Chemours Update – Division of Waste Management

North Carolina Department of Environmental Quality

March 12, 2020

GenX

- **GenX** = HFPO-DA or C3 Dimer Acid = $C_6HF_{11}O_3$
- GenX is a trade name for a manmade and unregulated chemical used in manufacturing nonstick coatings and for other purposes.
- It is an *emerging compound* in a family of chemicals known as per- and poly- fluorinated alkyl substances (PFAS).
- GenX is produced and emitted by one company in NC – Chemours - Fayetteville Works (formerly Dupont).
- It has been discharged into the Cape Fear River for more than 30 years, as a byproduct and then product.
- Labs couldn't test for it until the past 2-3 years.

Emerging Compounds

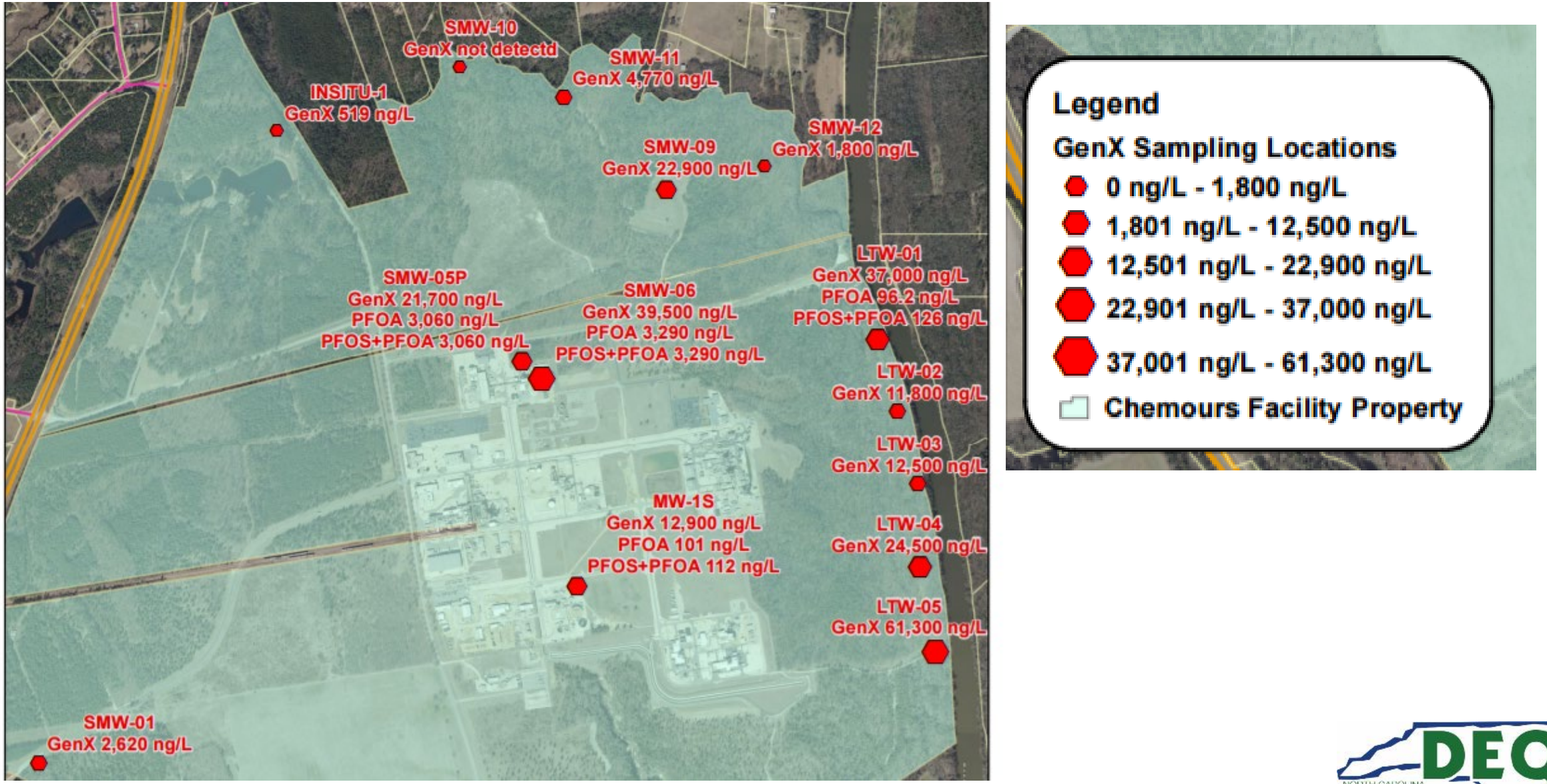
What do we mean when we say emerging compounds?

- No specific limit in environmental regulations.
- Little is known about how they behave in the environment.
- Little known about their effects on human health and environment.
- Significant challenge for regulatory agencies.
- How to prioritize? Research? Minimize impacts?
- *Communicate?*

Emerging Compounds – GenX Case History

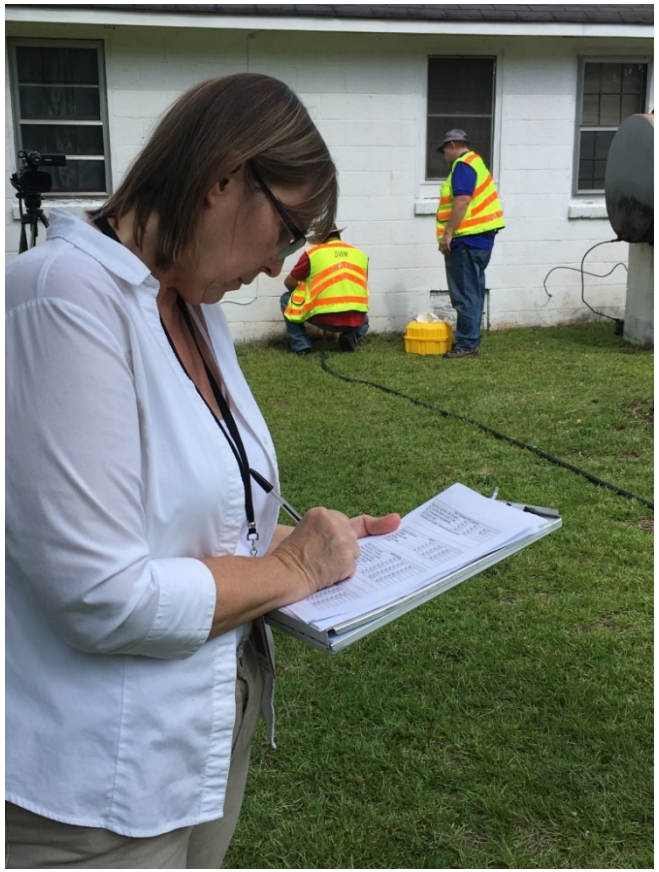
- Early-mid 2017: Focus on surface water issues
- Mid 2017: Groundwater issues discovered
- Mid-late 2017: Air emission contributions
- Through 2018: Testing of emissions and drinking wells
- Feb. 2019: Consent Order signed
- Dec. 2019: Thermal Oxidizer installed
- 2019-2020: Ongoing private well testing
- Currently: Focus on the residual PFAS

