



The Chemours Company  
Corporate Remediation Group  
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October 11, 2018

Dr. Joe Ghiold, Ph.D., Project Manager  
Facility Management Branch  
Hazardous Waste Section  
Division of Waste Management  
NC Department of Environmental Quality  
1646 Mail Service Center  
Raleigh, NC 27699-1646

**Re: Revised – Post Hurricane Florence Sampling Plan  
Chemours Fayetteville Works  
Fayetteville, North Carolina  
EPA ID No. NCD 047 368 642**

Dear Dr. Ghiold:

Enclosed, please find a PDF copy of the *Post Hurricane Florence Sampling Plan* for the Chemours Fayetteville Works. This document presents a field investigation to collect surface water, surface soil, on-Site groundwater and off-Site groundwater samples from around the Chemours Fayetteville Works, North Carolina site. This sampling plan is intended to collect samples from representative locations and environmental media to evaluate for potential changes in the concentration of per- and polyfluoroalkyl substances (PFAS) after Hurricane Florence. This sampling plan has been revised to incorporate suggestions from NCDEQ regarding the number, depth and concentration of off-Site groundwater sampling locations (i.e. residential wells). All selected sampling locations have pre-existing PFAS data that will be used to facilitate a comparison upon receipt of results.

If you have any questions or need any additional information, please contact me at [Kevin.Garon@Chemours.com](mailto:Kevin.Garon@Chemours.com).

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Kevin Garon', is written in a cursive style.

Kevin Garon  
Project Director  
Chemours Corporate Remediation Group

cc: Christel Compton – Chemours Fayetteville Works  
File  
Enclosures

## Revised – Post Hurricane Florence Sampling Plan Chemours Fayetteville Works, North Carolina

11 October 2018

### INTRODUCTION

This work plan, prepared by Geosyntec Consultants of NC, P.C. (Geosyntec), outlines a field investigation to collect surface water, surface soil, on-Site groundwater and off-Site groundwater samples from around the Chemours Fayetteville Works, North Carolina site (the Site). This sampling plan is intended to collect samples from representative locations and environmental media to evaluate for potential changes in the concentration of per- and polyfluoroalkyl substances (PFAS) after Hurricane Florence. All identified sampling locations have pre-existing PFAS data that will be used to facilitate a comparison upon receipt of results. The remainder of this work plan memorandum contains the following sections and components:

- Sampling Locations – Where samples are to be collected;
- Field Sampling Methods and General Procedures – How samples are to be collected;
- Laboratory Analyses – Bottle ware to prepare, analyses to perform;
- Event Timing and Sample Sequence – Considerations for implementing the event;
- Field Notes and Data Reporting – Considerations for communicating collected data;
- References – Work plan reference documentation;
- Table 1 – Sampling Locations;
- Table 2 – Analytes, Laboratories and Methods;
- Figure 1 – Off-Site Sampling Locations; and
- Figure 2 – On and Near Site Sampling Locations.

### SAMPLING LOCATIONS

Sample locations and IDs, along with duplicates, rinsate blanks, matrix spike samples and field blanks are specified in Table 1. Sampling locations are shown on Figures 1 and 2 of this sampling plan. The samples are categorized into four media types as listed in Table 1: a) Surface Water; b)

on-Site Soils; c) on-Site groundwater; and d) off-Site groundwater. The selected sampling categories include the following samples:

- Three (3) tributary surface water samples (Willis Creek, Georgia Branch Creek, Old Outfall channel);
- One (1) Excess River Water sample;
- One (1) Outfall 002 sample;
- Two (2) Cape Fear River samples – one upstream and one downstream of the Site;
- Two (2) ponds – Marshwood lake and an on-Site pond;
- Fourteen (14) on-Site wells – five wells adjacent the Cape Fear River and nine perched zone wells;
- Eight (8) on-Site soil Leachate samples;
- Twenty (20) off-Site wells – private residence wells;
- Four (4) duplicate samples – one per media;
- Four (4) matrix spike and replicate samples – one per media;
- Four (4) or more daily rinsate samples – one per media per day; and
- Daily field blank samples during sampling.

Two of the on-Site, perched zone wells will be selected by the field team. While collecting samples from the first seven perched zone wells, which provide a spatially representative set of wells, the field team will observe ground conditions to identify up to two additional perched zone wells in or near an area of pooled rain water during and after Hurricane Florence. As part of this process, the field team will also consult on-Site Chemours staff to confirm areas where there was pooled rain water as a result of the hurricane.

The Cape Fear River Samples have been selected to be accessible from shore. The upstream location at River Mile 74 is located where an electrical transmission right-of-way crosses the river, which should enable easier access to the river. The downstream location at River Mile 83.5 is located at the Tar Heely Ferry Rd. bridge. The sample can be collected from the bridge.

## **FIELD SAMPLING METHODS AND GENERAL PROCEDURES**

This section describes the general field methods and specific procedures for collecting samples. These procedures are consistent with procedures described in the following work plans and report:

- Cape Fear River Surface Water Sampling Plan (Parsons, 2017a);
- Additional Investigation Work Plan (Parsons, 2017b);
- Residential Drinking Water Well Surveying and Sampling Plan (Parsons, 2017c);

- Assessment of the Chemical and Spatial Distribution of PFAS in the Cape Fear River (Geosyntec, 2018); and
- Long-Term Groundwater Monitoring Plan (Parsons, 2018).

