

Cape Fear River PFAS Mass Loading Assessment - Fourth Quarter 2022 Report

DocuSigned by:

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Chemours Fayetteville Works

Prepared for

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LIST OF ABBREVIATIONS

cfs cubic feet per second

CO Consent Order

CO Addendum Addendum to Consent Order Paragraph 12

DVM Data Verification Module

FTC flow through cell

HDPE high-density polyethylene

HFPO-DA hexafluoropropylene oxide-dimer acid

kg kilograms

LDPE low-density polyethylene

mg/s milligrams per second

m³ cubic meters

ng/L nanograms per liter

NCDEQ North Carolina Department of Environmental Quality

PFAS per- and polyfluoroalkyl substances

PFHpA perfluoroheptanoic acid

Q1 first quarter

Q2 second quarter

Q3 third quarter

Q4 fourth quarter

SOP standard operating procedure

SWTS stormwater treatment system

USEPA United States Environmental Protection Agency



1 INTRODUCTION

Geosyntec Consultants of NC, P.C. (Geosyntec) has prepared this Cape Fear River PFAS Mass Loading Assessment - Fourth Quarter 2022 Report for The Chemours Company, FC, LLC (Chemours). This report provides monitoring and assessment results pursuant to the requirements of Paragraphs 1(a) and 1(b) of the Addendum to Consent Order Paragraph 12 (CO Addendum) and Paragraph 16 of the executed Consent Order (CO) (dated February 25, 2019) between the North Carolina Department of Environmental Quality (NCDEQ), Cape Fear River Watch, and Chemours. The CO Addendum requires sampling the Cape Fear River and mass loading transport pathways for the per- and polyfluoroalkyl substances (PFAS) compounds listed in Attachment C of the CO (Geosyntec 2020a). This is the twelfth report prepared since the first quarter (Q1) 2020.

1.1 Site Remedies

Chemours operates the Fayetteville Works facility in Bladen County, North Carolina (the Site) (Figure 1). The Site is within a 2,177-acre property at 22828 NC Highway 87, approximately 20 miles southeast of the city of Fayetteville.

From October 2020 through June 2021,¹ Chemours installed multiple remedies to capture PFAS at the Site and to prevent PFAS from reaching the Cape Fear River. Thus far, these remedies include two treatment systems and four on-site seeps interim flow-through cells (FTC). The start date of operation of each remedy are as follows:

- Old Outfall 002 treatment system (October 1, 2020)
- Seep C FTC (December 16, 2020)
- Seep A FTC (April 28, 2021)
- Seep B FTC (June 8, 2021)
- Seep D FTC (June 24, 2021)
- Outfall 002 stormwater treatment system (SWTS) (implemented on June 30, 2021) ²

One year of monthly sampling of the mass loading model pathways per CO Paragraph 1(b) was completed in December 2021. Starting in January 2022 (Q1 2022), quarterly sampling of the mass loading model pathways was initiated and will continue for a period of 4 years (through Q4 2026),

There have been numerous other interim and permanent actions taken to limit PFAS reaching the Cape Fear River prior to Q4 2022, i.e., air abatement measures (installation of the thermal oxidizer and carbon beds, etc.), grouting of the terracotta pipe, sediment removal from onsite channels, among others, and these may not be reflected in the captured mass load calculations but should be considered in the overall assessment of PFAS reductions.

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Diversion sumps in the conveyance network surrounding the Monomers/IXM area capture stormwater flows that would otherwise flow to Outfall 002 and transfers the stormwater to the SWTS for treatment. The diversion sumps and SWTS are designed to convey and then treat stormwater from storm events up to 1-inch over 24-hours. Further details on the SWTS are provided in the Stormwater Treatment System Capture and Removal Efficiency Report (Geosyntec, 2021a).



as outlined in the Cape Fear River Mass Loading Calculation Protocol Version 2 (Geosyntec 2020a).

1.2 Monitoring and Report Objectives

This report presents data collected and analytical results for the fourth quarter 2022 (Q4 2022; October through December 2022) PFAS mass-loading assessment of the Cape Fear River. The primary objectives of the quarterly monitoring are as follows:

- 1. Assess the PFAS mass loads reaching the river primarily using the analytical results of the composite samples collected in the Cape Fear River at Tar Heel Ferry Road Bridge (Tar Heel), which is approximately 7 miles downstream of the Site (Figure 2).
- 2. Assess the PFAS mass loads that are being prevented from reaching the Cape Fear River by the remedies that have been implemented³.

Along with presenting the results of the composite sampling conducted at Tar Heel, this report also presents the results of the grab samples collected at three downstream locations along the Cape Fear River: Bladen Bluffs, Tar Heel, and Kings Bluff Intake Canal (Kings Bluff) (Figure 3). The Tar Heel and Bladen Bluffs locations are within 2 miles of each other. The Kings Bluff location is farther away from the Site (48 miles downstream from Tar Heel).

This report also summarizes the surface water and groundwater sampling (Figures 4 and 5) that was conducted to estimate the relative PFAS loadings from the different PFAS transport pathways to the Cape Fear River, as identified in the conceptual site model (Figure 6) (Geosyntec 2019). The estimated relative PFAS loadings were modeled for this current reporting period using the Q4 2022 data and the mass loading model. A summary of the mass loading model is presented in this report, and the scope and analysis are in Appendix A.

The results are presented as three PFAS groupings and presented in Table 1: Total Table 3+ (17 compounds)⁴, Total Table 3+ (20 compounds), and Total Attachment C (Geosyntec 2020b). Although the report tables include results for Total Attachment C and Total Table 3+ (20 compounds), the text, tables, and figures of this report focus on the Total Table 3+ (17 compounds) PFAS grouping.

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An attempt was made to collect samples from the model pathways during a wet event in Q4 2022, but coordination of field sampling with a predicted rain event was not achieved. As such, there will be two wet events in 2023, where the first one was conducted in Q1 2023 and the second one is to be determined.

⁴ Total Table 3+ PFAS concentrations are calculated and presented two ways in this report: (i) summing over 17 of the 20 Table 3+ compounds "Total Table 3+ (17 compounds)", i.e., excluding results of R-PSDA, Hydrolyzed PSDA, and R-EVE, and (ii) summing over 20 of the Table 3+ compounds "Total Table 3+ (20 compounds)"



1.3 Report Organization

The remainder of this report is organized as follows:

- Section 2 presents details of the field work conducted (e.g., samples collected, measurements taken) and the laboratory analyses completed.
- Section 3 presents the sampling results.
- Section 4 presents the mass load and mass discharge calculations.
- Section 5 provides a summary and conclusions of the Q4 2022 mass load assessment.

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2 SAMPLING ACTIVITIES AND LABORATORY ANALYSIS

The field work associated with collecting data for this Q4 2022 mass load assessment was completed by Parsons of NC (Parsons) and Geosyntec from October 1 through December 31, 2022. The scope of sampling and analysis conducted are presented below. Details of the sampling methods and flow measurement methods can be found in *Cape Fear River Mass Loading Calculation Protocol Version 2* (Geosyntec 2020a). Details of the sampling scope for the mass loading model are in Appendix A and are not presented in this section.

2.1 Sampling Activities

In Q4 2022, composite samples were collected from Tar Heel (sample location CFR-TARHEEL), which is approximately 7 miles downstream of the Site (Figure 2). In addition, grab samples were collected at the three downstream locations along the Cape Fear River. The flow measurements were collected at W.O. Huske Dam (Station #2105500) and Cape Fear Lock and Dam #1 (Station #2105769) and are summarized in Appendix B. Field forms are provided in Appendix C.

The composite samples were collected using an autosampler and were generally composited over 24 hours with aliquots collected at 1-hour intervals and at two samples per week. A total of 26 primary composite samples and 3 field duplicate composite samples were collected from this location from October 5 through December 29, 2022. The duplicate samples were collected on October 10, November 14, and December 22, 2022. There were no interruptions to the composite sampling from events such as vandalism, equipment malfunction, or a high river stage.

The grab samples were collected using a peristaltic pump and new dedicated high-density polyethylene (HDPE) or low-density polyethylene (LDPE) tubing and dedicated silicone tubing for the pump head. A total of three grab samples were collected: one from Tar Heel (sample location CFR-TARHEEL) and one from Bladen Bluffs (sample location CFR-BLADEN) on November 9, 2022, and one from Kings Bluff (sample location CFR-KINGS) on November 14, 2022. The grab sample from Kings Bluff was collected five days after sampling conducted at Tar Heel and Bladen Bluffs to account for travel time between these locations.

For the remedies installed at Old Outfall 002; Seeps A, B, C, and D; and Outfall 002, samples were collected at the influent and effluent stilling basins and measured flows at the Old Outfall 002 treatment system. The sampling methods for the Seeps are not part of the scope of the mass loading assessment but are provided in *Interim Seep Remediation O&M Reports 12 and 13* (Geosyntec 2022a, 2023).

2.2 Laboratory Analyses

Samples were sent to Eurofins Scientific (West Sacramento, California). The composite samples from Tar Heel were analyzed for PFAS by Table 3+ Laboratory standard operating procedure (SOP). The grab samples from the Bladen Bluffs, Tar Heel, and Kings Bluff were analyzed for Table 3+ Laboratory SOP and Method Mod 537 (35 compounds).



PFAS ANALYTICAL RESULTS

Table 3+ analytical results from samples collected at Bladen Bluffs, Tar Heel, and Kings Bluff in O4 2022 are presented in Tables 2 and 3. The laboratory reports and Data Verification Module (DVM) reports are provided in Appendix D. The analytical data have been reviewed and validated. The duplicate samples have also been compared to the primary samples.

3.1 Data Validation

The laboratory data were reviewed using the DVM within the LocusTM Environmental Information Management (EIM) system, a commercial software program used to manage data. Following the DVM process, a secondary review of the data was conducted. The DVM and secondary review results were combined in a data review narrative report for each set of sample results, which were consistent with Stage 2b of the United States Environmental Protection Agency (USEPA) Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use (USEPA 2009).

Additional details of the data validation are provided in Appendix A. Based on the review, the data are complete, representative, and comparable, with the exception of R-PSDA, Hydrolyzed PSDA, and R-EVE⁵.

3.2 Equipment Blanks, Quality Assurance/Quality Control, and Duplicate **Samples**

No equipment blank samples were collected for the Tar Heel sampling program (CFR-TARHEEL) during this period because there were no maintenance activities conducted on the composite samplers. There were no other quality assurance/quality control samples collected for this reporting period.

Two equipment blank samples and a field blank sample were collected as part of the surface water sampling activities on November 9, 2022. No reported PFAS were detected in these samples above the applicable reporting limits. These blank samples are further discussed in Appendix A.

PFAS results for the primary and duplicate samples had relative percent differences less than 30% for the reported compounds.

3.3 Analytical Results

The Q4 2022 analytical results from the composite samples collected at Tar Heel are presented in Table 2. The Total Table 3+ (17 compounds) concentrations ranged from 4.9 ng/L to 120

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As reported in the Matrix Interference During Analysis of Table 3+ Compounds memorandum (Geosyntec, 2020b), matrix interference studies conducted by the analytical laboratory (TestAmerica, Sacramento) have shown that the quantitation of three compounds (R-PSDA, Hydrolyzed PSDA, and R-EVE) is inaccurate due to interferences by the sample matrix in both groundwater and surface water.



nanograms per liter (ng/L). This range in concentrations is within the observed range in previous quarterly sampling events that occurred after the remedies were in operation.

The Q4 2022 Table 3+ analytical results from the grab samples collected at Bladen Bluffs, Tar Heel, and Kings Bluff are presented in Table 3 and Method Mod 537 are presented in Appendix B, Table B2. The analytical results for these downstream locations are discussed in Section 4.3.



