inspection is a partial compliance evaluation (PCE) focused on the four marquee issues addressed by the consent decree: (i) emissions control at the Fluidized Catalytic Cracking Unit (FCCU), Heaters, and Boilers; (ii) emissions control at Sulfur Recovery Plants (SRPs) and flaring; (iii) Benzene Waste Operations NESHAP (BWON) program enhancements; and (iv) Leak Detection and Repair (LDAR) program enhancements. The consent decree addresses the requirements of nitrogen oxides (NOx), sulfur dioxide (SO_2), carbon monoxide (CO), particulate matter (PM), volatile organic compounds (VOCs), and benzene emission reductions through various construction projects, process additives, and process and/or program enhancements.

FACILITY DESCRIPTION

The TotalEnergies Port Arthur Refinery is an integrated petroleum refinery with associated petrochemical operations and a crude processing capacity of 238,000 barrels per day. Crude oil is delivered to the refinery to be processed and refined into various petrochemical products such as gasoline, diesel, jet fuel, heating oils, and aromatics. Crude oil arrives via pipeline and marine vessel. The crude is split into various petroleum fractions via distillation. Products leave the facility by pipeline, railcar, trucks, and maritime shipping. A plant wide process flow diagram, and written facility description are included as **Appendix 4**.

Section II – OBSERVATIONS

TotalEnergies operates a mobile continuous emissions monitoring system ("CEMS") trailer that has all the calibration gases used to conduct quarterly cylinder gas audits ("CGAs"). We verified that the certifications and concentrations of the gases were current and accurate. Photographs of the CEMS trailer are included as **Photo Nos. 3 and 4** in **Appendix 1**.

Part V. New Source Review/Prevention of Significant Deterioration (NSR/PSD)

A. Control of NOx Emissions Reduction from FCCU

Program Summary: *TOTAL shall limit NOx emissions from any FCCU to 30 ppmvd or less on a 365- day rolling average basis and 60 ppmvd or less on a 7-day rolling average basis, each at 0% Oxygen (O_2). TOTAL shall use a NOx CEMS to monitor the performance of any FCCU and to report compliance with the terms and conditions of the consent decree.*

TotalEnergies complies with the NOx emissions limits mainly by adjusting temperature and oxygen levels and occasionally using low-NOx combustion promoters. TotalEnergies fully incorporated the NOx emission limits in permit 46396, PSDTX1073M3 and N044 issued April 4, 2024. We observed that TotalEnergies installed and is operating NOx and O_2 CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and current. Photographs of the outlet and inlet CEMS analyzers are included as **Photo Nos. 1 and 2** respectively, in **Appendix 1**.

The trends for the FCCU NOx emission limits from May 1, 2024 – April 30, 2025 is included as **Appendix 5**. There was no exceedance of the 7-day rolling average limit, however TotalEnergies exceeded the 365-day rolling average limit throughout the entire period [see ***Area of Concern*** ("***AOC***") ***#1***].

I noted that TotalEnergies did not conduct quarterly CEMS audits in accordance with the applicable requirements for the period January 2018 - December 2024 (see ***AOC #2***).

B. Control of SO_2 Emissions from FCCU

Program Summary: *TOTAL shall limit SO_2 emissions from any FCCU at the refinery to 25 ppmvd on a 365-day rolling average and 50 ppm on a 7-day rolling average, each at 0% O_2. TOTAL shall use a SO_2 CEMS to monitor the performance of any FCCU and to report compliance with the terms and conditions of the consent decree.*

TotalEnergies installed and operates a wet gas scrubber to comply with the SO_2 emissions limits. TotalEnergies fully incorporated the SO_2 emission limits in permit 46396, PSDTX1073M3 and N044 issued April 4, 2024. We observed that TotalEnergies installed and is operating SO_2 and O_2 CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and current. Photographs of the outlet and inlet CEMS analyzers are included as **Photo Nos. 1 and 2** respectively, in **Appendix 1**.

The trends for the FCCU SO_2 emission limits from May 1, 2024 – April 30, 2025 is included as **Appendix 5**. There was no exceedance of the limits during the period.

I noted that TotalEnergies did not conduct quarterly CEMS audits in accordance with the applicable requirements for the period January 2018 - December 2024 (see **AOC #2**).

C. Control of PM Emissions from FCCU

Program Summary: *TOTAL shall limit PM emissions from any FCCU at the refinery to 0.5 pounds or less per 1000 pounds of coke burned on a 3-hour average basis.*

TotalEnergies has fully incorporated the PM emission limit in permit 46396, PSDTX1073M3 and N044 issued April 4, 2024, and conducts performance tests to demonstrate compliance with the PM emission limit. The PM emission limit was not exceeded during performance tests conducted on March 20, 2024, and May 8, 2024.

D. Control of CO Emissions from FCCU

Program Summary: *TOTAL shall limit CO emissions from any FCCU at the refinery to 500 ppmvd or less on a 1-hour average basis and 100 ppmvd or less on a 365-day rolling average basis. TOTAL shall use a CO CEMS to monitor the performance of any FCCU and to report compliance with the terms and conditions of the consent decree.*

TotalEnergies complies with the CO emissions limits mainly by adjusting temperature and oxygen levels. TotalEnergies fully incorporated the CO emission limits in permit 46396, PSDTX1073M3 and N044 issued April 4, 2024. We observed that TotalEnergies installed and is operating CO and O_2 CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and current. Photographs of the outlet and inlet CEMS analyzers are included as **Photo Nos. 1 and 2,** respectively, in **Appendix 1**.

The trends for the FCCU CO emission limits from May 1, 2024 – April 30, 2025, is included as **Appendix 5**. There was no exceedance of the CO limits during the period.

I noted that TotalEnergies did not conduct quarterly CEMS audits in accordance with the applicable requirements for the period of January 2018 - December 2024 (see ***AOC #2***).

E. NSPS Subparts A and J Applicability to FCCU Regenerator

Program Summary: *Any FCCU Catalyst Regenerator at the refinery shall be an "affected facility" as the term is used in 40 C.F.R. Part 60, Subparts A and J, and therefore subject to, and required to comply with, the requirements of 40 C.F.R. Part 60, Subparts A and J, for each relevant pollutant. TOTAL shall continuously monitor and record (1) the pressure drop across the wet gas scrubber, and (2) the scrubber liquid to gas ratio.*

TotalEnergies fully incorporated the FCCU NSPS A and J requirements for SO_2, CO, PM and Opacity emission limits in Federal Operating Permit O1267 issued August 13, 2010. In lieu of continuous opacity monitoring, TotalEnergies obtained an alternative monitoring plan that monitors the pressure drop across the wet gas scrubber (ΔP) and the liquid to gas (L/G) ratio. TotalEnergies incorporated this requirement in permit 46396, PSDTX1073M3 and N044 issued April 4, 2024.

The trends for the ΔP and L/G ratio limits from May 1, 2024 – April 30, 2025, is included as **Appendix 5**. TotalEnergies did not meet the minimum limits for both ΔP and the L/G ratio multiple times during the period (see ***AOC #1***).

F. Control of NOx Emissions from Heaters and Boilers

Program Summary: *TOTAL shall install NOx control technology on or otherwise limit NOx emissions from the covered Heaters and Boilers as listed in Appendix A of the consent decree such that, the refinery-wide weighted-average NOx emission is no greater than 0.040 lbs.-NOx/mmBtu. TOTAL shall monitor each covered Heater or Boiler as follows: (i) For a Covered Heater or Boiler with a Heat Input Capacity greater than 100 MMBTU/hr (HHV), TOTAL shall install or continue to operate a CEMS for NOx; (ii) For a Covered Heater or Boiler with a Heat Input Capacity of less than or equal to 100 MMBTU/hr (HHV), TOTAL shall conduct an initial performance test and any periodic tests that may be required by EPA or by the applicable State or local permitting authority under the applicable regulatory authority.*

TotalEnergies complies with the emission reduction from Heaters and Boilers at the refinery by limiting NOx emissions on some units. The final update for covered Heaters and Boilers is included as **Appendix 6**. TotalEnergies has not included the limits for some of the covered heaters in permit 46396, PSDTX1073M3 and N044 issued April 4, 2024 (see **AOC #3**). TotalEnergies also used inaccurate NOx limits in excess emissions reporting (see **AOC #4**). We observed that TotalEnergies installed NOx converter on the Heater and Boiler CEMS analyzers to convert NOx to NO, and is operating NO and O_2 CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and current. Photographs of some of the CEMS analyzers are included as **Photo Nos. 5, 6, and 8** in **Appendix 1**.

The trends for the Heater and Boilers NOx emission limits from May 1, 2024 – April 30, 2025, are included as **Appendix 7**. All the heaters exceeded the annual NOx lb/mmBtu limit multiple times during the period (see **AOC #1**).

I noted that TotalEnergies did not conduct quarterly CEMS audits in accordance with the applicable requirements for the period January 2018 - December 2024 (see **AOC #2**).

G. Control of SO_2 emissions from Heaters and Boilers

Program Summary: *All heaters and boilers at the Refinery shall be "affected facilities," as that term is used in 40 C.F.R. Part 60, Subparts A and J, and therefore subject to, and required to comply with 40 C.F.R. Part 60, Subparts A and J for fuel combustion devices. TOTAL shall not burn Fuel Oil in any combustion unit at the Refinery.*

TotalEnergies is required to comply with H_2S concentration limit of 162 ppmv on a 3-hour rolling average basis for fuel gas combusted in heaters and boilers. TotalEnergies incorporated the fuel gas H_2S concentration limit in permit 46396, PSDTX1073M3 and N044 issued April 4, 2024, but the requirement that TotalEnergies will not burn fuel oil in any combustion device is not incorporated in the permit (see **AOC #3**).

TotalEnergies monitors the refinery fuel gas at two locations identified as V106A and V106. We observed that TotalEnergies has installed and is operating the H_2S CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and current. Photographs of representative CEMS analyzers are included as **Photo Nos. 5, 6, and 8** in **Appendix 1**.

The trends for the refinery fuel gas H_2S concentration limit on a 3-hour rolling average basis from May 1, 2024 – April 30, 2025, for V106A is included as **Appendix 8**. TotalEnergies exceeded the 3-hour rolling average concentration limit of 162 ppmv once during the period.

I noted that TotalEnergies did not conduct quarterly CEMS audits in accordance with the applicable requirements for the period of January 2018 - December 2024 (see **AOC #2**).

Part VI. New Source Performance Standards (NSPS) and Flaring

A. NSPS Applicability to Sulfur Recovery Plants

Program Summary: *All Sulfur Recovery Plants at the refinery shall be "affected facilities," as that term is used in 40 C.F.R. Part 60, Subparts A and J. All Sulfur Recovery Plants at the Refinery shall be subject to, and required to comply with, the requirements of 40 C.F.R. Part 60, Subparts A and J. TOTAL shall monitor emissions from each SRP with CEMS at each emission point, unless an SO_2 alternative monitoring procedure has been approved by EPA, per 40 C.F.R. § 60.13(i), for any of the emission points. TOTAL shall continue to route, or will route, all sulfur pit emissions at the Refinery so that they are eliminated, controlled, or included and monitored as part of a SRP's emissions subject to the NSPS Subpart J limit for SO_2 at 40 C.F.R. § 60.104(a)(2).*

TotalEnergies's Port Arthur refinery operates four sulfur recovery plants identified as SRU #1, SRU #3 SRU #4, and SRU #5. SRUs #1 and #3 share a common tail gas treatment unit and thermal oxidizer. TotalEnergies incorporated the requirements to comply with SO_2 emission limits, and the control of sulfur pit emissions in permit 46396, PSDTX1073M3 and N044 issued April 4, 2024. We observed that TotalEnergies installed and is operating the SO_2 CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and current. We also observed that sulfur pit emissions were routed to the tail gas treatment units. Photographs of representative CEMS analyzers are included as **Photo Nos. 11, and 12** in **Appendix 1**.

The trends for the sulfur recovery plant SO_2 emission limits on a 12-hour rolling average basis from May 1, 2024 – April 30, 2025, are included as **Appendix 9**. TotalEnergies exceeded the 12-hour rolling average emission limit of 250 ppm multiple times at SRUs #1, #3, and #4, and once at SRU #5 during the period (see **AOC #1**). We viewed the tail gas treatment units with an optical gas imaging (OGI) camera, and observed hydrocarbon emissions from the SRU #5 thermal oxidizer (see **Video FLIR0301 in Appendix 2, AOC #5**)

I noted that TotalEnergies did not conduct quarterly CEMS audits in accordance with the applicable requirements for the period of January 2018 - December 2024 (see **AOC #2**).

F. NSPS Applicability to Flaring Devices

Program Summary: *Each Flaring Device shall be an "affected facility," as that term is used in 40 C.F.R. Part 60, Subparts A and J, and therefore subject to, and required to comply with, the requirements of 40 C.F.R. Part 60, Subparts A and J, for fuel gas combustion devices.*

TotalEnergies operates four flares at the Port Arthur refinery identified as North, South, East and Middle flares, and is complying with H_2S concentration limit of 162 ppmv on a 3-hour rolling average basis for fuel gas combusted in the flares. We observed that TotalEnergies has installed and is operating H_2S CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and current.

We did not observe visible emissions from any of the flares during the inspection; however, we observed hydrocarbon emissions from the flares with optical gas imaging (OGI) camera (see **Video FLIR0288, FLIR0296,** and **FLIR0297** in **Appendix 2**, **AOC #5**). I reviewed flaring incidents and noted that there was an increasing trend in the number of occurrences per year (see **AOC #6**)

I noted that TotalEnergies did not conduct quarterly CEMS audits in accordance with the applicable requirements for the period January 2018 - December 2024 (see **AOC #2**).

J. Flare Gas Recovery Systems

Program Summary: *To the extent that TOTAL currently operates or will operate a flare gas recovery system, TOTAL will take all reasonable measures to minimize emissions while periodic maintenance is being performed.*

TotalEnergies operates two interconnected flare gas recovery systems (FGRS) to control continuous or routine combustion in the flaring devices (FGR1 and FGR2). At the time of the inspection, one of the three compressors on FGR1 was out of service and sent out for repairs. We viewed the units with an OGI camera and did not observe any significant trailing hydrocarbon emissions.

Part VII. Benzene Waste Operations NESHAP ("BWON") Program Enhancements

Program Summary: *TOTAL shall comply with the compliance option set forth at 40 C.F.R. § 61.342(e) ("6 BQ Compliance Option"), along with all other applicable requirements of 40 C.F.R. Part 61, Subpart FF ("Benzene Waste Operations NESHAP" or "Subpart FF"). TOTAL shall continue to operate dual carbon canisters, in series, at all locations within the refinery where a carbon canister(s) is used as a control device under Subpart FF. TOTAL shall conduct audits of all laboratories that perform analyses of TOTAL's Subpart FF samples to ensure that proper analytical and quality assurance/quality control procedures are followed for such samples. TOTAL shall develop and begin implementation of annual training for all employees asked to draw benzene waste samples for Subpart FF compliance.*

TotalEnergies is complying with the 6 BQ compliance option and operates dual carbon canisters in series as a control device. A written description of the BWON sampling plan and simplified process diagram are included as **Appendix 10**.

I reviewed carbon canister monitoring records for May 1, 2024 - April 30, 2025, and noted that TotalEnergies monitored for breakthrough and replaced carbon canisters as required. TotalEnergies operates 18 tanks in BWON service that hold recovered oil, process water, storm water, slop oil and sour water. We viewed the tanks and drain system with an OGI camera and did not observe hydrocarbon emissions. We noted one instance of a drainpipe wrapped with an ice bag, shown as **Photo No. 15** in **Appendix 1** (see **AOC #7**). We observed employees conduct sampling at the Process Water Treating Complex (PWTC) laboratory sampling point. Photographs of the employee's field records and chain of custody are included as **Photo Nos. 18, and 19** in **Appendix 1**. I reviewed records of audits conducted at laboratories that perform BWON sample analyses, and noted that TotalEnergies conducted audits of the Eurofins Xenco laboratory biennially as required by the consent decree in 2018, 2020, 2021, and 2023. I reviewed annual training records of employees that draw benzene samples from 2018 - 2024, and noted lapses in the employee training (see **AOC #8**).

VIII. Leak Detection and Repair ("LDAR") Program

Program Summary: *TOTAL shall implement measures to enhance the refinery's LDAR program under 40 CFR Subpart GGG, Part 61 Subparts J and V and Part 63 Subparts F, H and CC. TOTAL shall develop a written description of a Refinery-wide program designed to achieve and maintain compliance with all applicable federal and state LDAR regulations, as well as all requirements imposed by this Part. TOTAL shall implement a training program at the Refinery for LDAR personnel. TOTAL shall conduct periodic refinery-wide audits of TOTAL's compliance with all applicable LDAR requirements at the Refinery.*

TotalEnergies uses Atlas Technical Consultants (formerly Dexter Field Services) to implement the LDAR program. We verified that TotalEnergies conducts mid-day and end-of-shift drift checks, as required by the CD. We observed that TotalEnergies calibrated monitoring instruments (Phoenix 21) accurately. I verified that certification and concentrations of calibration gases were accurate and current, and that TotalEnergies uses electronic data collection for LDAR monitoring with data loggers, and leak tracking and reporting software (LeakDAS).

TotalEnergies consistently maintains equipment calibration records, and conducted LDAR program audits in 2019, 2021, and 2023 as required by the consent decree. I reviewed annual training records of LDAR personnel and noted some lapses (see **AOC #9**). We walked through the units and observed that some components were not properly tagged (see **AOC #10**). Photographs of some of the tagging issues are shown as **Photo Nos. 7, 9, 13, 14, and 17** in **Appendix 1**. We also observed some leaking components with an OGI camera (see **Videos FLIR0290, FLIR0291, FLIR0292, FLIR0293, FLIR0294, FLIR 0295, FLIR0298, and FLIR0299** in **Appendix 2,** see **AOC #5**)

Section III – AREAS OF CONCERN

1. Emission limit exceedances: The consent decree requires TotalEnergies to control emissions and comply with emission limits. TotalEnergies exceeded the emission limits at the following units during the period of May 1, 2024, - April 30, 2025:
    a. FCCU 30 ppm NOx 365-day rolling average for the entire period of May 1, 2024, - April 30, 2025. Though the 60 ppm 7-day rolling average was not exceeded, it was above 30 ppm most of the period, and thus impacting the length of time it will take to come into compliance with the 365-day rolling average limit.
    b. FCCU Wet Gas Scrubber alternative monitoring parameters; pressure drop across the wet gas scrubber (ΔP) and the liquid to gas (L/G) ratio 3-hour averages almost the entire period of May 1, 2024, - April 30, 2025.
    c. Heaters and Boilers NOx lb/mmBtu for most of the period of May 1, 2024 - April 30, 2025 at eight (8) heaters that TotalEnergies uses to comply with the refinery-wide weighted-average NOx emission limit of 0.040 lbs.-NOx/mmBtu.
    d. Sulfur Recovery Plant 250 ppm SO_2 12-hour rolling average multiple times during the period at SRU #s 1, 3, and 4.
2. CEMS audit issues:
    a. FCCU - TotalEnergies conducted CGAs instead of RATA during the 4th quarter of 2021 and conducted successive audits closer than two months apart between 3rd and 4th quarters of 2024.
    b. Heaters and Boilers - TotalEnergies conducted two audits in 1st quarter of 2021 and did not conduct an audit in 2nd quarter of 2021 at ACU H-101; did not conduct audit in 4th

quarter of 2024 at ACU H-201; conducted successive audits closer than two months apart between 4th quarter of 2023 and 1st quarter of 2024 at VDU H-301; conducted successive audits closer than two months apart between 1st and 2nd quarters of 2018, 3rd and 4th quarters of 2020, and did not conduct an audit in 4th quarter of 2021 at Unibon 13H-1; and conducted successive audits closer than two months apart between 3rd and 4th quarters of 2018 at Boilers H-300 and H-350.

c. Sulfur Recovery Plants - TotalEnergies did not conduct RATAs in 2021-2024, and conducted successive audits closer than two months apart between 2nd and 3rd quarters of 2018 and 2nd and 3rd quarters of 2020 at SRU #1 and #3; did not conduct an audit in the 1st quarter of 2023 at SRU #4; and did not conduct an audit in 2nd quarter of 2023 at SRU #5.

d. Flares - TotalEnergies conducted successive audits closer than two months apart between 2nd and 3rd quarters of 2019 at North and South Flares; 1st and 2nd quarters of 2019, and 2nd and 3rd quarters of 2020 at East Flare; and 2nd and 3rd quarters of 2018, and 2nd and 3rd quarters of 2019 at Middle Flare.

e. Refinery Fuel Gas – TotalEnergies did not conduct RATA in 2018 at V106, and did not conduct quarterly audits in 2nd quarter of 2022 at V106 and V106A.

3. Permit deficiencies in TotalEnergies' permit 46396, PSDTX1073M3 and N044 issued April 4, 2024:
   a. Special Condition (SC) 9 states that *"The permittee shall comply with the maximum hourly firing rates represented in Attachment A."* Attachment A does not include the following heaters which are included in TotalEnergies' 2023 updated list of covered Heaters and Boilers under the consent decree NOx reduction plan: (i) No. 1 Crude Heater, ACU-1 H-101 (ii) No. 2 Crude Heater, ACU-2 H-201 (iii) Vacuum Distillation Unit 1 Heater, VDU-1 H-301 (iv) Demex Heater 3H-1 (v) Unibon Heater 13H-1 (vi) DHT Heaters 51H-1, 52H-1 and 52H-2 (vii) Condensate Splitter Heater H-1
   b. SC 11 states in part that *"The permittee shall comply with the nitrogen oxides (NOx) and carbon monoxide (CO) emission limits represented in Attachment B."* Attachment B includes annual NOx lb/mmBtu limits for only four (4) of the covered heaters; DHT Heaters 51H-1 and 52H-2, Condensate Splitter Heater H-1, and Unibon Heater 13H-1
4. Heaters and Boilers excess emissions reporting errors:
   TotalEnergies is required to limit NOx emissions from the covered Heaters and Boilers as listed in Appendix A of the consent decree such that, the refinery-wide weighted-average NOx emission is no greater than 0.040 lbs.-NOx/mmBtu. TotalEnergies took NOx limits for each of the covered Heaters and Boilers to achieve the refinery-wide weighted average of 0.040 lb/mmBtu as shown in TotalEnergies' 2023 updated list of covered Heaters and Boilers under the consent decree NOx reduction plan. TotalEnergies submitted semi-annual excess emissions and CEMS downtime reports for 2018 - 2024. Some of the excess emissions reported were based on a 0.08 lb/mmBtu hourly limit instead of the limits required under the consent decree. TotalEnergies must review all the reports and resubmit with the actual emission limits as applicable.
5. Hydrocarbon emissions were observed emanating from flares, a sulfur recovery plant tail gas thermal oxidizer, and some LDAR components using forward-looking infrared OGI camera.
6. Increasing flaring incidents:
   There is a gradual increase in the number of flaring incidents from 2022 to 2024, and TotalEnergies must take appropriate actions to eliminate or reduce flaring incidents.
7. Wrapping an ice bag around a drainpipe to temporarily direct water into a drain is not an acceptable practice. TotalEnergies must take appropriate corrective actions to direct water from the defective pipe into the drain.
8. BWON employee training lapses:

TotalEnergies is required to develop and implement an annual training for all employees that draw benzene waste samples. Training records show some gaps in employee training. For example, there is no record of a particular employee's training in 2021, but there are records of training in 2020, 2022, 2023, and 2024. Additionally, there is significant variability in the number of employees that had annual training (2018 and 2019-1, 2020-5, 2021-4, 2022-3, 2023-11, and 2024-7).

