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Interim Four Counties Sampling and Drinking Water Plan (New Hanover, Brunswick, Columbus and Pender Counties) Chemours Fayetteville Works

Prepared for

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ACRONYMS AND ABBREVIATIONS

ASR	Aquifer Storage and Recovery
CFPUA	Cape Fear Public Utility Authority
CFRW	Cape Fear River Watch
HFPO-DA	hexafluoropropylene oxide dimer acid
IA	investigative area
LCFWASA	Lower Cape Fear Water & Sewer Authority
NCDEQ	North Carolina Department of Environmental Quality
ng/L	nanograms per liter
PFAS	per- and polyfluoroalkyl substances

1.0 INTRODUCTION

This Interim Four Counties Sampling and Drinking Water Plan has been prepared by Geosyntec Consultants of NC, P.C. (Geosyntec) for The Chemours Company FC, LLC (Chemours). This document presents an interim plan for sampling private wells and implementing mitigation measures in New Hanover, Brunswick, Columbus, and Pender Counties (the counties) of North Carolina.

In a letter from the North Carolina Department of Environmental Quality (NCDEQ) on 3 November 2021 (NCDEQ, 2021), NCDEQ requested that Chemours submit an updated Drinking Water Compliance Plan pursuant to Paragraph 24 of the Consent Order between Chemours, NCDEQ, and Cape Fear River Watch (CFRW), which was entered by the Court on 25 February 2019. In this letter, NCDEQ also requested that the updated Drinking Water Compliance Plan include a sampling plan for drinking water wells in the counties and provide replacement drinking water to qualifying parties. To address these requests from NCDEQ, this Interim Sampling and Drinking Water Plan has been prepared specifically for the four counties.

NCDEQ also posted to their website¹ on 3 November 2021 per- and polyfluoroalkyl substances (PFAS) data from groundwater samples collected from NCDEQ and Cape Fear Public Utility Authority (CFPUA) public supply wells between 2019 and 2021. These data were supplemented with additional PFAS data from groundwater samples collected from different wells, including private, public supply and emergency wells, which were provided to Chemours on behalf of NCDEQ via email on 5 December 2021.

1.1 Four Counties Sampling and Drinking Water Plan Workflow

The Drinking Water Compliance Plan for the area surrounding the Fayetteville Works Facility (Facility; Parsons, 2019) was developed to identify private wells with Consent Order Attachment C PFAS (Attachment C PFAS; Table 1) from Facility air emissions and provide a replacement drinking water supply. As such, not all elements of the Drinking Water Compliance Plan, including the sampling design, are relevant to the private wells in the four specified counties. As a result, a Sampling and Drinking Water Plan specific to the four counties is needed to fulfill the request from NCDEQ; however, there is currently very limited information about the four counties.

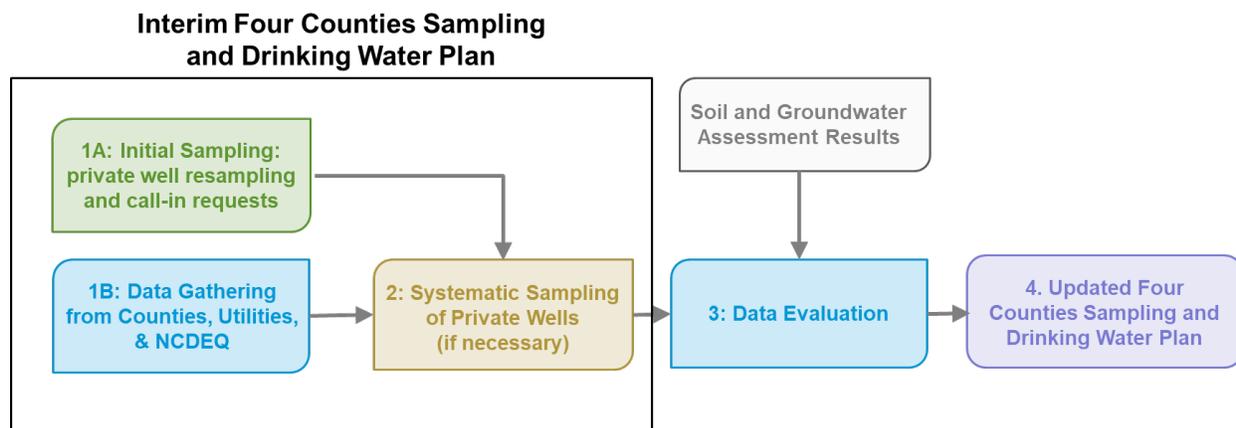
The PFAS analytical results provided by NCDEQ included only 11 private wells in New Hanover County². NCDEQ provided PFAS data from a single well in Brunswick County and no PFAS analytical data from any wells in Pender County or Columbus County. The counties encompass an

¹ <https://deq.nc.gov/dwr-gwr-lcfr-pfas-data-2019-2021>

² Total Attachment C PFAS concentrations in private wells were reported by NCDEQ to range from concentrations below detection limits at three sampling locations to a maximum value of 380 nanograms per liter (ng/L) at one location, which was not on a residential property. Only 2 out of the 11 private wells sampled in New Hanover County were identified to be on residential property, and total Attachment C PFAS were below the detection limits for one private well and 250 ng/L for the other private well.

area of over 2,900 square miles, and the number of private wells and their distribution across the counties, as well as overlay with existing utilities, is currently being investigated. The potential source and cause of Table 3+ PFAS³ contamination in the counties is also being investigated pursuant to the Framework to Assess Table 3+ PFAS in New Hanover, Brunswick, Columbus, and Pender Counties (Soil and Groundwater Assessment Framework; Geosyntec, 2022), which has been submitted under separate cover.

To fulfill the 3 November 2021 request from NCDEQ while gathering information for each of the counties, a workflow has been developed as shown in Figure 1.



This workflow includes four steps:

- Step 1A: Initial sampling, including resampling of the 11 private wells that were included in the data provided by NCDEQ, and sampling of requested private wells via the call center, if eligible (Sections 2.1.3 and 3.0)
- Step 1B: Data gathering, including compilation of private well and other supporting information (Section 2.2)
- Step 2: Systematic sampling of private wells in each of the four counties, if necessary, based on results of Steps 1A and 1B (Sections 2.3 and 3.0)
- Step 3: Data evaluation
- Step 4: Preparation of an Updated Four Counties Sampling and Drinking Water Plan

Steps 1A, 1B, and 2 represent the scope associated with this Interim Four Counties Sampling and Drinking Water Plan presented in this document. Steps 1A and 1B will occur simultaneously, where initial sampling will be completed during the data gathering stage. During the initial

³ Table 3+ PFAS are often attributed to operations at the Chemours Fayetteville Works Site and include the Attachment C PFAS (Geosyntec, 2021).

sampling, eligible residents who call to request sampling via the call center will be scheduled for private well testing in addition to the resampling of the 11 private wells sampled by NCDEQ.

Based on the results of Steps 1A and 1B, Step 2 will include selecting and sampling of additional private wells in each county using a systematic sampling design.

