

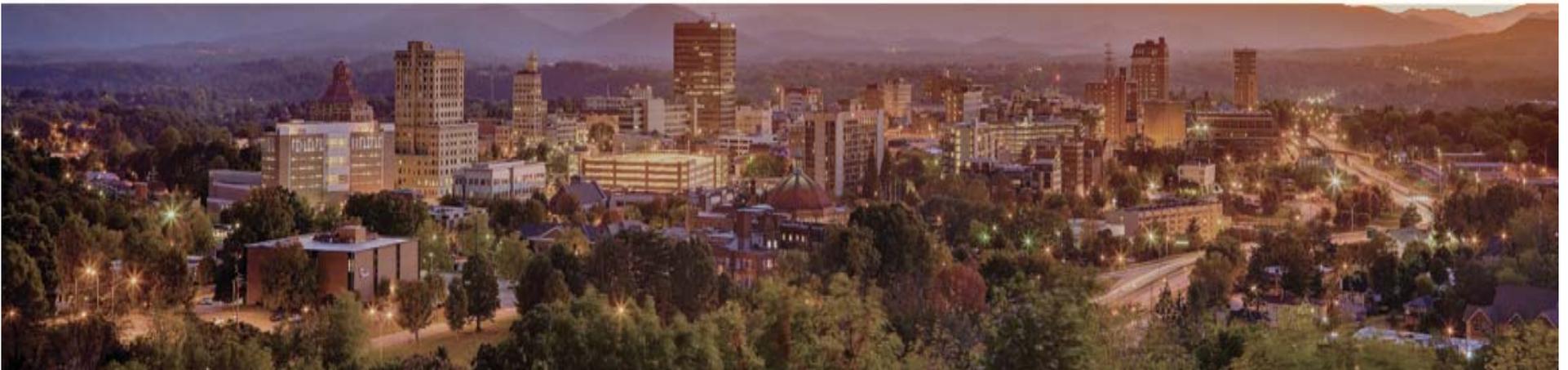


**DEQ Public Information Session
GenX and Emerging Compounds Update
May 29, 2018**





Division of Water Resources

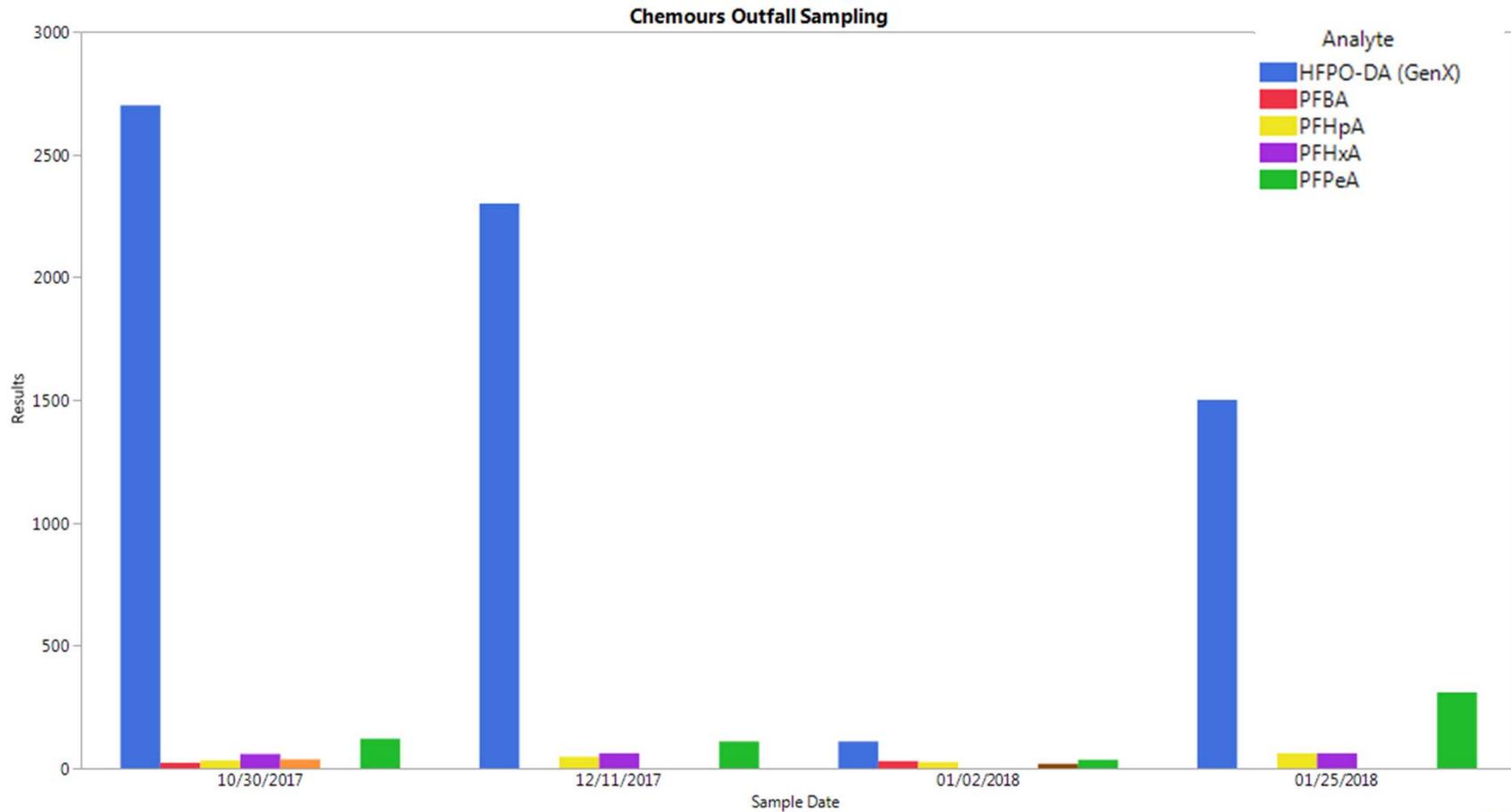


Current Sampling

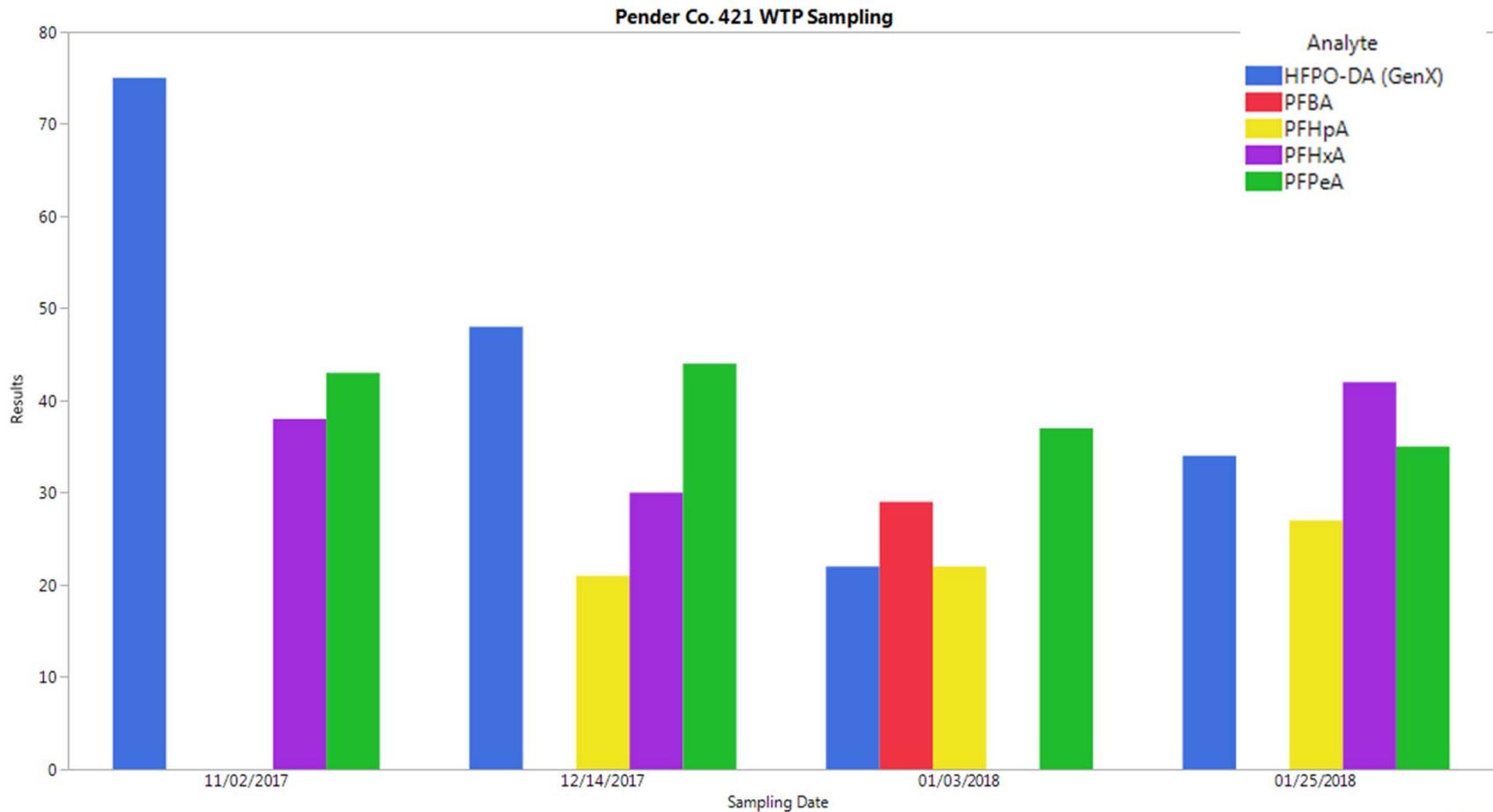
- Two composite samples weekly at Chemours wastewater outfall into the Cape Fear River: Monday - Thursday and Friday - Sunday
- Drinking water facilities downstream are sampled weekly:
 - Bladen Bluff
 - International Paper
 - NW Brunswick
 - Pender County
 - CFPU Sweeney
- Ambient monitoring for PFAS across North Carolina
 - Jordan Lake watershed monthly Jan – June 2018
 - Cape Fear Reservoirs May – October 2018