The following sub-sections detail methods for collection samples specified in this work plan:

- General Field Procedures;
- Other Field Activities;
- On-Site Surface Soil Leachate Sampling;
- Surface Water Sampling;
- Excess River Water and Outfall 002 Sampling;
- On-Site Groundwater Sampling;
- Off-Site Groundwater Sampling; and
- Sample Packing and Shipping.

### **General Field Procedures**

All equipment will be inspected by the field program on-Site supervisor and calibrated daily prior to use in the field according to the manufacturer's recommended guidelines. Calibration information will be recorded in a field logbook. Field parameters will be measured with a water quality meter prior to sample collection and include the following:

- pH;
- Temperature (degrees Celsius; °C);
- Specific conductance [SC] (micromhos, µmho);
- Dissolved oxygen [DO] (milligrams per liter; mg/L);
- Oxidation/Reduction Potential [ORP] (millivolts; mV);
- Turbidity (nephelometric turbidity units, NTU);
- Color; and
- Odor.

All sampling equipment will be decontaminated between sample locations in the following manner:

- Tap water rinse;
- Scrub with tap water containing non-phosphate detergent (i.e., Alconox®);
- Tap water rinse;
- De-ionized water rinse; and
- Air dry.

Disposable equipment (e.g. gloves, tubing, etc.) will not be reused. New sample containers will be used for each sample.

### **Other Field Activities**

The field team will perform the following activities during the sampling program:

- Observe ground conditions at Site to identify areas where rain water pooled and collected after Hurricane Florence. Chemours Site staff will also be consulted to identify these areas. These observations will guide selection of up to two additional perched zone wells to sample in areas where there was pooled water;
- Inspect LTW wells for evidence water entering the wells during the flood stage of the Hurricane. The LTW wells were submerged by up to 10 feet water during the crest of the Cape Fear River after Hurricane Florence according to Cape Fear River level data from the United States Geological Survey (USGS) station at WO Huske Dam about half a mile south of the last LTW well; and
- Develop the LTW wells and any perched zone wells that were also potentially submerged by pooled rain water to remove water that potentially infiltrated into the wells via the riser pipe during the flood stage of the Cape Fear River. Develop wells by pumping a minimum of 10 well column volumes (about 200 liters, i.e. 53 gallons) and then until field parameters stabilize within criteria outlined below.

### **On-Site Surface Soil Leachate Sampling**

On-Site soil leachate samples will be collected over the depth interval of zero to 0.5 ft bgs. Samples will be collected using either a hand auger or soil core with sliding hammer attachment. If necessary, soil will be transferred from the hand auger to a stainless-steel mixing bowl for homogenization. The homogenized sample will then be transferred to the laboratory-supplied high-density polyethylene (HDPE) sample containers using decontaminated stainless-steel spoons or trowels. Collected samples will be prepared using the Synthetic Precipitation and Leachate Procedure (SPLP), method EPA 1312 as described in the following section, Laboratory Analyses. Field equipment will consist of some or all of the following:

- HDPE collection bottles (laboratory provided);
- Plastic sheet liners;
- Field sampling record and soil boring logs; and
- Stainless-steel knife, trowels, spoons, scoops, and bowls.

### **Surface Water Sampling**

Surface water samples will be collected using a peristaltic pump and new dedicated HDPE tubing and dedicated silicone tubing for the pump head at each location. The tubing will be lowered to

the specified sampling depth below the water surface using an anchor weight and the tubing fastened to the anchor pointing upwards. Surface water will be pumped directly from the submerged tubing through the pump head to a flow-through cell until turbidity measurements are below 20 nephelometric turbidity units and all other field parameters (pH, temperature, SC, DO, ORP) are stabilized within  $\pm 10\%$  over a five-minute interval. Once flow-through cell readings are stable, the flow-through cell will be disconnected, the tubing cut to provide a new, clean end and grab samples will be collected from the discharge of the peristaltic pump in new 250 milliliters (mL) laboratory-supplied HDPE bottles. Two bottles will be collected for each analysis method at each location.

### **Excess River Water and Outfall 002 Sampling**

A composite Excess River Water sample will be collected by collecting a minimum of four equal volumes samples at equally spaced time intervals from the Excess River Water discharge. The individual samples for compositing will be collected over a minimum time period of 8 hours and a maximum time period of 24 hours. During each sample collection event two (2) 250 mL HDPE bottles will be collected. Individual samples will be collected by placing an HDPE bottle under the pipe discharging the Excess River Water then compositing the samples in a decontaminated stainless-steel pot. The composited water was transferred into sample bottles for each analysis method.

A one-day composite sample will be collected from Outfall 002 using a Hach SD900 composite sampler. The composite sampler will collect water over a 24-hour interval at a constant flow rate from Outfall 002 into an HDPE water collection chamber. A portion of this water will be transferred from the composite sampler collection chamber into new 250 mL laboratory-supplied HDPE bottles. Two bottles will be collected for each analysis method at each location.

Excess River Water and Outfall 002 composite sample collection will occur on the same day.

### **On-Site Groundwater Sampling**

Groundwater samples will be collected using low-flow sampling techniques. Water will be collected using a peristaltic pump and new dedicated HDPE tubing and dedicated silicone tubing for the pump head at each well. Groundwater will be pumped directly from submerged tubing through the pump head to a flow-through cell until turbidity measurements are below 20 nephelometric turbidity units and all other field parameters (pH, temperature, SC, DO, ORP) are stabilized within  $\pm 10\%$  over a five-minute interval. Once flow-through cell readings are stable, the flow-through cell will be disconnected, the tubing cut to provide a new clean end and grab samples will be collected from the discharge of the peristaltic pump in new 250 mL laboratory-supplied HDPE bottles. Two bottles will be collected for each analysis method at each location.

