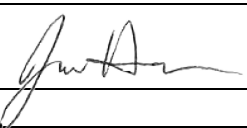




Region 6 - Enforcement & Compliance Assurance Division
INSPECTION REPORT

Inspection Date(s):	3/2-5/2020	
Media Program:	Air	
Regulatory Program(s)	Consent Decree (Civil Action 6:09-cv-00061), NSPS, NESHAP	
Company Name:	Formosa Plastics Corporation, Texas	
Facility Name:	Point Comfort Plant	
Facility Physical Location:	201 Formosa Drive	
(city, state, zip code)	Point Comfort, TX 77978	
Mailing address:	201 Formosa Drive	
(city, state, zip code)	Point Comfort, TX 77978	
County:	Calhoun	
Facility Phone Number	361-987-7000	
Facility Contact:	Stephanie Schmidt	Environmental Senior Manager
	StephanieSchmidt@ftpc.fpcusa.com	
FRS Number:	110018925957	
Identification/Permit Number:	RN100218973	
Media Identifier Number:	AFS No. 48-057-00015	
NAICS:	325211, Plastics Material and Resin Manufacturing	
SIC:	2869, Industrial Organic Chemicals	
Personnel participating in inspection:		
James Haynes	EPA Region 6, ECDAT	Physical Scientist
Sarah Frey	EPA Region 6, ECDAT	Physical Scientist
Armando Bustamante	EPA, NEIC	Environmental Engineer
Martha Hamre	EPA, NEIC	Chemical Engineer
Bill Squier	EPA, NEIC	Mechanical Engineer
Crystal Chaloupka	TCEQ, Region 14	Environmental Investigator
Trent Pinion	TCEQ, Region 14	Environmental Investigator
Tom Andersen	Formosa Plastics Corporation, USA	Corporate Environmental Manager
Stephanie Schmidt	Formosa Plastics Corporation, Texas	Environmental Senior Manager
Justin Iwuala	Formosa Plastics Corporation, Texas	Air Manager
Travis Stephens	Formosa Plastics Corporation, Texas	Environmental Specialist - Air
LeAnn Usoff	Formosa Plastics Corporation, Texas	Environmental Specialist - Air
Clinton Hurley	Formosa Plastics Corporation, Texas	Environmental Specialist - Air
Rick Crabtree	Formosa Plastics Corporation, Texas	VP/GM
EPA Lead Inspector Signature/Date		6/23/2020
	James Haynes	Date
Supervisor Signature/Date		
	Marie Stucky	Date

Section I - INTRODUCTION

PURPOSE OF THE INSPECTION

United States Environmental Protection Agency (“EPA”) Region 6 inspectors with EPA’s National Enforcement Investigation Center (“NEIC”) inspectors (the “inspection team”) arrived at Formosa Plastics Corporation (“Formosa”), Point Comfort Plant (“FPC TX” or “Formosa Point Comfort”) at approximately 08:30 on March 2, 2020 for an announced inspection. Region 6 inspectors Mr. James Haynes, Physical Scientist, and Dr. Sarah Frey, Physical Scientist, led the inspection. NEIC inspectors Mr. Armando Bustamante, Environmental Engineer, Ms. Martha Hamre, Chemical Engineer, and Mr. Bill Squier, Mechanical Engineer, assisted in the inspection. Armando Bustamante conducted an opening conference with FPC TX’s environmental team led by Ms. Stephanie Schmidt, Environmental Senior Manager, and Mr. Tom Andersen, Formosa’s Corporate Environmental Manager. Ms. Crystal Chaloupka and Mr. Trent Pinion, Environmental Investigators with Texas Commission on Environmental Quality (“TCEQ”) Region 14, participated in the inspection. The inspection team presented credentials to Mr. Andersen and Ms. Schmidt and informed them that this was an EPA Region 6 led inspection to determine compliance with the facility’s Consent Decree (“CD”), Civil Action No. 6:09-cv-00061, and other requirements under the Clean Air Act (“CAA”). The scope of the inspection was a partial compliance evaluation and includes evaluations of the CD and other applicable federal regulations including New Source Performance Standards (“NSPS”), National Emission Standards for Hazardous Air Pollutants (“NESHAP”), and State Implementation Plan (“SIP”) requirements.

FACILITY DESCRIPTION

Formosa Point Comfort consists of production facilities to manufacture base and intermediate materials for plastics (e.g., olefin compounds, ethylene dichloride, vinyl chloride monomer, and chlorine gas); thermoplastics such as polyvinyl chloride, high density polyethylene, linear low density polyethylene, and polypropylene; organic chemicals including ethylene glycols (e.g., diethylene glycol, triethylene glycol, and polyethylene glycol); and inorganic chemicals such as caustics and acids.

EPA conducted compliance inspections of the FPC TX facility in November 2003 and February 2004. The findings of those inspections, and inspections performed at other Formosa facilities, were resolved by the United States and Formosa Plastics Corporation by entering into a CD, which was lodged September 29, 2009 (“Date of Lodging”) and entered February 3, 2010. A First Amendment to the CD was filed March 13, 2013. The CD requirements for Formosa’s Baton Rouge facility are outside the scope of this inspection.

Section II - OBSERVATIONS

The inspection team was on-site daily from March 2 to March 5, 2020. Activities performed by the inspection team included interviews with facility operators, contractors, and environmental staff;

document and database review; comparative monitoring; and a walking tour of the Olefins I and Olefins II units.

The inspection team focused on compliance with the CD in three primary areas:

- Leak Detection and Repair (“LDAR”) requirements from NSPS and NESHAP regulations, FFPC TX’s implementation of the Enhanced LDAR Program (“ELP”) detailed in Appendix A of the CD, and comparative monitoring by NEIC
- Benzene Waste Operations NESHAP (“BWON”) requirements and Appendix B of the CD
- Vinyl Chloride NESHAP requirements under Appendix C of the CD, vinyl chloride monomer (“VCM”) requirements, and FPC TX’s implementation of the Leak Detection and Elimination (“LDE”) Program

LEAK DETECTION AND REPAIR - James Haynes, EPA Region 6

Appendix A: Subsection A (Applicability)

The CD requires Formosa to minimize or eliminate emissions of Volatile Organic Compounds (“VOCs”), benzene, Volatile Hazardous Air Pollutants (“VHAPs”), Organic Hazardous Air Pollutants (“HAPs”), by implementing an ELP at all Covered Types of Equipment in all Covered Process Units. Covered Types of Equipment is defined in the CD and can include valves, connectors, pumps, agitators, and open-ended line closure devices in light liquid, heavy liquid, or gas/vapor service, dependent on the applicable regulations.

Covered Process Units include the following manufacturing areas at FPC TX:

- ethylene dichloride unit (“EDC”),
- ethylene glycol unit (“EG”),
- Formosa hydrocarbons unit (“FHC”),
- high density polyethylene units (“HDPE I/HDPE II”),
- linear low density polyethylene unit (“LLDPE”),
- polypropylene units (“PP I/PP II”),
- marine traffic unit,
- inland traffic,
- olefins units (“OL I/ OL II”),
- gasoline hydrotreater unit (“GHU”),
- propylene purification unit (“PPU”),
- vinyl chloride monomer unit (“VCM”), and
- suspension polyvinyl chloride unit (“PVC”);

As part of Subsection A, the CD states that the ELP is in addition to, and not in lieu of, any other requirements of any federal, state, or local LDAR program.

During the inspection, Formosa indicated that new process units within the battery limits of the manufacturing areas are not subject to the ELP. For example, if FPC TX constructed a new fractionator inside the battery limits of OL I or OL II, Formosa believes that this unit is not subject to the requirements of the ELP as described in the CD; however, Formosa believes that an additional train or

expansion to an existing manufacturing unit would cause the new unit to be subject to ELP requirements. Currently, the Olefins Plant consists of several processing areas including the Fractionation II Unit, which produces feedstock for OL I and OL II. This process area is not subject to the requirements of the Enhanced LDAR Program (**AOC 1**).