Onsite Groundwater Testing at Chemours 2017



Offsite Groundwater Testing

- Found high levels of PFAS compounds in onsite monitoring wells
- In 2017, NC DHHS established a GenX drinking water health goal of 140 ng/L (ppt)
- DEQ tested wells on properties adjacent to Chemours first and found high levels
- Asked Chemours to test additional wells in the area to determine extent of contamination



NORTH CAROLINA
Department of Environmental Quality

Chemours – Consent Order Feb. 2019

Addressing contamination

- NC DEQ entered into a Consent Order with Chemours on February 26, 2019 https://deq.nc.gov/news/key-issues/genx-investigation
- Requirements to reduce air emissions and to achieve maximum reductions of all remaining PFAS contributions to the Cape Fear River on an accelerated basis, including groundwater.
- Notify and coordinate with downstream public water utilities when potential discharge of GenX compounds into the Cape Fear River above 140 ppt.
- Additional penalties will apply if Chemours fails to meet the conditions and deadlines established in the Consent Order.

Consent Order: Plans Under Review

Addressing contamination

Plans that are currently under review:

- Accelerated Reduction of PFAS to the Cape Fear River
  - Received August 2019
  - Focuses on reductions to be achieved in 2 years; 5 years for additional reductions
- On- and Off-site Assessment of Contamination
  - Report received September 30, 2019
  - Response from DEQ soon
- Corrective Action Plan (CAP)
- Toxicity Studies on Potential Health Risks
  - Received March 25, 2019
  - Contract labs to assess potential human and environmental health effects.

Plans Under Review: Chemours Corrective Action Plan

- Plan received December 31, 2019
- Currently under review
- Includes groundwater remediation and other PFAS contamination on- and off-site.
- Public comment period currently open.
- Send comments to publiccomments@ncdenr.gov

Consent Order: Plans Under Review

DEQ Concerns

DEQ's main concerns regarding the Corrective Action Plan and On- and Offsite Assessment are:

- More data may be requested to fully understand all contamination on- and off-site.
- The best options for remediating the remaining PFAS are still under review.
- More information on potential effects to receptors may be requested.

As part of the Consent Order, Chemours must:

- Achieve control technology improvements and emissions reduction milestones;
- Determine which PFAS at what amounts are in wastewater and stormwater at the facility (bimonthly for two years; then may decrease frequency);
- Determine which PFAS at what amounts are in river sediment and downstream raw water intakes for drinking water plants;
- Fund method development to test for Total Organic Fluorine in air emissions and wastewater;
- Submit and implement a Drinking Water Compliance Plan (April 2019); and
- Conduct additional reporting.