### **Off-Site Groundwater Sampling**

Off-Site groundwater samples will be collected from twenty (20) previously sampled private drinking water supplies. The selected twenty locations span a range of resident reported well depths of 14 ft bgs to 90 ft bgs and a range of maximum measured hexafluoropropylene oxide dimer acid (HFPO-DA) concentrations from 100 to 1,400 ng/L. Residents will be contacted by Chemours representatives requesting permission to collect samples at these locations. Alternate locations may be used if not all residents selected grant permission for sample collection.

At these locations where residents grant permission water will be sampled from taps at residential locations. To prevent cross-contamination between sampling locations, the sampler collecting the samples will wear clean, disposable latex and/or nitrile gloves and limit his/her contact with the samples. Samples will be collected in in new 250 mL laboratory-supplied HDPE bottles. Two bottles will be collected for each analysis method at each location. The following procedure will be followed during sampling from residential taps:

- Wash hands and don a new pair of powderless disposable gloves for each sample being collected;
- Locate an appropriate tap water source. If the bottle will not fit under the tap faucet, then look for a different appropriate source;
- Open the valve and allow water to run for at least two minutes to flush the valve system and supply lines;
- Hold the sampling bottle by the body. Do not touch or handle the bottle by the neck and mouth. Remove the bottle cap and do not set it down at any point, place the bottle under the tap, and fill. Do not allow the neck or the mouth of the bottle to touch the tap. Do not use a secondary container to fill the bottle;
- Recap the sample bottle;
- Affix a sample label, unless the label was affixed by the laboratory; and
- Place the sample in a cooler of ice.

### **Sample Packing and Shipping**

Upon sample collection, each containerized sample will be labeled and placed as soon as possible into an insulated sample cooler. The cooler will serve as a shipping container and will be provided by the laboratory along with the appropriate sample containers. Wet ice will be placed around the sample containers within heavy-duty plastic bags within the sample cooler. Samples will be maintained at a cool temperature (optimum 4°Celsius ± 2°Celsius) from the time of collection until the coolers arrive at the laboratory (if required). Plastic “bubble wrap” and/or polystyrene foam may also be used to protect the samples during shipping.

Prior to shipment of the samples to the laboratory, a chain-of-custody form will be completed by the field sample custodian. Sample locations, sample identification numbers, description of samples, number of samples collected, and specific laboratory analyses to be run on each sample will be recorded on the chain-of-custody form.

## **LABORATORY ANALYSES**

Collected samples will be analyzed by three laboratory methods used for assessing PFAS:

- EPA Method 537;
- EPA Method 8321 Mod;
- Table 3 Lab SOP; and
- Table 3+ Lab SOP.

Analyte lists for each method are provided in Table 2. Samples will be shipped to either TestAmerica Sacramento, TestAmerica Denver or Lancaster Laboratories depending on laboratory availability at the time of sampling. Samples for Table 3+ SOP will be sent to the Chemours Fluoroproducts Analytical Group in Wilmington, Delaware. Table 3+ SOP is an analytical method presently in development by Chemours. Table 3+ SOP evaluates samples for the presence of additional PFAS that are not quantitated by the other three methods.

All samples will be analyzed for all four methods listed above. Surface soil leachate samples will be prepared by SPLP method EPA 1312 before analysis by all four methods.

Below are the estimated bottle ware needs, including duplicate, rinsate and matrix spike samples:

- 120 sets of 2 x 250-mL HDPE bottles; and
- 30 sets of Soil Leachate HDPE bottles.

## **SAMPLE SEQUENCE CONSIDERATIONS**

The following sample collection sequencing conditions, if possible, should be met:

- Collect samples in following priority order:
  - On-Site surface soil leachate samples;
  - Surface water samples (Cape Fear River, tributaries, Outfall 002, Excess River Water);
  - On-Site perched zone groundwater;
  - On-Site groundwater adjacent to the Cape Fear River; and
  - Off-Site groundwater (residential drinking water).



- The 1-day composite sampling period for the excess river water and Outfall 002 samples should overlap; and
- River samples should be collected in order from upstream to downstream.

## **FIELD NOTES AND DATA REPORTING**

The project field team will keep a daily diary of field activities and note sample collection times, measured field parameters, and other recorded field data or observations. All field collected data will be furnished to the project team within 10 business days of the conclusion of the field event.

## **REFERENCES**

Parsons, 2017a. Technical Memorandum. Cape Fear River Surface Water Sampling Plan. To: Michael Johnson, Kevin Garon, and Andrew Hartten; From: Tracey Ovbey. 22 September 2017.

Parsons, 2017b. Additional Investigation Work Plan. Chemours Fayetteville Works Site. RCRA PERMIT NO. NCD047368642-R1

Parsons, 2017c. Technical Memorandum. Residential Drinking Water Well Surveying and Sampling Plan, Fayetteville Works Facility, Fayetteville, North Carolina. September 8, 2017.

Parsons, 2018. Long-Term Groundwater Monitoring Plan. Chemours Fayetteville Works. RCRA Permit No. NCD047368642-R2-M3. September 2018.

Geosyntec, 2018. Assessment of the Chemical and Spatial Distribution of PFAS in the Cape Fear River. Chemours Fayetteville Works Site. 17 September 2018.

