U.S. Environmental Protection Agency
Office of Compliance and Enforcement
1200 Pennsylvania Avenue, NW
Washington, DC 20460

CHEMOURS CHAMBERS WORKS
CLEAN WATER ACT (CWA)
INSPECTION AND SAMPLING

Deepwater,
New Jersey

Report Date: September 6, 2019 (Revised 4/13/2023)

Inspection and Sampling Activities: July 9 – 11, 2019

Signature Page

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Note: All Confidential Business Information (CBI) has been removed from this report.

1.0 Introduction

On July 9 through 11, 2019, representatives from the U.S. Environmental Protection Agency (EPA) Headquarters, along with EPA contractors Eastern Research Group, Inc. (ERG) and PG Environmental (PG) (hereinafter, collectively, the Inspection and Sampling Team), conducted a Clean Water Act (CWA) inspection and sampling event at Chemours' Chambers Works facility located in Deepwater, New Jersey (hereinafter, facility or Chambers Works).

The Inspection and Sampling Team gathered information by interviewing facility representatives, conducting walk-throughs of facility process and storage areas, collecting and reviewing relevant documentation, and collecting samples at process area sumps, process wastewater collection tanks, and National Pollutant Discharge Elimination System (NPDES)-permitted outfalls. The following are the primary representatives who participated in the inspection, organized by Inspection and Sampling Team, state representatives, key facility personnel that participated in the majority of the inspection, and additional facility representatives that participated in portions of the inspection focused on their respective knowledge areas. A sign-in sheet is included as Appendix A: Sign-In Sheet.

<u>Inspection and Sampling Team:</u>	Loren Denton, EPA Headquarters, Chief – Municipal Enforcement Branch – Water Enforcement Division Jake Albright, PG, Inspector and Sampler Danny O'Connell, PG, Inspector Michelle Spiezio, ERG, Inspector and Sampler
<u>Chemours Key Representatives:</u>	Scott Northey, Chemours, Site Environmental Manager Kristine Wellman, Chemours, Plant Manager Mike Ohm, Chemours, Site Safety and Occupational Health Leader Brian Coll, Chemours, Manufacturing Technical (MT) Manger Michele McClellan, Chemours, MT Chemist Mitchell Press, Chemours, Corporate Environmental Consultant Kevin Sparks, Chemours, Laboratory Supervisor
<u>Chemours Performance Chemicals (PC) Representatives</u>	Bryan Sautter, Chemours, PC Unit Manager Michael Drees, Chemours, PC East Area Manager Evan Hollins, Chemours, PC East Kevin Stewart, Chemours, PC East Joyce Finkle, Chemours, PC East Unit Technology Leader Sven Saldanha, Chemours, PC West Operations Area Manager Kyle Mathis, Chemours, PC West – Specialty Monomers Production Facility (SMPF) Unit Technology Leader

Chemours Site Manufacturing Services (SMS) Representatives	Carolyn Yatsko, Chemours, Site Manufacturing Services (SMS) – Secured Environmental Treatment (SET) and Landfills Environmental Consultant Brian Boettler, Chemours, SMS – Power and Utilities (P&U) and Elastomers Environmental Consultant Joe Ferrante, Chemours, Sampling Consultant Don, AECOM, Sampling Consultant Unitas Todd, AECOM, Sampling Consultant Dennis Thornton, Chemours, SMS – Landfills Melanne Caverly, Chemours, SMS – SET MT Engineer Mark Richmond, Chemours, SMS – Landfills Uriel Bohorquez, Chemours, SMS – SET Operations Area Manager Thomas, Chemours, SMS – SET Grant Robinson, Chemours, SMS – SET Tom Cantwell, Chemours, SMS – Water Treatment Plant Operator Jason Sellers, Chemours, SMS – P&U
Chemours Legal Counsel	Allison Rumsey, Arnold & Porter, Attorney Larry Culleen, Arnold & Porter, Attorney
DuPont Representative	Mahgoub Mahgoub, DuPont

1.1 Purpose of the Inspection

The purpose of the inspection was to evaluate compliance with the CWA and the requirements of the facility's NPDES discharge permit (hereinafter, the permit), permit number NJ0005100, effective April 1, 2018, issued to the facility by New Jersey Department of Environmental Protection (NJDEP) and to evaluate whether there were unauthorized discharges. Due to previous detections of per- and poly-fluoroalkyl substances (PFAS) in the Delaware River (the receiving water for the facility's discharge) and surrounding groundwater, the focus of the sampling was on PFAS. The potential areas of concern observed during the inspection and sampling activities are presented in Section 4.0.

A Toxic Substances Control Act (TSCA) inspection was performed concurrently with the CWA inspection. TSCA inspection activities and findings are not included in this report. Individuals on the sign-in sheet included in Appendix A: Sign-In Sheet who only participated in the TSCA inspection are not included in the list of representatives in Section 1.0.

1.2 Background

Chemours' Chambers Works facility is a fluoropolymer manufacturing facility. The facility produces fluoropolymers and precursors and intermediates for fluoropolymers, which Chemours sends to other industrial facilities for further processing into final products or articles. Hexafluoropropylene oxide (HFPO) dimer acid (referred to as GenX) is used as a processing aid in one process (Building 1205 FRD) at Chambers Works and is also formed as an unintended by-product in the Krytox production process. Refer to Section 2.0 for additional process information.

The facility is part of an industrial complex that houses operations owned and operated by Chemours, E. I. du Pont de Nemours and Company (henceforth, DuPont), and Chambers Cogeneration LP (henceforth, CoGen). Additionally, a portion of the site is a part of the Formerly Utilized Sites Remedial Action Program (FUSRAP), which is a remediation project being managed by the United States Army Corps of Engineers (USACE). The industrial complex is owned by Chemours; DuPont and Kuraray are tenants of Chemours, and USACE is conducting remediation on Chemours property.

The operations at the industrial complex that are currently owned by Chemours were previously owned by DuPont and sold to Chemours on July 1, 2015. Note that DuPont retained a portion of operations at the industrial complex, which were not sold to Chemours. The scope of the inspection and sampling activities primarily included operations owned by Chemours. The Inspection and Sampling Team briefly visited and sampled one location in the DuPont operational area. The Inspection and Sampling Team did not visit the CoGen operations or the USACE remediation site. Refer to Appendix B: Site Diagram for a diagram of the industrial complex.

The entire industrial complex is permitted for discharges under one NPDES permit number NJ00005100, for which Chemours is the sole permittee. The NPDES permit includes coverage for discharges of process wastewater, groundwater (landfill leachate), stormwater, non-contact cooling water, and sanitary wastewater. The industrial complex has one biological wastewater treatment plant that is owned and operated by Chemours. Chemours refers to the wastewater treatment plant (WWTP) as Secure Environmental Treatment (SET).

Chemical production process wastewater from Chemours and its two tenants, DuPont and CoGen, is captured by sumps that service individual process areas. The sumps pump the process wastewater to regional tanks, which are ultimately pumped to the WWTP for treatment (refer to Section 2.5 for a summary of sumps and regional tanks). The WWTP also treats sanitary wastewater from the facility and its two tenants. Treated effluent is ultimately discharged through Outfall DSN 002A. There is a pretreatment system located in the Capstone Intermediates (CI) process area of the facility. Pretreated process wastewaters from CI are sent to the WWTP for treatment prior to discharge through Outfall DSN 002A (refer to Section 2.1.5 for additional information on the CI Pretreatment System).

Chemours additionally operates a water treatment plant (WTP), which takes water from the Salem Canal (which is connected to the Delaware River) and provides treatment for use as process wastewater or as sanitary water. The treatment for process wastewater and sanitary water are the same, except that sanitary water has additional treatment through granulated activated carbon (GAC) beds for the removal of PFAS. The WTP distributes the treated canal water via separate process wastewater and sanitary water systems for use by Chemours and its tenants.

1.3 Permitting and Compliance

This section summarizes the facility’s relevant permitting, enforcement, and compliance considerations.

1.3.1 Outfalls

The facility has three external outfalls that all discharge to the Delaware River and two internal outfalls listed in the permit. Table 1-1 lists each outfall listed in the facility's permit, with description of the type of discharge, associated treatment technology (excluding the upstream treatment at the WTP), and notes on the progression of water. A copy of the facility's water flow diagram from the most recent NPDES permit application, received by NJDEP on March 1, 2016, is included in Appendix C: Water Flow Diagram.

Table 1-1. NPDES Permit Number NJ0005100 Permitted Outfalls

Outfall	Type of Discharge	Treatment	Notes [a]
DSN 001A	• Non-contact cooling water (NCCW) • Stormwater	Yes – Sedimentation in B Basin	NCCW and stormwater are collected in B Basin. The water from B Basin discharges through both Outfalls DSN 001A and 002A. The facility primarily uses Outfall DSN 002A and only discharges to Outfall DSN 001A as needed, such as during wet weather.
DSN 002A	• Process wastewater from all production areas (including DuPont and CoGen) • Groundwater • Landfill leachate • Contact cooling water • NCCW • Stormwater • Organic Chemicals, Plastics and Synthetic Fibers (OCPSF) process waste [b]	Yes – Process wastewater (note process wastewater from the CI process area is pretreated), groundwater, landfill leachate, and contact cooling water are sent to the WWTP for treatment. NCCW and stormwater undergo sedimentation in B Basin.	Treated process wastewater from the WWTP first goes through internal Outfall DSN 662A for monitoring, then is comingled with stormwater and NCCW from B Basin for discharge through Outfall DSN 002A.
DSN 013A	• Stormwater • NCCW (only from utilities generation)	None	According to the facility's permit, a small portion of stormwater and NCCW (which does not go to B Basin) may be discharged through Outfall DSN 013A.
DSN 321 [c]	• Not applicable – internal monitoring point for stormwater and NCCW going into B Basin	Not applicable	There are no monitoring requirements in the permit for this internal outfall.
DSN 662A	• Not applicable – internal monitoring point for effluent from the WWTP	Not applicable	The permit includes monitoring requirements for biological oxygen demand percent removal, total suspended solids, PFAS, and other parameters at this outfall.

a – These notes are based on observations and facility interviews during the inspection.

b – The facility's permit lists OCPSF process waste; however, the Inspection and Sampling Team did not observe this type of discharge at the facility. The permit indicates that the facility is permitted to accept and treat outside wastes. At the time of the inspection, the facility was not treating wastes from outside companies; however, the WWTP personnel stated that the facility wished to do so in the future. Refer to Area of Concern 12.
c – The permit lists this outfall as both DSN 332A and DSN 322; however, this is the same monitoring point. Additionally, the facility representatives indicated that those are not the numbers that the facility uses to identify the monitoring point. The facility refers to this as Outfall DSN 321.

1.3.2 PFAS Monitoring

NJPDES Permit and DMR Data

The facility does not currently have numeric limits for the discharge of PFAS. The permit was modified on August 2, 2018, to include monitoring requirements (effective September 1, 2018) for 16 PFAS compounds at the facility's internal monitoring point for treated process wastewater coming from the WWTP, Outfall DSN 662A. Note that the facility processes fluorotelomers, produces fluoropolymers, and both uses and unintentionally produces GenX.

The Inspection and Sampling Team reviewed discharge monitoring report (DMR) data for Outfall DSN 662A from September 2018 to June 2019 for PFAS. The DMR data only include sampling results for Perfluorooctanoic acid (PFOA) and Perfluorononanoic acid (PFNA). The facility provides the monitoring data for the additional 14 PFAS compounds to NJDEP as attachments to DMR submissions. The Inspection and Sampling Team reviewed the DMR attachments with data for the additional 14 PFAS for 2018 (the team did not have the attachments for the same timeframe as the DMRs).

According to the reviewed DMRs, the PFNA monthly averages and daily maximums were 0 µg/L for all months. The PFOA monthly averages ranged from 2 to 7 µg/L and daily maximums generally ranged from 3 to 6 µg/L, with the daily maximum for February 2019 being the highest at 11 µg/L. The data for the 14 additional PFAS includes higher levels (> 11 µg/L) of:

- Perfluoropentanoic acid (PFPeA): One sample of 12 µg/L in July 2018
- Perfluorohexanoic acid (PFHxA): 36 samples ranging from 12 to 45 µg/L over March through November 2018
- Perfluoroheptanoic acid (PFHpA): One sample of 26 µg/L in July 2018
- GenX: Nine samples ranging from 12 to 32 µg/L in March, September, and October 2018

The Inspection and Sampling Team sampled Outfall DSN 662A. The results are discussed in Section 3.0.

While the facility is not required per the permit to monitor for PFAS in locations other than Outfall DSN 662A, the facility has conducted PFAS sampling at multiple additional locations. These sampling results were provided for 2018 in Chemours' response to EPA's CWA Section 308 information request discussed below.

308 Information Request

EPA issued an information request pursuant to Section 308 of the CWA (henceforth, referred to as 308 letter) to the facility on December 27, 2018. In summary, EPA's 308 letter requested that the Chambers Works facility provide:

- Information and any sampling results for PFAS discharges, including GenX, through all permitted outfalls and any additional pathways not identified in the permit.
- Sampling results for PFAS in groundwater.
- Information on treatment utilized to reduce or eliminate PFAS in groundwater or surface water.

The facility provided a response to the 308 letter dated February 25, 2019. While the scope of the inspection and sampling activities and this report does not include a comprehensive review of the information provided by the facility in the 308 response, the Inspection and Sampling Team did review portions of the response as background for the inspection.

2.0 Observations by Process Area

Figure 2-1 depicts the operations and support functions conducted by Chemours at the Chambers Works facility. The following subsections summarize the interviews and visits to these process areas, including the following information:

- Overview of operations
- Summary of wastes produced and how they are treated or disposed
    - The summary focuses on liquid wastes, but also includes air emissions and solid wastes where the Inspection and Sampling Team observed or discussed such waste.
    - Process wastewater is conveyed to the WWTP through a series of sumps and regional tanks, which are summarized at the end of this section.
- Observations made during walk-throughs of the process areas, including areas of concern

Note that the support functions are not physical process areas and are not discussed in the subsections below.

[CBI redacted]

Figure 2-1. Chemours Operation and Support Function Diagram

2.1 Performance Chemicals (PC) East

Mr. Evan Hollins and Ms. Joyce Finkle described the PC East process area operations and answered questions from the Inspection and Sampling Team about these process areas.

[CBI redacted]

2.1.2 Capstone Intermediates (CI)

Overview of Operations

[CBI redacted]

Wastes Generation and Disposal

[CBI redacted]

Observations During Walk-Through

The Inspection and Sampling Team walked through the CI process areas on Wednesday, July 10, 2019. As part of the process, the Inspection and Sampling Team also reviewed the CI process area computerized distributed control system (DCS).

The following observations are also highlighted in Area of Concern 1:

> The Inspection and Sampling Team observed a temporary pump located near the raw material unloading pad for trucks in the CI process area adjacent to C Sump (refer to Photograph 1 and Photograph 2). Facility representatives indicated that this pump is used to convey process wastewater from washing trailer tank interiors used to transport raw materials, specifically perfluoroalkyl iodides. The facility representatives explained that they began washing emptied trailer tanks in March 2019, due to a backlog of tanks requiring inspection. The facility had previously used off-site contractors to inspect trailer tanks, for which washing is first required; however, they were unhappy with the contractors work and thus began washing and inspecting the trailer tanks internally. When asked, facility representatives estimated that they have washed approximately six trailer tanks. The facility provided a log indicating that the facility washed six total trailer tanks on the following dates: 2/25/2019, 4/1/2019, 4/8/2019, 4/22/2019, 4/29/2019, and 5/6/2019. The facility representatives indicated they have not washed trailer tanks since 5/6/2019, because they no longer have a backlog of trailer tanks requiring inspection.
>
> The facility representatives explained that, when trailer tank washing occurs, process wastewater from the process is isolated in the C-Sump. C-Sump normally feeds J Regional Tank, which discharges to the WWTP; however, during trailer tank washing, C-Sump is locked out so that no process wastewater can leave. The facility then uses the temporary pump and black tubing to pump the process wastewater from the C-Sump to Tank T-56 (refer to Photograph 3). The contents of Tank T-56 are sent to the CI pretreatment system, which discharges to E Sump, the J Regional Tank, then to the WWTP for treatment before final discharge through Outfall 002.

Capstone Ethylation

The Inspection and Sampling Team walked through the processes in the Capstone Ethylation area and did not make any observations.

Capstone Alcohol

The Inspection and Sampling Team observed the scrubbers for Capstone Alcohol. The facility representatives explained that, while the scrubber wastewater from this area is normally sent to Tank T56 for pretreatment thorough the CI Pretreatment process, the facility will divert the flow to F Sump (which goes to J Regional Tank then to the WWTP) when process operations are down but the scrubbers are running to maintain equipment.

The Inspection and Sampling Team observed some equipment that was leaking at the time of the inspection (refer to Photograph 1 and Photograph 2). The facility representatives explained that the leak was utility water.

Capstone Acrylates

The Inspection and Sampling Team observed a valve at the bottom of the reaction vessel (K42) that leads directly to F Sump. The facility representatives explained that this valve remains closed and is automatically blocked such that it cannot be opened mistakenly. Chemours provided follow-up documentation indicating that the process operations are automated and controlled through the DCS. The documentation indicates that, in order to open this valve, the process must be switched from automatic to manual control. The provided documentation shows that, under normal operating conditions, the valve at the bottom of reaction vessel K42 remains blocked; however, this documentation does not include the maintenance history of the valve, which would show historic failures (or lack thereof) and maintenance of the valve to ensure that it is in working order such that it will not fail (i.e., open unexpectedly).

2.1.3 Building 115

Overview of Operations

[CBI redacted]

Wastes Generation and Disposal

[CBI redacted]

Observations During Walk-Through

[CBI redacted]

2.1.4 Building 185

Overview of Operations

[CBI redacted]

Wastes Generation and Disposal

[CBI redacted]

Observations During Walk-Through

The Inspection and Sampling Team did not do a walk-through of this process area.

2.1.5 CI Pretreatment System

Overview of Operations

[CBI redacted]

Wastes Generation and Disposal

[CBI redacted]

Observations During Walk-Through

The following observations are also highlighted in Area of Concern 2:

> The Inspection and Sampling Team observed that the continuously stirred tank reactor (CSTR) was not in service at the time of the inspection. The facility representatives explained that the CSTR is used for additional residence time for pH adjustment and that the facility currently just uses the static mixer for pH adjustment. The facility provided a follow-up statement indicating that the CSTR has been out of service since January 2017 due to insufficient pH loop control, which indicates potential process control issues. However, the facility's statement indicates that the CI Pretreatment facility has shown consistent efficacy since the CSTR was removed from service. Therefore, the Inspection and Sampling Team questions the design of the CI Pretreatment system, since the design includes the CSTR, but according to the facility representatives the system can run appropriately without it. Note that the facility provided the diagram of the CI Pretreatment system included in Appendix D in their February 2019 response to the 308 letter. It includes the CSTR, even though it has been out of service since January 2017.

The Inspection and Sampling Team also observed numerous other pieces of equipment that were not in service at the time of the inspection, including tanks T2, T3, T4, and filter press F1. The facility representatives explained that this equipment was used as a part of an Oberlin filter system that the facility had previously operated as a part of the CI Pretreatment process. The facility took this system offline in summer of 2018 and now just uses cartridge filters for solids removal. The facility representatives indicated that they took the Oberlin filter system offline because it was not needed to achieve the necessary solids removal.

2.2 Performance Chemicals (PC) West

Mr. Kyle Mathis and Mr. Sven Saldanha described the PC West process area operations and answered questions from the Inspection and Sampling Team about these process areas.

2.2.2 Krytox

Overview of Operations

[CBI redacted]

Wastes Generation and Disposal

[CBI redacted]

Observations During Walk-Through
The Inspection and Sampling Team did not do a walk-through of this process area. However, the Inspection and Sampling Team sampled R Sump and G Regional Tank. Sampling information and sample results are provided in Section 3.0.

2.2.3 Specialty Monomer Production Facility (SMPF)

Overview of Operations
[CBI redacted]

Wastes Generation and Disposal
[CBI redacted]

Observations During Walk-Through
The Inspection and Sampling Team did not do a walk-through of this process area. However, the Inspection and Sampling Team sampled G Sump and G Regional Tank. Sampling information and sample results are provided in Section 3.0.

2.2.4 Building 1205 FRD

Overview of Operations
[CBI redacted]

Wastes Generation and Disposal
[CBI redacted]

Observations During Walk-Through
The Inspection and Sampling Team walked through the operations in Building 1205 FRD.

