

**From:** Hope Taylor  
**To:** [comments.chemours](#)  
**Subject:** [External] RE: Comment on Proposed Order for Preliminary Injunctive Relief  
**Date:** Wednesday, July 11, 2018 11:25:56 PM

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Dear Linda Culpepper (DWR), Michael Scott (DWM), Michael Abraczinskas (DAQ) and Sheila Holman, Assistant Secretary, DEQ:

Clean Water for North Carolina, a science-based Environmental Justice organization, with members in over 60 North Carolina counties, submits the following comments on DEQ's Draft Proposed Order for Preliminary Injunctive Relief, resulting from a massive history of documented violations of surface water quality, groundwater quality and air quality violations by Chemours, Inc.

We are one of the organizations that participated in the C-8 Working group back in 2005 to 2008, and worked with local community members and churches to hold E.I. Dupont Demours and company accountable for continuing contamination of surface water, groundwater and air surrounding the C-8 production site and downstream of DuPont, including presentations at shareholder meetings and repeated meetings with DENR officials. We are deeply disturbed by the shameless actions of Chemours, DuPont's successor at the Fayetteville works, including the same environmental manager, Michael Johnson, who waged a campaign of PR and disinformation for years to evade enforcement and to deflect public and shareholder criticism.

Given the weak formulation of EPA's "PFOA Stewardship Initiative," it was no surprise that the industry's response was simply to focus its manufacture of synthetic agents to perform the same functions on highly similar chemicals about which even less was known about human and ecological health impacts than about PFOA itself! We have been pleased and impressed by the full-throated response of communities whose drinking water sources have been impacted, so it seemed that there was less need over the past year for our organization's advocacy to get DEQ's attention than when the public was far less aware of C-8, and there were only a few organizations working to protect DuPont employees and drinking water and demand transparency. The detail of DEQ's investigations and actions since the first detections of Genx and the determination to investigate GenX in all media, despite lack of legislative support, has been impressive and has created a record that well justifies stronger injunctive relief than what is called for in DEQ's Draft Order.

In particular:

The flagrant non-compliance of Chemours, repeated and prolonged failure to disclose substances of likely toxicity discharged to water, leaked and spilled to groundwater and emitted to air, coupled with the lack of substantive responsiveness to excessively reasonable regulatory requirements, as documented in items 10 through 44 of the Draft Order, give more than sufficient justification for stronger injunctive relief for the people and environment of North Carolina. The most basic requirement of all, to "...**terminate and control the discharge, mitigate any hazards resulting from exposure to the pollutants and notify the Department.**" 15A N.C.A.C. 2L .0106(b), has been almost completely ignored by Chemours, as it was by its predecessor, and the company must be held accountable.

While many European nations would never have allowed the production of substances such as PFOA, GenX, or other substances that had not been proven safe for the environment or health of several species, under long-standing REACH requirements, the long history of corporate regulatory

control in the U.S. has thwarted attempts to prevent production or release of likely or even proven toxins!

As pointed out in item 60, there is no requirement that the state show actual injury or irreparable harm in order to obtain injunctive relief, including a preliminary injunction, but simply that the acts of the party being complained of are causing adverse impact on the public's interest through existing or threatened violations. Chemours has openly flaunted its regulatory responsibilities, as listed in item 61, despite large financial resources and access to considerable legal expertise.

Details of the proposed injunctive relief that must be strengthened include:

Items 62-64: Inadequacy of proposed air emissions reductions.

There is no excuse for not requiring immediate cessation of all air emissions of compounds not disclosed at the time of air permitting for Chemours' operations. DAQ and this Order must require an end to all air emissions, to be determined by agency inspection within 10 days of the issuance of the Order. There is simply no comparison of the economic harm to Chemours to the ecological and potential human health harms of allowing a plethora of per- and poly fluorinated compounds to continue to accumulate in the environment and likely in the bodies of people who have been unknowingly consuming these compounds for years! To allow continued emissions is to do exactly what the public has accused the agency of doing routinely, issuing "permits to pollute" at the behest of the industry receiving the permit! If production must cease to meet this requirement, then that must happen. The evidence is strong that Chemours initiated production knowing that it was not disclosing substances that it was likely to emit as a result of production at the Fayetteville works.

