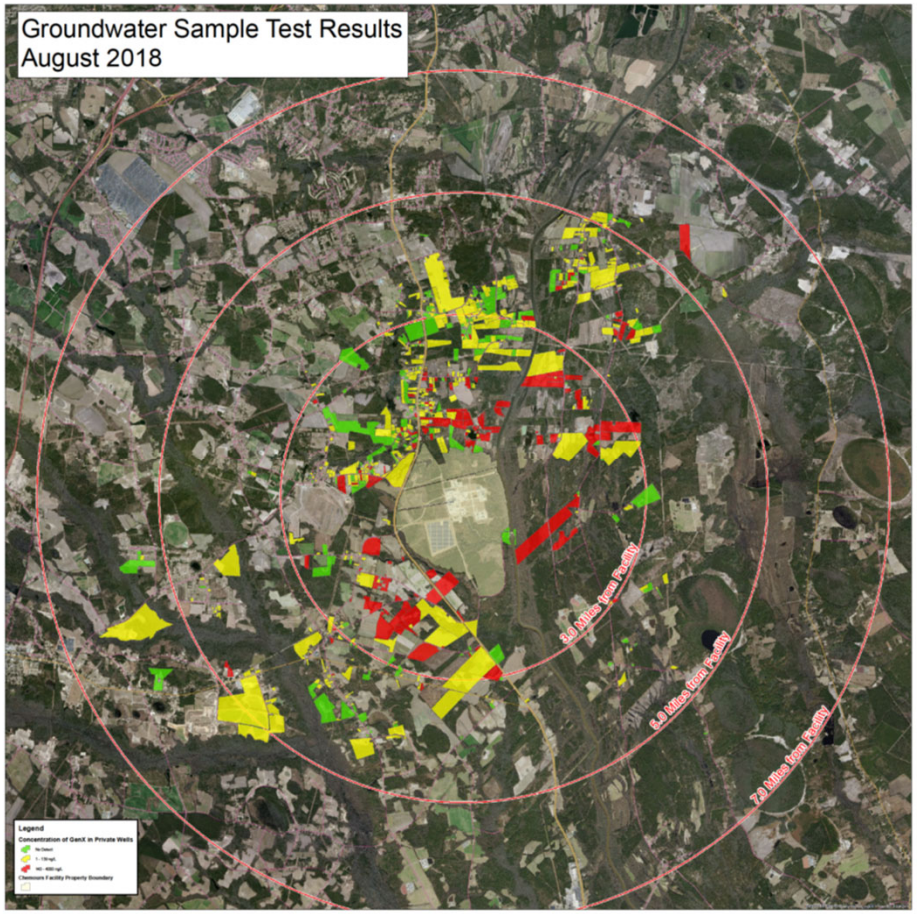
Division of Waste Management

December 11, 2018

Division of Waste Management



Well Sampling Results in Chemours area,
Approximate distances from facility boundary:
Northeast – 5.5 miles
West – 3 miles
Southwest – 5 miles
East – 3.5 miles

GenX: NC provisional health goal = 140 ppt

- >140 ppt
- 0 - 140 ppt
- Non detect

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Private well water GenX summary	Combined well data
Distance from Chemours' border	Up to 5.5 miles
Well collection dates	9/6/2017 – 8/31/2018
Number of wells tested	835
Number of not-detected ("ND") GenX analyses	222
Number of GenX detections less than the Provisional Health Goal [a]	441
Number of exceedances of the GenX Provisional Health Goal [a]	172
Maximum Detected GenX Concentration	4000 ppt

a. The NC DHHS Provisional Drinking Water Health Goal for GenX is 140 ppt (July 2017)

Combined Phase I, II, III , IV (partial) Private Well PFAS Data.

Includes sampling by Chemours's consultants, DEQ and Robeson Co. staff.