Defined as Covered Process Units, marine and inland traffic appear as a single process unit, "Traffic", according to the Consent Decree. Formosa previously treated it as a single unit in 2014 as part of a third-party audit, but the process units were separated in a later audit conducted in 2018. Similarly, the Consent Decree includes the GHU and PPU units in the definition of a Covered Process Unit; however, there is some ambiguity if these units belong solely to OL I or if they are "independent" Covered Process Units. According to a general process description written by Formosa Point Comfort for a Title V permit application (Permit No. O1958) submitted to TCEQ dated February 16, 2017:

The Olefins Plant consists of five process areas; Olefins 1, Olefins 2, Fractionation II Unit, Gasoline Hydrotreating Unit, and Propylene Purification Unit. The [OL I and OL II] units process a range of feedstocks into ethylene, propylene, and other hydrocarbon products for use within [Formosa Point Comfort] and for export. The Fractionation II Unit processes and separates natural gas liquids into suitable feedstock for OL I and OL II and other hydrocarbon products. The GHU processes and refines the raw pyrolysis gasoline produced in [OL I and OL II] to reduce import of naphtha feedstocks and produce hydrocarbon products. The PPU processes refinery-grade propylene, either from within the facility or imported into the site, into polymer-grade propylene for use as a feedstock in the facility; additionally, the PPU treats recycled propylene from the Polypropylene Unit(s) to reduce vent emissions, and recovers propane from the refinery-grade propylene for use in the Olefins Units.

From the permit application description, the GHU and PPU are part of the Olefins Plant but operate as independent process units. Based on Formosa Point Comfort's records, it is unclear if requirements of the ELP are being met. While the Amendment to the CD appears to combine OL I with GHU and PPU, this seems to be limited to the Comprehensive First Amendment LDAR Evaluation. *See Appendix A: Subsection J for additional discussion on the GHU and PPU applicability.*

Appendix A: Subsection B (Written Facility-Wide LDAR Program Procedures)

The CD requires Formosa to develop a written, facility-wide, LDAR program procedures document to ensure compliance with all federal, state, and local LDAR regulations. It also requires Formosa to review the LDAR program procedures and update it on an annual basis if necessary. Formosa Point Comfort maintains two sets of written LDAR procedures: a general LDAR procedures document that describes how the site will comply with non-CD requirements and a separate CD LDAR procedures document ("CD Manual") that details how FPC TX will implement the ELP requirements for maintenance, repairs, training, and other areas outlined by the Consent Decree.

Observations during the inspection reveal that FPC TX may not be thoroughly performing this annual review. For example, Paragraph 10 of Appendix A, Subsection E of the CD requires the facility to attempt

at least two drill-and-tap repairs on valves leaking above 500 ppm VOC; however, within the Process Map titled, "Leak Management," contained in the CD Manual, Formosa states that they will consider drill-and-tap for valves that are leaking above 2,500 ppm VOC. This discrepancy between the CD Manual and the requirements of the CD indicate that a review and update of the CD Manual may not be occurring annually (**AOC 2**). See *Appendix A: Subsection E for additional discussion regarding drill-and-tap procedures*.

Appendix A: Subsection C (Leak Definition)

The CD requires FPC TX to utilize lower, internal leak definitions of 250 ppm VOC for valves, connectors, and closure devices at open-ended lines; and 500 ppm VOC for pumps and agitators. This subsection also contains a provision that allows FPC TX to report leak rates at either the applicable regulatory leak definition or the lower, internal leak definition in regulatory reports to the federal, state, or local agency. A detailed review of documents regarding compliance with the lower, internal leak definition will be conducted off-site as a follow-up to this inspection.

Appendix A: Subsection D (Monitoring Frequency and Equipment)

The ELP requires FPC TX to generally monitor Covered Equipment at the following frequencies:

- valves – quarterly,
- connectors – annually,
- pumps and agitators – monthly,
- closure devices at open-ended lines – annually;

In the event a federal, state, or local agency requires more frequent monitoring, FPC TX shall comply with the more stringent monitoring frequency. For components designated as either unsafe-to-monitor ("UTM") or difficult-to-monitor ("DTM"), FPC TX shall follow the UTM/DTM requirements of the applicable LDAR regulations. A detailed review of documents regarding compliance with UTM/DTM requirements will be conducted off-site as a follow-up to this inspection.

Appendix A: Subsection E (Repairs)

The CD requires FPC TX to perform Directed Maintenance and incorporate drill-and-tap into repair procedures prior to placing a valve on delay of repair ("DOR"). The CD defines Directed Maintenance as, "the utilization of concurrent monitoring ... to repair a leaking piece of equipment to achieve the best repair/lowest emission rate reasonably possible." During my review of the CD Manual, I reviewed Procedure 2, Attachment A.2.3 which discusses Directed Maintenance and includes an example Directed Maintenance Form. The procedures contain the definition of Directed Maintenance; however, two example scenarios do not explain how the concurrent monitoring is used to achieve the best repair/lowest emission rate reasonably possible. Rather, the scenarios describe only how the concurrent monitoring with operations and/or maintenance will ensure that the leak is fixed (**AOC 3**).

I reviewed six current records for valves on DOR (except control valves), which includes the Directed Maintenance Form. On the form, there is an option to notate whether operations and/or maintenance

performed Directed Maintenance as required by the CD. Three of the six Directed Maintenance Forms did not document if the Directed Maintenance was performed **(AOC 4)**.

As required by Appendix A Subsection E(10), FPC TX shall attempt at least two drill-and-tap repairs prior to placing a valve on DOR or document the reasons drill-and-tap was not performed. In Procedure 2, Attachment A.2.4 of the CD Manual, Formosa describes the drill-and-tap procedures and has excluded certain valves from drill-and-tap in certain circumstances (detailed below). During the review of six non-excluded current valves on DOR, FPC TX did not attempt any drill-and-tap repairs **(AOC 5)**.

According to Formosa's CD Manual (Attachment A.2.4.1), Formosa excludes specific valves from these drill-and-tap procedures. The types of excluded valves, include the following:

- Control valves
- Diaphragm valves
- Needle valves
- Butterfly valves
- Globe, gate, angle, and orbit valves smaller than half an inch

If FPC TX were to exclude other valves from the drill-and-tap procedures following a leak, the CD Manual states that they shall document if there is a major safety, mechanical, product quality, or environmental issue with repairing the valve using drill-and-tap. This documentation is tracked on a form titled, "Exemption from Drill-and-Tap". None of the DOR records reviewed included this exemption form **(AOC 6)**.

Appendix A: Subsection F (Delay of Repair)

The CD requires the relevant manufacturing area supervisor (or the Unit Operations Environmental Person in Charge) at FPC TX to sign-off on any piece of Covered Equipment before it is placed on DOR if it is technically infeasible to repair the component without a process unit shutdown. Additionally, while the Covered Equipment is on DOR, FPC TX shall continue to perform periodic monitoring at the same frequency identified in Subsection D of the CD. Formosa Point Comfort has included these requirements in Procedure 2, Attachment A.2, Section 7.6 of the CD Manual. During my review of records for current valves on DOR, I confirmed records contained an authorized representative's signature attesting that FPC TX could not repair or isolate the component without a process unit shutdown.

Appendix A: Subsection G (Equipment Replacement/Installation)

The CD requires FPC TX to implement a program to replace and/or improve valves and connectors in VHAP and non-VHAP Covered Process Units. For VHAP Covered Process Units, these manufacturing areas are a defined subset of the units that are subject to the ELP while non-VHAP Covered Process Units cover the remaining manufacturing areas still subject to the Enhanced LDAR Program. The VHAP Covered Process Units include the following:

- EDC Unit
- EG Unit
- VCM Unit

- PVC Unit

On March 5, I requested two reports of all valves in VHAP service from each of the VHAP Covered Process Units. Travis Stephens, Environmental Specialist at FPC TX, retrieved the reports using Guideware, Formosa's LDAR compliance management software. The first report, to satisfy the requirements of the CD, was to note the valve count, or number of valves, in service at the Date of Lodging of the Consent Decree. The second report noted the valve count as of March 5, 2020 in each VHAP Covered Process Unit. For any new valve added in any VHAP Covered Process Unit, FPC TX is required to install a Certified Low-Leaking Valve or it must be fitted with Certified Low-Leaking Valve Packing Technology unless it is commercially unavailable for the service and operations conditions of the valve. The tables below show the approximate number of valves added since the Date of Lodging:

Table 1. Valve counts in VHAP Covered Process Units.

VHAP Covered Process Unit	Valve Count					
	Prior to 1/1/2011*			As of 3/5/2020		
	Light Liquid	Gas/Vapor	TOTAL	Light Liquid	Gas/Vapor	TOTAL
PVC	1,575	1,437	3,012	1,687	1,521	3,208
VCM	7,586	2,441	10,027	8,615	2,873	11,488
EDC	1,359	305	1,664	1,727	316	2,043
EG	188	839	1,027	214	914	1,128

* Formosa Point Comfort generated the report to filter for valves with an Add Date prior to 1/1/2011; however, the Date of Lodging was 9/29/2009. The difference in dates may lead to additional valves being included in the Valve Count: Prior to 1/1/2011 that were not Existing Valves for the purposes of this Subsection.