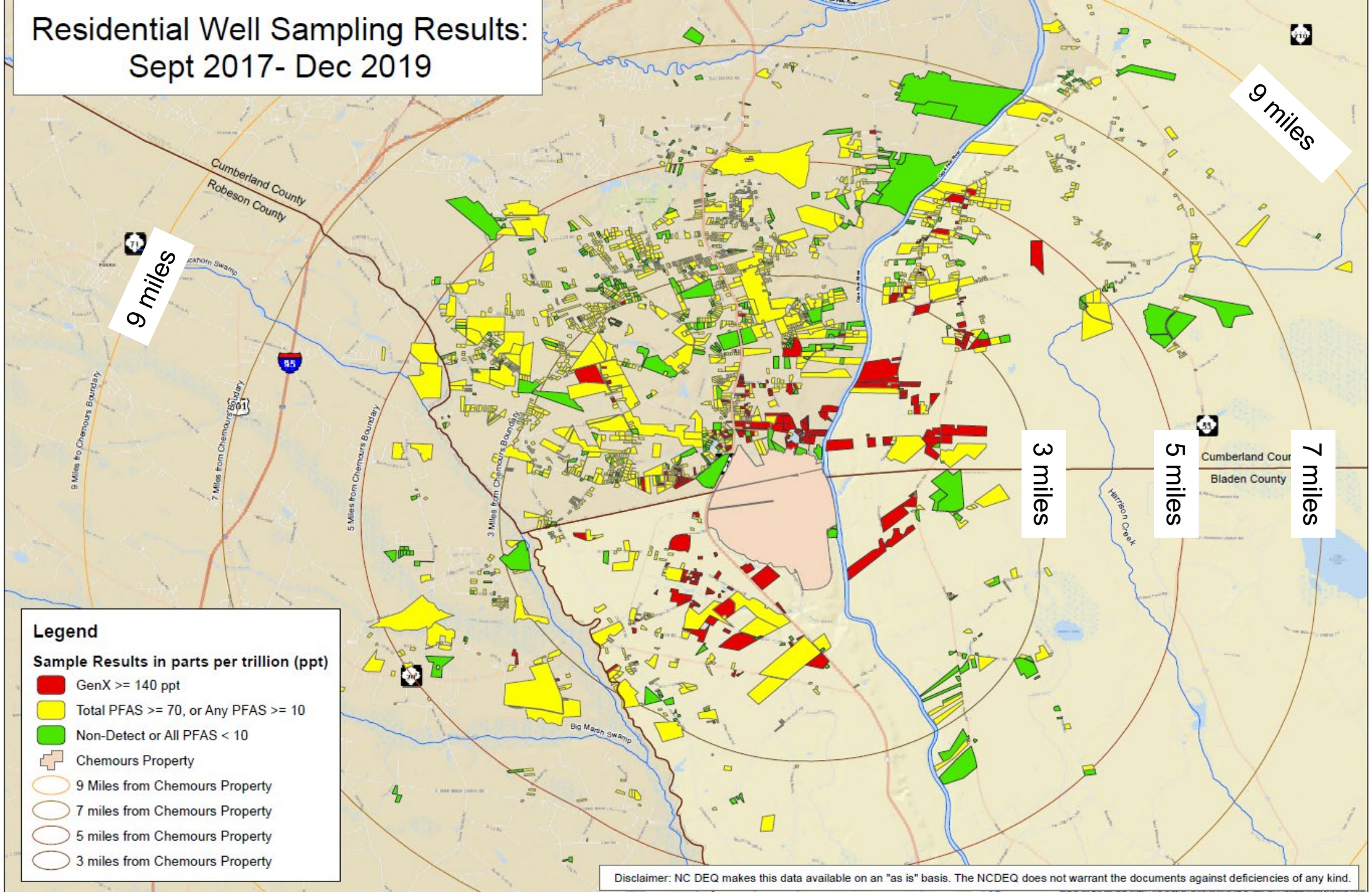
Sample Wells and Provide Drinking Water

- Sample drinking water wells
  - Chemours proposed a Well Sampling Step-Out and Infill Plan.
  - Chemours consultant Parsons will sample ¼-mile beyond the closest well that had PFAS levels above 10 parts per trillion
  - Annually retest wells that were previously sampled once both the step-out and infill plans have been completed.
  - Provides bottled water in three days from receipt of test results if exceed a Consent Order limit

Sample Wells and Provide Drinking Water

- Provide permanent drinking water supply
  - For those with GenX above 140 parts per trillion or applicable health advisory.
  - Public waterline connection or whole building GAC filtration system

- Provide, install and maintain up to three under-sink (reverse osmosis or RO) systems per residence
  - Combined PFAS levels above 70 parts per trillion or any individual PFAS compound above 10 parts per trillion.
  - Within six months (unless extended as needed) of Consent Order or receiving test results


Residential Well Sampling Results:
Sept 2017- Dec 2019
Cumberland County
Robeson County
Cumberland Coun
Bladen County
9 miles
9 miles
3 miles
5 miles
7 miles
9 Miles fro Chemours Boundary
7 Miles from Chemours Boundary
5 Miles from Chemours Boundary
3 Miles from Chemours Boundary
Big Marsh Swamp
Harrison Creek
Legend
Sample Results in parts per trillion (ppt)
GenX >= 140 ppt
Total PFAS >= 70, or Any PFAS >= 10
Non-Detect or All PFAS < 10
Chemours Property
9 Miles from Chemours Property
7 miles from Chemours Property
5 miles from Chemours Property
3 miles from Chemours Property
Disclaimer: NC DEQ makes this data available on an "as is" basis. The NCDEQ does not warrant the documents against deficiencies of any kind.

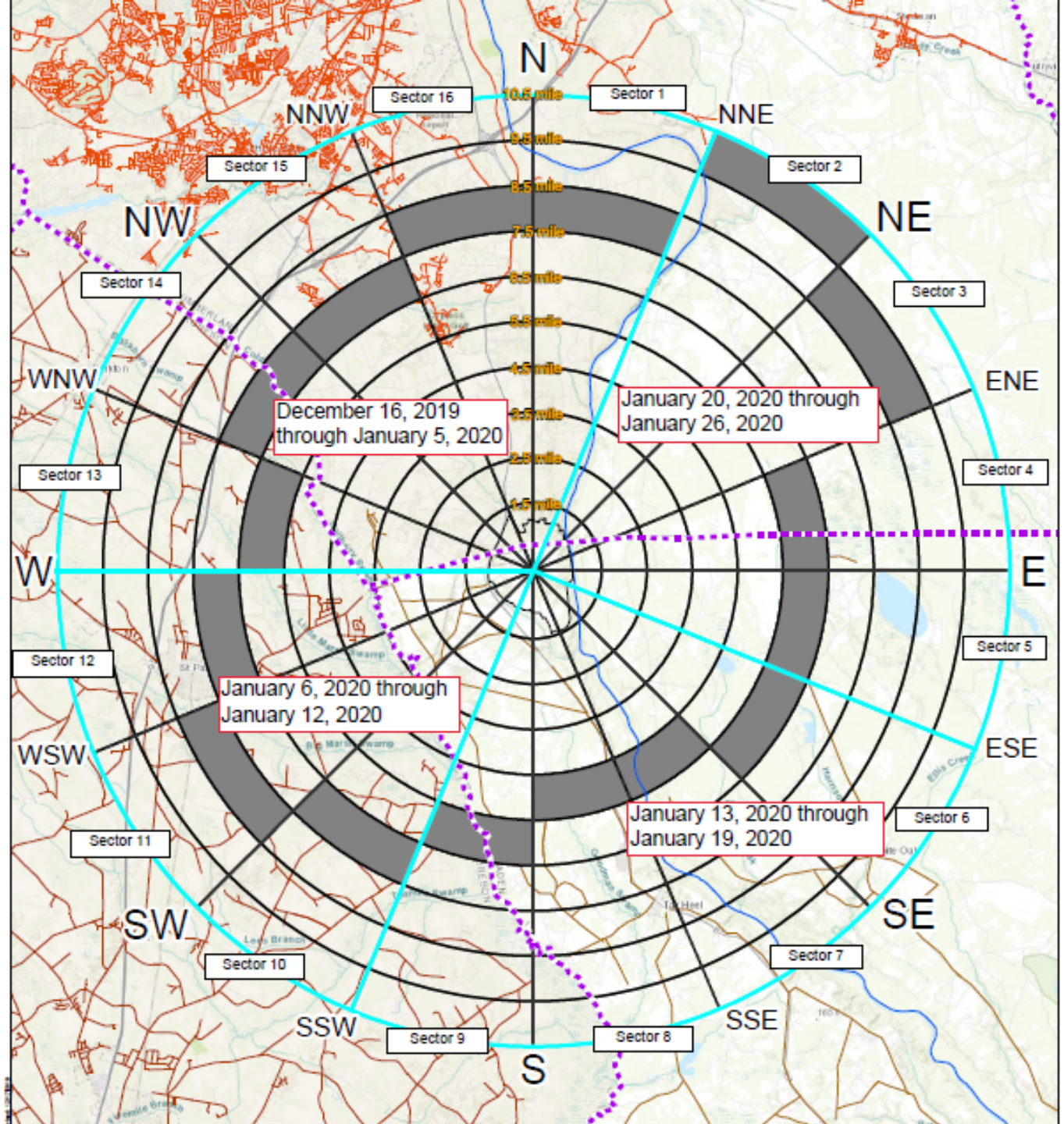
GenX Private Well Summary Data

All Private Well PFAS Data, including Chemours- and DEQ-collected data and Robeson Co. data collected through Dec. 31, 2019