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Granular Activated Carbon (GAC) Whole House Filtration Systems

- **Pilot study goals**:
  - Assess for residential wells with GenX at or above 140 ppt.
  - Are they effective at chemical removal?
  - What maintenance and monitoring is required?

- **Basic study information:**
  - 6 Locations
  - Avg. GenX in untreated water = 178 - 1,719 ppt
  - Avg. water usage = 571 to 2,438 gallons/week
  - Analyzing for GenX and 32 other PFAS

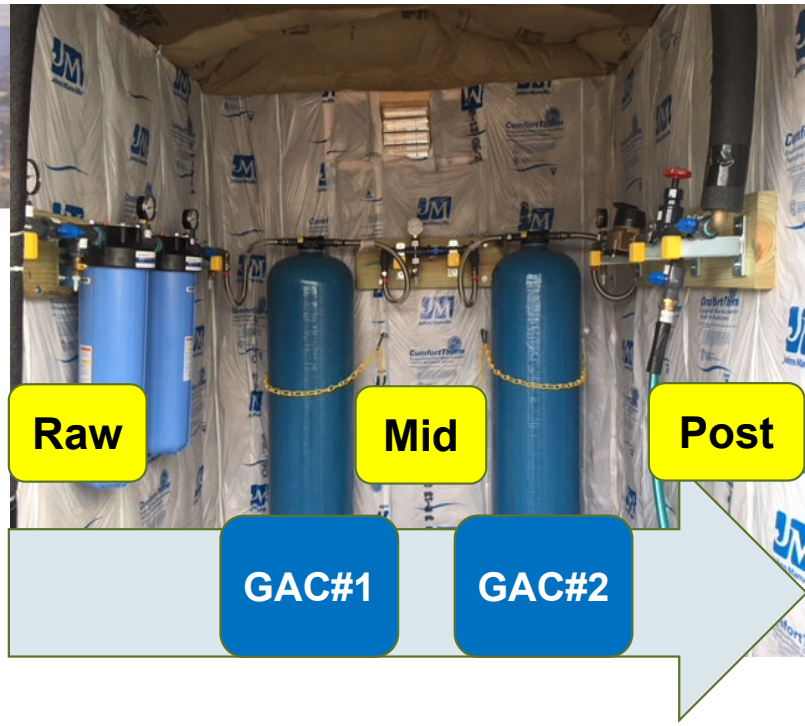
Disclaimer: This GAC system may be different from other GAC systems available on the market.

GAC System Pilot Study: Preliminary Results

- **Raw:** Untreated water samples
  - 15 PFAS: Not detected
  - 17 PFAS: Detected
    - 7 PFAS: 50 ppt or higher at 1 or more sites: GenX, PFMOAA, PFO2HxA, PFMOPrA, PFO3OA, PFMOBA, and Nafion BP2

- **Mid:** Evaluating chemical "breakthrough" for operation and maintenance.

- **Post:** Finished water samples
  - No PFAS detected above 10 ppt.