9. LDAR personnel training lapses:
   TotalEnergies is required to conduct annual training for all persons assigned LDAR responsibilities as a primary job function, such as monitoring technicians, database users, QA/QC personnel, and the LDAR Coordinator. Training records show some gaps in personnel training. For example, there is no record of a particular employee's training in 2021 and 2022, but there is records of training in 2018, 2019, 2020, 2023, and 2024. Additionally, there is significant variability in the number of employees that had annual training (2018-4, 2019 and 2020-5, 2021-6, 2022-12, 2023-21, and 2024-16).
10. LDAR tag issues:
    Untagged components, tag on the ground, repair tags still hanging after leak repair is completed, difficult to read tags, and component tagged "unknown" are some of the issues of concern with the LDAR program.

Closing Conference

EPA Region 6 inspectors Kim Nguyen, Nicolas Studebaker, and I (Prince Nfodzo) conducted a closing conference at TotalEnergies PAR at 10.00 am on May 23, 2025, for the inspection. During the closing conference, I reviewed the Areas of Concern noted during the inspection (AOC #s 1, 3-7, and 10), fielded questions from facility personnel, and provided information about the next steps in the inspection process. Additionally, AOCs #s 2, 8 and 9 were determined after the conclusion of the inspection and were not included in the closing conference. The attendees sign-in sheet for the closing conference is included as **Appendix 3**.

Section IV – FOLLOW UP

Some information and documents requested during the inspection were received from May 26-30, 2025.

I had a follow-up Teams call on June 12, 2025, with Mr. Sam Breaux [Environmental Superintendent], Ms. Connie Howard [Environmental Engineering Advisor], Mr. Charles Joynor [Sr. Analyzer Specialist] and Mr. Larry Nguyen [On-Stream Analyzer Technician] to discuss how TotalEnergies operates the CEMS trailer. Mr. Joynor explained that the trailer system is equipped with an umbilical cord which connects a gas bottle to a CEMS analyzer and typically conducts analysis on one analyzer at a time, although it can run two analyzers simultaneously if necessary. The system is fully automated and integrated into the Data Acquisition System (DAS), and operators do not manually record any data.

Section V – LIST OF APPENDICES

Appendix 1 - Photo Log
Appendix 2 - Video Log
Appendix 3 - Opening and Closing Conference Sign-in Sheets
Appendix 4 – Plant-wide Process Flow Diagram and Process Description
Appendix 5 - FCCU NOx CO, SO_2, L/G and ΔP Trends
Appendix 6 - Heaters and Boilers NOx Control Plan
Appendix 7 - Heaters and Boilers NOx Trends
Appendix 8 - Refinery Fuel Gas H_2S Trends
Appendix 9 - Sulfur Recovery Plants SO_2 Emission Trends
Appendix 10 - BWON end-of-line Sampling Plan and Process Flow Diagram
Appendix CBI - (None)

Appendices

Appendix 1

Photograph Log

Note: Wrong year on date stamp, should be 2025 instead of 2021

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 1

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

Photo File Name: DSCN1057.JPG
Date of Photo: 05/20/25
Time of Photo: 10:04 AM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: FCCU CEMS (Outlet).
NO = 26.67 ppm
SO_2 = 6.9 ppm

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 2

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

Photo File Name: DSCN1058.JPG
Date of Photo: 05/20/25
Time of Photo: 10:09 AM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: FCCU CEMS (Inlet).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 3

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

Photo File Name: DSCN1059.JPG
Date of Photo: 05/20/25
Time of Photo: 10:43 AM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: Mobile CGA Calibration Trailer.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 4

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

Photo File Name: DSCN1060.JPG
Date of Photo: 05/20/25
Time of Photo: 10:45 AM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: Calibration gas cylinders in Mobile CGA Calibration Trailer.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 5

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

Photo File Name: DSCN1061.JPG
Date of Photo: 05/20/25
Time of Photo: 11:47 AM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: Boiler's H-350 and H-300 CEMS. (Shared stack)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 6

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

Photo File Name: DSCN1062.JPG
Date of Photo: 05/20/25
Time of Photo: 11:50 AM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: Boiler's H-350 and H-300 CEMS recording system. (Shared stack)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 7

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

Photo File Name: DSCN1063.JPG
Date of Photo: 05/21/25
Time of Photo: 08:54 AM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: Environmental Leak Tag (Tag # 184924T) at H-202B's area.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 8

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

Photo File Name: DSCN1064.JPG
Date of Photo: 05/21/25
Time of Photo: 09:18 AM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: Crude Heater 202B CEMS.
NOx = 31.14 ppm
CO = 0.100 ppm

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 9

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

Photo File Name: DSCN1065.JPG
Date of Photo: 05/21/25
Time of Photo: 09:29 AM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: Environmental Leak Tag (tag # 0092.07) at H-101.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 10

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

Photo File Name: DSCN1066.JPG
Date of Photo: 05/21/25
Time of Photo: 10:04 AM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: Calibration Gas at H-201 CEMS.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 11

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

Photo File Name: DSCN1067.JPG
Date of Photo: 05/21/25
Time of Photo: 01:47 PM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: SRU 4 CEMS.
SO_2 = 101 ppm (0-500)
SO_2 = 109 ppm (0-20000)
O_2 = 4.06 %
NO = 28 ppm
CO = 21 ppm

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 12

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

Photo File Name: DSCN1068.JPG
Date of Photo: 05/21/25
Time of Photo: 03:42 PM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: SRU 1 and 3 CEMS (Shared Stack).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 13

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

Photo File Name: DSCN1069.JPG
Date of Photo: 05/22/25
Time of Photo: 10:10 AM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: “UNKNOWN” White Tag at Flare Gas Recovery Unit 2.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 14

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

Photo File Name: DSCN1070.JPG
Date of Photo: 05/22/25
Time of Photo: 10:51 AM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: “BWON VISUAL INSPECTION FAIL” flagged on top of Tag DR40PS78.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 15

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

Photo File Name: DSCN1071.JPG
Date of Photo: 05/22/25
Time of Photo: 11:28 AM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: Ice bag covering a drain at Tag 4PS117.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 16

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

Photo File Name: DSCN1072.JPG
Date of Photo: 05/22/25
Time of Photo: 03:11 PM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: Out-of-service pump at Water Treatment Plant area.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 17

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

Photo File Name: DSCN1073.JPG
Date of Photo: 05/22/25
Time of Photo: 03:14 PM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: LDAR Technician flagged missing component with white tag for tag MT1110200.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 18

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

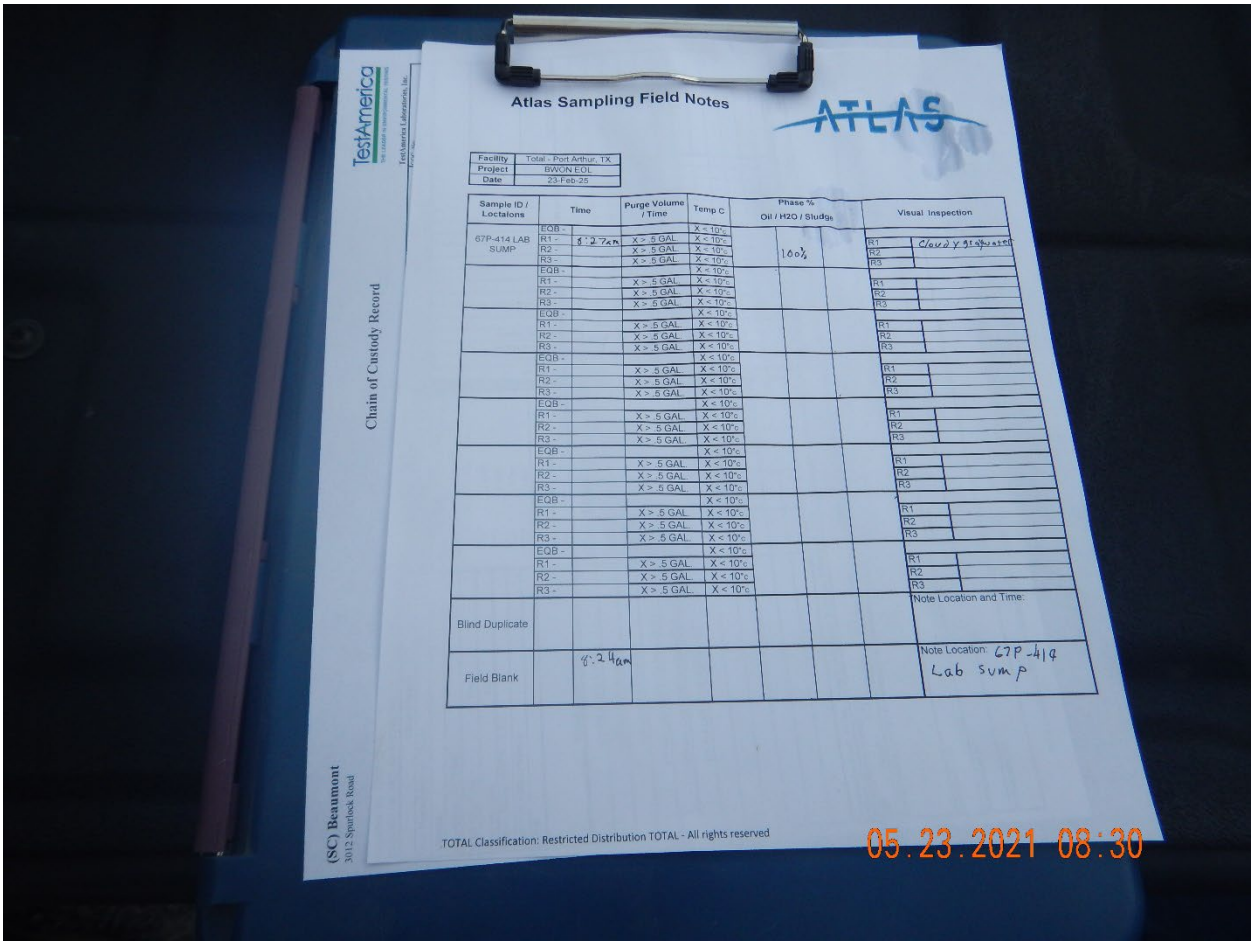


Photo File Name: DSCN1074.JPG
Date of Photo: 05/23/25
Time of Photo: 08:30 AM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: BWON Sampling Plan.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 19

Location: Total Petrochemicals and Refining USA Inc., Port Arthur Refinery		
City: Port Arthur	County/Parish: Jefferson	State: Texas

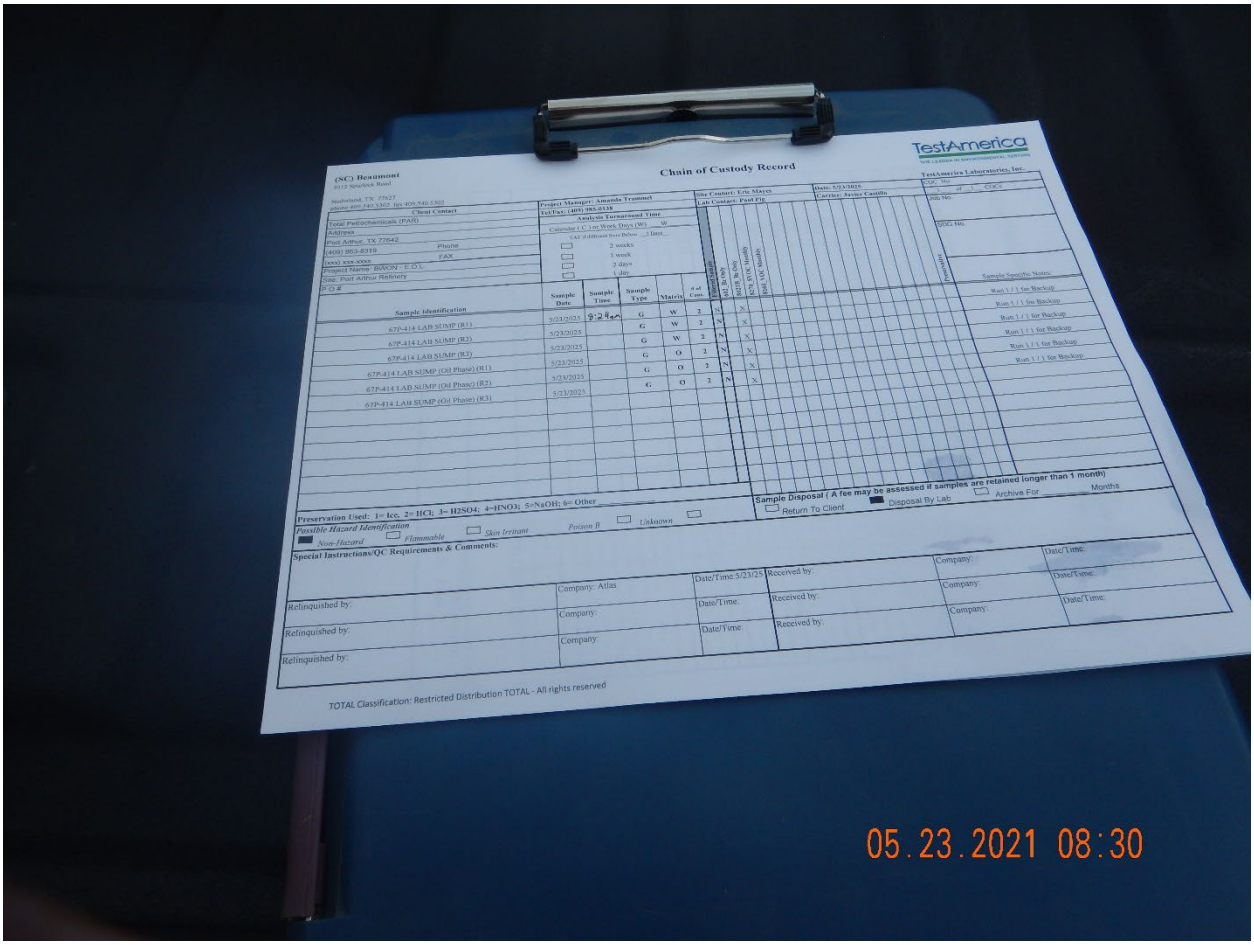


Photo File Name: DSCN1075.JPG
Date of Photo: 05/23/25
Time of Photo: 08:30 AM
Photographer: Prince Nfodzo
Site Name: Port Arthur Refinery
Description: BWON Sampling's Chain of Custody.

Appendix 2
Video Log

Appendix 2

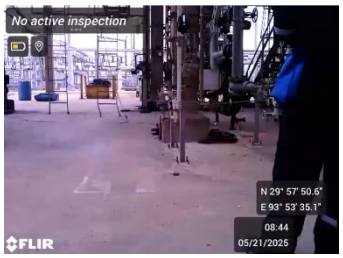
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Video Log

Location: **TotalEnergies Port Arthur Refinery**		
City: **Port Arthur**	County: **Jefferson**	State: **Texas**

Video File Name: FLIR0288
Date of Video: 05/20/2025
Time of Video: 09:34
Videographer: Nicolas Studebaker
Description: North Flare – Pilot light lit, view of trailing emissions from operational flare.

Video File Name: FLIR0289
Date of Video: 05/21/2025
Time of Video: 08:43
Videographer: Nicolas Studebaker
Description: Video cut short. Not referred to in the associated inpsection report.



Video File Name: FLIR0290
Date of Video: 05/21/2025
Time of Video: 08:45
Videographer: Nicolas Studebaker
Description: H202B – View of emissions from a valve located on the pilot gas line.

Video File Name: FLIR0291
Date of Video: 05/21/2025
Time of Video: 09:32
Videographer: Nicolas Studebaker
Description: H201 – View of emissions from the burner 16 pilot gas line union.

Appendix 2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Video Log

Location: **TotalEnergies Port Arthur Refinery**		
City: **Port Arthur**	County: **Jefferson**	State: **Texas**

Video File Name: FLIR0292
Date of Video: 05/21/2025
Time of Video: 09:44
Videographer: Nicolas Studebaker
Description: H201 – View of emissions from the burner 5 pilot gas line union.

Video File Name: FLIR0293
Date of Video: 05/21/2025
Time of Video: 09:50
Videographer: Nicolas Studebaker
Description: H301 – View of emissions from the burner 2 refinery fuel gas hose.

Video File Name: FLIR0294
Date of Video: 05/21/2025
Time of Video: 09:59
Videographer: Nicolas Studebaker
Description: H301 – View of emissions from a plug on the pilot gas supply line.

Video File Name: FLIR0295
Date of Video: 05/21/2025
Time of Video: 12:59
Videographer: Nicolas Studebaker
Description: Reformer – View of emissions from a pipe valve from 17V-19.

Appendix 2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Video Log

Location: **TotalEnergies Port Arthur Refinery**		
City: **Port Arthur**	County: **Jefferson**	State: **Texas**

Video File Name: FLIR0296
Date of Video: 05/21/2025
Time of Video: 14:09
Videographer: Nicolas Studebaker
Description: South Flare – Pilot light lit, view of trailing emissions from operational flare.

Video File Name: FLIR0297
Date of Video: 05/21/2025
Time of Video: 14:16
Videographer: Nicolas Studebaker
Description: East Flare – Pilot light lit, view of trailing emissions from operational flare.

Video File Name: FLIR0298
Date of Video: 05/21/2025
Time of Video: 14:44
Videographer: Nicolas Studebaker
Description: H1 – View of emissions from burner C pilot line 5.

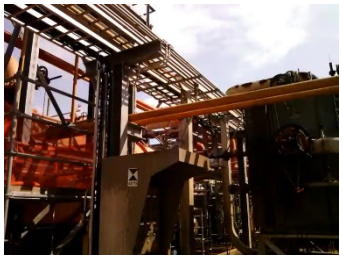
Video File Name: FLIR0299
Date of Video: 05/21/2025
Time of Video: 14:49
Videographer: Nicolas Studebaker
Description: H1 – View of emissions from burner H pilot line 3.

Appendix 2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Video Log

Location: **TotalEnergies Port Arthur Refinery**		
City: **Port Arthur**	County: **Jefferson**	State: **Texas**



Video File Name: FLIR0300
Date of Video: 05/22/2025
Time of Video: 10:15
Videographer: Nicolas Studebaker
Description: Video cut short. Not referred to in the associated inpsection report.

Video File Name: FLIR0301
Date of Video: 05/22/2025
Time of Video: 2:51 pm
Videographer: Nicolas Studebaker
Description: TTO5 – Pilot light lit, view of trailing emissions from operational thermal oxidizer.

Appendix 3

Opening and Closing Conference Sign-in Sheets

Opening Conference

Commence opening/pre-inspection meeting 5/19/25 Time: 2:45 pm

Name	Title	Representing	e-Mail	Phone
Prince Nfodzo	Environmental Engineer	US EPA	Nfodzo.prince@epa.gov	(214) 665-7491
Kim Nguyen	Environmental Scientist	US EPA	nguyen.kim.j@epa.gov	(214) 665-7133
Christopher Koch	Maint & TA Mgr	TE	chris.koch@totalenergies.com	(409) 282 9035
Cyrille MIRGAIN	Industrial Perf. Mgr	TE	cyrille.mirgain@totalenergies.com	(409) 540 9416
Paul Simmons	Platform Deputy General Mgr	TTE	Paul.Simmons@totalenergies.com	(409) 460-3481
Isaac Bankola	Ind Perf	TTE	Isaac.Bankola@totalenergies.com	409 985 0446
SEBASTIEN ROULIER	HSSE MANAGER	TTE	SEBASTIEN-ROULIER@TOTALENERGIES.COM	409 659 1073
FABIEN ALLEMAND	ECU Operation Manager	TTE	fabien.allemand@totalenergies.com	
Mariano Del Pozo	Technical Manager	TTE	mariano.del-pozo@totalenergies.com	
Trisha Froemming	Environmental	TTE	trisha.froemming@totalenergies.com	
Stella Pulman	HSE Deputy GC	TTE	stella.pulman@totalenergies.com	
Meredith Youngson	Environmental	TTE	meredith.youngson@totalenergies.com	
Anthony McLaughlin	Envir	TTE	anthony.mclaughlin@totalenergies.com	

Conclude opening/pre-inspection meeting ..... Time: 4:45 pm

Initials / Date: PN / 5/19/25

Kristopher Beard - Environmental Engineering Advisor - TTE - kristopher.beard@totalenergies.com - 409-937-4843

Amanda Trammel - Environmental Specialist - TTE - amanda.trammel@totalenergies.com 409-985-0138

Ebun Broomes - Environmental Advisor - TTE - ebun.broomes@totalenergies.com. 409-985-0173

Connie Howard - Env Engineering Advisor - TTE - connie.howard@totalenergies.com 409-985-0377

Sam Breaux ENV. ~~Supervisor~~ Superintendent TTE sam.breaux@totalenergies.com ~~409-985-1184~~ 409-985-0668

Nicolas Studebaker - CAA Inspector - EPA - Studebaker.nicolas@epa.gov 214-665-3133

Closing Conference

Commenced meeting 5/23/2025 Time: 10:00 am

Name	Title	Representing	e-Mail	Phone
Prince Nfodzo	Environmental Engineer	US EPA	Nfodzo.prince@epa.gov	(214) 665-7491
Kim Nguyen	Environmental Scientist	US EPA	nguyen.kim.j@epa.gov	(214) 665-7133
Nicolas Studebaker	Physical ~~Environmental~~ Scientist	US EPA	Studebaker.Nicolas@epa.gov	214-665-3133
Peggya Mosavi-Hecht	Regional Counsel	USEPA		214-665-3190
Amanda Trammel	Env Specialist	TEPRI	amanda.trammel@totalenergies.com	409-985-0138
Sam Breaux	Env. Superintendent	TEPRI	Sam.breaux@totalenergies.com	409 985 -~~0668~~ -0668
Cyrille MIRGAIN	Ind. Perf. Myer	TEPRI	cyrille.mirgain@totalenergies.com	409 540 9416
Sebastien ROULIER	HSSE Manager	TEPRI		~~(409)460-3481~~
Paul S. Simmons	Deputy General Mgr	TTE	Paul.Simmons@totalenergies.com	(409)460-3481
Stella Putman	Deputy General Counsel	TTE	Stella.Putman@totalenergies.com	
Trista Froemming	HSE Corporate	TTE	trista.froemming@totalenergies.com	
Isaac Bankole	Ind Performance	TTE	Isaac.Bankole@totalenergies.com	409 985 0446
Anthony McLaughlin	ENVIR	TTE	mclaughlin.anthony@ymail.com	

Conclude meeting 5/23/2025 Time: 10:43 am

Kristopher Beard	Environmental Engineering Advisor	TTE	~~totalenergies~~ kristopher.beard@totalenergies.com	409-985-0158
Connie Howard	Env. Ear Advisor	TTE	connie.howard@totalenergies.com	409-985-0377

Initials / Date: PN / 5/23/25

Appendix 4

Plant-wide Process Flow Diagram and Process Description

Process Description

The refinery manufactures transportation fuels: gasoline, diesel, jet fuel, propane, butane, and bunker oil. The refinery also makes asphalt and recovers benzene, toluene, and xylene - the basic building blocks for plastics - from its fuel products. The refinery is a high conversion facility. The process units at the site, described as follows, are: Process Waste Water Treating Complex (PWTC), Cogen/ Steam Boilers, LPG Loading Rack, Truck Loading Rack, OM&S, Marine Docks and Vapor Recovery Unit, Pressure Swing Adsorption Unit (PSA), Coker Naphtha Hydrotreater Unit (KNHT), Amine Regeneration Unit (ARU-2), Distillate Hydrotreater No. 3 (DHT-3), Delayed Coker Unit (DCU), Condensate Splitter, Fluidized Catalytic Cracking Unit (FCCU), Alkylation, DEMEX, UNIBON, Sulfur Recovery Units #1, #3, #4, and #5 (SRUs 1, 3, 4, and 5), Sour Water Strippers #1, #2,#3 and #4 (SWS-1, 2, 3 and 4), Distillate Hydrotreater # 2, Gas Rerun Unit (GRU), Distillate Hydrotreater #1 (DHT-1), Gas Rerun Unit (GRU), and Toluene Disproportionation (TDP).