For the private wells sampled during this Interim Sampling and Drinking Water Plan (i.e., Steps 1A and 2), a voucher card will be offered as an interim drinking water replacement if Attachment C PFAS concentrations exceed the criteria outlined in Paragraphs 19 and 20 of the Consent Order⁴.

Next, Step 3 will include an evaluation of the private well sampling data in conjunction with the data gathered from the Soil and Groundwater Assessment Framework (Geosyntec, 2022). Step 4 will incorporate findings from the two programs to develop an updated Four Counties Sampling and Drinking Water Plan.

Table 1 Attachment C PFAS Compounds

Common Name	Chemical Name	CASRN	Chemical Formula
HFPO-DA ¹	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
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	C7HF13O7
PS Acid	Ethanesulfonic acid, 2-[1-[difluoro[(1,2,2-trifluoroethyl)oxy]methyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoro-	29311-67-9	C7HF13O5S

⁴ Any single Attachment C PFAS compound is greater than or equal to 10 nanograms per liter (ng/L), the sum of the Attachment C PFAS compounds is greater than or equal to 70 ng/L, or hexafluoropropylene oxide dimer acid (HFPO-DA) is greater than equal to 140 ng/L.

Common Name	Chemical Name	CASRN	Chemical Formula
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 ¹	Perfluoroheptanoic acid	375-85-9	C7HF13O2

Notes:

¹ HFPO-DA and PFHpA can be analyzed under methods Table 3+ Standard Operating Procedure (SOP) and Environmental Protection Agency (EPA) Method 537 Mod.

CASRN - Chemical Abstract Service Registry Number

2.0 PRIVATE WELL SAMPLING

2.1 Step 1A – Initial Sampling

Initial sampling (Step 1A) will be completed in conjunction with the data gathering stage (Step 1B). For the duration of the data gathering step, initial sampling efforts will include resampling of the 11 private wells sampled by NCDEQ, and sampling of requested private wells, if eligible. Private well sampling will be completed by Chemours subcontractor Parsons of NC (Parsons) using procedures outlined in Appendix A. Data collected during a sampling team visit will be uploaded to the project database. A voucher card will be offered to qualifying residents as an initial interim replacement to private drinking water supply in accordance with procedures in Section 3.0.

2.1.1 Call Center

An information call line will be activated by Chemours by 15 February 2022. This call line will be used to answer questions about the activities covered in this plan and for residents to request sampling of their private wells. Residents can call (910) 678-1100 at any time to leave a message requesting additional well sampling information or to leave questions about any step in the interim drinking water replacement process. Messages to the call line are monitored during regular business hours (Monday through Friday, 9am to 5pm). Calls requiring follow-up are usually returned within 24 to 48 hours starting on the next business day.

2.1.2 Resampling of Private Wells in New Hanover

As part of the initial sampling step, Chemours will resample the 11 private wells sampled by NCDEQ to confirm the Attachment C PFAS analytical results. Based on the analytical results, if a resident qualifies for interim replacement drinking water, then a voucher card will be provided (see Section 3.0).

2.1.3 Private Well Owner/Resident Sampling Requests

For residents that request sampling via the call center (Section 2.1.1), Chemours will sample the private well if the following conditions are satisfied:

- The private well is the primary source of drinking water on the property, and
- The private well is located within half mile of Cape Fear River⁵, or

⁵ As described in the Soil and Groundwater Assessment Framework (Geosyntec, 2022), Cape Fear River water withdrawals and usage may potentially be responsible for Table 3+ PFAS detected in samples collected by NCDEQ. One hypothesis identified in the framework is Table 3+ PFAS originating from aquifer recharge by Cape Fear River including recharge in Floodplain areas.

- The private well is within a public water service area and/or sanitary sewer networks⁶

Based on the analytical results, if a resident qualifies for interim replacement drinking water, then a voucher card will be provided (see Section 3.0).

2.2 Step 1B - Compilation of Private Well and Other Supporting Information

Prior to the development of the systematic sampling of private wells, a data gathering stage will be conducted to compile existing/available information. The objective of the data gathering stage is to identify:

1. Additional private wells for systematic sampling (i.e., private wells to be considered for selection and sampling in Step 2).
2. Potential areas to focus the systematic sampling design.

Table 2 summarizes the specific data needs by objective, which will be a starting point, but additional data needs may be identified throughout the scope of this Interim Four Counties Sampling and Drinking Water Plan. Geosyntec has begun compiling some of the required information from publicly available sources. Other required information is presently in possession of other organizations such as NCDEQ, the counties and various utilities. In response to the NCDEQ letter, Geosyntec has sent letters to these organizations requesting this information and a teleconference to discuss these data requests. Receipt of information requested from the NCDEQ and other organizations is currently pending.

The first data gathering objective is to identify potential additional private wells for systematic sampling in each county. Locations of the identified private wells will be mapped and overlain with public water and sewer distribution⁶ and residential parcel data to understand their spatial distribution across each county. Data on public water usage, as available, will also be used to determine the primary source of drinking water at each residential property (i.e., public water vs. private well) so that private well users are considered for sampling.

The second data gathering objective is to identify potential areas in each county to be prioritized for sampling. This will be achieved through collection of data in conjunction with the Soil and Groundwater Assessment Framework (Geosyntec, 2022).

The data gathering stage is anticipated to last up to six months depending upon the responsiveness of the various parties that are in possession of necessary data. Once the data gathering stage has been completed, the compiled information along with the results of any initial private well sampling within the four counties will be used to develop the systematic sampling plan for the counties.

⁶ As described in the Soil and Groundwater Assessment Framework (Geosyntec, 2022), one hypothesis being evaluated is Table 3+ PFAS originating from leaks in water distribution and sanitary sewer lines. If during the assessment this hypothesis is refined or not supported, then this criterion will be changed accordingly.

Table 2 Summary of Data Needs

Data Needs	Objective
Residential parcels, tax detail data, and building footprint in digital form	1
A consolidated list containing private well location information (such as eastings, northings, address and/or tax parcels), well owner, elevations, screen interval depths, and hydrogeological data (including, without limitation, start and end depth of each hydrogeological unit)	1
Digital computerized map of potable water distribution networks	1
Database of residences using public water, i.e., not using private well as the primary source of drinking water	1
Records regarding the numbers, locations, registrations, usages, and well service and operation histories of private and public drinking water supply wells	1
Any data (and relevant information, including but not limited to laboratory EDDs and sample collection information, etc.) indicating the presence of PFAS in water sources	2
Data about water distribution system leaks since 1979 (including known water mains with leaks, and leak and repair locations)	2
Information since 1979, on a per year basis, of the proportion of Cape Fear River water versus groundwater or other water sources used in each distribution system	2
Locations where surface water from the Cape Fear River was injected into subsurface aquifers	2
List of parties permitted to draw Cape Fear River water since 1979 (NCDEQ)	2
Records of customers of Lower Cape Fear Water & Sewer Authority (LCFWASA), Aqua of NC, Inc., Cape Fear Public Utility Authority (CFPUA), and other utilities	2
Identification of golf courses, cemeteries and parks irrigating lawns using water sourced from the Cape Fear River	2
Identification of farmland practices and locations using Cape Fear River water for irrigation	2
Records of Aquifer Storage and Recovery (ASR) program (volumes injected, dates operational, etc.)	2

2.3 Step 2 - Systematic Sampling of Private Wells

Upon completion of Steps 1A and 1B (anticipated to last up to six months depending upon the responsiveness of the various parties), Chemours will proceed with Step 2: the systematic sampling of private wells in the counties. The following subsections provide details on the systematic sampling approach and provision of sample results.