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4 CAPE FEAR RIVER MASS LOAD AND MASS DISCHARGE CALCULATIONS

The analytical results from the sampling and the flows reported from W.O. Huske Dam (Station #2105500) and Cape Fear Lock and Dam #1 (Station #2105769) (Appendix B) were used to estimate the Total Table 3+ (17 compounds) mass loads and mass discharge in the Cape Fear River. Specifically, the mass load is calculated as the product of the concentration of PFAS and the total volume of water that flowed passed the sampling point within the sampling time interval (milligrams [mg] or kilograms [kg]); and the mass discharge is generally calculated as the product of the concentration of PFAS and the volumetric flow rate (milligrams per second [mg/s]).

The Total Table 3+ (17 compounds) mass load measured in the Cape Fear River and prevented from entering the Cape Fear River due to the remedies are summarized in Table 4. The mass load estimation intervals are presented in Tables 5A to 5G.

4.1 PFAS Estimations in the Cape Fear River

Analytical results from Tar Heel and flows reported at W.O. Huske Dam (Station #2105500) were used to estimate the Total Table 3+ (17 compounds) mass loads and PFAS mass discharge in the Cape Fear River.

In Q4 2022, the in-river Total Table 3+ (17 compounds) mass load measured at Tar Heel was 17.3 kg and is based on the 56 mass loading estimation intervals (Table 5A). The Total Table 3+ (17 compounds) mass discharge among samples with detected Total Table 3+ (17 compounds) concentrations ranged from 0.94 to 3.2 mg/s (Table 6), with the median mass discharge being 1.8 mg/s.

The flow measured in Cape Fear River, the Total Table 3+ concentrations, and mass discharge over time have been plotted from the start of the mass loading program (from March 28, 2020, to December 31, 2022; Figure 7) and within the last 12 months (from January 1, 2022, to December 31, 2022; Figure 8). The mass discharge began to decrease at the end of June 2021, which also corresponds to the time when Old Outfall 002 treatment system, the Seep FTCs, and the SWTP were installed and operating.

4.2 PFAS Prevented From Reaching the River

Analytical results measured from samples collected at the influent and effluent of the remedies and their respective flows were used to estimate the Total Table 3+ (17 compounds) mass loads and PFAS mass discharge prevented from discharging to the Cape Fear River. During the Q4 2022 reporting period, the remedies prevented 38.0 kg of Total Table 3+ mass load.

• For the Old Outfall 002 treatment system, a total of 8.5 kg of PFAS was captured and prevented from reaching the Cape Fear River with a total treated flow of 180,000 cubic meters (m³) (Table 5B).



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- For the Seep A FTC, a total of 7.7 kg was captured and prevented from reaching the Cape Fear River with a total measured flow of about 43,810 m³ (Table 5C).
- For the Seep B FTC, a total of 15 kg was captured and prevented from reaching the Cape Fear River with a total measured flow of about 58,885 m³ (Table 5D).
- For the Seep C FTC, a total of 2.6 kg was captured and prevented from reaching the Cape Fear River with a total measured flow about 22,527 m³ (Table 5E).
- For the Seep D FTC, a total of 3.4 kg was captured and prevented from reaching the Cape Fear River with a total measured flow of about 37,784 m³ (Table 5F).
- The SWTS captures PFAS originating from stormwater in the Monomers/IXM area that would otherwise flow to Outfall 002 during storm events. When stormwater is being treated at the SWTS, HFPO-DA, PFMOAA, and PMPA concentrations are measured in the SWTS influent and effluent flows. The captured total mass of HFPO-DA, PFMOAA, and PMPA during storm events between October 1, 2022, and December 31, 2022, was 0.41 kg. This estimate was based on mass loading estimates for 17 days when flow was recorded at the SWTS in Q4, with a total treated flow of about 6,785 m³ (Table 5G). This captured total mass likely underestimates the mass of PFAS captured by the SWTS during Q4 2022 because the samples collected are analyzed for the three indicator compounds HFPO-DA, PFMOAA, and PMPA and not the full Table 3+ analyte list.

4.3 PFAS at the Downstream River Locations

The Total Table 3+ (17 compounds) concentrations and mass discharge values from the Q4 2022 event are shown in the table below. Total Table 3+ (17 compounds) concentrations at the three downstream river locations ranged from 17 nanograms per liter (ng/L) (CFR-KINGS) to 65 ng/L (grab sample at CFR-TARHEEL). The Tar Heel and Bladen Bluffs sampling locations are located within 2 miles of each other and have similar sample results. In Q4 2022, the grab samples collected at CFR-TARHEEL and CFR-BLADEN did have similar Total Table 3+ (17 compounds) concentrations (65 ng/L and 63 ng/L, respectively). The Kings Bluff location is located further away (i.e., 48 miles from Tar Heel) and had lower concentrations to the other two locations with a Total Table 3+ (17 compounds) concentration of 17 ng/L.

As per the Cape Fear River Mass Loading Calculation Protocol Version 2 (Geosyntec, 2020a), CFR-KINGS was sampled five days after CFR-TARHEEL and CFR-BLADEN to account for travel time between these two locations and CFR-KINGS. Flows reported at W.O. Huske Dam (Station #2105500) are adjusted for travel time and used in the calculation of mass discharge for Bladen Bluffs and Tar Heel. Flows reported at Cape Fear Lock and Dam #1 (Station #2105769) are used in the calculation of mass discharge for Kings Bluff. The flow measured at CFR-KINGS (2,330 cfs) was greater than the flows at CFR-BLADEN and CFR-TARHEEL (940 cfs and 950 cfs) due to a 1.6-inch rainfall event that occurred in between the 5-day travel time period that the samples were collected (November 10 to 11, 2022).



The Total Table 3+ (17 compounds) mass discharge ranged from 1.1 mg/s (CFR-KINGS) to 1.8 mg/s (grab sample at CFR-TARHEEL). The mass discharge across the three downstream river locations in Q4 2022 was relatively consistent with previous quarters. Specifically, from the mass discharges from Q4 2021 to Q3 2022 were 1.1 to 3.0 mg/s at CFR-BLADEN, non-detect to 3.0 mg/s at CFR-TARHEEL (grab samples), and 1.1 to 4.4 mg/s at CFR-KINGS (Geosyntec: 2022b, 2022c, 2022d, 2022e). The mass discharges at the downstream river locations similar and were also consistently lower over the past five quarters (i.e., since Q4 2021) than in previous assessments, which may reflect the reduced mass discharge from the Site due to implemented remedies described in Section 4.2.

	Sample	Sample		Total Table 3+ (17 Compounds)	
Sample Location	Collection Method	Collection Date	Flow Rate (cfs)	Concentration (ng/L)	Mass Discharge (mg/s)
CFR-BLADEN	Grab	11/9/2022	940	63	1.7
CFR-TARHEEL	Grab	11/9/2022	950	65	1.8
CFR-KINGS	Grab	11/14/2022	2,330	17	1.1

4.4 Mass Loading Model Assessment

Where Section 3 presented the Total Table 3+ PFAS mass load in the Cape Fear River, this section presents the estimation of mass discharge from the identified PFAS transport pathways using the mass loading model and an assessment of the relative contributions by pathway. The results of the mass loading model assessment for Q4 2022 are briefly described below. Details on the mass loading model results and calculations are provided in Appendix A.

The reduction in mass discharge is estimated as the difference between the mass discharge calculated upgradient of the remedies ("before" remedies) and downgradient of the remedies ("after" remedies). In Q4 2022 (November 2022), the total reduction in Total Table 3+ mass discharges due to the operation of the remedies was 4.37 mg/s. Specifically, the reduction of mass discharge was 0.87 mg/s at Old Outfall 002; 0.84 mg/s at Seep A; 1.37 mg/s at Seep B; 0.42 mg/s at Seep C; 0.53 mg/s at Seep D; and 0.34 mg/L at Outfall 002.

In terms of relative contributions, the largest contributing pathways upgradient of the remedies (i.e., before the water passes through the remedies) continue to be the seeps, on-site groundwater, Old Outfall 002, and Outfall 002 (see below an except from Appendix A Table A11), which is consistent with previous events (Geosyntec 2020c, 2020d, 2020e, 2021b, 2021c, 2021d, 2021e, 2022b, 2022c, 2022d, 2022e). Implementation of the Old Outfall 002 treatment system, the Stormwater Treatment System at Outfall 002, and FTCs at Seeps A, B, C, and D have reduced the potential loading at these pathways to approximately 1% of the Total Table 3+ (17 compounds) mass load reaching the Cape Fear River. A complete comparison of relative contributions per pathway for the Q4 2022 mass loading model assessments is provided in Appendix A.



Dothway	Q4 2022		
Pathway	Lower	Upper	
Onsite Groundwater	22%	25%	
Seeps	48%	46%	
Seeps (After Remedies)	1%	1%	
Outfall 002	6%	5%	
Outfall 002 (After Remedies)	<1%	<1%	
Old Outfall 002	14%	13%	
Old Outfall 002 (After Remedies)	1%	1%	

The largest remaining contributing pathway downgradient of the remedies (i.e., after the water passes through the remedies) is onsite groundwater. The onsite groundwater reaching the Cape Fear River will be addressed in the future by the groundwater barrier wall remedy which includes a groundwater extraction and treatment system.



5 SUMMARY AND CONCLUSIONS

This Q4 2022 Cape Fear River PFAS assessment at Tar Heel estimated the Total Table 3+ (17 compounds) that was measured at the Cape Fear River over the load assessment period of October 1, 2022, through December 31, 2022. Over this period, the in-river Total Table 3+ (17 compounds) mass load measured at Tar Heel was 17.3 kg. The remedies that have been installed at Old Outfall 002; Seeps A, B, C, and D; and Outfall 002 prevented a load of 38.0 kg of Total Table 3+ (17 compounds).

The PFAS mass discharge sampling at Bladen Bluffs, Tar Heel, and Kings Bluff consisted of three grab samples collected at the three downstream locations along Cape Fear River. There is inherent variability associated with river sample collection due to changing flow rates, precipitation near the Site and along the river, sample collection location, and grab sampling methods, which can lead to variability in the PFAS mass discharge at these three locations. Overall, the mass discharges measured at the downstream river locations were relatively consistent in Q4 2022 and have been consistently lower since Q4 2021, which might in part reflect the reduced mass discharge from the Site due to implemented remedies.

In November 2022, samples were collected from the PFAS transport pathways (seeps, creeks, Old Outfall, Outfall 002, groundwater) and were used to estimate the mass discharge and the relative contribution per transport pathway to the Cape Fear River. The implementation of remedies at the Old Outfall 002 and Seeps A, B, C, and D resulted in reductions of model-estimated mass discharges of about 4.37 mg/s. These reductions represent the estimated reductions for this single mass loading event and are similar to model-estimated reductions reported in Q3 2022 of 4.98 mg/s (Geosyntec, 2022e).

In terms of relative contributions, the pathways with the largest PFAS mass discharges continue to be the seeps (transport pathway 6) onsite groundwater (transport pathway 5), and to a lesser extent Outfall 002 (transport pathway 4) and Old Outfall 002 (transport pathway 7). For the Seeps, Outfall 002 and Old Outfall 002 (transport pathways 6 and 7), the implementation of the Stormwater Treatment Plant, Old Outfall 002 treatment system and the seep FTC remedies have reduced the relative contribution of the Total Table 3+ (17 compounds) mass discharge from those three pathways to the Cape Fear River. In Q4 2022, the relative contributions of Outfall 002, Old Outfall 002 and the Seeps were reduced to approximately 1% each. Accounting for implemented remedies, the remaining largest contributing pathway is onsite groundwater. Onsite groundwater reaching the Cape Fear River will be addressed in the future by the groundwater barrier wall remedy which includes a groundwater extraction and treatment system.

Quarterly sample collection was initiated in January 2022 and will continue for a period of 4 years (through Q4 2026). Assessment of PFAS mass loads will continue in future sampling events, including evaluation of reductions in mass loads from the model pathways due to the implemented remedies and calculations of measured mass loads at Tar Heel.