Private Well Water Testing Summary	Combined Well Data
Distance from Chemours	Up to ~10 miles
Well Collection Dates	Up to Jan. 2020
Number of Wells Tested (by land parcel)	2,349
Number of Exceedances of Provisional Health Goal (Gen X, 140 ng/L)[a]	204
Number of Consent Order Exceedances of 10 ng/L for single PFAS or 70 ng/L total PFAS	1,773
Results all PFAS below 10 ng/L	372
Maximum Detected GenX Concentration	4,000 ng/L (ppt)

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

Well Sampling Step-Out Plan



Consent Order required Chemours to develop a plan for well testing.

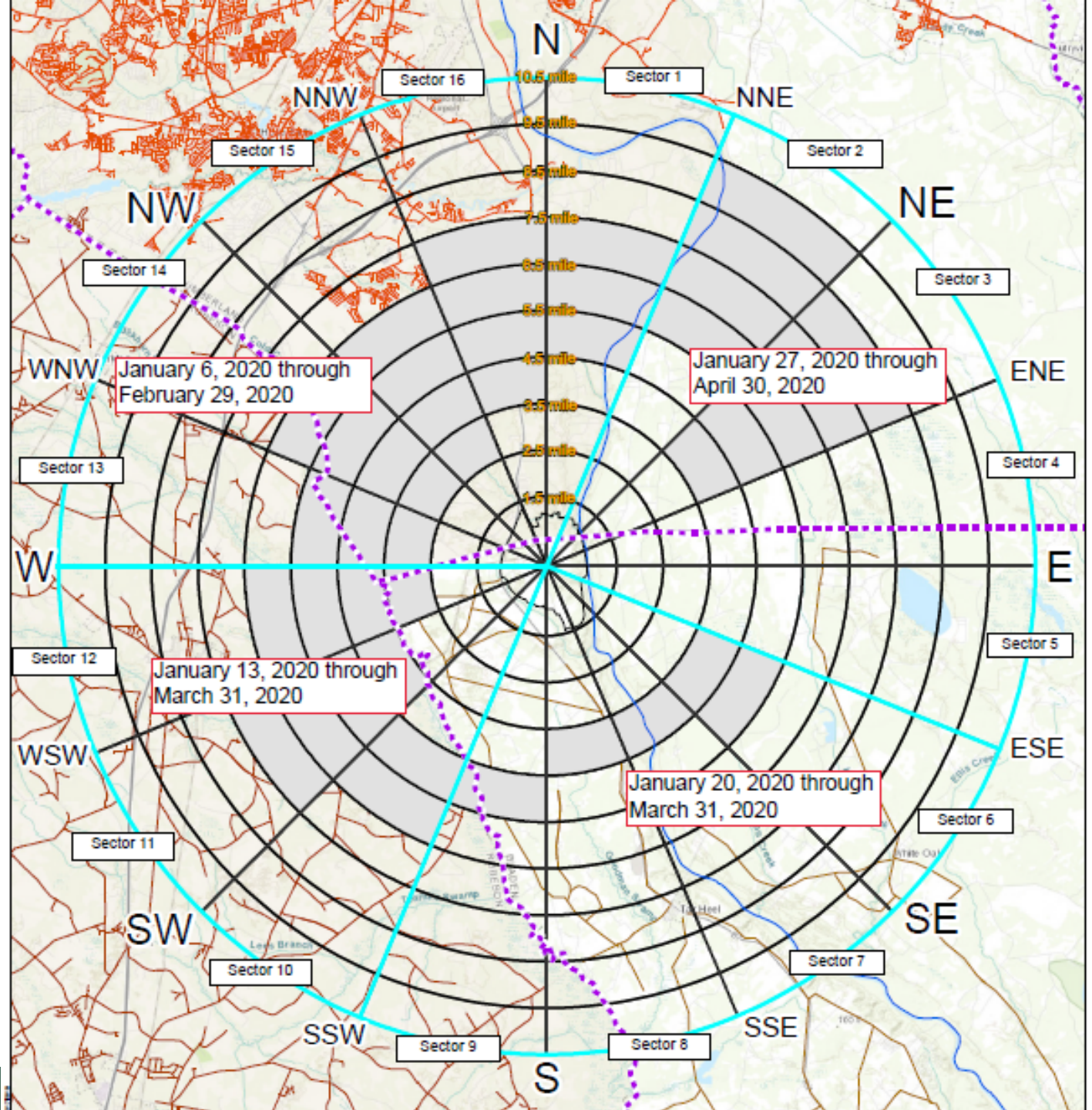
Chemours' Well Sampling Step-Out and Infill Plan, based on a 16-sector bullseye diagram, is shown on the left.

The dark gray areas show "Step-Out" testing areas planned for December 2019 - January 2020

Well Sampling Infill Testing

After Step-Out testing, the Well Sampling Plan then requires Infill Testing.

The light gray areas on this map show “Infill” testing planned for January through April of 2020.



Testing and Your Well

- To request well testing, call Chemours at **910-678-1101**
- Parsons Environment and Infrastructure, known as “Parsons,” is an independent water testing contractor for Chemours.
  - If you do not respond, you will not be able to get tested.
  - If you refuse well testing, you will not be eligible for replacement water.