[CBI redacted]

The Inspection and Sampling Team requested the facility provide batch logs and waste records for 2018, showing the wastes produced from FRD-926. The following observations are also highlighted in Area of Concern 3:

> The facility provided records of waste transportation for the acetone used to clean the vessels after the two FRD-926 campaigns in 2018, and before the FRD-921 campaigns. For the March 2018 campaign, the facility stated that they cleaned vessels with two drums of acetone on March 16, 2018 (FRD-926 campaign ended on March 13, 2018 and the FRD-921 campaign started on March 18, 2018). The facility's statement indicates that the batch log sheet for FRD-921 includes the washing waste. For the August 2018 campaign, the facility stated that wastes from vessel cleaning was not included on the batch log sheet. However, the facility located a waste transportation order form showing the disposal of acetone from vessel cleaning on August 14, 2018.
>
> The facility did not provide the batch logs for FRD-926 or FRD-921, claiming that this

information was may be considered to include DuPont Confidential Business Information. The Inspection and Sampling Team could not review these batch logs to fully evaluate the facility's tracking of waste generation and disposal practices in Building 1205 FRD. Based on the facility's statements for the two vessel cleaning occurrences in 2018, one of the two occurrences was not recorded on a batch log; however, this waste was sent off site for incineration based on the waste transportation order forms provide by the facility.

2.2.5 Building 1207/1205 Dry Films

Overview of Operations
[CBI redacted]

Wastes Generation and Disposal
[CBI redacted]

Observations During Walk-Through
The Inspection and Sampling Team did not do a walk-through of this process area. However, the Inspection and Sampling Team sampled G Regional Tank. Sampling information and sample results are provided in Section 3.0.

2.3 Viton Elastomers and TFE Refining

2.3.2 Viton Elastomers

Overview of Operations
[CBI redacted]

Wastes Generation and Disposal
[CBI redacted]

Observations During Walk-Through
The Inspection and Sampling Team did not do a walk-through of this process area. However, the Inspection and Sampling Team sampled A Regional Tank. Sampling information and sample results are provided in Section 3.0.

2.3.3 TFE Refining

Overview of Operations
[CBI redacted]

Wastes Generation and Disposal
[CBI redacted]

Observations During Walk-Through
The Inspection and Sampling Team did not do a walk-through of this process area. However, the Inspection and Sampling Team sampled A Regional Tank. Sampling information and sample results are provided in Section 3.0.

2.4 *Site Manufacturing Services (SMS)*

2.4.2 Landfills

Overview of Operations
[CBI redacted]

Wastes Generation and Disposal
[CBI redacted]

Observations During Walk-Through
The Inspection and Sampling Team drove around Landfill C and observed a portable pump on top of Landfill C. The facility representatives said the float-activated pump is for stormwater in Landfill C.

The facility collects landfill leachate in tank TC-504, which is sent to the WWTP for treatment. The facility representatives indicated that the landfill leachate is considered hazardous waste and undergoes waste characterization every two years. The facility provided the facility's last waste characterization form and associated laboratory analyses, dated October 2017. The Inspection and Sampling Team sampled the landfill leachate from TC-504. Sampling information and sample results are provided in Section 3.0.

2.4.3 Water Treatment Plant (WTP)

Mr. Tom Cantwell, the operator of the Water Treatment Plant, described the WTP operations and answered questions from the Inspection and Sampling Team. The Water Treatment Plant is a part of the power and utilities operations at the facility.

Overview of Operations
[CBI redacted]

Wastes Generation and Disposal
[CBI redacted]

Observations During Walk-Through
The facility pumps in approximately 1,900 gallons of water per minute from Salem Canal. Mr. Cantwell indicated that, at the time of the inspection, the mix chamber was in the process of being rebuilt.

The following observations are also highlighted in Area of Concern 4:

> The Inspection and Sampling Team observed structural issues along the exterior concrete wall of the clarifier tanks. Specifically, there were cracks, crumbling, and lime leaching from the exterior concrete wall of the clarifiers (refer to Photograph 4, Photograph 5, and Photograph 6). The Inspection and Sampling Team observed orange outlines along the exterior wall of the clarifiers. The facility representatives explained that the orange lines were from an integrity assessment of the clarifiers performed by a contractor and that the

facility was in the process of determining the required repairs.

The Inspection and Sampling Team also observed vegetation in one of the clarifiers and in the proceeding chemical mix chamber (refer to Photograph 7 and Photograph 8). Additionally, the Inspection and Sampling Team observed corrosion in the piping conveying treated water from the sand filters to the diversion box (refer to Photograph 9).

[CBI redacted]

The following observations are also highlighted in Area of Concern 5:

Due to significant reduction at the site since the time the WTP was designed, the pumps that service sanitary and process wastewater distribution were oversized for the current demand. At the time of the inspection, WTP operators were bleeding flow from the sanitary service line prior to distribution in order to keep the larger-than-needed pumps running at an optimal capacity (refer to Photograph 10). The water bleed from the sanitary service line goes into A Basin, which is sent to the WWTP for treatment prior to discharge through Outfall DSN 002A.

Mr. Cantwell and Mr. Sellers indicated that, due to the decline in demand for process and sanitary water, the facility has considered using water from the City instead of treating water from the Salem Canal. They explained that the facility does not have a direct access point to City piping. It would require a large capital expense to obtain access and install the required piping, so the facility decided against using City water at that time. Currently, the facility is in the process of trying to obtain funding to resize the WTP to the current demand.

2.4.4 Wastewater Treatment Plant (WWTP)

Ms. Melanne Caverly described the WWTP operations and answered questions from the Inspection and Sampling Team. The WWTP, also referred to as Secured Environmental Treatment (SET).

Overview of Operations
A diagram of the WWTP, including equipment names, is included in Appendix E: Wastewater Treatment Plant Diagram.

[CBI redacted]

Wastes Generation and Disposal
[CBI redacted]

Observations During Walk-Through
The Inspection and Sampling Team walked through the WWTP, reviewed operation and maintenance activities, and interviewed WWTP personnel. On July 10, 2019, the Inspection and Sampling Team observed the primary treatment operations, under normal operating conditions at the WWTP. The Inspection and Sampling Team inspected the secondary and tertiary treatment processes on July 11, 2019, which were not in normal operating conditions. The following observations are also

highlighted in Area of Concern 6:

> When the Inspection and Sampling Team arrived to inspect the secondary and tertiary treatment operations at the WWTP on June 11, 2019, at approximately 8:30 – 9:00 a.m., the WWTP operations team had changed operational flows within the plant. Specifically, the WWTP operators were changing flows from biological aeration tank AE-152 to biological aeration tank AE-153. Due to this change in operations, the Inspection and Sampling Team was unable to inspect the secondary and tertiary treatment operations at the WWTP under normal operating conditions. This is because, while AE-153 was being filled, flow through the remainder of the secondary treatment operations was decreased and flow through the tertiary treatment operations was eliminated (refer to Photograph 11 and Photograph 12). The facility representatives indicated that the change in operation occurred just before 8:00 a.m. on June 11, 2019. However, on June 10, 2019, facility representatives said AE-153 was out of service. Note: The Inspection and Sampling Team conducted sampling at the facility earlier that day and obtained samples from Outfall DSN 662A and DSN 002A around 7:00am, prior to the change in operational flows. The sampling data is reflected in Section 3.0.

The Inspection and Sampling Team observed the pump pit, into which process wastewater is collected prior to treatment at the WWTP. The Inspection and Sampling Team made the following observations, also highlighted in Area of Concern 7:

> A portion of the influent to the WWTP is collected at the pump pit and treated with sulfuric acid. Facility representatives explained that the facility adds sulfuric acid to achieve a pH of 2 for the treatment of fecal coliform. However, this treatment practice is not typical, as secondary biological treatment is used for treatment of biological waste, including fecal coliform. The Inspection and Sampling Team observed excessive solids buildup in equipment prior to the primary clarifiers, which may be partially due to solids precipitation caused by the pH adjustment to 2 in the pump pit and subsequent lime neutralization during primary treatment, before the wastewater reaches the primary clarifiers. The addition of sulfuric acid at the pump pit to reduce the pH to 2 is not a standard practice.

The Inspection and Sampling Team observed numerous operation and maintenance (O&M) issues throughout the WWTP. Specifically, the Inspection and Sampling Team made the following observations, also highlighted in Area of Concern 8:

> While inspecting the primary treatment operations, the Inspection and Sampling Team observed large amounts of sediment built up in numerous pieces of equipment, which will reduce the capacity and functionality of the equipment and may compromise the structural integrity. Multiple pieces of equipment were nearly full of solids, eliminating their ability to function as designed. Specifically, the Inspection and Sampling Team observed:
>
> - Solids deposition on the bottom of neutralizer NE-41 (not in use during the inspection), such that there was evident alligatoring and vegetation growth within

the alligatoring (refer to Photograph 13 and Photograph 14). Mr. Bohorquez estimated that there was around 2 to 3 feet of solids in neutralizer NE-41. He said the facility intends to have the solids removed but has not determined when and how best to do so. Mr. Bohorquez also indicated that the bottom of the tank is lined.

- Multiple feet of solids deposition along the interior of the outer wall of the flow splitter conveying water from the neutralizers to the flocculators (refer to Photograph 15).
- Solids deposition visible from the top of flocculator FL-62, extending to the top of the influent pipes (refer to Photograph 16, Photograph 17, and Photograph 18).
- Solids deposition visible from the top of flocculators FL-63 and 64 (not in use during the inspection) (refer to Photograph 19).

Additionally, the Inspection and Sampling Team observed numerous pieces of equipment that may be structurally compromised for reasons other than sediment buildup, including:

- Damaged coating along the side of the neutralizer NE-43 (not in use during the inspection) (refer to Photograph 20).
- Large cracks in the walls of the flocculators (refer to Photograph 21 and Photograph 22).
- Rusted support structures:
    - Flow splitter GT-161, which receives flow from the aerators in secondary treatment (refer to Photograph 23 and Photograph 24).
    - Secondary clarifier CF-161 (not in use during the inspection) (refer to Photograph 25).
- Damaged floating roof on surge tank TS-501, including broken expansion valves. This tank was out of service at the time of the inspection and the facility was conducting repairs, with an estimated completion date of summer 2020.

Further, the Inspection and Sampling Team observed:

- Vegetation in the:
    - Primary clarifier CF-63 (refer to Photograph 26)
    - Secondary treatment aerator AE-153 (not in use during the inspection) (refer to Photograph 27)
    - Secondary clarifier CF-162 (refer to Photograph 28 and Photograph 29)
    - Secondary clarifier CF-163 (refer to Photograph 30 and Photograph 31)
    - Tertiary treatment aerator AE-251 Cell A (not in use during the inspection) and Cell B (refer to Photograph 32 and Photograph 33)
    - Tertiary clarifier CF-261 (not in use during the inspection) (refer to Photograph 34)
    - Tertiary clarifier CF-262 (refer to Photograph 35 and Photograph 36).
- A temporary pump being used to replace a broken pump (P606), which conveys wastewater to the neutralizers (refer to Photograph 37). Facility representatives indicated that pump P606 broke approximately three weeks prior to the inspection. The Inspection and Sampling Team asked about work orders for this

pump, which the facility provided as part of a follow-up documentation request. The work orders include an order to inspect an expansion joint with a start date of June 10, 2019, followed by screen cleaning with a start date of June 12, 2019, expansion joint replacement with a start date of June 28, 2019, and a work order to rebuild and install with a start date of July 17, 2019.
- Two decommissioned return activated sludge (RAS) screw pumps (refer to Photograph 38) that the facility replaced by a different pump (refer to Photograph 39).
- Leaking equipment.
- Excessive air flow in areas of biological aeration basin AE-152 actively used for secondary treatment (refer to Photograph 40). Facility representatives indicated that there was broken piping in the air distribution system contributing to the excessive air flow. The excessive air flow was evident by the higher than average dissolved oxygen (DO) concentrations in the water in AE-152 on the monthly process control data reviewed by the Inspection and Sampling Team.
- Lack of maintenance for equipment that is not generally used because the plant was running at lower capacity than designed for (refer to Photograph 13, Photograph 14, Photograph 19, Photograph 20, Photograph 25, Photograph 27, Photograph 32, and Photograph 34).

The Inspection and Sampling Team reviewed the WWTP's monthly process control data and shift turnover sheets to further evaluate O&M procedures at the WWTP. These data indicate numerous equipment issues and failures and the facility's actions to correct the issues, including trying to determine the cause of the issues, repairs, and replacements. These issues include freezing in equipment, solids buildup requiring removal, pH probe issues in NE-42, and issues with lime slurry tanks and distribution lines. The excessive sediment buildup, compromised structure of the equipment, vegetation, leaking, and frequent maintenance issues in the WWTP indicate insufficient O&M procedures.

The facility representatives explained that the tertiary effluent from the WWTP is discharged into a ditch, which the facility refers to as the "10-foot ditch." The Inspection and Sampling Team observed the tertiary effluent pipe into the 10-foot ditch and, adjacent to this pipe, another pipe of equal size (refer to Photograph 41). Facility representatives indicated that this other pipe was for primary effluent, but it is not used. Along the 10-foot ditch, the Inspection and Sampling Team observed the internal monitoring point for Outfall DSN 662A (refer to Photograph 42 and Photograph 43). The internal monitoring point is located approximately 100 feet from the tertiary effluent pipe going into the 10-foot ditch.

Due to decline in demand, the facility was operating the WWTP much lower than design capacity (the WWTP was operating at 3 to 5 MGD and has a design capacity of 40 MGD), resulting in many pieces of equipment that were not in use at the time of the inspection. The Inspection and Sampling Team made the following observations, also highlighted in Area of Concern 9:

The Inspection and Sampling observed multiple critical process units not in use and being evaluated for repairs or decommissioning at the time of the inspection. Specifically, the Inspection and Sampling Team observed surge tanks, neutralizers, flocculators, primary

> clarifiers, secondary biological treatment aeration basins, blowers, pumps, secondary clarifiers, and tertiary clarifiers were not in use at the time of the inspection (refer to Photograph 13, Photograph 14, Photograph 19, Photograph 20, Photograph 25, Photograph 27, Photograph 32, and Photograph 34 and Appendix E: Wastewater Treatment Plant Diagram [out of service equipment is listed as "OOS" on the WWTP diagram]). Due to equipment redundancy, the facility was still operating other process units; however, the amount of equipment not in use indicates that the WWTP is oversized for the current demand. The WWTP has a design capacity of 40 MGD and was operating at 3 to 5 MGD at the time of the inspection.
>
> In addition to equipment that was not in use for repair or decommissioning, the Inspection and Sampling Team observed operations to be different from those described in the March 2016 permit application. Specifically, facility representatives indicated that they were using the in-service flocculators to convey water, as opposed to its designed functionality of flocculating solids. This is evident by the solids buildup to nearly the top of the flocculators (refer to Photograph 16, Photograph 17, and Photograph 18). Additionally, the facility formerly added powdered activated carbon into the secondary treatment process for color control. However, at the time of the inspection, the Inspection and Sampling Team observed that the facility was no longer using activated carbon for treatment.
>
> The changing of operations and equipment usage at the WWTP are not reflected in the facility's March 2016 permit application.

The Inspection and Sampling Team made the following observations, also highlighted in Area of Concern 10:

> The WWTP representatives indicated that the facility wishes to accept and treat wastes from outside companies in the future. The facility is currently permitted for centralized waste treatment (CWT) wastewater at the WWTP. However, based on the observations detailed in Area of Concern 8, the O&M procedures and condition of the equipment at the WWTP may not be sufficient to treat additional wastewater.

2.5 Regional Tanks and Sumps

The facility collects process wastewater or other wastewater to be treated at the WWTP in a series of sumps that feed into regional tanks. Table 2-1 list the active regional tanks, sumps which contribute to the regional tanks, and the associated process areas that contribute flow to these sumps. The facility provided standard operating procedures (SOPs) for regional tank maintenance, which includes multiple types of inspections (infrared, external visual, 30-day in-service), pump maintenance, and cleaning activities.

Table 2-1. List of Regional Tanks and Sumps

[CBI redacted]

2.6 Groundwater Recovery System

The facility operates a groundwater recovery system to pump and treat groundwater underneath the facility. The groundwater recovery system consists of an interceptor well system, comprised of eight recovery wells, and a landfill recovery system, consisting of an additional two recovery wells. The facility pumps approximately 1 MGD of groundwater from the ten wells. The facility sends the pumped groundwater to the WWTP for treatment and discharge.

In addition to the recovery wells, the facility installed a sheet pile barrier along the facility's southwest perimeter, which is along the Salem Canal and Delaware River (see Appendix F: Sheet Pile Barrier Map), to prevent the flow of groundwater off site into these water bodies. In Chemours' response to the 308 letter, Chemours states that quarterly water level monitoring indicates that groundwater does not migrate off site due to the pumping efforts. Additionally, in the response to the 308 letter, Chemours indicates that it does not have any sampling data indicating that PFAS in groundwater are reaching the Delaware River.

3.0 Sampling

This section summarizes the Inspection and Sampling Team's sampling activities at the facility, including the analytical results for the wastewater samples collected during the inspection, which were all collected on July 11, 2019. Facility representatives aided in the Inspection and Sampling Team's sample collection due to safety and convenience reasons. Specifically, the facility's sampler, Mr. Joe Ferrante, contractors with AECOM, and Mr. Kevin Stewart, an operator in the PC Process Area, assisted with sampling.

While collecting samples, the Inspection and Sampling observed the facility's sampling procedures. Mr. Joe Ferrante collects the samples from the facility's permitted outfalls and regional tanks. Chemours contractors with AECOM collect additional sampling as needed, including from sumps. AECOM specifically conducts sampling on Wednesdays for the facility's two-year compliance plan with the Delaware River Basin Commission for nutrients and solids.

The Inspection and Sampling Team made the following observations, also highlighted in Area of Concern 11:

> The Inspection and Sampling Team spoke with Mr. Kevin Sparks, Chemours Laboratory Supervisor, who develops the schedule for sample collection. Mr. Sparks indicated that the facility conducts sampling for permit monitoring requirements on Thursdays, which was chosen based on the preference of the WWTP operations team, so the data would be more useful for process control purposes.

3.1 Introduction

All samples were analyzed with a modified version of EPA Method 537 using isotope dilution for the following PFAS analytes, organized below with the corresponding Chemical Abstracts Service (CAS) number:

Analyte	CAS No.
Perfluorobutane sulfonic acid (PFBS)	375-73-5
Perfluorohexane sulfonic acid (PFHxS)	355-46-4
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8
Perfluorooctane sulfonic acid (PFOS)	1763-23-1
Perfluorodecane sulfonic acid (PFDS)	335-77-3
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnDA)	2058-94-8
Perfluorododecanoic acid (PFDoDA)	307-55-1
Perfluorotridecanoic acid (PFTrDA)	72629-94-8
Perfluorotetradecanoic acid (PFTeDA)	376-06-7
Perfluorooctanesulfonamide (FOSA)	754-91-6
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2
N-Methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
N-Ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	13252-13-6

3.2 Sampling Locations

The Inspection and Sampling Team collected 14 wastewater samples, a field blank, and a trip blank. Table 3-1 summarizes the samples taken, including the sample point location, sample description, and date and time that the sample was taken. All samples were liquid and were analyzed for the PFAS listed above.