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Tables

TABLE 1 PFAS ANALYTE LIST Chemours Fayetteville Works, North Carolina

	PFAS Grouping ²					
Common Name ¹	Attachment C	Table 3+ (17 compounds)	Table 3+ (20 compounds)	Chemical Name	CASN	Chemical Formula
HFPO-DA ³	✓	√	√	Hexafluoropropylene oxide dimer acid	13252-13-6	C6HF11O3
PEPA	✓	√	√	Perfluoro-2-ethoxypropionic acid	267239-61-2	C5HF9O3
PFECA-G	✓	√	√	Perfluoro-4-isopropoxybutanoic acid	801212-59-9	C12H9F9O3S
PFMOAA	✓	√	√	Perfluoro-2-methoxyacetic acid	674-13-5	C3HF5O3
PFO2HxA	✓	√	√	Perfluoro-3,5-dioxahexanoic acid	39492-88-1	C4HF7O4
PFO3OA	✓	√	√	Perfluoro-3,5,7-trioxaoctanoic acid	39492-89-2	C5HF9O5
PFO4DA	✓	√	√	Perfluoro-3,5,7,9-tetraoxadecanoic acid	39492-90-5	C6HF11O6
PMPA	✓	√	√	Perfluoro-2-methoxypropionic acid	13140-29-9	C4HF7O3
Hydro-EVE Acid		√	√	2,2,3,3-tetrafluoro-3-({1,1,1,2,3,3-hexafluoro-3-[(1,2,2,2-tetrafluoroethyl)oxy]propan-2-yl}oxy)propionic acid	773804-62-9	C8H2F14O4
EVE Acid		√	√	2,2,3,3-tetrafluoro-3-({1,1,1,2,3,3-hexafluoro-3-[(1,2,2-trifluoroethenyl)oxy]propan-2-yl}oxy)propionic acid	69087-46-3	C8HF13O4
PFECA B		√	√	Perfluoro-3,6-dioxaheptanoic acid	151772-58-6	C5HF9O4
R-EVE			√	Pentanoic acid, 4-(2-carboxy-1,1,2,2-tetrafluoroethoxy)-2,2,3,3,4,5,5,5-octafluoro-	2416366-22-6	C8H2F12O5
PFO5DA	✓	√	√	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	C7HF13O7
R-PSDA			√	Pentanoic acid, 2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-	2416366-18-0	C7H2F12O6S
R-PSDCA		√	√	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro-1-(trifluoromethyl)propoxy]-	2416366-21-5	C6H2F12O4S
Hydrolyzed PSDA			√	Acetic acid, 2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-	2416366-19-1	C7H3F11O7S
NVHOS		√	√	1,1,2,2,4,5,5,5-heptafluoro-3-oxapentanesulfonic acid; or 2-(1,2,2,2-ethoxy)tetrafluoroethanesulfonic acid; or 1-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-1,2,2,2-tetafluoroethane	801209-99-4	C4H2F8O4S
PES		√	√	Perfluoro-2-ethoxyethanesulfonic acid	113507-82-7	C4HF9O4S
PS Acid	√	√	√	Ethanesulfonic acid, 2-[1-[difluoro[(1,2,2-trifluoroethenyl)oxy]methyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoro-	29311-67-9	C7HF13O5S
Hydro-PS Acid	✓	√	✓	Ethanesulfonic acid, 2-[1-[difluoro(1,2,2,2-tetrafluoroethoxy)methyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoro-	749836-20-2	C7H2F14O5S
PFHpA ³	✓			Perfluoroheptanoic acid	375-85-9	C7HF13O2

Notes:

1 - Analyzed under analytical method Table 3+ Lab SOP.

3 - HFPO-DA and PFHpA can be analyzed under methods Table 3+ SOP and EPA Method 537 Mod.

EPA - Environmental Protection Agency

PFAS - Per- and Polyfluoroalkyl substances

SOP - Standard Operating Procedure

^{2 -} As reported in the Matrix Interference During Analysis of Table 3+ Compounds memorandum (Geosyntec, 2020a), matrix interference studies conducted by the analytical laboratory (TestAmerica, Sacramento) have shown that the quantitation of three compounds (R-PSDA, Hydrolyzed PSDA, and R-EVE) is inaccurate due to interferences by the sample matrix in both groundwater and surface water. Given the matrix interference issues, Total Table 3+ PFAS concentrations have been calculated and presented as: (i) the summation of 17 of the 20 Table 3+ compounds "Total Table 3+ (17 compounds)", i.e., excluding results of R-PSDA, Hydrolyzed PSDA, and R-EVE, and (ii) the summation of 20 of the Table 3+ compounds "Total Table 3+ (20 compounds)".

Sampling Event	Q4 2022	Q4 2022	Q4 2022	Q4 2022	Q4 2022
Location ID	CFR-TARHEEL	CFR-TARHEEL	CFR-TARHEEL	CFR-TARHEEL	CFR-TARHEEL
Field Sample ID	CFR-TARHEEL-24-100522	CFR-TARHEEL-24-100722	CFR-TARHEEL-24-101022	CFR-TARHEEL-24-101022-D	CFR-TARHEEL-24-101322
Sample Date	10/05/22	10/07/22	10/10/22	10/10/22	10/13/22
Sample Type	Composite	Composite	Composite	Composite	Composite
Sample Start Date and Time	10/05/22 12:00 AM	10/07/22 12:00 AM	10/10/22 12:00 AM	10/10/22 12:00 AM	10/13/22 12:00 AM
Sample Stop Date and Time	10/05/22 11:00 PM	10/07/22 11:00 PM	10/10/22 11:00 PM	10/10/22 11:00 PM	10/13/22 11:00 PM
Composite Duration (hours)	24	24	24	24	24
QA/QC				Field Duplicate	
Sample Delivery Group (SDG)	320-93125-1	320-93125-1	320-93125-1	320-93125-1	320-93407-1
Lab Sample ID	320-93125-1	320-93125-2	320-93125-3	320-93125-4	320-93407-1
Table 3+ SOP (ng/L)					
HFPO-DA	3.7	5.7	8.4	8.5	9.1
PFMOAA	12	18	25	28	32
PFO2HxA	5.6	9.1	13	13	16
PFO3OA	<2.0	2.3	3.5	3.1	3.9
PFO4DA	<2.0	<2.0	<2.0	<2.0	<2.0
PFO5DA	<2.0	<2.0	<2.0	<2.0	<2.0
PMPA	<10	<10	12	11	15
PEPA	<20	<20	<20	<20	<20
PS Acid	<2.0	<2.0	<2.0	<2.0	<2.0
Hydro-PS Acid	<2.0	<2.0	<2.0	<2.0	<2.0
R-PSDA	<2.0	<2.0	<2.0	<2.0	6.7 J
Hydrolyzed PSDA	4.2 J	5.3 J	<2.0	7.6 J	10 J
R-PSDCA	<2.0	<2.0	<2.0	<2.0	<2.0
NVHOS	2.3	<2.0	3.0	2.9	7.1
EVE Acid	<2.0	<2.0	<2.0	<2.0	<2.0
Hydro-EVE Acid	<2.0	<2.0	<2.0	<2.0	<2.0
R-EVE	<2.0	<2.0	<2.0	<2.0	<2.0
PES	<2.0	<2.0	<2.0	<2.0	<2.0
PFECA B	<2.0	<2.0	<2.0	<2.0	<2.0
PFECA-G	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroheptanoic Acid	4.4	4.3	3.5	3.5	2.9
Total Attachment C ^{1,2}	21	35	62	64	76
Total Table 3+ (17 compounds) ^{2,3}	24	35	65	67	83
Total Table 3+ (20 compounds) ²	28	40	65	74	100

Sampling Event	O4 2022				
Location ID	CFR-TARHEEL	CFR-TARHEEL	CFR-TARHEEL	CFR-TARHEEL	CFR-TARHEEL
Field Sample ID	CFR-TARHEEL-24-101722	CFR-TARHEEL-24-102022	CFR-TARHEEL-24-102422	CFR-TARHEEL-24-102722	CFR-TARHEEL-24-103122
Sample Date	10/17/22	10/20/22	10/24/22	10/27/22	10/31/22
Sample Type	Composite	Composite	Composite	Composite	Composite
Sample Start Date and Time	10/17/22 12:00 AM	10/20/22 12:00 AM	10/24/22 12:00 AM	10/27/22 12:00 AM	10/31/22 12:00 AM
Sample Stop Date and Time	10/17/22 11:00 PM	10/20/22 11:00 PM	10/24/22 11:00 PM	10/27/22 11:00 PM	10/31/22 11:00 PM
Composite Duration (hours)	24	24	24	24	24
QA/QC					
Sample Delivery Group (SDG)	320-93407-1	320-93660-1	320-93660-1	320-93997-1	320-93997-1
Lab Sample ID	320-93407-2	320-93660-2	320-93660-1	320-93997-1	320-93997-2
Table 3+ SOP (ng/L)					
HFPO-DA	8.8	11	13	12 J	14 J
PFMOAA	26	47	59	39 J	42 J
PFO2HxA	12	17	19	20 J	19 J
PFO3OA	2.5	4.4	5.0	5.5 J	4.6 J
PFO4DA	<2.0	<2.0	<2.0	<2.0 UJ	<2.0 UJ
PFO5DA	<2.0	<2.0	<2.0	<2.0 UJ	<2.0 UJ
PMPA	<10	10	12	12 J	13 J
PEPA	<20	<20	<20	<20 UJ	<20 UJ
PS Acid	<2.0	<2.0	<2.0	<2.0 UJ	<2.0 UJ
Hydro-PS Acid	<2.0	<2.0	<2.0	<2.0 UJ	<2.0 UJ
R-PSDA	7.5 J	7.1 J	8.1 J	3.6 J	12 J
Hydrolyzed PSDA	6.9 J	8.6 J	9.4 J	7.7 J	8.9 J
R-PSDCA	<2.0	<2.0	<2.0	<2.0 UJ	<2.0 UJ
NVHOS	8.9	5.6	7.8	5.0 J	11 J
EVE Acid	<2.0	<2.0	<2.0	<2.0 UJ	<2.0 UJ
Hydro-EVE Acid	<2.0	<2.0	<2.0	<2.0 UJ	<2.0 UJ
R-EVE	<2.0	<2.0	2.7 J	<2.0 UJ	<2.0 UJ
PES	<2.0	<2.0	<2.0	<2.0 UJ	<2.0 UJ
PFECA B	<2.0	<2.0	<2.0	<2.0 UJ	<2.0 UJ
PFECA-G	<2.0	<2.0	<2.0	<2.0 UJ	<2.0 UJ
Perfluoroheptanoic Acid	3.6	4.2	4.9	4.1 J	5.4 J
Total Attachment C ^{1,2}	49	89	110	89	93
Total Table 3+ (17 compounds) ^{2,3}	58	95	120	94	100
Total Table 3+ (20 compounds) ²	73	110	140	100	120