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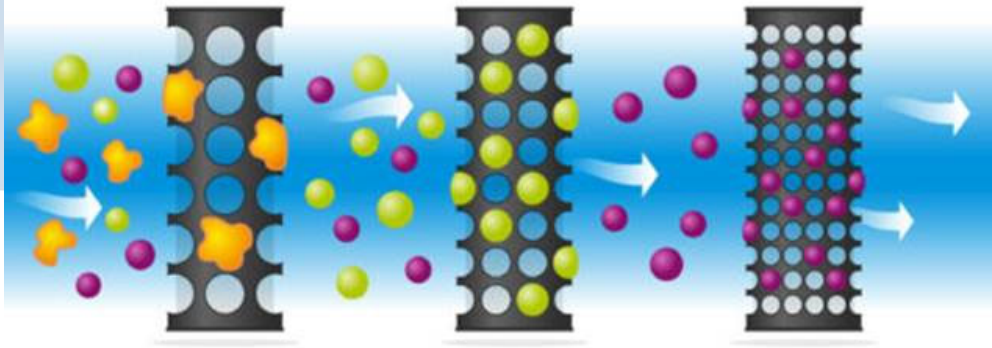
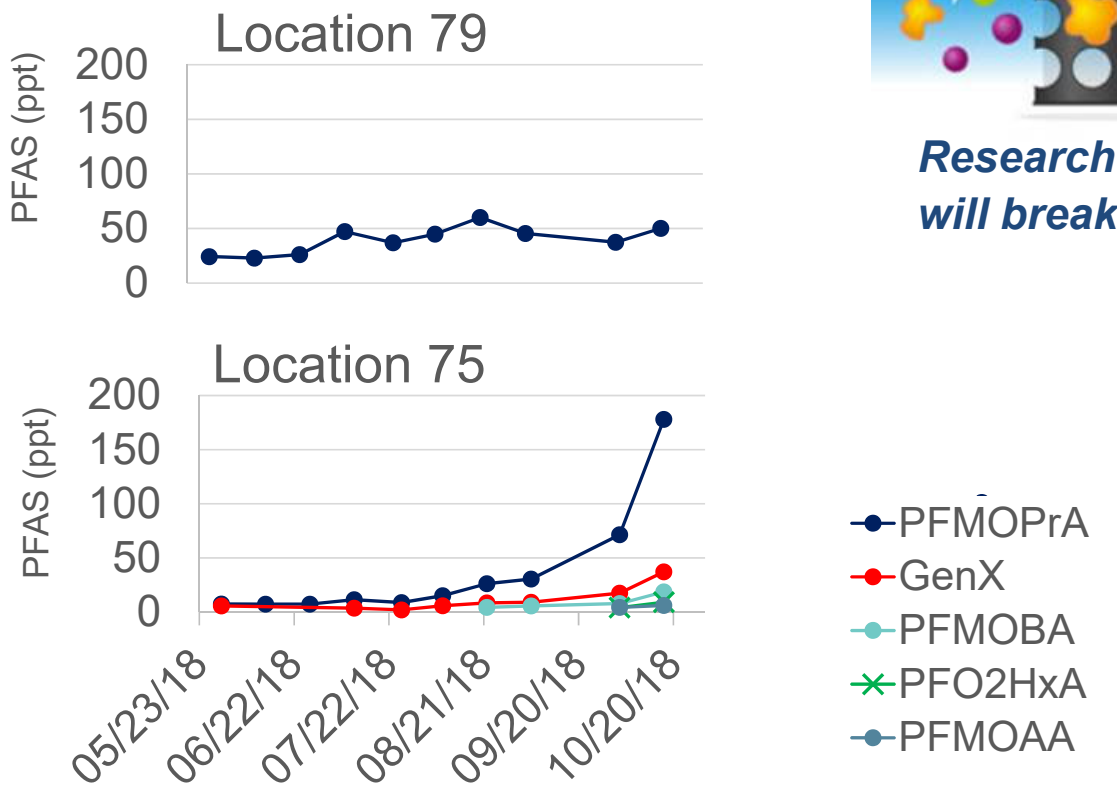
Breakthrough-
Inside the GAC System



Research predicts that smaller chemicals will breakthrough first.



GAC Pilot Study Summary

- **System performance**
  - Based on first 5 months of data, filters appear to be removing GenX & other PFAS.

- **System maintenance**
  - Beginning of breakthrough and filter replacement, at some sites.
  - Sampling at GAC sites is ongoing and will continue.
  - DEQ will evaluate results to determine:
    - How long filters maintain water quality at levels that protect public health?
    - How often do systems require monitoring?

- **Reviewing concerns of residents**
  - Water pressure, cold temperatures in sheds.

Other GAC Pilot Study Sampling

- **Indoor water quality:** After leaving the GAC system, can water pick up more GenX and PFAS?
  - Yes, detected at GAC location 71 only.
  - Possible sources where chemicals may be “sticking around” include water softener and heater.