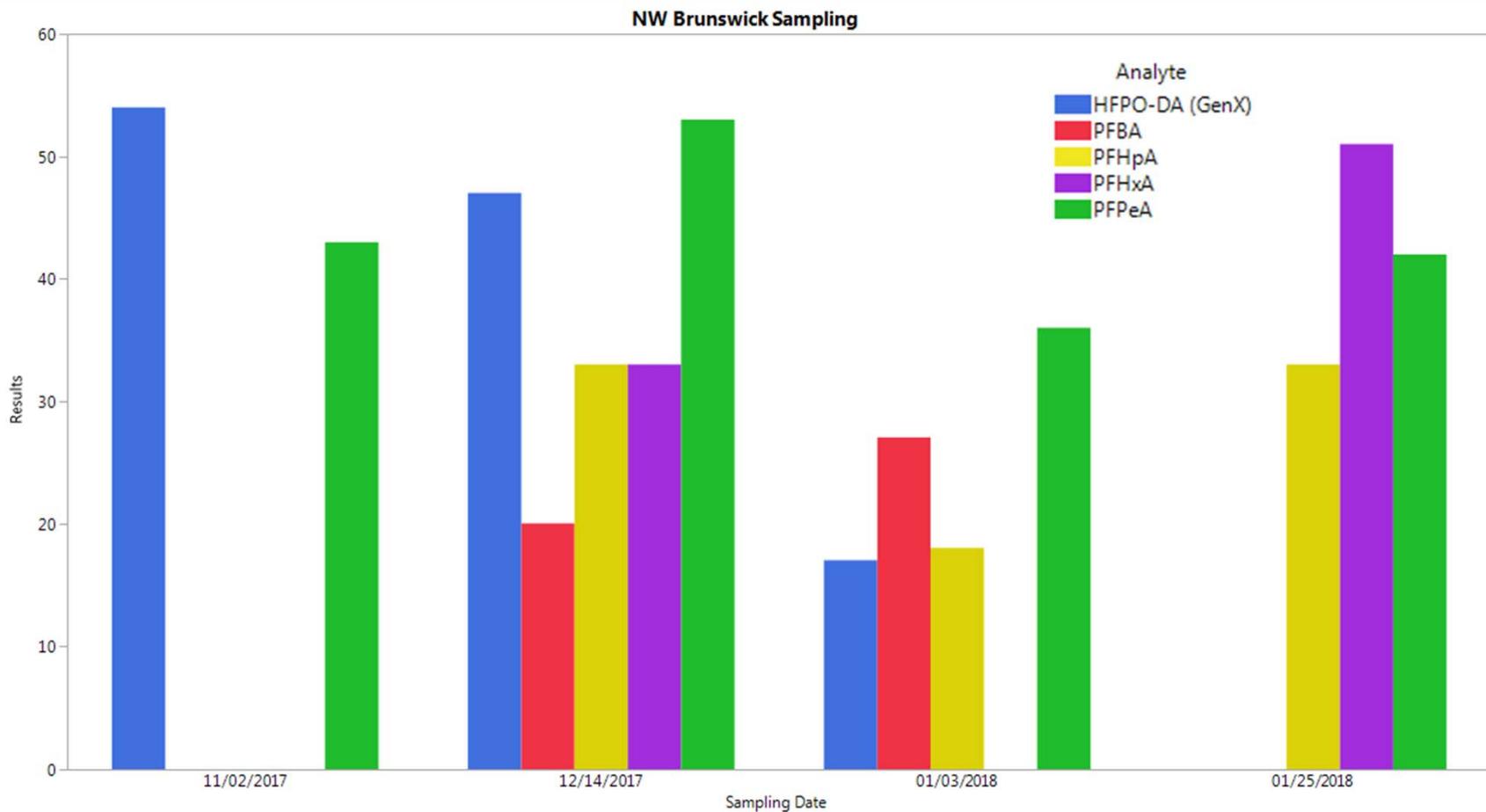
Data at Chemours Outfall 002 GenX (parts per trillion)



Data at Drinking Water Facilities GenX (parts per trillion)



Data at Drinking Water Facilities GenX (parts per trillion)





Upcoming

- Resources to continue monitoring in the Cape Fear River basin and ambient monitoring for fluorinated chemicals across the state.
- Chemical analysis – continue EPA Athens lab analysis for weekly monitoring. Limitation – 5 week turnaround.
- Ambient monitoring will have to be coordinated to fit into EPA Athen's schedule, due to their support needed by other states.
- Evaluate factors for potential bioaccumulation and aquatic toxicity to develop surface water and groundwater standards, including SAB review.