Table 2. New valves added to VHAP Covered Process Units since 2011.

VHAP Covered Process Unit	New Valves Added
PVC	196
VCM	1,461
EDC	379
EG	101

Formosa Point Comfort has certified that they have not claimed a commercial unavailability exemption for at least the last three years of Annual Reports. In other words, FPC TX should have been able to replace or repack Existing Valves with a Certified Low-Leaking Valve or Certified Low-Leaking Valve Packing Technology. It is unclear if all of the new valves added (over 2,000) in Table 2 are Certified Low-Leaking Valves or fitted with Certified Low-Leaking Packing Technology.

Procedure 2, Appendix A.6 of the CD Manual states that each new valve shall have a Low Leaking Valve Survey initiated, if one is not already available. Per the procedure, Certified Low Leaking Valves should be tagged by the manufacturer, and a document should be generated through the Management of Chance ("MOC") process to link the manufacturer's tag and the equipment identification number in the LDAR database. A detailed review of documents regarding compliance with the Certified Low-Leaking

Valve and Certified Low-Leaking Valve Technology requirements at VHAP Covered Process Units will be conducted off-site as a follow-up to this inspection.

For Existing Valves, the CD requires FPC TX to replace or repack a valve when a LDAR technician records a reading or above 250 ppm VOC during any two monitoring periods during a 12-month rolling period. A detailed review of documents regarding compliance with existing valves that may have been subject to replacement or repacking requirements at VHAP Covered Process Units will be conducted off-site as a follow-up to this inspection.

Regarding connectors in any VHAP Covered Process Unit, the CD requires FPC TX to ensure that all new connectors will be the best performing connectors commercially available for the service and operating conditions for the connector. Formosa Point Comfort shall also implement a connector replacement and improvement program. The facility describes the program in Section 7.6 of Procedure 2, Appendix A.6 of the CD Manual: where a LDAR technician records a reading at a connector at or above 250 ppm VOC during any two out of three consecutive monitoring periods, the connector shall be replaced following the guidelines for new connectors (*i.e.*, installing the best performing connector). A detailed review of documents regarding compliance with connector requirements at VHAP Covered Process Units will be conducted off-site as a follow-up to this inspection.

The CD requires FPC TX to replace or repack valves that are “chronic leakers” at non-VHAP Covered Process Units. In a non-VHAP Covered Process Unit, a valve is a chronic leaker if it leaks above 1,000 ppm VOC in any three out of four consecutive quarters (based on quarterly monitoring) after the valve was last repaired. Formosa Point Comfort shall replace or repack all valves in non-VHAP Covered Process Units that are chronic leakers using a Certified Low-Leaking Valve or Certified Low-Leaking Valve Packing Technology unless claiming a commercial unavailability exemption. If the facility were to claim the exemption, FPC TX shall replace the valve with the best performing valve at the first maintenance shutdown following the monitoring even that triggered the replacement or repacking requirement. A detailed review of documents regarding compliance with replacement or repacking requirements at non-VHAP Covered Process Units will be conducted off-site as a follow-up to this inspection.

Appendix A: Subsection H (Training)

The CD requires Formosa to develop a LDAR training protocol and training programs for FPC TX personnel newly-assigned to LDAR responsibilities prior to beginning work in the program. Additionally, the personnel must complete an annual training. For other facility personnel, including operators, maintenance staff, and contractors, FPC TX shall provide the staff with an initial training program and an annual refresher training. Formosa Point Comfort utilizes Bureau Veritas (formerly Summit Inspection Services) as the site’s LDAR contractor. In Procedure 2, Attachment A.7 of the CD Manual, FPC TX identified the protocols required to satisfy the training requirements for Bureau Veritas technicians in the Consent Decree. While on-site, Mr. Pinion of TCEQ reviewed a general training that instructs Bureau Veritas personnel and LDAR technicians on EPA Method 21. This is a computer-based training that reviews specific measuring and monitoring techniques required by the CD that a technician must complete prior to beginning any field work (*i.e.*, LDAR inspections). Mr. Bustamante and I reviewed a

second training that instructs all LDAR personnel on specific conditions and requirements of the Enhanced LDAR Program.

Appendix A: Subsection I (Quality Assurance/Quality Control)

The CD requires each Bureau Veritas technician to sign a certification at the end of each day in which monitoring occurred. Each technician shall certify that they have reviewed their own individual monitoring data and that the data collected accurately represents the monitoring performed. During the on-site review, some of these daily certifications did not have a signature from the monitoring personnel (**AOC 7**). In one example, Mr. Stephens stated that while daily monitoring occurred, he explained that signatures were not obtained by Bureau Veritas or FPC TX because these employees were dismissed at the end of the day. As additional quality assurance, Bureau Veritas and FPC TX run reports that flag when a LDAR technician monitors over 600 components in a day. It also flags monitoring data when a LDAR technician records more than 20 consecutive identical readings as an abnormal data pattern due to the subtraction of background values. In some documents, I observed Bureau Veritas technicians recorded over 200 and 300 consecutive readings below background with the analyzer (**AOC 8**). Bureau Veritas and FPC TX review these daily reports, and LDAR technicians document the reason they were able to monitor over 600 components in a day and the reason for the abnormal data pattern.

Subsection I also requires that FPC TX conduct unannounced, quarterly reviews by an LDAR-trained employee who does not conduct LDAR monitoring. At FPC TX, Mr. Stephens conducts these quarterly reviews, or quarterly audits. When Mr. Stephens conducts his audits, the checklist has twelve items/questions that he must review. Table 3 combines the quarterly CD audit requirements of the CD with the audit items from Formosa Point Comfort's quarterly review:

Table 3. Comparison of CD Quarterly Audit Requirements and FPC TX Quarterly Audit Evaluations

CD Quarterly Audit Requirement	Formosa Point Comfort Audit Questions
• Review whether any pieces of equipment that are required to be in the LDAR program are not included	• Are Project Worksheets maintained to ensure timely additions/removal of components?
• Verify that equipment was monitored at the appropriate frequency	• Were all required valves monitored? • Were all required pumps/agitators monitored each month? • Was progress made towards completing annual connector monitoring?
• Verify that proper documentation and sign-offs have been recorded for all equipment placed on the DOR list	• Was a DOR authorization form signed by the unit for each component placed on DOR?
• Verify that repairs have been performed in the required periods	• Were all first repair attempts made within 5 days? • Were all final repairs completed (or all the components placed on DOR) within 15 days?

• Review monitoring data and equipment counts (<i>e.g.</i>, number of pieces of equipment monitored per day) for feasibility and unusual trends	• Did the same monitoring technician exceed 600 inspections/day more than once in any week?
• Verify that proper calibration records and monitoring instrument maintenance information are maintained	• Were quarterly certifications performed (and records available) for each TVA? • Are maintenance records maintained for each TVA?
• Verify that other LDAR program records are maintained as required	• Was the daily Monitoring Technician certification completed each day?

In each quarterly audit report for Calendar Year 2019, Mr. Stephens commented, "See database," or similar language. While it appears that Mr. Stephens completed each quarterly audit at the appropriate frequency and addressed the areas identified by the CD, FPC TX has also reported noncompliance in each Annual Report for the previous three years related to components that were either not monitored or not included in the LDAR program. See Table 4 below for a summary of the last three years of LDAR noncompliance items reported in the Annual Reports:

Table 4. LDAR Concerns in Annual Report, 2017-19

LDAR Annual Report	Submission Date	No. of LDAR Concerns	Description
2017	1/31/2018	5	1) 1 leaking flange was not repaired within 15 days (February 2017) 2) 797 components were not included in the LDAR program (May 2017) 3) 1,239 components were not monitored (July 2017) 4) 2 valves were not included in the LDAR program (July 2017) 5) 32 components were not monitored (September 2017)
2018	1/31/2019	2*	1) 56 components were not included in the LDAR program; 5 open-ended lines ("OELs") (May 2018) 2) 315 components were incorrectly placed on "out of service" in Guideware and were not monitored for three quarters (December 2018)
2019	1/31/2020	1^	1) 1 valve was not in the LDAR program (March 2019)

* The 2018 Annual Report cites five LDAR concerns; however, three items are from the previous year (2017).

^ The 2019 Annual Report cites three LDAR concerns; however, two items are from the previous year (2018).