Sampling Event	O4 2022	Q4 2022	O4 2022	O4 2022	O4 2022
Location ID	CFR-TARHEEL	CFR-TARHEEL	CFR-TARHEEL	CFR-TARHEEL	CFR-TARHEEL
Elocation 15			CAP4Q22-CFR-TARHEEL-	CAP4Q22-CFR-TARHEEL-24-	
Field Sample ID	CFR-TARHEEL-24-110322	CFR-TARHEEL-24-110722	110922 ⁴	111022	CFR-TARHEEL-24-111222
Sample Date	11/03/22	11/07/22	11/09/22	11/10/22	11/12/22
Sample Date Sample Type	Composite	Composite	Grab	Composite	Composite
Sample Start Date and Time	11/03/22 12:00 AM	11/07/22 12:00 AM	11/09/22 9:00 AM	11/09/22 3:48 AM	11/12/22 12:00 AM
Sample Start Date and Time	11/03/22 12:00 AM 11/03/22 11:00 PM	11/07/22 12:00 AM 11/07/22 11:00 PM	11/09/22 9:00 AWI	11/10/22 2:48 AM	11/12/22 12:00 AM 11/12/22 11:00 PM
Composite Duration (hours)	24	24		24	24
OA/OC	24	24		24	24
Sample Delivery Group (SDG)	320-94322-1	320-94322-1	320-94321-1	320-94321-1	320-94573-1
Lab Sample ID	320-94322-1	320-94322-1	320-94321-3	320-94321-1	320-94573-1
Table 3+ SOP (ng/L)	320-74322-1	320-94322-2	320-34321-3	320-7-321-1	320-74373-1
HFPO-DA	6.8	7.8	9.3	9.0	14
PFMOAA	21	26	29	31	<2.0
PFO2HxA	11	13	18	16	22
PFO3OA	2.2	3.3	4.2	3.6	4.3
PFO4DA	<2.0	<2.0	<2.0	<2.0	<2.0
PFO5DA	<2.0	<2.0	<2.0	<2.0	<2.0
PMPA	<10	<10	<10	13	14
PEPA	<20	<20	<20	<20	<20
PS Acid	<2.0	<2.0	<2.0	<2.0	<2.0
Hydro-PS Acid	<2.0	<2.0	<2.0	<2.0	<2.0
R-PSDA	<2.0	<2.0	<2.0	<2.0	<2.0
Hydrolyzed PSDA	4.0 J	4.5 J	5.9 J	6.3 J	<2.0
R-PSDCA	<2.0	<2.0	<2.0	<2.0	<2.0
NVHOS	8.3	6.4	4.6	5.1	3.7
EVE Acid	<2.0	<2.0	<2.0	<2.0	<2.0
Hydro-EVE Acid	<2.0	<2.0	<2.0	<2.0	<2.0
R-EVE	<2.0	<2.0	<2.0	<2.0	<2.0
PES	<2.0	<2.0	<2.0	<2.0	<2.0
PFECA B	<2.0	<2.0	<2.0	<2.0	<2.0
PFECA-G	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroheptanoic Acid	7.1	6.4	4.7	4.3	4.5
Total Attachment C ^{1,2}	41	50	61	73	54
Total Table 3+ (17 compounds) ^{2,3}	49	57	65	78	58
Total Table 3+ (20 compounds) ²	53	61	71	84	58

Sampling Event	Q4 2022	Q4 2022	Q4 2022	Q4 2022	Q4 2022
Location ID	CFR-TARHEEL	CFR-TARHEEL	CFR-TARHEEL	CFR-TARHEEL	CFR-TARHEEL
Field Sample ID	CFR-TARHEEL-24-111422	CFR-TARHEEL-24-111422-D	CFR-TARHEEL-24-111722	CFR-TARHEEL-24-112122	CFR-TARHEEL-24-112422
Sample Date	11/14/22	11/14/22	11/17/22	11/21/22	11/24/22
Sample Type	Composite	Composite	Composite	Composite	Composite
Sample Start Date and Time	11/14/22 12:00 AM	11/14/22 12:00 AM	11/17/22 12:00 AM	11/21/22 12:00 AM	11/24/22 12:00 AM
Sample Stop Date and Time	11/14/22 11:00 PM	11/14/22 11:00 PM	11/17/22 11:00 PM	11/21/22 11:00 PM	11/24/22 11:00 PM
Composite Duration (hours)	24	24	24	24	24
QA/QC		Field Duplicate			
Sample Delivery Group (SDG)	320-94573-1	320-94573-1	320-94670-2	320-94670-2	320-94890-1
Lab Sample ID	320-94573-2	320-94573-3	320-94670-2	320-94670-1	320-94890-2
Table 3+ SOP (ng/L)					
HFPO-DA	5.9	6.2	9.4 J	7.2 J	9.0
PFMOAA	<2.0 UJ	<2.0	25 J	18 J	16
PFO2HxA	7.7	8.1	12 J	8.8 J	13
PFO3OA	<2.0	<2.0	3.0 J	2.0 J	2.6
PFO4DA	<2.0	<2.0	<2.0 UJ	<2.0 UJ	<2.0
PFO5DA	<2.0 UJ	<2.0	<2.0 UJ	<2.0 UJ	<2.0
PMPA	<10 UJ	<10	10 J	15 J	14
PEPA	<20	<20	<20 UJ	<20 UJ	<20
PS Acid	<2.0	<2.0	<2.0 UJ	<2.0 UJ	<2.0
Hydro-PS Acid	<2.0	<2.0	<2.0 UJ	<2.0 UJ	<2.0
R-PSDA	<2.0	<2.0	<2.0 UJ	7.8 J	<2.0
Hydrolyzed PSDA	<2.0	<2.0	7.1 J	7.3 J	<2.0
R-PSDCA	<2.0	<2.0	<2.0 UJ	<2.0 UJ	<2.0
NVHOS	3.3	3.2	3.8 J	6.7 J	4.3
EVE Acid	<2.0	<2.0	<2.0 UJ	<2.0 UJ	<2.0
Hydro-EVE Acid	<2.0	<2.0	<2.0 UJ	<2.0 UJ	<2.0
R-EVE	<2.0 UJ	<2.0	<2.0 UJ	<2.0 UJ	<2.0
PES	<2.0	<2.0	<2.0 UJ	<2.0 UJ	<2.0
PFECA B	<2.0	<2.0	<2.0 UJ	<2.0 UJ	<2.0
PFECA-G	<2.0	<2.0	<2.0 UJ	<2.0 UJ	<2.0
Perfluoroheptanoic Acid	5.0 J	7.1 J	6.0 J	5.1 J	5.0
Total Attachment C ^{1,2}	14	14	59	51	55
Total Table 3+ (17 compounds) ^{2,3}	17	18	63	58	59
Total Table 3+ (20 compounds) ²	17	18	70	73	59

Sampling Event	Q4 2022				
Location ID	CFR-TARHEEL	CFR-TARHEEL	CFR-TARHEEL	CFR-TARHEEL	CFR-TARHEEL
Field Sample ID	CFR-TARHEEL-24-112822	CFR-TARHEEL-24-120122	CFR-TARHEEL-24-120522	CFR-TARHEEL-24-120822	CFR-TARHEEL-24-121222
Sample Date	11/28/22	12/01/22	12/05/22	12/08/22	12/12/22
Sample Type	Composite	Composite	Composite	Composite	Composite
Sample Start Date and Time	11/28/22 12:00 AM	12/01/22 12:00 AM	12/05/22 12:00 AM	12/08/22 12:00 AM	12/12/22 12:00 AM
Sample Stop Date and Time	11/28/22 11:00 PM	12/01/22 11:00 PM	12/05/22 11:00 PM	12/08/22 11:00 PM	12/12/22 11:00 PM
Composite Duration (hours)	24	24	24	24	24
QA/QC					
Sample Delivery Group (SDG)	320-94890-1	320-94890-1	320-95117-1	320-95368-1	320-95368-1
Lab Sample ID	320-94890-1	320-94890-3	320-95117-1	320-95368-1	320-95368-2
Table 3+ SOP (ng/L)					
HFPO-DA	7.1	3.4	2.7	12	3.3
PFMOAA	12	<2.0	5.6	13	8.5 J
PFO2HxA	11	3.4	3.4	7.8	5.5
PFO3OA	2.2	<2.0	<2.0	<2.0	<2.0
PFO4DA	<2.0	<2.0	<2.0	<2.0	<2.0
PFO5DA	<2.0	<2.0	<2.0	<2.0	<2.0
PMPA	12	11	<10	<10	<10
PEPA	<20	<20	<20	<20	<20
PS Acid	<2.0	<2.0	<2.0	<2.0	<2.0
Hydro-PS Acid	<2.0	<2.0	<2.0	<2.0	<2.0
R-PSDA	<2.0	<2.0	<2.0	<2.0	<2.0
Hydrolyzed PSDA	<2.0	<2.0	<2.0	2.5 J	<2.0
R-PSDCA	<2.0	<2.0	<2.0	<2.0	<2.0
NVHOS	<2.0	<2.0	<2.0	<2.0	<2.0
EVE Acid	<2.0	<2.0	<2.0	<2.0	<2.0
Hydro-EVE Acid	<2.0	<2.0	<2.0	<2.0	<2.0
R-EVE	<2.0	<2.0	<2.0	<2.0	<2.0
PES	<2.0	<2.0	<2.0	<2.0	<2.0
PFECA B	<2.0	<2.0	<2.0	<2.0	<2.0
PFECA-G	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroheptanoic Acid	5.0	4.5	4.9	<2.0	<2.0
Total Attachment C ^{1,2}	44	18	12	33	17
Total Table 3+ (17 compounds) ^{2,3}	44	18	12	33	17
Total Table 3+ (20 compounds) ²	44	18	12	35	17

Sampling Event	Q4 2022	Q4 2022	Q4 2022	Q4 2022
Location ID	CFR-TARHEEL	CFR-TARHEEL	CFR-TARHEEL	CFR-TARHEEL
Field Sample ID	CFR-TARHEEL-24-121222-D	CFR-TARHEEL-24-121722	CFR-TARHEEL-24-121922	CFR-TARHEEL-24-122222
Sample Date	12/12/22	12/17/22	12/19/22	12/22/22
Sample Type	Composite	Composite	Composite	Composite
Sample Start Date and Time	12/12/22 12:00 AM	12/17/22 12:00 AM	12/19/22 12:00 AM	12/22/22 12:00 AM
Sample Stop Date and Time	12/12/22 11:00 PM	12/17/22 11:00 PM	12/19/22 11:00 PM	12/22/22 11:00 PM
Composite Duration (hours)	24	24	24	24
QA/QC	Field Duplicate			
Sample Delivery Group (SDG)	320-95368-1	320-95534-1	320-95534-1	320-95616-1
Lab Sample ID	320-95368-3	320-95534-1	320-95534-2	320-95616-1
Table 3+ SOP (ng/L)				
HFPO-DA	3.3	5.9	2.3	5.1
PFMOAA	8.4	<2.0	<2.0	<2.0
PFO2HxA	5.3	2.5	2.8	4.1
PFO3OA	<2.0	<2.0	<2.0	<2.0
PFO4DA	<2.0	<2.0	<2.0	<2.0
PFO5DA	<2.0	<2.0	<2.0	<2.0
PMPA	<10	<10	<10	<10
PEPA	<20	<20	<20	<20
PS Acid	<2.0	<2.0	<2.0	<2.0
Hydro-PS Acid	<2.0	<2.0	<2.0	<2.0
R-PSDA	<2.0	<2.0	<2.0	<2.0
Hydrolyzed PSDA	<2.0	<2.0	<2.0	<2.0
R-PSDCA	<2.0	<2.0	<2.0	<2.0
NVHOS	<2.0	2.0	<2.0	<2.0
EVE Acid	<2.0	<2.0	<2.0	<2.0
Hydro-EVE Acid	<2.0	<2.0	<2.0	<2.0
R-EVE	<2.0	<2.0	<2.0	<2.0
PES	<2.0	<2.0	<2.0	<2.0
PFECA B	<2.0	<2.0	<2.0	<2.0
PFECA-G	<2.0	<2.0	<2.0	<2.0
Perfluoroheptanoic Acid	<2.0	<2.0	<2.0	<2.0
Total Attachment C ^{1,2}	17	8.4	5.1	9.2
Total Table 3+ (17 compounds) ^{2,3}	17	10	5.1	9.2
Total Table 3+ (20 compounds) ²	17	10	5.1	9.2

Sampling Event	Q4 2022	Q4 2022
Location ID	CFR-TARHEEL	CFR-TARHEEL
Field Sample ID	CFR-TARHEEL-24-122622	CFR-TARHEEL-24-122922
Sample Date	12/26/22	12/29/22
Sample Type	Composite	Composite
Sample Start Date and Time	12/26/22 12:00 AM	12/29/22 12:00 AM
Sample Stop Date and Time	12/26/22 11:00 PM	12/29/22 11:00 PM
Composite Duration (hours)	24	24
QA/QC		
Sample Delivery Group (SDG)	320-95616-1	320-95803-1
Lab Sample ID	320-95616-2	320-95803-3
Table 3+ SOP (ng/L)		
HFPO-DA	2.4	2.2 J
PFMOAA	<2.0	<5.0 UJ
PFO2HxA	2.5	4.4 J
PFO3OA	<2.0	<2.0 UJ
PFO4DA	<2.0	<2.0 UJ
PFO5DA	<2.0	<2.0 UJ
PMPA	<10	16 J
PEPA	<20	<20 UJ
PS Acid	<2.0	<2.0 UJ
Hydro-PS Acid	<2.0	<2.0 UJ
R-PSDA	<2.0	<2.0 UJ
Hydrolyzed PSDA	<2.0	<2.0 UJ
R-PSDCA	<2.0	<2.0 UJ
NVHOS	<2.0	<2.0 UJ
EVE Acid	<2.0	<2.0 UJ
Hydro-EVE Acid	<2.0	<2.0 UJ
R-EVE	<2.0	<2.0 UJ
PES	<2.0	<2.0 UJ
PFECA B	<2.0	<2.0 UJ
PFECA-G	<2.0	<2.0 UJ
Perfluoroheptanoic Acid	<2.0	4.0 J
Total Attachment C ^{1,2}	4.9	23
Total Table 3+ (17 compounds) ^{2,3}	4.9	23
Total Table 3+ (20 compounds) ²	4.9	23

Notes:

Bold - Analyte detected above associated reporting limit.