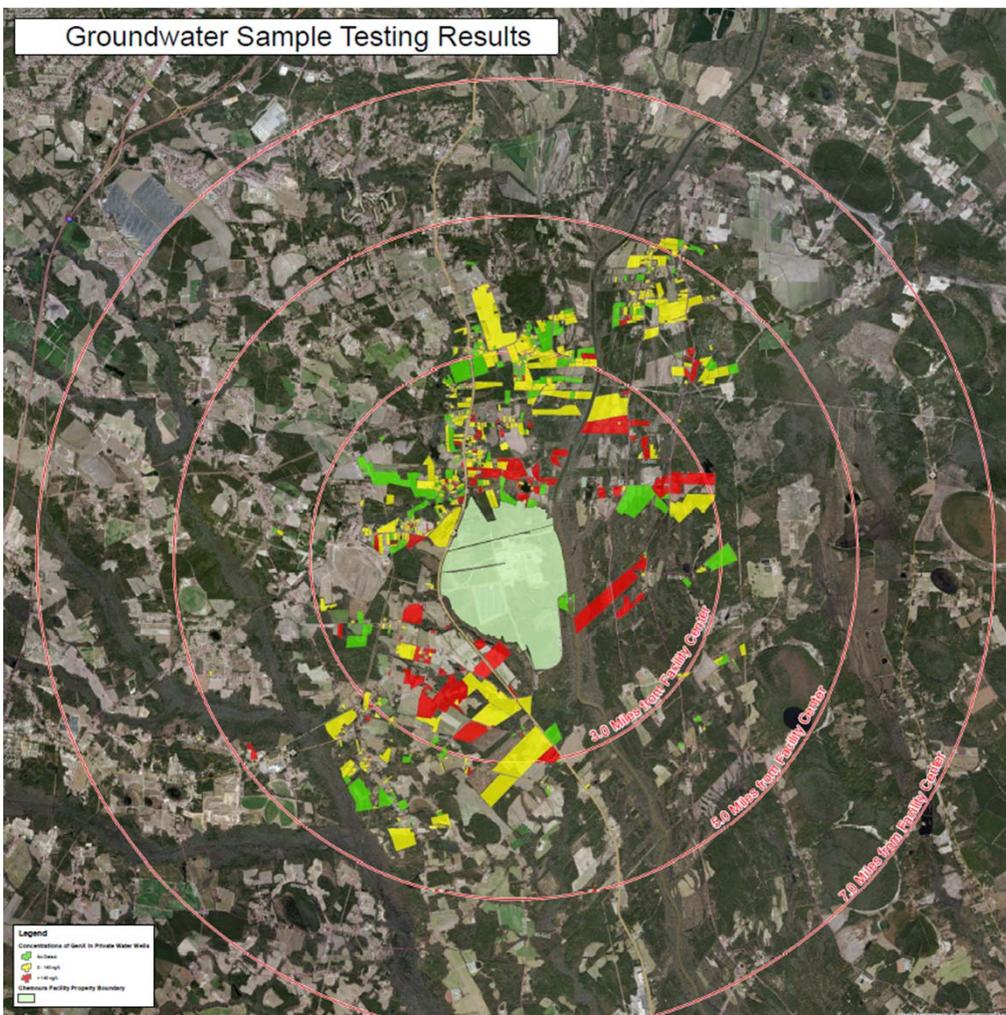




Division of Waste Management



Division of Waste Management

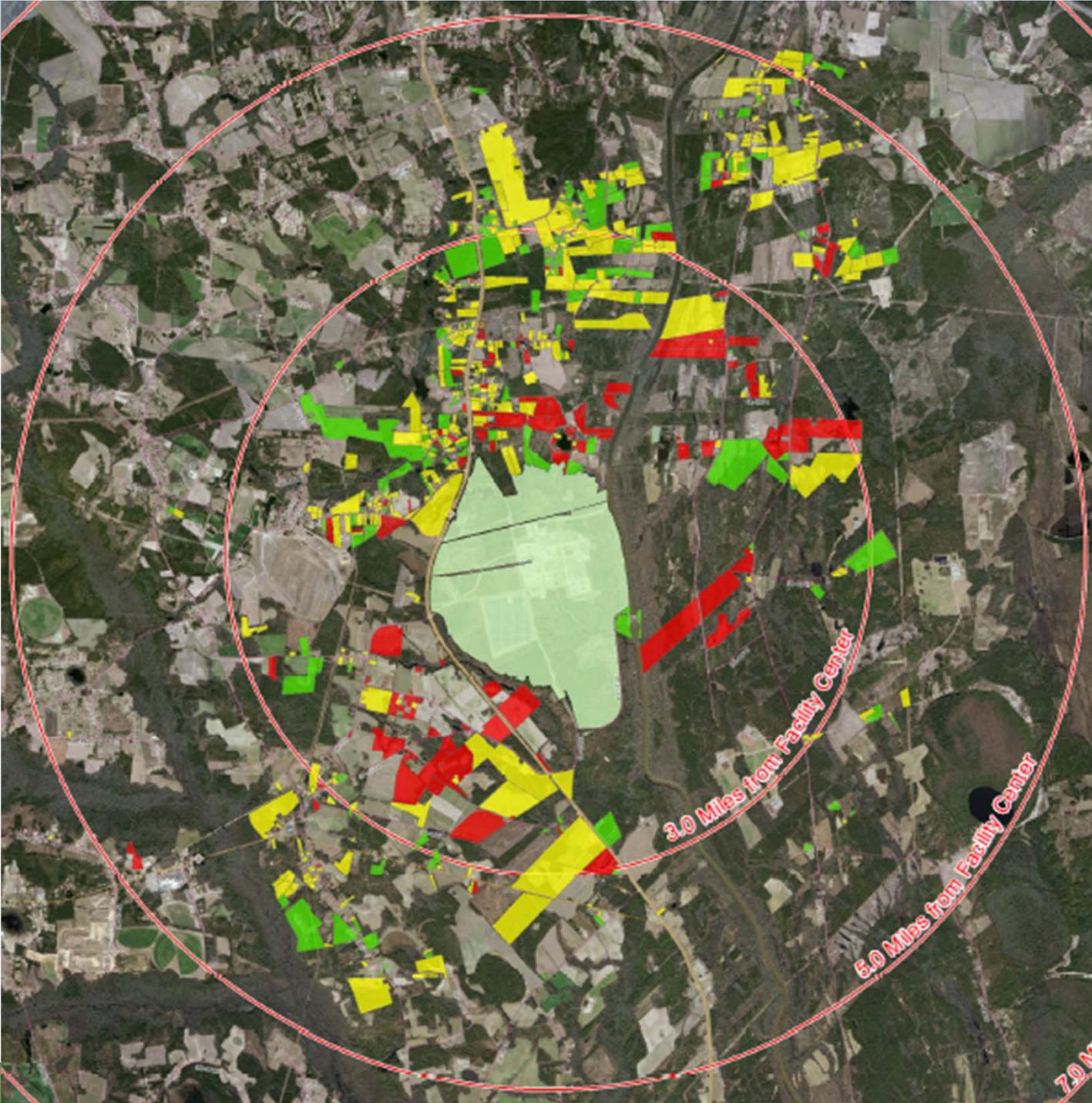


Well Sampling Results
in the Chemours area,
Approximate distances from
facility boundary:
Northeast – 5.5 miles
West – 3 miles
Southwest – 5 miles
East – 3.5 miles