Of the eight instances of LDAR-related CD noncompliance items previously reported, FPC TX never attributed the discovery of these items to a quarterly audit. Additionally, based on the quarterly audit records for 2018 and 2019, FPC TX did not note any discrepancies or comment beyond general

statements regarding a review of databases and records. If FPC TX discovered any CD noncompliance items through the CD's requirement to conduct quarterly audits, these audit records should reflect the discovery of any noncompliance. Since the records did not document or describe any noncompliance, the accuracy and thoroughness of these quarterly audits appears to be inadequate (**AOC 9**). For example, FPC TX provided a list of all valves repaired using drill-and-tap procedures. In the record, I noted that there was one valve in 2019 that exceeded the 15-day requirement to make a final repair (**AOC 10**). Formosa Point Comfort did not discover this potential noncompliance event in the quarterly audit.

Appendix A: Subsection J (LDAR Audits and Corrective Action)

The CD requires FPC TX to conduct a biennial third-party audit ("LDAR Audits") occurring in the same calendar quarter that the initial LDAR Audit occurred. At FPC TX, this LDAR Audit occurs in the second quarter. Think Consulting conducted the last audit in April 2018 and reviewed Subsection C through J of the Consent Decree. As part of the audit, Think Consulting reviewed applicable regulations and permit conditions, inventory data and diagrams, comparative monitoring, observations, and other relevant records. The audit focused on the following units: OL II, Inland Traffic, EDC, and VCM units. Think Consulting appears to have inaccuracies in the LDAR Audit, and they also conducted a limited review of the applicable LDAR programs based on the scope of the review stated in the audit (**AOC 11**). For example, Think Consulting states they reviewed the VCM unit for compliance with 40 C.F.R. Part 63 Subpart UU (and a TCEQ fugitive emissions program); however, the audit does not address the VCM units other applicability under 40 C.F.R. Part 60 Subpart VV, 40 C.F.R. Part 61 Subpart V, or 40 C.F.R. Part 63 Subpart H. Additionally, the audit states incorrectly that FPC TX utilizes an internal leak definition of 200 ppm VOC for valves. As defined in the CD (referenced in Subsection C), FPC TX shall use an internal leak definition of 250 ppm VOC for valves.

As mentioned in Subsection A regarding the Marine and Inland Traffic units, FPC TX conducted a third-party audit in 2014 covering both units, but Formosa Point Comfort later separated the process units. In 2018, FPC TX conducted a third-party audit at the Inland Traffic process unit. As of the date of the inspection, FPC TX has not conducted a third-party audit of the Marine Traffic unit as its own unit (**AOC 12**). According to the CD, FPC TX must rotate and complete an LDAR Audit at each Covered Process Unit prior to conducting a second audit at a Covered Process Unit, and in 2018, Formosa Point Comfort conducted a third-party audit for a second time at the OL II and EDC units.

For GHU and PPU, FPC TX has included these units with OL I; however, if these are separate units, FPC TX has failed to conduct an audit of the GHU and PPU (**AOC 13**). As mentioned above, FPC TX must rotate and complete an LDAR Audit at each Covered Process Unit prior to conducting a second audit at a Covered Process Unit. According to Title V permits issued by TCEQ, FPC TX treats these areas as different process units, and each process unit has its own applicability to federal, state, and local LDAR programs. For example, according to Title V Permit No. O1958, the GHU is subject to 40 C.F.R. Part 63 Subpart H and the PPU is subject to 40 C.F.R. Part 60 Subpart VV and 40 C.F.R. Part 63 Subpart FFFF. Each of these federal LDAR regulations are in addition to these state LDAR programs: 28VHP, 28CNTA, and 28CNTQ. The concern with including the GHU and PPU with OL I, particularly during an LDAR audit, is that the CD

requires each audit to conduct comparative monitoring in at least four Covered Process Units. The third-party auditor will use the comparative monitoring data of the Covered Process Unit to calculate a Comparative Monitoring Audit Leak Percentage. This is compared to the process units' historic leak rates to calculate a Comparative Monitoring Leak Ratio. If the Comparative Monitoring Leak Ratio exceeds 3.0, FPC TX shall implement Corrective Action. Because FPC TX has included the GHU and PPU with the OL I process unit, the LDAR Audit is not clear on how the historical leak rates were calculated and where auditors conducted comparative monitoring to demonstrate a statistically representative percentage of Covered Equipment was monitored (**AOC 14**).

Most recently in 2018, Think Consulting calculated and determined a Comparative Monitoring Leak Ratio for valves of 3.32 at the VCM unit. Appendix A, Paragraph 30 of the Consent Decree requires corrective actions where a Comparative Monitoring Leak Ratio identified during an audit is calculated as 3.0 or higher. During a review of LDAR Audits, I observed that the Comparative Monitoring Leak Ratio exceeded 3.0 several times. Mr. Andersen stated that because FPC TX already conducts quarterly monitoring at valves, there is no additional corrective action that Formosa could implement (**AOC 15**).

Appendix A: Subsection K (Certification of Compliance)

The CD requires FPC TX to certify the following within 180 days of completing the Initial LDAR audit:

- Formosa is in compliance with all applicable LDAR regulations and the CD's Enhanced LDAR Program;
- Formosa has completed, or is in the process of completing, all applicable corrective actions;
- All Equipment regulated under a federal, state, or local LDAR program has been identified and included in the LDAR program.

On September 29, 2010 Mr. Randy White certified that "all equipment at the Facility that is regulated under a federal, state, or local leak detection and repair program has been identified and included in the Facility's LDAR program."

Appendix A: Subsection L (Recordkeeping)

The CD requires FPC TX to retain all original records of each LDAR Audit and any written records of Corrective Actions taken in response to deficiencies identified during the audit. Additionally, FPC TX shall submit certain information from the LDAR Audit in the subsequent Annual Report. Formosa Point Comfort must also make all LDAR monitoring data available to EPA in their original electronic format during the life of the Consent Decree. During the inspection, I received a copy of the backup file (*.bak) that includes all of the LDAR monitoring at FPC TX. I will review this data at a later time to determine compliance. Presently, FPC TX appears to be retaining all necessary records according to the requirements of the Consent Decree.

NEIC Comparative Monitoring

See Table 5 below for a summary of NEIC's LDAR comparative monitoring:

Table 5. Daily Comparative Monitoring Summary

Date	NEIC Inspector	Unit
March 02, 2020	A. Bustamante, B. Squier	HDPE I
March 03, 2020	A. Bustamante, B. Squier	LLDPE
March 04, 2020	A. Bustamante, B. Squier	OL I
March 05, 2020	B. Squier	FHC

During the comparative monitoring, NEIC detected leaks at Covered Equipment (pumps equipped with dual-mechanical seals) that FPC TX does not routinely inspect with EPA Method 21 (**AOC 16**). These may be exempt from monitoring; however, additional information is necessary to confirm additional details such as the design of the barrier fluid system (*e.g.*, operating pressure of the barrier fluid relative to the pump's stuffing box pressure or the use of a barrier fluid degassing system vented through a closed vent system to a control device). The LDAR regulations also require FPC TX to maintain a barrier fluid sensor system capable of detecting the failure of the seal system, the barrier fluid, or both and conduct the required weekly visual inspections. In addition to the pumps, NEIC also discovered two valves in OL I on a line labeled as 50-pound steam (**AOC 17**). More information is necessary to confirm the valves are not in VOC service, as defined by federal, state, or local LDAR programs.

See **Appendix 1** for NEIC's report.

Benzene Waste Operations NESHAP - Sarah Frey, EPA Region 6

Appendix B: Benzene Waste Operations NESHAP

Inspectors Dr. Frey and Ms. Hamre focused on evaluating compliance with the BWON provisions of the CD by reviewing records, discussing Total Annual Benzene ("TAB") calculations, and conducting interviews with facility representatives.

Appendix B Paragraph 3. One Time Review and Verification of OL I/OL II TAB and Compliance status

The CD required Formosa retain a third party to complete a one-time review and verification of OL I and OL II's TAB quantity. Formosa Point Comfort completed the review in 2009. Formosa Point Comfort submitted a BWON Compliance Review and Verification Report to EPA on January 21, 2010. This report included identification of waste streams, calculations and/or measurements to determine flow, identification of benzene concentration in each waste stream, identification of waste stream control, and identification of existing noncompliance with the requirements of Part 61 Subpart FF.