2.3.1 Systematic Sampling Approach

As part of the systematic sampling program, up to 200 private wells may be sampled from each county, as described below.

A systematic sampling approach of private wells will be undertaken using the information compiled during the initial sampling and the data gathering steps. This systematic approach allows for selection and sampling of private wells and is anticipated to result in a relatively uniform distribution of wells across the extent of each county to assess the presence of Attachment C constituents. This will help in defining any future sampling efforts, if needed, that can be focused in the potentially impacted areas. An overview of this systematic approach is provided in Figure 2.

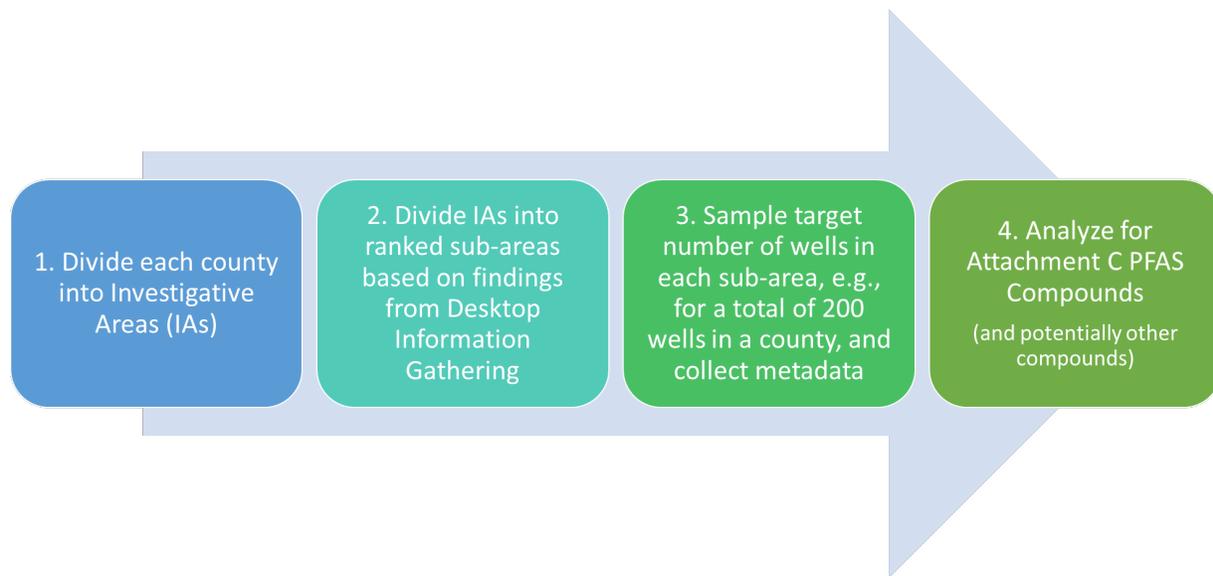


Figure 2 Private Well Systematic Sampling Workflow Diagram

Counties have been subdivided into investigative areas (IAs; see Appendix B). The IAs shown in Figures B.1 to B.4 are based on Geosyntec’s current understanding of the public water distribution networks and/or service areas and may be updated as additional information is obtained through Steps 1A and 1B. The boundaries of the IAs in Figures B.1 to B.4 were determined based on the extent of known public water service areas in each county, while the size of each IA was proportionally selected to capture the density and distribution of the residential parcels.

Each IA will then be further subdivided into subareas based on information obtained through Steps 1A and 1B. In each subarea, a target number of private wells will be sampled, and metadata (for example, well depth) will be collected from these wells. The number of private wells to be sampled will be proportionally weighted to the size of each subarea, density of private wells, and proximity to potential features of interest. Other factors may be considered in the determination of the sample size in each subarea based on the findings from the data gathering and initial sampling results. Sampling will continue in each county until up to 200 private wells have been sampled. All samples collected will be analyzed for Attachment C PFAS compounds (Table 1) and may also be

analyzed for other parameters (e.g., other PFAS, other contaminants, other water quality parameters, etc.) such as those listed in Appendix B.

Private well sampling will be completed by Chemours subcontractors Parsons using procedures outlined in Appendix A. Data collected during a sampling team visit will be uploaded to the project database. A voucher card will be offered to qualifying residents as an interim replacement to private drinking water supply in accordance with procedures in Section 3.0.

2.3.2 Provision of Sampling Results

On an ongoing basis and within seven days of receipt of final laboratory results, Chemours will provide new groundwater sampling results to NCDEQ, with samples identified by both address and sample identification code. In addition, within seven days of receipt of final laboratory results, Chemours will also provide the results in the form of a certified summary certificate to the party who had their well tested. Results may also be provided to the individual counties or other state and local government agencies.

Correspondence will be sent to each well owner providing them with their sampling results for Attachment C PFAS compounds. If analyzed for additional compounds (Appendix B), a separate letter will be sent which will include the laboratory analytical report. If the residents have any questions regarding results of the analytical results, they can contact their local health department or NCDEQ. Parsons may also attempt to hand deliver returned letters. For parties represented by legal counsel, communications will be made through counsel.

3.0 INTERIM REPLACEMENT OF PRIVATE DRINKING SUPPLIES

As discussed in Section 1.1, bottled water and a voucher card will be offered as an interim drinking water replacement if the Attachment C PFAS concentrations in the private wells sampled during the Interim Sampling and Drinking Water Plan exceed the criteria outlined in Paragraphs 19 and 20 of the Consent Order⁷.

3.1 Bottled Water and Letter Delivery

Upon notification that a resident qualifies for replacement drinking water, Chemours representatives (Parsons) will provide initial replacement drinking water within 5 days by visiting the residence and delivering up to one month's supply of bottled water along with a letter explaining the path forward for interim bottled water. If the team is not able to deliver the initial replacement drinking water, a scheduler will attempt to call the resident and make an appointment for the team to return and make the delivery.

Water and letter delivery, as well as all delivery attempts, messages, and conversations, will be documented in the project database.

3.2 Bottled Water Voucher Card

After bottled water and letter delivery, the resident will receive a bottled water voucher card for purchasing drinking water. The voucher card will be preloaded with \$225 for three months of drinking water, which equates to \$75 per month. This card is only to be used for purchasing bottled water. Residents will receive detailed voucher card instructions, customer service contact information, and the Chemours Call Line phone number, along with the voucher card.