Atmospheric Crude #1 (ACU1) and Atmospheric Crude #2 (ACU2)

The Atmospheric Crude Units 1 and 2 are used to process crude oil into its various components, which are then sent to other units throughout the refinery for further processing. The heavy residuals from ACU-1 and ACU-2 go to the Vacuum Tower prior to being pumped to other units. The crude is pumped from tankage by crude charge pumps, is preheated, and is sent to the desalter. The crude mixture is desalted by passing through a high-voltage field; it goes through this process twice. The crude oil is then heated via a series of heat exchangers and heaters, and is directed to the Crude Fractionator. The heated crude is introduced into the flash zone of the fractionation tower, where liquid and vapor separation takes place. The crude oil components produced through this process are heavy naphtha, jet fuel, furnace oil, atmospheric gas oil and atmospheric residuals are routed to numerous units. Waste gases generated are routed to the Fuel Gas recovery system and/or the Refinery Flare System.

Vacuum Distillation Units (VDU1 and VDU2)

VDU1 and VDU2 take a combination of reduced crude from the bottom of the Atmospheric Crude Units (ACU1 & ACU2) and purchased atmospheric residuals. The combined feed is pumped and heated in the Vacuum Charge Heater (where it is partially vaporized). The partially vaporized residual leaves the heater and enters the flash zone, where again, vapor-liquid separation occurs. Light hydrocarbon vapors vent from the top and are burned. LVGO (light vacuum gas oil) is drawn off and is pumped to the Unibon Unit. HVGO (heavy vacuum gas oil) is drawn off and is recycled to the Vacuum Tower, pumped to the Unibon, or pumped to the FCCU. Residual liquid from the flash zone is directed, in part, to the Demex Unit and, in part, to #6 fuel oil blending. Distillation under vacuum in VDU 2 will produce the following fractions: vacuum tower bottoms (residue), heavy vacuum gas oil (HVGO), light vacuum gas oil (LVGO), and untreated fuel gas. Vacuum tower bottoms will be further processed into higher value products in the Coker Unit; whereas the light and heavy vacuum gas oils will be hydrotreated and/or processed in the FCCU. Waste gases generated are routed to the Fuel Gas Recovery system and/or the Refinery Flare System.

Naphtha Hydrotreater (NHT)

The Naphtha Hydrotreater removes poisons from the naphtha feeding the Reformer by means of catalytic and fractionation sections. The feed to the NHT comes from the Crude Unit to the Sat Gas Unit where the C-5 pentanes and lighter are removed in the Naphtha Stabilizer before going to the

NHT. The NHT is a catalytic process using a select catalyst in the presence of hydrogen to convert and remove organic sulfur, oxygen, nitrogen, and metallic compounds which will poison the Continuous Catalytic Reformer catalyst. The NHT also contains a fractionation tower to remove pentanes and lighter from the naphtha prior to being fed to the Continuous Catalytic Reformer. The NHT product is sweet (desulfurized) Naphtha which is fed to the Continuous Catalytic Reformer unit.

Continuous Catalytic Reformer

The Continuous Catalyst Regeneration (CCR) Reformer converts low octane naphtha to a high octane gasoline blending component. The CCR Reformer feed is sweet (desulfurized) naphtha from the NHT. The CCR Reforming process consists of two steps: reforming and fractionation. The reforming step uses a high temperature, catalytic process in which low-octane naphtha is converted to a high-octane gasoline for blending or processing in the Sulfolane and BTX units. Hydrogen is a major by-product of the reaction and is sent to numerous refinery units (e.g., NHT, Unibon unit, TDP, Total Isomerization Unit). The fractionating step separates the reacted products into overhead vapor, overhead liquid, and a heavy reformate product. The liquid overhead stream is fed to the Saturate Liquid unit for stabilization and is then sent to Total Isomerization as feed. Light distillate from the unit is also used as a gasoline blending component. The waste gasses from the process vents are routed to the Fuel Gas Recovery System and or the Refinery Flare System.

Sulfolane Unit

The Sulfolane unit separate high purity aromatic fractions from hydrocarbon streams containing both aromatics and non-aromatics. The feedstocks are the drag from the BTX unit and the Light Reformate stream from the Continuous Catalytic Reformer unit. The name Sulfolane refers to the chemical name of the solvent used in the process. The Sulfolane process utilizes a “Sulfolane” solvent in extraction, extractive distillation, and distillation operations in the unit to recover high purity benzene, toluene, and mixed xylenes. The non-aromatic product streams (Raffinate) are sent to the Raffinate Splitter and the aromatic extract stream is sent to the BTX unit. The waste gasses from the process vents are routed to the Fuel Gas Recovery System.

Total Isomerization

The ISOM Unit converts normal paraffins contained in the pentane/hexane feedstock into higher octane branched isomers. The primary feedstocks to the ISOM unit are the Light Raffinate stream from the Raffinate Splitter in the Sulfolane unit and the Pentane stream from the Debutanizer Tower which is a part of the Saturate Liquids Unit. The isomerization process is a steady state operation that converts normal to isomers in the presence of hydrogen via the utilization of a catalyst. The adsorption process is an unsteady state system that separates normal hydrocarbons from non-normals by adsorbing the normals into the cavities of the adsorbent. The normals are desorbed by stripping with hydrogen. The integration consists of placing the adsorption process in the hydrogen circulation loop ahead of the isomerization reactor. Conventional equipment is used to move, heat, cool and separate the process streams. The product stream from the Isom unit is Isomerate which is sent to tankage and used in gasoline blending. The waste gasses from the process vents are routed to the Fuel Gas Recovery System and or to the Flare System.

Saturate Liquids

The Saturate Liquids takes the light ends from other units and separate out the components of naphtha, pentane/hexane, mixed butanes, propane, and fuel gas. Feed to the naphtha stabilizer is unstabilized, light naphtha from both atmospheric crude units. The naphtha stabilizer overhead liquid

is amine treated (for H2S removal), and then caustic treated (for mercaptan removal) before going to the deethanizer. NHT Fractionator overhead liquid is amine treated (for H2S removal) then sent to the debutanizer. The overhead from the debutanizer combines with the stabilizer overhead and goes to the deethanizer. Deethanizer bottoms provide the feed for the depropanizer. Deethanizer vapor product goes either to the Cogen unit or to the Fuel Gas Recovery System. Depropanizer bottoms product is mixed butanes. The overhead propane product is sent to the KOH treaters to remove traces of water and H2S and then goes to tank storage.

Benzene/Toluene/Xylene (BTX)

The BTX unit separates the mixed BTX (benzene, toluene, xylene) streams into benzene, toluene, xylene, and C9+ aromatics. Feed to the BTX unit is clay-treated, aromatic extract from the Sulfolane unit and BTX from the TDP unit. A distillation process is used to separate BTX into benzene, toluene,and mixed xylenes, which are sent to storage tanks and ultimately sold as product or used for gasoline blending. The waste gasses from the process vents in the BTX unit are routed to the Fuel Gas Recovery System.

Toluene Disproportionation (TDP)

The TDP unit converts toluene into the more valuable products benzene and xylenes. Toluene feed enters the unit directly from the toluene tower of the BTX unit. If necessary, it can also be pumped in from tank storage. The toluene is mixed with recycle hydrogen and heated in exchangers and in the TDP charge heater. It enters the reactor where in the presence of catalyst, one-half of the toluene is converted to benzene, mixed xylenes, toluene, and C9+ aromatics, and non-aromatics. The product stream goes on to a high pressure separator section where the vapor portion, which is mainly hydrogen, is routed to the compressor after being mixed with makeup hydrogen from the reformer. The liquid stream which is mainly toluene, benzene, and mixed xylenes, goes on to a stabilization section. This section runs the stream through a tower to remove C3's (Depropanizer Tower) and lighter compounds. The vapor stream from the stabilizer section is added to the refinery fuel gas, or sent to the unit heater to be used as fuel. The liquid product stream is used as feed to the BTX unit, where it is separated into benzene, toluene, xylene, and C9+ aromatics. The benzene and xylene are sold as products. The C9+ aromatics are used in the gasoline blending pool. The toluene is recycled back to the TDP feed. The waste gasses from the process vents are routed to the Fuel Gas Recovery System and or the Refinery Flare System.

Gas Rerun Unit (GRU)

The Gasoline Rerun Unit (GRU) produces TOTAL Aromatic Solvent 150, FAS-150, Atosol or a finished furnace oil (FFO). The GRU is designed to take a feed, usually the xylene column bottoms but can also process the reformer's heavy reformate, and distill it to produce the desired products. The mode of operation governs which product is made. FAS-150 is collected as bottoms product and sent to tankage, to finished furnace oil, or to gasoline blending. It can also be sent to the front of the unit as charge. Atosol is collected as an overhead product and can be sent to tankage or to gasoline blending.

Distillate Hydrotreater #1 (DHT-1)

The Distillate Hydrotreater #1 (DHT-1) removes sulfur compounds from the unfinished middle distillates (jet fuel and furnace oil). The unit feed is composed of straight run kerosene from the Atmospheric Crude Units and the Condensate Splitter. The sulfur in the feed is converted into

hydrogen sulfide in the presence of catalyst so that it can be removed from the gas stream more easily. The unit produces jet fuel or kerosene. The final jet product is then sent to tank storage. The waste gasses from the process vents are routed to the Fuel Gas Recovery System and or the Refinery Flare System.

Distillate Hydrotreater # 2

DHT-2 produces low sulfur diesel as a finished product. The unit processes atmospheric gas oil, AGO, from both atmospheric crude units, and light vacuum gas oil, LVGO, from the two vacuum distillation units (VDU1 and VDU2). After the feed is preheated, it is sent to the reactor where sulfur and nitrogen compounds in the feed are reacted with hydrogen to form hydrogen sulfide and ammonia. After cooling and liquid separation, the gas stream enters the amine section where the hydrogen sulfide is removed and sent to the sulfur recovery unit (SRU). The liquid from the hot high pressure separator then enters the fractionation section. The fractionation section separates the products of the reaction section. It produces hydrotreated gas oil, naphtha, and a middle distillate.

Sour Water Strippers #1, #2, #3 and #4 (SWS-1, 2, 3 and 4)

The sour water strippers remove dissolved hydrogen sulfide and ammonia from process waste water streams of refinery process units, including: DHT-1, DHT-2, DHT-3, UNIBON, DEMEX, Amine, SCOT, NHT, KNHT,ACU-1, ACU-2, VDU1, VDU2 and the flare area. The waste water streams are fed into a surge drum from their various sources. This step helps to remove entrained liquid hydrocarbons and dissolved gases due to the change in pressure. This water is then sent to one of the available tanks (Tanks 1000, 1001, and 1002) to settle and to prevent fluctuations in feed from upsetting the unit. Hydrocarbons that settle on the top are manually skimmed and sent to the refinery slop oil. The sour water is then preheated through heat exchange with the reboiler and sent to the top of the tower. Steam is injected into the bottom of the tower and draws the ammonia and hydrogen sulfide into that stream. The wet over head vapor rich in hydrogen sulfide and ammonia is sent to the sulfur recovery units (SRUs). The stripped water is either sent to the crude units to be used as desalting water, or to refinery process units to be injected as wash water. It may also be sent to PWTC to be treated and discharged.

Sulfur Recovery Units #1, #3, #4, and #5 (SRUs 1, 3, 4, and 5)

The Sulfur Recovery Units recover the sulfur content from the incoming refinery amine system acid gas streams and/or sour gas from the SWSs as elemental sulfur by using state of the art Claus SRUs followed by tail gas treatment to maximize sulfur recovery. Acid gas (composed primarily H2S and ammonia) will be fed to the trains from the Amine Regeneration Unit-1&2, Unibon, DHT-1&2, and SWS(s). The combined acid gas stream will be fed to the reaction furnace along with a limited amount of air. Inside the reaction furnace, the mixture of acid gas and air will be heated sufficiently to oxidize a portion of the H2S into elemental sulfur and SO2. Reaction conditions will be controlled to achieve optimum H2S to SO2 ratios. The thermal reactor will also destroy ammonia in the acid gas feed. The gas exiting the thermal reactor and catalytic converters passes through a condenser to recover elemental sulfur. The SRU exhaust will consist primarily of H2S, sulfur vapor, SO2, water and nitrogen and is routed to the Tail Gas Unit (TGU). The TGU system will convert sulfur compounds in the tailgas into H2S, and will selectively remove H2S from the converted gas and route the treated gas to a Tail Gas Incinerator (TGI) or Tailgas Thermal Oxidizer (TTO). The H2S removed in the TGU system will be recycled to the front-end of the SRUs for further conversion into sulfur. Effluent gases from the TGU Amine Contactor will be combined with SRU complex storage pit/truck loading sweep gases and flow to the new incinerator where natural gas and combustion air will be added to a burner to convert any remaining sulfur compounds to SO2.

Unibon Unit

The Unibon unit (called a hydrotreater) reduces the concentration of impurities (sulfur, nitrogen, metals, carbon) from a portion of the charge to the FCCU. The feed to the Unibon reactors is composed of: HVGO, DMO, resin, and hydrogen. Impurities in the charge to the Unibon are converted to hydrogen sulfide (H2S) and ammonia (NH3) and separated from the liquid phase. Some of the impurities remain in the product. H2S and NH3 are sent to the Sulfur Recovery Unit (SRU) and Sour Water Stripper (SWS) for further processing. Metals in the feed are retained on the catalyst. The liquid phase is sent to a fractionation section where it is split into various products, unibon product to FCCU, diesel, naphtha.

Demex Unit

The Demex removes a valuable gasoil product from vacuum tower bottoms (VTB) from other products used for heavy oil blending. The unit feed is VTBs from the Atmospheric Crude Units. The Demex unit utilizes a solvent deasphalting process that utilizes liquid-liquid extraction. The Demex unit is a solvent deasphalting process that utilizes liquid-liquid extraction and supercritical butane or isopentane solvent to extract two streams called demetalized oil (DMO) and resin from heavier asphaltenes. After extraction and separation, residual solvent is removed from the DMO, resin and asphaltene streams in individual stripping columns. DMO and resin are then sent to the Unibon unit, though resin may also be used for road asphalt blending. Asphaltenes are sent to road asphalt blending or 6 Oil. Waste gases generated are routed to the Fuel Gas Recovery System and/or the Refinery Flare System.

Alkylation Unit

The Alkylation (Alky) unit produces a high octane alkylate which boils in the aviation gasoline range by the chemical reaction of olefin hydrocarbons (usually normal and isobutylene) with isoparaffin (isobutane) in the presence of sulfuric acid catalyst. This conversion of C4 olefins with isobutene into highly branched isoparrafins results in the formation of alkylate. The C4 olefin feedstock comes from the Fluid Catalytic Cracking Unit (FCCU) and the isobutene feed comes from the Saturated Liquids Unit. The alkylate product is sent to tankage and used in gasoline blending. The spent acid is shipped offsite, the liquid waste is sent to the Wastewater Treatment Unit and the waste gasses are sent to the Fuel Gas Recovery System and/or the refinery flare system.

Fluidized Catalytic Cracking Unit (FCCU)

The FCCU cracks heavy hydrocarbons in gas oils into smaller molecular hydrocarbons, which are processed into more profitable products. The feed to the FCC consists of gas oil, usually coming from tankage and other units within the refinery such as the Unibon and Crude Units. Gas oil enters the reactor riser through feed distribution nozzles. These nozzles help vaporize the feed for better contacting with the fluidized catalyst. The oil and catalyst react as they travel up the riser. The catalyst then travels down through the reactor stripper and to the regenerator. At the regenerator, coke deposits on the catalyst are burned and then the catalyst returns to the reactor. The products from the burning of the coke (flue gas) are sent to the wet gas scrubber to remove SO2 and particulate matter. The reaction products disengage from the catalyst at the top of the reactor and go to the main column. The fractionator separates the products into slurry, Heavy Cycle Oil, Light Cycle Oil, Heavy Cat Naphtha, and Light Cat Naphtha and lighter. The LCN stream is amine and HCN streams are each treated for sulfur in the GHT before they are sent to storage. The LPG stream is

amine and Merox treated to remove sulfur and then separated into propane/propylene and butane/butylene streams and sent to storage. The fuel gas is then sent to the Offgas Treater to remove contaminants before being sent to the steam cracker. Waste gases generated are routed to the Fuel Gas Recovery System and/or the Refinery Flare System.

Condensate Splitter

The Condensate Splitter Process is designed to separate Sleipner or Oso light crude condensates producing jet fuel, diesel, gas oil, heavy naphtha, and light naphtha. The condensates are fed to the feed surge drum from storage tanks. The separation process is achieved through a fractionating column and the naphtha splitter column. Heavy naphtha is used as NHT reformer feed, and the light naphtha is sent to the steam cracker as feed. The jet and diesel is sent directly to tank storage. Gas oil is sent to FCCU for feed.

Delayed Coker Unit (DCU)

The Delayed Coker Unit (DCU) will primarily process vacuum residue and PITCH/ Resin to produce LPGs, unfinished transportation fuels (Coker Naphtha, Light Coker Gas Oil, Heavy Coker Gas Oil), fuel coke, and untreated fuel gas. Feed is supplied to Delayed Coker unit from Vacuum Tower, VDU-2, DEMEX unit and Storage. Feed is typically composed of C34+ hydrocarbons containing contaminants such as water, sulfur, nitrogen, and oxygen compounds, as well as trace amounts of heavy metals (nickel, vanadium, lead, iron, etc). The Coker uses a delayed coking process whereby heavy hydrocarbons (resid) are quickly brought to thermal cracking temperature in the heaters. The DCU feed stream is introduced into the bottom of the fractionators where it is heated, in the presence of velocity steam, in the Coker heaters to facilitate oil thermal cracking and to further the delayed coking process in the Coker drum(s). Coker Heaters are provided with ultra low NOx burners and selective catalyst reduction (SCR) for further NOx control. Once coking cycle is complete, steam will be used to strip the volatile hydrocarbon vapors from the coke. The overhead vapor is sent first to Fractionator and switched to the blowdown system while the coke remains in the drum. Following steam stripping the coke is cooled with water. After the coke in the drum is cooled, the coke will be removed by hydraulic cutting, stored in the coke pad, and then sent to coke pile, where it will be processed for transferring off-site via barge or ship. The C3 product is normally blended off into FCC C3 product, BB product is routed to storage on flow control, Coker naphtha product is normally routed to the KNHT, LKGO Product is cooled for its disposition to storage, to be used as feed to DHT-3 unit, and HKGO product is normally routed to UNIBON unit. Waste gasses are sent to the Fuel Gas Recovery System and/or the refinery flare system. Heater flue gases are routed to the SCR reactor where they are contacted with vaporized ammonia. The flue gases and gaseous ammonia contact a selective catalyst to reduce nitrogen oxides to diatomic (two atom) nitrogen (N2) and water.

Distillate Hydrotreater No. 3 (DHT-3)

The DHT-3 will remove sulfur entrained in distillate to produce ultra low sulfur diesel (ULSD). DHT-3 will receive feed from Crude Unit, FCCU, Coker , DHT-2 and Unibon. DHT-3 feed with recycle hydrogen will be preheated by heat exchangers and then brought to reaction temperature utilizing a feed charge heater (source of emission) before entering the inlet of the reactor. The hydrotreater reactions are exothermic and will cause a temperature rise in the reactants; water is injected into the reactor effluent upstream of the product separator to minimize corrosion, minimize deposits of ammonium salts, and to remove ammonia. The hydrogen is separated from diesel in the separator and recycled using back to the front of the unit after amine scrubbing. Some hydrogen may be purged to improve the recycle hydrogen purity. The separator off-gas, high in hydrogen, will be sent to PSA unit for hydrogen recovery. The recycle hydrogen is treated with lean amine to remove H2S. The rich

amine will be routed to the new Amine Regenerator Unit. The liquid stream from the separator will be routed to a stripper where naphtha, fuel gas, and treated distillate are fractionated prior to unit discharge. The treated distillate will be vacuum dried and cooled before sending it to storage. The sour water recovered from the stripper overhead receiver will be either used in reactor effluent washing or processed in the refinery sour water system.

Amine Regeneration Unit (ARU-2)

Amine is circulated within the refinery scrubbers to treat fuel gas and LPG streams by absorbing H2S. The purpose of the amine regeneration unit is to continuously regenerate the amine by removing absorbed H2S in a stripper tower. Rich amine, laden with H2S produced in the various refinery process units, is collected in a common system and fed to the amine regeneration unit. After stripping, lean amine is pumped from the regeneration unit back to the refinery process units.

Coker Naphtha Hydrotreater Unit (KNHT)

The feed for KNHT will come from Coker. The KNHT will remove sulfur entrained in unfinished naphtha to produce finished (or low sulfur) naphtha. Then KNHT feed and recycle hydrogen will be preheated by heat exchangers and then brought to reaction temperature utilizing a feed charge heater before entering the inlet of the reactor. The hydrotreater reactions are exothermic and will cause a temperature rise in the reactants; water is injected into the reactor effluent upstream of the product separator to minimize corrosion, minimize deposits of ammonium salts, and to remove ammonia. The hydrogen is separated from diesel in the separator and recycled using back to the front of the unit after amine scrubbing. Some hydrogen may be purged to improve the recycle hydrogen purity. The separator off-gas, high in hydrogen, will be sent to PSA unit for hydrogen recovery. The recycle hydrogen is treated with lean amine to remove H2S. The rich amine will be routed to the new Amine Regenerator Unit. The liquid stream from the separator will be routed to existing NHT for stripping.

Pressure Swing Adsorption Unit (PSA)

The low purity hydrogen from Reformer, NHT purge, DHT-3 purge, DHT-2 purge and KNHT purge is sent to PSA make high purity hydrogen. The Pressure Swing Adsorption Unit (PSA) is a purification unit. The purifier consists of ten adsorber vessels with adsorbent, one skid containing process valves and piping, and a control unit. The hydrogen purifier uses a pressure swing adsorption process to purify the low purity hydrogen stream and produce a high purity hydrogen product stream. The impurities are adsorbed from the feed gas at the high feed gas pressure and then desorbed at a low pressure. The process operates on a repeated cycle having two basic steps, adsorption and regeneration. During normal operation two vessels are on adsorption and the others are in various stages of regeneration. No change in temperature occurs except for that caused by the heats of adsorption and desorption. The off gas is sent to amine unit using a tail gas compressor.

Marine Docks and Vapor Recovery Unit

The marine terminal docks are used to unload/load raw materials/products at the refinery. The marine terminal consists of 4 berths where vessels, ships, and barges dock to load or discharge crude oil or refined products. The Docks/Terminal Area consists of the docks (marine terminal) and terminal. Products and crude are transferred between the docks and on-shore tankage over pipelines. The boundaries of the Docks and Dock activities generally extend from the tank discharge valve of all the product shipping (via docks) tanks and crude receiving tanks in the Refinery to the cargo (hose-to-vessel) connection. Waste gases generated during the loading of some refinery products are routed

to a marine vapor recovery system and ultimate the marine terminal thermal oxidizers. Waste gases generated during the loading of minimally volatile refinery products vent directly to atmosphere during loading.

OM&S

The storage and transfer of petroleum products at the Port Arthur TOTAL refinery is the primary responsibility of the Oil Movement and Storage Department. It includes everything that is not included in a unit battery limits: tanks, pumps outside of units, pipelines, and all the supporting equipment.