Items 65-66: Inadequacy of proposed reductions in discharges to surface and groundwater

All discharges of process wastewater from the facility must be ended, given that Chemours knowingly applied for discharge permits without disclosing substances that the company had every reason to know it would be discharging. The sampling requirements as proposed must continue, but Chemours cannot be allowed to continue to add to the environmental burden of per and poly fluorinated compounds as the investigation and clean up continue under DEQ supervision.

Item 67: Inappropriate for Chemours to carry out health studies, must provide funding

Chemours simply cannot be expected to carry out unbiased health studies on GenX and related compounds. Instead, it must provide funding for such studies to be carried out by an independent research entity with no conflicts of interest.

Item 68: Unnecessary public expense and harm incurred simply to allow Chemours' continued production and discharges

Coordination with water utilities is one more example of an ongoing expense to the public simply to allow continued production of the per- and poly-fluorinated compounds that Chemours has continually demonstrated it cannot produce without air, surface water and groundwater releases. If production is stopped, this coordination will not be necessary except for any accidental releases during mitigation and clean up activities.

Item 76: Inappropriate for Chemours to host Public meetings.

A similar line of reasoning to avoid conflict of interest applies to the requirement for Chemours to host public meetings. We have talked with a number of residents in the 2005 through 2007 time frame who reported on the kind of "information" they were given at public meetings hosted by DuPont, at which Michael Johnson was a key presenter. These were simply PR sessions that gave little accurate or useful information to concerned residents. Simply having DEQ be notified of public meetings and even attending them will not prevent this kind of PR presentation, minimizing any

potential harms, at Chemours-hosted public meetings. In our experience, this same management, formerly of DuPont at the Fayetteville Works and now of Chemours, is shamelessly self-interested in its bending and selection of facts to present. Instead, Chemours should be required to provide funds to enable DEQ to pay for venues and staff to host public meetings at which Chemours can participate, but should not be allowed host or lead the meeting or dominate presentations.

Items 69 through 75. Investigation requirements critical, but must have strong oversight— Chemours must cover costs of oversight and post substantial bond

All of the requirements for provision of replacement drinking water and investigations on and off-site are critical, but must be carried out under close DEQ supervision, and Chemours must be required to cover the costs of such supervision, with a substantial bond required to be paid in advance or held in escrow to ensure cooperation from Chemours.

Item 69: Requirement to provide safe replacement drinking water supply

In the case of providing replacement water, DEQ must take a far stronger stance on provision of public water lines and connections than the agency has done in the case of replacement water supply for coal ash impacted wells. The agency must give far less deference to affordability for Chemours, in the interest of well users impacted by GenX and related compounds, than it has done for residents impacted by Duke Energy coal ash!

Having worked with residents around the state's largest coal ash deposits at Roxboro Steam Station, where water lines were judged to be cost-prohibitive, I know that are faced with treatment systems that many residents have been told they do not trust (so they will continue to buy bottled water at their own expense), and declining property values in the face of an uncertain continued safe water supply! This is an outrageous injustice and should not be allowed to happen to well users impacted by GenX. Having to continue to deal with employees or contractors of the company that has contaminated your drinking water in order to maintain a treatment system, rather than having access to public water, is a source of ongoing aggravation for many impacted residents around coal ash, and would be in the case of well users impacted by GenX and related compounds as well.

Thank you for the opportunity to comment on this Draft Order, an unusual circumstance showing genuine concern on the part of the agency, and I hope that the public's comments will be taken very seriously into consideration in amending this order.

Yours sincerely,

Hope Taylor, MSPH

Executive Director, Clean Water for North Carolina

3326 Guess Rd., Suite 105, Durham, NC 27705

(919) 401-9600 [hope@cwfn.org](mailto:hope@cwfn.org)

**From:** Mike Watters  
**To:** [comments.chemours](#)  
**Subject:** [External] New Document.pdf  
**Date:** Wednesday, July 11, 2018 11:25:37 PM  
**Attachments:** [New Document.pdf](#)  
[Request for Amendment of N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580..docx](#)

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Please find our Comments and attached signature sheets.

**From:** Kathleen Gallagher  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF  
**Date:** Wednesday, July 11, 2018 10:52:59 PM

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Department of Environmental Quality  
via [comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)  
Assistant Secretary's Office  
RE: Chemours Public Comment  
1601 Mail Service Center  
Raleigh, N.C. 27699-1601

**SUBJECT:** Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

**1. Dupont/Chemours production should be *suspended* until full compliance with 2009 TSCA Consent Order, air emissions and water discharges, due to the following facts;**

In 2009, Dupont and USEPA executed a TSCA Consent Order for a Pre-Manufacture Notice (PMN) for GenX. (Perfluorinated aliphatic carboxylic acid, ammonium salt (generic) (P-08-0509) §5(e) 62037-80-3 and Perfluorinated aliphatic carboxylic acid (generic) (P-08-0508) §5(e) 13252-13-6), which I will refer to both as GenX.