⁷ Any single Attachment C PFAS compound is greater than or equal to 10 nanograms per liter (ng/L), the sum of the Attachment C PFAS compounds is greater than or equal to 70 ng/L, or hexafluoropropylene oxide dimer acid (HFPO-DA) is greater than equal to 140 ng/L.

4.0 SCHEDULE AND REPORTING

Sample results will be provided to each resident and to NCDEQ when final data are available. Information is provided to the resident via mail, and to the property owner when Chemours is made aware that the resident is not the owner. Residents who are not the property owner will receive notification indicating eligibility and will be offered interim replacement drinking water (if applicable).

Quarterly reports documenting the implementation of the Interim Four Counties Sampling and Drinking Water Plan will be submitted to NCDEQ. These quarterly reports will include summaries of the sampling activities completed and the residents who are eligible for interim replacement drinking water. These quarterly reports may be submitted separately to NCDEQ or will be included as a separate section in the current quarterly report that is required under Paragraph 28 of the CO.

Chemours will also provide notification to NCDEQ (as requested) via email of each resident that declines interim replacement drinking water within seven days or as soon as practicable thereafter of the resident declining. The notification will include the names, addresses, and contact information for all the residents who have declined. Because the quarterly reports are public documents and, as such, should not include private contact information of residents, Chemours will provide this information (i.e., names, addresses, and contact information for all the residents who have declined) in a separate report on a quarterly basis.

5.0 REFERENCES

Geosyntec Consultants of NC, P.C. 2021a. *Response to NCDEQ Comments on Consent Order Paragraph 18 On and Offsite Assessment Report*. June 14, 2021.

Geosyntec Consultants of NC, P.C. 2022. *Framework to Assess Table 3+ PFAS in New Hanover, Brunswick, Columbus and Pender Counties: Chemours Fayetteville Works*. February 1, 2022.

NCDEQ. 2021. “*Re: Notice Regarding Chemours’ Obligations Under Consent Order and 15A NCAC 02L .0106 – Offsite Groundwater Assessment and Provision of Replacement Drinking Water Supplies.*” North Carolina Department of Environmental Quality, Assistant Secretary for the Environment. November.

Parsons. 2019. *Drinking Water Compliance Plan: Chemours Fayetteville Works*. April.

Appendix A
Private Drinking Water Well Sampling
Procedures

APPENDIX A PRIVATE DRINKING WATER WELL SAMPLING PROCEDURES

The purpose of this appendix is to describe the general sampling procedures to be used for private well sampling as outlined in the Interim Drinking Compliance Plan.

Sampling Notification and Documentation

To conduct the sampling, Chemours subcontractor representatives (Parsons of NC) will go to the identified residence, knock on the door, and deliver a notification letter from Chemours. The notification letter (i) describes the private well sampling program; (ii) requests the resident's participation if applicable; and (iii) includes a phone number that the resident can call to request information about the program and/or to schedule sampling of their private well. Notifications and responses to notifications (e.g., accept or decline) will be documented on electronic field forms.

If the resident is at home and accepts the offer to have their private well sampled, then the resident can choose to either have the sample collected at that time or reschedule sampling for a later time. If the resident declines the offer of sampling, then the decline will be noted in the electronic field form.

If no one is home, the sampling team will leave the notification letter in a prominent location and the notification will be noted in the electronic field form.

For residents that either have not called to request sampling or whose residence was inaccessible, Chemours subcontractor representatives will attempt to make contact again via a mailed letter sent after the initial visit. The mailed letter will again offer sampling of private wells. If needed, the project team may also make a return visit to the residence to deliver another copy of the notification letter. If no communication is received from the resident after the letter is mailed, follow-up letters will be sent each quarter for the next three quarters (a total of 4 letters will be mailed to the resident).

Chemours subcontractor representatives will maintain a database that includes addresses, the dates and status of attempts to contact each resident, resident's contact information (name, mailing address, phone number), sampling completed, and any declines of the offer to sample.

Sample Collection Methodology

The procedure for sampling private wells is as follows:

1. Record available information about the resident (name, contact number, etc.), the property owner, and the well (well age, depth, construction history, presence/location of any filters or other systems, etc.).
2. Don a new pair of powderless, disposable nitrile (or similar) gloves for each sample being collected.
3. Find the spigot closest to the well head.

Appendix A
Private Drinking Water Well Sampling Procedures

4. Turn on water at the selected spigot and purge the well until the pump turns on (usually approximately 5 to 10 minutes).
5. Hold the high-density polypropylene 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 spigot, and fill completely. Do not allow the neck or the mouth of the bottle to touch the spigot. Do not use a secondary container to fill the bottle.
6. Recap the sample bottle and secure cap completely.
7. Affix a pre-printed sample label to the bottle (unless already affixed by the laboratory). If the label is not pre-printed, fill out relevant sample information on the label.
8. Place the sample in a cooler of wet ice or in cold storage for future shipping.
9. Record the sample name, date, and time in the electronic field form.
10. Complete the chain of custody form(s), secure the cooler, and ship the samples to the analytical laboratory.
11. Information related to collection of each private well sample will be recorded on an electronic data collection form. Drinking water will be sampled directly from the well head (or as close as possible) at private wells. To ensure against cross-contamination between drinking water sampling locations, the sampler collecting the samples will wear clean, disposable latex and/or nitrile gloves and limit his/her contact with the samples. Sample bottles and containers appropriate for PFAS analysis will be prepared by the contracted laboratory and will be sealed to ensure cleanliness. Sample bottles will not be cleaned or reused in the field.

Preservation and Handling of Samples

Each containerized sample will be labeled and placed as soon as possible into an insulated sample cooler, which will serve as a shipping container. Wet ice will be placed in the sample containers within heavy-duty plastic bags. Samples will be maintained at a cool temperature (optimum 4°C ± 2°C) 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.