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**TABLE 1**  
**SAMPLING LOCATIONS**  
Chemours Fayetteville Works, North Carolina

| SAMPLING LOCATION                | MEDIA TYPE            | SAMPLE DESCRIPTION       | ANALYTICAL METHOD |                 |                 |                           |
|----------------------------------|-----------------------|--------------------------|-------------------|-----------------|-----------------|---------------------------|
|                                  |                       |                          | EPA 537 Mod       | EPA 8321 Mod    | Table 3 SOP     | Table 3+ SOP <sup>1</sup> |
| Historic Outfall - SW-OLD002-01  | Surface Water         | Tributary                | ✓                 | ✓               | ✓               | ✓                         |
| Willis Creek - SW-WC-03          | Surface Water         | Tributary                | ✓                 | ✓               | ✓               | ✓                         |
| Georgia Branch Creek - SW-GBC-02 | Surface Water         | Tributary                | ✓                 | ✓               | ✓               | ✓                         |
| Excess River Water               | Surface Water         | Water to be Used at Site | ✓                 | ✓               | ✓               | ✓                         |
| Outfall 002                      | Surface Water         | Water Used at Site       | ✓                 | ✓               | ✓               | ✓                         |
| Cape Fear River Mile 74          | Surface Water         | Up Stream of Site        | ✓                 | ✓               | ✓               | ✓                         |
| Cape Fear River Mile 83          | Surface Water         | Down Stream of Site      | ✓                 | ✓               | ✓               | ✓                         |
| Marshwood Lake                   | Surface Water         | Pond                     | ✓                 | ✓               | ✓               | ✓                         |
| On-Site Pond                     | Surface Water         | Pond                     | ✓                 | ✓               | ✓               | ✓                         |
| LTW-01                           | On-Site Groundwater   | Well Adjacent River      | ✓                 | ✓               | ✓               | ✓                         |
| LTW-02                           | On-Site Groundwater   | Well Adjacent River      | ✓                 | ✓               | ✓               | ✓                         |
| LTW-03                           | On-Site Groundwater   | Well Adjacent River      | ✓                 | ✓               | ✓               | ✓                         |
| LTW-04                           | On-Site Groundwater   | Well Adjacent River      | ✓                 | ✓               | ✓               | ✓                         |
| LTW-05                           | On-Site Groundwater   | Well Adjacent River      | ✓                 | ✓               | ✓               | ✓                         |
| MW-8S                            | On-Site Groundwater   | Perched Zone Well        | ✓                 | ✓               | ✓               | ✓                         |
| MW-23                            | On-Site Groundwater   | Perched Zone Well        | ✓                 | ✓               | ✓               | ✓                         |
| MW-24                            | On-Site Groundwater   | Perched Zone Well        | ✓                 | ✓               | ✓               | ✓                         |
| NAF-06                           | On-Site Groundwater   | Perched Zone Well        | ✓                 | ✓               | ✓               | ✓                         |
| NAF-08A                          | On-Site Groundwater   | Perched Zone Well        | ✓                 | ✓               | ✓               | ✓                         |
| PZ-11                            | On-Site Groundwater   | Perched Zone Well        | ✓                 | ✓               | ✓               | ✓                         |
| SMW-07                           | On-Site Groundwater   | Perched Zone Well        | ✓                 | ✓               | ✓               | ✓                         |
| Field Decision                   | On-Site Groundwater   | Perched Zone Well        | ✓                 | ✓               | ✓               | ✓                         |
| Field Decision                   | On-Site Groundwater   | Perched Zone Well        | ✓                 | ✓               | ✓               | ✓                         |
| SB-02                            | On-Site Surface Soils | SPLP Leachate Analysis   | ✓ <sup>-2</sup>   | ✓ <sup>-2</sup> | ✓ <sup>-2</sup> | ✓ <sup>-2</sup>           |
| SB-03                            | On-Site Surface Soils | SPLP Leachate Analysis   | ✓ <sup>-2</sup>   | ✓ <sup>-2</sup> | ✓ <sup>-2</sup> | ✓ <sup>-2</sup>           |
| SB-10                            | On-Site Surface Soils | SPLP Leachate Analysis   | ✓ <sup>-2</sup>   | ✓ <sup>-2</sup> | ✓ <sup>-2</sup> | ✓ <sup>-2</sup>           |
| SB-13                            | On-Site Surface Soils | SPLP Leachate Analysis   | ✓ <sup>-2</sup>   | ✓ <sup>-2</sup> | ✓ <sup>-2</sup> | ✓ <sup>-2</sup>           |
| SB-16                            | On-Site Surface Soils | SPLP Leachate Analysis   | ✓ <sup>-2</sup>   | ✓ <sup>-2</sup> | ✓ <sup>-2</sup> | ✓ <sup>-2</sup>           |
| SB-24                            | On-Site Surface Soils | SPLP Leachate Analysis   | ✓ <sup>-2</sup>   | ✓ <sup>-2</sup> | ✓ <sup>-2</sup> | ✓ <sup>-2</sup>           |
| SB-27                            | On-Site Surface Soils | SPLP Leachate Analysis   | ✓ <sup>-2</sup>   | ✓ <sup>-2</sup> | ✓ <sup>-2</sup> | ✓ <sup>-2</sup>           |
| SB-31                            | On-Site Surface Soils | SPLP Leachate Analysis   | ✓ <sup>-1</sup>   | ✓ <sup>-2</sup> | ✓ <sup>-2</sup> | ✓ <sup>-2</sup>           |