On page 36 of that PMN Consent Order, Dupont/Chemours was mandated to comply as follows;

CONTROL OF EFFLUENT & EMISSIONS, states:

(a) The Company shall recover and capture (destroy) or recycle the PMN substances at an overall efficiency of 99% from all the effluent process streams and the air emissions (point source and fugitive).

Clearly, Chemours has failed to comply with the air emissions, and in the process streams it is likely a failure as well, as they plead that "only" the processing aid was discharged.

In 2011, West Virginia executed a Consent Order for GenX. Within the Order, Dupont interpreted to apply to all US sites, as written under page 2, #5 of the order.

"...The U.S. EPA, through a Toxic Substances Control Act Section 5(e) Consent Order ("TSCA Order") executed by DuPont on January 28, 2009, granted DuPont approval, under conditions set forth in the TSCA Order, to commercially manufacture, process, and distributes the processing aid. The TSCA Order requires that DuPont shall recover and capture (destroy) or recycle the New Compound "at an overall efficiency of 99% from all the effluent streams and the air emissions (point source and fugitive)." This requirement is interpreted by DuPont to be applied in the aggregate on an annual

basis, for all U.S. sites where the New Compound is used. The wastewater treatment system for the Facility's fluoropolymers processes will be modified to achieve the TSCA Order requirements at present and future production capacity.”

6. At this time, based on the results of its ongoing research and development activities, DuPont is planning to undertake construction of related upgrades to the Facility's wastewater treatment system for fluoropolymers processes currently discharging through internal Outlets 102 and 305, in conjunction with the use of the New Compound, and to commence the initial phase of commercial-scale production using the New Compound.

7. The planned upgrades to the fluoropolymers wastewater treatment system include new higher efficiency processing aid recovery, addition of a new reverse osmosis ("RO") system, and expansion of the existing carbon bed systems

Dupont upgraded the wastewater treatment system in West Virginia, as described in #7, to comply with the “new compound”, to meet the 2009 TSCA Consent Order requirements.

Dupont/Chemours failed to upgrade the Fayetteville, NC site, and certainly did not install a Reverse Osmosis system. (I don't recall any mention of GAC beds at the site.) Dupont/Chemours had eight (8) years to comply with the 2009 TSCA Order, and executed a binding agreement to comply with West Virginia DEQ, yet again, did not comply in Fayetteville, NC.

“...EPA relies upon TSCA § 8(e) information to be made aware of potential risks to human health and the environment posed by chemicals.. Congress established the TSCA § 8(e) reporting requirement to ensure that EPA would be informed about potential risks so that it could be able to take any appropriate action to protect the public or the environment.” Chemours/Dupont submitted sixteen (16) TSCA § 8(e) reports on GenX. Companies are only required to report of potential risks to human health and the environment. In my opinion, Dupont/Chemours are fully aware that GenX is not safe, just like they knew that PFOA and PFOS are not safe, and will never confirm this. They hide behind, we “believe” statements about safety. So did/does 3M. You know how that ended.

Had Dupont/Chemours complied with the 2009 TSCA Order, we would not be in the egregious situation we are in North Carolina. Dupont/Chemours should not be granted additional time to comply. Dupont/Chemours should production should be suspended until full compliance is complete. I would like to see the NCDEQ take a firm position and stop any production until 99% is captured, emissions and discharges.

Why didn't Chemours comply with these orders, and why didn't NC enforce this TSCA requirement? There is an additional Consent Order executed January 2018 that added Chemours retroactively to all consent orders which applied to Dupont.

Any Consent Order mentioned is available upon request.

*If the NCDEQ doesn't suspend production until compliance, then the following information needs to be amended or updated;*

2. **Why isn't the state directing Chemours to connect any resident above the PQL?**  
PQL is an enforceable regulation and the "health goal" is unenforceable. In addition, Chemours has paid Dr. Shea to prepare a much higher "health goal", which is contrary to the direction ATSDR is taking with this class of chemicals. SAB has not determined health goal yet.

3. **Omit any reference to a "Health Goal" or 140ppt (should not be used).**

- a. Use the NPDES permit to control releases, with PPT explicitly defined (for surface water).