Truck Loading Rack

The truck terminal is loads either regular, premium, mid-grade, diesel or FAS-150 solvent. Blended gasoline, Diesel and FAS 150 is blended and tested before being sent to the Fuel Truck Terminal Storage Tanks. From the tankage, these materials are loaded through the rack manually by drivers into trucks. Displaced vapors are controlled by a loading rack flare.

LPG Loading Rack

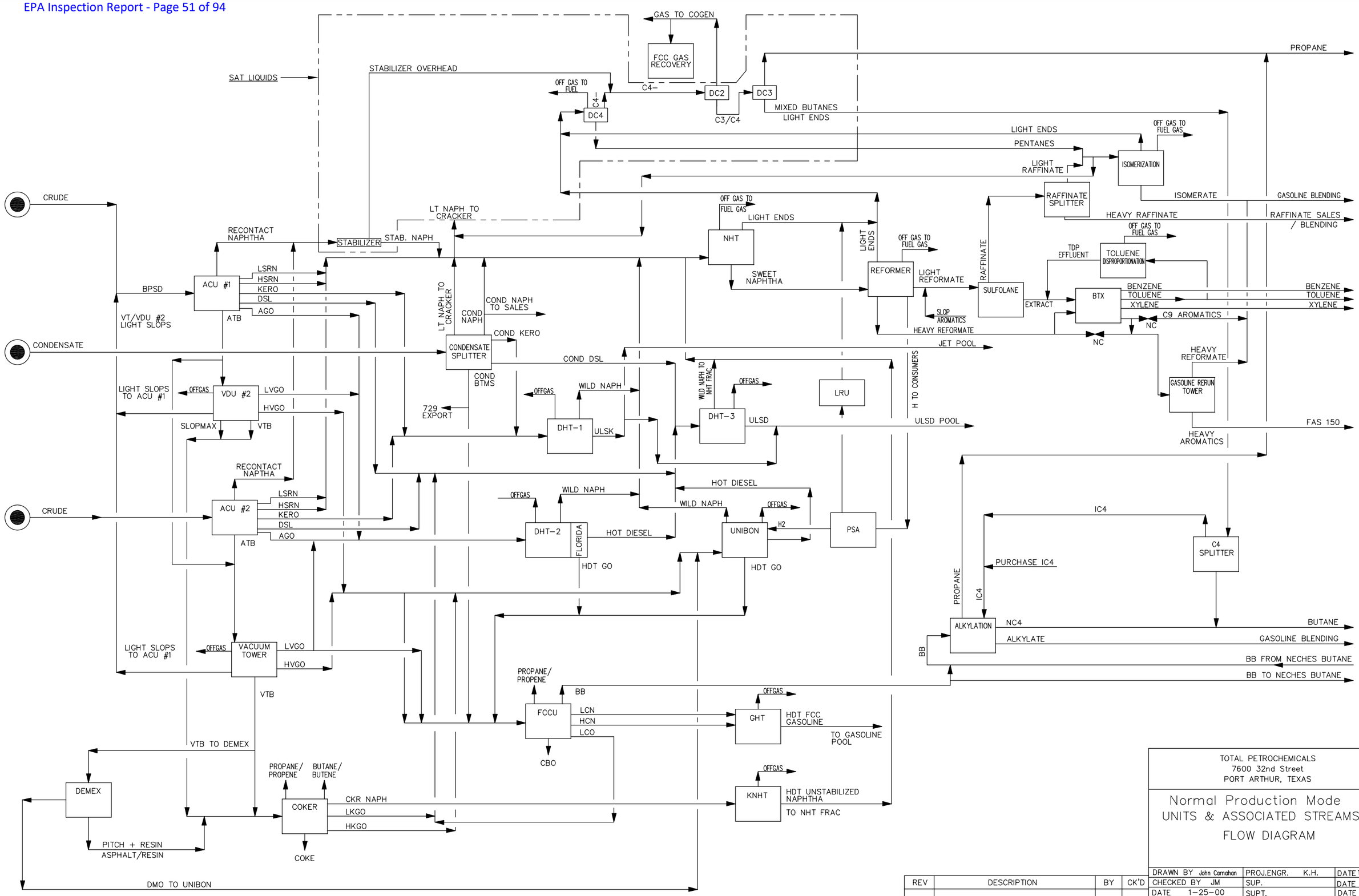
The LPG Loading and Storage Area provides storage and pumping facilities for Propane, Butane, Refinery Grade Propylene, Isobutane and Butylene. Pumping facilities are provided to pump propane to pipeline and the Truck Loading Rack.

Cogen/ Steam Boilers

The Cogen and associated equipment are used in the Refinery to burn natural gas, reformer hydrogen and deethanizer off-gas to power a turbine which generates electrical power that is consumed in the refining process. The by-product of this operation is waste heat in the turbine exhaust which is utilized to generate steam. The unit also produces water suitable for high pressure boiler feedwater (HPBFW) which is used in boilers or generators. Other equipment associated with the Cogen Unit include a raw water clarifier, drinking water section, and cooling tower section.
The steam boilers and associated equipment's primary purpose is to produce steam for the Refinery in order to supply process heat and mechanical energy. The control of the unit is based on maintenance of the pressure in the steam system. This includes backup of the waste heat generators in the Refinery in case they shutdown (i.e. Cogen, Cat Cracker). The boilerhouse also pumps and treats water for utility purposes, low pressure boiler feedwater (LPBFW), and water suitable for demineralization. The boilerhouse pumps raw water from the LNVA canal to the process area in order to remove contaminates to provide water for cooling tower makeup, Low Pressure Boiler Feedwater, and Demineralizer feed.

Process Wastewater Treating Complex (PWTC)

The process waste water treating complex (PWTC) provides a means to treat the refinery’s generated waste waters so that they may be safely discharged back into the environment. The PWTC receives feed the refinery’s process water and storm water sewer systems. Treatment of the water is accomplished by mechanical, chemical and biological processes/separation that occurs in the NESHAP Pretreatment Unit, Biological Pretreatment Unit, Biological Treatment Unit, Solids/Liquids Separation System, Recovered Oil System, North Oily Water System, and the South Storm System .



TOTAL PETROCHEMICALS
7600 32nd Street
PORT ARTHUR, TEXAS

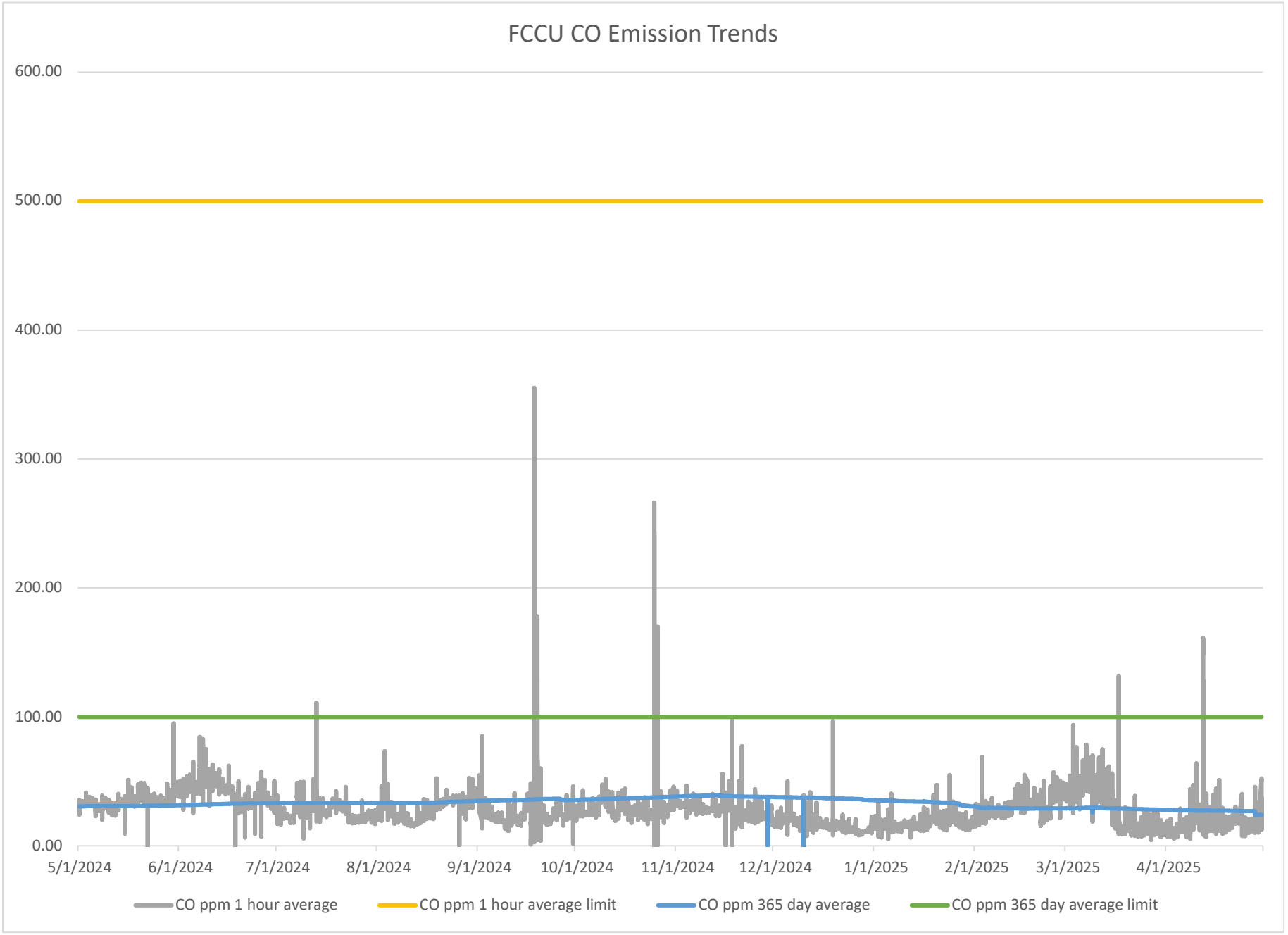
Normal Production Mode
UNITS & ASSOCIATED STREAMS
FLOW DIAGRAM

REV	DESCRIPTION	BY	CK'D
0	TAX VERSION	HEC	

DRAWN BY John Carnahan	PROJ.ENGR. K.H.	DATE 1–00
CHECKED BY JM	SUP.	DATE
DATE 1–25–00	SUPT.	DATE
SCALE ~	PROJ. NO.	
DWG. NO. 750–D–50–258C–P		REV. 0

Appendix 5

FCCU NOx CO, SO_2, L/G Ratio, and ΔP Trends


FCCU CO Emission Trends
600.00
500.00
400.00
300.00
200.00
100.00
0.00
5/1/2024
6/1/2024
7/1/2024
8/1/2024
9/1/2024
10/1/2024
11/1/2024
12/1/2024
1/1/2025
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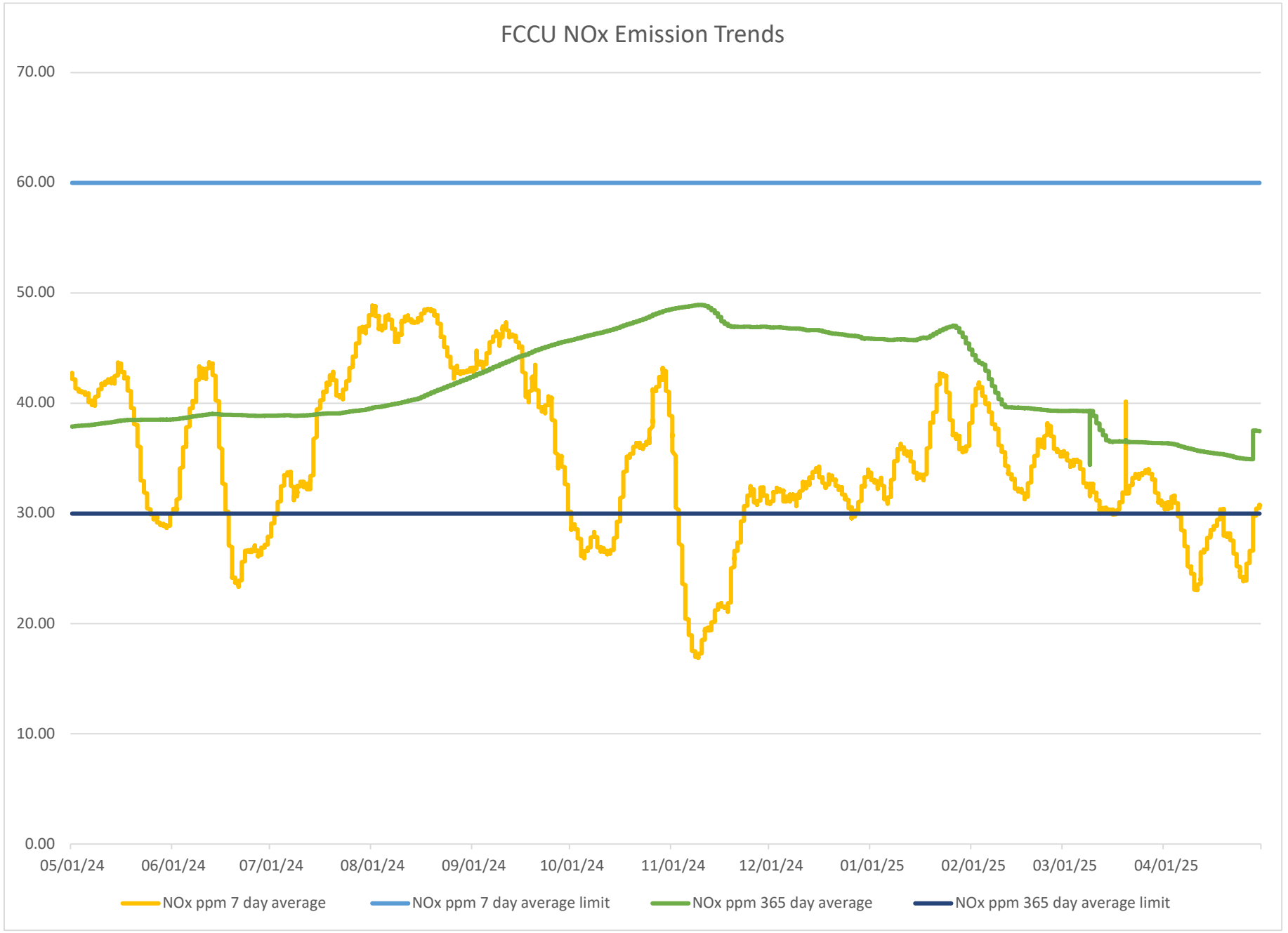
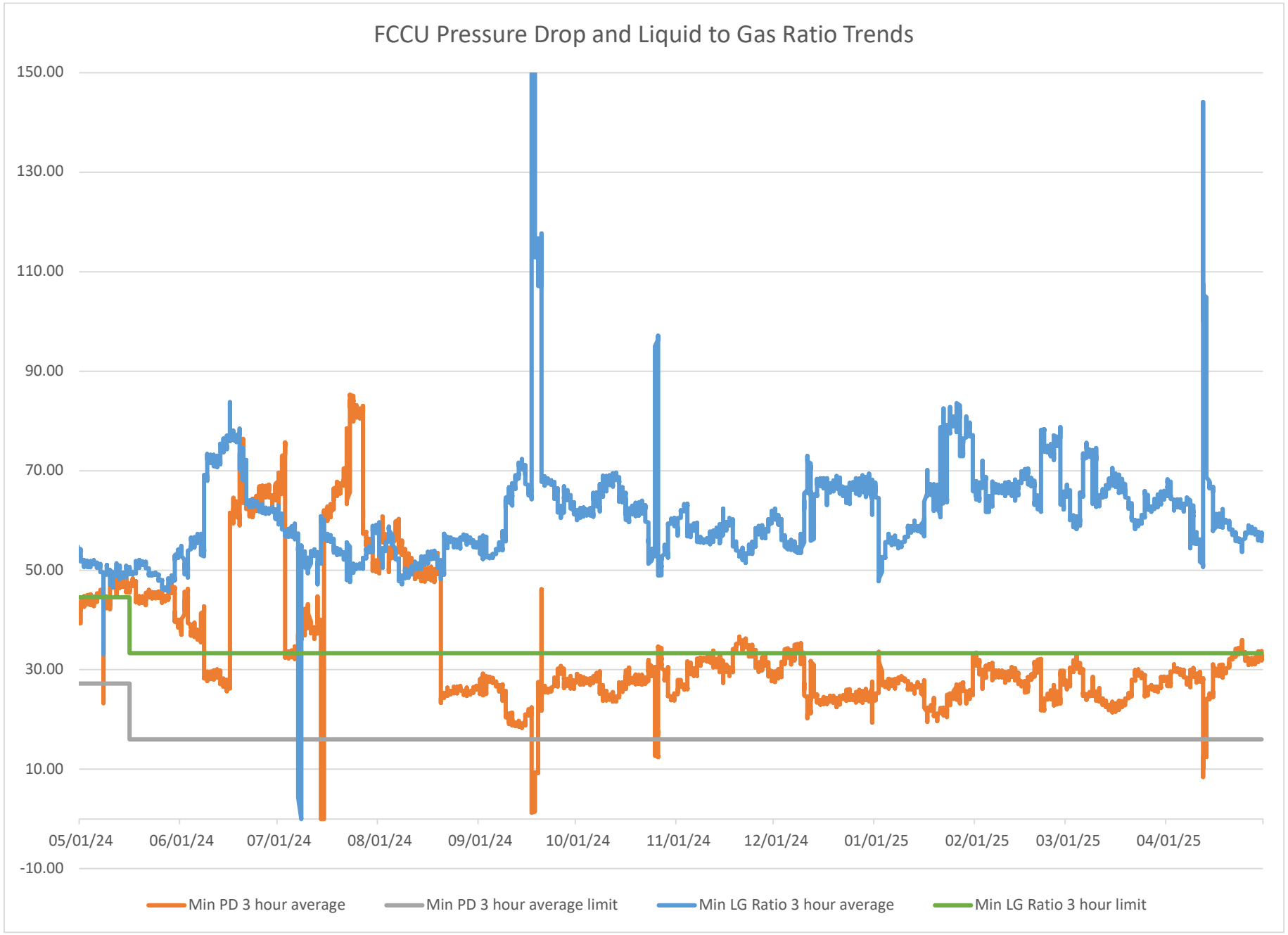
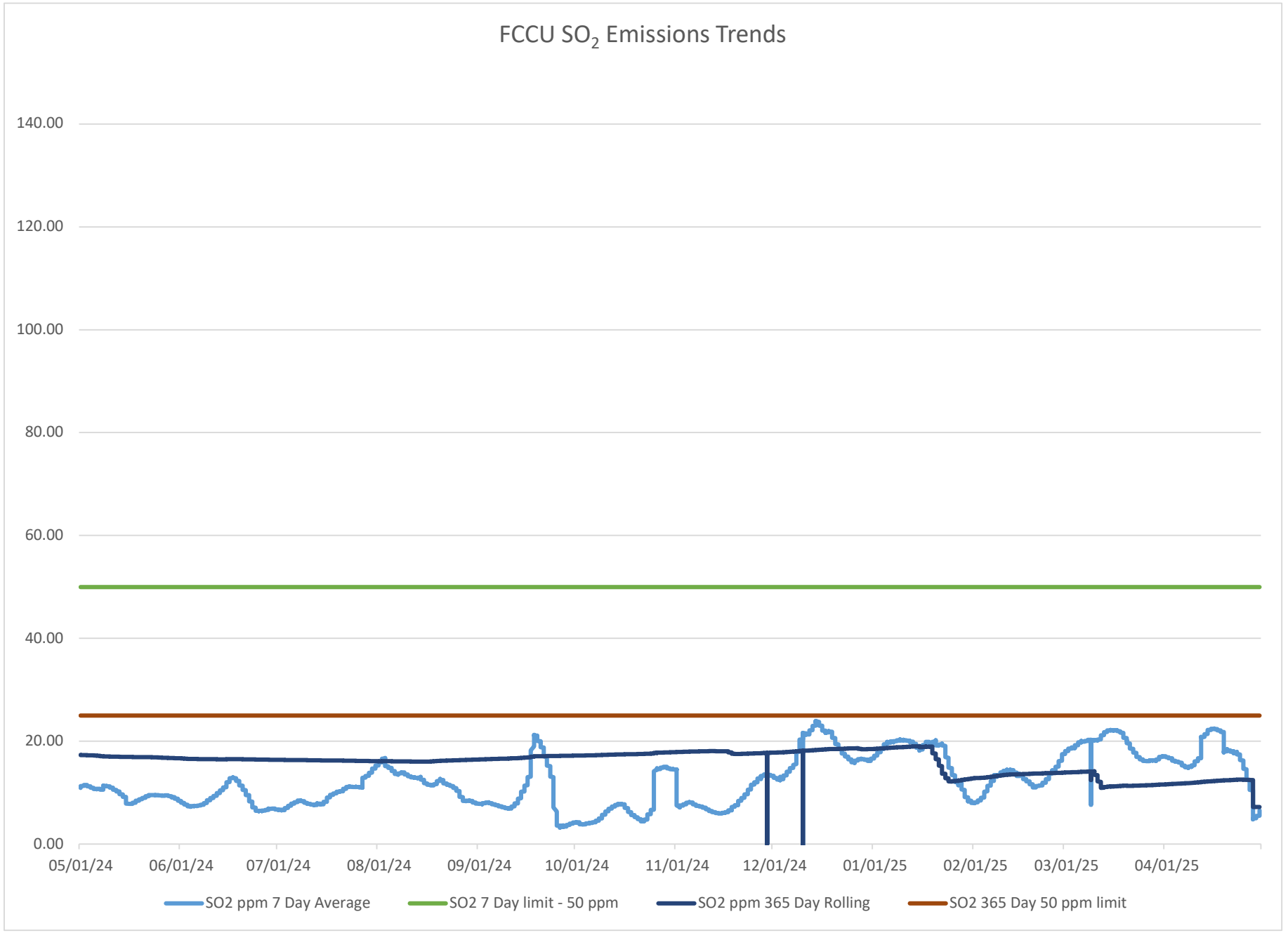
3/1/2025
4/1/2025
CO ppm 1 hour average
CO ppm 1 hour average limit
CO ppm 365 day average
CO ppm 365 day average limit


FCCU NOx Emission Trends
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
05/01/24
06/01/24
07/01/24
08/01/24
09/01/24
10/01/24
11/01/24
12/01/24
01/01/25
02/01/25
03/01/25
04/01/25
NOx ppm 7 day average
NOx ppm 7 day average limit
NOx ppm 365 day average
NOx ppm 365 day average limit


FCCU Pressure Drop and Liquid to Gas Ratio Trends
150.00
130.00
110.00
90.00
70.00
50.00
30.00
10.00
-10.00
05/01/24
06/01/24
07/01/24
08/01/24
09/01/24
10/01/24
11/01/24
12/01/24
01/01/25
02/01/25
03/01/25
04/01/25
Min PD 3 hour average
Min PD 3 hour average limit
Min LG Ratio 3 hour average
Min LG Ratio 3 hour limit


FCCU SO_2 Emissions Trends
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
05/01/24
06/01/24
07/01/24
08/01/24
09/01/24
10/01/24
11/01/24
12/01/24
01/01/25
02/01/25
03/01/25
04/01/25
SO2 ppm 7 Day Average
SO2 7 Day limit - 50 ppm
SO2 ppm 365 Day Rolling
SO2 365 Day 50 ppm limit

Appendix 6

Heaters and Boilers NOx Control Plan

TotalEnergies

United States of America

TotalEnergies Petrochemicals & Refining USA, Inc.