Table 3-1. Sample Identification

Sample ID	Sampling Point Location	Sample Description	Date and Time
SP-AR	A Regional Tank	Process wastewater sample from the tap on A Regional Tank, which includes pretreated DuPont process wastewater. Sample was clear liquid with an orange tint and no visible solids.	7/11/2019, 6:33am
SP-662	Internal Outfall DSN 662A	Process wastewater sample from a 24-hr composited sample taken at Outfall DSN 662A, which is the effluent from the WWTP. Sample was clear liquid with a slight orange-yellow	7/11/2019, 6:50am

Table 3-1. Sample Identification

Sample ID	Sampling Point Location	Sample Description	Date and Time
		tint and no visible solids.	
SP-JR	J Regional Tank	Process wastewater sample from the tap on J Regional Tank, which holds process wastewater from PC East. Sample was clear liquid with an orange tint and no visible solids.	7/11/2019, 7:05am
SP-002	Outfall 002	Process wastewater sample from a grab tap at Outfall 002. Sample was clear liquid with a slight yellow tint and no visible solids.	7/11/2019, 7:14am
SP-321	Internal Outfall 321 (B Basin)	Process wastewater sample collected from tubing connected to a composite sample pump at Outfall 321 (B Basin). Sample was clear liquid with a slight yellow tint and no visible solids.	7/11/2019, 7:24am
SP-GR	G Regional Tank	Process wastewater sample from the tap on G Regional Tank, which holds process wastewater from PC West. Sample was clear liquid with no visible color or solids.	7/11/2019, 7:37am
SP-FMDL	DuPont treated water	DuPont process wastewater sample from the tap at the end of the GAC pretreatment system for DuPont process area. Sample was clear liquid with no visible color or solids.	7/11/2019, 9:45am
SP-504	Landfill leachate	Landfill leachate sample from a tap at tank TC-504, from which landfill leachate is sent to the WWTP. Sample was black, cloudy liquid.	7/11/2019, 10:09am
SP-T56	Influent to CI pretreatment	Process wastewater sample taken with a bailer from tank T56, which holds process wastewater to be treated in the CI Pretreatment system. Sample was clear liquid with no visible color or solids.	7/11/2019, 10:46am
SP-CB81	Effluent from CI Pretreatment	Process wastewater sample from the tap of the polishing GAC bed in CI Pretreatment, which is the effluent from CI Pretreatment to J Regional Tank. Sample was clear liquid with no visible color or solids.	7/11/2019, 10:55
SP-RR	R Sump (to G Regional Tank)	Process wastewater sample collected from tubing connected to a composite sample pump at R Sump, which contains process wastewater from Krytox. Sample was clear liquid with no visible color and grey solids stuck to the bottom of the bottle.	7/11/2019, 11:20am
SP-YS	Y Sump (to G Regional Tank)	Process wastewater sample collected from tubing connected to a composite sample pump at Y Sump, which contains process wastewater from Building 1205. Sample was clear liquid with no visible color or solids.	7/11/2019, 11:25am
SP-GS	G Sump (to G Regional Tank)	Process wastewater sample collected from tubing connected to a composite sample pump at G Sump, which contains process wastewater from SMPF. Sample was clear liquid with no visible color or solids.	7/11/2019, 11:32am
SP-HC	Henby Creek	Surface water sample collected with a dipper pole into the sample bottle in Henby Creek. Sample was clear liquid with a yellow tint and a some some brown solids.	7/11/2019, 12:02pm
Field Blank	Field Blank - Near R Sump	PFAS-free water provided by ALS Environmental. Transferred near R Sump.	7/11/2019, 11:12am

Table 3-1. Sample Identification

Sample ID	Sampling Point Location	Sample Description	Date and Time
Trip Blank	Trip Blank	PFAS-free water provided by ALS Environmental.	Not applicable.

3.3 Results

This section includes discussion of the analytical results of the 14 wastewater samples, field blank, and trip blank.

3.3.2 Quality Control

The laboratory conducted analyses on the field blank and trip blank. Two analytes in the field blank were above the method detection limit, but below the reporting limit. One of these analytes was detected in the associated method blank, indicating potential contamination from the method for this analyte in the field blank. As discussed in Appendix G: Sample Quality Assurance / Quality Control Discussion, the laboratory reperformed analyses associated with this contaminated method blank for all other samples, but did not have enough sample volume for the field blank to reperform analyses. All remaining analytes in the field blank and all analytes in the trip blank were not detected.

The results for certain analytes in samples SP-GR and SP-RR were impacted by matrix interference. Specifically, the results show low surrogate recovery, which affects the quantitation of the native analytes. These results are denoted in the summaries below. Additional information on this matrix interference and a summary of which analytes were impacted in the above samples are included in Appendix G: Sample Quality Assurance / Quality Control Discussion.

Additional discussion on the laboratory's quality assurance and quality control analyses is included in Appendix G: Sample Quality Assurance / Quality Control Discussion. Information on the exchange of samples and laboratory analysis by ALS Environmental is provided in the chain-of-custody forms in Appendix H: Chain of Custody Form.

Based on the results of the quality control analysis, and the information in Appendix G: Sample Quality Assurance / Quality Control Discussion, ERG determined that the sampling data described in this sample summary are acceptable for use, except for those analytes in SP-GR and SP-RR for which matrix interference impacts the sample results.

3.3.3 Field Sample Results

Table 3-6, Table 3-7, and Table 3-8 present the results of the PFAS analyses and the associated reporting limits. Reporting limits may be elevated due to dilutions, which are required due to the presence of elevated levels of target analytes. The permit does not include limits for PFAS to which these results can be compared. The sample results are discussed and summarized below. Summaries of results presented in Table 3-2 through Table 3-5 use 1 µg/L for comparisons purposes; this value was chosen for summarization purposes and does not otherwise hold significance (e.g., it is not a regulatory limit).

Table 3-2 summarizes results for the Chemours sumps and DuPont process area samples. Process wastewater from these areas are sent to regional tanks and then to the WWTP for treatment before discharge through Outfall DSN 002A. The following is also highlighted in Area of Concern 12:

> GenX was detected at 80 µg/L in R Sump, which is associated with the Krytox processes. At the time of the inspection, the Krytox process was not in operation. As discussed in Section 2.2.2, GenX is generated as an unintended byproduct during the Krytox production processes. The facility sends process wastewater from the Krytox process to the R Sump. Chemours disclosed the potential presence of GenX in this process wastewater to EPA in the 308 response. During the inspection, facility representatives indicated that the facility is currently awaiting approval from NJDEP to use GAC filters for pretreatment of the process wastewater produced in the Krytox processes. The process wastewater is sent to the WWTP; however, there is no pretreatment to remove PFAS from the process wastewater in R Sump.
>
> GenX was also detected at 15 µg/L in Y Sump, which is the sump for the Building 1205 FRD processes [CBI redacted]. The processes in Building 1205 were not in operation at the time of the inspection. As discussed in Section 2.2.4, facility representatives indicated that all liquid waste from Building 1205 FRD is captured and sent off site for incineration. The Inspection and Sampling Team did not discern the pathway from which GenX enters Y Sump. The process wastewater is sent to the WWTP; however, there is no pretreatment to remove PFAS from the process wastewater in Y Sump.

Table 3-2. Summary of Sampling Results for Sumps and DuPont Process Area

Sampled Sump/Area	Associated Process Area	Result Notes
DuPont	Effluent from the lag GAC bed in DuPont process area (which goes to A Regional Tank)	• 26 of 28 analytes were non-detect or below the reporting limit • The remaining analytes were all detected at levels below 1 µg/L

R Sump (to G Regional Tank)	PC West – Krytox (GenX created as an unintended byproduct)	• 10 of 28 analytes were non-detect or below the reporting limit
		• The remaining analytes were detected at levels below 1 µg/L except for the following:
		  o PFBA = 4.2 µg/L
		  o PFPeA = 1.2 µg/L
		  o PFHxA = 1.5 µg/L
		  o HFPO-DA (GenX) = 80 µg/L

Y Sump (to G Regional Tank)	PC West – Building 1205 (GenX used)	• 13 of 28 analytes were non-detect or below the reporting limit • The remaining analytes were detected at levels below 1 µg/L except for the following: o HFPO-DA (GenX) = 15 µg/L
G Sump (to G Regional Tank)	PC West – SMPF	• 19 of 28 analytes were non-detect or below the reporting limit

Table 3-2. Summary of Sampling Results for Sumps and DuPont Process Area

Sampled Sump/Area	Associated Process Area	Result Notes
		• The remaining analytes were all detected at levels below 1 µg/L

Table 3-3 summarizes the sampling results for the influent and effluent from the CI Pretreatment system. This table also includes the calculated percent removal for selected analytes between the influent and effluent samples. The following is also highlighted in Area of Concern 12:

> In general, GAC is useful for longer-chain PFAS and is less effective for shorter chain PFAS.[1] This is generally consistent for the sample results, apart from the PFBA results. The removal efficiency of PFPeA, PFHxA, and PFHpA are significantly lower than that for the longer chain PFOA and PFDA.
>
> The sampling results for the CI Pretreatment influent and effluent show an increase of nearly 6,000% in 4:2 FTS. 4:2 FTS was detected in J Regional Tank at a higher concentration than that in the CI Pretreatment system effluent (shown in Table 3-4). The facility produces 42-I (in Capstone Intermediates) and 42-U (in Building 115, A14 operation), which are fluorotelomer-based products. However, the facility does not purchase or produce 4:2 FTS based on the information obtained by the Inspection and Sampling Team. Fluorotelomers have degradation pathways in which they degrade into intermediate degradation products, including fluorotelomer alcohols, fluorotelomer carboxylic acids, and fluorotelomer sulfonic acids, before degrading to terminal degradation products such as PFBA, PFPeA, PFHxA, PFHpA, and PFOA.[2] The Inspection and Sampling Team did not further evaluate the potential for degradation of PFAS at the facility.

Table 3-3. Summary of Sampling Results for CI Pretreatment System

Sampled Area	Associated Process Area	Result Notes
Tank T56	Influent to the CI Pretreatment system	• 15 of 28 analytes were non-detect or below the reporting limit • The remaining analytes were detected at levels below 1 µg/L except for the following: ○ PFBA = 25 µg/L ○ PFPeA = 31 µg/L ○ PFHxA = 580 µg/L ○ PFHpA = 120 µg/L ○ PFOA = 14 µg/L ○ PFDA = 3.1 µg/L

[1] U.S. EPA. "Reducing PFAS in Drinking Water with Treatment Technologies." August 23, 2018. Available at: https://www.epa.gov/sciencematters/reducing-pfas-drinking-water-treatment-technologies

[2] Interstate Technology Regulatory Council (ITRC). *Naming Conventions and Physical and Chemical Properties of Per- and Polyfluoroalkyl Substances (PFAS)*. March 15, 2018. Available at: https://pfas-1.itrcweb.org/wp-content/uploads/2018/03/pfas_fact_sheet_naming_conventions__3_15_18.pdf

Table 3-3. Summary of Sampling Results for CI Pretreatment System

Sampled Area	Associated Process Area	Result Notes
		• Note the sample result for 4:2 FTS = 0.047 µg/L
GAC bed AD1	Effluent from the CI Pretreatment System (to J Regional Tank)	• 18 of 28 analytes were non-detect or below the reporting limit (the same 15 analytes as Tank T56 plus three additional analytes) • For comparison to the influent, the results for analytes listed above in the effluent are: o PFBA = 3.7 µg/L (85% removal) o PFPeA = 25 µg/L (19% removal) o PFHxA = 460 µg/L (21% removal) o PFHpA = 46 µg/L (62% removal) o PFOA = 0.015 µg/L (~100% removal) o PFDA = 0.0047 µg/L (~100% removal) o 4:2 FTS = 2.7 µg/L (~6000% increase)

Table 3-4 includes a summary of the sampling results for samples taken at regional tanks and landfill leachate. Process wastewater from the regional tanks and the landfill leachate are sent to the WWTP for treatment before discharging through Outfall DSN 002A. The following is also highlighted in Area of Concern 12:

> PFAS concentrations in the samples taken at J Regional Tank and the landfill leachate were relatively high compared to all other samples, with PFHxA concentrations of 310 µg/L and 200 µg/L, respectively. In addition, the landfill leachate had the highest number of detected analytes and analytes at concentrations above 1 µg/L. These waste streams are sent to the WWTP; however, there are no pretreatment methods to remove PFAS from these streams prior to the WWTP. Additionally, the operations in the WWTP do not include treatment for PFAS. Generally, the same PFAS compounds that were detected in the effluent of the WWTP (Outfall DSN 662A in Table 3-5) were also detected in the samples in Table 3-4 and vice-versa.

Table 3-4. Summary of Sampling Results for Regional Tanks and Landfill Leachate

Regional Tank	Associated Process Area(s)	Result Notes
A Regional Tank	DuPont, CoGen, Chemours Elastomers, Warehousing	• 17 of 28 analytes were non-detect or below the reporting limit • The remaining analytes were all detected at levels below 1 µg/L
J Regional Tank	PC East – Capstone Intermediates	• 16 of 28 analytes were non-detect or below the reporting limit • The remaining analytes were detected at levels below 1 µg/L except for the following: o PFBA = 14 µg/L o PFPeA = 7.7 µg/L o PFHxA = 310 µg/L o PFHpA = 14 µg/L o 4:2 FTS = 4.5 µg/L

Table 3-4. Summary of Sampling Results for Regional Tanks and Landfill Leachate

Regional Tank	Associated Process Area(s)	Result Notes
G Regional Tank	PC West – SMPF, Dry Films, Krytox, and Building 1205	• 10 of 28 analytes were non-detect or below the reporting limit • The remaining analytes were detected at levels below 1 µg/L except for the following: o HFPO-DA (GenX) = 8.2 µg/L

Landfill Leachate	Landfill C (Hazardous landfill)	• 8 of 28 analytes were non-detect or below the reporting limit
		• The remaining analytes were detected at levels below 1 µg/L except for the following:
		  o PFBS = 1.3 µg/L
		  o PFBA = 5.4 µg/L
		  o PFPeA= 69 µg/L
		  o PFHxA = 200 µg/L
		  o PFHpA = 21 µg/L
		  o PFOA = 60 µg/L
		  o PFNA = 4.5 µg/L
		  o PFDA = 4.4 µg/L
		  o 6:2 FTS = 2.2 µg/L
		  o HFPO-DA (GenX) = 4.3 µg/L

Table 3-5 includes a summary of sampling results from the samples taken at the permitted outfalls. Water from B Basin (Outfall DSN 321) and Outfall DSN 662A (effluent from the WWTP) are comingled and discharged through Outfall DSN 002A. The following is also highlighted in Area of Concern 12:

> The sample taken at Outfall DSN 321 has PFAS concentrations of 1.5 µg/L for PFHxA and 1.1 µg/L for GenX. The sample taken at Outfall DSN 662A has PFAS at higher concentrations, with six compounds at levels above 1 µg/L, including PFHxA at a concentration of 32 µg/L. The wastewater from DSN 321 and DSN 662A is discharged through Outfall 002A without additional treatment. The sample taken at DSN 002A has PFAS concentrations at levels lower than those in DSN 662A, showing the dilution of these analytes from the comingling of water from DSN 662A and DSN 321.

Table 3-5. Summary of Sampling Results for Outfalls

Outfall	Associated Process Area	Result Notes

DSN 321	B Basin – Water from B Basin is comingled with that from DSN 662A (WWTP effluent) and discharged through DSN 002A	• 10 of 28 analytes were non-detect or below the reporting limit
		• The remaining analytes were detected at levels below 1 µg/L except for the following:
		  o PFHxA = 1.5 µg/L
		  o HFPO-DA (GenX) = 1.1 µg/L

DSN 662A	WWTP effluent	• 10 of 28 analytes were non-detect or below the reporting limit

Table 3-5. Summary of Sampling Results for Outfalls

Outfall	Associated Process Area	Result Notes
		• The remaining analytes were detected at levels below 1 µg/L except for the following: ○ PFBA = 5.1 µg/L ○ PFPeA = 4.1 µg/L ○ PFHxA = 32 µg/L ○ PFHpA = 3.1 µg/L ○ PFOA = 4.4 µg/L ○ HFPO-DA (GenX) = 1.4 µg/L µg/L
DSN 002A	Final discharge to Delaware River (co-mingled water from DSN 321 and DSN 662A)	• 10 of 28 analytes were non-detect or below the reporting limit • The remaining analytes were detected at levels below 1 µg/L except for the following: ○ PFBA = 1.7 µg/L ○ PFPeA = 1.1 µg/L ○ PFHxA = 12 µg/L ○ PFOA = 1.4 µg/L ○ HFPO-DA (GenX) = 1.1 µg/L

Additionally, the Inspection and Sampling Team sampled Henby Creek near its discharge point to the Delaware River. The results of the sampling show non-detects or concentrations below the reporting limit for 18 of the 28 analytes. The remaining 10 analytes all had concentrations below 0.1 µg/L (10 ng/L).

The following discussion is related to Area of Concern 12:

> The analyte with the highest concentration in the majority of samples is PFHxA, with levels up to 580 µg/L (in the CI Pretreament influent). In addition, the sample results generally show the detection of multiple PFAS, including PFHxA, that are not manufactured, imported, processed, or otherwise used at the facility. The Inspection and Sampling Team did not evaluate the source of these analytes in the facility's process wastewater, based on the inspection and sampling activities as discussed above, fluorotelomers, as well as other PFAS, have the potential to degrade into different PFAS chemicals. This is further supported by the results of the landfill leachate sample, which show the highest number of analytes detected, with concentrations as high as 200 µg/L. However, the Inspection and Sampling Team did not further evaluate the potential for degradation of PFAS at the facility.

Table 3-6. Summary of PFAS Sample Results – A Regional Tank, Outfall DSN 662A, J Regional Tank, Outfall DSN662A, and Outfall DSN321

Analyte	Value (µg/L)									
	A Regional Tank		Outfall DSN662A (from WWTP)		J Regional Tank		Outfall DSN002A (final effluent)		Outfall DSN321 (B Basin)	
	SP-AR Result	Reporting Limit	SP-662 Result	Reporting Limit	SP-JR Result	Reporting Limit	SP-002 Result	Reporting Limit	SP-321 Result	Reporting Limit
Perfluorobutane sulfonic acid (PFBS)	0.0022 J	0.0042	0.048	0.0042	0.0019 J	0.02	0.019	0.0044	0.012	0.0042
Perfluorohexane sulfonic acid (PFHxS)	0.0016 J	0.0042	0.0072	0.0042	ND	0.02	0.0025 J	0.0044	0.002 J	0.0042
Perfluoroheptane sulfonic acid (PFHpS)	ND	0.0042	0.00048 J	0.0042	ND	0.02	0.00075 J	0.0044	ND	0.0042
Perfluorooctane sulfonic acid (PFOS)	0.0058	0.0042	0.014	0.0042	0.005 J	0.02	0.0063	0.0044	0.0067	0.0042
Perfluorodecane sulfonic acid (PFDS)	ND	0.0042	ND	0.0042	ND	0.02	ND	0.0044	ND	0.0042
Perfluorobutanoic acid (PFBA)	0.02	0.0042	5.1	0.42	14	2	1.7	0.044	0.53	0.042
Perfluoropentanoic acid (PFPeA)	0.032	0.0042	4.1	0.042	7.7	0.2	1.1	0.044	0.35	0.0042
Perfluorohexanoic acid (PFHxA)	0.056	0.0092	32	9.2	310	78	12	0.92	1.5	0.092
Perfluoroheptanoic acid (PFHpA)	0.017	0.0042	3.1	0.042	14	0.2	0.79	0.044	0.25	0.0042
Perfluorooctanoic acid (PFOA)	0.12	0.0017	4.4	0.17	0.29	0.0078	1.4	0.018	0.67	0.017
Perfluorononanoic acid (PFNA)	0.0071	0.0042	0.3	0.0042	0.034	0.02	0.12	0.0044	0.099	0.0042
Perfluorodecanoic acid (PFDA)	0.0092	0.0042	0.6	0.042	0.057	0.02	0.22	0.0044	0.21	0.0042
Perfluoroundecanoic acid (PFUnDA)	0.0024 J	0.0042	0.057	0.0042	0.014 J	0.02	0.033	0.0044	0.036	0.0042
Perfluorododecanoic acid (PFDoDA)	0.0062	0.0042	0.048	0.0042	0.072	0.02	0.061	0.0044	0.066	0.0042
Perfluorotridecanoic acid (PFTrDA)	ND	0.0042	0.0039 J	0.0042	0.015 J	0.02	0.0065	0.0044	0.0083	0.0042
Perfluorotetradecanoic acid (PFTeDA)	0.0031 J	0.0042	0.0077	0.0042	0.061	0.02	0.013	0.0044	0.014	0.0042
Perfluorooctanesulfonamide (FOSA)	ND	0.0042	ND	0.0042	ND	0.02	ND	0.0044	ND	0.0042
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	0.0042	ND	0.0042	ND	0.02	ND	0.0044	ND	0.0042
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	0.0042	ND	0.0042	ND	0.02	ND	0.0044	ND	0.0042
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	ND	0.0042	ND	0.0042	ND	0.02	ND	0.0044	ND	0.0042
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	ND	0.0042	ND	0.0042	ND	0.02	ND	0.0044	ND	0.0042
N-Methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	ND	0.0042	ND	0.0042	ND	0.02	ND	0.0044	ND	0.0042
N-Ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	ND	0.0042	ND	0.0042	ND	0.02	ND	0.0044	ND	0.0042

Table 3-6. Summary of PFAS Sample Results – A Regional Tank, Outfall DSN 662A, J Regional Tank, Outfall DSN662A, and Outfall DSN321

Analyte	Value (µg/L)									
	A Regional Tank		Outfall DSN662A (from WWTP)		J Regional Tank		Outfall DSN002A (final effluent)		Outfall DSN321 (B Basin)	
	SP-AR Result	Reporting Limit	SP-662 Result	Reporting Limit	SP-JR Result	Reporting Limit	SP-002 Result	Reporting Limit	SP-321 Result	Reporting Limit
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	0.0011 J	0.0042	0.26	0.0042	4.5	0.02	0.074	0.0044	0.025	0.0042
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	0.051	0.045	0.59	0.0046	0.17	0.019	0.24	0.0042	0.11	0.0042
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	0.0011 J	0.0042	0.067	0.0042	0.006 J	0.02	0.038	0.0044	0.046	0.0042
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	0.001 J	0.0042	0.0082	0.0042	0.0015 J	0.02	0.0045	0.0044	0.0048	0.0042
2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy) propanoic Acid (HFPA-DA) (i.e., GenX)	0.0042	0.0042	1.4	0.042	0.15	0.02	1.1	0.044	1.1	0.042

ND – Analyte not detected.
J – Sample results were above the method detection limit but below the reporting limit.