Public Water Feasibility Decisions

Public water supply (municipal) options for those with GenX at or above 140 ppt where feasible

- Public water feasibility letter issued by DEQ for the East side of the Cape Fear River
- Public water feasibility letter issued by DEQ for Bladen County West of the Cape Fear River
- Ongoing dialogue with Cumberland County about the locations on the West side of the Cape Fear River and the recent commitment by the county to run municipal water

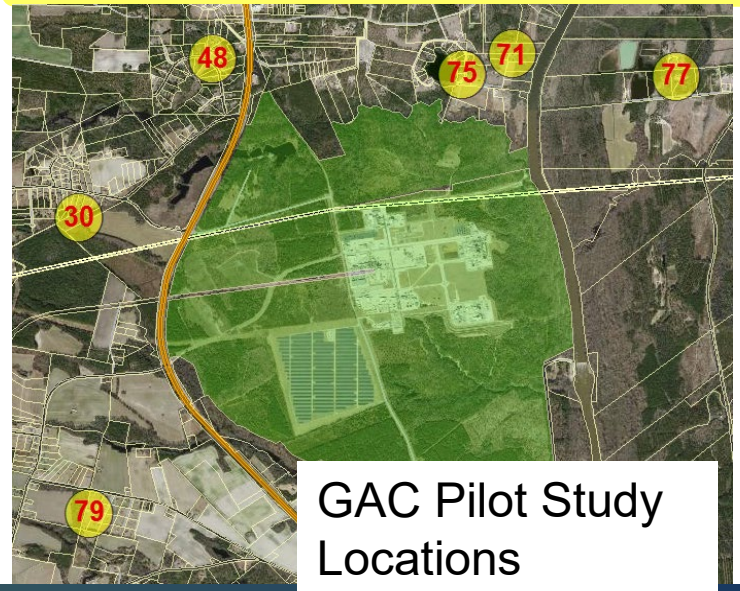
GAC Filter Pilot Study

Results of whole house GAC (Granular Activated Carbon) filter Study

- **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?

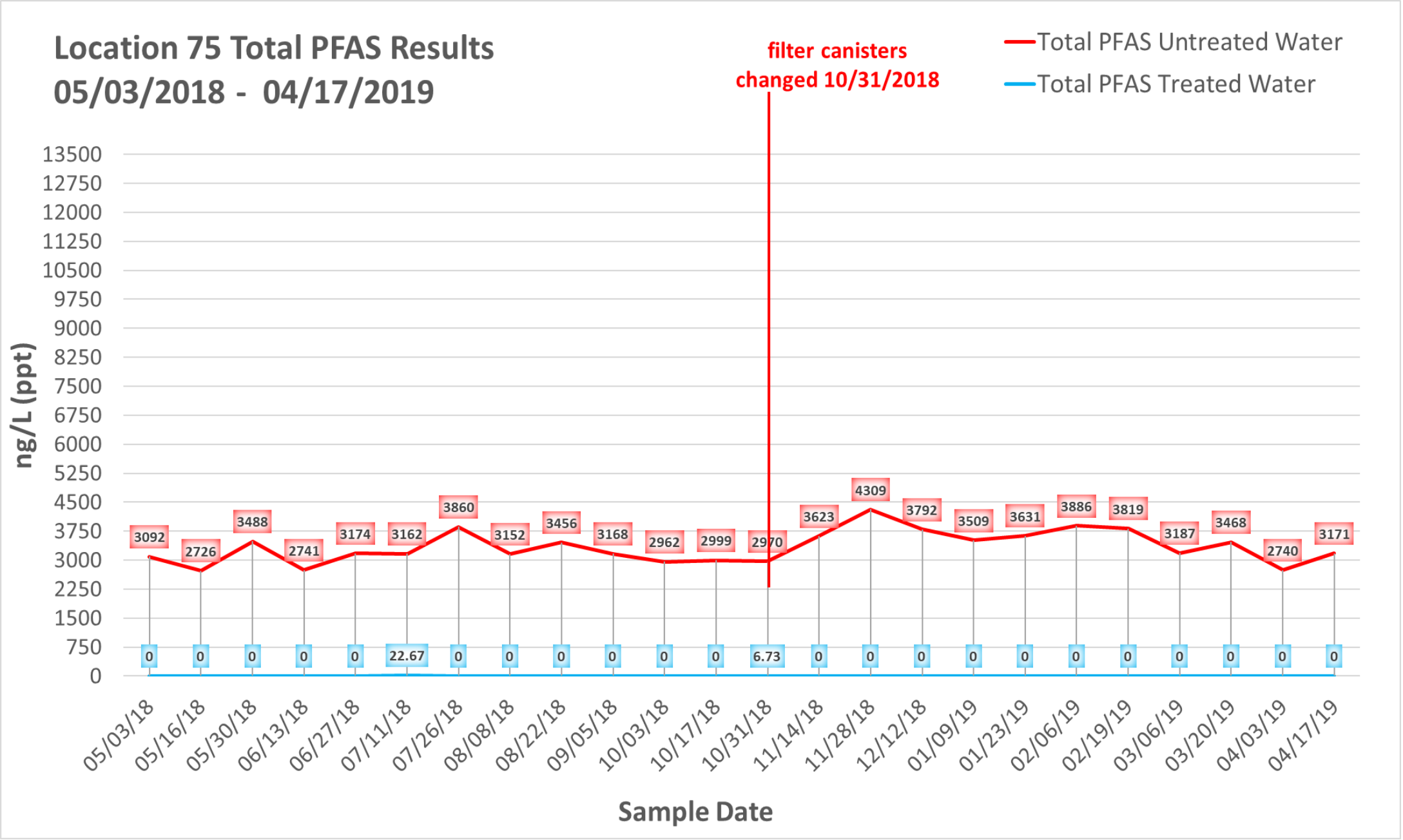
- **Basic study information:**
  - Six Locations
  - Average. GenX in untreated water = 178 - 1,719 ppt
  - Average water usage = 571 to 2,438 gallons/week
  - Analyzing for GenX and 32 other PFAS