Refining & Chemicals

FEDERAL EXPRESS

March 28, 2024

Chief
Environmental Enforcement Section
Environmental and Natural Resources Division
U.S. Department of Justice
950 Pennsylvania Ave NW
Ben Franklin Station
Washington, D.C. 20530-0001
Reference Case No. 90-5-2-1-08283/3

RE: Annual Update to Appendix A
Consent Decree Reference Case No. 90-5-2-1-08283/3
TotalEnergies Petrochemicals and Refining USA, Inc.
Port Arthur Refinery, Port Arthur, Texas

To Whom It May Concern:

Pursuant to Section V.F., Paragraph 22 of the above-referenced Consent Decree, TotalEnergies Petrochemicals & Refining USA, Inc. hereby submits the annual update to Appendix A of the referenced Consent Decree. During the 2023 calendar year, there were no changes to the initial inventory of Covered Heaters and Boilers.

Upon the submittal of this certification, I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and that I have made a diligent inquiry of those individuals immediately responsible for obtaining the information and that to the best of my knowledge and belief, the information submitted herewith is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

If you have any questions or comments, please contact Connie Howard, Environmental Engineering Advisor, at (409) 985-0377.

Sincerely,

Isaac Bankole
Environmental Compliance and Assurance Superintendent – Port Arthur Refinery
TotalEnergies Petrochemicals & Refining USA, Inc.

ATTACHMENTS

TotalEnergies

cc:

ELECTRONIC COPY

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U.S. Environmental Protection Agency
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Washington, D.C. 20460-0001

FEDERAL EXPRESS

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Office of Civil Enforcement
c/o Matrix New World Engineering, Inc.
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HOUS-NRI-CONSENT-DECREE-CORRESPONDENCE

TotalEnergies Petrochemicals & Refining USA, Inc.
Port Arthur Refinery
APPENDIX A
Initial Inventory of Covered Heaters and Boilers
Annual Update for Calendar Year 2023 - Submitted March 28, 2024

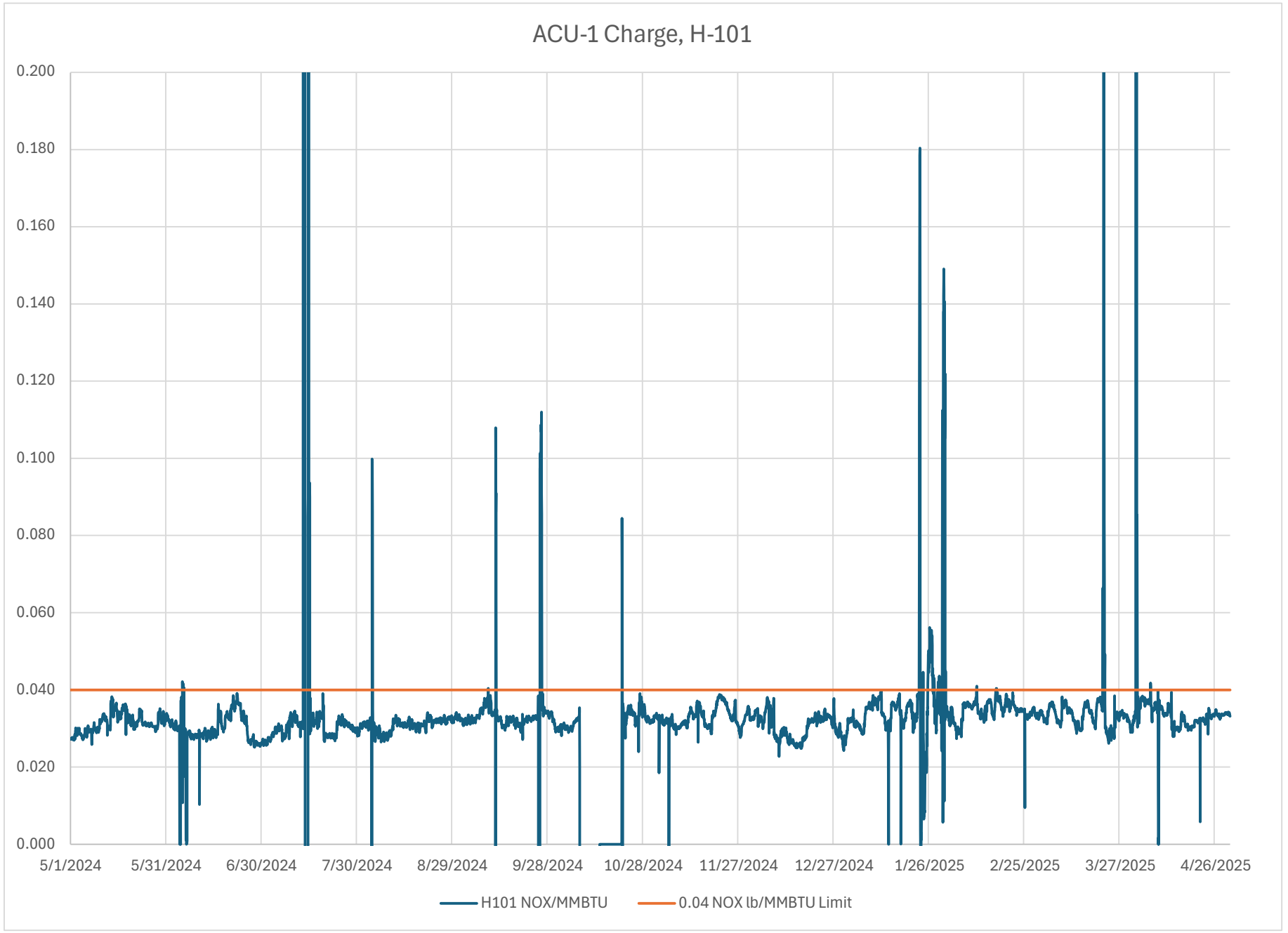
Unit	Source Type	Emission Point Number (EPN)	Description	Current NOx Limit (lb/MMBtu)	CEM Equipped and Operational	Heat Input Capacity (MMBtu/hr)	Source for Heat Input Capacity
No. 1 Crude	Heater	01ACU1H101	ACU-1 Charge, H-101[2]	0.040	Y	145.00	TCEQ Table 6 - Heaters and Boilers (Submitted with Permit Package)
No. 2 Crude	Heater	02ACU2H201	ACU-2 Charge, H-201[2]	0.030	Y	129.00	TCEQ Table 6 - Heaters and Boilers (Submitted with Permit Package)
No. 1 Crude	Heater	01ACU1202A	ACU-1 Charge, H-202A	0.060	Y	187.00	Attachment A - Heater Maximum Firing Rate (Special Conditions - Permit Numbers 46396, PSDTX1073M1, and N044) December 8, 2014
No. 1 Crude	Heater	01ACU1202B	ACU-1 Charge, H-202B	0.060	Y	187.00	Attachment A - Heater Maximum Firing Rate (Special Conditions - Permit Numbers 46396, PSDTX1073M1, and N044) December 8, 2014
Vacuum Distillation Unit 1	Heater	01 VACTH301	VDU-1 Charge, H-301[2]	0.030	Y	105.00	TCEQ Table 6 - Heaters and Boilers (Submitted with Permit Package)
Demex	Heater	10DEMEXH-2	DEMEX Asphalt, 3H-2	0.035	N	70.00	Attachment A - Heater Maximum Firing Rate (Special Conditions -Permit Numbers 46396, PSDTX1073M1, and N044) December 8, 2014
Demex	Heater	10DEMEXH-4	DEMEX DMO Phase, 3H-4[2]	0.035	N	98.00	Attachment A - Heater Maximum Firing Rate (Special Conditions -Permit Numbers 46396, PSDTX1073M1, and N044) December 8,2014
Unibon	Heater	13UNTBH301	Unibon Charge, 13H-1	0.030	Y	100.00	TCEQ Table 6 - Heaters and Boilers (Submitted with Permit Package)
NHT 1	Heater	17NHTHTRS	NHT 17H-101[2]	0.030	N	56.60	Attachment A - Heater Maximums Firing Rate (Special Conditions - Permit Numbers 46396, PSDTX1073M1, and N044) December 8, 2014
NHT 1	Heater	17NHTHTRS	NHT 17H-102[2]	0.030	N	69.00	Attachment A - Heater Maximum Firing Rate (Special Conditions - Permit Numbers 46396, PSDTX1073M1, and N044) December 8, 2014
Reformer	Heater	17NHTHTRS	Reformer Charge 1[1,2]	0.033	Y	127.16	Attachment A - Heater Maximum Firing Rate (Special Conditions - Permit Numbers 46396, PSDTX1073M1, and N044) December 8, 2014
Reformer	Heater	171411THTRS	Reformer Charge 2 [1,2]	0.033	Y	144.12	Attachment A - Heater Maximum Firing Rate (Special Conditions -Permit Numbers 46396, PSDTX1073M1, arid NO44) December 8, 2014
Reformer	Heater	17NHTHTRS	Reformer Charge 3 [1,2]	0.033	Y	79.52	Attachment A - Heater Maximum Firing Rate (Special Conditions - Permit Numbers 46396, PSDTX1073M1, and N044) December 8, 2014
Reformer	Heater	17NHTHTRS	Reformer Charge 4 [1,2]	0.033	Y	56.21	Attachment A - Heater Maximum Firing Rate (Special Conditions -Permit Numbers 46396, PSDTX1073M1, and N044) December 8, 2014
BTX	Heater	04BTXH-53	Xylene Trim Heater, 4H-53	0.060	N	65.00	Attachment A- Heater Maximum Firing Rate (Special Conditions -Permit Numbers 46396, PSDTX1073M1, and N044) December 8, 2014
BTX	Heater	04BTX11-52	Toluene Trim Heater, 4H-52	0.060	N	63.00	Attachment A - Heater Maximum Firing Rate (Special Conditions - Permit Numbers 46396, PSDTX1073M1, and N044) December 8, 2014
DHT 1	Heater	51DHT1H-1	DHT Charge, 51H-1	0.040	N	46.44	TCEQ Table 6 - Heaters and Boilers (Submitted with Permit Package)
DHT 2	Heater	52DHT2H-1	DHT-2 Charge, 52H-1	0.035	N	46.45	TCEQ Table 6 - Heaters and Boilers (Submitted with Permit Package)
DHT 2	Heater	52DHT2H-2	DHT-2 Florida, 52H-2	0.035	N	52.63	TCEQ Table 6 - Heaters and Boilers (Submitted with Permit Package)
Condensate Splitter	Heater	40CSPLTH-1	Condensate Splitter H-1	0.050	Y	230.00	TCEQ Table 6 – Heaters and Boilers (Submitted with Permit Package) February 3 2012
Utility	Boiler	61BLRH300	Boiler H-300 [3]	0.035	Y	249.00	TCEQ Table 6 -Heaters and Boilers (Submitted with Permit Package)
Utility	Boiler	61BLRH350	Boiler H-350 [3]	0.035	Y	249.00	TCEQ Table 6 - Heaters and Boilers (Submitted with Permit Package)

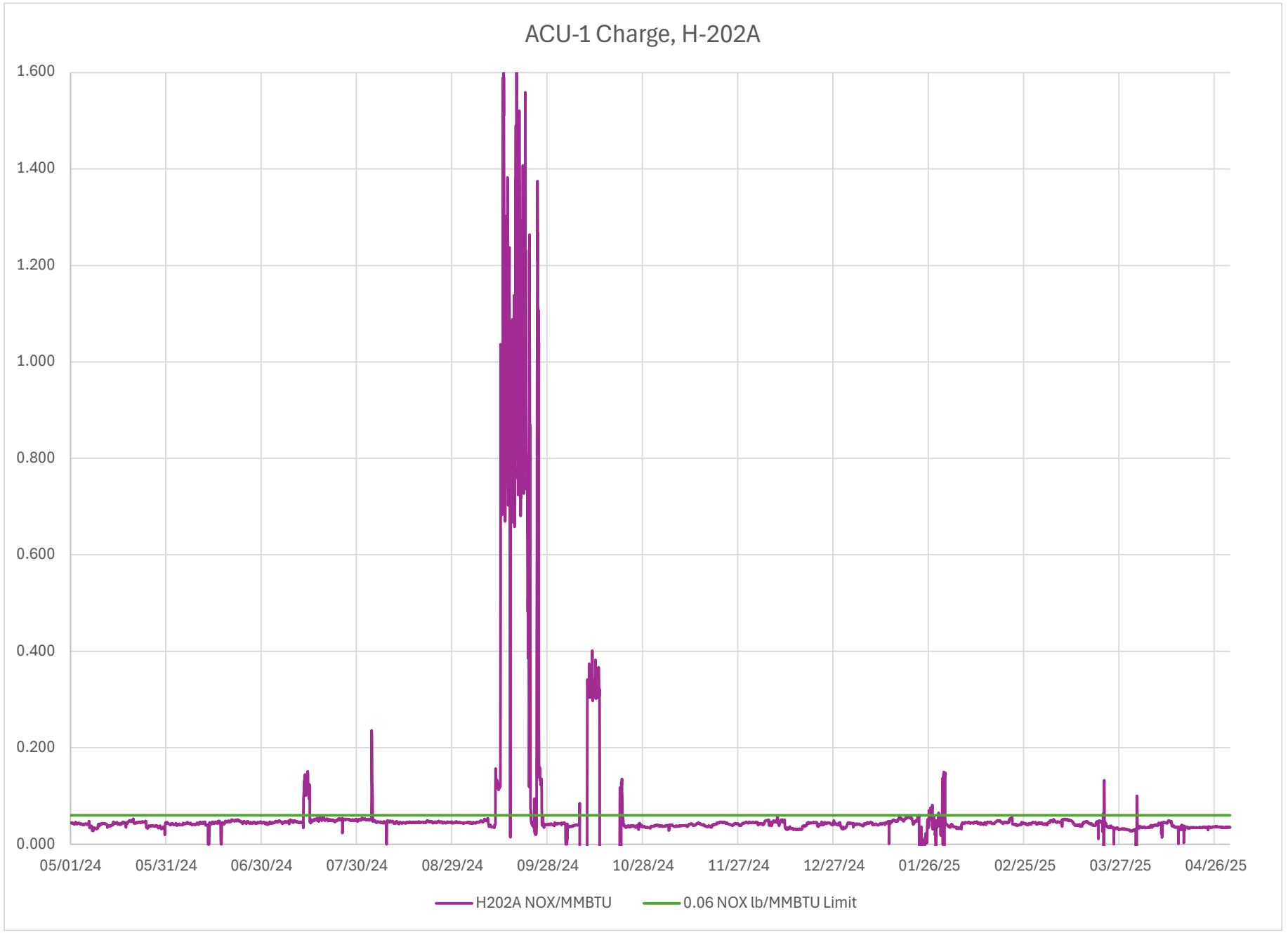
[1] Heaters routed to common stack - CEMS on common stack.
[2]NOx Controls proposed on heaters for netting on NSR Permit (NN067) submitted on June 20, 2006, to the EPA/TCEQ. TotalEnergies may use 106 tons or less of offsets from NOx emissions from these heaters for the offsets required by NSR Permit application 6N067 should a permit be issued under that application or under another application for the same project.
[3] Boilers routed to common stack - CEMS on common stack.

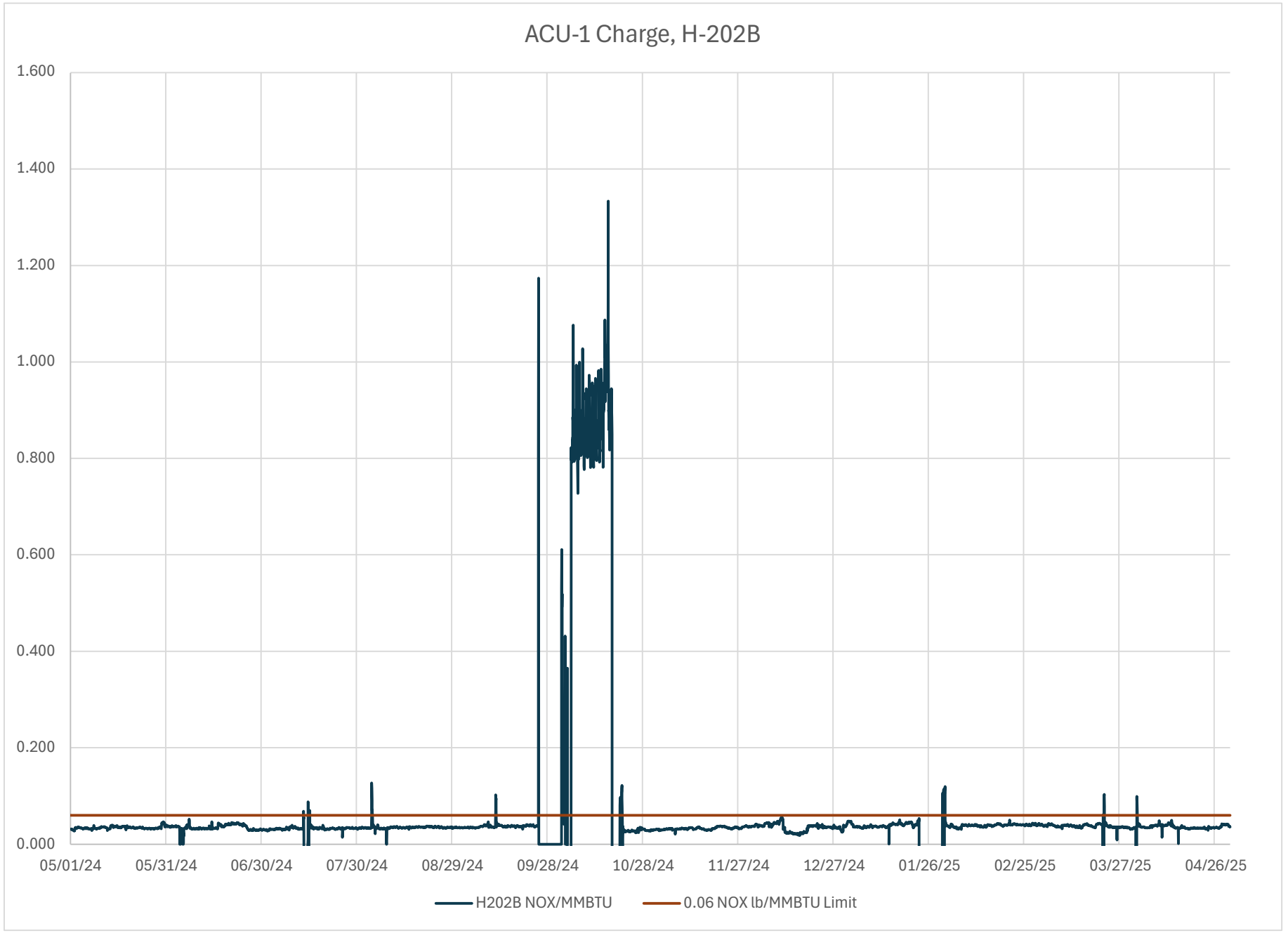
There were no changes to the initial inventory of Covered Heaters and Boilers during calendar year 2023.