Table 3-7. Summary of PFAS Sample Results – G Regional Tank, DuPont Process Wastewater, Landfill Leachate, Influent to CI Pretreatment, and Effluent from CI Pretreatment

Analyte	Value (µg/L)									
	G Regional Tank		Process wastewater from DuPont (to A Regional Tank)		Landfill leachate		Tank T56 (influent to CI Pretreatment)		Lag GAC bed in CI Pretreatment (effluent to J Regional Tank)	
	SP-GR Result	Reporting Limit	SP-FMDL Result	Reporting Limit	SP-504 Result	Reporting Limit	SP-T56 Result	Reporting Limit	SP-CB81 Result	Reporting Limit
Perfluorobutane sulfonic acid (PFBS)	0.036	0.0045	ND	0.0043	1.3	0.043	0.0035 J	0.019	0.0012 J	0.0044
Perfluorohexane sulfonic acid (PFHxS)	0.0025 J	0.0045	ND	0.0043	0.25	0.0043	0.0059 J	0.019	ND	0.0044
Perfluoroheptane sulfonic acid (PFHpS)	0.00052 J	0.0045	ND	0.0043	0.011	0.0043	ND	0.019	ND	0.0044
Perfluorooctane sulfonic acid (PFOS)	0.0081	0.0045	ND	0.0043	0.11	0.0043	0.0074 J	0.019	ND	0.0044
Perfluorodecane sulfonic acid (PFDS)	ND	0.0045	ND	0.0043	ND	0.0043	ND	0.019	ND	0.0044
Perfluorobutanoic acid (PFBA)	0.21	0.0045	0.00052 J	0.0043	5.4	0.43	25	1.9	3.7	0.44
Perfluoropentanoic acid (PFPeA)	0.071	0.0045	ND	0.0043	69	0.43	31	1.9	25	0.44
Perfluorohexanoic acid (PFHxA)	0.12	0.0092	ND	0.0092	200	9.2	580	38	460	46
Perfluoroheptanoic acid (PFHpA)	0.034	0.0045	ND	0.0043	21	4.3	120	1.9	46	4.4
Perfluorooctanoic acid (PFOA)	0.071	0.0018	0.0068	0.0017	60	1.7	14	0.077	0.015	0.0018
Perfluorononanoic acid (PFNA)	0.013	0.0045	ND	0.0043	4.5	0.43	0.87	0.019	0.0026 J	0.0044
Perfluorodecanoic acid (PFDA)	0.022	0.0045	ND	0.0043	4.4	0.43	3.1	0.19	0.0047	0.0044
Perfluoroundecanoic acid (PFUnDA)	0.0088	0.0045	ND	0.0043	0.21	0.0043	0.068	0.019	ND	0.0044
Perfluorododecanoic acid (PFDoDA)	0.042 X	0.0045	ND	0.0043	0.4	0.0043	0.11	0.019	0.0054	0.0044
Perfluorotridecanoic acid (PFTrDA)	0.014	0.0045	ND	0.0043	0.053	0.0043	0.013 J	0.019	0.0021 J	0.0044
Perfluorotetradecanoic acid (PFTeDA)	0.034	0.0045	ND	0.0043	0.25	0.0043	0.045	0.019	0.0051	0.0044
Perfluorooctanesulfonamide (FOSA)	ND	0.0045	ND	0.0043	0.002 J	0.0043	ND	0.019	ND	0.0044
N-Methyl perfluorooctane sulfonamide (MeFOSA)	0.0076	0.0045	ND	0.0043	0.00082 J	0.0043	ND	0.019	ND	0.0044
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	0.0045	ND	0.0043	0.0012 J	0.0043	0.003 J	0.019	ND	0.0044
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	ND	0.0045	ND	0.0043	0.001 J	0.0043	ND	0.019	ND	0.0044
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	0.0015 J	0.0045	ND	0.0043	ND	0.0043	ND	0.019	ND	0.0044
N-Methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	ND	0.0045	ND	0.0043	ND	0.0043	ND	0.019	ND	0.0044

Table 3-7. Summary of PFAS Sample Results – G Regional Tank, DuPont Process Wastewater, Landfill Leachate, Influent to CI Pretreatment, and Effluent from CI Pretreatment

Analyte	Value (µg/L)									
	G Regional Tank		Process wastewater from DuPont (to A Regional Tank)		Landfill leachate		Tank T56 (influent to CI Pretreatment)		Lag GAC bed in CI Pretreatment (effluent to J Regional Tank)	
	SP-GR Result	Reporting Limit	SP-FMDL Result	Reporting Limit	SP-504 Result	Reporting Limit	SP-T56 Result	Reporting Limit	SP-CB81 Result	Reporting Limit
N-Ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	ND	0.0045	ND	0.0043	0.0024 J	0.0043	ND	0.019	ND	0.0044
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	0.0015 J	0.0045	ND	0.0043	0.71	0.0043	0.047	0.019	2.7	0.44
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	0.078	0.0045	0.0045 J	0.0054	2.2	0.43	0.12	0.02	0.0028 J	0.0045
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	0.099	0.0045	ND	0.0043	0.33	0.043	0.013 J	0.019	0.00021 J	0.0044
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	0.012	0.0045	ND	0.0043	0.018	0.0043	0.0021 J	0.019	ND	0.0044
2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy) propanoic Acid (HFPA-DA) (i.e., GenX)	8.2	0.45	0.023	0.0043	4.3	0.43	0.081	0.019	0.066	0.0044

ND – Analyte not detected.
J – Sample results were above the method detection limit but below the reporting limit.
X – Sample results are affected by matrix interference. See additional discussion in Appendix G: Sample Quality Assurance / Quality Control Discussion.

Table 3-8. Summary of PFAS Sample Results – R Regional Tank, Y Sump, G Sump, Henby Creek, Field Blank, and Trip Blank

Analyte	Value (µg/L)											
	R Regional Tank		Y Sump		G Sump		Henby Creek		Field Blank		Trip Blank	
	SP-RR Result	Reporting Limit	SP-YS Result	Reporting Limit	SP-GS Result	Reporting Limit	SP-HC Result	Reporting Limit	Field Blank Result	Reporting Limit	Trip Blank Result	Reporting Limit
Perfluorobutane sulfonic acid (PFBS)	0.66	0.0041	0.0039 J	0.004	0.0025 J	0.0041	0.0028 J	0.004	ND	0.0047	ND	0.0042
Perfluorohexane sulfonic acid (PFHxS)	0.0025 J	0.0041	0.0025 J	0.004	0.0023 J	0.0041	0.0026 J	0.004	ND	0.0047	ND	0.0042
Perfluoroheptane sulfonic acid (PFHpS)	0.00094 J	0.0041	ND	0.004	0.00053 J	0.0041	ND	0.004	ND	0.0047	ND	0.0042
Perfluorooctane sulfonic acid (PFOS)	0.009	0.0041	0.0082	0.004	0.007	0.0041	0.0092	0.004	ND	0.0047	ND	0.0042
Perfluorodecane sulfonic acid (PFDS)	ND	0.0041	ND	0.004	ND	0.0041	ND	0.004	ND	0.0047	ND	0.0042
Perfluorobutanoic acid (PFBA)	4.2	0.41	0.02	0.004	0.02	0.0041	0.021	0.004	ND	0.0047	ND	0.0042
Perfluoropentanoic acid (PFPeA)	1.2	0.041	0.031	0.004	0.028	0.0041	0.036	0.004	ND	0.0047	ND	0.0042
Perfluorohexanoic acid (PFHxA)	1.5	0.092	0.067	0.0092	0.049	0.0092	0.076	0.0092	ND	0.0094	ND	0.0092
Perfluoroheptanoic acid (PFHpA)	0.63	0.0041	0.02	0.004	0.015	0.0041	0.023	0.004	ND	0.0047	ND	0.0042
Perfluorooctanoic acid (PFOA)	0.55	0.0016	0.081	0.0016	0.044	0.0016	0.069	0.0016	ND	0.0019	ND	0.0017
Perfluorononanoic acid (PFNA)	0.17	0.0041	0.011	0.004	0.0085	0.0041	0.019	0.004	ND	0.0047	ND	0.0042
Perfluorodecanoic acid (PFDA)	0.15	0.0041	0.014	0.004	0.0048	0.0041	0.034	0.004	ND	0.0047	ND	0.0042
Perfluoroundecanoic acid (PFUnDA)	0.059	0.0041	0.0043	0.004	0.0016 J	0.0041	0.011	0.004	ND	0.0047	ND	0.0042
Perfluorododecanoic acid (PFDoDA)	ND X	0.0041	0.016	0.004	ND	0.0041	0.016	0.004	ND	0.0047	ND	0.0042
Perfluorotridecanoic acid (PFTrDA)	0.24 X	0.0041	0.0032 J	0.004	ND	0.0041	0.0025 J	0.004	ND	0.0047	ND	0.0042
Perfluorotetradecanoic acid (PFTeDA)	0.094 X	0.0041	0.01	0.004	ND	0.0041	0.0029 J	0.004	ND	0.0047	ND	0.0042
Perfluorooctanesulfonamide (FOSA)	ND X	0.0041	ND	0.004	ND	0.0041	0.00052 J	0.004	ND	0.0047	ND	0.0042
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND X	0.0041	ND	0.004	ND	0.0041	ND	0.004	ND	0.0047	ND	0.0042
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND X	0.0041	0.00031 J	0.004	ND	0.0041	ND	0.004	ND	0.0047	ND	0.0042

Table 3-8. Summary of PFAS Sample Results – R Regional Tank, Y Sump, G Sump, Henby Creek, Field Blank, and Trip Blank

Analyte	Value (µg/L)											
	R Regional Tank		Y Sump		G Sump		Henby Creek		Field Blank		Trip Blank	
	SP-RR Result	Reporting Limit	SP-YS Result	Reporting Limit	SP-GS Result	Reporting Limit	SP-HC Result	Reporting Limit	Field Blank Result	Reporting Limit	Trip Blank Result	Reporting Limit
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	ND	0.0041	ND	0.004	0.00071 J	0.0041	ND	0.004	ND	0.0047	ND	0.0042
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	0.0028 J	0.0041	ND	0.004	ND	0.0041	ND	0.004	0.00014 J	0.0047	ND	0.0042
N-Methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	ND	0.0041	ND	0.004	ND	0.0041	ND	0.004	ND	0.0047	ND	0.0042
N-Ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0053	0.0041	ND	0.004	ND	0.0041	0.0012 J	0.004	ND	0.0047	ND	0.0042
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	0.021	0.0041	0.00085 J	0.004	ND	0.0041	ND	0.004	ND	0.0047	ND	0.0042
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	0.19	0.0043	0.084	0.0041	0.037	0.0041	0.0031 J	0.0042	0.00059 BJ	0.0047	ND	0.0042
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	0.018	0.0041	0.026	0.004	0.003 J	0.0041	0.0005 J	0.004	ND	0.0047	ND	0.0042
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	0.007	0.0041	0.024	0.004	0.0021 J	0.0041	ND	0.004	ND	0.0047	ND	0.0042
2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy) propanoic Acid (HFPA-DA) (i.e., GenX)	80	4.1	15	0.4	0.0032 J	0.0041	0.0038 J	0.004	ND	0.0047	ND	0.0042

ND – Analyte not detected.
J – Sample results were above the method detection limit but below the reporting limit.
X – Sample results are affected by matrix interference. See additional discussion in Appendix G: Sample Quality Assurance / Quality Control Discussion.
B – The analyte was found in the associated method blank at a level that is significant as defined by the Department of Defense (DOD) or National Environmental Laboratory Accreditation Conference (NELAC) standards. Note that the result was above the method detection limit but below the reporting limit. See additional discussion in Appendix G: Sample Quality Assurance / Quality Control Discussion.

4.0 Areas of Concern

The potential CWA Areas of Concerns referred to in the narrative of this report are summarized as follows:

Area of Concern 1

The facility began washing trailer tanks in March 2019, producing a new source of process wastewater that was not considered during the renewal of the facility's NPDES permit effective April 4, 2018. Specifically, the Inspection and Sampling Team observed a temporary pump in the CI process area that is used to convey process wastewater from washing emptied trailer tanks (used to transport perfluoroalkyl iodides) to Tank T-56 (refer to Photograph 1, Photograph 2, and Photograph 3). The contents of Tank T-56 are sent to the CI pretreatment system, which discharges to E Sump, the J-Regional Tank, then to the WWTP for treatment before final discharge through Outfall 002.

Part II.B.4.a of the facility's permit requires the facility to provide:

> "…written notification to the Department [NJDEP] of any planned physical or operational alterations or additions to the permitted facility when the alteration is expected to result in a significant change in the permittee's discharge and/or residuals use or disposal practices."

Because the trailer tanks are used to transport perfluoroalkyl iodides, the periodic washing has the potential for significant contribution of PFAS pollutants to the process wastewater collection system, CI pretreatment system, and the WWTP.

Area of Concern 2

The Inspection and Sampling Team observed that the continuously stirred tank reactor (CSTR), which is one of two sequential vessels used for pH adjustment of wastewater in the CI Pretreatment system, was not in service at the time of the inspection. The facility provided a follow-up statement indicating that the CSTR has been out of service since January 2017, due to insufficient pH loop control, which indicates potential process control issues. However, the facility's statement indicates that the CI Pretreatment facility has shown consistent efficacy since the CSTR was removed from service. Therefore, the Inspection and Sampling Team questions the design of the CI Pretreatment system, since the design includes the CSTR, but the system can run appropriately without it, according to the facility representatives.

Area of Concern 3

Based on statements by facility representatives, one of two 2018 FRD-926 campaign vessel cleaning occurrences was not recorded on a batch log. The Inspection and Sampling Team requested the facility provide batch logs and waste records for 2018, showing the wastes produced from FRD-926 in Building 1205 FRD. Chemours provided records of waste transportation for the acetone used to clean the vessels after the two FRD-926 campaigns in 2018, and before the FRD-921 campaigns. However, Chemours did not provide the batch logs for FRD-926 or FRD-921, claiming that this information may be considered to include DuPont Confidential Business Information. The Inspection and Sampling Team could not review these batch logs to fully evaluate the facility's tracking of waste generation and disposal practices in Building 1205 FRD. Facility representatives were able to show via waste transportation order forms that the process wastewater from the vessel cleaning in question was captured and sent off site for incineration.

Area of Concern 4

At the WTP, the Inspection and Sampling Team observed structural issues along the exterior concrete wall of the clarifier tanks. Specifically, there were cracks, crumbling, and lime leaching from the exterior concrete wall of the clarifiers (refer to Photograph 4, Photograph 5,and Photograph 6). The Inspection and Sampling Team also observed vegetation in one of the clarifiers and in the proceeding chemical mix chamber (refer to Photograph 7 and Photograph 8). Additionally, the Inspection and Sampling Team observed corrosion in the piping conveying treated water from the sand filters to the diversion box (refer to Photograph 9).

These issues indicate a need for maintenance and may compromise the effectiveness of the treatment units at the WTP. This may impact the facility's compliance with the Safe Drinking Water Act (SDWA).

Area of Concern 5

Due to significant reductions at the site since the time the WTP was designed, the pumps that service sanitary and process wastewater distribution are oversized for the current demand. At the time of the inspection, WTP operators were bleeding flow from the sanitary service line prior to distribution in order to keep the larger-than-needed pumps running at an optimal capacity (refer to Photograph 10). The water bleed from the sanitary service line goes into A Basin, which is sent to the WWTP for treatment prior to discharge through Outfall DSN002A. Note the facility is in the process of trying to obtain funding to resize the WTP to the current demand. This may impact the facility's compliance with the Safe Drinking Water Act (SDWA).

Area of Concern 6

When the Inspection and Sampling Team arrived to inspect the secondary and tertiary treatment operations at the WWTP on June 11, 2019, at approximately 8:30 – 9:00 a.m., the WWTP operations team had changed operational flows within the plant. Specifically, the WWTP operators were changing flows from biological aeration tank AE-152 to biological aeration tank AE-153. Due to this change in operations, the Inspection and Sampling Team was unable to inspect the secondary and tertiary treatment operations at the WWTP under normal operating conditions. This is because, while AE-153 was being filled, flow through the remainder of the secondary treatment operations was decreased and flow through the tertiary treatment operations was eliminated. The facility representatives indicated that the change in operation occurred just before 8:00 a.m. on June 11, 2019. However, on June 10, 2019, the facility representatives said AE-153was out of service.

Area of Concern 7

A portion of the influent to the WWTP is collected in the pump pit and treated with sulfuric acid. Facility representatives explained that the facility adds sulfuric acid to achieve a pH of 2 for the treatment of fecal coliform. This treatment practice is not typical for process wastewater, as secondary biological treatment is used for treatment of biological waste, including fecal coliform. The Inspection and Sampling Team observed excessive solids buildup in equipment prior to the primary clarifiers, which may be partially due to solids precipitation caused by the pH adjustment to 2 in the pump pit and subsequent lime neutralization during primary treatment, before the wastewater reaches the primary clarifiers. The addition of sulfuric acid at the pump pit to reduce the pH to 2 is not a standard practice.

Area of Concern 8

The Inspection and Sampling Team observed numerous O&M issues at the facility. Specifically, the Inspection and Sampling Team observed large amounts of sediment built up in numerous pieces of equipment, which will reduce the capacity and functionality of the equipment and may compromise the structural integrity. Multiple pieces of equipment were nearly full of solids, potentially eliminating their ability to function as designed (refer to Photograph 13 through Photograph 19). Additionally, the Inspection and Sampling Team observed numerous pieces of equipment that may be structurally compromised due to damaged coatings (refer to Photograph 20), cracks (refer to Photograph 21 and Photograph 22), rusted support structures (refer to Photograph 23 through Photograph 25), and damaged covers.

The Inspection and Sampling Team observed additional issues such as vegetation in numerous pieces of equipment (refer to Photograph 26 through Photograph 36), broken pumps (refer to Photograph 37 through Photograph 39), leaking equipment, and excessive air flow in one of the secondary treatment aerators (refer to Photograph 40). The Inspection and Sampling Team observed a general lack of maintenance for equipment that is not generally used because the plant was running at lower capacity than designed for (refer to Photograph 13, Photograph 14, Photograph 19, Photograph 20, Photograph 25, Photograph 27, Photograph 32, and Photograph 34). Additionally, the Inspection and Sampling Team reviewed the WWTP's monthly process control data and shift turnover sheets to further evaluate O&M procedures at the WWTP. These data indicate numerous additional equipment issues and failures.

Part I.A.1.c of the permit indicates that the facility is subject to New Jersey's operation and maintenance requirements at N.J.A.C. 7:14A-6.12. These requirements state that:

> "A permittee shall, at all times, maintain in good working order and operate the treatment works and facilities which are installed or used by the permittee to achieve compliance with the terms and conditions of the discharge permit. Proper operation and maintenance, includes, at a minimum:
>
> 1. Effective performance based upon treatment levels for which the treatment works was designed;
> 2. Adequate funding;
> 3. Effective management;
> 4. Adequate operator staffing and training;
> 5. Regularly scheduled inspection and maintenance programs; and
> 6. Adequate laboratory and process controls including appropriate quality assurance procedures as described in 40 CFR Part 136 and applicable State laws and rules."