**TABLE 1**  
**SAMPLING LOCATIONS**  
Chemours Fayetteville Works, North Carolina

| SAMPLING LOCATION | MEDIA TYPE                         | SAMPLE DESCRIPTION | ANALYTICAL METHOD |              |             |                           |
|-------------------|------------------------------------|--------------------|-------------------|--------------|-------------|---------------------------|
|                   |                                    |                    | EPA 537 Mod       | EPA 8321 Mod | Table 3 SOP | Table 3+ SOP <sup>1</sup> |
| Site 511          | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 495          | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 1368         | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 869          | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 137          | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 784          | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 860          | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 2124         | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 864          | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 915          | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 674          | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 426          | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 566          | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 872          | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 875          | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 144          | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 634          | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 545          | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 1033         | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Site 446          | Off-Site Groundwater               | Residential Well   | ✓                 | ✓            | ✓           | ✓                         |
| Dup-1             | Surface Water Duplicate            | QA/QC              | ✓                 | ✓            | ✓           | ✓                         |
| Daily-Rinsate-1   | Surface Water Daily Rinsate        | QA/QC              | ✓                 | ✓            | ✓           | ✓                         |
| MS & Rep-1        | Surface Water MS & Rep             | QA/QC              | ✓                 | ✓            | ✓           | ✓                         |
| Dup-2             | On-Site Groundwater Duplicate      | QA/QC              | ✓                 | ✓            | ✓           | ✓                         |
| Daily-Rinsate-2   | On-Site Groundwater Daily Rinsate  | QA/QC              | ✓                 | ✓            | ✓           | ✓                         |
| MS & Rep-2        | On-Site Groundwater MS & Rep       | QA/QC              | ✓                 | ✓            | ✓           | ✓                         |
| Dup-3             | On-Site Leachate Duplicate         | QA/QC              | ✓                 | ✓            | ✓           | ✓                         |
| Daily-Rinsate-3   | On-Site Leachate Daily Rinsate     | QA/QC              | ✓                 | ✓            | ✓           | ✓                         |
| MS & Rep-3        | On-Site Leachate MS & Rep          | QA/QC              | ✓                 | ✓            | ✓           | ✓                         |
| Dup-4             | Off-Site Groundwater Duplicate     | QA/QC              | ✓                 | ✓            | ✓           | ✓                         |
| Daily-Rinsate-4   | Off-Site Groundwater Daily Rinsate | QA/QC              | ✓                 | ✓            | ✓           | ✓                         |
| MS & Rep-4        | Off-Site Groundwater MS & Rep      | QA/QC              | ✓                 | ✓            | ✓           | ✓                         |
| Field Blank       | Daily Field Blanks                 | QA/QC              | ✓                 | ✓            | ✓           | ✓                         |

**TABLE 1**  
**SAMPLING LOCATIONS**  
Chemours Fayetteville Works, North Carolina

**Notes**

1 - Table 3+ SOP samples will be submitted to the Chemours internal laboratory for analysis.

2 - Leachate samples will be submitted for SPLP extraction method 1312; samples will be submitted as 1312/ before the method, i.e. 1312/537M, on the chain of custody