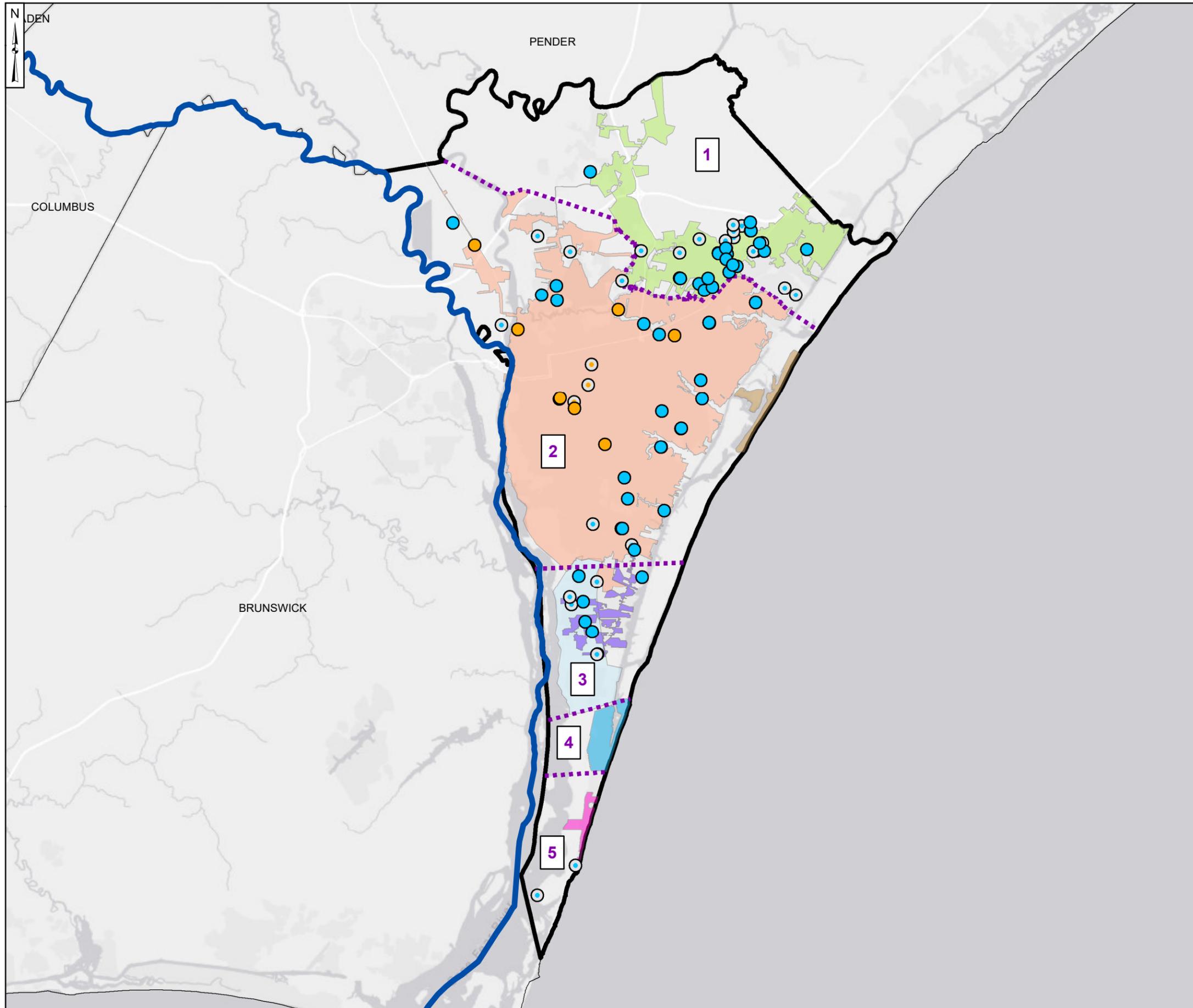
Prior to shipment of the samples to the laboratory, a chain of custody form will be completed by the sample team. Sample locations, sample identification numbers, description of samples, number of samples collected, and specific laboratory analyses to be run on each sample will be recorded on the chain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

Appendix A
Private Drinking Water Well Sampling Procedures

Quality Assurance/Quality Control

Associated quality control samples as required by the laboratory/analytical method will be collected and analyzed throughout the duration of the project. These may include field duplicates, matrix spikes/duplicates, and field blanks.

Appendix B
Investigative Areas by County and List of
Additional Analytes



Legend

- Private Well Sampling Locations (Detected)
- Private Well Sampling Locations (Non-detect)*
- NCDEQ PFAS Sampling Locations (Detected)
- NCDEQ PFAS Sampling Locations*
- # Investigative Area Identifier
- Investigative Areas (Tentative; May change as additional information is gathered)
- Cape Fear River
- ▭ County Boundary
- ▭ Surrounding North Carolina County

New Hanover County Public Water Service Areas

- Town of Carolina Beach
- Town of Kure Beach
- Town of Wrightsville Beach
- Monterey Heights Groundwater
- Sweeney Treatment Plant
- Richardson Nano Filtration
- Cape Master

Notes:

* Data provided by NCDEQ indicates a Table 3+ value of 0 ng/L at these locations.

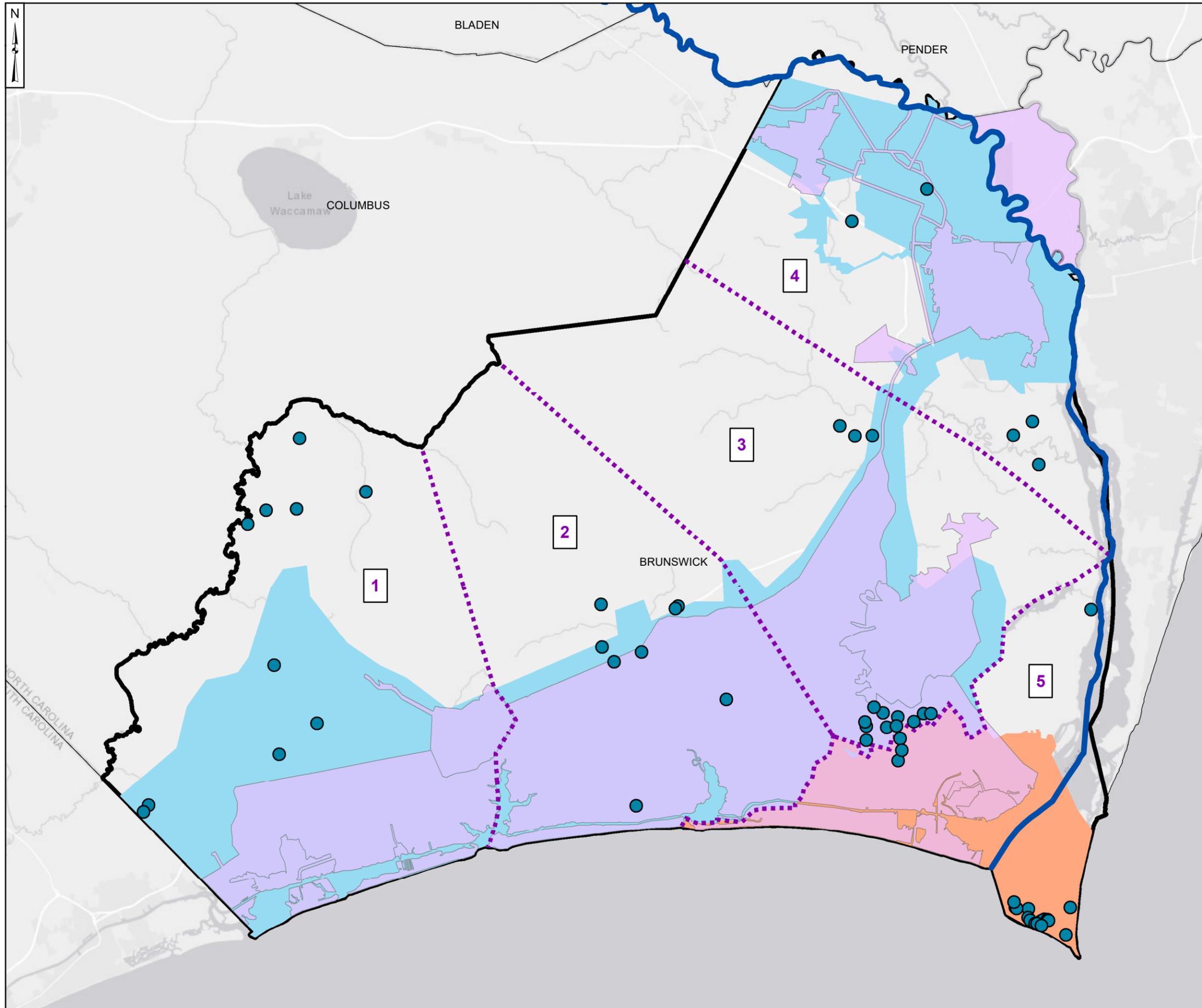
1. Public and Private well data provided by The North Carolina Department of Environmental Quality (NCDEQ) on November and December 2021.
2. Public Water Service Areas for the Towns of Carolina Beach, Kure Beach, and Wrightsville Beach was downloaded from The Drinking Water Resilience Interactive Project (DRIP) site (<http://drip.unctv.org/maps/maps-051716/>).
3. Water service areas for the Monterey Heights Groundwater, Sweeney Treatment Plant, and Richardson Nano Filtration from Cape Fear Public Utility Authority (CFPUA) site was downloaded from ArcGIS Online Feature service (<https://services.arcgis.com/UfH3YtFuVFnIN4Zz/ArcGIS/rest/services/WaterServiceArea/FeatureServer/0>).
4. Cape Master Water System is based on North Carolina Water Quality Report (<https://www.ncwaterquality.com/media/The-Cape-2021-Flushing-Master-Maps.pdf>).
5. County Boundaries was downloaded from OneMap site (<https://www.nconemap.gov>).
6. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
7. Basemap source: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community.