The excessive sediment buildup, compromised structure of the equipment, vegetation, leaking, and frequent maintenance issues in the WWTP indicate insufficient O&M procedures.

Area of Concern 9

The Inspection and Sampling Team observed that the WWTP operations appeared to be different from those described in the facility's March 2016 permit application. Specifically, the Inspection and Sampling Team observed:

- Multiple critical process units were not in use and being evaluated for repairs or decommissioning (refer to Photograph 13, Photograph 14, Photograph 19, Photograph 20, Photograph 25, Photograph 27, Photograph 32, and Photograph 34 and Appendix E: Wastewater Treatment Plant Diagram [out of service equipment is listed as "OOS" on the WWTP diagram]).
  - The March 2016 permit application states "All treatment tanks may be temporarily or indefinitely out of service for maintenance or reduction in production."
- Facility representatives indicated that they were using the in-service flocculators to convey water, as opposed to its designed functionality of flocculating solids. This is evident by the solids deposition to nearly the top of the flocculators (refer to Photograph 16, Photograph 17, and Photograph 18).
  - The March 2016 permit application states that "The primary solids are flocculated, separated by clarification…"
- The facility formerly added powdered activated carbon into the secondary treatment process for color control. However, at the time of the inspection, the Inspection and Sampling Team observed that the facility was no longer using activated carbon for treatment.
  - The March 2016 permit application describes the use of powdered activated carbon. It states that "…powdered activated carbon can be added directly into aerators containing activated sludge as needed for color removal."

Per Part II.B.4.a of the permit:

> "…the permittee shall give written notification to the Department of any planned physical or operational alterations or additions to the permitted facility when the alteration is expected to result in a significant change in the permittee's discharge and/or residuals use or disposal practices."

Due to the extent of equipment not in use and operational changes at the WWTP, the final effluent and residuals production may be impacted such that these changes require notification to NJDEP.

Additionally, per Part IV.D.1.a of the permit:

> "The permittee shall amend the Operation & Maintenance Manual whenever there is a change in the treatment works design, construction, operations or maintenance which substantially changes the treatment works operations and maintenance procedures."

The observed equipment not in use and operational changes may warrant updates to the facility's O&M manual and SOPs.

Area of Concern 10

The WWTP representatives indicated that the facility wishes to accept and treat wastes from outside companies in the future. The facility is currently permitted for centralized waste treatment (CWT) wastewater at the WWTP. However, based on the observations detailed in Area of Concern 8, the O&M procedures and condition of the equipment at the WWTP may not be sufficient to treat additional wastewater.

Area of Concern 11

Mr. Kevin Sparks, Chemours Laboratory Supervisor, indicated that the facility conducts sampling for permit monitoring requirements on Thursdays, which was chosen based on the preference of the WWTP operations team, so the data is more useful for process control purposes. Always conducting compliance monitoring on the same day may reduce the reflectiveness of the samples on actual operating conditions, as operating conditions may vary throughout the week.

Area of Concern 12

The following are potential areas of concern from the sampling results:

- GenX was detected at 80 µg/L in R Sump, which is associated with the Krytox processes. GenX was also detected at 15 µg/L in Y Sump, which is the sump for the Building 1205 FRD processes [CBI redacted]. Neither the Krytox nor the Building 1205 FRD processes were in operation at the time of the inspection.
  - As discussed in Section 2.2.2, GenX is produced as an unintended byproduct during the Krytox operations. The facility is currently awaiting approval from NJDEP to use GAC beds for pretreatment of the process wastewater produced in the Krytox processes to remove GenX; however, the facility does not have any current pretreatment methods at the facility to remove PFAS from the process wastewater in R Sump.
  - As discussed in Section 2.2.4, the facility representatives indicated that all liquid waste from Building 1205 FRD is captured and sent off site for incineration. The Inspection and Sampling Team did not discern the pathway from which GenX enters Y Sump. The process wastewater is sent to the WWTP; however, there is no pretreatment to remove PFAS from the process wastewater in Y Sump.
- The sampling results for the CI Pretreatment influent and effluent show lower removal efficiencies for the shorter chain PFAS: PFPeA (19%), PFHxA (21%), and PFHpA (62%), as compared to the nearly 100% removal of the longer chain PFAS: PFOA and PFDA.
- The sampling results for the CI Pretreatment influent and effluent show an increase of nearly 6,000% in 4:2 FTS. The facility produces [CBI redacted]. Fluorotelomers have degradation pathways in which they degrade into intermediate degradation products, including fluorotelomer alcohols, fluorotelomer carboxylic acids, and fluorotelomer sulfonic acids, before degrading to terminal degradation products such as PFBA, PFPeA, PFHxA,

PFHpA, and PFOA. The Inspection and Sampling Team did not further evaluate the potential for degradation of PFAS at the facility.

- PFAS concentrations in the samples taken at J Regional Tank and the landfill leachate were relatively high compared to all other samples, with PFHxA concentrations of 310 µg/L and 200 µg/L, respectively. In addition, the landfill leachate had the highest number of detected analytes and analytes at concentrations above 1 µg/L. These waste streams are sent to the WWTP; however, there are no pretreatment methods to remove PFAS from these streams prior to the WWTP. Additionally, the operations in the WWTP do not include treatment for PFAS. Generally, the same PFAS compounds that were detected in the effluent of the WWTP were also detected in the above waste streams, and vice-versa.
- The sample taken at Outfall DSN 321 (B Basin effluent) had PFAS concentrations of 1.5 µg/L for PFHxA and 1.1 µg/L for GenX. The sample taken at Outfall DSN 662A (WWTP effluent) had PFAS at higher concentrations than DSN321; six compounds were above 1 µg/L, including PFHxA at a concentration of 32 µg/L. The wastewater from DSN 321 and DSN 662A is combined and discharged through Outfall 002A.
- The sample results show high concentrations of multiple PFAS that are not manufactured, imported, processed, or otherwise used at the facility. The Inspection and Sampling Team did not evaluate the source of these analytes in the facility's process wastewater during the inspection and sampling activities. As discussed above, fluorotelomers, as well as other PFAS, have the potential to degrade into different PFAS chemicals. This is supported by the results of the landfill leachate sample, which had the highest number of analytes detected, with concentrations as high as 200 µg/L. However, the Inspection and Sampling Team did not further evaluate the potential for degradation of PFAS at the facility.

<u>Appendix A: Sign-In Sheet</u>

Appendix B: Site Diagram

Appendix C: Water Flow Diagram

Appendix D: Capstone Intermediates Pretreatment Diagram

Appendix E: Wastewater Treatment Plant Diagram

Appendix F: Sheet Pile Barrier Map

Appendix G: Sample Quality Assurance / Quality Control Discussion

Sample Quality Assurance / Quality Control Discussion

ALS Environmental was selected as the laboratory for these analyses because it operates a National Environmental Laboratory Accreditation Certification (NELAC) certified laboratory for the method used in this sampling episode.

For this sampling episode, ERG followed all Quality Assurance Project Plan sampling requirements.

Sample Receipt Condition

The samples were received for analysis at ALS Environmental in good condition and consistent with the accompanying chain of custody form. The field samples were stored in a refrigerator at 4ºC upon receipt at the laboratory; however, the field blank and trip blank were inadvertently stored outside of the refrigerator and were therefore not stored below the recommended preservation temperature of 6 degrees Celsius.

Holding Times

All holding times were met.

Laboratory Control Samples

The initial method blank performed by the laboratory showed a detection of 6:2 FTS of 72 ng/L, indicating potential contamination of this analyte from the laboratory method. Due to this potential contamination, the laboratory reperformed analyses associated with this method blank for all samples except for the field blank, due to insufficient volume of the field blank to reperform the analyses. The method blank for the reperformed analyses shows that all analytes were below the reporting limit, indicating that there was no contamination from the method and that the data from the reperformed analyses are acceptable.

The laboratory conducted analyses on a laboratory control sample (LCS) and a duplicate laboratory control sample. ERG reviewed the RPD for each analyte between these samples and found that there were no analytes with an RPD greater than 30 percent. All RPD values were less than six percent. Laboratory control sample and duplicate laboratory control sample analyte measurements were all within applicable percent recovery criteria.

Matrix Spikes and Duplicates

All percent recoveries and RPDs were within acceptance criteria except for the following discussions below.

- Matrix spike recovery exceeded QC limits for sample SP-002. Batch accepted based on LCS recovery.
- Surrogate recovery was outside of laboratory control limits for the below samples and analytes. Laboratory narrative indicates that, assuming the native analytes performed similar to the labeled analog, the effect on the reported results was minimal.

Sample	Analyte
SP-AR	PFBA
SP-662	PFBS, PFHxA
SP-JR	PFHxA

Sample	Analyte
SP-504	PFBA, PFHxA, PFHpA, PFOA
SP-T56	PFHxA
SP-CB81	PFHxS, PFBA, PFHxA, PFHpA, 4:2 FTS
SP-RR	PFDA, HFPO-DA

- Surrogate recovery was significantly low (less than 10%) for the below samples and analytes due to matrix interference. The laboratory noted "The low recoveries for the labeled analogs suggested increased variability for the quantitation of the associated native compounds in this matrix. A re-analysis of the sample was performed, but produced similar results." The results for these analytes in these samples are not acceptable for use based on the matrix interference.

Sample	Analyte
SP-GR	PFDoDA
SP-RR	PFDoDA, PFTrDA, PFTeDA, FOSA, MeFOSA, and EtFOSA

Additional Quality Notes from the Laboratory
The laboratory results included the following three additional quality notes. These notes are replicated below and do not indicate any issues that would make the data unacceptable for use.

The analysis of Perfluorohexanoic acid (PFHxA) in sample SP-662, SP-JR, SP-504, SP-T56, and SP-CB81 required a dilution, which resulted in the isotope concentrations being below the quantitation range. The responses measured for the associated native analytes in this analysis were quantitated using the injection internal standard instead of the labeled analog. No further corrective action was appropriate.

The analysis of Perfluoroheptanoic acid (PFHpA) in sample SP-504 and SP-CB81 required a dilution, which resulted in the isotope concentrations being below the quantitation range. The responses measured for the associated native analytes in this analysis were quantitated using the injection internal standard instead of the labeled analog. No further corrective action was appropriate.

The analysis of Perfluorooctanoic acid (PFOA) in sample SP-504 required a dilution, which resulted in the isotope concentrations being below the quantitation range. The responses measured for the associated native analytes in this analysis were quantitated using the injection internal standard instead of the labeled analog. No further corrective action was appropriate.

The analysis of Hexafluoropropylene Oxide Dimer Acid (HFPO-DA) in sample SP-RR required a dilution, which resulted in a concentration of the associated surrogate below the quantitation range. The responses measured for the native analyte in this analysis were quantitated using the injection internal standard instead of the labeled analog. No further corrective action was appropriate.

The control criteria was exceeded for one or more isotopes in Continuing Calibration Verifications (CCV) KQ1910045-01, KQ1910230-03, KQ1910386-01, KQ1910565-01, KQ1910575-03, KQ1910816-01, and KQ1910993-01. The recoveries of the associated native analytes were within control criteria, which indicated the analysis was in control. No further corrective action was appropriate.

Conclusion

Based on ERG's review of the available quality control data, the analytical data provided by the laboratory are acceptable for use in this report, except for those analytes in SP-GR and SP-RR for which matrix interference impacts the sample results.

Appendix H: Chain of Custody Form

Appendix I: Photograph Log

Inspection Photos

[CBI redacted]

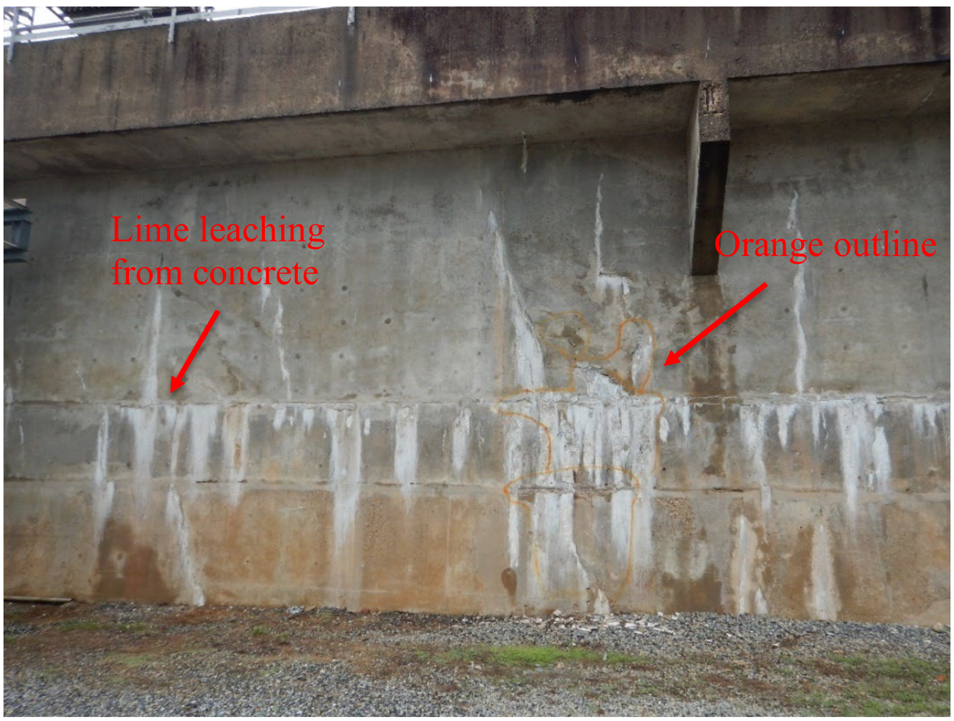
Photograph 1. Temporary pump in CI process area used for trailer tank wash water. Leaking utility water is shown on the ground. Note: Photograph was taken by the facility because the process area is electrically classified. The photograph is CBI.

[CBI redacted]

Photograph 2. Closer view of pump in Photograph 1. Leaking utility water is shown on the ground. Note: Photograph was taken by the facility because the process area is electrically classified. The photograph is CBI.

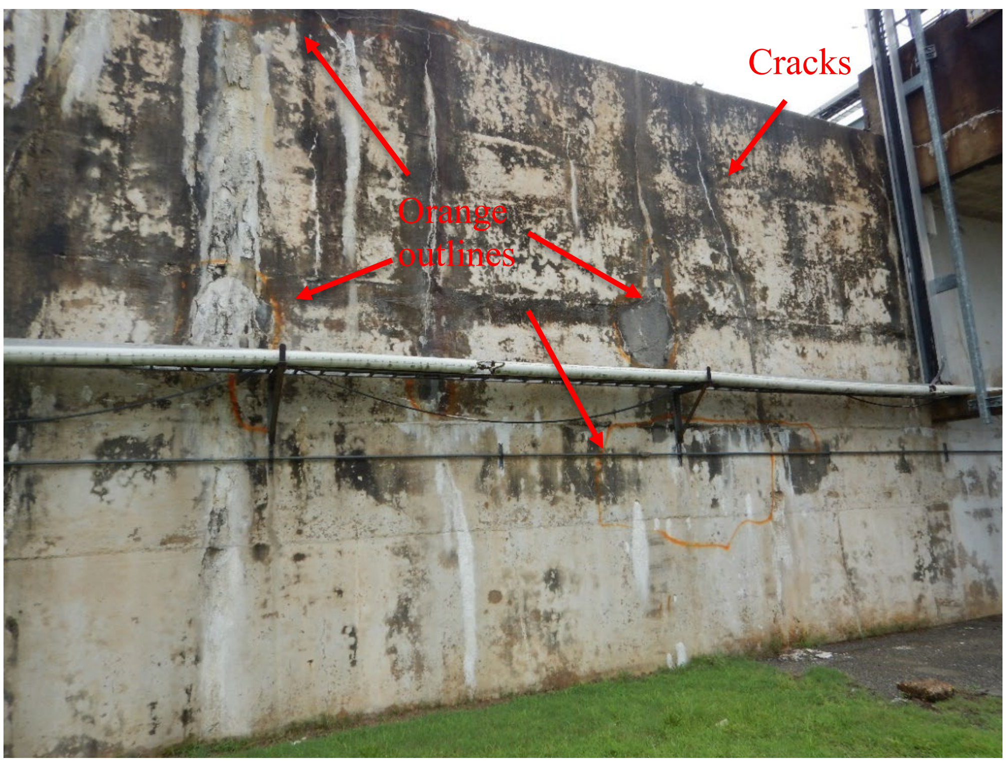
[CBI redacted]

Photograph 3. Black hose from temporary pump into Tank T-56. Note: Photograph was taken by the facility because the process area is electrically classified. The photograph is CBI.

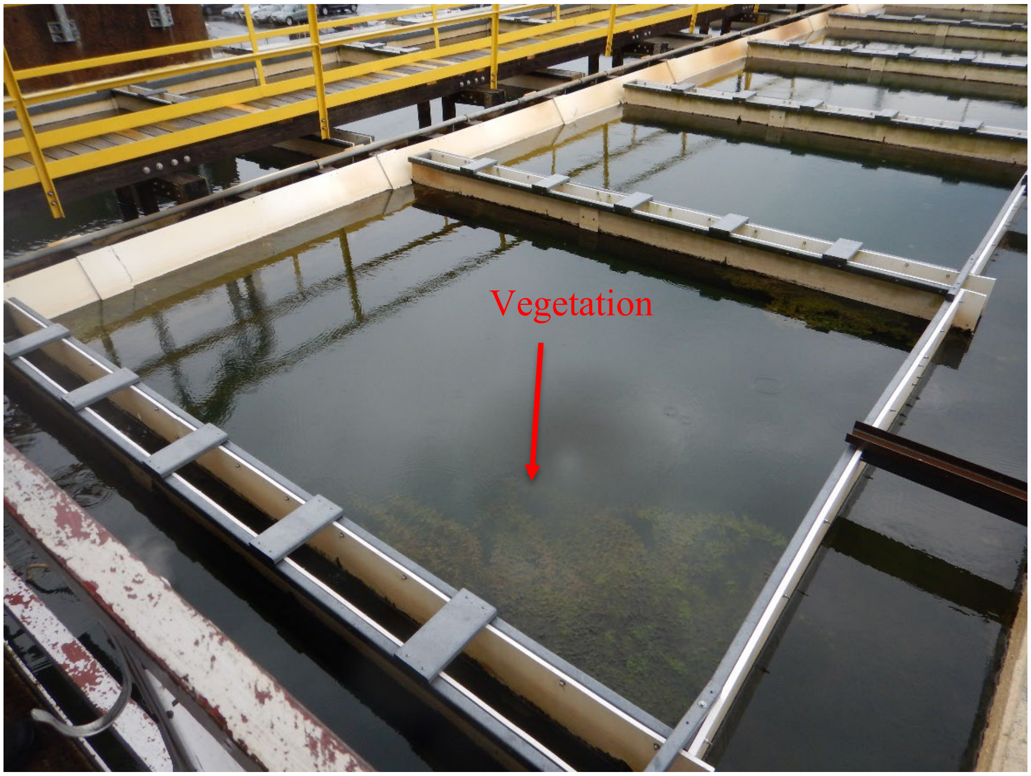


Photograph 4. Cracks and lime (white substance) leaching from the exterior of the WTP clarifier. Note orange outline from previous integrity assessment by outside vendor.

Photograph 5. Cracks, crumbling, and lime (white substance) leaching from the exterior of the WTP clarifier. Note orange outline from previous integrity assessment by outside vendor.



Photograph 6. Cracks on the side of the WTP clarifier. Note orange outline from previous integrity assessment by outside vendor.