B - analyte detected in an associated blank.

J - Analyte detected. Reported value may not be accurate or precise.

ND - no Table 3+ analytes were detected above the associated reporting limits.

ng/L - nanograms per liter

QA/QC - Quality assurance/ quality control

SDG - Sample Delivery Group

SOP - standard operating procedure

UJ - Analyte not detected. Reporting limit may not be accurate or precise.

- < Analyte not detected above associated reporting limit.
- - not applicable
- 1 Total Attachment C does not include Perfluoroheptanoic acid (PFHnA)
- 2 Total Table 3+ and Total Attachment C were calculated including J qualified data but not non-detect data. The sum is rounded to two significant figures.
- 3 Total Table 3+ (17 compounds) does not include PFHpA, R-PSDA, Hydrolyzed PSDA, and R-EVE.
- 4 Results for this grab sample are also presented in Table 3.

TABLE 3 SURFACE WATER ANALYTICAL RESULTS AT DOWNSTREAM LOCATIONS

Chemours Fayetteville Works, North Carolina

Location ID	CFR-BLADEN	CFR-KINGS	CFR-TARHEEL	EB	EB	FBLK
Field Sample ID	CAP4Q22-CFR-BLADEN-110922	CAP4Q22-CFR-KINGS-111422	CAP4Q22-CFR-TARHEEL-110922	CAP4Q22-EQBLK-IS-110922	CAP4Q22-EQBLK-PP-110922	CAP4Q22-FB-110922
Sample Date	11/09/2022	11/14/2022	11/09/2022	11/09/2022	11/09/2022	11/09/2022
QA/QC				Equipment Blank	Equipment Blank	Field Blank
Sample Delivery Group (SDG)	320-94320-1	320-94574-1	320-94321-1	320-94319-1	320-94319-1	320-94319-1
Lab Sample ID	320-94320-4	320-94574-1	320-94321-3	320-94319-9	320-94319-8	320-94319-10
Table 3+ SOP (ng/L)						
HFPO-DA	8.5	7.6	9.3	<2.0	<2.0	<2.0
PFMOAA	21	<2.0	29	<2.0	<2.0	<2.0
PFO2HxA	14	6.7	18	<2.0	<2.0	<2.0
PFO3OA	3.2	<2.0	4.2	<2.0	<2.0	<2.0
PFO4DA	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFO5DA	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PMPA	11	<10	<10	<10	<10	<10
PEPA	<20	<20	<20	<20	<20	<20
PS Acid	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hydro-PS Acid	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
R-PSDA	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hydrolyzed PSDA	5.1 J	<2.0	5.9 J	<2.0	<2.0	<2.0
R-PSDCA	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
NVHOS	4.9	2.7	4.6	<2.0	<2.0	<2.0
EVE Acid	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hydro-EVE Acid	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
R-EVE	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PES	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFECA B	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFECA-G	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroheptanoic Acid	4.8	7.1	4.7	<2.0	<2.0	<2.0
Total Attachment C ^{1,2}	58	14	61	ND	ND	ND
Total Table 3+ (17 compounds) ^{2,3}	63	17	65	ND	ND	ND
Total Table 3+ (20 compounds) ²	68	17	71	ND	ND	ND

Notes:

B - analyte detected in an associated blank

Bold - Analyte detected above associated reporting limit

EPA - Environmental Protection Agency

J - Analyte detected. Reported value may not be accurate or precise.

ND - no analytes were detected above the associated reporting limits.

ng/L - nanograms per liter

QA/QC - Quality assurance/ quality control

SDG - Sample Delivery Group

SOP - standard operating procedure

- < Analyte not detected above associated reporting limit.
- -- Data not available
- 1 Total Attachment C does not include Perfluoroheptanoic acid (PFHpA).
- 2 Total Table 3+ and Total Attachment C were calculated including J qualified data but not non-detect data. The sum is rounded to two significant figures.
- 3 Total Table 3+ (17 compounds) does not include PFHpA, R-PSDA, Hydrolyzed PSDA, and R-EVE.

TABLE 4 SUMMARY OF CALCULATED TOTAL MASS LOAD IN THE CAPE FEAR RIVER Chemours Fayetteville Works, North Carolina

		T	otal Attachment	C^4	Total T	able 3+ (17 Comp	oounds) ⁵	Total T	Table 3+ (20 Com	pounds)
Reporting Period ^{1,2,3}	River volume (m ³)	Projected Load (kg) ⁶	Measured Load in Cape Fear River (kg) ⁷	Remedy Reduction Load (kg) ⁸	Projected Load (kg) ⁶	Measured Load in Cape Fear River (kg) ⁷	Remedy Reduction Load (kg) ⁸	Projected Load (kg) ⁶	Measured Load in Cape Fear River (kg) ⁷	Remedy Reduction Load (kg) ⁸
2020 Q2	1,734,001,289	116	116		117	117	-	151	151	
2020 Q3	1,035,966,622	78	78		79	79	-	100	100	
2020 Q4	2,192,048,740	102	77	26	104	78	26	127	100	27
2021 Q1	3,085,926,339	126	97	28	127	98	29	152	122	29
2021 Q2	700,543,076	118	75	43	121	77	44	152	106	47
2021 Q3	590,536,121	97	39	58	99	41	59	112	49	64
2021 Q4	278,609,600	61	17	44	64	19	45	72	22	50
2022 Q1	1,439,412,208	68	31	37	71	33	38	82	40	42
2022 Q2	664,371,267	55	13	42	58	15	42	65	19	46
2022 Q3	297,747,556	53	9	44	55	11	45	61	13	49
2022 Q4	625,939,023	54	16	37	55	17	38	60	19	41
Last Four Quarters	3,027,470,054	230	70	160	239	76	163	268	90	178

Notes:

- 1 Prior to Q2 2022, the reporting periods were based on the start and end time and date intervals of the sample. The reporting period has been adjusted to the date range of the reporting period.
- 2 Calculated total mass loads by compound and time interval are provided in Tables 5A though 5G for 2022 Q4 and in Appendix B for previous reporting periods.
- 3 The remedies at Old Outfall 002, Seeps A, B, C, and D, and at Outfall 002 were operational since Q3 2021.
- 4 Total Attachment C does not include Perfluoroheptanoic acid (PFHpA).
- 5 Total Table 3+ (17 compounds) does not include Perfluoroheptanoic acid (PFHpA), R-PSDA, Hydrolyzed PSDA, and R-EVE.
- 6 Projected load is calculated as the total of the measured load in the Cape Fear River and the calculated remedy reduction load.
- 7 Measured load in Cape Fear River represent loads measured in the Cape Fear River at the CFR-TARHEEL sampling location downstream of the Site.
- 8 Calculated remedy reduction loads represent the total load that was prevented from reaching the Cape Fear River. This is calculated as the total load from Old Outfall 002, Seeps A to D and the Stormwater Treatment System.

kg - kilograms

m3 - cubic meters

TABLE 5A CAPE FEAR RIVER PFAS MASS LOAD BY COMPOUND AND TIME INTERVAL - Q4 2022 Chemours Fayetteville Works, North Carolina