Location 71 Indoor Water Quality	
Sampling Point	**GenX (ppt)**
After GAC System	Not Detected
Indoor Cold	59.1
Indoor Hot	120 & 134

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Installation of New GAC Systems

- Chemours has offered to install GAC Units for residences where wells exceed 140 ppt GenX.

- As of November 29 Chemours has:
  - Interviewed 51 residents interested in GAC installation
  - Secured 38 signed Access Agreements
  - Installed 10 GAC units, plumbing has been installed and electrical is pending
  - Completed 2 GAC Units, plumbing and electrical
  - 22 GAC units are in the process of installation (not counting the 12 listed above)

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Post-Hurricane Florence Sampling

Chemours has re-sampled to assess impacts of the hurricane

- **Surface Water**
  - 3 Tributary Creeks: Willis Creek, Georgia Branch Creek, Old Outfall Channel.
  - Ponding floodwater near the river.
  - Chemours Outfall 002 Sample.
  - Cape Fear River: one upstream of facility, one downstream of facility.
  - Ponds: one at Marshwood Lake, one at an onsite pond.
- **Groundwater**
  - 14 on-site wells: 5 adjacent to the Cape Fear River, 9 perched zone wells.
  - 20 residential drinking water wells: various depths, locations and concentrations.
- **Will analyze for a broad range of PFAS not just GenX**
- **Awaiting results**

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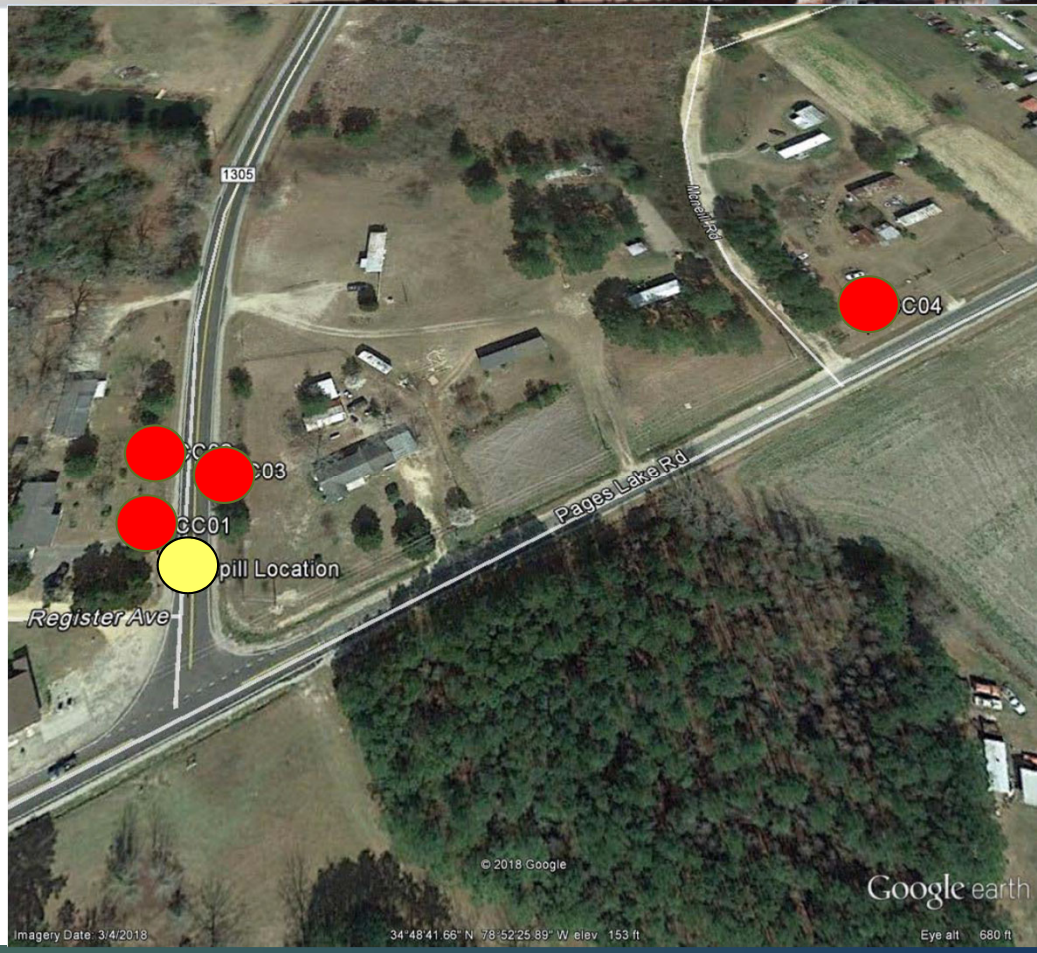
Truck Spill on 9/18/18