**Acronyms**

Dup - duplicate

ft - feet

MS - matrix spike

QA/QC - quality assurance / quality control

REP - replicate

SPLP - Synthetic Precipitation Leaching Procedure

**TABLE 2**  
**Analytes, Laboratories and Methods**  
 Chemours Fayetteville Works, North Carolina

| Compound Group  | Name  | Abbreviation | Carbon Atoms | CAS Number  | Laboratory             | Method                 | Leachate Sampling Containers | Water Sampling Containers |
|---|---|--------------|--------------|-------------|------------------------|------------------------|------------------------------|---------------------------|
| Perfluoroalkyl carboxylic acids (PFCAs)                     | Perfluorobutanoic acid                                    | PFBA         | 4            | 375-22-4    | TestAmerica Sacramento | EPA 537 PFAS Compounds | HDPE Sampling Bottles        | 2x250-mL HDPE Bottles     |
|   | Perfluoropentanoic acid                                   | PFPeA        | 5            | 2706-90-3   |                        |                        |                              |                           |
|   | Perfluorohexanoic acid                                    | PFHxA        | 6            | 307-24-4    |                        |                        |                              |                           |
|   | Perfluoroheptanoic acid                                   | PFHpA        | 7            | 375-85-9    |                        |                        |                              |                           |
|   | Perfluorooctanoic acid                                    | PFOA         | 8            | 335-67-1    |                        |                        |                              |                           |
|   | Perfluorononanoic acid                                    | PFNA         | 9            | 375-95-1    |                        |                        |                              |                           |
|   | Perfluorodecanoic acid                                    | PFDA         | 10           | 335-76-2    |                        |                        |                              |                           |
|   | Perfluoroundecanoic acid                                  | PFUnA        | 11           | 2058-94-8   |                        |                        |                              |                           |
|   | Perfluorododecanoic acid                                  | PFDoA        | 12           | 307-55-1    |                        |                        |                              |                           |
|   | Perfluorotridecanoic acid                                 | PFTriA       | 13           | 72629-94-8  |                        |                        |                              |                           |
|   | Perfluorotetradecanoic acid                               | PFTeA        | 14           | 376-06-7    |                        |                        |                              |                           |
|   | Perfluorohexadecanoic acid                                | PFHxDA       | 15           | 67905-19-5  |                        |                        |                              |                           |
| Perfluorooctadecanoic acid                                  | PFODA   | 16           | 16517-11-6   |             |                        |                        |                              |                           |
| Perfluoroalkyl sulfonic acids (PFSAs)                       | Perfluorobutanesulfonic acid                              | PFBS         | 4            | 375-73-5    | TestAmerica Sacramento | EPA 537 PFAS Compounds | HDPE Sampling Bottles        | 2x250-mL HDPE Bottles     |
|   | Perfluoropentanesulfonic acid                             | PFPeS        | 5            | 2706-91-4   |                        |                        |                              |                           |
|   | Perfluorohexanesulfonic acid                              | PFHxS        | 6            | 355-46-4    |                        |                        |                              |                           |
|   | Perfluoroheptanesulfonic acid                             | PFHpS        | 7            | 375-92-8    |                        |                        |                              |                           |
|   | Perfluorooctanesulfonic acid                              | PFOS         | 8            | 1763-23-1   |                        |                        |                              |                           |
|   | Perfluorononanesulfonic acid                              | PFNS         | 9            | 474511-07-4 |                        |                        |                              |                           |
|   | Perfluorodecanesulfonic acid                              | PFDS         | 10           | 335-77-3    |                        |                        |                              |                           |
|   | Perfluorododecanesulfonate                                | PFDoS        | 11           | 79780-39-5  |                        |                        |                              |                           |
| Other   | 4:2 fluorotelomersulfonate                                | 4:2 FTS      | 6            | 757124-72-4 | TestAmerica Sacramento | EPA 537 PFAS Compounds | HDPE Sampling Bottles        | 2x250-mL HDPE Bottles     |
|   | 6:2 fluorotelomersulfonate                                | 6:2 FTS      | 8            | 27619-97-2  |                        |                        |                              |                           |
|   | 8:2 fluorotelomersulfonate                                | 8:2 FTS      | 10           | 39108-34-4  |                        |                        |                              |                           |
|   | 10:2-fluorotelomersulfonate                               | 10:2 FTS     | 12           | 120226-60-0 |                        |                        |                              |                           |
|   | N-ethyl perfluorooctane sulfonamidoacetic acid            | NEtFOSAA     | 12           | 2991-50-6   |                        |                        |                              |                           |
|   | N-ethyl heptadecafluoro octanesulfonamid                  | NEtPFOSA     | 10           | 4151-50-2   |                        |                        |                              |                           |
|   | N-ethyl-N-(2-hydroxyethyl)perfluorooctylsulphonamide      | NEtPFOSAE    | 12           | 1691-99-2   |                        |                        |                              |                           |
|   | N-methyl perfluorooctane sulfonamidoacetic acid           | NMeFOSAA     | 11           | 2355-31-9   |                        |                        |                              |                           |
|   | heptadecafluoro-N-methyloctanesulphonamide                | NMePFOSA     | 9            | 31506-32-8  |                        |                        |                              |                           |
|   | N-methylperfluorooctanesulfonamidoethanol                 | NMePFOSAE    | 11           | 24448-09-7  |                        |                        |                              |                           |
|   | Perfluorooctanesulfonamide                                | PFOSA        | 8            | 754-91-6    |                        |                        |                              |                           |
|   | Ammonium 4,8-dioxa-3H-perfluoronanoate                    | ADONA        | 7            | 958445-44-8 |                        |                        |                              |                           |
|   | chlorododecafluorohexyloxy tetrafluoroethanesulfonic acid | F-53B Major  | 10           | 73606-19-6  |                        |                        |                              |                           |
| chlorohexadecafluorooctyloxy tetrafluoroethanesulfonic acid | F-53B Minor   | 8            | 83329-89-9   |             |                        |                        |                              |                           |

**TABLE 2**  
**Analytes, Laboratories and Methods**  
 Chemours Fayetteville Works, North Carolina

| Compound Group  | Name  | Abbreviation | Carbon Atoms | CAS Number  | Laboratory                               | Method           | Leachate Sampling Containers | Water Sampling Containers |
|---|---|--------------|--------------|-------------|--|------------------|------------------------------|---------------------------|
| Other   | Hexafluoropropylene oxide dimer acid  | HFPO-DA      | 6            | 13252-13-6  | TestAmerica Denver                       | EPA 8321 Mod     | HDPE Sampling Bottles        | 2x250-mL HDPE Bottles     |
| Perfluoroalkyl ether carboxylic acids (PFECAs)                                    | Perfluoro-1-methoxyacetic acid  | PFMOAA       | 3            | 674-13-5    | TestAmerica Sacramento                   | Table 3 Lab SOP  | HDPE Sampling Bottles        | 2x250-mL HDPE Bottles     |
|   | Perfluoro(3,5-dioxahexanoic) acid   | PFO2HxA      | 4            | 39492-88-1  |  |                  |                              |                           |
|   | Perfluoro(3,5,7-trioxaoctanoic) acid  | PFO3OA       | 5            | 39492-89-2  |  |                  |                              |                           |
|   | Perfluoro(3,5,7,9-tetraoxadecanoic) acid  | PFO4DA       | 6            | 39492-90-5  |  |                  |                              |                           |
|   | Perfluoro(3,5,7,9,11-pentaoxatridecanoic) acid  | PFO5DA       | 7            | 39492-91-6  |  |                  |                              |                           |
|   | Perfluoro-3-methoxypropanoic acid   | PMPA         | 4            | 13140-29-9  |  |                  |                              |                           |
|   | Perfluoro-4-methoxybutanoic acid  | PEPA         | 5            | 863090-89-5 |  |                  |                              |                           |
| Perfluoroalkyl ether sulfonic acids (PFESAs)                                      | Perfluoroether alkyl carbonic acid – G  | PFECA-G      | 7            | 801212-59-9 | Chemours Fluoroproducts Analytical Group | Table 3+ Lab SOP | HDPE Sampling Bottles        | 2x250-mL HDPE Bottles     |
|   | Nafion Byproduct #1, Perfluoro-3,6-dioxa-4-methyl-7-octene-1-sulfonic acid  | PFESA BP 1   | 7            | 29311-67-8  |  |                  |                              |                           |
|   | Nafion Byproduct #2, 2-[1-[difluoro(1,2,2,2-tetrafluoroethoxy)methyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoro-Ethanesulfanoic acid | PFESA BP 2   | 7            | 749836-20-2 |  |                  |                              |                           |
| PFECAs, PFESAs, and Perfluoroalkyl ether sulfonic and carboxylic acids (PFES-CAs) | Specific Analyte List Under Development   |              |              |             |  |                  |                              |                           |