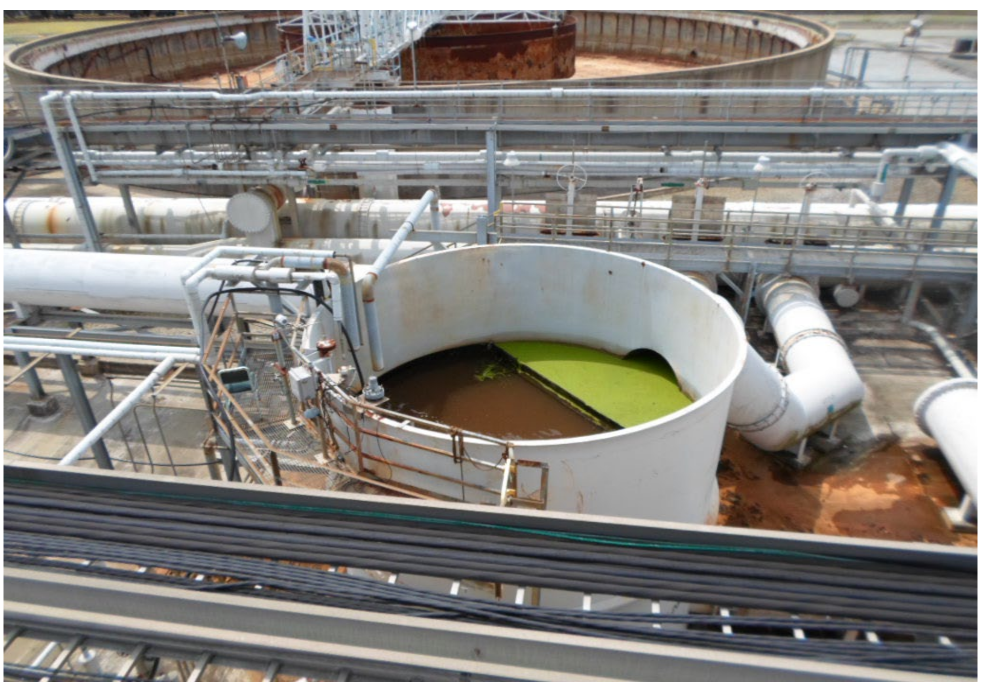
Photograph 7. Vegetation growth in a WTP clarifier.

Photograph 8. Vegetation in the WTP chemical mix chamber prior to the clarifier.

Photograph 9. Corrosion on piping in the WTP conveying treated water from the sand filters to the diversion box.

Photograph 10. Sanitary service water bleeding from the sanitary service line distribution pumps into A Basin (which is routed to the WWTP).

Photograph 11. Aerator AE-153 at the WWTP, which was said to be out of service. The facility was filling the tank during the inspection, thereby decreasing flows through the remainder of the WWTP.

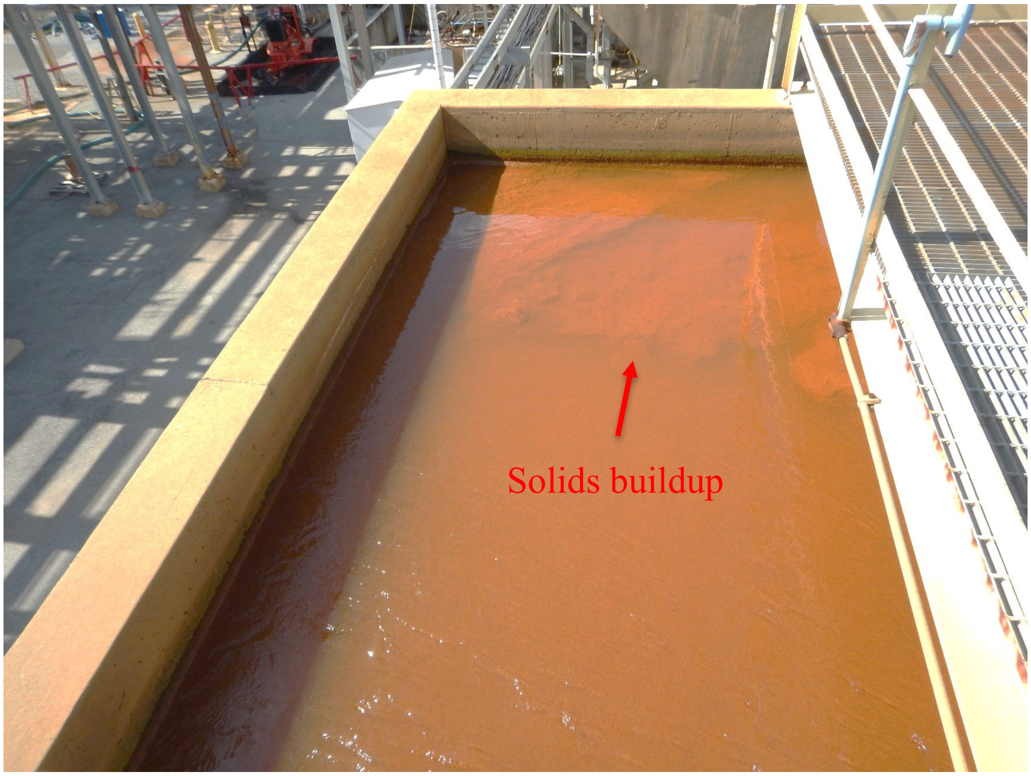


Photograph 12. Wet well for the tertiary system, GT-261, which typically receives effluent from secondary clarifiers. The water level was below normal due to process changes earlier that day; no flow was being sent to the tertiary system during the inspection.

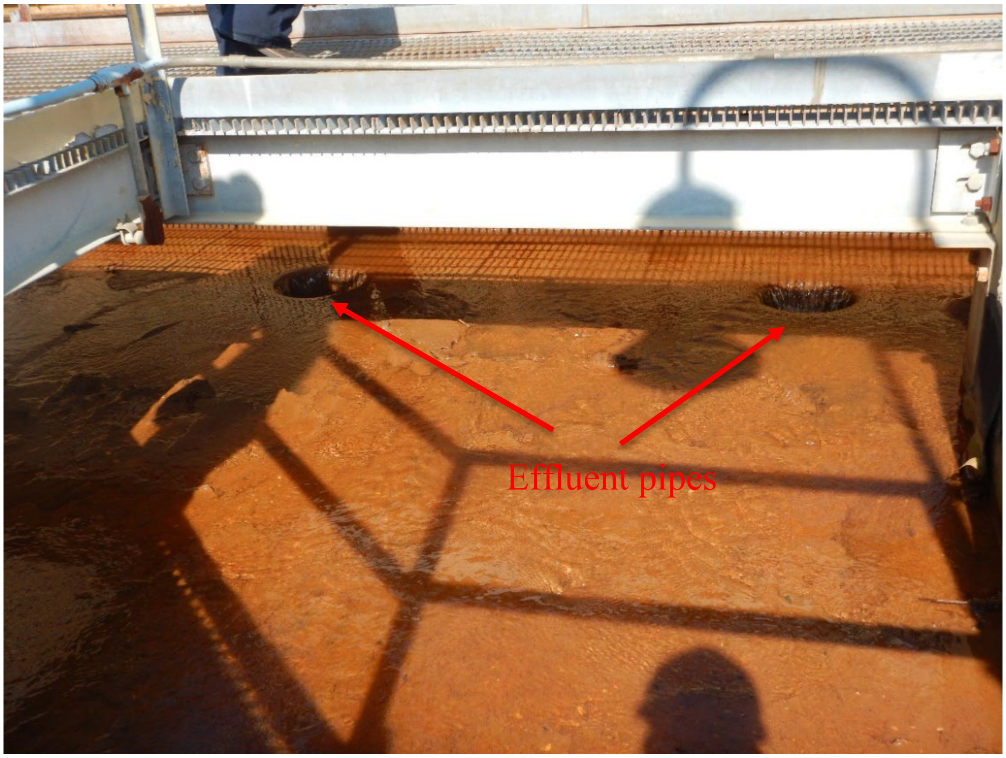
Photograph 13. Alligatoring and vegetation on bottom of the neutralizer NE-41 at the WWTP.

Photograph 14. Alligatoring along bottom of the neutralizer NE-41 at the WWTP.

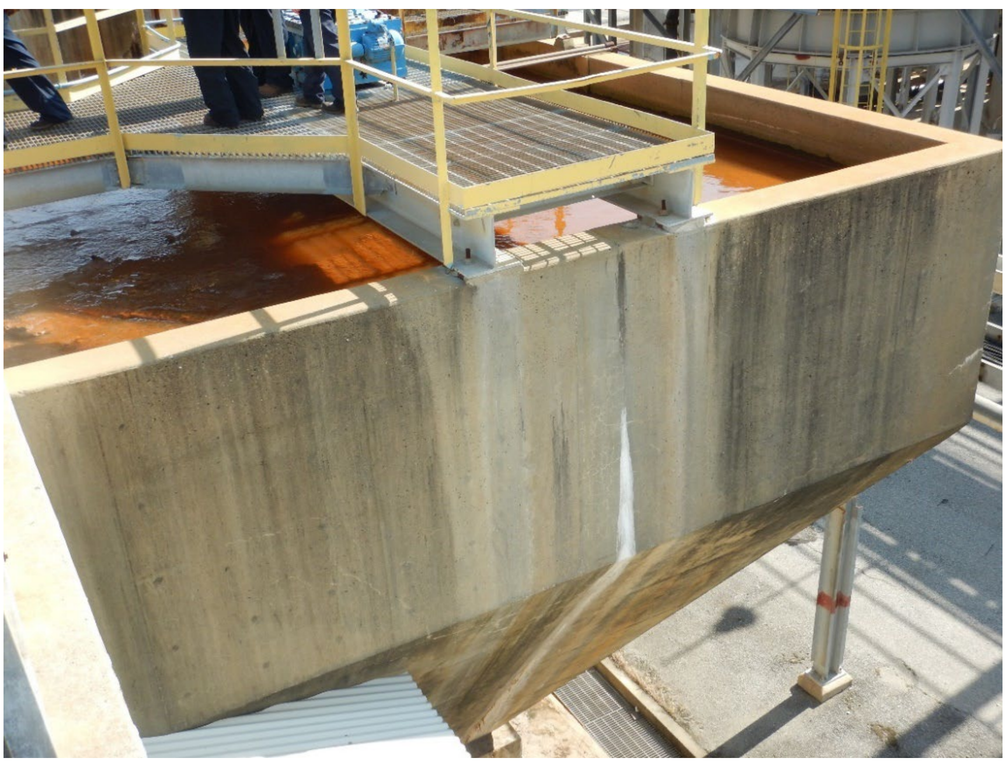
Photograph 15. Solids buildup along outer wall of the flow splitter at the WWTP.



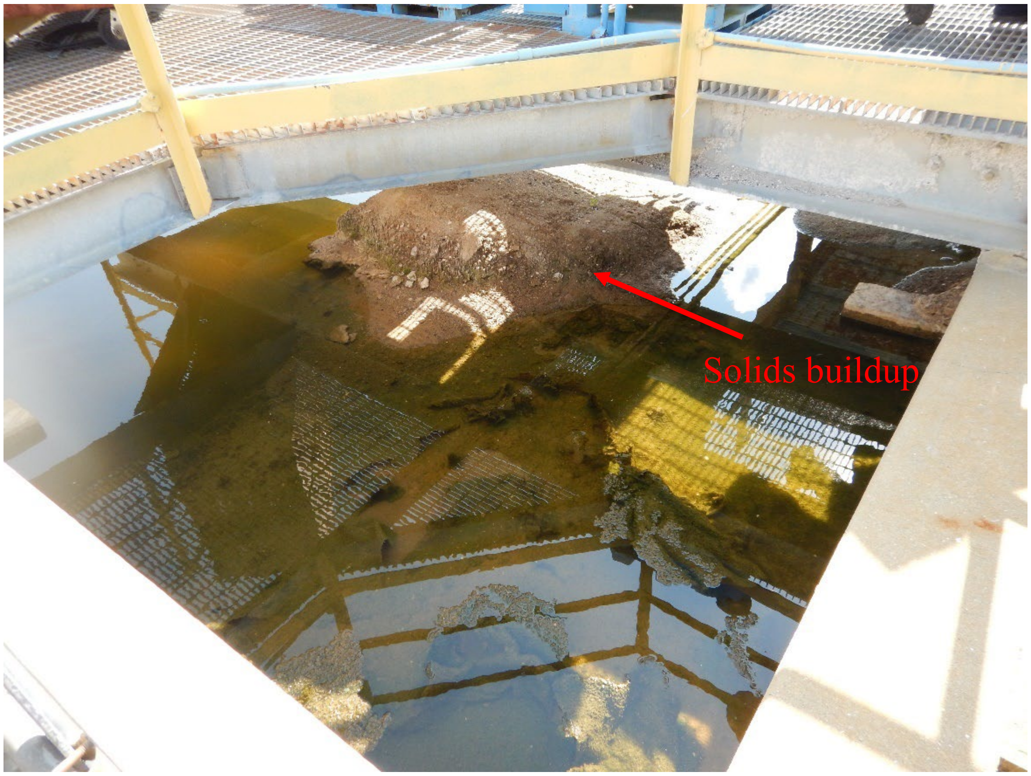
Photograph 16. Solids buildup in the flocculator FL-62 at the WWTP.



Photograph 17. Solids buildup in the flocculator FL-62, reaching the top of the effluent pipes at the WWTP.

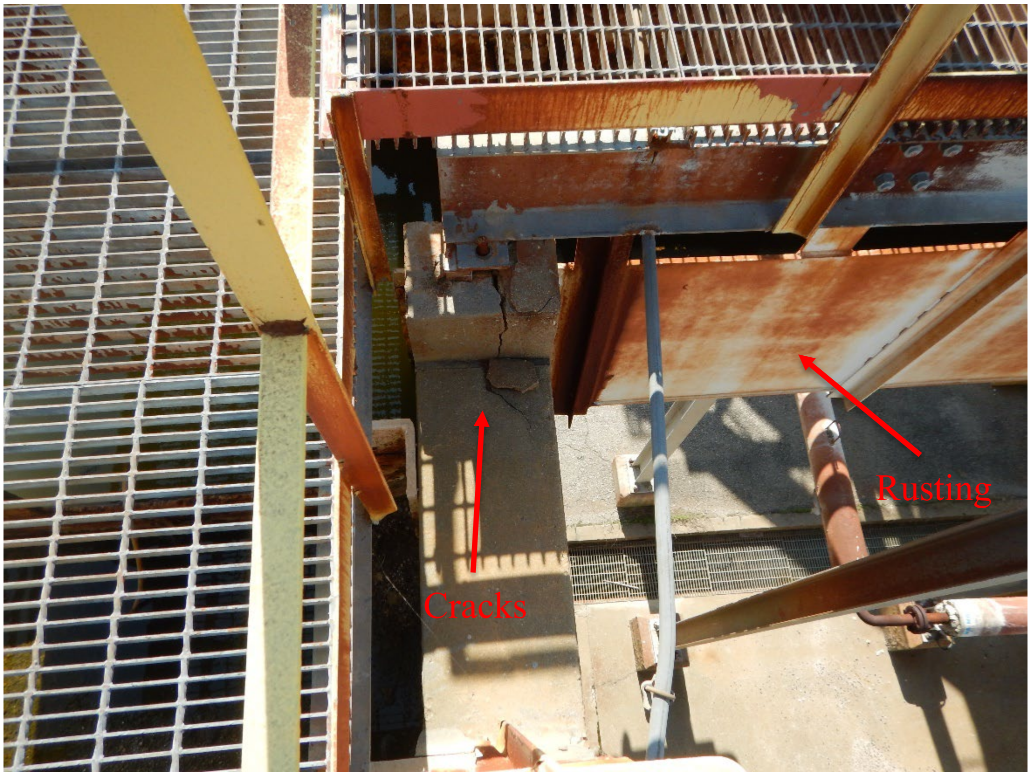


Photograph 18. Side view of flocculator FL-62, showing depth of solids deposition, at the WWTP.



Photograph 19. Solids buildup in a flocculator at the WWTP not being used at the time of the inspection.

Photograph 20. Damaged coating on the interior of neutralizer NE-43 at the WWTP.



Photograph 21. Cracks in the wall of the flocculator FL-62 and rusting of the support structures at the WWTP.

Photograph 22. Cracks in the wall of the flocculator FL-62 and rusting of the support structures at the WWTP.

Photograph 23. Flow splitter GT 161 receiving flow from the WWTP's secondary treatment aerators. The structural supports between the exterior wall and internal flow receiver had failed at multiple locations due to rust.

Photograph 24. View of the upper exterior tank wall on flow splitter GT-161 at the WWTP. The wall has rusted through in areas creating holes in the tank wall.

Photograph 25. Secondary clarifier CF-161 at the WWTP, which was out of service at the time of the inspection. The structure supports under the effluent trough had failed and were laying on the bottom of the clarifier and hanging from the trough.

Photograph 26. Vegetation along the primary clarifier CF-63 at the WWTP.

Photograph 27. Secondary treatment aerator AE-153 at the WWTP, with floating debris and vegetation along the surface of the tank.

Photograph 28. Secondary clarifier CF-162 at the WWTP, covered with duck weed. Note the clarifier had just started receiving flow from the secondary aeration tanks at the time the photograph was taken.

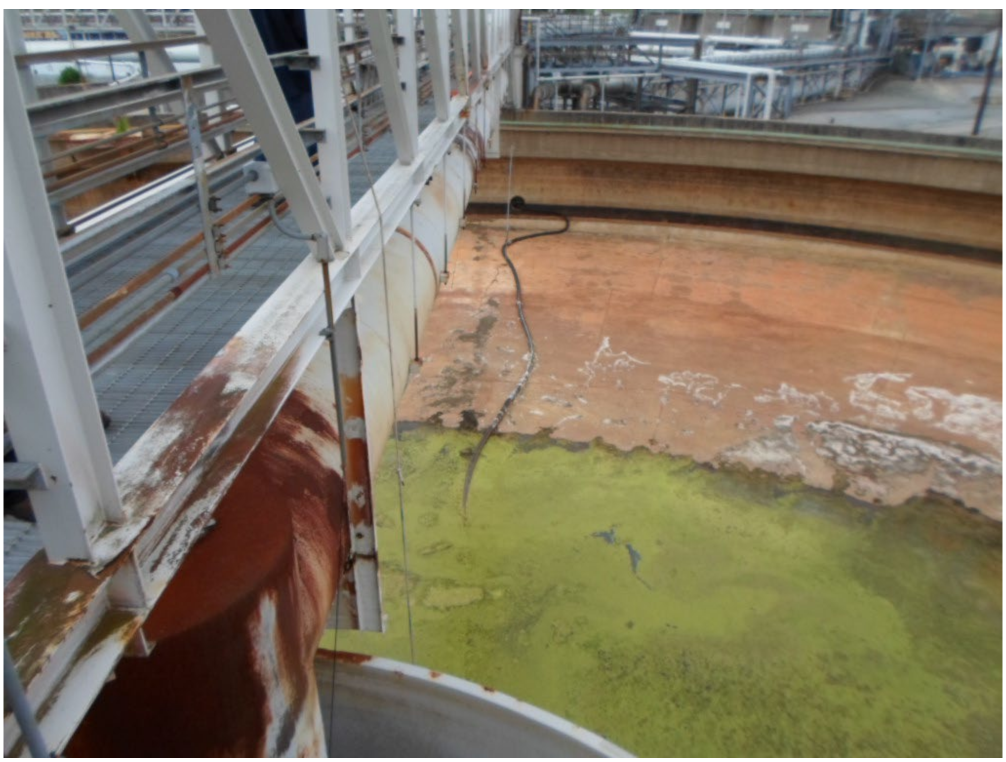
Photograph 29. Alternate view of the duck weed in secondary clarifier CF-162 at the WWTP. The water level was approximately two feet below the weir plate and scum beach due to operational redirection of flows earlier in the day.

Photograph 30. Vegetation in the effluent trough in multiple locations around secondary clarifier-CF 163 at the WWTP. The process wastewater level was below the weir plate and slowly rising.

Photograph 31. Alternate view of vegetation in the effluent trough in multiple locations around secondary clarifier-CF 163 at the WWTP. Some vegetation was over four feet high.