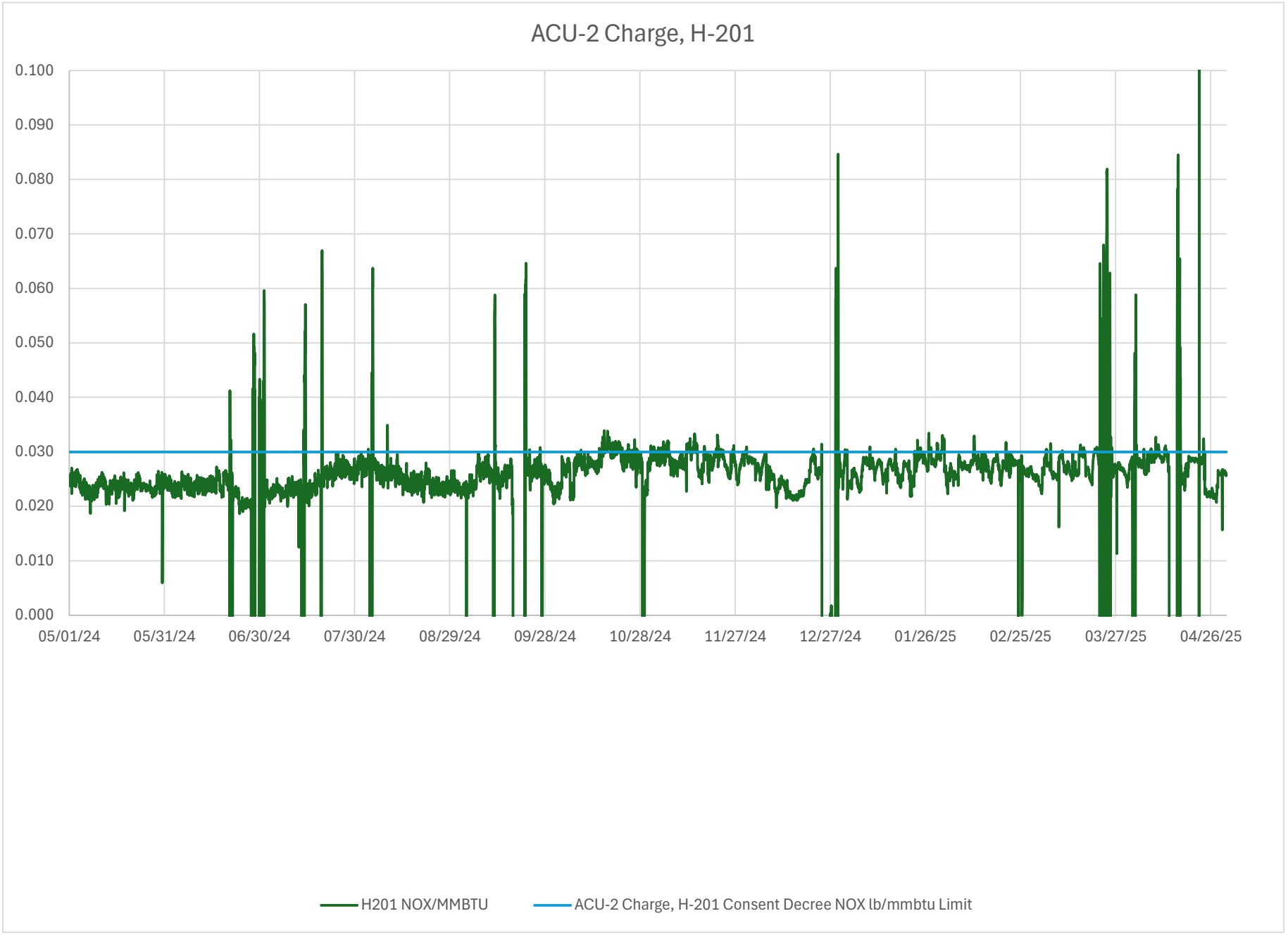
Appendix 7

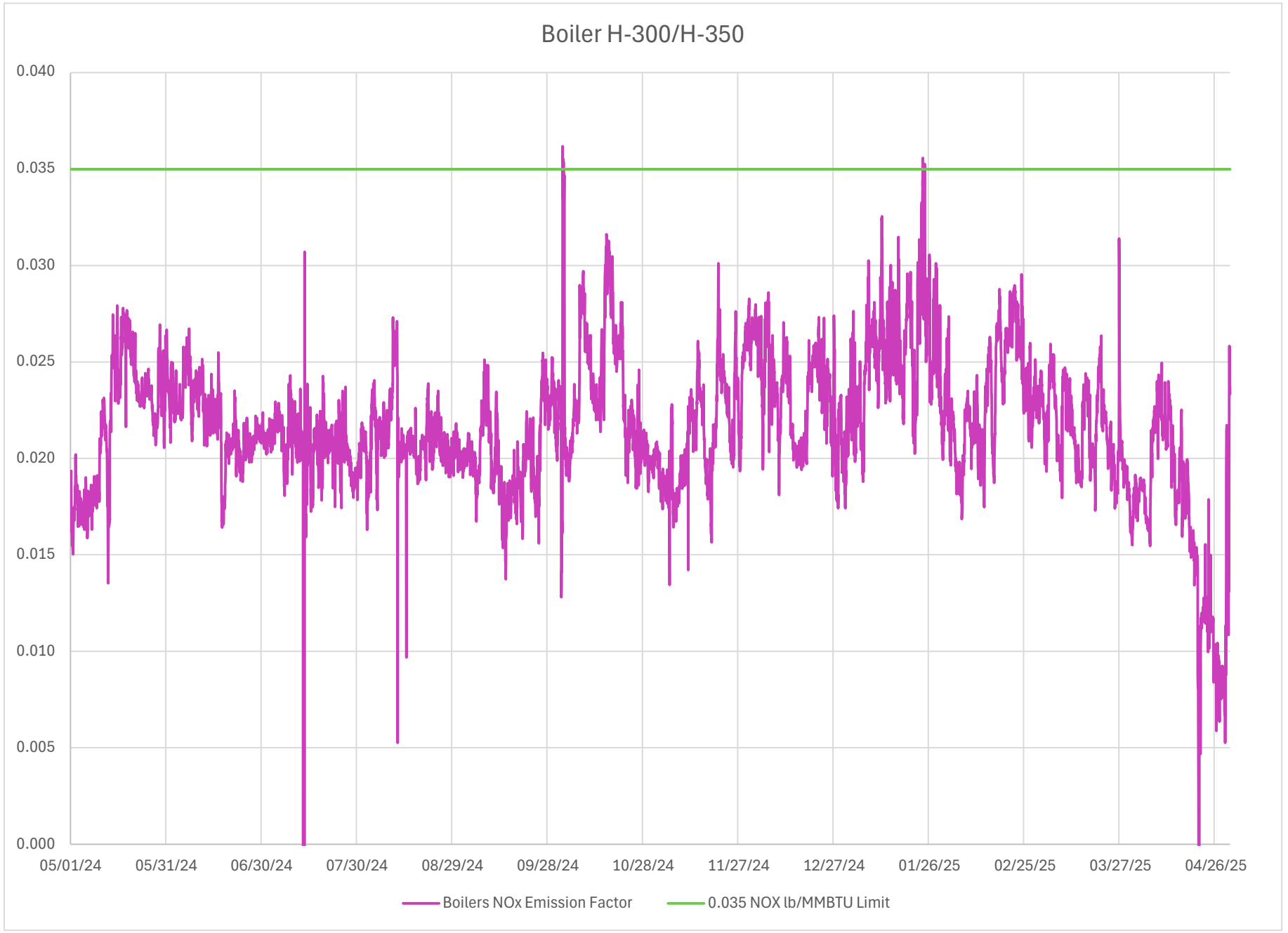
Heaters and Boilers NOx Trends

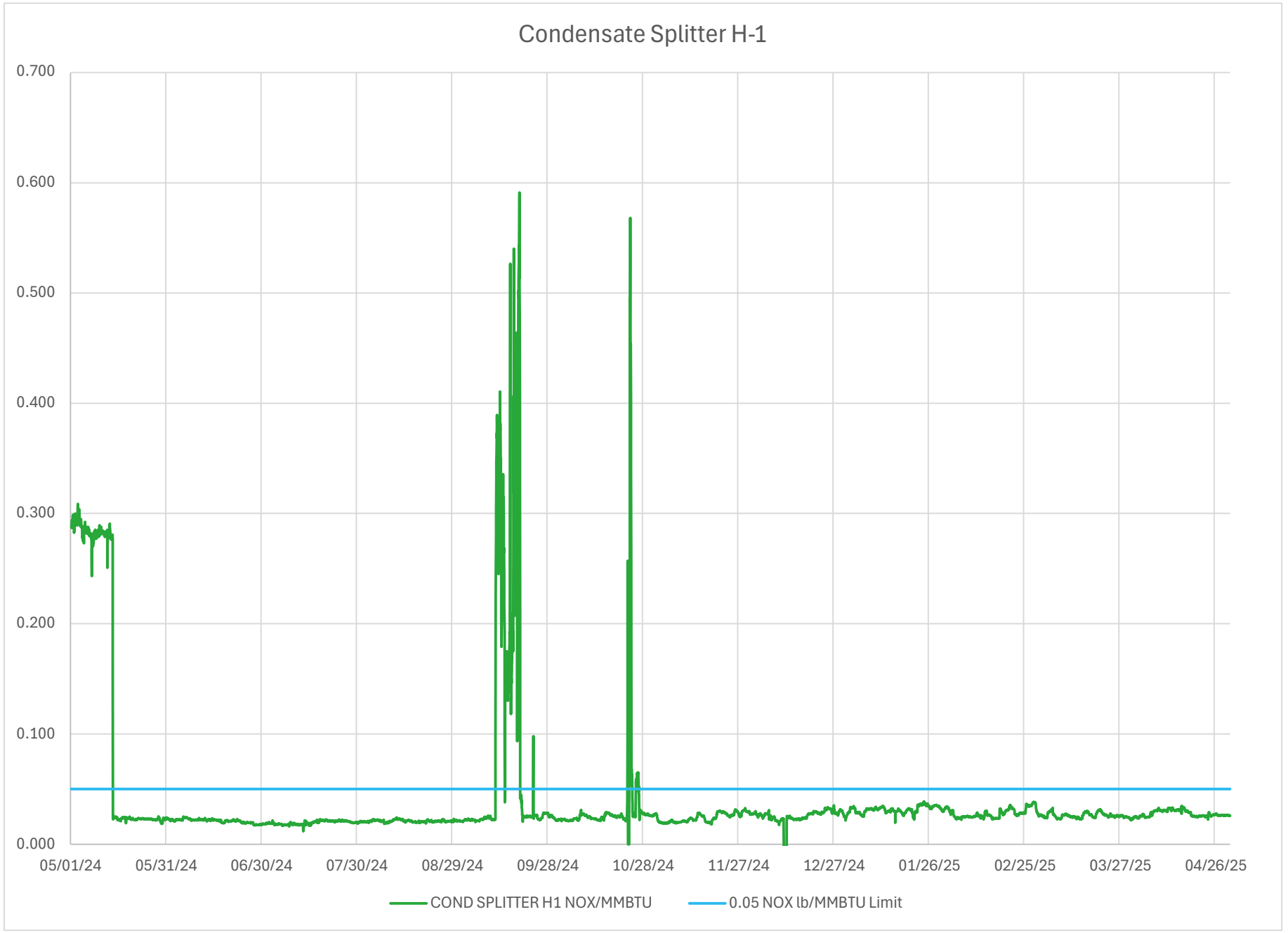

ACU-1 Charge, H-101
0.200
0.180
0.160
0.140
0.120
0.100
0.080
0.060
0.040
0.020
0.000
5/1/2024
5/31/2024
6/30/2024
7/30/2024
8/29/2024
9/28/2024
10/28/2024
11/27/2024
12/27/2024
1/26/2025
2/25/2025
3/27/2025
4/26/2025
H101 NOX/MMBTU
0.04 NOX lb/MMBTU Limit

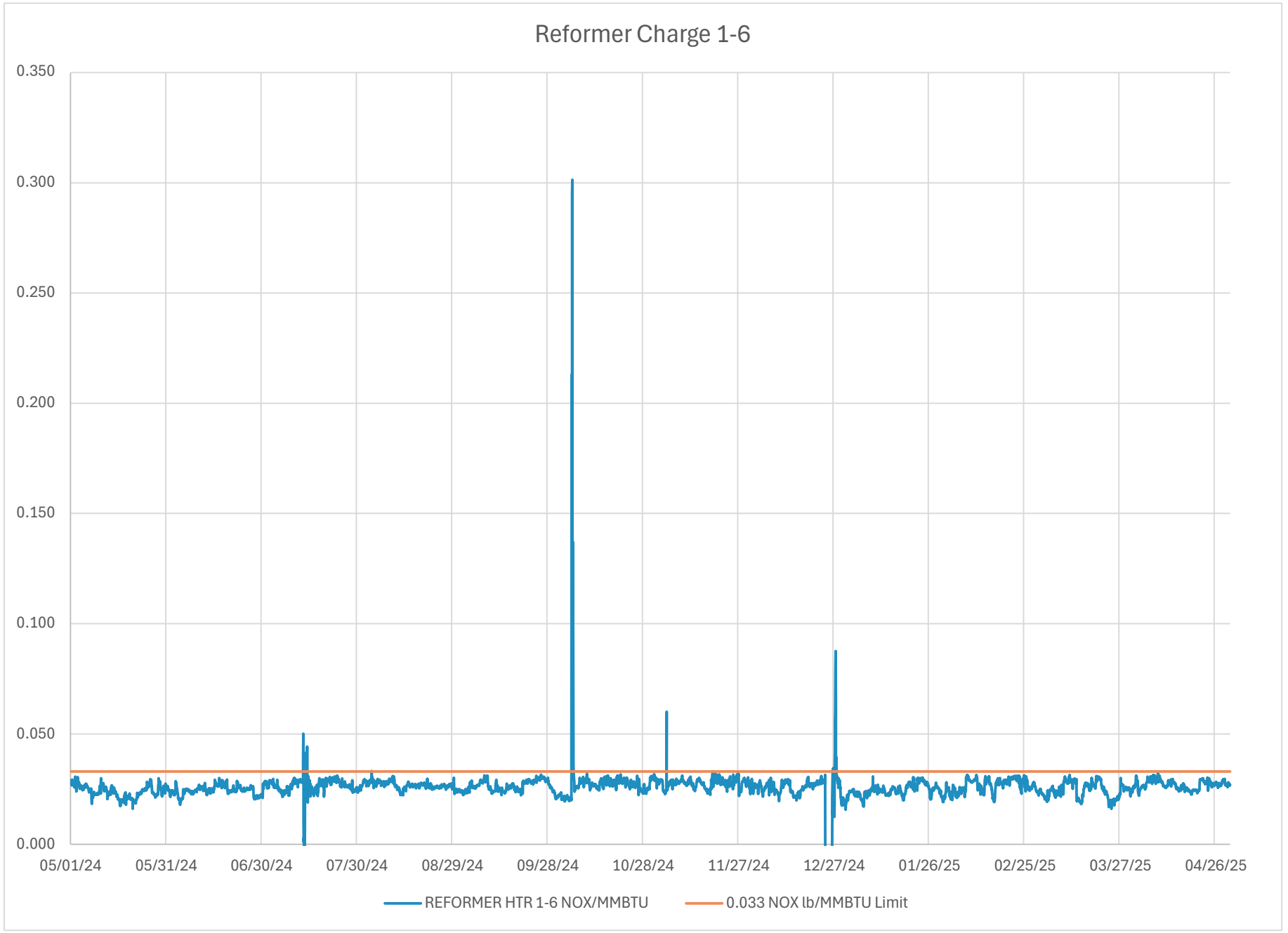

ACU-1 Charge, H-202A
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
05/01/24
05/31/24
06/30/24
07/30/24
08/29/24
09/28/24
10/28/24
11/27/24
12/27/24
01/26/25
02/25/25
03/27/25
04/26/25
H202A NOX/MMBTU
0.06 NOX lb/MMBTU Limit

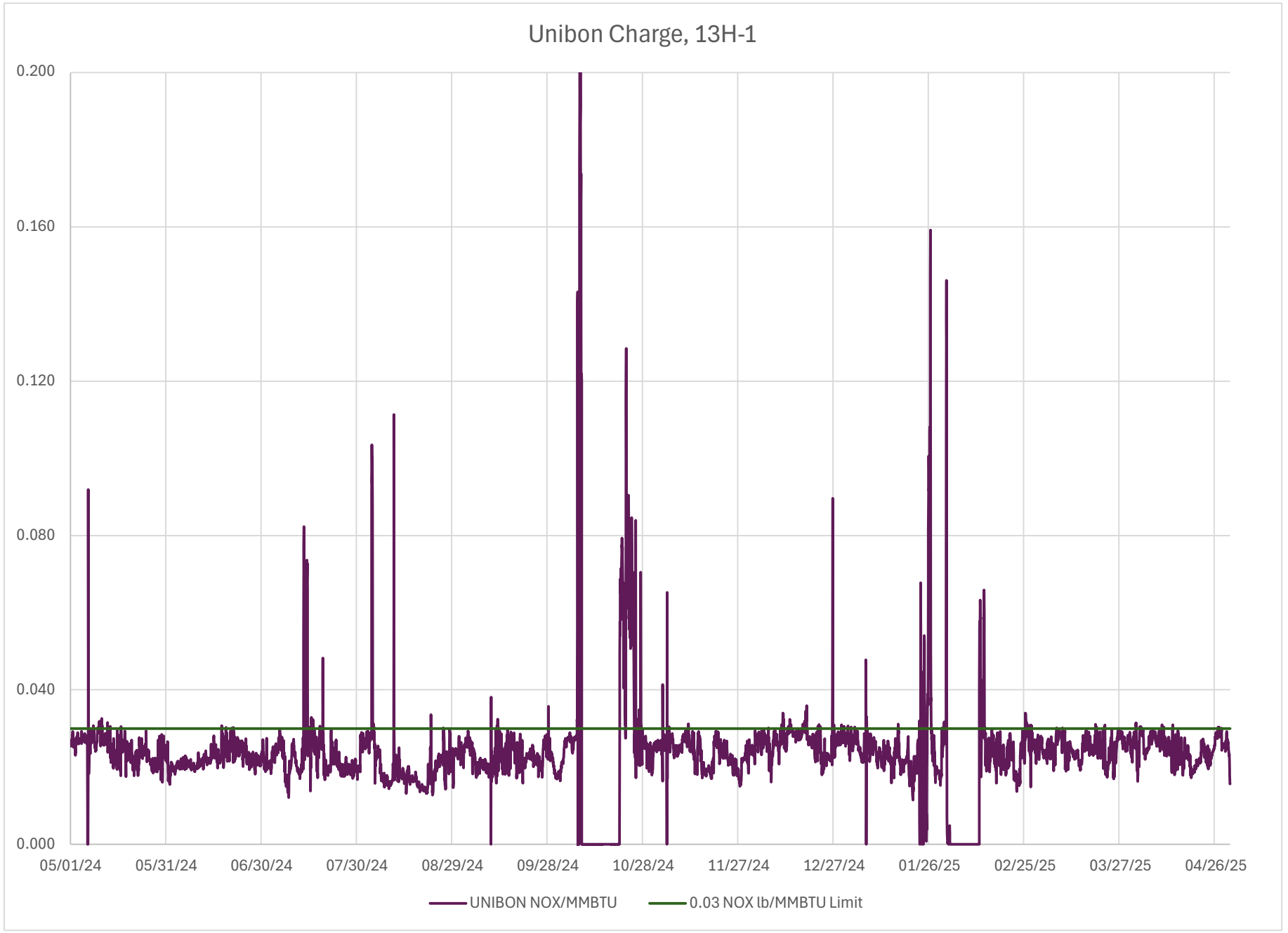

ACU-1 Charge, H-202B
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
05/01/24
05/31/24
06/30/24
07/30/24
08/29/24
09/28/24
10/28/24
11/27/24
12/27/24
01/26/25
02/25/25
03/27/25
04/26/25
H202B NOX/MMBTU
0.06 NOX lb/MMBTU Limit

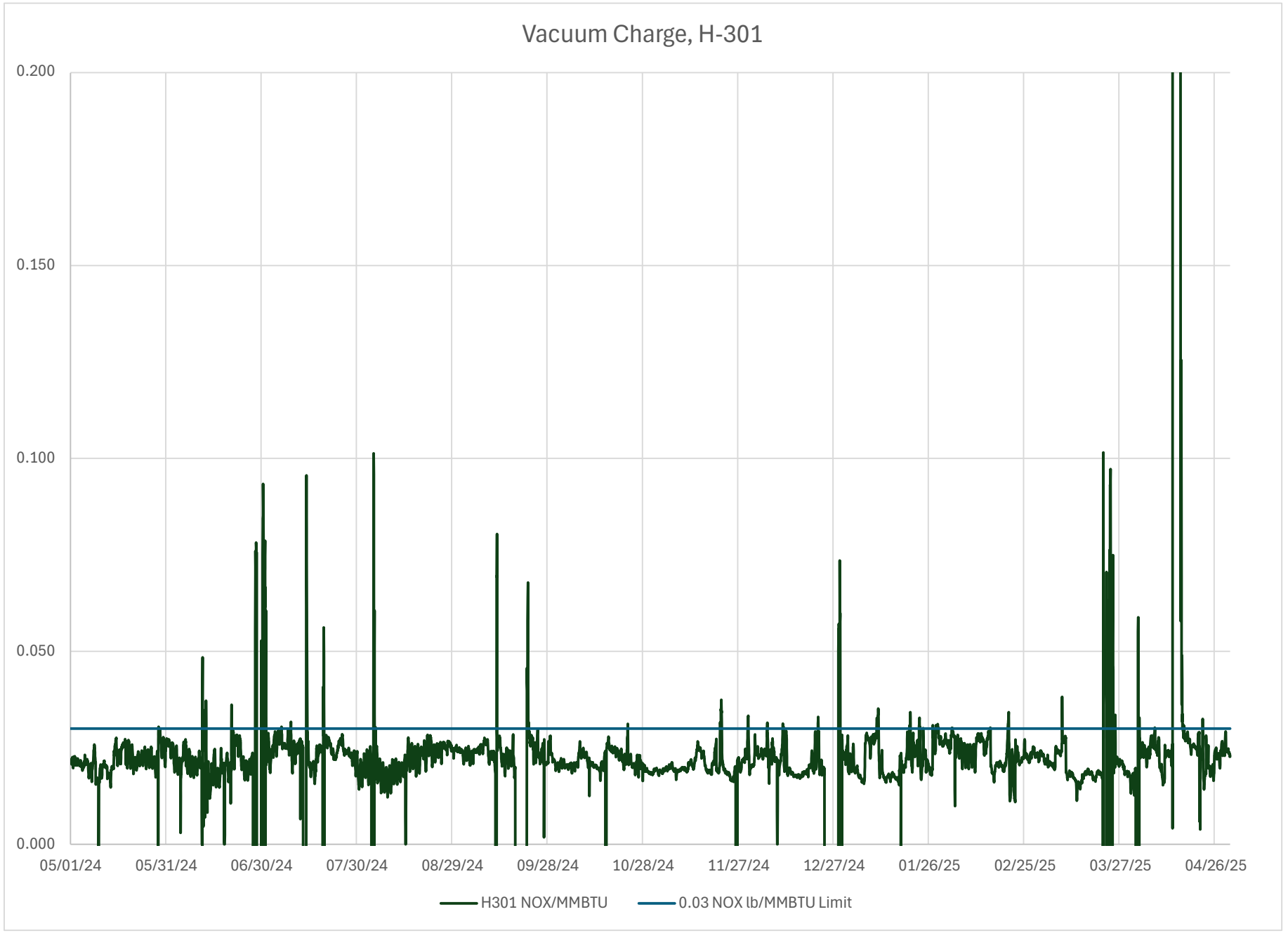

ACU-2 Charge, H-201
0.100
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
05/01/24
05/31/24
06/30/24
07/30/24
08/29/24
09/28/24
10/28/24
11/27/24
12/27/24
01/26/25
02/25/25
03/27/25
04/26/25
H201 NOX/MMBTU
ACU-2 Charge, H-201 Consent Decree NOX lb/mmbtu Limit


Boiler H-300/H-350
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
05/01/24
05/31/24
06/30/24
07/30/24
08/29/24
09/28/24
10/28/24
11/27/24
12/27/24
01/26/25
02/25/25
03/27/25
04/26/25
Boilers NOx Emission Factor
0.035 NOX lb/MMBTU Limit


Condensate Splitter H-1
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
05/01/24
05/31/24
06/30/24
07/30/24
08/29/24
09/28/24
10/28/24
11/27/24
12/27/24
01/26/25
02/25/25
03/27/25
04/26/25
COND SPLITTER H1 NOX/MMBTU
0.05 NOX lb/MMBTU Limit

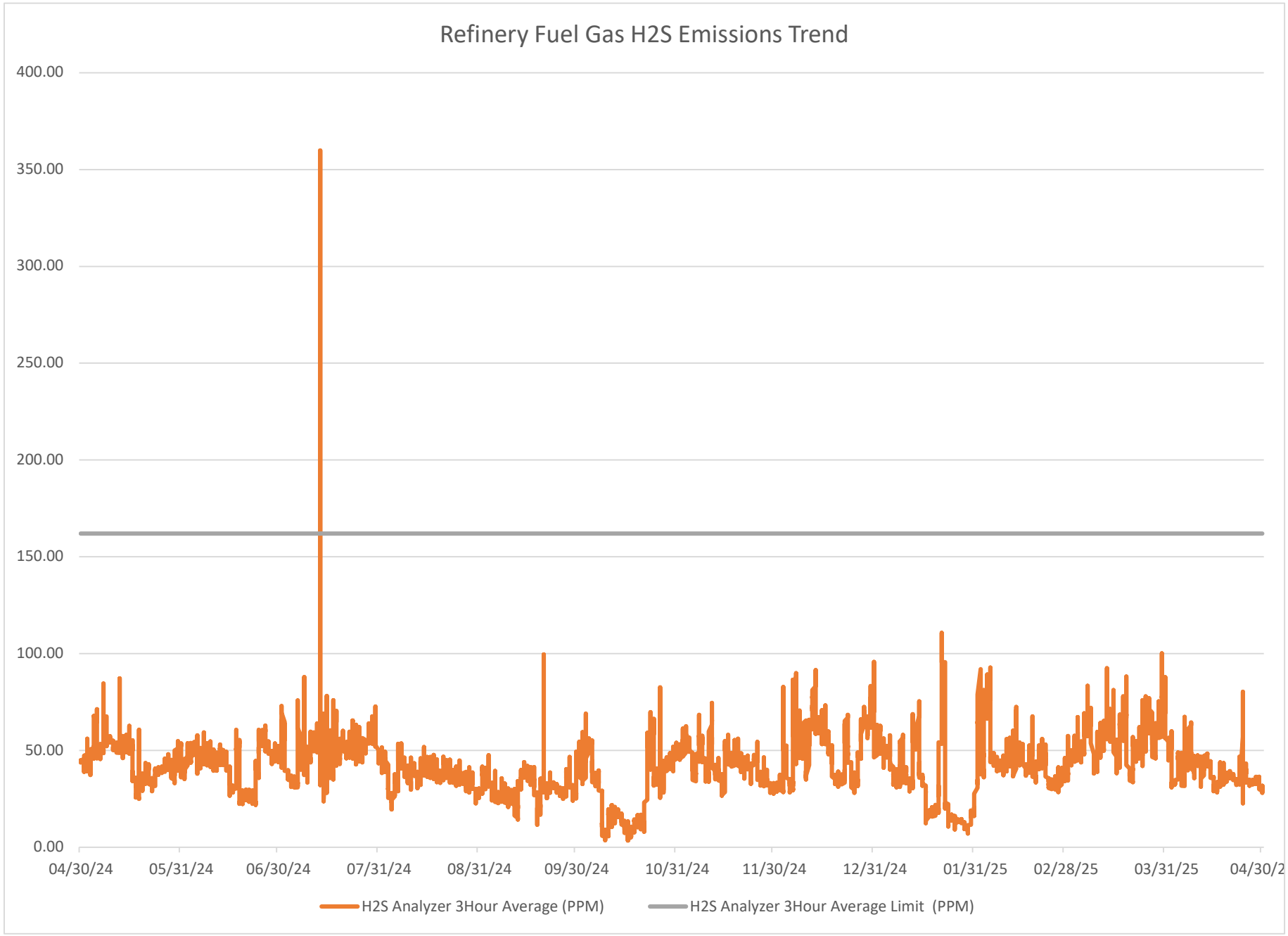

Reformer Charge 1-6
0.350
0.300
0.250
0.200
0.150
0.100
0.050
0.000
05/01/24
05/31/24
06/30/24
07/30/24
08/29/24
09/28/24
10/28/24
11/27/24
12/27/24
01/26/25
02/25/25
03/27/25
04/26/25
REFORMER HTR 1-6 NOX/MMBTU
0.033 NOX lb/MMBTU Limit