Marchall		Interva	l Details														Calcul	ated M	ass Load	d ² (kg)								
18622 164 18622 164	Interval ID			Flow (m ³)	HFPO-DA	PFMOAA	PFO2HxA	PFO3OA	PFO4DA	PFO5DA	PMPA	PEPA		Hydro-PS Acid	R-PSDA		R-PSDCA	NVHOS			R-EVE	PES		PFECA-G				Total Table 3+ (20 Compounds)
902 Q4 05-223 07-223 0	2022_1_Q4	9/30/22 23:01	10/5/22 0:01	48,997,161	0.36	1.00	0.58	0.10	0	0.00	0.37	0	0	0	0	0.27	0	0	0	0	0.00	0	0	0	0.31	2.4	2.6	2.9
2012 Q4 010722001 0107222001 020722301 020722301 020722001 020	2022_2_Q4	10/5/22 0:01	10/5/22 23:01	6,462,018	0.02	0.08	0.04	0.00	0	0.00	0.00	0	0	0	0	0.03	0	0	0	0	0.00	0	0	0	0.03	0.1	0.2	0.2
2022 QN 00722 SN 00722 SN 00722 SN CN CN SN SN SN SN SN	2022_3_Q4	10/5/22 23:01	10/7/22 0:01	4,424,479	0.02	0.07	0.03	0.01	0	0.00	0.00	0	0	0	0	0.02	0	0	0	0	0.00	0	0	0	0.02	0.1	0.1	0.2
2022 Q. Q.	2022_4_Q4	10/7/22 0:01	10/7/22 23:01	3,201,446	0.02	0.06	0.03	0.01	0	0.00	0.00	0	0	0	0	0.02	0	0	0	0	0.00	0	0	0	0.01	0.1	0.1	0.1
2022 Q4 0102223201 010322001 04032301 040322001 05032001 04032001 040300 040 050	2022_5_Q4	10/7/22 23:01	10/10/22 0:01	5,184,650	0.04	0.11	0.06	0.02	0	0.00	0.03	0	0	0	0	0.01	0	0	0	0	0.00	0	0	0	0.02	0.3	0.3	0.3
2022 10 0.013222301 0.013222301 0.013222301 0.01322330 0.0132330 0.01	2022_6_Q4	10/10/22 0:01	10/10/22 23:01	2,215,349	0.02	0.06	0.03	0.01	0	0.00	0.03	0	0	0	0	0.01	0	0	0	0	0.00	0	0	0	0.01	0.1	0.1	0.2
2002 10 10 10 10 10 10 1	2022_7_Q4	10/10/22 23:01	10/13/22 0:01	4,267,618	0.04	0.12	0.06	0.02	0	0.00	0.06	0	0	0	0	0.02	0	0	0	0	0.00	0	0	0	0.01	0.3	0.3	0.4
2002 19 Q4 1017/22 2019 2019	2022_8_Q4	10/13/22 0:01	10/13/22 23:01	1,906,341	0.02	0.06	0.03	0.01	0	0.00	0.03	0	0	0	0	0.02	0	0	0	0	0.00	0	0	0	0.01	0.1	0.2	0.2
2022 13 Q+ 1097/222339 1090/22339 1090/22	2022_9_Q4	10/13/22 23:01	10/17/22 0:01	7,021,825	0.06	0.20	0.10	0.02	0	0.00	0.05	0	0	0	0	0.06	0	0	0	0	0.00	0	0	0	0.02	0.4	0.5	0.6
2022 13 ct 10 ct 10 ct 20 ct		10/17/22 0:01	10/17/22 23:01			0.05	0.03	0.01	0	0.00	0.00	0	0	0	0	0.01	0	0	0	0	0.00	0	0	0	0.01	0.1	0.1	0.2
2002 13 04 102002 23 05 102402 23 05 102402 23 05 102402 05 05 06 07 07 07 08 08 09 09 09 09 09 09	2022 11 Q4	10/17/22 23:01	10/20/22 0:01	4,087,310	0.04	0.15	0.06	0.01	0	0.00	0.02	0	0	0	0	0.03	0	0	0	0	0.00	0	0	0	0.02	0.3	0.3	0.4
$ \begin{array}{c} 2022 & 14 & 04 & 102422 & 2501 & 102422 & 2501 & 1.78 & 0.02 & 0.02 & 0.01 & 0.03 & 0.01 & 0.02 & 0.00 & 0.00 & 0.00 & 0.0 & 0.00 & 0.$	2022 12 Q4	10/20/22 0:01	10/20/22 23:01	1,656,586	0.02	0.08	0.03	0.01	0	0.00	0.02	0	0	0	0	0.01	0	0	0	0	0.00	0	0	0	0.01	0.1	0.2	0.2
2021 15 Q4 10742/2304 10772/2304 15828/8 0.07 0.07 0.29 0.11 0.03 0 0.00 0.07 0 0 0 0 0 0.05 0 0 0 0 0 0 0 0 0 0 0 0	2022 13 Q4	10/20/22 23:01	10/24/22 0:01	5,329,330	0.06	0.28	0.10	0.03	0	0.00	0.06	0	0	0	0	0.05	0	0	0	0	0.01	0	0	0	0.02	0.5	0.6	0.7
2002 10 Q4 00.7712 0:01 10.9712 2:301 1.882,818 0.02 0.07 0.04 0.01 0 0.00 0.00 0.0 0 0 0 0	2022 14 Q4	10/24/22 0:01	10/24/22 23:01	1,786,026	0.02	0.11	0.03	0.01	0	0.00	0.02	0	0	0	0	0.02	0	0	0	0	0.00	0	0	0	0.01	0.2	0.2	0.2
2002 17 04 027/22/301 031/12/201 1971,322 03 0.08 0.04 0.01 0.00 0.07 0 0 0 0 0 0 0 0 0	2022 15 Q4	10/24/22 23:01	10/27/22 23:01	5,846,627	0.07	0.29	0.11	0.03	0	0.00	0.07	0	0	0	0	0.05	0	0	0	0	0.01	0	0	0	0.03	0.6	0.6	0.7
2002 19 19 19 19 19 19 19 1	2022 16 Q4	10/27/22 0:01	10/27/22 23:01	1,882,818	0.02	0.07	0.04	0.01	0	0.00	0.02	0	0	0	0	0.01	0	0	0	0	0.00	0	0	0	0.01	0.2	0.2	0.2
2002 1 10 10 11 12 20 1 11 1	`	10/27/22 23:01			_	0.23	0.11	0.03	0	0.00	0.07	0	0	0	0	0.05	0	0	0	0	0.00	0	0	0	0.03	0.5	0.6	0.7
2022 29 Q4 11/3/22 2501 11/3/22 2501 2,306/86 0.02 0.09 0.02 0.09 0.00 0.		10/31/22 0:01	10/31/22 23:01	1,972,322	0.03		0.04	0.01	0	0.00	0.03	0	0	0	0	0.02	0	0	0	0	0.00	0	0	0	-	0.2	0.2	0.2
2002 22 Q4 11/722 23:01 11/722 23:01 2,386,968 0.02 0.06 0.03 0.08 0.04 0.01 0.00 0	`				0.06	0.20	0.09	0.02	0	0.00	0.04	0	0	0	0	0.04	0	0	0	0	0.00	0	0	0	0.04		0.5	0.6
2022 22 Q4 11/722 2301 11/722 2301 202 23 Q4 11/722 2301 11/	`	11/3/22 0:01	11/3/22 23:01	3,881,645	0.03	0.08	0.04	0.01	0	0.00	0.00	0	0	0	0	0.02	0	0	0	0	0.00	0	0	0	0.03	0.2	0.2	0.2
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	`				_	0.22	0.11	0.03	0	0.00	0.00	0	0	0	0	0.04	0	0	0	0	0.00	0	0	0	0.06	0.4	0.5	0.5
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	`	11/7/22 0:01	11/7/22 23:01	2,306,968	0.02		0.03	0.01	0	0.00	0.00	0	0	0	0	0.01	0	0	0	0	0.00	0	0	0	0.01	0.1	0.1	0.1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		11/7/22 23:01	11/9/22 9:00		-	0.09	0.05	0.01	0	0.00	0.00	0	0	0	0	0.02	0	0	0	0	0.00	0	0	0	0.02	0.2	0.2	0.2
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					_	0.04	0.02	0.01	0	0.00	0.01	0	0	0	0	0.01	0	0	0	0	0.00	0	0	0	-	0.1	0.1	0.1
2022 26 Q4			11/10/22 23:01		_				0			0	0	0	0	_	0	0	0	0	0.00	0	0	0		0.1		0.2
2022 27 Q4 11/12/22 23:01 11/14/22 001 11/12/22 23:01 4,013,403 0.06 0.00 0.09 0.02 0 0.00 0.06 0 0 0 0 0 0 0 0 0 0 0 0 0 0	`				_				0	0.00		0	0	0	0	0.01	0	0	0	0	0.00	0	0	0		0.2		0.2
2022 28 Q4 11/14/22 23:01 11/14/22 23:01 4,620/15 0.03 0.00 0.04 0.00 0.08 0.01 0 0.00 0.00 0 0 0 0 0 0 0 0 0 0 0									0	l		0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	1	0.2		0.2
2022_29_Q4 11/14/22_0:01 11/14/22_0:01 11/14/22_0:01 11/14/22_0:01 9,053,349 0.07 0.11 0.09 0.00	`				_				0			0	0	0	0	0.00	0	0	0	0		0	0	0	-	•		0.2
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					_				0			0	0	0	0	0.00	0	0	0	0		0	0	0				0.1
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	`								0	-			0		0		0	0	0	0	_	0		1	_			0.4
2022_32_Q4	`				-									- T	0		Ť	- ŭ	0					1				0.2
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$										-					0						+			1				0.5
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$										-					0	+			0						-			0.2
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$									0	-			0		0				0		_				-	•		0.3
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$										-					0	+			-					1		-		0.1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$															0	+			0	1	1			1	-			0.4
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$									0				0		0	+			0	0				1				0.2
2022_39_Q4 12/1/22 0:01 12/1/22 0:01 12/1/22 0:01 13,252,284 0.05 0.00 0 0.00 0	`				-				0			0	0		0	_	0	0	0	0	_	0		1	1	•		0.7
2022_40_Q4 12/1/22_23:01 12/5/22_0:01 48,341,020 0.15 0.14 0.16 0.00 0										-			0		0	+			0	0		0				-		0.2
2022 41 Q4 12/5/22 0:01 12/5/22 23:01 10,625,783 0.03 0.06 0.04 0.00 0										-		_	0	0	0	_	0		0	0	_	0			-			0.7
2022_42_Q4					_	0.06			0			0	0	0	0	0.00	0	0	0	0	_	0	0	0		0.1	0.1	0.1
 													0		0	+			0	0	_	0		1	-			0.4
	2022 43 Q4	12/8/22 0:01	12/8/22 23:01		0.05								0		0	+			0	0	_				-			0.1
													0	0	0	+			0	0	_					•		0.5
					_				0			0	0	0	0		0		0	0		0	0			-		0.1
					_				0				0	0	0		0		0	0		0	-			-		0.3

TABLE 5A CAPE FEAR RIVER PFAS MASS LOAD BY COMPOUND AND TIME INTERVAL - Q4 2022 Chemours Fayetteville Works, North Carolina

	Interval	Details			1	1		1		ı		1	1			Calcul	ated Ma	ass Load	l 2 (kg)			ı	1	•			
Interval ID	Start Time ¹	End Time ¹	Total River Flow (m³)	HFPO-DA	PFMOAA	PFO2HxA	PFO3OA	PFO4DA	PFO5DA	PMPA	PEPA	PS Acid	Hydro-PS Acid	R-PSDA	Hydrolyzed PSDA	R-PSDCA	NVHOS	EVE Acid	Hydro-EVE Acid	R-EVE	PES	PFECA B	PFECA-G	РЕНрА	Total Attachment C ³	Total Table 3+ (17 Compounds) ⁴	Total Table 3+ (20 Compounds)
2022_47_Q4	12/17/22 0:01	12/17/22 23:01	24,957,619	0.15	0.00	0.06	0.00	0	0.00	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0.00	0.2	0.3	0.3
2022_48_Q4	12/17/22 23:01	12/19/22 0:01	27,714,349	0.11	0.00	0.07	0.00	0	0.00	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0.00	0.2	0.2	0.2
2022_49_Q4	12/19/22 0:01	12/19/22 23:01	18,592,700	0.04	0.00	0.05	0.00	0	0.00	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0.00	0.1	0.1	0.1
2022_50_Q4	12/19/22 23:01	12/22/22 0:01	37,874,264	0.14	0.00	0.13	0.00	0	0.00	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0.00	0.3	0.3	0.3
2022_51_Q4	12/22/22 0:01	12/22/22 23:01	15,790,606	0.08	0.00	0.06	0.00	0	0.00	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0.00	0.1	0.1	0.1
2022_52_Q4	12/22/22 23:01	12/26/22 0:01	62,331,609	0.23	0.00	0.21	0.00	0	0.00	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0.00	0.4	0.4	0.4
2022_53_Q4	12/26/22 0:01	12/26/22 23:01	17,467,275	0.04	0.00	0.04	0.00	0	0.00	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0.00	0.1	0.1	0.1
2022_54_Q4	12/26/22 23:01	12/29/22 0:01	27,744,676	0.07	0.00	0.07	0.00	0	0.00	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0.00	0.1	0.1	0.1
2022_55_Q4	12/29/22 0:01	12/29/22 23:01	11,761,147	0.03	0.00	0.04	0.00	0	0.00	0.09	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0.02	0.2	0.2	0.2
2022 56 Q4	12/29/22 23:01	12/31/22 23:59	16,659,905	0.04	0.00	0.07	0.00	0	0.00	0.27	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0.07	0.4	0.4	0.4

Notes

- 1 Start and end times are adjusted based on sampling times \pm one hour to account for the total flow of the Cape Fear River.
- 2 The calculated mass load is a product of weighted concentration and total river flow. Refer to the Cape Fear River PFAS Mass Loading Calculation Protocol Version 2 (Geosyntec, 2020a) for more details.
- 3 Total Attachment C does not include Perfluorohepthanoic acid (PFHpA).
- 4 Total Table 3+ (17 compounds) does not include PFHpA, R-PSDA, Hydrolyzed PSDA, and R-EVE.