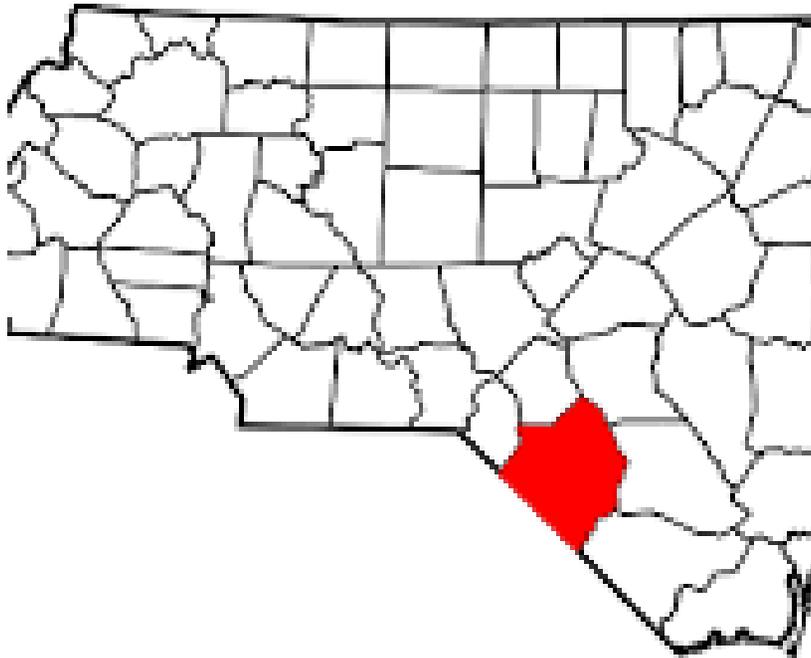
GenX: NC health goal = 140 ng/L

Red ≥ 140 ng/L
Yellow = 0 - 140 ng/L
Green = Non detect





Robeson County Private Well Testing



- Robeson County tested 39 drinking water wells. 36 were from residences and 3 were from county-run facilities.
- Sample dates: 1/29/18, 2/13/18 and 3/26/2018 and 4/23/2018
- Results:
 - 1 residence well was reported at 232 ng/L GenX, exceeding the Provisional Health Goal of 140 ng/L.
 - 35 wells had GenX detections, 4 were ND
 - 29 wells had PFOS detections, 27 had PFOA detections, 6 wells were ND for both
 - 1 well exceeded the health goal for PFOS + PFOA (70 ng/L)
 - 4 wells were ND for all three PFAS



Division of Waste Management

Combined Phase I, II, III , IV (partial) Private Well PFAS Data, also Includes Robeson Co. and DEQ-collected Data

Private Well Water GenX Summary	Combined Well Data
Distance from Chemours' border	Up to 5.5 miles
Well Collection Dates	9/6/2017 – 4/23/2018
Number of Wells tested	1000
Number of Exceedances of the GenX Provisional Health Goal	225
Number of Not-Detected (“ND”) GenX Analyses	231
Number of GenX Detections Less than the Health Goal ^a	538
Maximum Detected GenX Concentration	4000 ng/L

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



Granular Activated Carbon Point of Use Filtration Systems

- Chemours has submitted to DEQ a proposal to install granular activated carbon filtration systems for residences with Gen X present in the well at or above 140 ppt
- A pilot study at 6 residents to determine the effectiveness of the filter system is currently underway.
- The final system was installed on April 20. Both DEQ and Chemours have sampled all of the filter units. Sampling occurs every week.
- DEQ sampling results for 2 of the residents show non-detect after the filter units for all of the PFAS constituents analyzed. Additional data has been received from Chemours and is currently being reviewed.



On-site Remediation

Chemours actions

- **Reason – to reduce infiltration of PFAS in groundwater and then the river**
- Excavation of contaminated soil
 - 2 phases complete
 - Waiting on sample results to determine next steps
- Dewatering of Perched Zone
 - Highest concentrations of PFAS are in the Perched Zone
 - Pumping began February 2018
 - 6,500 gallons removed as of May 14
- Remove residual PFAS contamination from equipment
 - Wipe down complete
 - Waiting on sample results to determine if additional wipe down is needed



On-site Remediation

continued

- Cooling water channel excavation and lining
 - Analyzing design and construction options
- Design of Sediment Basin Impoundment Sediment Removal and Lining Project
 - Design is currently under review
 - Implementation at the South Basin in 2018
- Design of lining or piping Old Outfall 002
 - Currently GW discharges from Perched Zone to Old Outfall 002
 - 2 Options are being considered
 - Evaluation memo is anticipated by June 15, 2018



Current Activities

- Chemours is currently providing bottled water for all residents with GenX equal to or exceeding 140 ppt
- Chemours and DEQ are currently conducting a pilot study of the effectiveness of Granulated Active Carbon (GAC) on the GenX contamination.
 - 6 residents have the GAC units installed.
 - Sampling is conducted on the 6 residential units weekly
- Chemours is retesting all residential wells that had GenX greater than 100 ppt and less than 140 ppt.



Fish Tissue Testing

Marshwood Lake Testing by DEQ

- DEQ sampled Marshwood Lake in early March:
 - 2 surface water sample locations
 - 2 composite sediment sample locations
 - 2 Largemouth Bass fillet tissue composites
 - 1 Redear Sunfish fillet tissue composite
- Catfish was collected in late April
- A drinking water well onsite at the lake was sampled
- All samples collected have been analyzed using USEPA M537-modified for Full PFAS Suite at GEL Labs
- Surface water has been tested for Total Organic Carbon, Dissolved Organic Carbon, pH and Total Particulates; Sediment will also be tested for Total Organic Carbon and %Lipids
- Partial data has been received and is under review





Division of Air Quality



Emerging Compounds

DAQ's investigation involving GenX and other PFAS from Chemours

- **GenX emissions data**
 - Started with only estimates
 - Required stack tests
 - Method development
 - First of its kind measurements