A truck leaving the Chemours facility spilled liquid on the road near the intersection of Tobermory Rd. and Register Ave.

- **Liquid samples:** collected by waste receiving facility and a concerned citizen.
- **Soil samples**: collected by DEQ and EPA staff.
  - Being analyzed for GenX and full suite of PFAS.



On-site Remediation: Chemours Actions

Reason – to reduce infiltration of PFAS to groundwater and the river

- **Lining of Cooling Water Channel** – complete November 7, 2018
- **Lining of Sediment Basins**
  - South Basin – completed October 25, 2018
  - North Basin – to be completed no later than December 31, 2018
- **Dewatering of Perched Zone**
  - Highest concentrations of PFAS are in the Perched Zone
  - Pumping began February 2018
  - 41,363 gallons removed as of November 26, 2018

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Fish Sampling

- **Marshwood Lake:** Sampled by DEQ in Spring and Fall 2018
- **Samples collected:** Lake water, sediment, and fish. Fish include largemouth bass, redear sunfish and blue catfish.
- **Chemical analysis:** GenX and other PFAS
- **Complex analysis:** Data is still under review.

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Questions?

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PFAS - Community Update

Linda Culpepper, NC DEQ Division of Water Resources
December 11, 2018

Emerging Compounds Resources

State Resources

- Division of Air Quality (DEQ)
- Division of Waste Management (DEQ)
- Division of Water Resources (DEQ)
- Department of Health and Human Services
- Department of Agriculture and Consumer Services

Federal Resources

- EPA
- National Institute for Environmental Health Science
- Centers for Disease Control

Local Resources

- County Health Departments
- Boards of Commissioners
- Citizens
- NGOs

New EPA Drinking Water Method 537.1

Analyte	Acronym	Chemical Abstract Services Registry Number (CASRN)
• Hexafluoropropylene oxide dimer acid	HFPO-DA ('GenX')	13252-13-6b
• N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA	2991-50-6
• N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA	2355-31-9
• Perfluorobutanesulfonic acid	PFBS	375-73-5
• Perfluorodecanoic acid	PFDA	335-76-2
• Perfluorododecanoic acid	PFDoA	307-55-1
• Perfluoroheptanoic acid	PFHpA	375-85-9
• Perfluorohexanesulfonic acid	PFHxS	355-46-4
• Perfluorohexanoic acid	PFHxA	307-24-4
• Perfluorononanoic acid	PFNA	375-95-1
• Perfluorooctanesulfonic acid	PFOS	1763-23-1
• Perfluorooctanoic acid	PFOA	335-67-1
• Perfluorotetradecanoic acid	PFTA	376-06-7
• Perfluorotridecanoic acid	PFTrDA	72629-94-8
• Perfluoroundecanoic acid	PFUnA	2058-94-8
• 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9c
• 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	9Cl-PF3ONS	756426-58-1d
• 4,8-dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4e

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Continuing Sampling

- Two composite samples weekly at Chemours wastewater outfall into the Cape Fear River:
  - Monday-Thursday and Friday-Sunday