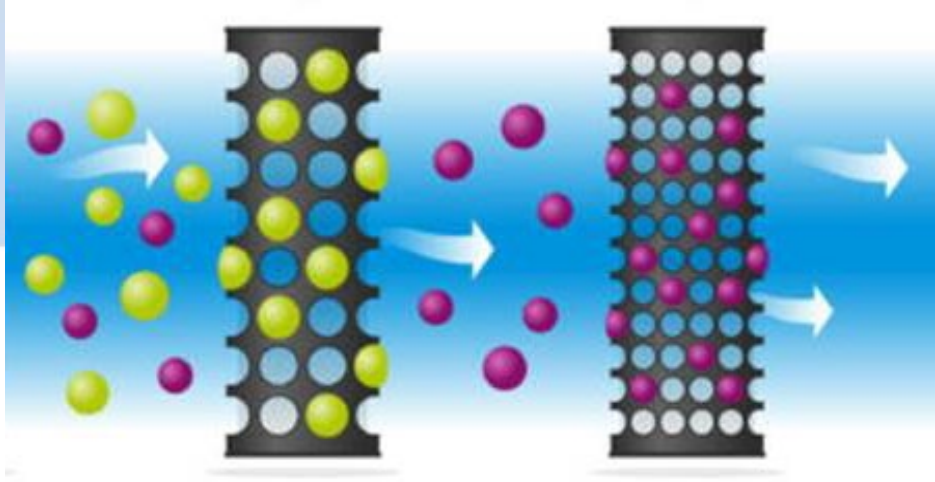
This GAC system may perform differently from other GAC systems available on the market.



GAC Pilot Study Locations

Results at one site of DEQ's whole-house Granular Activated Carbon filter study





GAC Maintenance:

- GAC systems must be maintained to be effective.
- Consent Order requires quarterly testing *between* the filters to check for breakthrough.
- Consent Order requires that filters must be changed when any PFAS reaches 100 ppt *between* the filters.
- If filters are not changed regularly, they can become a source and *increase* levels of PFAS in the water.

Reverse Osmosis Filter Pilot Study

Results of under-sink reverse osmosis (RO) filter study

Pilot study goals:

- Are they effective at chemical removal?
- Assess High and Low concentrations:
  - Low concentrations were eligible for RO (GenX = 10-139 ppt)
  - High concentrations were eligible for GAC (GenX greater than140 ppt)

Reverse Osmosis Filter Pilot Study

Results of under-sink reverse osmosis (RO) filter study

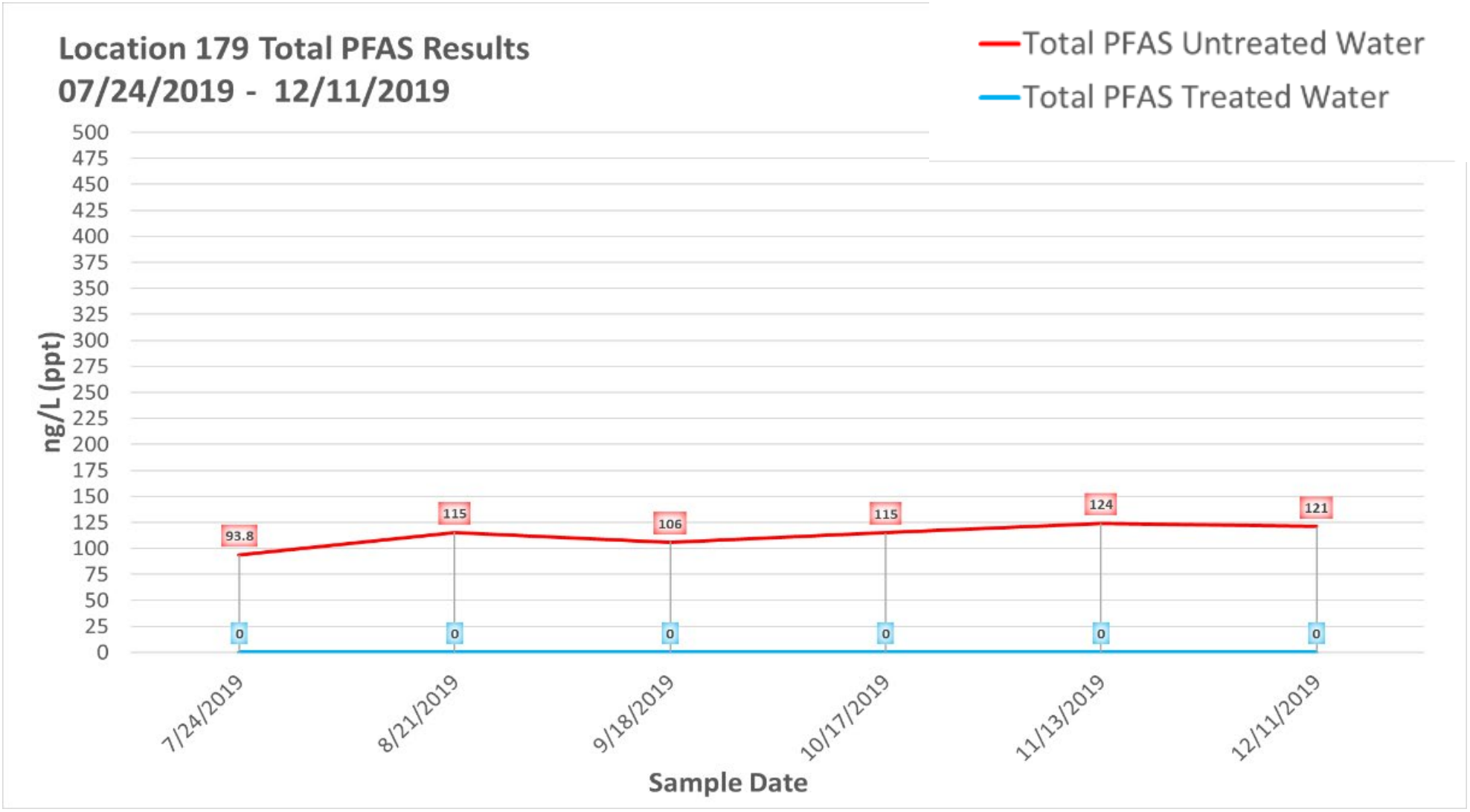
Basic study information:

- 4 Locations:
  - 3 Low concentration homes:
    - Average Total PFAS in untreated well water = 101-155 ppt
    - Up to 7 PFAS detected
  - 1 High concentration home:
    - Average Total PFAS in untreated well water = 3,359 ppt
    - Up to 18 PFAS detected
- Analyzing for GenX and 44 other PFAS (two more PFAS added mid-September)

This reverse osmosis system may perform differently from other reverse osmosis systems available on the market.