Where mass loads are equal to 0 kg, the compound was not detected above the reporting limit.

kg - kilogram

m³ - cubic meter

NA - Compound not analyzed

TABLE 5B OLD OUTFALL 002 CAPTURED MASS LOAD BY COMPOUND AND TIME INTERVAL - Q4 2022 Chemours Fayetteville Works, North Carolina

	Inte	rval Details	_									_					Calculate	d Captur	ed Mass	Load (kg)1	_					
Interval ID	Start Time	End Time	Duration (hours)	Total Flow (m ³)	HFPO-DA	PEMOAA	PF02HxA	PF030A	PFO4DA	PFO5DA	PMPA	PEPA	PS Acid	Hydro-PS Acid	R-PSDA	Hydrolyzed PSDA	R-PSDCA	NVHOS	EVE Acid	Hydro-EVE Acid	R-EVE	PES	PFECA B	PFECA-G	Total Attachment C ²	Total Table 3+ (17 compounds) ³	Total Table 3+ (20 compounds)
OF003 2022 1 Q4	10/1/22 0:00	10/31/22 23:59	744	60,000	0.37	1.2	0.48	0.11	0.046	0.024	0.20	0.065	0.036	0.018	0.013	0.042	0	0.018	0.0013	0.010	0.008	0	0	0	2.6	2.6	2.6
OF003_2022_2_Q4	11/1/22 0:00	11/30/22 23:59	720	60,000	0.35	1.5	0.57	0.15	0.068	0.037	0.29	0	0.074	0.023	0.030	0.085	0	0.032	0	0.016	0.014	0	0	0	3.1	3.1	3.3
OF003_2022_3_Q4		12/31/22 23:59	744	60,000	0.41	1.3	0.51	0.15	0.064	0.035	0.21	0	0.076	0.019	0.021	0.064	0	0.021	0	0.015	0	0	0	0	2.7	2.8	2.9
			Total	180,000	1.1	4.0	1.6	0.42	0.18	0.10	0.70	0.065	0.19	0.060	0.064	0.19	0	0.072	0.0013	0.040	0.022	0	0	0	8.4	8.5	8.8

Notes:

- 1 The calculated captured mass load is a product of the concentration difference in the influent and the effluent samples and total flow at the influent for the sampling interval, see Appendix B for more details.
- 2 Total Attachment C does not include Perfluorohepthanoic acid (PFHpA).
- 3 Total Table 3+ (17 compounds) does not include PFHpA, R-PSDA, Hydrolyzed PSDA, and R-EVE.

Where mass loads are equal to 0 kg, the compound was not detected above the reporting limit.

OF003 - Outfall 003, i.e., Old Outfall 002 treatment system

kg - kilogram

TABLE 5C SEEP A FLOW THROUGH CELL CAPTURED MASS LOAD BY COMPOUND AND TIME INTERVAL - Q4 2022 Chemours Fayetteville Works, North Carolina

	Interva	l Details															Calculated	l Capture	ed Mass L	oad (kg) ¹							
Interval ID	Start Time	End Time	Duration (hours)	Total Flow (m ³)	Hfpo Dimer Acid	PFMOAA	PFO2HxA	PF030A	PFO4DA	PF05DA	PMPA	PEPA	PS Acid	Hydro-PS Acid	R-PSDA	Hydrolyzed PSDA	R-PSDCA	NVHOS	EVE Acid	Hydro-EVE Acid	R-EVE	PES	PFECA B	PFECA-G	Total Attachment C ²	Total Table 3+ (17 compounds) ³	Total Table 3+ (20 compounds)
SeepA_2022_1_Q4	10/1/22 0:00	10/16/22 9:00	369	7,060	0.14	0.49	0.27	0.071	0.033	0.020	0.10	0.035	0.011	0.010	0.016	0.18	0	0.0078	0.0011	0.010	0.0067	0	0	0	1.2	1.2	1.4
SeepA_2022_2_Q4	10/16/22 9:01	10/30/22 21:00	348	5,653	0.13	0.38	0.23	0.073	0.040	0.023	0.062	0.025	0.0042	0.0068	0.014	0.17	0.00025	0.0051	0.00041	0.0085	0.0054	0	0	0	1.0	1.0	1.2
SeepA_2022_3_Q4	10/30/22 21:01	11/15/22 6:00	369	8,302	0.18	0.62	0.32	0.083	0.045	0.022	0.091	0.031	0.017	0.0091	0.016	0.16	0	0.0083	0.0017	0.0091	0	0	0	0	1.4	1.4	1.6
SeepA_2022_4_Q4	11/15/22 6:01	11/30/22 4:00	358	8,188	0.18	0.54	0.29	0.090	0.050	0.028	0.11	0.043	0.020	0.011	0.019	0.24	0.00033	0.010	0.0017	0.012	0.0079	0	0	0	1.4	1.4	1.6
SeepA_2022_5_Q4	11/30/22 4:01	12/14/22 18:00	350	6,400	0.14	0.56	0.29	0.083	0.042	0.022	0.10	0.037	0.018	0.010	0.015	0.15	0	0.0077	0.0019	0.010	0.0077	0	0	0	1.3	1.3	1.5
SeepA_2022_6_Q4	12/14/22 18:01	12/31/22 23:59	414	8,208	0.16	0.57	0.27	0.076	0.040	0.021	0.10	0.034	0.021	0.0076	0.014	0.14	0.00027	0.0071	0.0022	0.0090	0.0062	0	0	0	1.3	1.3	1.5
			Total	43,810	0.94	3.2	1 7	0.48	0.25	0.14	0.57	0.20	0.091	0.054	0.093	1.0	0.00085	0.046	0.0089	0.050	0.034	Λ	0	Λ	7.6	7 7	8.8

Notes:

- 1 The calculated captured mass load is a product of the concentration difference in the influent and the effluent samples and total flow recorded at the influent for the sampling interval.
- 2 Total Attachment C does not include Perfluorohepthanoic acid (PFHpA).
- 3 Total Table 3+ (17 compounds) does not include PFHpA, R-PSDA, Hydrolyzed PSDA, and R-EVE.

Where mass loads are equal to 0 kg, the compound was not detected above the reporting limit.

kg - kilogram

TABLE 5D SEEP B FLOW THROUGH CELL CAPTURED MASS LOAD BY COMPOUND AND TIME INTERVAL - Q4 2022 Chemours Fayetteville Works, North Carolina

	Interv	al Details															Calculated	l Captur	ed Mass Lo	oad (kg) ¹							
Interval ID	Start Time	End Time	Duration (hours)	Total Flow (m ³)	Ifpo Dimer Acid	FMOAA	F02HxA	F030A	F04DA	FO5DA	MPA	EPA	S Acid	lydro-PS Acid	-PSDA	Iydrolyzed PSDA	-PSDCA	VHOS	VE Acid	Hydro-EVE Acid	LEVE	ES	FECA B	FECA-G	Total Attachment C ²	Total Table 3+ (17 compounds) ³	Total Table 3+ (20 compounds)
SeepB 2022 1 Q4		10/18/2022 14:00	422	14,005	0.22	1.96	0.77	0.14	0	0	0.32	0.095	0	0.0080	0	0.38	0	0.029	0	0.011	0	<u> </u>	0	0	3 5	3.5	3.9
SeepB 2022 2 Q4			48	1,467	0.025	0.21			0.0021	0	0.034	0.011		0.0010		0.038	0	0.0029	0	0.0012	0	0	0	0	0.37	0.38	0.41
SeepB 2022 3 Q4			119	2,899	0.043	0.52				0	0.049				0.0072		0	0.0049	0	0.0026	0.0022	0	0	0	0.84	0.84	0.93
SeepB_2022_4_Q4			48	1,428	0.024	0.24	0.074	0.020	0.0026	0	0.027	0.0091	0.00020	0.00069	0.0034	0.034	0	0.0023	0	0.0014	0.0012	0	0	0	0.40	0.40	0.44
SeepB_2022_5_Q4	10/27/2022 13:01	11/15/2022 06:00	449	9,779	0.25	2.0	0.68	0.16	0.031	0	0.24	0.080	0.0067	0.0082	0.032	0.28	0	0.028	0	0.011	0.012	0	0	0	3.4	3.4	3.8
SeepB_2022_6_Q4			358	11,270	0.19	1.4	0.52	0.11	0.018	0	0.25	0.077	0.0015	0.0062	0.026	0.29	0.00025	0.023	0	0.010	0.012	0	0	0	2.5	2.6	2.9
SeepB_2022_7_Q4			350	9,684	0.15	1.4	0.45		0.015	0	0.19	0.061	0	0.0048	0.021	0.18	0	0.017	0	0.0085	0.0088	0	0	0	2.3	2.3	2.5
SeepB_2022_8_Q4	12/14/2022 18:01	12/31/2022 23:59	414	8,355	0.21	1.0	0.33	0.067	0.011	0	0.23	0.10	0.0014	0.0048	0.028	0.22	0	0.020	0.00092	0.011	0.016	0	0	0	1.9	2.0	2.3
	·	·	Total	58,885	1.1	8.6	3.1	0.64	0.08	0	1.3	0.45	0.010	0.035	0.12	1.5	0.00025	0.13	0.00092	0.057	0.052	0	0	0	15	15	17

Notes

- 1 The calculated captured mass load is a product of the concentration difference in the influent and the effluent samples and total flow recorded at the influent for the sampling interval.
- 2 Total Attachment C does not include Perfluorohepthanoic acid (PFHpA).
- 3 Total Table 3+ (17 compounds) does not include PFHpA, R-PSDA, Hydrolyzed PSDA, and R-EVE.

Where mass loads are equal to 0 kg, the compound was not detected above the reporting limit.

kg - kilogram

TABLE 5E SEEP C FLOW THROUGH CELL CAPTURED MASS LOAD BY COMPOUND AND TIME INTERVAL - Q4 2022 Chemours Fayetteville Works, North Carolina

	Interv	al Details															Calculat	ed Captu	red Mass	Load (kg)1						
Interval ID	Start Time	End Time	Duration (hours)	Total Flow (m ³)	Hfpo Dimer Acid	PFMOAA	PFO2HxA	PF030A	PFO4DA	PFO5DA	PMPA	PEPA	PS Acid	Hydro-PS Acid	R-PSDA	Hydrolyzed PSDA	R-PSDCA	NVHOS	EVE Acid	Hydro-EVE Acid	R-EVE	PES	PFECA B	PFECA-G	Total Attachment C ²	Total Table 3+ (17 compounds) ³	Total Table 3+ (20 compounds)
SeepC_2022_1_Q4	10/1/22 0:00	10/16/22 9:00	369	4,150	0.050	0.13	0.07	0.018	0.0062	0	0.025	0.0079	0	0.0010	0.0022	0.0031	0	0.0019	0	0.0032	0.0020	0	0	0	0.30	0.31	0.32
SeepC_2022_2_Q4	10/16/22 9:01	10/30/22 21:00	348	3,521	0.074	0.19	0.11	0.032	0.012	0	0.031	0.011	0	0.0015	0.0035	0.0053	0	0.0023	0	0.0060	0.0030	0	0	0	0.46	0.46	0.49
SeepC_2022_3_Q4	10/30/22 21:01	11/15/22 6:00	369	4,005	0.10	0.29	0.13	0.032	0.012	0	0.036	0.010	0	0.0019	0.0038	0.0048	0	0.0034	0	0.0060	0.0029	0	0	0	0.60	0.64	0.64
SeepC 2022 4 Q4	11/15/22 6:01	11/30/22 4:00	358	3,053	0.055	0.14	0.076	0.021	0.0079 0.	.00025	0.026	0.0085	0	0.0013	0.0024	0.0040	0	0.0023	0	0.0049	0.0029	0	0	0	0.34	0.34	0.37
SeepC_2022_5_Q4	11/30/22 4:01	12/14/22 18:00	350	3,125	0.059	0.18	0.087	0.024	0.0088 0.	.00026	0.028	0.0084	0	0.0013	0.0027	0.0034	0	0.0022	0	0.0050	0.0028	0	0	0	0.41	0.41	0.41
SeepC_2022_6_Q4	12/14/22 18:01	12/31/22 23:59	414	4,671	0.070	0.19	0.10	0.028	0.011	0	0.036	0.011	0	0.0017	0.0033	0.0034	0	0.0026	0	0.0061	0.0033	0	0	0	0.45	0.46	0.47
1			TC ()	22,527	0.41	1	0.57	0.16	0.058 0.	.00051		0.057	1 =	0.0088	0.018	0.024		0.015		0.031	0.017			1 -			

Notes.