*If Chemours is successful at raising health goal, and free drinking water and interim GAC systems and permanent fix are deemed unnecessary by Chemours, this State will have a riot on their hands. Remove any reference to 140ppt or health goals.*

- b. Well owners should be tied to PQL. Unless there is a ND, **all** other well owners should be connected to public system, which is PFAS **free**, and provide drinking water and GAC systems in the interim. Should NOT be tied to health goal, since that is only one toxic chemical and all the wells have a cocktail of PFAS.

4. Why wasn't PFOA and PFOS included in prior NOV?  
Going forward, PFOA and PFOS should be included in any description exceeding PQL. The federal Health Advisories is only an advisory, not a MCL. **PFOA, CAS #335-67-1 and PFOS, CAS #1763-23-1.**

5. Please amend the language below;

61. Violations.

- d. Sampling frequency: For all PFAS **for which test methods** and lab standards have been developed, on at least a monthly basis,

**I would like to see DEQ state all of the PFAS they should be testing for, specifically, since test methods have not been developed for PFAS that was identified through non-targeted testing. Omits any grey area of what "all PFAS" includes the following;**

PFPrOPrA (GenX) CAS No. 13252-13-6; PFBS CAS No. 375-73-5; PFDA CAS No. 335-76-2; PFDoA CAS No. 307-55-1; PFHpA CAS No. 375-85-9; PFHxS CAS No. 355-46-4; PFHxA CAS No. 307-24-4; PFNA CAS No. 375-95-1; PFTriA CAS No. 72629-94-8; PFUnA CAS No. 2058-94-8; PFPeA CAS No. 2706-90-3; PFMOAA CAS No. 674-13-5; PFECA\_F CAS No. 377-73-1; PFO2HxA CAS No. 39492-88-1; PFO3OA CAS No. 39492-89-2; PFO4DA CAS No. 39492-90-5; PFO5DA CAS No. 39492-91-6; PFESA Byproduct 1 CAS No. 66796-30-3, PFESA Byproduct 2 CAS No. 749836-20-2, PFOA, CAS #335-67-1 and PFOS, CAS #1763-23-1.

No Discharge of Process Wastewater from Chemours Manufacturing Areas: Chemours shall not discharge process wastewater from Chemours' manufacturing areas unless or until issuance of an NPDES Permit expressly authorizing the discharge of such process wastewater and with such limits as DEQ deems necessary and appropriate to control the discharge of GenX Compounds and other PFAS.

**CHEMOURS SHOULD NOT BE PERMITTED TO RELEASE ANY DISCHARGE**

PROCESS WASTEWATER UNTIL THEY COMPLY WITH THE USEPA TSCA ORDER, executed January 28, 2009, AND THE WEST VIRGINIA CONSENT ORDER TO INSTALL GAC BEDS AND A REVERSE OSMOSIS WWTP. Consent Order 7418, executed November 18, 2011, so that no PFAS will be discharged at all.

6. Add the following language;

67. Health Studies: .... The plan shall be developed in consultation with DEQ, **facilitated by a third party, avoiding a conflict of interest**, and shall describe the specific steps to be taken and a time schedule for accomplishing these measures. Chemours shall implement the measures set forth in the plan. (Dupont/Chemours cannot be trusted)

7. Also, any study and all studies need to be the accumulation of all PFAS chemicals, since we are not exposed to any singular toxic chemical, but a chemical cocktail.

8. Chemours should be directed to conduct medical monitoring on all well owners (or upper Cape Fear Region) and also in the Lower Cape Fear Region. (2 separate) It will take years to have peer reviewed study published.

9. Notice to and Coordination with Water Utilities: In the event of an upset or other condition at the Facility that has the potential to cause a discharge of ***any PFAS*** Compounds into the Cape Fear River through Outfall 002 at concentrations exceeding **NPDES permit**, Chemours shall provide notice to downstream public water utilities within one (1) hour of knowledge of the condition, **in writing**. Chemours shall maintain a list of appropriate contacts of downstream public water utilities, which Chemours shall routinely update by requesting contact information from DEQ. Chemours shall also post a description of the condition including any estimated quantity of the release on a publicly available website (need to be more specific on the website) within twenty-four (24) hours of knowledge of the condition.