- Drinking water facilities downstream are sampled weekly:
  - Bladen Bluffs
  - International Paper
  - NW Brunswick
  - Pender County
  - CFPUA Sweeney

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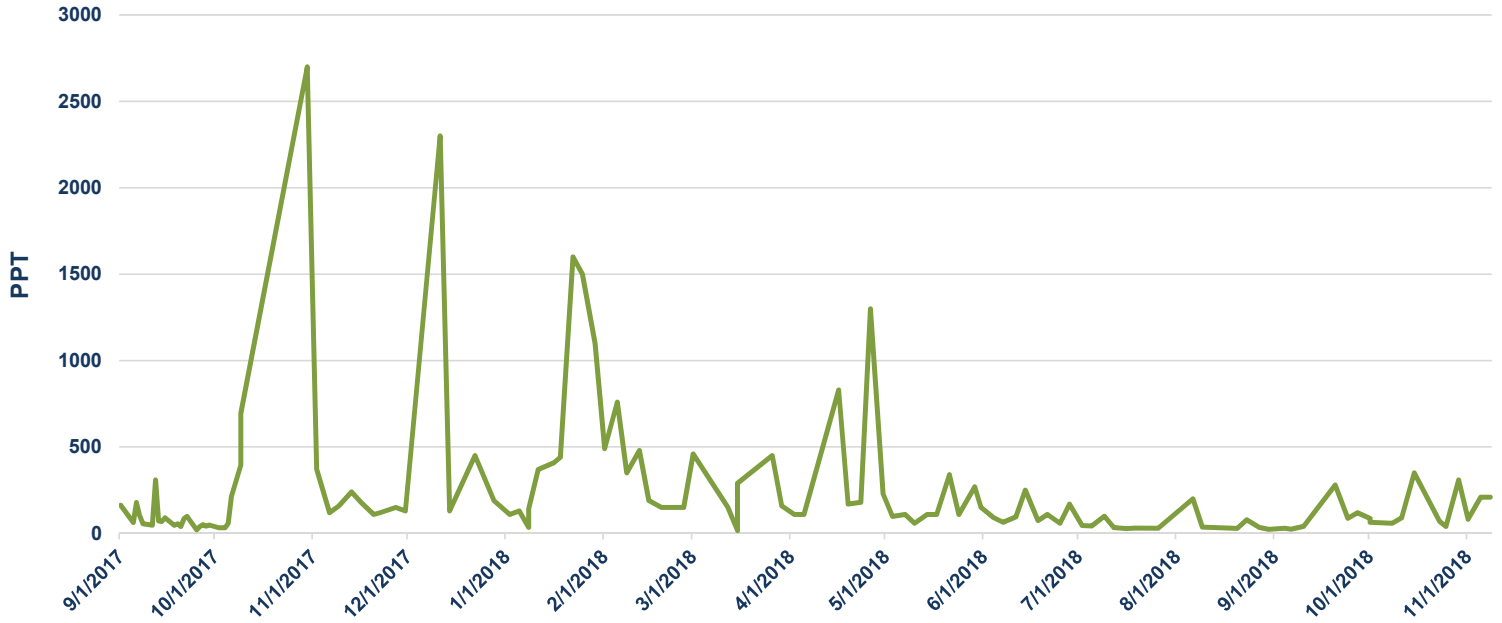
Data at Chemours Outfall 002
HPFO-DA (parts per trillion)