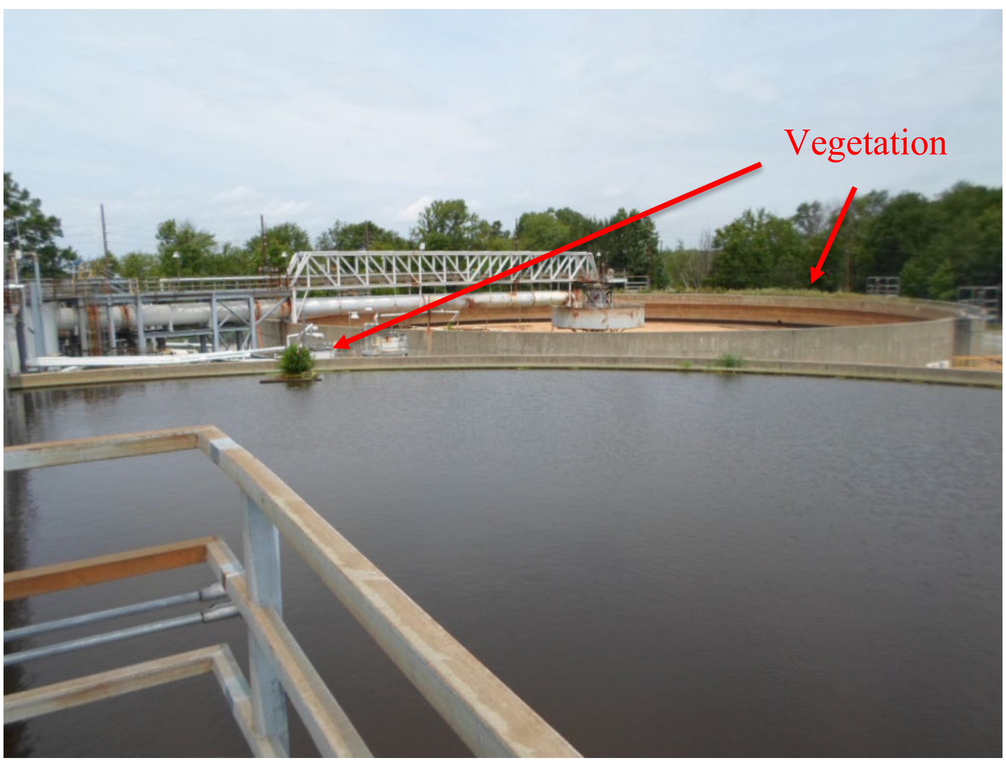
Photograph 32. Duck weed covering approximately 50% of Cell A of tertiary aerator AE-251, which was out of service, at the WWTP.

Photograph 33. Duck weed covering approximately 10% of Cell B (center of image) of tertiary aerator AE-251 at the WWTP.



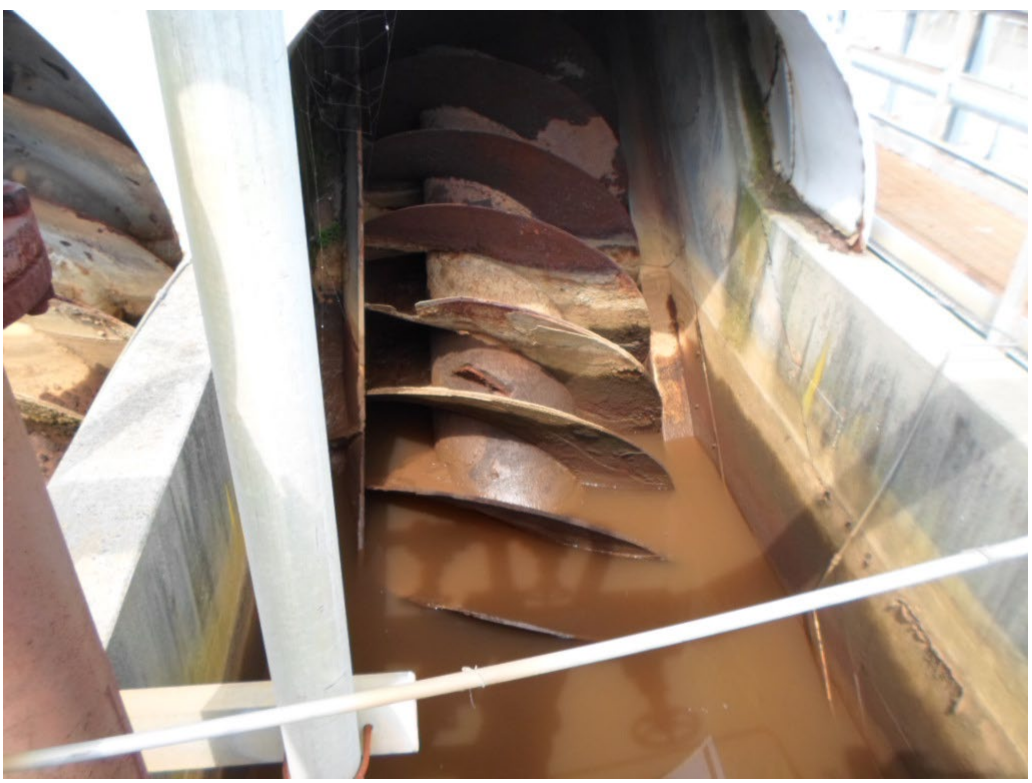
Photograph 34. Vegetation in tertiary clarifier CF-261 at the WWTP. Note CF-261 was out of service and being pumped down with a hose and a Godwin trailered pump.

Photograph 35. Vegetation in the effluent trough in multiple locations around tertiary clarifier CF-262 (foreground) and secondary clarifier CF-163 (background) at the WWTP.



Photograph 36. Vegetation in the effluent trough of tertiary clarifier CF-262 (foreground) and tertiary clarifier CF-261 (background - out of service and empty) at the WWTP.

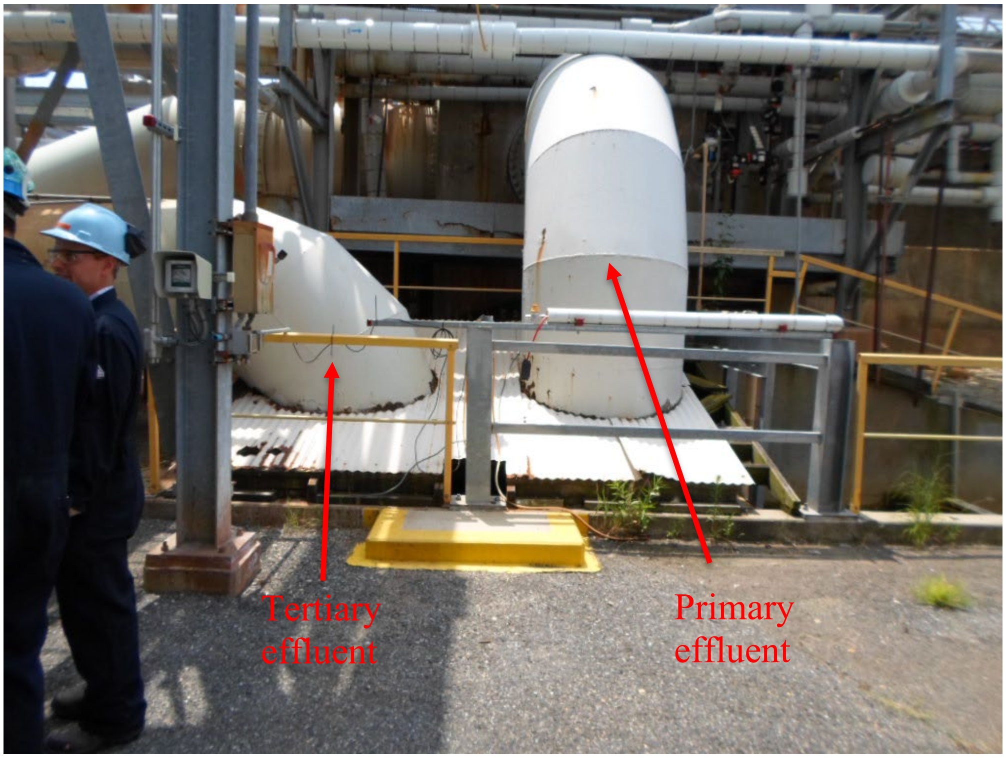
Photograph 37. Temporary pump being used to replace a broken pump used to transport water into the neutralizers at the WWTP.



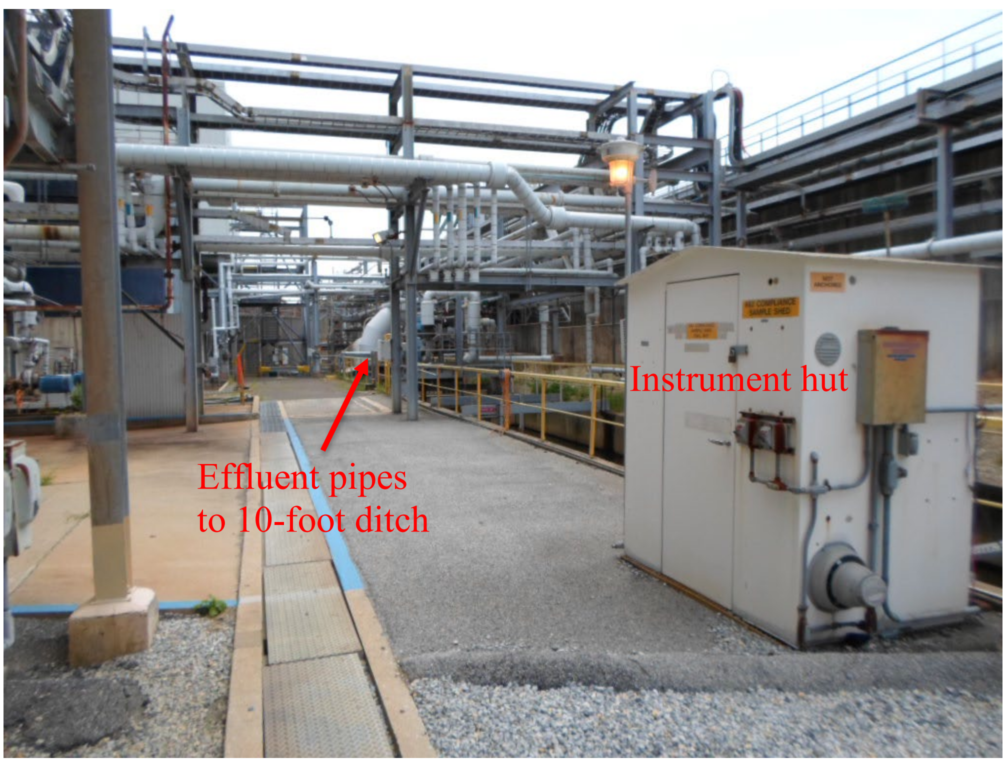
Photograph 38. Decommissioned return activated sludge screw pumps at the WWTP.

Photograph 39. Pump installed to replace the two screw pumps (pictured above) for returning activated sludge at the WWTP.

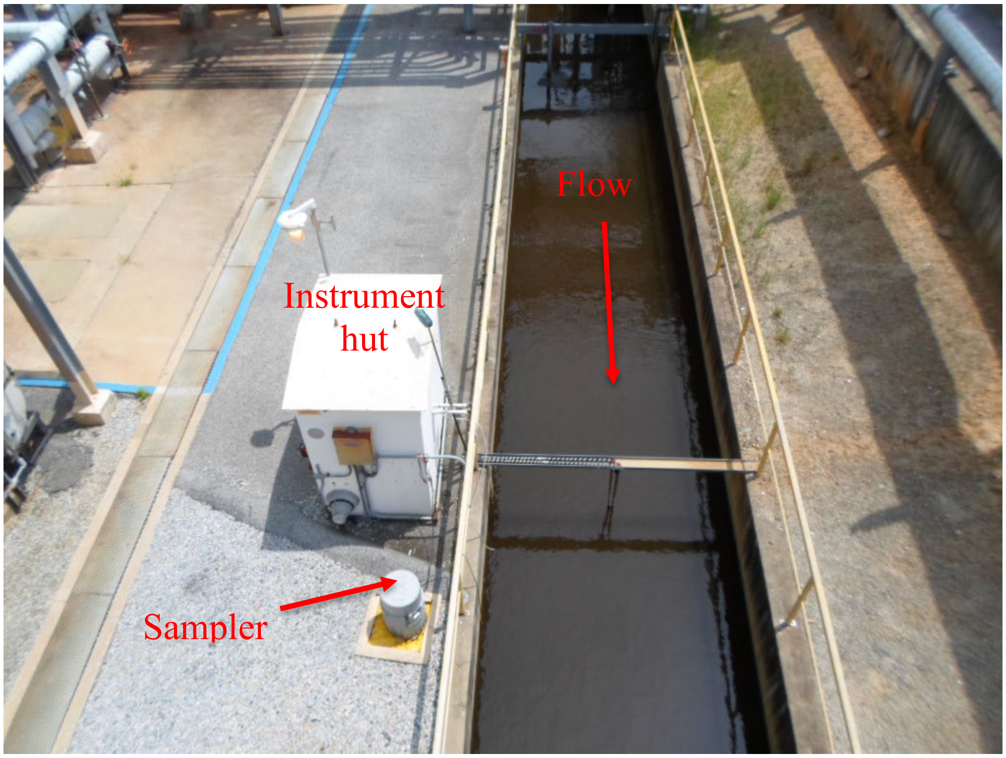
Photograph 40. Secondary treatment aerator AE-152 at the WWTP. Note some areas had excessive air flow.



Photograph 41. Primary and tertiary effluent pipes discharging into the facility's 10-foot ditch. Operators stated that the primary effluent pipe is not used.



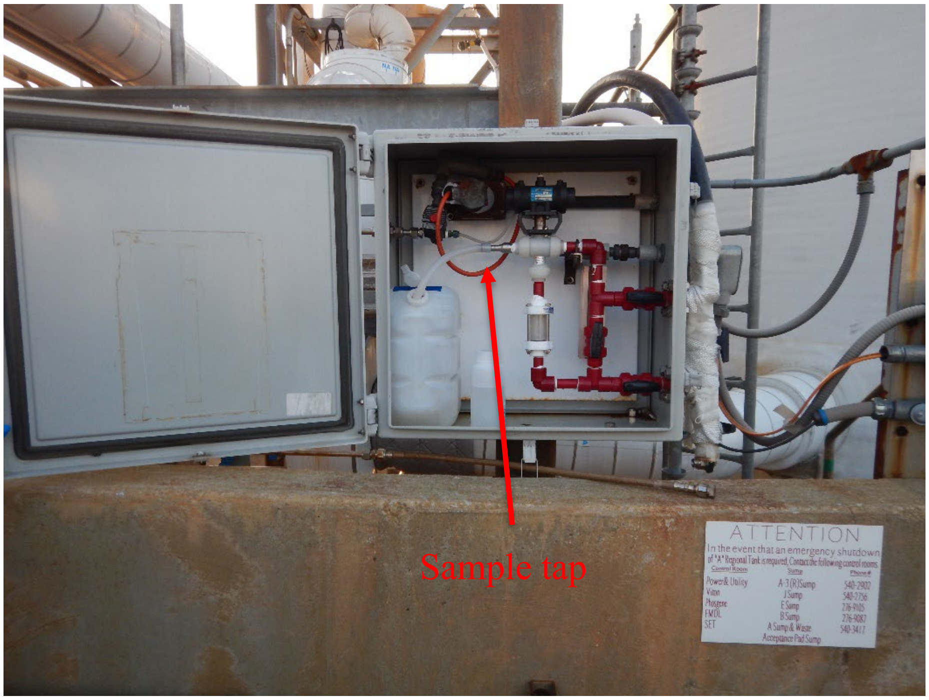
Photograph 42. Instrument hut for internal Outfall DSN 662A, approximately 100 feet downstream of effluent pipe discharge point.



Photograph 43. Alternate view of sampling point for internal Outfall DSN 662A.

Sampling Photos

Sample ID: SP-AR	**Date sample taken:** 7/11/2019
Sample taken by: Joe Ferrante (Chemours)	**Sample location:** A Regional Tank



Photograph 44. Sampling box for A Regional Tank.

Photograph 45. Sample SP-AR, which had an orange tint.

Sample ID: SP-662	**Date sample taken:** 7/11/2019
Sample taken by: Joe Ferrante (Chemours)	**Sample location:** Outfall DSN 662A

Photograph 46. Sample point for Outfall DSN 662A.

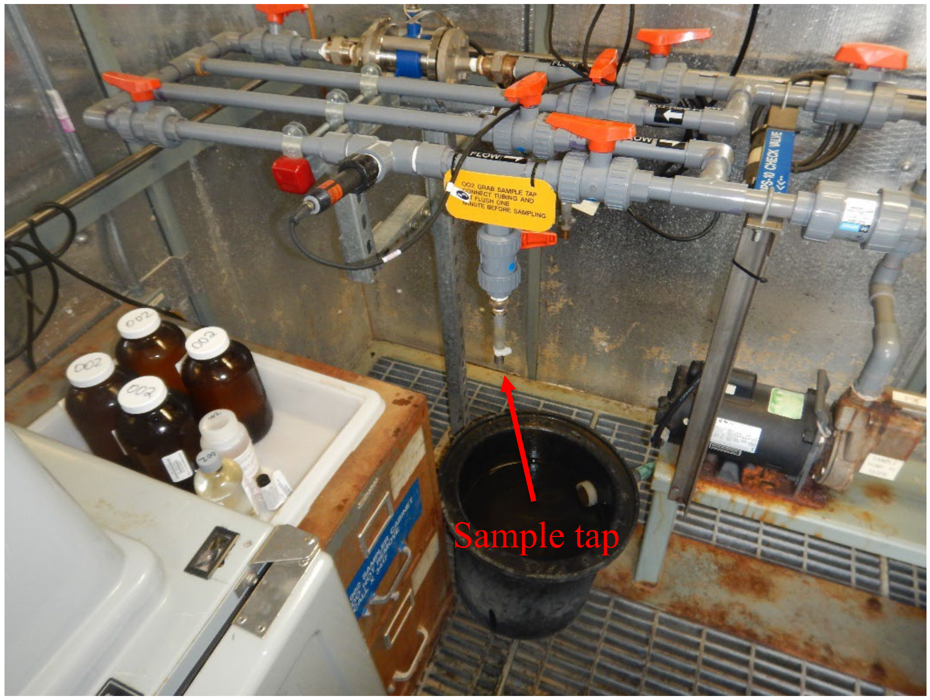
Photograph 47. Sample SP-662, which had a slight yellow-orange tint.

Sample ID: SP-JR	**Date sample taken:** 7/11/2019
Sample taken by: Joe Ferrante (Chemours)	**Sample location:** J Regional Tank

Photograph 48. Sample box for J Regional Tank.

Photograph 49. Sample SP-JR, which had an orange tint.

Sample ID: SP-002	**Date sample taken:** 7/11/2019
Sample taken by: Michelle Spiezio	**Sample location:** Outfall 002



Photograph 50. Sample point for Outfall DSN 002A.

Photograph 51. Sample SP-002, which had a slight yellow tint.

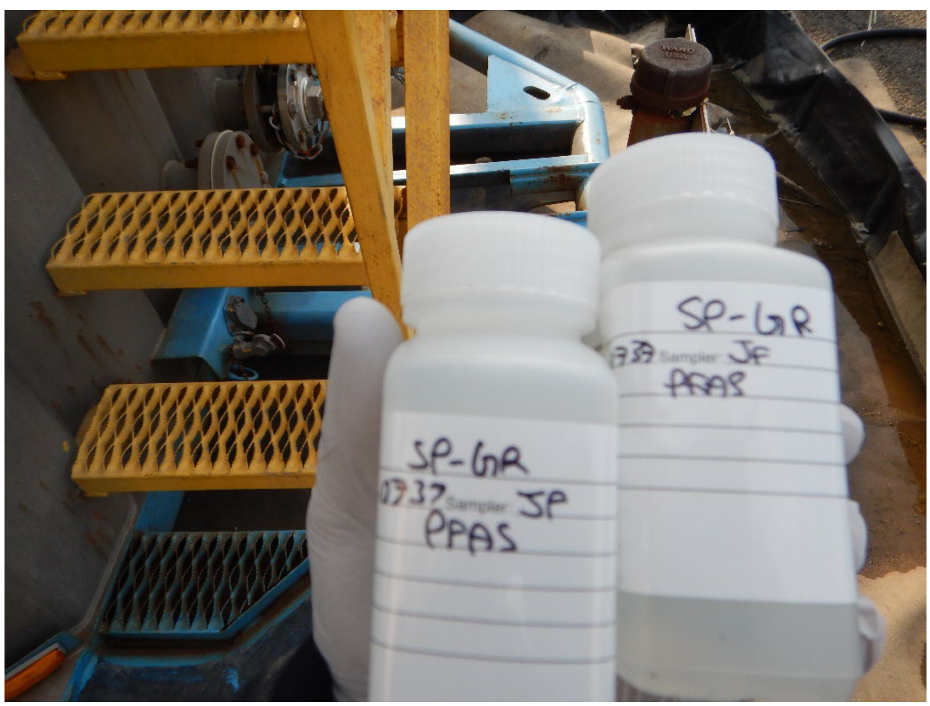
Sample ID: SP-321	**Date sample taken:** 7/11/2019
Sample taken by: Joe Ferrante (Chemours)	**Sample location:** Outfall 321

Photograph 52. Sample point for Outfall DSN 321.