- 1 The calculated captured mass load is a product of the concentration difference in the influent and the effluent samples and total flow recorded at the influent for the sampling interval.
- 2 Total Attachment C does not include Perfluorohepthanoic acid (PFHpA).
- 3 Total Table 3+ (17 compounds) does not include PFHpA, R-PSDA, Hydrolyzed PSDA, and R-EVE.

Where mass loads are equal to 0 kg, the compound was not detected above the reporting limit.

kg - kilogram

TABLE 5F SEEP D FLOW THROUGH CELL CAPTURED MASS LOAD BY COMPOUND AND TIME INTERVAL - Q4 2022 Chemours Fayetteville Works, North Carolina

	Interv	al Details														(Calculate	d Captur	ed Mass	Load (kg)1						
Interval ID	Start Time	End Time	Duration (hours)	Total Flow (m ³)	Hfpo Dimer Acid	PFMOAA	PFO2HxA	PF030A	PFO4DA	PFO5DA	PMPA	PEPA	PS Acid	Hydro-PS Acid	R-PSDA	Hydrolyzed PSDA	R-PSDCA	NVHOS	EVE Acid	Hydro-EVE Acid	R-EVE	PES	PFECA B	PFECA-G	Total Attachment C ²	Total Table 3+ (17 compounds) ³	Total Table 3+ (20 compounds)
SeepD_2022_1_Q4	10/1/22 0:00	10/16/22 9:00	369	11,374	0.17	0.55	0.26	0.069	0.019	0.0013	0.083	0.025	0	0.0032	0.010	0.022	0	0.0081	0	0.011	0.0094	0	0	0	1.1	1.3	1.3
SeepD 2022 2 Q4	10/16/22 9:01	10/30/22 21:00	348	6,144	0.10	0.30	0.15	0.045	0.015	0	0.039	0.014	0	0.0017	0.0056	0.013	0	0.0034	0	0.0080	0.0055	0	0	0	0.68	0.68	0.68
SeepD_2022_3_Q4	10/30/22 21:01	11/15/22 6:00	369	5,540	0.066	0.20	0.089	0.023	0.0078	0	0.020	0.0066	0	0.0012	0.0025	0.0055	0	0.0025	0	0.0039	0.0022	0	0	0	0.42	0.43	0.44
SeepD_2022_4_Q4	11/15/22 6:01	11/30/22 4:00	358	3,419	0.058	0.16	0.075	0.021	0.0072	0.00051	0.021	0.0072	0	0.0012	0.0029	0.0068	0	0.0026	0	0.0048	0.0028	0	0	0	0.34	0.34	0.38
SeepD_2022_5_Q4	11/30/22 4:01	12/14/22 18:00	350	4,144	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SeepD_2022_6_Q4	12/14/22 18:01	12/31/22 23:59	414	7,163	0.093	0.37	0.16	0.042	0.014	0	0.041	0.014	0	0.0019	0.0050	0.010	0	0.0039	0	0.0079	0.0051	0	0	0	0.72	0.72	0.79
			Total	37,784	0.49	1.6	0.74	0.20	0.063	0.0018	0.20	0.067	0	0.0091	0.026	0.057	0	0.021	0	0.036	0.025	0	0	0	3.3	3.4	3.5

Notes:

- 1 The calculated captured mass load is a product of the concentration difference in the influent and the effluent samples and total flow recorded at the influent for the sampling interval.
- 2 Total Attachment C does not include Perfluorohepthanoic acid (PFHpA).
- 3 Total Table 3+ (17 compounds) does not include PFHpA, R-PSDA, Hydrolyzed PSDA, and R-EVE.

Where mass loads are equal to 0 kg, the compound was not detected above the reporting limit.

kg - kilogram

TABLE 5G

Geosyntec Consultants of NC, P.C.

STORMWATER TREATMENT SYSTEM CAPTURED MASS LOAD BY COMPOUND AND DATE - Q4 2022

Chemours Fayetteville Works, North Carolina

		Cal	culated Capture	ed Mass Load (l	(g) ^{3,4}
Date ¹	Total Flow (m ³) ²	HFPO-DA	PFMOAA	PMPA	Total of 3 Compounds 5
10/1/22	566	0.022	0.0054	0.0020	0.029
10/2/22	590	0.022	0.0057	0.0021	0.030
11/9/22	266	0.025	0.0035	0.0023	0.031
11/10/22	153	0.014	0.0020	0.0013	0.018
11/11/22	497	0.046	0.0065	0.0043	0.057
11/12/22	603	0.039	0.0049	0.0034	0.047
11/13/22	628	0.041	0.0051	0.0035	0.049
11/14/22	123	0.0080	0.0010	0.00069	0.010
11/16/22	150	0.0056	0.0010	0.00090	0.0074
12/2/22	253	0.0089	0.0025	0.00038	0.012
12/3/22	375	0.013	0.0037	0.00056	0.017
12/14/22	275	0.013	0.0044	0.00055	0.018
12/15/22	477	0.022	0.0076	0.0010	0.031
12/16/22	442	0.021	0.0071	0.00088	0.029
12/22/22	629	0.0017	0.0044	0.00069	0.0068
12/23/22	611	0.0016	0.0043	0.00067	0.0066
12/31/22	146	0.0070	0.0010	0.00037	0.0083
Total	6,785	0.31	0.070	0.026	0.41

Notes:

- 1 Listed dates are days when flow was recorded at the Stormwater Treatment System.
- 2 Total daily flows were based on the volume recorded via a totalizer at the Stormwater Treatment System effluent.
- 3 The calculated captured mass load is a product of the concentration difference in the influent and the effluent samples and total flow at the effluent for the sampling date, see Appendix B for more details.
- 4 For days where only flow was recorded, the concentrations from the closest date was used to calculate mass loads.
- 5 Only HFPO-DA, PFMOAA and PMPA are recorded at this location. Thus, the total captured mass load presented here is summed over these three compounds only.

TABLE 6 SUMMARY OF TOTAL PFAS MASS DISCHARGE AT TAR HEEL FERRY ROAD BRIDGE - Q4 2022 Chemours Fayetteville Works, North Carolina

		Collection	Hours		Concentrations (ng/L)		Total Volume	Instantaneous		Mass Discharge (mg/	s)
Quarter	Field Sample ID	Date	Composited ¹	Total	Total Table 3+	Total Table 3+	(ft ³) ⁴	Flow Rate	Total	Total Table 3+	Total Table 3+
		Date	Composited	Attachment C ²	(17 compounds) ³	(20 compounds)	(11)	$\left(\mathbf{ft}^3/\mathbf{s}\right)^5$	Attachment C ²	(17 compounds) ³	(20 compounds)
2022 Q4	CFR-TARHEEL-24-100522	10/5/22 23:01	24	21	24	28	228,200,000		1.6	1.8	2.2
2022 Q4	CFR-TARHEEL-24-100722	10/7/22 23:01	24	35	35	40	114,570,000		1.4	1.4	1.6
2022 Q4	CFR-TARHEEL-24-101022	10/10/22 23:01	24	62	65	65	78,234,000		1.7	1.7	1.7
2022 Q4	CFR-TARHEEL-24-101022-D	10/10/22 23:01	24	64	67	74	78,234,000		1.7	1.8	2.0
2022 Q4	CFR-TARHEEL-24-101322	10/13/22 23:01	24	76	83	100	67,322,000		1.7	1.9	2.3
2022 Q4	CFR-TARHEEL-24-101722	10/17/22 23:01	24	49	58	73	74,389,000		1.2	1.5	1.8
2022 Q4	CFR-TARHEEL-24-102022	10/20/22 23:01	24	89	95	110	62,120,000		1.9	2.0	2.4
2022 Q4	CFR-TARHEEL-24-102422	10/24/22 23:01	24	110	120	140	63,073,000		2.4	2.5	2.9
2022 Q4	CFR-TARHEEL-24-102722	10/27/22 23:01	24	89	94	100	66,491,000		2.0	2.1	2.4
2022 Q4	CFR-TARHEEL-24-103122	10/31/22 23:01	24	93	100	120	69,652,000		2.2	2.5	3.0
2022 Q4	CFR-TARHEEL-24-110322	11/3/22 23:01	24	41	49	53	137,080,000		1.9	2.3	2.5
2022 Q4	CFR-TARHEEL-24-110722	11/7/22 23:01	24	50	57	61	81,470,000		1.4	1.6	1.7
2022 Q4	CAP4Q22-CFR-TARHEEL-110922	11/9/22 9:00	0	33	71	71		954	0.89	1.9	1.9
2022 Q4	CAP4Q22-CFR-TARHEEL-24-111022	11/10/22 23:01	24	0	78	84	72,111,000		0	1.9	2.1
2022 Q4	CFR-TARHEEL-24-111222	11/12/22 23:01	24	54	58	58	141,730,000		2.6	2.8	2.8
2022 Q4	CFR-TARHEEL-24-111422	11/14/22 23:01	24	14	17	17	163,180,000		0.78	0.94	0.94
2022 Q4	CFR-TARHEEL-24-111422-D	11/14/22 23:01	24	14	18	18	163,180,000		0.78	0.98	0.98
2022 Q4	CFR-TARHEEL-24-111722	11/17/22 23:01	24	59	63	70	109,120,000		2.2	2.4	2.6
2022 Q4	CFR-TARHEEL-24-112122	11/21/22 23:01	24	51	58	73	94,005,000		1.6	1.9	2.3
2022 Q4	CFR-TARHEEL-24-112422	11/24/22 23:01	24	55	59	59	79,700,000		1.5	1.6	1.6
2022 Q4	CFR-TARHEEL-24-112822	11/28/22 23:01	24	44	44	44	149,790,000		2.3	2.3	2.3
2022 Q4	CFR-TARHEEL-24-120122	12/1/22 23:01	24	18	18	18	468,000,000		2.9	2.8	2.8
2022 Q4	CFR-TARHEEL-24-120522	12/5/22 23:01	24	3.4	12	12	375,250,000		0.44	1.5	1.5
2022 Q4	CFR-TARHEEL-24-120822	12/8/22 23:01	24	7.8	35	35	148,700,000		0.4	1.8	1.8
2022 Q4	CFR-TARHEEL-24-121222	12/12/22 23:01	24	14	17	17	238,340,000		1.1	1.4	1.4
2022 Q4	CFR-TARHEEL-24-121222-D	12/12/22 23:01	24	0	17	17	238,340,000		0	1.4	1.4
2022 Q4	CFR-TARHEEL-24-121722	12/17/22 23:01	24	8.4	10	10	881,370,000		2.5	3.1	3.1
2022 Q4	CFR-TARHEEL-24-121922	12/19/22 23:01	24	0	5.1	5.1	656,590,000		0	1.1	1.1
2022 Q4	CFR-TARHEEL-24-122222	12/22/22 23:01	24	0	9.2	9.2	557,640,000		0	1.8	1.8
2022 Q4	CFR-TARHEEL-24-122622	12/26/22 23:01	24	4.9	4.9	4.9	616,850,000		1.0	1.0	1.0
2022 Q4	CFR-TARHEEL-24-122922	12/29/22 23:01	24	23	23	23	415,340,000		3.3	3.2	3.2

Notes:

- 1 Samples with a compositing duration of zero (0) hours are grab samples.
- 2 Total Attachment C does not include Perfluoroheptanoic acid (PFHpA).
- 3 Total Table 3+ (17 compounds) does not include PFHpA, R-PSDA, Hydrolyzed PSDA, and R-EVE.
- 4 Total flow volume is determined based on measurements taken over the sample collection period.
- 5 For samples with a duration of zero (0) hours, i.e., grab samples, the instantaneous flow rate was used to calculated the mass discharge.

-- - not applicable

ng/L - nanograms per liter

ft³ - cubic feet

mg/s - milligrams per second

ft³/s - cubic feet per second



Figures