Investigative Areas in New Hanover County
Chemours Fayetteville Works
North Carolina

	Geosyntec Consultants of NC, P.C. NC License No.: C 3500 and C 295	Figure B.1
Raleigh	February 2022	

Projection: NAD83 North Carolina IUS; Units in Foot US

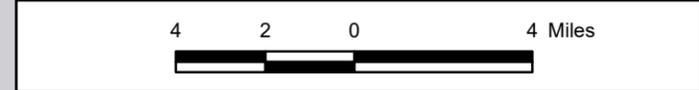


Legend

- Public Water Supply Water Source
- # Investigative Area Identifier
- Investigative Areas (Tentative; May change as additional information is gathered)
- Cape Fear River
- ▭ County Boundary
- ▭ Surrounding North Carolina County
- ▭ Brunswick County Public Water Service Areas
- ▭ NWWTP Service Area
- ▭ 211 WTP Service Area

Notes:

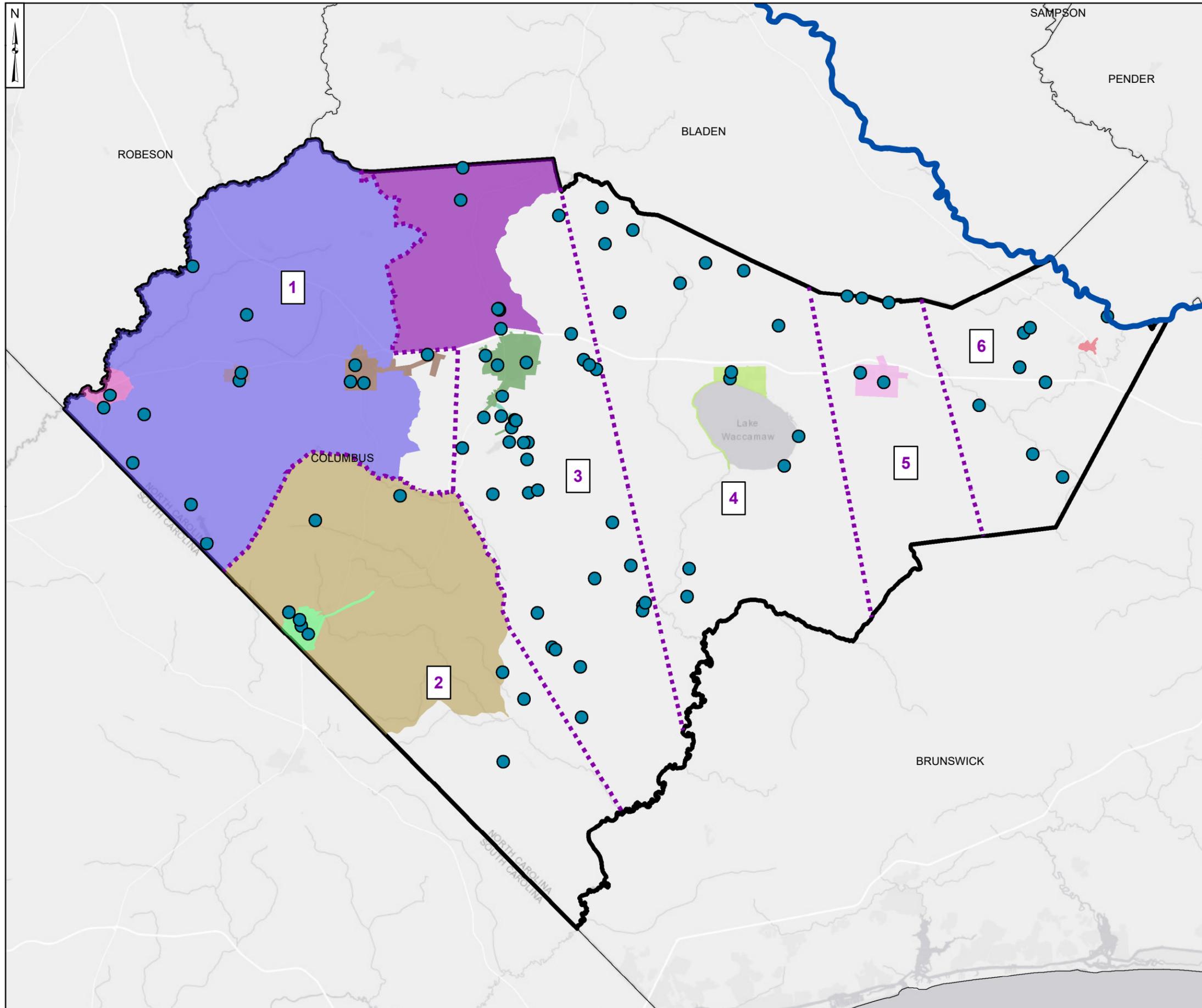
1. Public and Private well data provided by The North Carolina Department of Environmental Quality (NCDEQ) on November and December 2021.
2. Public Water Service Area was downloaded from The Drinking Water Resilience Interactive Project (DRIP) site (<http://drip.unctv.org/maps/maps-051716/>).
3. County Boundaries was downloaded from OneMap site (<https://www.nconemap.gov>).
4. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
5. Basemap source: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community.