Reverse Osmosis Filter Pilot Study

Results of under-sink reverse osmosis (RO) filter study

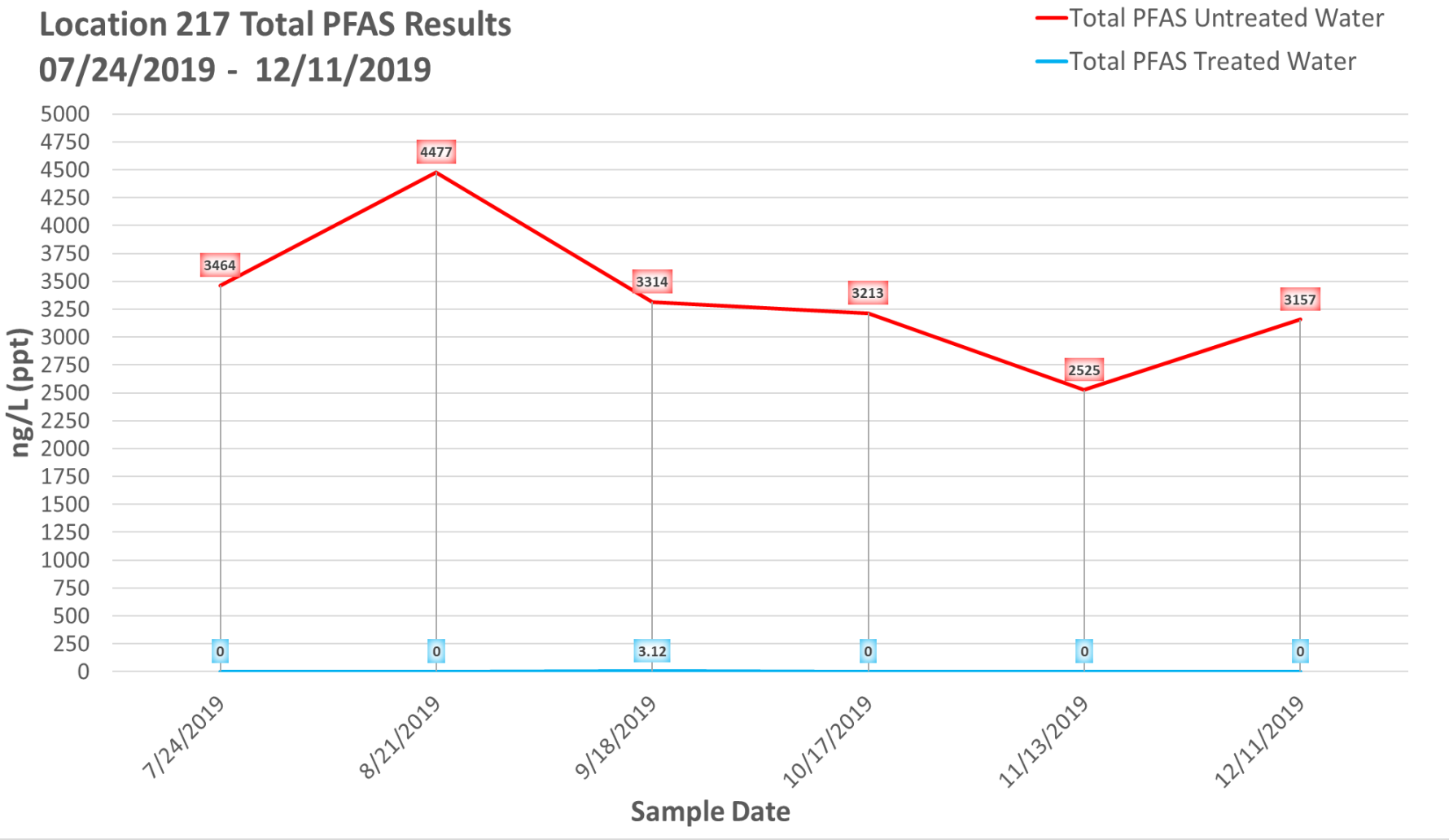


Results for one of four pilot study sites.

Additional graphs showing results can be found the DEQ website.