Chemours 2016 emissions estimates as originally reported to DAQ	Chemours revised 2016 emissions estimates as of October 2017	Latest calculations, including January through April 2018 stack test measurements
66.6 lb/yr	594 lb/yr	2758 lb/yr

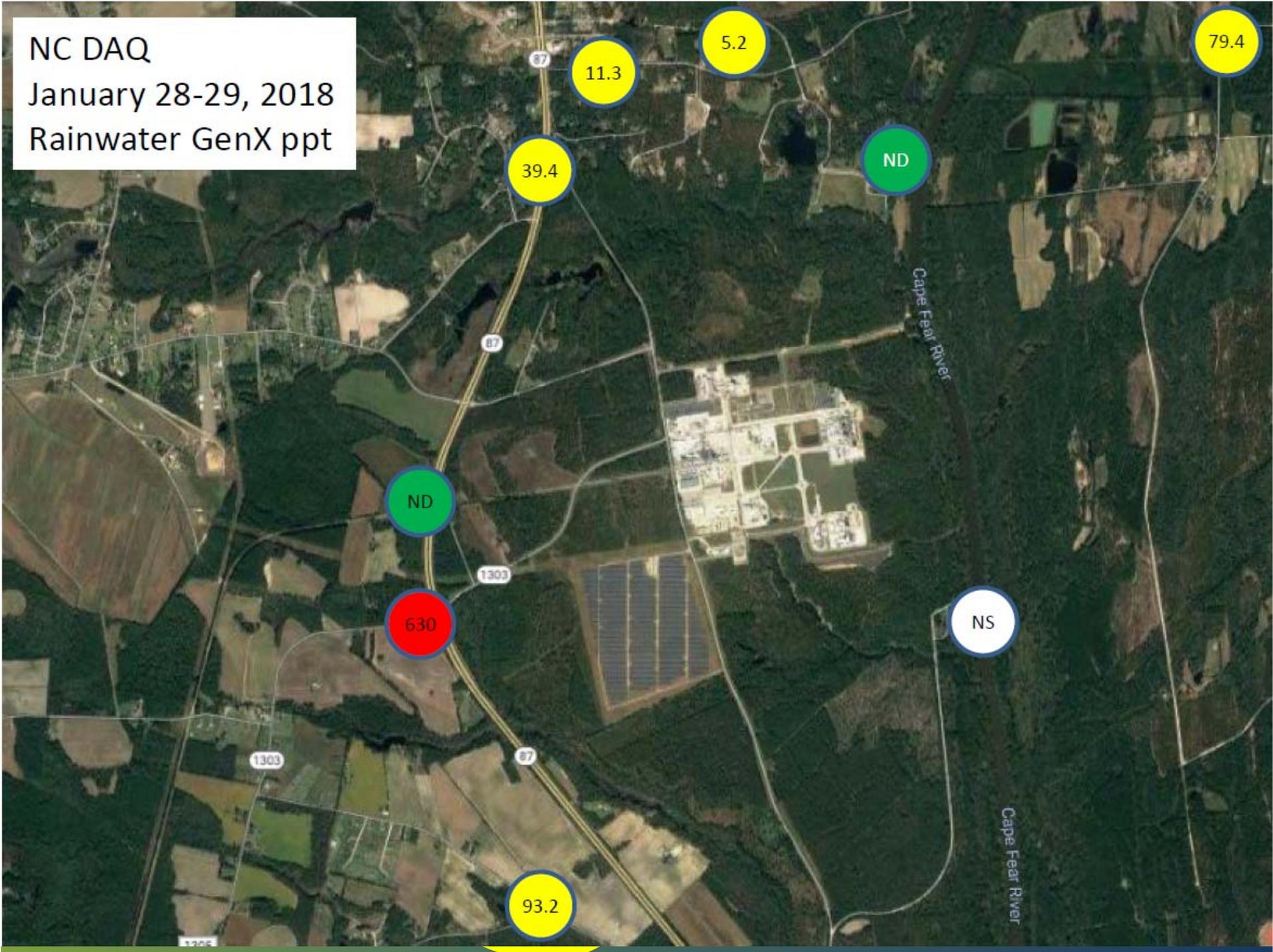
Emerging Compounds

DAQ's investigation involving GenX and other PFAS from Chemours