Photograph 53. Sample SP-321, which had a slight yellow tint.

Sample ID: SP-GR	**Date sample taken:** 7/11/2019
Sample taken by: Joe Ferrante (Chemours)	**Sample location:** G Regional Tank

Photograph 54. Sample box for G Regional Tank.



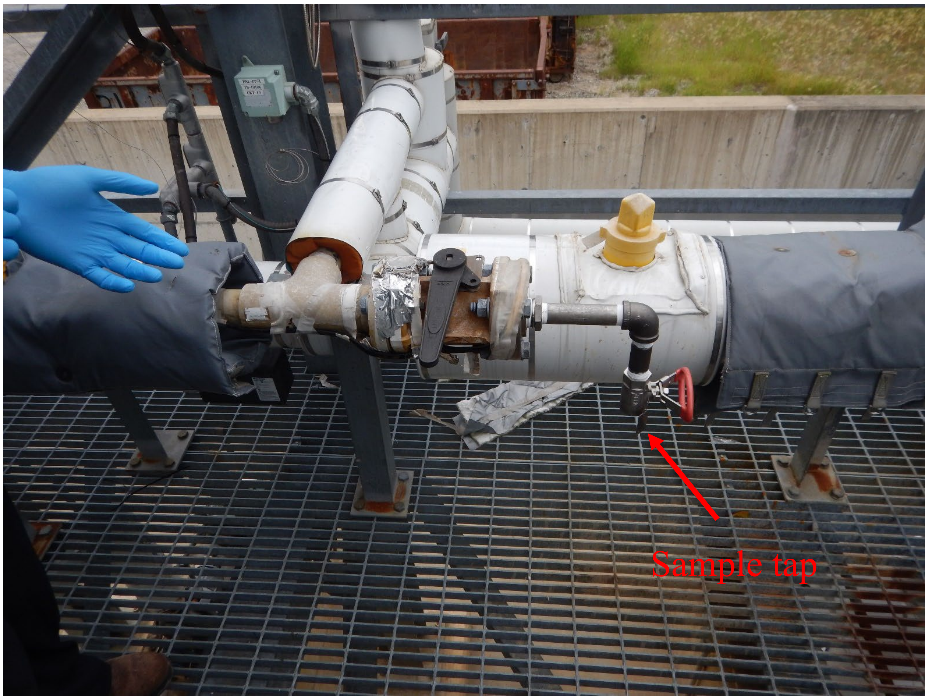
Photograph 55. Sample SP-GR, which had no visible color.

Sample ID: SP-FMDL	**Date sample taken:** 7/11/2019
Sample taken by: Michelle Spiezio	**Sample location:** Effluent from DuPont's pretreatment system (last GAC bed)

Photograph 56. Sample point for effluent from DuPont's lag GAC bed in the pretreatment system.

Photograph 57. Sample SP-FMDL, which had no visible color.

Sample ID: SP-504	**Date sample taken:** 7/11/2019
Sample taken by: Dennis Thornton (Chemours)	**Sample location:** Tank TC-504 (landfill leachate)

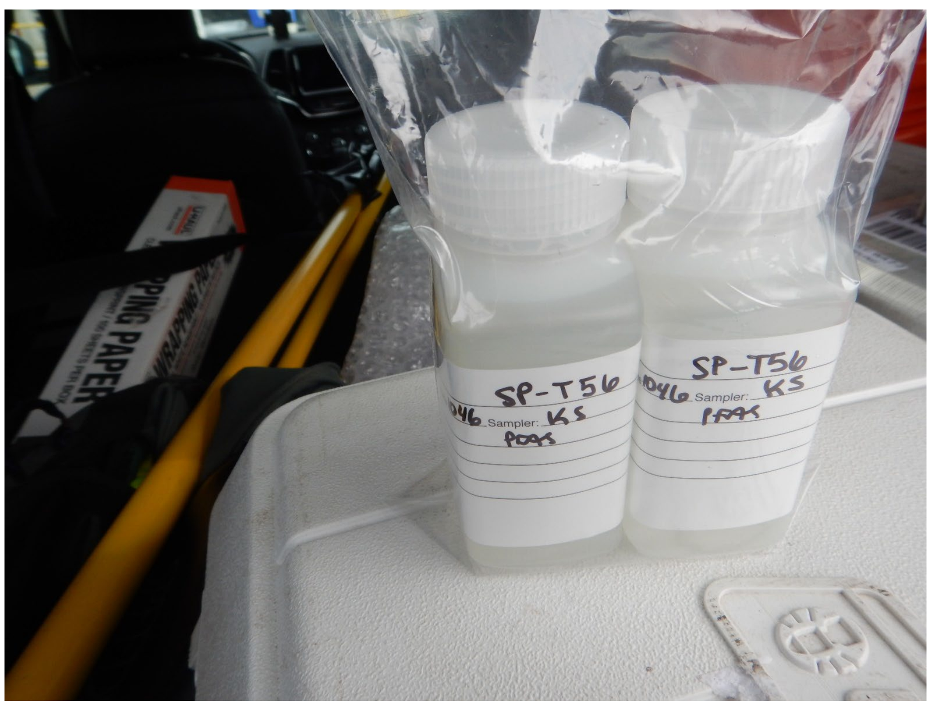


Photograph 58. Sample tap for the sample taken from Tank TC-504.

Photograph 59. Sample SP-504, which was black and cloudy.

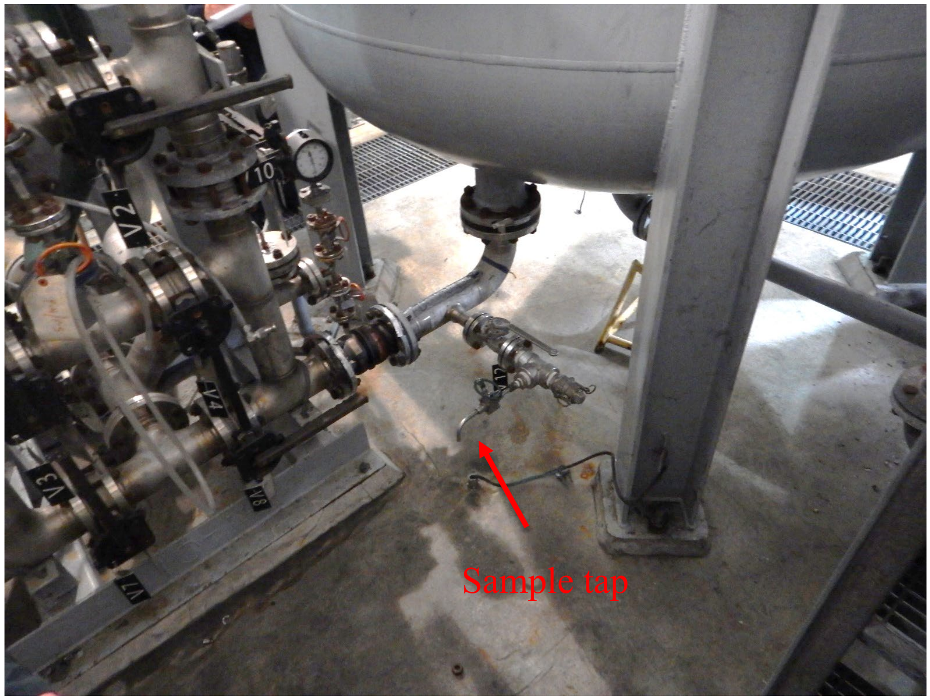
Sample ID: SP-T56	**Date sample taken:** 7/11/2019
Sample taken by: Kevin Stewart (Chemours)	**Sample location:** Tank T56 (influent to CI Pretreatment)

Photograph 60. Sample being taken with a bailer from Tank T56 by Chemours (due to safety reasons).

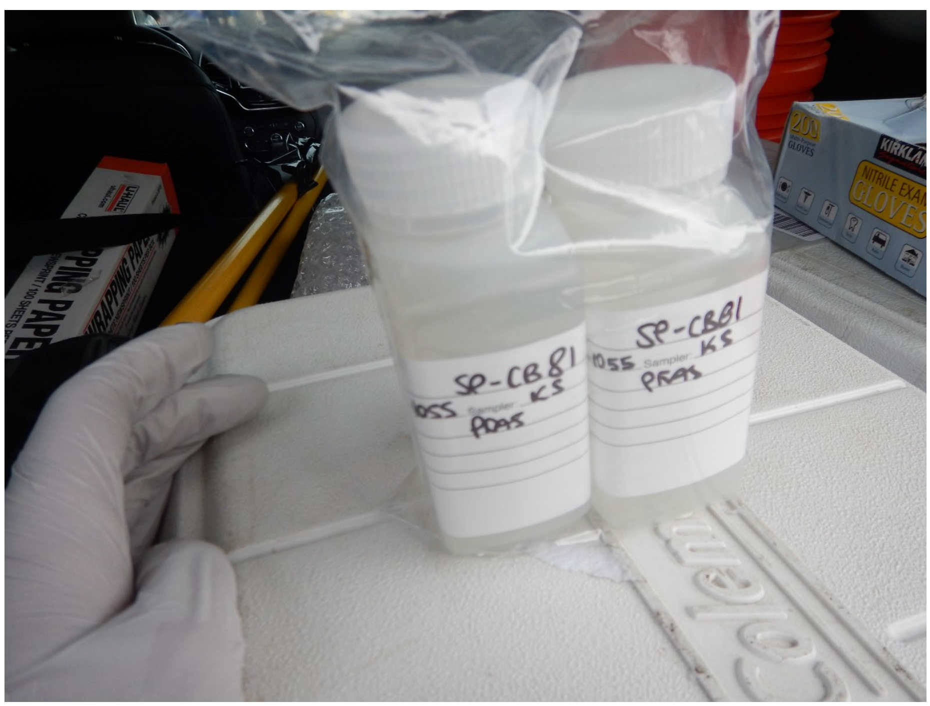


Photograph 61. Sample SP-T56, which had no visible color.

Sample ID: SP-CB81	**Date sample taken:** 7/11/2019
Sample taken by: Kevin Stewart (Chemours)	**Sample location:** Effluent from GAC bed AD1 (lag GAC bed in CI Pretreatment system)



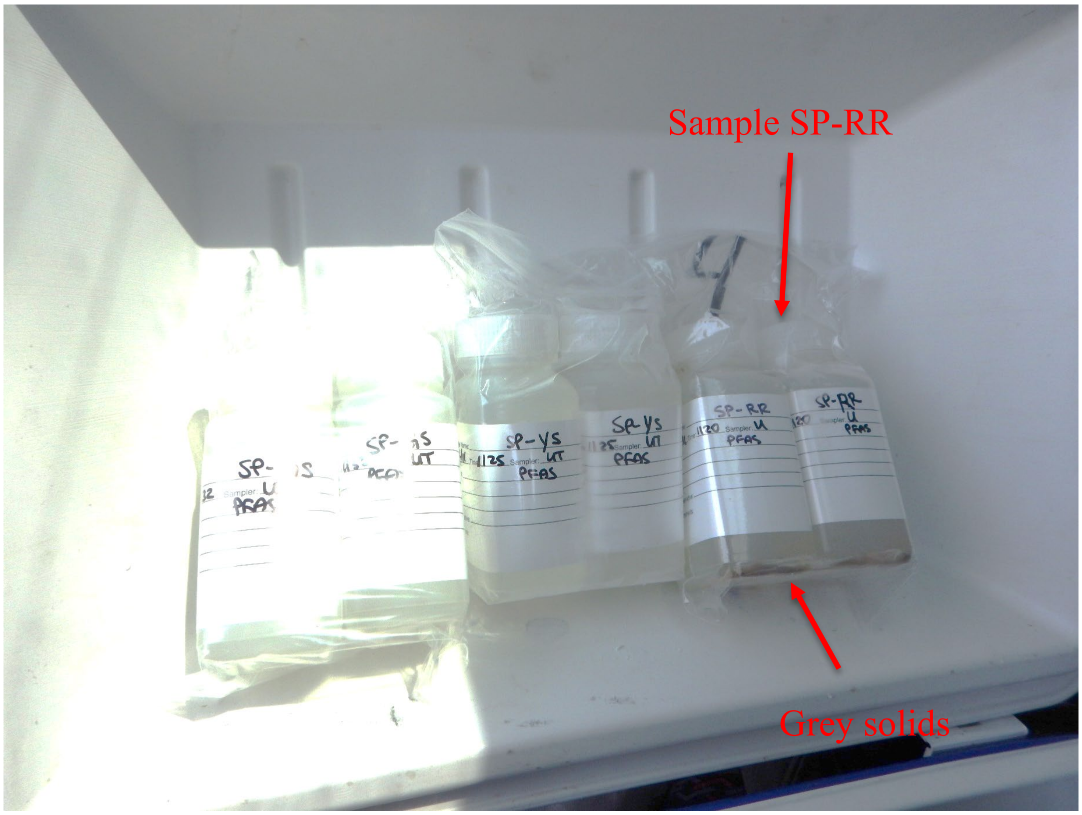
Photograph 62. Sample tap for effluent from GAC bed AD1, which is the lag GAC bed in the CI Pretreatment System. This represents the effluent from CI Pretreatment to J Regional Tank.



Photograph 63. Sample SP-CB81, which had no visible color.

Sample ID: SP-RR	**Date sample taken:** 7/11/2019
Sample taken by: Unitas Todd (AECOM)	**Sample location:** R Sump (to G Regional Tank)

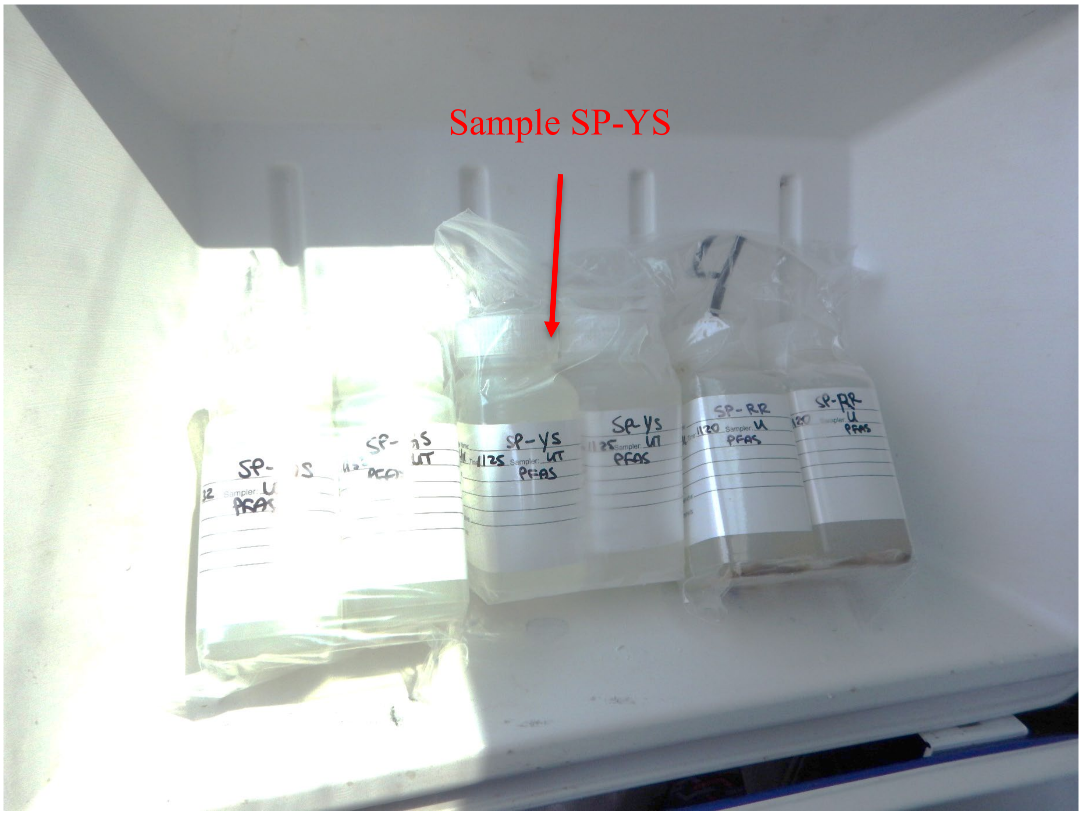
Note: The Inspection and Sampling Team did not photograph R Sump because the process area was electrically classified.



Photograph 64. Sample SP-RR, which had no visible color and grey solids.

Sample ID: SP-YS	**Date sample taken:** 7/11/2019
Sample taken by: Unitas Todd (AECOM)	**Sample location:** Y Sump (to G Regional Tank)

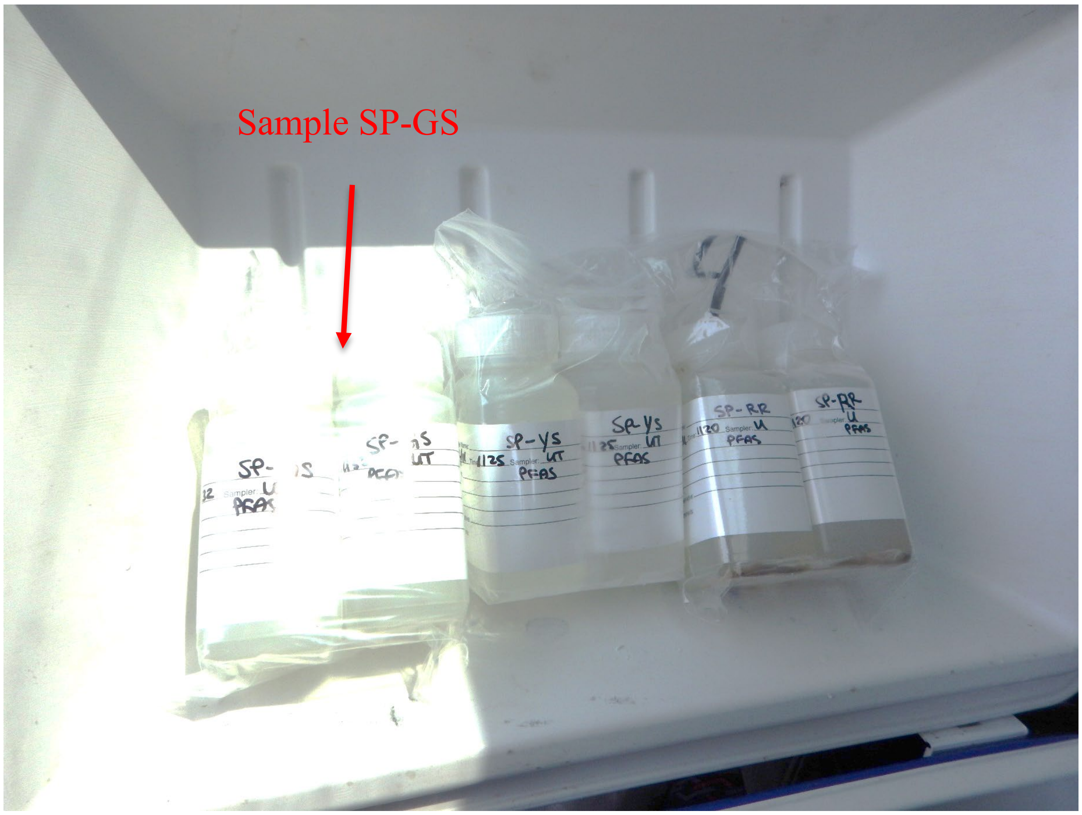
Note: The Inspection and Sampling Team did not photograph Y Sump because the process area was electrically classified.



Photograph 65. Sample SP-YS, which had no visible color.

Sample ID: SP-GS	**Date sample taken:** 7/11/2019
Sample taken by: Unitas Todd (AECOM)	**Sample location:** G Sump (to G Regional Tank)

Note: The Inspection and Sampling Team did not photograph G Sump because the process area was electrically classified.



Photograph 66. Sample SP-GS, which had no visible color.

Sample ID: SP-HC	**Date sample taken:** 7/11/2019
Sample taken by: Jake Albright	**Sample location:** Henby Creek GPS: 39.701050, -75.495950

Photograph 67. Sample location for SP-HC.

Photograph 68. Map showing the sample location for SP-HC.

Photograph 69. Sample SP-HC, which had a yellow tint and some brown solids.