**Acronyms**

HDPE - high density polyethylene

mL - milliliters

**TABLE 3**  
**OFF-SITE GROUNDWATER LOCATION DEPTHS AND CONCENTRATIONS**  
 Chemours Fayetteville Works, North Carolina

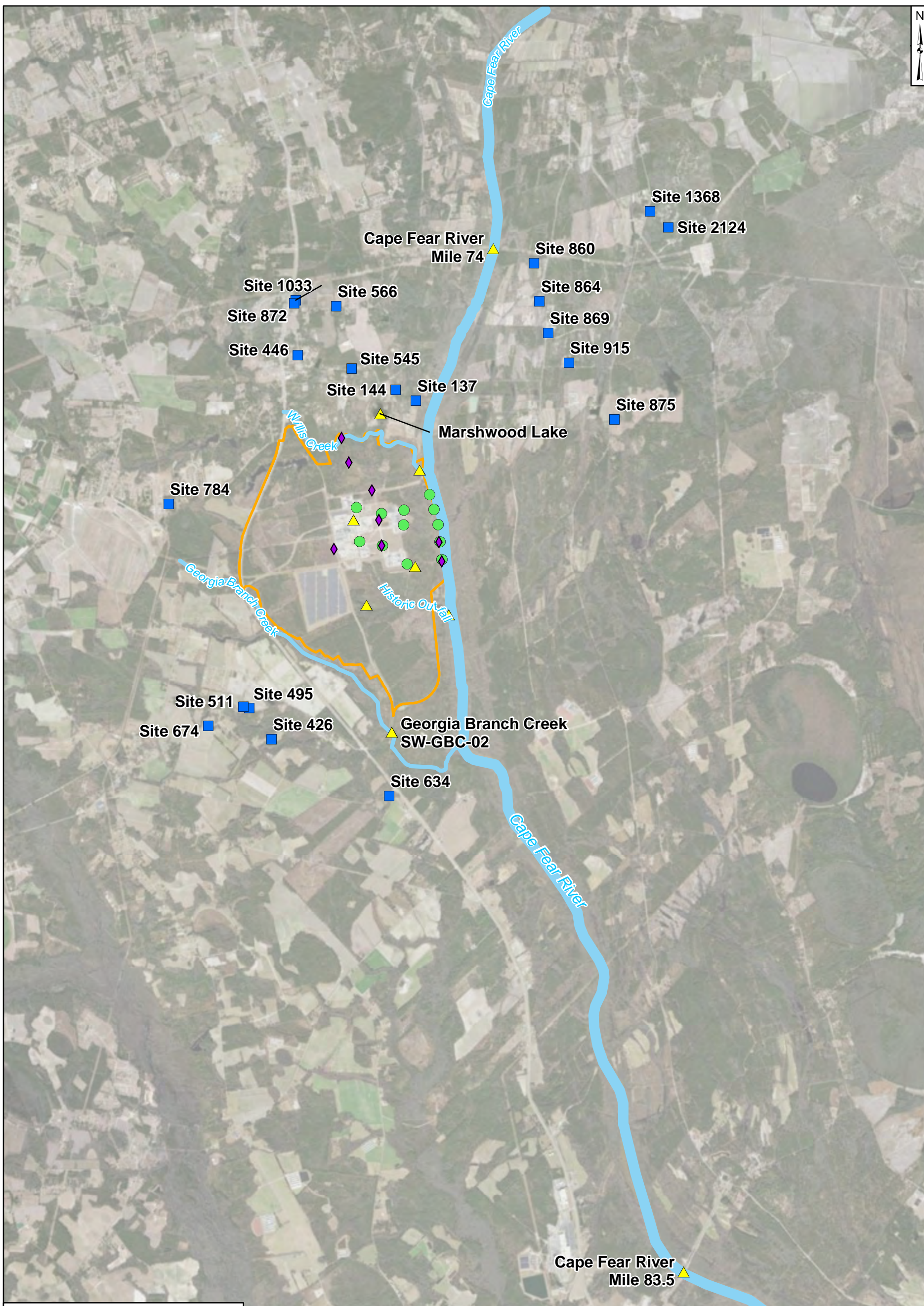
| Off-Site Groundwater<br>Residential Well Location | Resident Reported<br>Well Depth (ft bgs) | Maximum Measured<br>HFPO-DA<br>Concentration (ng/L) |
|---|--|---|
| Site 511  | 14                                       | 350   |
| Site 495  | 15                                       | 440   |
| Site 1368   | 18                                       | 1,100   |
| Site 869  | 18                                       | 170   |
| Site 137  | 18                                       | 690   |
| Site 784  | 19                                       | 180   |
| Site 860  | 19                                       | 100   |
| Site 2124   | 20                                       | 140   |
| Site 864  | 20                                       | 730   |
| Site 915  | 20                                       | 1,400   |
| Site 634  | 27                                       | 340   |
| Site 674  | 35                                       | 530   |
| Site 545  | 36                                       | 1,200   |
| Site 1033   | 45                                       | 330   |
| Site 426  | 50                                       | 920   |
| Site 446  | 60                                       | 1,300   |
| Site 566  | 60                                       | 170   |
| Site 872  | 62                                       | 510   |
| Site 875  | 75                                       | 280   |
| Site 144  | 90                                       | 770   |