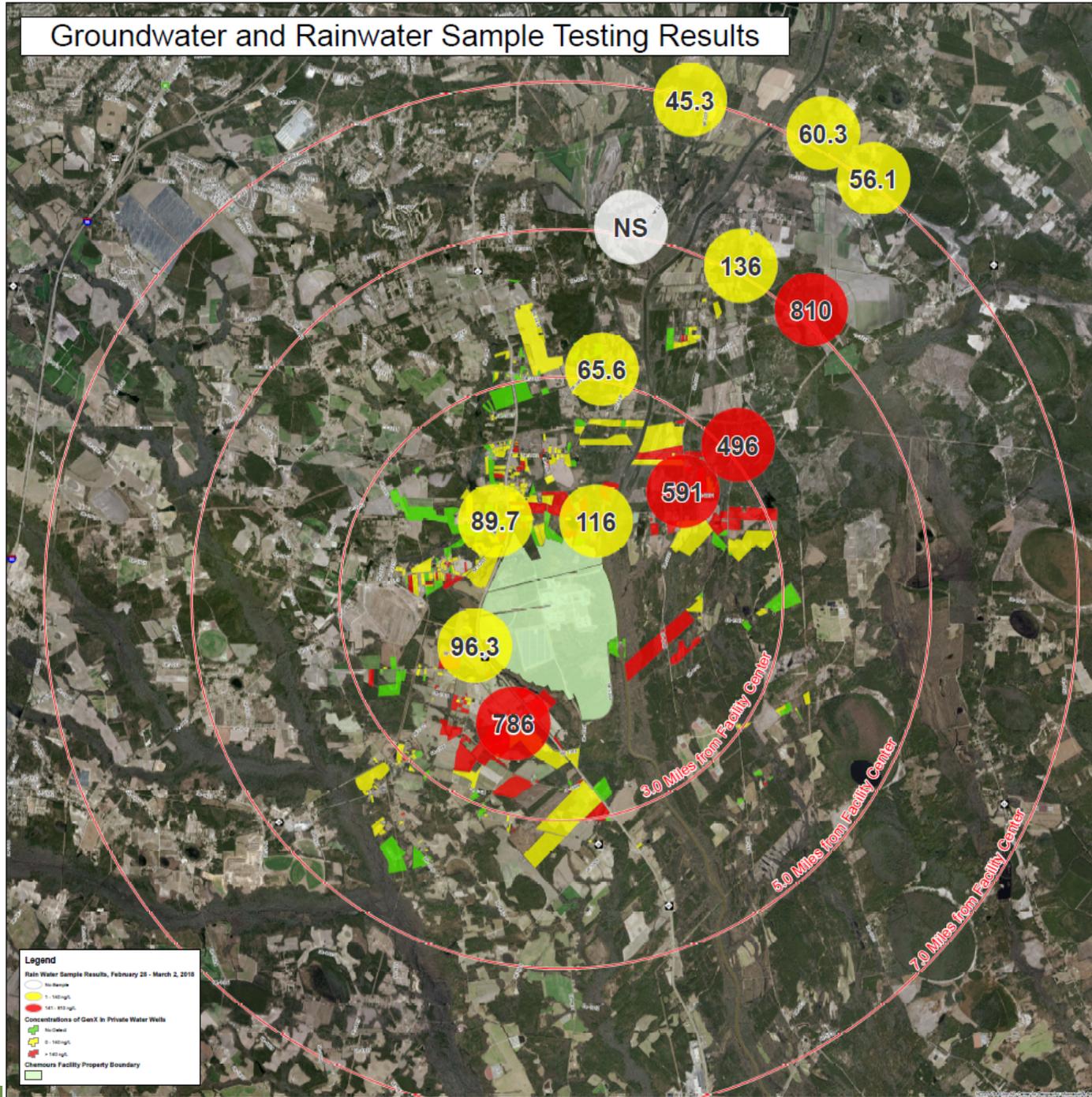
- **GenX ambient air quality data**
- **Methods?**
- **Wet deposition data - first of its kind**
- **7 separate rainfall catch and analysis**
 - **Near facility**
 - **Distance of 3, 5, 7 miles**
 - **Distance up to 20 miles**
 - **Rainfall and vegetation throughfall**
- **Five fixed sites**
 - **Weekly sampling**
 - **2 sites with wet and dry deposition**