Investigative Areas in Brunswick County
Chemours Fayetteville Works
North Carolina

	Geosyntec Consultants of NC, P.C. NC License No.: C 3500 and C 295	Figure B.2
Raleigh	February 2022	

Projection: NAD83 North Carolina IUS; Units in Foot US



Legend

- Public Water Supply Water Source
- # Investigative Area Identifier
- Investigative Areas (Tentative; May change as additional information is gathered)
- Cape Fear River
- ▭ County Boundary
- ▭ Surrounding North Carolina County

Public Water Service Areas

- Columbus County WD I
- Columbus County WD II
- Columbus County WD III
- Riegelwood Sanitary District
- Tabor City
- Town Of Bolton
- Town of Brunswick
- Town of Cerro Gordo
- Town of Chadbourn
- Town of Fair Bluff
- Town of Lake Waccamaw
- Town of Whiteville

Notes:

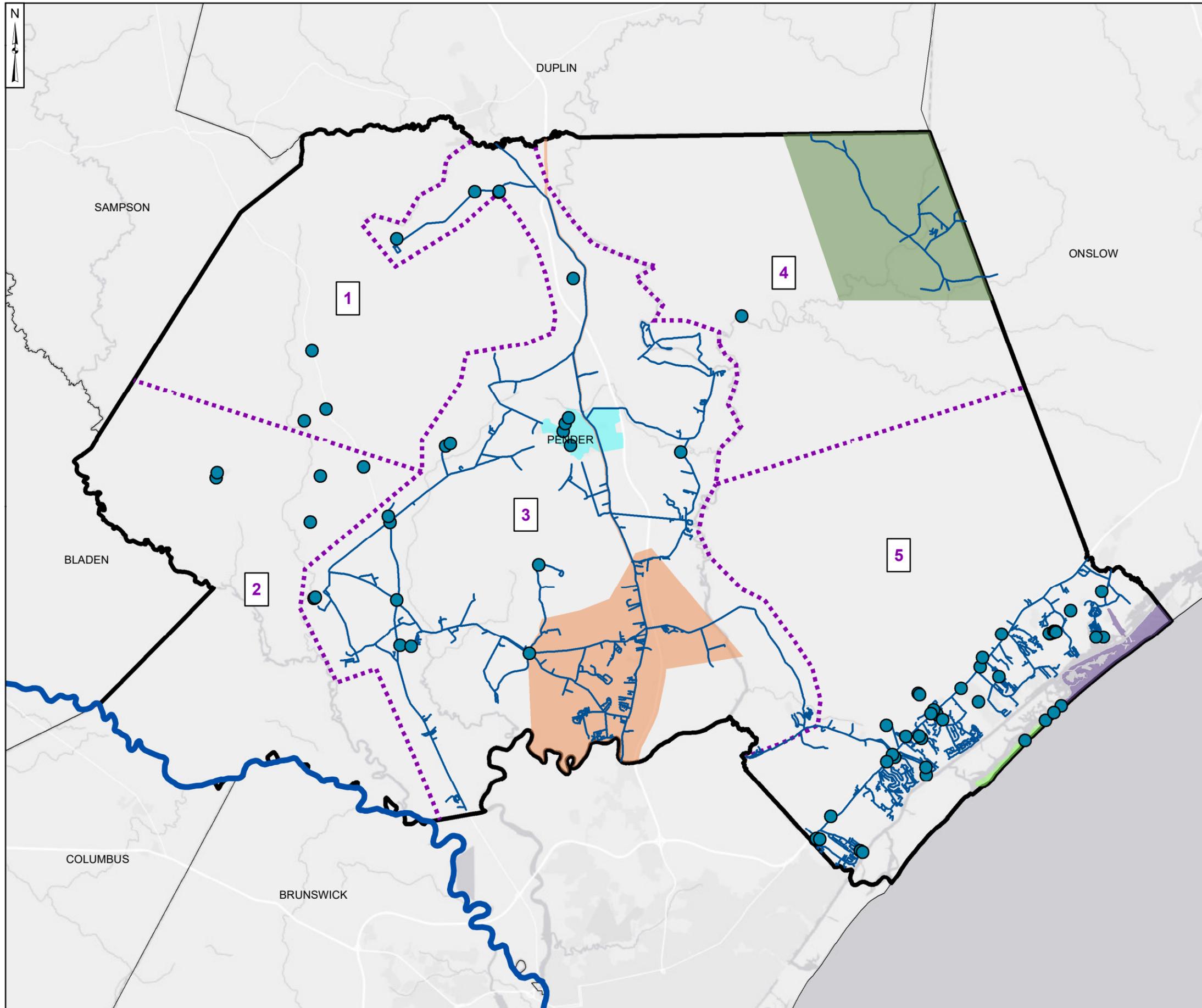
1. Public and Private well data provided by The North Carolina Department of Environmental Quality (NCDEQ) on November and December 2021.
2. Public Water Service Area was downloaded from The Drinking Water Resilience Interactive Project (DRIP) site (<http://drip.unctv.org/maps/maps-051716/>).
3. County Boundaries was downloaded from OneMap site (<https://www.nconemap.gov>).
4. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
5. Basemap source: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community.



Investigative Areas in Columbus County
Chemours Fayetteville Works
North Carolina

	Geosyntec Consultants of NC, P.C. NC License No.: C 3500 and C 295	Figure B.3
Raleigh	February 2022	

Projection: NAD83 North Carolina IUS; Units in Foot US



Legend

- Public Water Supply Water Source
- # Investigative Area Identifier
- ⋯ Investigative Areas (Tentative; May change as additional information is gathered)
- Cape Fear River
- ▭ County Boundary
- ▭ Surrounding North Carolina County
- Public Water Supply Lines

Public Water Service Areas

- Maple Hill Water District
- Rocky Pt/Topsail WS Dist
- Town of Burgaw
- Town of Surf City
- Town of Topsail Beach

Notes:

1. Public and Private well data provided by The North Carolina Department of Environmental Quality (NCDEQ) on November and December 2021.
2. Public Water Service Areas and the Public Water Supply Source were downloaded from The Drinking Water Resilience Interactive Project (DRIP) site (<http://drip.unctv.org/maps/maps-051716/>).
3. Public Water Supply Lines was downloaded from Pender County GIS data (<https://gis.pendercountync.gov/arcgis/rest/services/Layers/MapServer/50>).
4. County Boundaries was downloaded from OneMap site (<https://www.nconemap.gov>).
5. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
6. Basemap source: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community.