Unibon Charge, 13H-1
0.200
0.160
0.120
0.080
0.040
0.000
05/01/24
05/31/24
06/30/24
07/30/24
08/29/24
09/28/24
10/28/24
11/27/24
12/27/24
01/26/25
02/25/25
03/27/25
04/26/25
UNIBON NOX/MMBTU
0.03 NOX lb/MMBTU Limit


Vacuum Charge, H-301
0.200
0.150
0.100
0.050
0.000
05/01/24
05/31/24
06/30/24
07/30/24
08/29/24
09/28/24
10/28/24
11/27/24
12/27/24
01/26/25
02/25/25
03/27/25
04/26/25
H301 NOX/MMBTU
0.03 NOX lb/MMBTU Limit

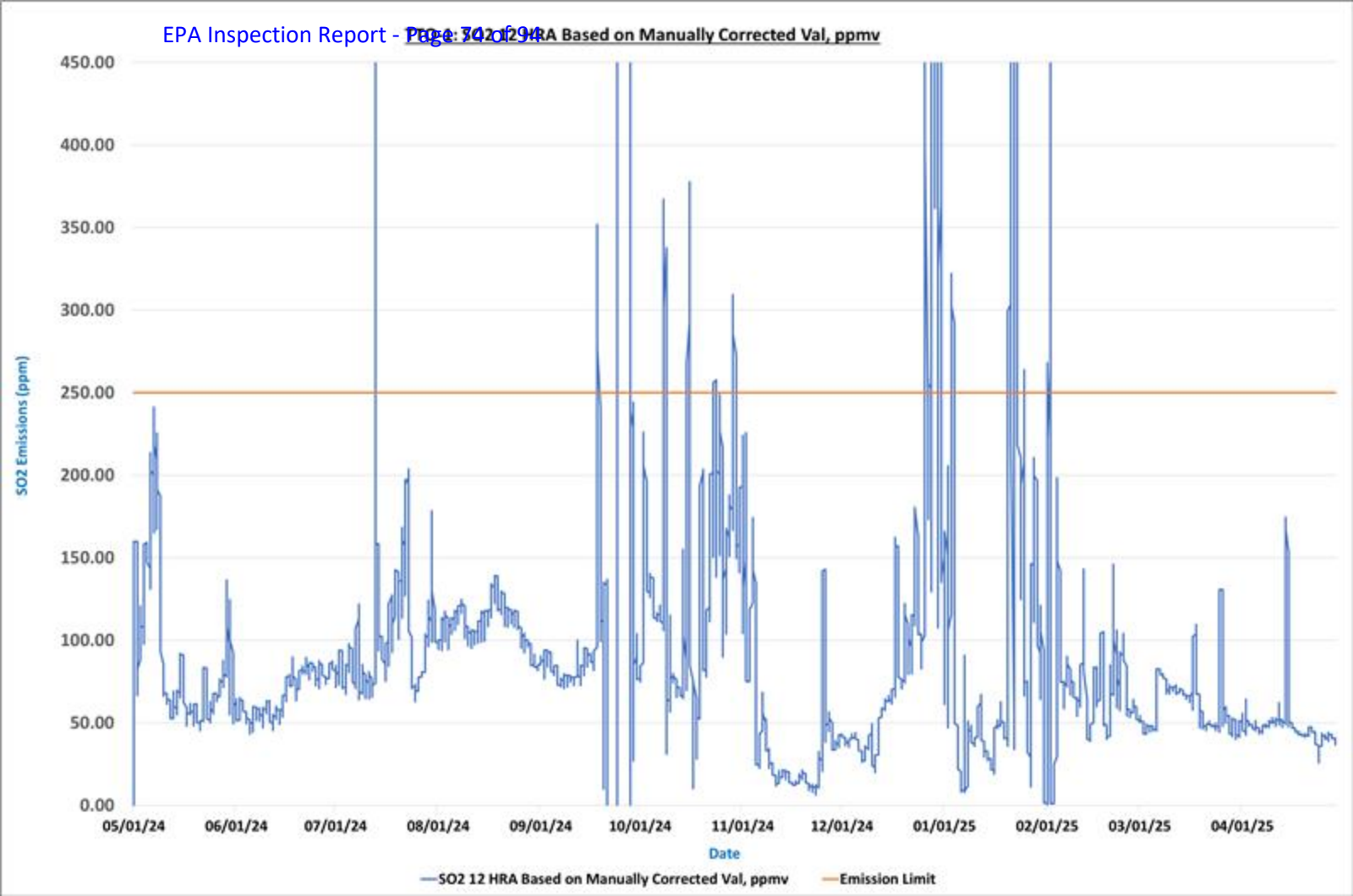
Appendix 8

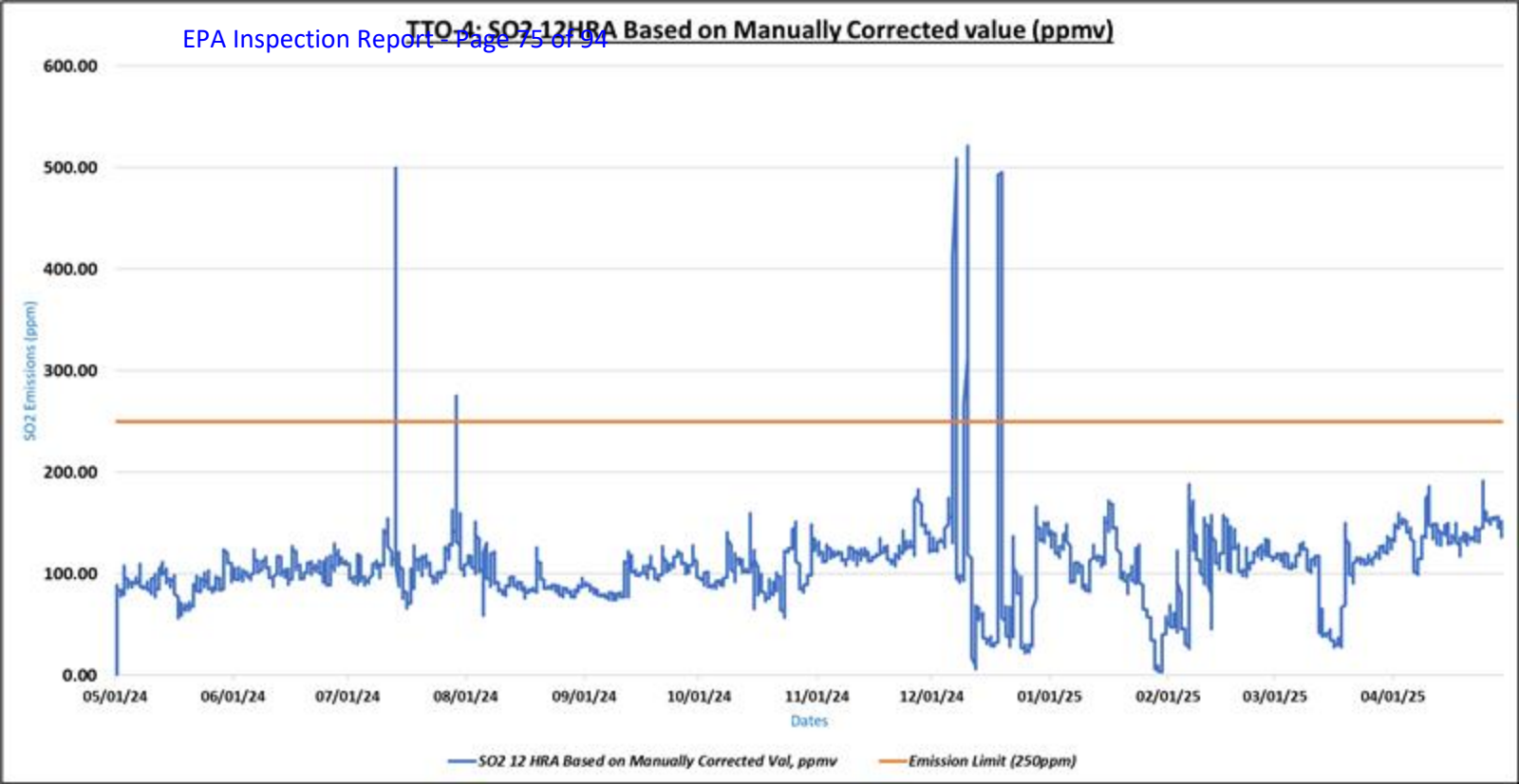
Refinery Fuel Gas H_2S Trends

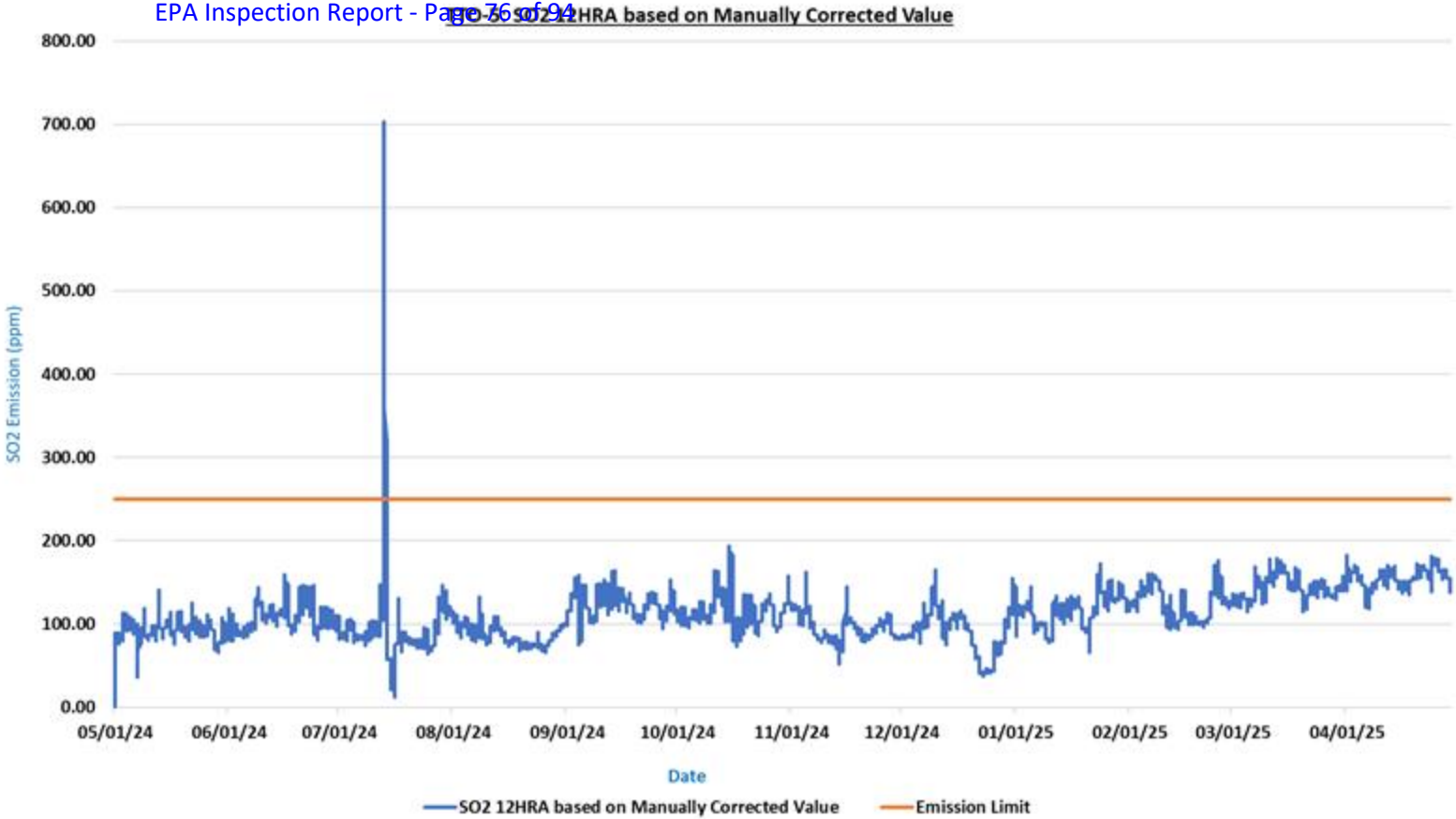

Refinery Fuel Gas H2S Emissions Trend
400.00
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
04/30/24
05/31/24
06/30/24
07/31/24
08/31/24
09/30/24
10/31/24
11/30/24
12/31/24
01/31/25
02/28/25
03/31/25
04/30/2
H2S Analyzer 3Hour Average (PPM)
H2S Analyzer 3Hour Average Limit (PPM)

Appendix 9

Sulfur Recovery Plants SO_2 Emission Trends


SO2 12 HRA Based on Manually Corrected Val, ppmv
450.00
400.00
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
SO2 Emissions (ppm)
05/01/24
06/01/24
07/01/24
08/01/24
09/01/24
10/01/24
11/01/24
12/01/24
01/01/25
02/01/25
03/01/25
04/01/25
Date
SO2 12 HRA Based on Manually Corrected Val, ppmv
Emission Limit


TTO-4: SO2 12HRA Based on Manually Corrected value (ppmv)
600.00
500.00
400.00
300.00
200.00
100.00
0.00
SO2 Emissions (ppm)
05/01/24
06/01/24
07/01/24
08/01/24
09/01/24
10/01/24
11/01/24
12/01/24
01/01/25
02/01/25
03/01/25
04/01/25
Dates
SO2 12 HRA Based on Manually Corrected Val, ppmv
Emission Limit (250ppm)


SO2 12HRA based on Manually Corrected Value
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
SO2 Emission (ppm)
05/01/24
06/01/24
07/01/24
08/01/24
09/01/24
10/01/24
11/01/24
12/01/24
01/01/25
02/01/25
03/01/25
04/01/25
Date
SO2 12HRA based on Manually Corrected Value
Emission Limit

Appendix 10

BWON end-of-line Sampling Plan and Process Flow Diagram

Wastewater Collection and Treatment Process Flow Schematic and End-of-Line Sampling Plan

Consent Decree Reference Case No. 90-5-2-1-08283/3
TOTAL Petrochemicals USA, Inc
Port Arthur Refinery, Port Arthur, Texas

Revised June 22, 2011

TABLE OF CONTENTS

1 Introduction 1-1

2 Overview of the Refinery Process Wastewater Treatment Complex 2-1

2.1 §61.342(c)(1) Controlled Waste Streams 2-1
2.2 §61.342(e)(2) Uncontrolled Waste Streams 2-1
2.3 Major Features of the TOTAL PAR Process Wastewater Treatment Complex 2-2

3 Description of End –of-line sampling flow Schematic 3-1

4 End-of-Line Sampling Plan 4-1

4.1 End-of-Line Sampling Locations 4-1
- Point 1 – Tank 905 Sump 4-2
- Point 2 – East-Side of DAF Sump 4-2
- Point 3 – Wash Slab Sump 4-2
- Point 4 – PWTC 67T-301 Sump 4-2
- Point 5 – PWTC 67T-412 Sump 4-2
- Point 6 – PWTC 67P-414 Lab Sump 4-2
- Point 7 – Storm Water Return Pumps Sample Line 4-2
- Point 8 - Solid Liquids Separation Unit Sump 4-2
- Point 9 – North CPI Sludge 4-2
- Point 10 – South CPI Sludge 4-2
- Point 11 – GHT-1 Manway (temporary sample point) 4-2

4.2 End-of-Line Benzene Quantity Calculation 4-2
4.3 Detailed Description of EOL Sampling Locations 4-4
4.3.1 Point 1 – Tank 905 Sump 4-4
4.3.2 Point 2 – East-Side DAF Sump 4-4
4.3.3 Point 3 – Wash Slab Sump 4-4
4.3.4 Point 4 – PWCT 67T-301 Sump 4-4
4.3.5 Point 5 – PWTC 67T-412 Sump 4-4
4.3.6 Point 6 – PWTC 67P-414 Lab Sump 4-4
4.3.7 Point 7 – Storm Water Return Pumps Sample Line 4-4
4.3.1 Point 8 – Solid Liquids Separation Unit Sump 4-5
4.3.2 Point 9 – North CPI Sludge 4-5
4.3.1 Point 10 – South CPI Sludge 4-5

TABLE OF CONTENTS

4.3.2 Point 11 – GHT-1 Manway 4-5
4.4 Point of Generation Sampling.....4-5
4.4.1 Uncontrolled Waste Streams Greater Than 0.05 Mg/yr 4-6
4.5 Sampling Schedule and Methodology 4-6

Appendices

APPENDIX A Wastewater Collection and Treatment System Process Flow Schematic
APPENDIX B EOL Sampling flow Schematic

SECTION 1
INTRODUCTION

On November 9, 2007, pursuant to Paragraphs 82 and 83 of the Consent Decree, the TOTAL Petrochemicals USA, Inc. Port Arthur Refinery (TOTAL PAR), submitted its Benzene Waste Operations NESHAP End of Line Sampling Plan ("BWON Sampling Plan"). The BWON Sampling Plan identified seven (7) end-of-line (EOL) sampling points. TOTAL PAR began collecting samples from those sampling points in the 1st quarter 2008 and collected samples, and reported the results there from, for each calendar quarter since that time.

Effective June 30, 2011, TOTAL PAR completed installation of new vapor controls on underground sewer vents and other process sewer structures open to the atmosphere to reduce the quantity of benzene released to the atmosphere from uncontrolled waste water sources. Installation of these vapor controls has resulted in the need to establish new EOL sampling locations for measuring uncontrolled benzene quantities.

Pursuant to Paragraph 84 of the Consent Decree, TOTAL PAR is required to submit a revised BWON Sampling Plan to EPA for approval if changes in processes, operations, or other factors lead TOTAL to conclude that its approved BWON Sampling Plan may no longer provide an accurate measure of the Refinery's quarterly benzene quantity in uncontrolled benzene waste streams. Because the seven EOL sampling points are now on a controlled system, new EOL sampling points need to be identified to accurately quantify the uncontrolled benzene managed by the refinery. Accordingly, TOTAL PAR hereby submits this revised BWON Sampling Plan.

Included as Appendix A herein is the "Wastewater Collection and Treatment System" process flow diagram, which shows the previous end-of-line sampling points as now controlled. Also attached as Appendix B is a schematic titled "EOL Sampling Flow Schematic" that shows the newly established EOL sampling locations.

The descriptive overview of the TOTAL PAR wastewater collection and treatment system is provided in Section 2. A description of the color coding and nomenclature of the "Wastewater Collection and Treatment System" process flow diagram and EOL Sampling Flow Schematic is provided in Section 3. The EOL Sampling Plan is provided in Section 4.

SECTION 2
OVERVIEW OF THE REFINERY PROCESS WASTEWATER TREATMENT COMPLEX

The wastewater streams at TOTAL PAR are generally managed in one of three pretreatment systems: the North process wastewater system, South process wastewater system, and Benzene NESHAP Pretreatment. The refinery uncontrolled sewer systems manage wastes that are not controlled pursuant to the Benzene Waste Operations NESHAP (BWON). The NESHAP sewer system, controlled oil recovery system, and the recovered/slop oil tankage manage those waste streams that are required to be controlled pursuant to the requirements of the BWON.

Paragraph 62 of the TOTAL consent decree requires that TOTAL PAR comply with a reduced uncontrolled benzene quantity of 4.2 Mg/yr, according to the requirements of the 6 BQ compliance option. Therefore, each waste stream at TOTAL PAR was grouped into one of the two following categories to identify the method of compliance for that stream under the BWON.

- Streams managed in controlled waste management units [§61.342(c)(1)]
- Streams managed in uncontrolled waste management units that sum to less than 4.2 Mg/yr benzene (4.2 BQ) [§61.342(e)(2), Consent Decree Paragraph 62]

Streams selected as uncontrolled under the provisions of §61.342(e)(2) are identified on the Appendix B schematic. A detailed discussion of each of the three categories of waste streams at the TOTAL PAR is provided below.

2.1 §61.342(c)(1) Controlled Waste Streams

Organic and aqueous streams that have been chosen for control are managed in controlled waste management units (WMU). The aqueous wastes subject to §61.342(c)(1) are managed in controlled WMU up to the point where the benzene concentration is below 10 ppmw and the waste has reached the refinery's Enhanced Biodegradation Unit (EBU) as provided for in §61.348(b)(2). The organic (hydrocarbon) or hydrocarbon skim streams are generally managed in the recovered/slop oil tankage system. The recovered oil is managed in controlled WMU (i.e., tankage) prior to recycle pursuant to the requirements of §61.342(c)(1)(iii).

The greater than 10 ppmw streams that are managed in controlled WMU are comingled with streams with a benzene content of less than 10 ppmw and/or are not selected for control as provided by §61.348(e)(2) in order to facilitate management in the EBU.

2.2 §61.342(e)(2) Uncontrolled Waste Streams

Streams not selected for control under §61.342(c)(1) are not required to be managed in controlled WMUs as long as the total benzene quantity of these streams sums to 4.2 Mg/yr or less.

2.3 Major Features of the TOTAL PAR Process Wastewater Treatment Complex

The BWON compliance strategy at TOTAL PAR was to segregate and treat selected high-benzene containing waste streams and to control refinery slop oils in WMUs operated according to the requirements of the BWON.

Effective June 30, 2011, TOTAL PAR completed a project by which most of the streams associated with the BWON-uncontrolled refinery wastewater collection system contributing to the North Gravity Sewer[1] and the South Gravity Sewer[2] subsystems are now controlled. The remaining uncontrolled streams are now discrete EOL sample points and are identified in this plan.

[1] The North Gravity Sewer collects wastewater from the northern portion of the refinery which is sent to the North Corrugated Plate Interceptor (CPI) for initial oil separation. The North CPI recovered oil is sent to controlled slop tankage and the water is sent to the induced gas flotation units (IGFs) en route to biological treatment in the EBU.

[2] The South Gravity Sewer collects wastewater from the southern portion of the refinery and tank farm areas which is sent to the South CPIs for initial oil separation. The South CPI recovered oil is sent to controlled slop tankage and the water is also sent to the IGFs en route to biological treatment in the EBU.

SECTION 3
DESCRIPTION OF END –OF-LINE SAMPLING FLOW SCHEMATIC

The schematic, entitled “EOL Sampling Flow Schematic ” incorporated in Appendix B identifies the location of the waste streams (and associated WMU's) that are uncontrolled under the Benzene Waste Operations NESHAP (BWON).

SECTION 4
END-OF-LINE SAMPLING PLAN

The primary purpose of the schematic in Appendix B is to identify the locations of the uncontrolled waste streams that will be sampled under the new EOL Sampling Program. As discussed above, the BWON control strategy at TOTAL PAR is to remove waste streams that contain relatively high benzene concentrations and waste flows from the refinery's open sewer system. These waste streams are hard piped through controlled waste management units for oil removal prior to mixing with waste from the open sewer system to facilitate treatment in the EBU.