NC DAQ
January 28-29, 2018
Rainwater GenX ppt



Groundwater and Rainwater Sample Testing Results



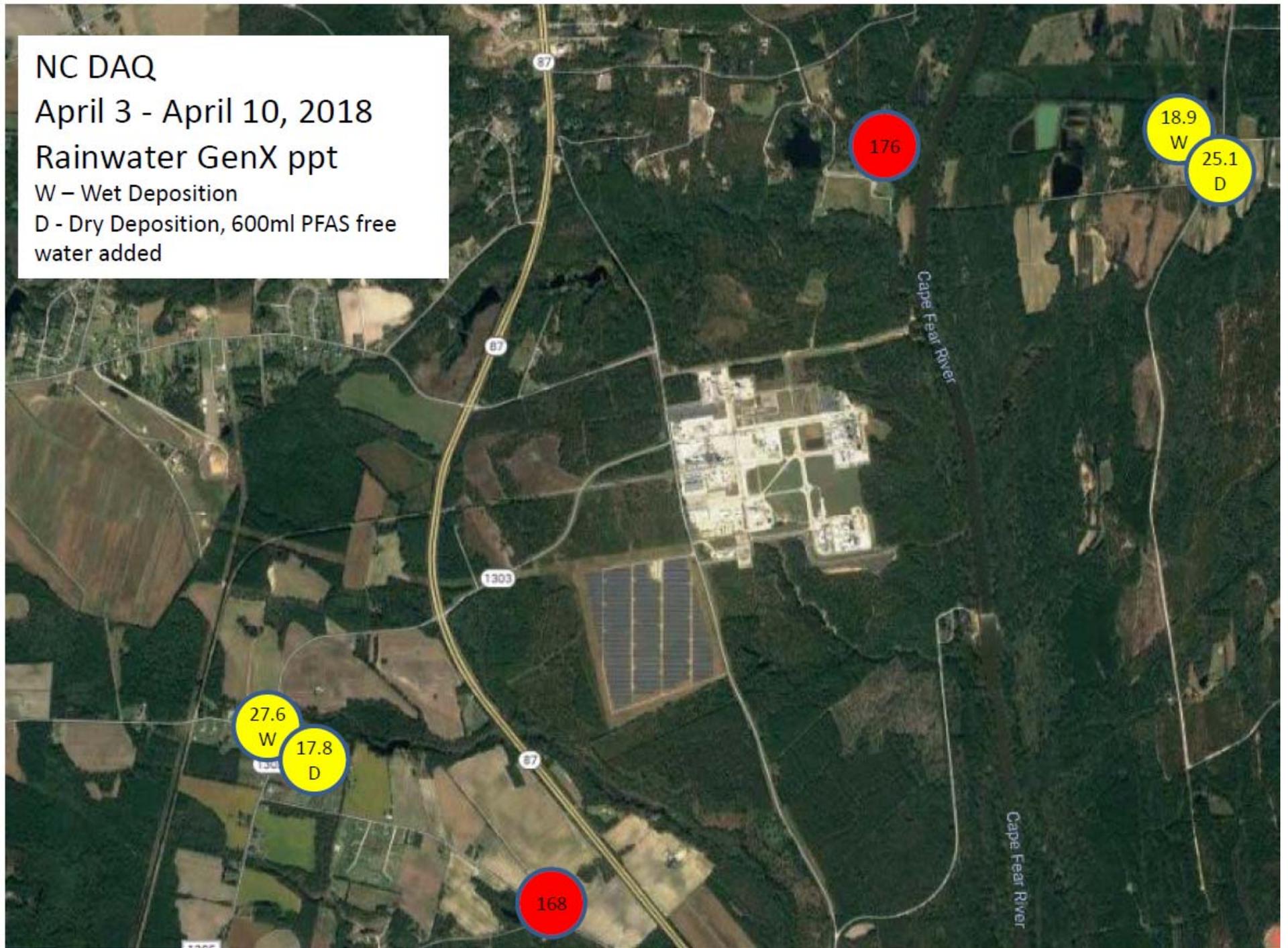
NC DAQ

April 3 - April 10, 2018

Rainwater GenX ppt

W – Wet Deposition

D - Dry Deposition, 600ml PFAS free water added



Emerging Compounds

DAQ's investigation involving GenX and other PFAS from Chemours

Summary of facts:

- The measured air emissions of GenX compounds are significantly higher than previously understood and reported.
- DAQ has measured GenX deposition through rainfall 20 miles from the facility.
- The evidence of atmospheric deposition of GenX shows a geographic footprint that is similar to the detection of GenX in groundwater samples.



Emerging Compounds

GenX - Recent Actions

April 6, 2018:

- **60 day notice of intent to modify Chemours' air permit:**
 - **Requires demonstration that emissions of GenX compounds do not or will not cause or contribute to violations of groundwater rules.**

The science and data collected to date informed this action.



Emerging Compounds

GenX - Recent Actions

April 9, 2018:

- **Amended complaint and motion for preliminary injunctive relief.**
- **Addresses the air emissions contributions to the groundwater violations.**



Emerging Compounds

GenX - Recent Actions

April 27, 2018:

- **Chemours response to 60 day notice**
 - **Chemours committed to:**
 - **Install & operate carbon beds by 5/25/18**
 - **Expected 40% reduction of GenX emissions**
 - **Upgrade scrubbers by October 2018**
 - **Expected 70% reduction of GenX emissions**



Emerging Compounds

GenX - Recent Actions

April 27, 2018:

- **Chemours response to 60 day notice**
 - **Chemours committed to:**
- **Install & operate a Regenerative Thermal Oxidizer by 2020**
 - **Expected 99% reduction of GenX emissions**



Emerging Compounds

GenX - Recent Actions

May 2018:

- **DAQ is evaluating:**
 - **The emissions data submitted**
 - **Reduction timeline**
 - **Source testing observation**
 - **Control device installation**





N.C. Department of Health and Human Services

Division of Public Health



Per- and Polyfluoroalkyl Substances (PFAS): Health Effects

- **Legacy PFAS (such as PFOA and PFOS) could have the following effects:**
 - **Affect growth and behavior of children**
 - **Interfere with the body's natural hormones**
 - **Increase cholesterol levels**
 - **Affect the immune system**
 - **Increase the risk of certain types of cancers**
 - **Different PFAS could have different effects**
-

Per- and Polyfluoroalkyl Substances (PFAS): Health Effects

- **GenX**
 - No human data available
 - Limited animal studies in mice and rats
 - Negative effects to the liver and blood
 - Cancer of the liver, pancreas, and testicles
 - **Other emerging PFAS (such as Nafion byproducts)**
 - No human data available
 - Limited or no animal studies
-



Public Health Role

- **Determine whether compounds detected through environmental sampling could pose a risk to human health**
 - **Provide health-based guidance on levels of exposure to such contaminants**
 - **Conduct risk assessments and risk communication**
-

Early Public Health Actions

- 1. Rapidly reviewed all available health information and consulted with the EPA, other agencies**
 - 2. Calculated a provisional health goal of 140 parts per trillion (ppt) for GenX in drinking water**
 - 3. Reviewed cancer incidence rates during 1996–2015 for counties in lower Cape Fear region**
-

What is the Provisional Drinking Water Health Goal?

- **Level of GenX in drinking water below which no adverse health effects would be expected over a lifetime of consumption**
 - **Calculated based on the most vulnerable population**
 - **Non-regulatory, non-enforceable**
 - **Change as new information becomes available**
-

Health Goal: Requirements

- **Must have sufficient health-related information**
 - Animal studies
 - Epidemiologic studies (human health)
 - Other laboratory studies
 - **Health-related information often lacking for emerging compounds**
-

Use Recommendations: GenX >140ppt

- **Do not use well water for drinking, cooking, or preparing baby formula**
 - **Can continue to use well water for bathing, washing dishes and laundry**
 - Per CDC, only a very small amount can get into the body through the skin
 - Little exposure expected during swimming, bathing, or showering
-

Ongoing Public Health Actions

- **Continuing to review all new and ongoing environmental testing results**
 - **Working with SAB to review and refine provisional drinking water health goal**
 - **Evaluating all new and updated health information; coordinating with CDC, EPA, NIEHS**
-



Ongoing Public Health Actions

- **Monitoring and responding to results of studies of blood and urine testing**
 - **Providing communities with information and assisting with outreach and health education**
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