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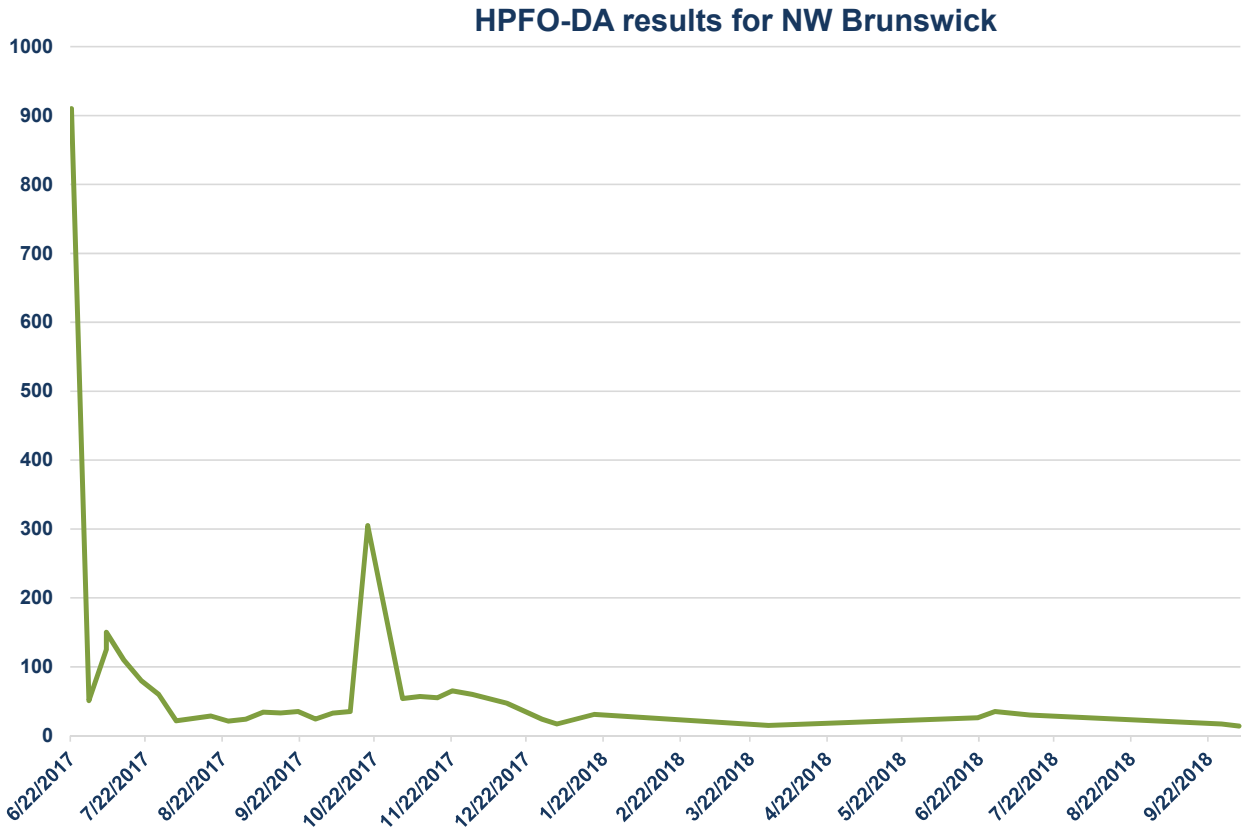

Data tables are at:
https://deq.nc.gov/news/hot-topics/genx-investigation/genx-sampling-sites

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Department of Environmental Quality GenX information:
https://deq.nc.gov/news/hot-topics/genx-investigation

Proposed Consent Order

Filed in Bladen County between DEQ, Chemours and SELC/Cape Fear River Watch

If signed, the order will:

- Prevent PFAS from the facility entering the environment
- Require Chemours to clean up groundwater contamination, a significant contributor to PFAS in the river
- Provide that Chemours will pay for alternate water
- Require disclosure of all PFAS in waste streams
- Require studies to better understand PFAS
- Require Chemours to communicate formal notices of activity changes, or spills
  - Community around the plant
  - Downstream – in and around Wilmington

Enforcement Authority

DEQ may penalize Chemours for missed deadlines, violations of the order

Court can hold company in contempt for violating the order

Appendix

Sweeney Plant GenX Measurements in Finished Water

SOURCE: Cape Fear Public Utility Authority

June 26, 2017 – November 5, 2018