***Acronyms***

ft bgs - feet below ground surface

HFPO-DA - Hexafluoropropylene oxide dimer acid

ng/L - nanograms per liter



**Legend**

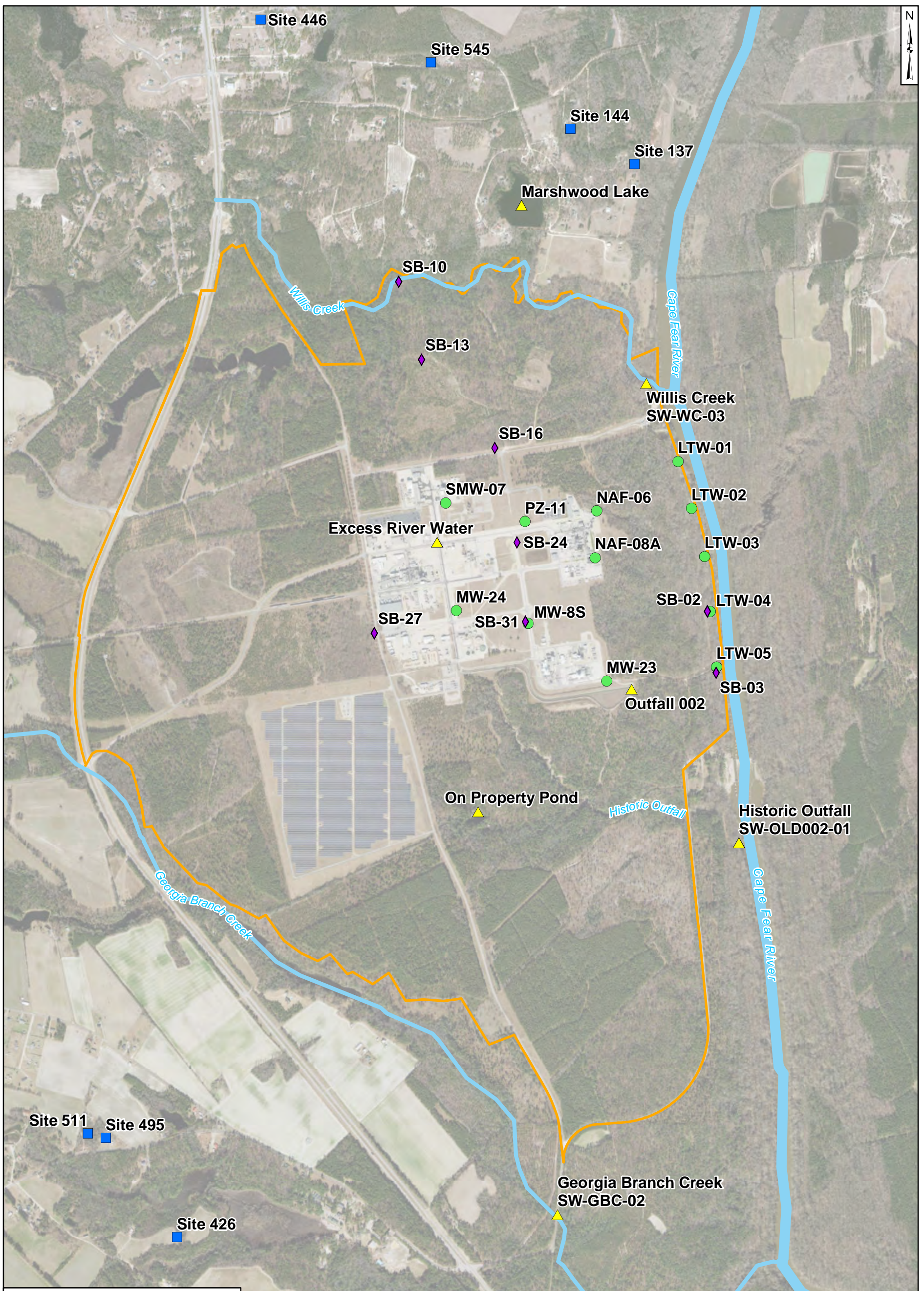
Sample Location Types

- ▲ Surface Water
- Groundwater
- ◆ Lechate
- Residential Well
- Site Boundary

Notes:  
Aerial provided by ESRI Basemaps 2017.

|   |            |
|---|------------|
| <p>5,000 2,500 0 5,000 Feet</p>   |            |
| <p><b>Off-Site Sampling Locations</b><br/>Chemours Fayetteville Works, North Carolina</p> |            |
| <p><b>Geosyntec</b><br/>consultants</p>   |            |
| Raleigh, NC   | April 2019 |
| <p>Figure<br/><b>1</b></p>  |            |





Legend

**Sample Location Types**

- ▲ Surface Water
- Groundwater
- ◆ Lechate
- Residential Well
- Site Boundary

Notes:  
Aerial provided by ESRI Basemaps 2017.

1,500 750 0 1,500 Feet

**On and Near Site Sampling Locations**  
Chemours Fayetteville Works, North Carolina

**Geosyntec**  
consultants

|             |            |
|-------------|------------|
| Raleigh, NC | April 2019 |
|-------------|------------|

**Figure**  
**2**

## **APPENDIX B**