Appendix B Paragraph 4. Implementation of Actions Necessary to Correct Non-Compliance or to Come Into Compliance

The CD required FPC TX to submit an Amended TAB report within 60 days after submission of the Benzene Waste Operations NESHAP ("BWON") Compliance Review and Verification Report. The original 2008 TAB was reported as 19.07 Megagrams ("Mg"), with no benzene uncontrolled. Formosa Point Comfort submitted an amended TAB report, due to findings of the third-party audit, on March 19, 2010. The amended 2008 TAB was reported as 765.42 Mg with 0.003 Mg uncontrolled benzene applied to the

2.0 Mg exemption limit. Based on a review of the BWON Compliance Review and Verification Report, the requirements of Appendix B Paragraphs 4b and 4c are not applicable.

Appendix B Paragraph 5. Carbon Canisters

The CD requires FPC TX to use dual canisters where they have elected to use carbon canister systems as control devices under NESHAP Part 61 Subpart FF. The facility currently has 3 dual 55-gallon canister systems. A fourth system was removed from OL II in 2011, EPN N7460LFCC, however this system is still listed in Special Condition 16 of FPC TX's PSD Permit 19168.

Formosa Point Comfort elected the "breakthrough" definition between the primary and secondary canisters to be any reading greater than 50 ppm VOC in a letter dated March 29, 2010. Although the CD requires monthly monitoring, FPC TX's PSD permit requires a canister exchange every 21 days. The facility has elected to monitor at the same frequency, prior to replacement. Monitoring is required between the primary and secondary canisters.

We reviewed the SOP titled, "Environmental Consent Decree Manual Procedure 3. Appendix B1 BWON Carbon Canister Procedure", effective 12/12/2011. The SOP clearly states that VOC concentration must be monitored between the primary and secondary canisters. Section 11 of the SOP describes record retention requirements and cites Paragraphs 57 and 58 of the CD. Paragraph 57 states that records must be retained for five years after the termination of the CD. Section 11.1 of the SOP states that Operations in OL I and OL II are responsible for maintaining Carbon Canister Replacement Documentation and Carbon Canister Inventory. The Environmental Department is responsible for Carbon Canister Monitoring Data, the Carbon Canister Monitoring Data Report Form, and all written notifications. OL II Change-Out Procedure was an attachment to the SOP and still includes the removed system N7460LFCC (**AOC 18**). OL I SOP Carbon Canister Normal Operating Procedures, effective 1/11/2012, was also reviewed. The SOP is blank for multiple sections and does not mention VOC monitoring at either canister. We noted that SOPs for both units include respirators and nitrile gloves as minimum PPE requirements. However, neither OL I nor OL II personnel use those types of PPE. Additionally, Attachments 3 and 4 are outdated and not used by either unit (**AOC 18**).

We interviewed operators on how monitoring, exchange, and labeling of canisters was executed. OL I and OL II follow different protocols and labeling schemes. OL I exchanges both the primary and secondary canisters every 21 days. If no breakthrough is observed, OL II moves the secondary canister to the primary position and puts a fresh canister in the secondary position. If there is breakthrough, OL II replaces both canisters.

We reviewed the carbon canister Change-Out and VOC monitoring records for OL I (2018, 2019) and OL II (2016-2019). OL I routinely monitors for breakthrough after the secondary canister, instead of after the required primary canister (**AOC 19**). Table 6 shows how often each dual-canister system has VOC readings > 50 ppm at the outlet of the primary and secondary canisters. Breakthrough of the secondary canister occurred at least 27 times. Breakthrough of the primary canister occurred at least 50 times in OL I (**AOC 20**). OL I was not able to provide field records of VOC monitoring and Carbon Canister Change-

Out for 2016 and 2017, as requested. Records should be maintained as required by Paragraph 57 of the CD (**AOC 21**). Additionally, OL II failed to measure and record VOC concentrations at both carbon canisters on 1/2/18.

Table 6. Frequencies of VOC measurements greater than 50 ppm from Carbon Canister Records.

Year	Unit	Equipment	No. of instances of Primary Breakthrough	No. of instances of Secondary Breakthrough
2016	OL I	2412FCC	Not provided ^{a, b}	Not provided ^b
2017	OL I	2412FCC	Not provided ^{a, b}	Not provided ^b
2018 ^b	OL I	2412FCC	Not provided ^a	0
2019	OL I	2412FCC	Not provided ^a	5
2016	OL II	N2412FCC	5	2
2017	OL II	N2412FCC	7	6
2018	OL II	N2412FCC	2	0
2019	OL II	N2412FCC	1	0
2016	OL II	N5704LF3CC	13	5
2017	OL II	N5704LF3CC	13	7
2018	OL II	N5704LF3CC	2	0
2019	OL II	N5704LF3CC	7	2

^aOL I did not record or report VOC readings taken between the primary and secondary canisters

^bOL I could only provide records Canister Change-Out Field Records (which includes monitoring data) beginning May 2018

The CD requires FPC TX to maintain a readily-available supply of fresh carbon canisters at all times where canisters are used as a control device. We observed the locations where OL I and OL II store readily-available fresh carbon canisters in the process unit. We observed the 2 fresh and 10 spent canisters at OL II. One of the fresh canisters still had a “spent” label attached and visible damage to the canister. We observed 1 fresh canister and 6 spent canisters at OL I. Formosa Point Comfort transfers canisters to and from an on-site warehouse. The warehouse has approximately 75 canisters, both fresh and spent. Once they have enough spent canisters, the facility ships them off-site for treatment. The protocol is for operators to notify their supervisor when additional canisters are needed in the unit, however interviews and records show that this protocol is not routinely followed. Mr. Eliot Orsak, Environmental Coordinator for OL I, must manually check the logs to know when to reorder, and he is responsible for ordering canisters for both OL I and OL II. OL I Carbon Canister Change-Out records showed zero canisters available “on-hand” 12 times between May 2018 and December 2019 (**AOC 22**).

Appendix B Paragraph 6. Periodic Review of Process Information

The CD requires FPC TX to modify existing MOC procedures or to develop a new program to annually review process and project information, including but not limited to construction projects, to ensure that all new benzene waste streams are included in the waste stream inventory. During interviews with OL I and OL II staff, it was indicated that no annual review occurs. Instead, the environmental staff updated the MOC process to include additional check boxes that allow for identification of benzene related processes on a project by basis per new proposed project.

Appendix B Paragraph 7. Laboratory Audits

The CD requires FPC TX to conduct audits of all laboratories that perform analyses of Formosa's Benzene Waste Operations NESHAP samples every two years. In 2014, FPC TX conducted laboratory audits on July 15 and August 5. In 2016, FPC TX conducted laboratory audits on June 8, July 20, and August 16. In 2018, FPC TX conducted laboratory audits on August 9 and August 10. Formosa Point Comfort submitted these audit reports to EPA in the 2014, 2016, and 2018 Annual Reports, respectively.

Appendix B Paragraph 8. Benzene Spills

The CD requires FPC TX to review each spill at the facility to determine if any benzene waste was generated and to include the quantity in the TAB. During interviews with the facility operators, managers described their use of a form created by the environmental staff that includes a checkbox for benzene.

Appendix B Paragraph 9. Training

The CD requires FPC TX to develop and implement a program for annual training of all employees who draw benzene waste samples for BWON purposes. The CD also requires FPC TX to develop standard operating procedures for all control devices and treatment processes used to comply with BWON and provide an initial and 3-year refresher training to "any persons who subsequently become operators, prior to the assumption of this duty". Paragraph 9(c) specifically requires that employees of any contractors hired to perform any of the requirements of Appendix B to be trained as well. Formosa Point Comfort requires relevant operators to be trained annually.

Formosa Point Comfort developed computerized training modules for BWON compliance and BWON sampling, as required. The carbon canister training section does not specify that breakthrough is determined between the primary and secondary canisters. The "Responsible Personnel" slide in the BWON Sampling Training is vague. During interviews with OL I and OL II managers and operators, specific "Responsible Personnel" could not be easily identified. The BWON Sampling Training provides slides with sample locations in OL I, OL II, and VCM, but also states "Sampling is not limited to these locations". This could be confusing for operators. The training also mentions Blind Duplicates, Trip Blanks, Field Blanks, and Equipment Blanks, but does not indicate how or when to collect these types of samples (**AOC 23**).

The inspection team reviewed the 2018 and 2019 training records of a subset of operators that were confirmed to be BWON sample collectors from OL I and OL II. Two of the 12 did not have readily available training records (**AOC 24**).

Appendix B Paragraph 10. Sampling

The CD requires FPC TX to submit to EPA a BWON Sampling Plan, submit uncontrolled benzene quantities in the Annual Report, and to submit revised Sampling Plans within 30 days after a need for updates is determined. The facility submitted the original BWON Sampling Plan on 3/29/2010 and submitted revised Sampling Plans on 2/20/2013 and 9/27/2013, removing sampling locations.