Reverse Osmosis Filter Pilot Study

Results of under-sink reverse osmosis (RO) filter study

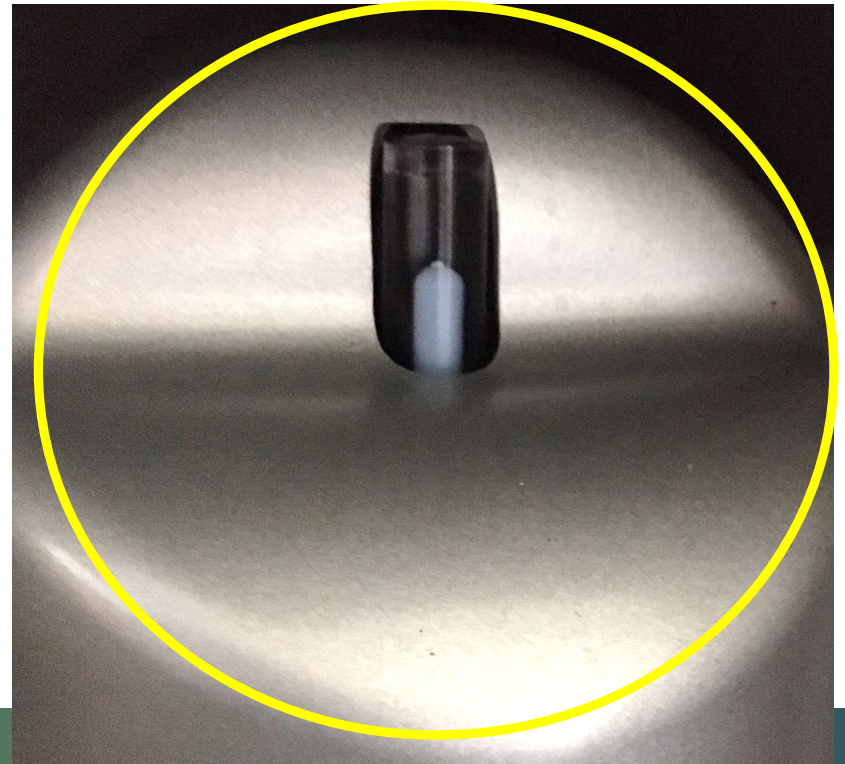


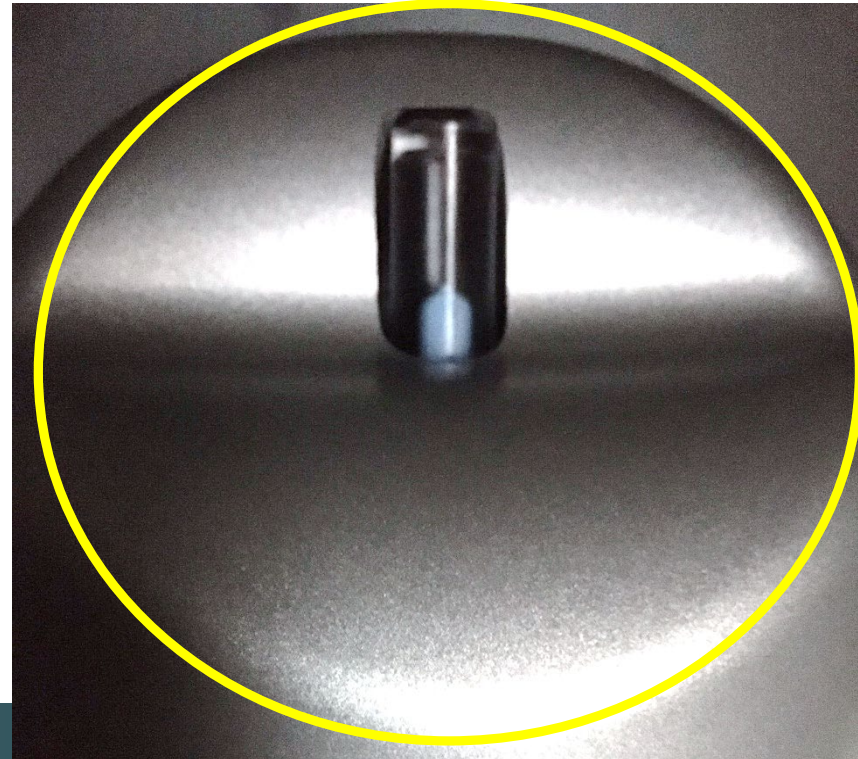
Results for a second of the four pilot study sites.

Additional graphs showing results can be found the DEQ website.

Reverse Osmosis Filter System Maintenance

- Systems generate up to 50 gallons per day
- Can view indicator on system - drops as filter nears end of life
- Filters stop working when filter is depleted





Community Update

February 2020

This community update includes the latest information that may be of interest to residents in the Cape Fear River Region and the communities near the Fayetteville Works facility.

The N.C. Department of Environmental Quality (DEQ) entered into a Consent Order with Chemours and Cape Fear River Watch in February 2019. The order requires Chemours to address all sources of PFAS at the facility to prevent further impacts to air, soil, groundwater and surface waters.

The full Consent Order and history of the GenX investigation can be found online at https://bit.ly/2Z7JHVA.

Air Emissions

Thermal Oxidizer Update

Division of Air Quality staff observed the performance testing of the thermal oxidizer at Chemours. Results will determine the effectiveness of the control equipment as required under the Consent Order. Chemours is required to reduce PFAS air emissions routed through the control device by 99.99 percent.

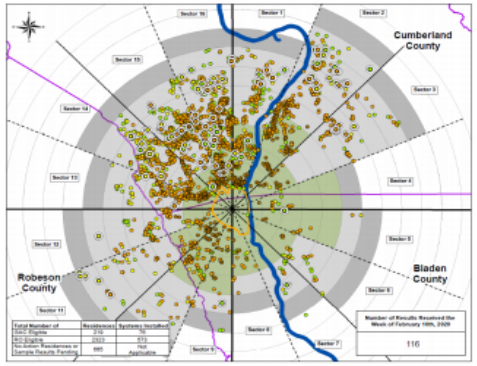
Groundwater

Request Sampling of a Private Drinking Water Well

Per the Consent Order, Chemours is required to sample private drinking water wells in the impacted areas. **Parsons** is the third-party consultant who will be contacting you to sample your private well. To request well sampling call (910) 678-1101.

Updated Well Sampling Map

Chemours sends DEQ well sampling maps weekly, which include samples collected, samples received, and status of the step-out and infill programs. To view the latest well sampling map (Feb. 10, 2020), go to: https://bit.ly/38WOxcK or click the image below.



Well Sampling Step-Out Plan

Public Water Options

DEQ has made a feasibility determination, with input from local government representatives, for areas **west** of the Cape Fear River in Bladen County. Chemours will be providing municipal water to the 52 residences served by private wells (if the well owner elects to have municipal water) west of the Cape Fear River in Bladen County whose drinking water results are at or above 140 ppt for GenX. To view this letter, go to: https://bit.ly/31YNF4W.

Cumberland County officials recently approved $10.5 million for waterline construction in the Gray's Creek area. DEQ staff is currently reviewing the county's decision as it relates to the terms of the state's Consent Order. The addition of the proposed waterlines announced recently will require an update to the study of the feasibility of public water in the area under the terms of the Consent Order.

For areas **west** of the Cape Fear River in Cumberland County: the Public Water Feasibility Analysis is still under review. DEQ has requested feedback from representatives of Cumberland County. DEQ granted an extension to Chemours until May 25, 2020, for the company to comply with the requirements of Paragraph 19 for the affected wells in Cumberland County west of the Cape Fear River. To view this letter, go to: https://bit.ly/39Au5hK.

For areas **east** of the Cape Fear River in both Bladen and Cumberland Counties: DEQ has made a feasibility determination, with input from local government representatives. To view this letter, go to: https://bit.ly/2LBRVlu.

Chemours will not be installing additional granular activated carbon (GAC) filtration systems in Cumberland County west of the Cape Fear River until a final public water feasibility determination is made. Bottled water delivery will continue in the interim for residences in these areas that are eligible either for public water or granular activated carbon filtration systems. Chemours

DEQ Community Updates

Residents' webpage:

deq.nc.gov/CommunityInfo

Questions?

Michael Scott, Director
Division of Waste Management, NC DEQ
Michael.Scott@ncdenr.gov
919-707-8200