4 2 0 4 Miles

Investigative Areas in Pender County
Chemours Fayetteville Works
North Carolina

Geosyntec consultants	Geosyntec Consultants of NC, P.C. NC License No.: C 3500 and C 295	Figure B.4
Raleigh	February 2022	

Projection: NAD83 North Carolina IUS; Units in Foot US

TABLE B.1
PFAS ANALYTES
Chemours Fayetteville Works, North Carolina

Common Name	PFAS Grouping (Method)			Chemical Name	CASRN	Chemical Formula
	Attachment C (Table 3+ SOP and Table 6)	Table 3+ (Table 3+ SOP)	Other PFAS (Method 537 Mod)			
HFPO-DA ¹	✓	✓	✓	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-tetrafluoroethane	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 ¹	✓	--	✓	Perfluoroheptanoic acid	375-85-9	C7HF13O2

TABLE B.1
PFAS ANALYTES
Chemours Fayetteville Works, North Carolina

Common Name	PFAS Grouping (Method)			Chemical Name	CASRN	Chemical Formula
	Attachment C (Table 3+ SOP and Table 6)	Table 3+ (Table 3+ SOP)	Other PFAS (Method 537 Mod)			
PFBA	--	--	✓	Perfluorobutanoic acid	375-22-4	C4HF7O2
PFPeA	--	--	✓	Perfluoropentanoic acid	2706-90-3	C5HF9O2
PFHxA	--	--	✓	Perfluorohexanoic acid	307-24-4	C6HF11O2
PFOA	--	--	✓	Perfluorooctanoic acid	335-67-1	C8HF15O
PFNA	--	--	✓	Perfluorononanoic acid	375-95-1	C9HF17O2
PFDA	--	--	✓	Perfluorodecanoic acid	335-76-2	C10HF19O2
PFUnA	--	--	✓	Perfluoroundecanoic acid	2058-94-8	C11HF21O2
PFDaA	--	--	✓	Perfluorododecanoic acid	307-55-1	C12HF23O2
PFTriA	--	--	✓	Perfluorotridecanoic acid	72629-94-8	C13HF25O2
PFTeA	--	--	✓	Perfluorotetradecanoic acid	376-06-7	C14HF27O2
PFHxDA	--	--	✓	Perfluorohexadecanoic acid	67905-19-5	C16HF31O2
PFODA	--	--	✓	Perfluorooctadecanoic acid	16517-11-6	C18HF35O2
PFBS	--	--	✓	Perfluorobutanesulfonic acid	375-73-5	C4HF9SO
PFPeS	--	--	✓	Perfluoropentanesulfonic acid	2706-91-4	C5HF11O3S
PFHxS	--	--	✓	Perfluorohexanesulfonic acid	355-46-4	C6HF13SO3
PFHpS	--	--	✓	Perfluoroheptanesulfonic acid	375-92-8	C7HF15O3S
PFOS	--	--	✓	Perfluorooctanesulfonic acid	1763-23-1	C8HF17SO3
PFNS	--	--	✓	Perfluorononanesulfonic acid	68259-12-1	C9HF19O3S
PFDS	--	--	✓	Perfluorodecanesulfonic acid	335-77-3	C10HF21O3S
PFDoDS	--	--	✓	Perfluorododecanesulfonic acid	79780-39-5	C12HF25O3S

TABLE B.1
PFAS ANALYTES
Chemours Fayetteville Works, North Carolina

Common Name	PFAS Grouping (Method)			Chemical Name	CASRN	Chemical Formula
	Attachment C (Table 3+ SOP and Table 6)	Table 3+ (Table 3+ SOP)	Other PFAS (Method 537 Mod)			
4:2 FTS	--	--	✓	4:2 Fluorotelomer sulfonic acid	757124-72-4	C6H5F9O3S
6:2 FTS	--	--	✓	6:2 Fluorotelomer sulfonic acid	27619-97-2	C8H5F13SO3
8:2 FTS	--	--	✓	8:2 Fluorotelomer sulfonic acid	39108-34-4	C10H5F17O3S
10:2 FTS	--	--	✓	10:2 Fluorotelomer sulfonic acid	120226-60-0	C12H5F21O3
NEtFOSAA	--	--	✓	N-ethyl perfluorooctane sulfonamidoacetic acid	2991-50-6	C12H8F17NO4S
NEtPFOSA	--	--	✓	N-ethylperfluoro-1-octanesulfonamide	4151-50-2	C10H6F17NO2S
NEtPFOSAE	--	--	✓	N-ethyl perfluorooctane sulphonamidoethanol	1691-99-2	C12H10F17NO3S
NMeFOSAA	--	--	✓	N-methyl perfluorooctane sulfonamidoacetic acid	2355-31-9	C11H6F17NO4S
NMePFOSA	--	--	✓	N-methyl perfluoro-1-octanesulfonamide	31506-32-8	C9H4F17NO2S
NMePFOSAE	--	--	✓	N-methyl perfluorooctane sulfonamidoethanol	24448-09-7	C11H8F17NO3S
PFOSA	--	--	✓	Perfluorooctane sulfonamide	754-91-6	C8H2F17NO2S
F-53B Major	--	--	✓	Perfluoro(2-((6-chlorohexyl)oxy)ethanesulfonic acid)	756426-58-1	C8HCIF16O4S
F-53B Minor	--	--	✓	Perfluoro(2-((8-chlorooctyl)oxy)ethanesulfonic acid)	763051-92-9	C10HCIF20O4S
DONA	--	--	✓	2,2,3-Trifluoro-3-(1,1,2,2,3,3-hexafluoro-3-(trifluoromethoxy)propoxy)propanoic acid	919005-14-4	C7H2F12O4

Notes:

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

CASRN - Chemical Abstract Service Registry Number

EPA - Environmental Protection Agency

PFAS - Per- and Polyfluoroalkyl substances

SOP - Standard Operating Procedure

TABLE B.2
ADDITIONAL ANALYTES
Chemours Fayetteville Works, North Carolina

Other Analytes	Lab Method
Antimony	200.7 Rev. 4.4
Arsenic	200.7 Rev. 4.4
Barium	200.7 Rev. 4.4
Beryllium	200.7 Rev. 4.4
Cadmium	200.7 Rev. 4.4
Calcium	200.7 Rev. 4.4
Chromium	200.7 Rev. 4.4
Cobalt	200.7 Rev. 4.4
Copper	200.7 Rev. 4.4
Iron	200.7 Rev. 4.4
Lead	200.7 Rev. 4.4
Magnesium	200.7 Rev. 4.4
Manganese	200.7 Rev. 4.4
Molybdenum	200.7 Rev. 4.4
Nickel	200.7 Rev. 4.4
Potassium	200.7 Rev. 4.4
Selenium	200.7 Rev. 4.4
Silver	200.7 Rev. 4.4
Sodium	200.7 Rev. 4.4
Strontium	200.7 Rev. 4.4
Vanadium	200.7 Rev. 4.4
Zinc	200.7 Rev. 4.4
Chloride	300.0
Fluoride	300.0
Nitrate	300.0/353.2
Nitrite	300.0/353.2
Sulfate	300.0
1,4-Dioxane	522
Total Coliforms by Presence/Absence	9222B
Total Dissolved Solids	SM 2540 C
Total Phosphorus	200.7 Rev. 4.4