The inspection team took a site tour to observe sampling locations in OL I and OL II. Although the BWON Sampling Plan states that samples will be collected quarterly, interviews with operators revealed that FPC TX collect samples monthly at more locations than detailed in the plan.

Appendix B Paragraph 11. Implementation of Corrective Actions

The CD requires FPC TX to submit a written BWON Sampling Report and Corrective Action Plan if any projected calendar year uncontrolled benzene quantity exceeds 1.5 Mg. The facility has not projected to exceed 1.5 Mg in any year since the lodging of the CD.

Appendix B Paragraph 12. Miscellaneous Inspections and Monitoring

The CD requires FPC TX to conduct monthly visual inspections and refill all Part 61 Subpart FF water traps within the affected individual drain systems. The CD requires weekly inspection of Part 61 Subpart FF conservation vents. Formosa Point Comfort may request a frequency modification from EPA Region 6 but has not done so. The CD requires FPC TX to conduct quarterly monitoring and repair of the oil-water separators in benzene waste service.

Formosa Point Comfort provides a “Dry Drains” Report for OL I and OL II within their annual NESHAPS Part 61 Subpart FF TAB Report. For OL I, the report states, “Drains are continuously wetted to ensure they do not go dry.” Per Mr. Aaron Jesson, OL I Assistant Production Manger, the drains on tank 5407FA and 5407FB were capped and sealed in 2010 (**AOC 25**). For OL II, the report states, “P-traps are wetted twice a shift to ensure drains do not get dry.” Although the CD requires monthly visual inspections, FPC TX elects to inspect water seals on individual drains once per shift, or twice per day.

The inspection team reviewed daily OL II operator records used to record if the p-traps on N5407FA and N5407FB are wetted each shift. The operators must manually check “Yes” or “No”. There is no option to note that the tank is out of service, and therefore not accessible to verify if water is present in the p-trap. On March 4, 2020 the inspection team observed tanks 5407FA and 5407FB and Mr. John Hunt, process operator, described the steps taken to ensure the drains are wetted. At the time, tank 5407FB was out of service for API testing. There was barricade tape and lockout tags dated February 22, 2020, making the water line inaccessible. However, the daily records indicate that the p-trap was wetted twice per day (**AOC 26, 27**).

Appendix B Paragraph 13. Recordkeeping and Reporting Requirements

The CD requires FPC TX to provide nine BWON components in the Annual Reports required by Section VI of the CD. Formosa Point Comfort is also required to retain records of monthly individual drain visual inspection results, conservation vent monitoring results, and oil/water separator monitoring results.

As noted in the previous section, the Dry Drains report submitted by the facility in the Annual TAB report includes OL I drains, however there have been no applicable drains since 2010 (**AOC 25**). In addition, OL II records indicate that the drains are wetted twice per day, however there is no way for an operator to note if the drain is out of service, and therefore cannot be inspected and treated (**AOC 26**).

The Dry Drains Report does not include unit names, tag numbers, date of inspections and refill, location, or corrective action. The report includes a blank table with the statement, "P-traps are wetted twice a shift to ensure drains do not get dry" (**AOC 27**).

VINYL CHLORIDE NESHAP - James Haynes and Sarah Frey, EPA Region 6

Leak Detection and Elimination ("LDE") Program

Appendix C, Paragraph 1 of the CD requires FPC TX to continue complying with all applicable requirements of 40 C.F.R. Part 61 Subpart F and to comply with the requirements of Appendix C to minimize VCM emissions at all Covered Process Units. At FPC TX, the LDE Program is applicable at the VCM and PVC units.

Ambient Monitoring System

Appendix C, Paragraph 2 required FPC TX to submit the current LDE Plan to EPA by no later than three months after the Date of Lodging of the CD and re-submit the LDE Plan for review if the LDE Plan is updated throughout the term of the CD. Formosa Point Comfort submitted the original LDE plan to EPA on December 21, 2009. During NEIC's multimedia compliance investigation conducted in November 2003 and February 2004, EPA noted that the ambient monitoring system had 61 sample locations in the VCM unit. As of a letter dated March 25, 2019, from FPC TX to TCEQ, the VCM unit now has 72 ambient monitors. With this most recent update, it does not appear that a copy of the updated map and locations were submitted to EPA as required by Appendix C, Paragraph 2 of the Consent Decree (**AOC 28**).

Ambient Monitoring System Leak Definition

Appendix C, Paragraph 3 requires FPC TX to set the ambient air monitoring system to alarm at 5 ppm VCM on a one-monitoring cycle basis. If the system alarms, FPC TX shall conduct a field walk-through to determine if a leak is present.

In a letter dated December 28, 2018, FPC TX self-reported a failure to conduct a field walk-through, as required by the CD. Both the letter and the Annual Report submitted January 31, 2019 stated that the incident was under investigation and corrective actions would be taken. Following a February 18, 2020 TCEQ investigation, FPC TX implemented corrective actions that included retraining all appropriate staff and modifying the alarm system to include a secondary notification of the alarm; however, Ms. Schmidt was unable to provide the training records, and there was no indication that FPC TX installed a secondary notification of alarms.

Ms. Schmidt provided EPA a document stating that additional corrective actions included an end-of-shift review by supervisors to ensure that operators conducted field walk-throughs. We asked how a supervisor records the end-of-shift review, and Ms. Schmidt indicated that a supervisor signs the Ambient Air Monitor Log at the end of each shift. The inspection team then requested the Daily Ambient Air Monitoring Logs for 2019 from the VCM unit, and FPC TX provided them electronically on March 18,

2020. It is not clear if the end-of-shift review is a newly instituted corrective action that FPC TX should have documented in any protocols or procedures.

Trend Analysis

Appendix C, Paragraph 4 requires FPC TX to evaluate the ambient air monitoring data to identify plant areas with the greatest alarms with respect to frequency and/or magnitude each quarter. After collecting four quarters of data, FPC TX shall develop a work plan to use the information to improve the location of monitors, number of monitoring points, number of fixed-point ambient air monitors, and response to alarms, if necessary.

The inspection team requested the 2019 LDE Trend Analysis for the VCM and PVC units. The analysis provided by FPC TX included a bar graph for each unit quantifying the number of alarms by the potential source of the alarm, sorted by calendar quarter. The quarterly trend analysis reports do not identify the areas with the greatest frequency of alarms or the greatest magnitude of alarm events (**AOC 29**).

Appendix C, Paragraph 5 requires FPC TX to include a summary of the results from the quarterly trend analysis in the Annual Report. For the last three years of Annual Reports, FPC TX has not included any summaries of the quarterly trend analysis in the Annual Reports (**AOC 30**). Instead, Formosa submitted the following statement in the Annual Report, "FPC TX has evaluated the ambient monitoring data based on location, frequency, and magnitude each quarter following the lodging of the Consent Decree." The Annual Report also state that FPC TX, "did not see any need to move the location of the monitors, increase or decrease the number of monitoring points, increase or decrease the number of monitors or alter the response to the alarms. Therefore, no modification of any portion of the ambient monitoring system at FPC TX was necessary." This response has been included in each of the FPC TX Annual Reports for the previous six years, including the 2015 Annual Report that contained two updated LDE Plans. As mentioned previously, in March 2019, FPC TX notified TCEQ of updated monitoring locations in the VCM unit with five additional sample locations. While the March 2019 update appears to be a direct result of a new processing area within the VCM unit and not a direct result of quarterly trend analysis, it is important to note these changes within the Annual Reports because there was a change to the LDE Program.

Appendix C, Paragraph 6 requires FPC TX to submit updated LDE plans to TCEQ for approval if a modification was required as a result of the quarterly trend analysis. Formosa Point Comfort submitted updated LDE plans to TCEQ, but FPC TX did not submit these plans to EPA as required by Appendix C, Paragraph 2.

LDE Audits

Appendix C, Paragraph 7 required Formosa to conduct an initial internal audit no later than 6 months after the Date of Lodging. The CD requires the initial audit to include the following:

- reviewing records to ensure date, time, location, and concentration of each confirmed leak is documented;
- reviewing records to ensure that corrective actions are documented and implemented;

- reviewing records to ensure that a field walk-through investigation was conducted and documented for each alarm event greater than 5 ppm;
- reviewing calculations of vinyl chloride emissions from confirmed leaks causing alarms to ensure that all appropriate reporting was completed for releases that exceeded a reportable quantity for VCM; and
- reviewing emissions inventory and Toxic Release Inventory reporting practices to ensure that confirmed sources of alarm events and releases are included and accounted for in each Covered Facility's emission reports.