In addition, TOTAL PAR continues to operate recovered/slop oil tankage that collects refinery oily wastes from maintenance, blowdown, turnaround events, some vacuum truck movements, and other sources. The recovered oil system consists of hard piping to floating roof storage tanks that meet 40 CFR Part 60, Subpart Kb design standards. The waste management units within the recovered oil system are controlled per the BWON. The decanted oils from the recovered oil system are then returned to the refinery's crude unit for reprocessing. Therefore, the oils are no longer considered a waste under BWON per 40 CFR 61.342(c)(1)(iii). However, the water separated from the oils within the recovered oil system is sent to the closed (controlled) wastewater treatment system (referred to as the Benzene NESHAP Pretreatment System) for further oil recovery prior to biological treatment in the EBU.

The wastewaters in the open sewer system are considered controlled wastes because the refinery's individual drain systems now meet the control requirements of the BWON[3]. The EOL Sampling Plan quantifies the amount of wastes managed in the uncontrolled or open system and identifies "end-of-line" sampling locations to generate a total uncontrolled benzene quantity for the refinery.

4.1 End-of-Line Sampling Locations

TOTAL PAR proposes to establish eleven (11) new EOL sampling locations to replace the points sampled under the November 2007 sampling plan. Each new sampling location is denoted on the Appendix B schematic and identified by the following point numbers:

[3] The waste streams managed in the "open" system generally fall into two categories: (1) waste streams with less than 10 parts per million by weight (ppmw) benzene managed in uncontrolled management units [§61.342(c)(2)], and (2) waste streams with greater than 10 ppmw benzene managed in uncontrolled waste management units that sum to less than 4.2 Mg/yr benzene (4.2 BQ) [§61.342(c)(3)]. See Section 2 for a detailed discussion of these categories.

- **Point 1 – Tank 905 Sump**
- **Point 2 – East-Side of DAF Sump**
- **Point 3 – Wash Slab Sump**
- **Point 4 – PWTC[4] 67T-301 Sump**
- **Point 5 – PWTC 67T-412 Sump**
- **Point 6 – PWTC 67P-414 Lab Sump**
- **Point 7 – Storm Water Return Pumps Sample Line**
- **Point 8 - Solid Liquids Separation Unit Sump**
- **Point 9 – North CPI Sludge**
- **Point 10 – South CPI Sludge**
- **Point 11 – GHT-1 Manway (temporary sample point)**

Please note that Point 11 will be controlled upon receipt of the pressure vacuum safety valve (PVSV) in August 2011.

4.2 End-of-Line Benzene Quantity Calculation

Conceptually, the uncontrolled benzene mass balance (or EOL compliance determination) will be calculated as follows:

End-of-Line Uncontrolled Benzene Quantity =
$\sum (Q_{H2Oi} \times \rho_{H2O} \times C_{H2Oi}) + \sum (Q_{OILi} \times \rho_{OILi} \times C_{OILi})$

or, specifically:

$((Q_{H2O1} \times \rho_{H2O} \times C_{H2O1}) + (Q_{OIL1} \times \rho_{OIL1} \times C_{OIL1}) + (Q_{OIL2} \times \rho_{OIL2} \times C_{OIL2}) + (Q_{H2O2} \times \rho_{H2O} \times C_{H2O2}) + (Q_{H2O3} \times \rho_{H2O} \times C_{H2O3}) + (Q_{OIL3} \times \rho_{OIL3} \times C_{OIL3}) + (Q_{H2O4} \times \rho_{H2O} \times C_{H2O4}) + (Q_{OIL4} \times \rho_{OIL4} \times C_{OIL4}) + (Q_{H2O5} \times \rho_{H2O} \times C_{H2O5}) + (Q_{OIL5} \times \rho_{OIL5} \times C_{OIL5}) + (Q_{H2O6} \times \rho_{H2O} \times C_{H2O6}) + (Q_{OIL6} \times \rho_{OIL6} \times C_{OIL6}) + (Q_{H2O7} \times \rho_{H2O} \times C_{H2O7}) + (Q_{OIL7} \times \rho_{OIL7} \times C_{OIL7}) + (Q_{H2O8} \times \rho_{H2O} \times C_{H2O8}) + (Q_{OIL8} \times \rho_{OIL8} \times C_{OIL8}) + (Q_{H2O9} \times \rho_{H2O} \times C_{H2O9}) + (Q_{OIL9} \times \rho_{OIL9} \times C_{OIL9}) + (Q_{H2O10} \times \rho_{H2O} \times C_{H2O10}) + (Q_{OIL10} \times \rho_{OIL10} \times C_{OIL10}) + (Q_{H2O11} \times \rho_{H2O} \times C_{H2O11}) + (Q_{OIL11} \times \rho_{OIL11} \times C_{OIL11}))$

[4] PWTC – Process Wastewater Treatment Complex

Where:

Numbers 1-11 are the End-of-Line locations identified in the attached schematic:
Q_{OILi} = Oil Phase Flow Rate for Stream i
C_{OILi} = Benzene Concentration in Oil Phase for Stream i
Q_{H2Oi} = Aqueous Phase Flow Rate for Stream i
C_{H2Oi} = Benzene Concentration in Aqueous Phase for Stream i
ρ_{H2O} = Density of Water
ρ_{OIL} = Specific Gravity of Oil x Density of Water

The flow rate for each sample point will be determined as described below.

The flow rate at EOL Point 1, Tank 905 Sump will be determined based upon the measured rain fall for the site and an estimation of the drainage surface area to the sump.

Flow meters will be installed on EOL Points 2 and 3, East-Side DAF Sump and Wash Slab Sump, and will be used to determine flow.

The flow rates for EOL Points 4 and 5, PWCT 67T-301 Sump and PWTC 67T-412 Sump, will be measured using a grab sample device. The streams entering the sumps are a result of a continuous sample purge at a constant rate.

The sample schedule for the PWTC is used to determine the flow from EOL Point 6, PWTC 67P-414 Lab Sump. The only material flowing to this sump would be the discarded wastewater laboratory samples.

The flow rate for EOL Point 7, Storm Water Return Pumps Sample Line, will be determined based upon the measured rain fall for the site and an estimation of the amount of wastewater purged from the sampling points when the pumps are operating.

The flow rate at EOL Point 8, Solid Liquids Separation Unit Sump, will be determined based upon the measured rain fall for the refinery and any vacuum truck movement associated with this sump.

The material collected at EOL Points 9 and 10, North CPI Sludge and South CPI Sludge, is a solid. Samples are taken of the material and sent to an outside laboratory for determining the benzene concentration. The weight of the material and measured benzene concentration are used to determine the benzene quantity.

While EOL Point 11, GHT-1 Manway, is a temporary sample point, the flow has been determined using the catch basin piping and applying some fluid calculations. The outlet piping to the modeled catch basin was shown to have a large slope. The pipe drops over 4 feet for a run that is assumed to be less than 20 feet. The pronounced slope calculated a maximum flow through the 10” pipe of 116 gpm assuming the catch basin to be 1-inch higher than the bottom of the pipe.

4.3 Detailed Description of EOL Sampling Locations

4.3.1 Point 1 – Tank 905 Sump

This EOL Point is intended to account for wastewater that is captured in the tank dike associated with Tank 905, containment slop oil drains for the pump 67P-905, the NESHAP process water transfer pumps 67P-312 and 67P-313 (these pumps are associated with the operation of the recovered oil Tank 905); the water pump 23P-105B, sump pumps 67P-14A/B, and the sump at the Veolia solid/liquids separation process during storm events.

4.3.2 Point 2 – East-Side DAF Sump

This EOL Point is intended to account for wastewater that is collected from within the Dissolved Air Floatation (DAF) unit and Induced Gas Flotation (IGF) boundaries and containment slop oil drains from the IGF float tank, 67T-660, and the de-inventory pumps 67P-104A or B during storm events.

4.3.3 Point 3 – Wash Slab Sump

This EOL Point is intended to account for any waste water deposited from vacuum trucks and the cleaning of equipment at the Refinery's "wash slab".

4.3.4 Point 4 – PWCT 67T-301 Sump

The NESHAP process area storm water sump 67T-301 collects rain water and spills within the limits of the NESHAP Pretreatment Unit. The Dissolved Nitrogen Flotation (DNF) effluent sample lines also drain to this sump. This EOL Point is intended to account for the wastewater from these sources and is considered uncontrolled.

4.3.5 Point 5 – PWTC 67T-412 Sump

The containment areas for the Equalization tank apron and pH adjustment/splitter tank area drain to pH Adjustment/Splitter Area Sump, 67T-412. Sample streams collected for pH and process control evaluation are purged to this sump as well. This EOL Point is intended to account for the wastewater from these sources and is considered uncontrolled.

4.3.6 Point 6 – PWTC 67P-414 Lab Sump

This EOL Point is intended to account for any wastewater sample streams collected for analysis and deposited into the PWTC Control Building Laboratory Sump, 67P-414.

4.3.7 Point 7 – Storm Water Return Pumps Sample Line

Process storm water collected within the refinery is conveyed to the Biological Pretreatment Unit from the South Process Storm Water Surge Tank System. There are two centrifugal storm water transfer pumps (67P-212 and 67P-501) and three centrifugal storm water transfer pumps

(67P-502A, B, and C) from which wastewater samples are collected when the pumps are operating. This EOL Point is intended to account for the wastewater purged to the sump when collecting samples.

4.3.1 Point 8 – Solid Liquids Separation Unit Sump

This EOL Point is intended to account for oily water and sludges that may be deposited into this sump when vacuum truck transfers are made into or out of the Gravity Separation Tanks, TK-679, TK-680 and TK-681. This sump captures any liquid or sludge that may be released when vacuum truck hoses are connected or disconnected to make a transfer. The function of the Gravity Separation Tanks is to separate sludge into solids, water, and oil by gravity with the aid of heat.

4.3.2 Point 9 – North CPI Sludge

This EOL Point is intended to account for any benzene-containing sludge wastes periodically removed from the North CPI. This waste is collected from the uncontrolled points of waste generation sent to the North Gravity Sewer.

4.3.1 Point 10 – South CPI Sludge

This EOL Point is intended to account for any benzene-containing sludge wastes periodically removed from the South CPI. This waste is collected from the uncontrolled points of waste generation sent to the South Gravity Sewer.

4.3.2 Point 11 – GHT-1 Manway

This EOL Point is intended to account for any wastewater draining due to storm water runoff into the wastewater sewer from within the unit boundaries of the number 1 Gasoline Hydrotreating Unit (GHT-1). This EOL Point is temporary in that plans are underway to control the vent off the cited manway. This system should be completed by August 30, 2011.

4.4 Point of Generation Sampling

In addition to identifying proposed sampling locations, paragraph 82 of the Consent Decree requires the BWON Sampling Plan to include proposed quarterly sampling at the "point of waste generation" of each waste stream that contributes 0.05 Mg/yr or more to the TOTAL PAR's 4.2 Mg uncontrolled benzene quantity. Several waste streams accounted for in the refinery's TAB are cumulative waste streams consisting of small sources such as pump, exchanger, filter, and instrument leg maintenance, uncontrolled vacuum truck movements, and others. In addition, included on the TAB are cooling waters and process storm water that may contribute 0.05 Mg/yr or more to the refinery's uncontrolled benzene quantity. It is impractical to sample these streams because they are small and intermittent. Therefore, they will not be sampled as part of the point of generation sampling . Below is a description of the waste streams at the point of generation that contribute greater than 0.05 Mg/yr to the refinery's uncontrolled benzene quantity.

4.4.1 Uncontrolled Waste Streams Greater Than 0.05 Mg/yr

TOTAL PAR has determined there are a total of three waste streams that contribute greater than 0.05 Mg/yr at their point of waste generation to the uncontrolled benzene quantity. One of the three streams represents conglomerations of numerous small waste streams that are grouped by classification to facilitate stream accounting in the TAB. That waste stream is identified as "Wastes Shipped Off-Site for Disposal".

The two[5] remaining waste streams that contribute greater than 0.05 Mg/yr to the refinery's uncontrolled benzene quantity can be characterized as "discrete" points of waste generation and thus will be sampled quarterly. The streams that are to be sampled under this category include the following:

- ACU-2 First Stage Desalter Rag Layer Visual Check
- Reformer/NHT Fuel Gas Knockout Drum

4.5 Sampling Schedule and Methodology

The EOL sampling will be performed at least monthly to arrive at the EOL calculation. The point of generation sampling will be performed at least quarterly. However, sampling may be performed at a greater overall frequency to minimize the effect of operating condition anomalies during the sampling. The sampling will follow 40 CFR §61.355 procedures to the extent possible along with the TOTAL PAR *BWON Sampling Protocol and Training Manual*. A notation in the sampling log book will be made if a sample cannot be taken according to the §61.355 procedures. In certain situations, it may not be possible to collect samples from open systems with the cooling coil. In the case of samples taken without the cooling coil, the samples will be placed on ice immediately.

[5] Two of the samples previously considered, the Jet Treater Mericat II Phase Separator Spent Caustic and Jet Treater Water Wash Phase Separator Rag Layer, have been deleted. The Jet Treater operation was discontinued as part of the Delayed Coker Project (DCP). Jet is now processed through the Distillate Hydrotreater Unit No. 1 (DHT-1).

APPENDIX A
WASTEWATER COLLECTION AND TREATMENT SYSTEM PROCESS FLOW SCHEMATIC

APPENDIX B
EOL SAMPLING FLOW SCHEMATIC

NORTH PROCESS WATER SYSTEM

GHT
FCCU
SAT LIQUIDS
REFORMER /NHT
580 GPM
590 GPM
MH-01
470 GPM
CARBON CANISTERS
NORTH BARREL SUMP PUMP
SOLIDS TO CONTR. SCALFUEL DEWATER
6
NORTH CORRUGATED PLATE INTERCEPTOR
4
15 GPM
CPI SKIMMED OIL TANK
CARBON CANISTERS
15 GPM
445 GPM
CPI WASTE WATER TANK
445 GPM
15 GPM
FPM BLOW DOWN
NORTH COOLING TOWER BLOW DOWN
15 GPM
75 GPM
10 GPM
TO FLARE HEADER
CARBON CANISTERS
NORTH STORMWATER TANK 927
40 GPM
35 GPM
10 GPM
105 GPM
NORTH STORMWATER SUMP
65 GPM
170 GPM
AMINE TREATER
ISOM
DEMEX
UNIBON
SCOT
SRU-1
SRU-3
ACU-1
LAB
TK 946
TK 911
SULFOLANE /BTX

SOUTH PROCESS WATER SYSTEM

75 GPM
535 GPM
10 GPM
1175 GPM
CARBON CANISTERS
CARBON CANISTERS
SOUTH DIVERSION BOX
21 GPM
SOUTH STORMWATER SUMP
10 GPM
SOUTH BARREL PUMP SUMP
SOUTH CORRUGATED PLATE INTERCEPTORS
RAPID MIX TANK
IGF SPLITTER BOX
IGF UNIT
5
1560 GPM
1300 GPM
1169 GPM
11 GPM
2
3
CARBON CANISTERS
SOUTH CPI OIL SKIM TANK
IGF FLOAT TANK
15 GPM
50 GPM
SOUTH CATCH BASIN
1350 GPM
85 GPM
1
OIL SKIM to TK-905
15 GPM
SOLIDS TO CONTR SCALFUEL DEWATER
7
ACU-2
JET TREATER
COGEN
SWS 1
DHT-1
SWS 2
TANK 500A (EFR)
TANK 500B (EFR)
70 GPM
DHT-2
ALKY
TDP
300 GPM
COND SPLITTER
GRU
C-200 AREA
WASH SLAB MAINT. WW
TANK WATER DRAWS

BIOLOGICAL PRETREATMENT UNIT

BENZENE NESHAPS PRETREATMENT UNIT

BASF STORM WATER (RECEIVED FROM OFFSITE)
520 GPM
API WATER
API SEPARATOR
API SOLIDS
RAPID MIX TANK
FLOC SPLITTER
DNF
DNF
DNF EFFLUENT TANK
API SEPARATOR
API OIL
RECOVERED OIL
TO TK-905
35 GPM
15 GPM
330 GPM
15 GPM
18 GPM

BIOLOGICAL TREATMENT UNIT

60 GPM
BASF STORM WATER (RECEIVED FROM OFFSITE)
200 GPM
BASF EFFLUENT (RECEIVED FROM OFFSITE)
EQUALIZATION TANK
2325 GPM COMBINED FLOW
EQUALIZATION TANK
CARBON CANISTERS
PH ADJUSTER SPLITTER TANK
2325 GPM
AERATION TANK A
AERATION TANK B
AERATION TANK C
3245 GPM
FLOC SPLITTER
CLARIFIER 405A
CLARIFIER 405B
CLARIFIER 405C
CLARIFIER EFFLUENT
2245 GPM
OUTFALL
1000 GPM
80 GPM
CLARIFIER FLOAT
920 GPM BIOLSUDGE RECYCLE
70 GPM
CONTRACT BIOSLUDGE DEWATERING
10 GPM
OFF-SITE
TO FLARE
CARBON CANISTERS
FROM TK 660, 679, 680 via VAC TRUCK
CONTRACT SCALFUEL DEWATERING
OFF-SITE
68 GPM

SOLIDS/LIQUIDS SYSTEM

185 GPM
OIL SKIM to SCALFUEL DEW. via VAC TRUCK
TANK 679
TANK 680
SPENT CAUSTIC FROM JET TRTR
SPENT CAUSTIC TANK 681
TO OFF-SITE DISPOSAL
CATALYST SLURRY FROM V-600 CLARIFIER
CATALYST SLURRY TANK 682
TO OFF-SITE DISPOSAL
300 GPM

RECOVERED OIL SYSTEM

BENZENE NESHAP WASTEWATER TANK 595 (IFR)
BENZENE NESHAP WASTEWATER TANK 595 (EFR)
BLOWDOWN DRUMS (3)
TANK 595 (IFR)
TANK 596 (IFR)
10 GPM
35 GPM
150 GPM
RECOVERED OIL STORAGE TANK 504
CRUDE CHARGE

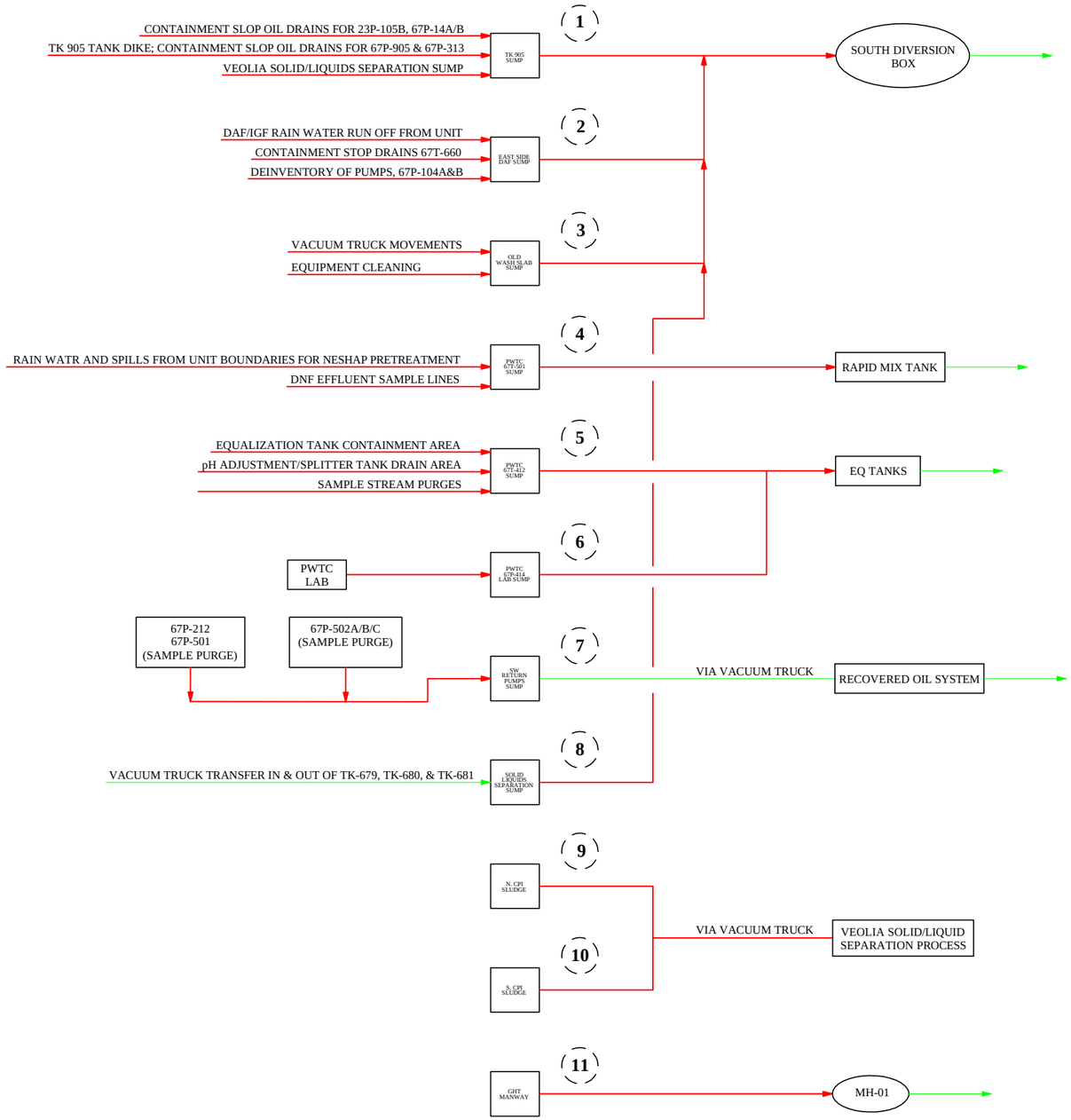
LEGEND

- DRY WEATHER FLOW
- WET WEATHER FLOW
- NESHAPS CONTROLLED STREAMS
- OFFGAS
- CONTROL DEVICE
- WASTE MANAGEMENT UNIT
- TANK FLOATING ROOF
- 5 END-OF-LINE SAMPLING POINT

TOTAL PETROCHEMICALS USA, INC.
PORT ARTHUR REFINERY
P. O. BOX 849
PORT ARTHUR, TEXAS

END OF LINE SAMPLING PLAN - APPENDIX A: WASTEWATER COLLECTION & TREATMENT SYSTEM PROCESS FLOW DIAGRAM

DRAWN BY John Carnahan	PROJ.ENGR. G.Y.	DATE 7-03
CHECKED BY YOUNG	REVISION BY: R.C.A.	DATE 11-07
DATE 07/24/03	SUPT.	DATE
SCALE	PROJ. NO. – CONSENT DECREE	
DWG. NO. 750-D-50-1288A		REV. 0



LEGEND

NESHAP UNCONTROLLED STREAMS

NESHAP CONTROLLED STREAMS (750-D-50-1288A - REV.4)

1 END OF THE LINE SAMPLING POINTS

NOTE: EOL SAMPLING POINT NO. 11 IS TEMPORARY AND WILL BE CONTROLLED ON OR BEFORE AUGUST 30, 2011.

REV	DESCRIPTION	BY	DATE

TOTAL PETROCHEMICALS USA, INC.
PORT ARTHUR REFINERY
P. O. BOX 849
PORT ARTHUR, TEXAS

END OF LINE SAMPLING PLAN - APPENDIX B: EOL SAMPLING FLOW SCHEMATIC

DRAWN BY: MNA	PROJ.ENGR.	DATE
CHECKED BY: JN	REVISION BY:	DATE
DATE 7/11	SUPT.	DATE
SCALE	PROJ. NO. – CONSENT DECREE	
DWG. NO. 750-D-50-4138		REV. (

FILENAME: 750–D–50–4138.dwg