The internal audit, conducted February 2010, appears to address all elements that the CD requires; however, the audit report references a debriefing held with representatives at the facility. In the debriefing, the auditors communicated all findings and exceptions noted during the audit with the facility representatives. The auditors appeared to document some of the concerns throughout the report, but a summary of all findings and exceptions was not included in the report; therefore, it is unknown if appropriate corrective actions have been implemented.

Appendix C, Paragraph 8 requires FPC TX to conduct an additional LDE Audit at the termination of the CD, and EPA will review the audit at that time. Paragraph 9 requires LDE Audit reports to be submitted within the subsequent Annual Report. Formosa Point Comfort included the initial LDE audit report in the 2011 Annual Report and satisfied the requirements of this Paragraph.

Enhanced Recordkeeping and Reporting

Appendix C, Paragraph 10 requires FPC TX to record the following information at the VCM and PVC units:

- the number of ambient monitoring system alarms greater than 5 ppm VCM;
- the type of equipment and/or activity involved in alarms for confirmed leaks greater than 5 ppm VCM;
- the location of each VCM alarm;
- the date and time of each VCM alarm;
- any corrective action taken; and
- system downtime for each ambient air monitor.

Appendix C, Paragraph 11 requires quarterly reporting to TCEQ that includes similar information recorded and maintained in Paragraph 10; however, the quarterly reports will not be required to report date/time and location of each alarm. Formosa Point Comfort shall include the concentration of each alarm event.

The inspection team reviewed a few Quarterly Ambient Air Monitoring Reports submitted to TCEQ and confirmed that FPC TX included all required items.

Section III - AREAS OF CONCERN

- 1) Formosa Point Comfort may not be implementing the ELP at all process units, such as the Fractionator II unit, which is within the battery limits of the Olefins Plant and provides feedstock to the OL I and OL II units.
- 2) Formosa Point Comfort may not be reviewing and updating the written LDAR Program on an annual basis, as required by Appendix A, Subsection B. An outdated process map in the CD Manual does not reflect CD current requirements and operations.
- 3) The CD Manual does not accurately describe the procedures for how Directed Maintenance should be implemented. Specifically, Scenario 1 and 2 of the CD Manual does not reference that monitoring is used to repair equipment to achieve the best repair and/or the lowest emission rate reasonably possible.
- 4) Formosa Point Comfort may not be performing Directed Maintenance as required by Appendix A, Subsection E(9) of the CD.
- 5) Formosa Point Comfort may not be following drill-and-tap procedures prior to placing valves on DOR list as required by Appendix A, Subsection E(10) of the CD. Records for current valves on DOR (except control valves) did not indicate if any attempts to repair the valve with drill-and-tap procedures had occurred.
- 6) Formosa Point Comfort may not be providing adequate justification for not attempting drill-and-tap repairs as required by Appendix A, Subsection E(10) of the CD. The facility did not include the form titled "Exemption from Drill-and-Tap" with any DOR records if FPC TX believed there was a major safety, mechanical, product quality, or environmental issue with repairing the valve using drill-and-tap repair procedures.
- 7) Bureau Veritas' monitoring technicians do not sign the daily certifications at the end of each monitoring day. During the review of daily certification records, the monitoring technicians rarely sign the daily certification at the end of each monitoring shift. Generally, the technicians are signing the certification the following day or several days following the monitoring shift.
- 8) Bureau Veritas' monitoring technicians recorded multiple occurrences where total monitoring exceeded 600 components in a day. There were also multiple occurrences where technicians recorded more than 20 consecutive readings below background during the monitoring day.
- 9) Formosa Point Comfort may not be conducting an accurate and complete quarterly LDAR audit as required by Appendix A, Subsection I(24) of the CD.
- 10) Formosa Point Comfort did not complete a final repair within 15 days for a leaking valve in 2019.
- 11) Think Consulting's 2018 LDAR Audit did not evaluate all LDAR regulations for the OL II, Inland Traffic, EDC, and VCM units.
- 12) Formosa Point Comfort failed to conduct an audit of the Marine Traffic unit with the Inland Traffic unit. If these audits were intended to be conducted separately, FPC TX failed to conduct an audit of the Marine Traffic Unit before conducting a second audit at a Covered Process Unit.
- 13) Formosa Point Comfort failed to conduct an audit of the GHU and PPU units before conducting a second audit at a Covered Process Unit.
- 14) Formosa Point Comfort may have incorrectly calculated historical leak rates by combining GHU and PPU with the OL I unit.
- 15) Formosa Point Comfort failed to identify and implement corrective actions when a third-party audit calculated a Comparative Monitoring Leak Ratio above 3.0.

- 16) NEIC discovered two leaking pumps equipped with dual-mechanical seals at Formosa Point Comfort.
- 17) NEIC discovered two leaking valves on steam lines at Formosa Point Comfort.
- 18) Formosa Point Comfort may need to ensure consistency of SOPs with actual procedures for Carbon Canister Change-Outs. SOPs stated minimum PPE requirements to include nitrile gloves and respirators, which neither OL I nor OL II operators use. OL I procedures are blank for sections 1-4, 6-7 and do not mention VOC monitoring at the canisters. OL II procedures include a carbon canister system that is no longer installed.
- 19) Formosa Point Comfort may not be monitoring carbon canisters for breakthrough between the primary and secondary canisters, as required by Appendix B, Paragraph 5(c) of the CD. Records from 2018 and 2019 provided by the facility show that OL I monitors for breakthrough after the secondary canister. Interviews with OL I operators confirmed that the breakthrough monitoring occurs at the secondary, or lag canister. Additionally, OL II failed to measure and record VOC concentrations at both carbon canisters on 1/2/18.
- 20) Formosa Point Comfort may not be using properly sized canisters, adequate Change-Out frequency, or adequate monitoring frequency, as required by 40 CFR §61.354(d) and Appendix B, Paragraph 5(c) of the CD. Canister monitoring records from 2016 through 2019 revealed breakthrough of the secondary carbon canister at least 27 times and breakthrough of the primary canister at least 50 times. See Table 6.
- 21) Formosa Point Comfort may not be keeping appropriate carbon canister records as required by 40 CFR §61.356(j)(10), Paragraph 57 of the CD, or the SOP created by the facility. The facility was unable to provide 2016 and 2017 Carbon Canister Change-Out field records for the OL I unit.
- 22) Formosa Point Comfort may not be keeping an adequate fresh supply of canisters on-hand within the unit as required by Appendix B, Paragraph 5(g). OL I Carbon Canister Change-Out records show zero canisters available "on-hand" 12 times between May 2018 and December 2019.
- 23) Formosa Point Comfort may need to update their BWON Sampling and BWON Consent Decree SOP training modules to be more specific or to provide clarity. Training programs are required by Appendix B, Paragraph 9 of the CD.
- 24) Formosa Point Comfort may not be training all operators who draw benzene waste samples as required by the CD. Of the 12 randomly selected operators, two did not have records of being trained to collect BWON samples. Formosa sent follow up information 3/18/2020. The employee from OL II was identified as a trainee, hired 6/10/19. The employee from OL I had recently signed a chain-of-custody form, indicating that they were the person responsible for collecting samples. Formosa asserts that he was a "Taurus employee" in training and was moved to operations 5/6/2019. Per Appendix B, Paragraphs 9(b) and 9(c) of the CD, training should be provided to any persons who subsequently become operators, prior to their assumption of duties.
- 25) Formosa Point Comfort may have been inaccurately reporting their Part 61 Subpart FF water trap/drain inspections. The Dry Drains report submitted by the facility includes OL I drains, however there have been no applicable drains since 2010. In addition, OL II records indicate that the drains are wetted twice per day, even though the drains could be temporarily out of service.
- 26) Formosa Point Comfort may not be keeping accurate records of Part 61 Subpart FF water trap/drain inspections, required by Appendix B, Paragraph 12 of the CD. We observed an out of service p-trap in OL II during the inspection, but the logs for that day showed that water was flushed into the drain.

The forms used do not provide an option for an operator to note if the drain is out of service, and therefore cannot be inspected and treated.

- 27) Formosa Point Comfort may not be appropriately reporting Part 61 Subpart FF water trap/drain inspections as required by 40 CFR §61.357(d)(8). The Dry Drains report submitted does not include unit names, tag numbers, date of inspections and refill, location, or corrective actions.
- 28) Formosa Point Comfort may not be submitting revisions of their LDE Plan to the EPA, as required by Appendix C, Paragraph 2 of the CD.
- 29) Formosa Point Comfort may not be conducting an adequate trend analysis in the VCM and PVC units to identify the areas with the greatest frequency of alarms or the greatest magnitude of alarms, as required by Appendix C, Paragraph 4 of the CD. This data is intended to inform FPC TX on whether it is necessary to improve the location of monitor, number of monitoring points, number of fixed-point ambient air monitors, and response to alarms. The analysis provided by FPC TX only identifies the total number of alarms per unit and the potential source of the alarm.
- 30) Formosa Point Comfort is not submitting PVC and VCM unit quarterly trend analysis summary reports as required by Appendix C, Paragraph 5 the CD.

The following Area of Concern was developed after the inspection team left the facility:

- 31) In subsequent review of OL II 2017 Carbon Canister Change-Out records, it was discovered that the Change-Out and monitoring event scheduled for 8/29/17 was missed due to Hurricane Harvey. Records indicate that canisters were exchanged without monitoring on 8/30/17. Subsequent monitoring was not performed until the next scheduled Change-Out, on 9/19/17. The caustic area secondary canister had a breakthrough of 1997 ppm and the primary canister had a reading of 10ppm. The Zimpro area secondary canister had a breakthrough of 78 ppm and the primary canister had a reading of 44 ppm. It is unclear if one or both of the canisters were exchanged in August 2017. The lack of monitoring may have resulted in uncontrolled benzene release for an undetermined amount of time. Formosa Point Comfort should have monitored the canisters as soon as practical, instead of waiting until the next scheduled date.

Section IV - FOLLOW UP

Following the inspection, the inspection team received additional information and records on the following dates after leaving FPC TX on March 5, 2020:

- March 6, 2020
- March 31, 2020
- April 7, 2020
- April 13, 2020
- April 14, 2020
- April 29, 2020

Section V - LIST OF APPENDICES

Formosa Plastics Corporation, Texas / Point Comfort Plant
Inspection Dates 3/2-5/2020

Appendix 1 - EPA NEIC: VP1372 Formosa Simplified Report (Final)

Appendix 1

EPA NEIC: VP1372 Formosa Simplified Report (Final)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF CRIMINAL ENFORCEMENT, FORENSICS AND TRAINING
NATIONAL ENFORCEMENT INVESTIGATIONS CENTER
P.O. BOX 25227, DENVER FEDERAL CENTER
DENVER, COLORADO 80225

April 1, 2020

SUBJECT: VP1372 Formosa Simplified Report – Formosa Plastics Corporation, Texas; Point Comfort, Texas
Work Product No.: NEICVP1372E01

FROM: Armando Bustamante, Environmental Engineer
U.S. Environmental Protection Agency (EPA), National Enforcement Investigations Center (NEIC)

**ARMANDO
BUSTAMANTE**

Digitally signed by ARMANDO BUSTAMANTE
DN: c=US, o=U.S. Government,
ou=Environmental Protection Agency,
cn=ARMANDO BUSTAMANTE,
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Date: 2020.04.01 10:27:40 -06'00'

THRU: Rebecca Connell, Field Branch Chief
EPA NEIC

**REBECCA
CONNELL**

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Agency, cn=REBECCA CONNELL,
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Date: 2020.04.01 12:26:51 -06'00'

TO: James Haynes, Physical Scientist
Air Toxics Section, Enforcement and Compliance Assurance Division
EPA Region 6

In response to your request, this report provides a summary of the technical support activities that NEIC performed on March 2-5, 2020.

EPA Region 6 requested that NEIC assist with a consent decree follow-up investigation at the Formosa Plastics Corporation, Texas facility (FPC TX), located at 201 Formosa Drive in Point Comfort, Texas. FPC TX consists of production facilities for the manufacture of the base and intermediate materials for plastics (olefin compounds, vinyl chloride monomer, and chlorine gas); thermoplastics (polyvinyl chloride [PVC], high density polyethylene [HDPEI/HDPEII], linear low density polyethylene [LLDPE], and polypropylene [PPI/PPII]); organic chemicals (ethylene glycol); and inorganic chemicals (caustics/acids).

NEIC's role in this investigation was to assist with an evaluation of the performance of FPC TX in meeting the Benzene Waste Operations National Emissions Standards for Hazardous Air Pollutants (Benzene Waste Operations NESHAP or BWON) and leak detection and repair (LDAR) terms and conditions set forth in its consent decree. As part of this evaluation, NEIC assisted with records review, interviews of Formosa personnel, a site inspection, and LDAR comparative monitoring. NEIC personnel included Armando Bustamante (A. Bustamante, project manager), Martha Hamre (M. Hamre), and Bill Squier (B.Squier). M. Hamre participated in the BWON evaluation, and A. Bustamante and B. Squier participated in the LDAR evaluation. A. Bustamante and B. Squier conducted LDAR comparative monitoring in the HDPEI, LLDPE, Formosa hydrocarbons (FHC), and olefins I (OLI) units. A summary of the LDAR comparative monitoring is provided as Attachment 1. EPA Region 6 personnel James Haynes and Sarah Frey also participated in the on-site inspection.

Detailed records of NEIC's activities are included in the project file. All environmental measurement activities were performed in accordance with the NEIC quality system. All field and laboratory activities described in this report are within the scope of NEIC's ISO/IEC 17025 accreditation issued by the ANSI National Accreditation Board (certificate No. AT-1646).

Attachment 1 On-site LDAR Comparative Monitoring Results (March 2-5, 2020)

cc: Mark Wingard/Civil Services Section Chief, EPA NEIC
James Haynes, EPA Region 6

Attachment 1

On-site LDAR Comparative Monitoring Results (March 2-5, 2020)
Formosa Plastics Corporation, Texas (VP1372)

HDPEI Unit			
Components monitored:			
Valves:		489	
Pumps:		16	
Leaking components			
Tag number	Component type	NEIC reading, ppm	Bureau Veritas reading, ppm
16685	Valve	486	341
17029	Valve	1,430	661
Miscellaneous:			
Fourteen pumps monitored by Bill Squier were identified as being equipped with dual mechanical seal systems and not requiring monthly monitoring, as indicated by the consent decree.			
17614 Pump, NEIC: 865 parts per million (ppm), Bureau Veritas: 1,047 ppm			
17458 Pump, NEIC: 1,300 ppm, Bureau Veritas: 1,211 ppm			
Both of these pumps were equipped with dual mechanical seal systems			

LLDPE Unit			
Components monitored:			
Valves:		965	
Pumps:		3	
Leaking components			
Tag number	Component type	NEIC reading, ppm	Bureau Veritas reading, ppm
08952	Valve	269	406
06489	Valve	791	415
14831	Valve	388	295
14833	Valve	393	390
14809	Valve	402	270
09347	Valve	290	279
125483	Valve	440	270
16177	Valve	476	710
16178	Valve	20,000	100,000
138908	Valve	40,000	Tagged 12/23/19
15692	Valve	30,000	Tagged 12/10/19
138912	Valve	10,000	Tagged 12/9/19
137870	Valve	440	312
15717	Valve	10,000	3,400
15635	Valve	940	320
8372	Valve	1,800	420
75040	Valve	2,100	1,200
Miscellaneous:			
15666 Flange, NEIC: 1,600 ppm, Bureau Veritas: Tagged 12/9/19			
8385 Connector, NEIC: 10,000 ppm, Bureau Veritas: 16,000 ppm			
8377 Plug, NEIC: 20,000 ppm, Bureau Veritas: 23,000 ppm			
8207 Connector, NEIC: 1,600 ppm, Bureau Veritas: 890 ppm			

OLI Unit			
Components monitored:			
Valves: 1,172			
Leaking components			
Tag number	Component type	NEIC reading, ppm	Bureau Veritas reading, ppm
108437	Valve	750	1,120
108219	Valve	4,600	6,500
106858	Valve	1,144	1,020
108172	Valve	23,000	688
108403	Valve	Flameout	10,000
Miscellaneous:			
Valve near tag 108072, NEIC: 875 ppm, Bureau Veritas: 2,300 ppm			
Valve near tag 107989, NEIC: 783 ppm, Bureau Veritas: 6,200 ppm			
Both of these valves were located on a line labeled as 50 pound steam			
108338 Gauge, NEIC: 2,500 ppm, Bureau Veritas: 3,300 ppm			

FHC Unit			
Components monitored:			
Valves: 370			
Pumps: 2			
Leaking components			
Tag number	Component type	NEIC reading, ppm	Bureau Veritas reading, ppm
74293	Valve	811	939
74235	Valve	465	1,518
74205	Valve	1,221	1,170
74202	Valve	494	600
72592	Valve	312	409
74366	Valve	563	600