10. **What about any other PFAS discharge? PFOA and PFOS are still created by degradation of other PFAS, and need to be reported. Nafion byproducts need to be reported. Why just through Outfall 002? The property is saturated with many PFAS and anytime it rains, there is a spike in discharge in the surface water.**

11. Permanent Replacement of Private Drinking Water Supplies: By no later than twelve (12) months after issuance of this Order, Chemours shall establish permanent replacement water supplies for each household with a water supply well contaminated by any PFAS **in exceedance of the any PQL for any chemical** (“affected households”). The replacement water supply shall be established by connection to a public water supply, which is *PFAS free*, except that (1) an affected household may elect to receive a filtration system approved by DEQ in lieu of a connection to public water supply, in which case Chemours shall install a filtration system **and maintain the system for life**, or (2) ~~if DEQ determines that connection to a public water supply to a particular household would be cost-prohibitive\*~~ or unsafe, DEQ may authorize provision of a permanent replacement water supply to that household through installation of a filtration system:

**Affected households should be defined as any well above with concentrations above the**



**PQL in groundwater for any PFAS, and NOT be tied to DHHS (would should be NC DHHS I believe) or advisory level by EPA. With the release of the ATSDR report, those amounts are likely 10 times higher than current numbers set by EPA.**

**\*Cost should NOT be a consideration!! Chemours saved \$5 million monthly, for 37 years, to avoid trucking these chemicals off for proper incineration. I would like that sentence removed. Please remove any reference to cost from the order. It also is a weak position.**

12. For affected households Chemours shall be liable for any water bills from public utilities and for periodic required maintenance of the filtration systems, **including continued testing to confirm PFAS has not “broken through” for as long as the resident owns their home.**
13. 73. Comprehensive Receptor Survey: Within 30 days of entry of this Order, Chemours shall submit to DWM a comprehensive receptor survey to include drinking water wells, **residential and municipal**, and surface waters within a ten (10) mile radius of the Facility.

Respectfully,

Kathleen Gallagher  
796 Washington Acres Road  
Hampstead, NC 28443

**From:** cnicole1203@aol.com  
**To:** [comments.chemours](#)  
**Subject:** [External] Chemours Comments- Chantay Allen  
**Date:** Wednesday, July 11, 2018 10:09:24 PM

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Dear DEQ,

Please do everything in your power to *immediately* stop Chemours from emitting and discharging PFAS into our environment and to ensure they clean up their waste promptly. Our community has already experienced negative impacts from the Duke Energy coal ash spill and I was heart-broken to discover Chemours had been discharging health and environmentally hazardous PFAS into our beloved Cape Fear River. The United States is a civilized nation and our local residents should be able to trust the tap water is safe to use and drink. Our scenic Cape Fear River is the largest river basin in the state of North Carolina, filled and surrounded by numerous ecosystems, lots of adventure, and at one time, a proud source of drinking water. Let's protect our river.

Thank you,

Chantay Allen  
Cape Fear River Watch Board Member

**From:** Joseph Adamsky  
**To:** [comments.chemours](#)  
**Subject:** [External] Chemours  
**Date:** Wednesday, July 11, 2018 8:55:00 PM

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I fully agree with and support the DEQs proposed court order against Chemours. I feel that Chemours actions starting with ignoring the directives of no GenX type compounds being emitted as an initial condition to the issuance of their permits are more criminal in nature than oversight and immediate and significant corrections are required. Thank you for your consideration.

Joe Adamsky

**From:** Paul Sommers  
**To:** [comments.chemours](#)  
**Subject:** [External] No injunctive relief  
**Date:** Wednesday, July 11, 2018 6:21:45 PM

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Chemours must pay expenses incurred by CFPUA and other utilities that are burdened by the cleanup of their mess. They should be paying for temporary costs of bottled water by residents. And they should be liable for any health problems that are attributable to GenX or other PFOAs. I see no reason to propose any legal relief for Chemours.

--Paul Sommers  
246 Inlet Point Dr  
Wilmington, NC 28409

**From:** dmartin166@nc.rr.com  
**To:** [comments.chemours](#)  
**Subject:** [External] Fwd: Re: Please Copy and Send Comments to DEQ on the Proposed Draft Order.  
**Date:** Wednesday, July 11, 2018 6:00:34 PM  
**Attachments:** [Re Please Copy and Send Comments to DEQ on the Proposed Draft Order..msg](#)

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**From:** Tom Rini  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Clean water is important  
**Date:** Wednesday, July 11, 2018 5:40:06 PM

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What we need in the area is clean, drinkable water. We do not have this today due to Chemours. My family and I are drinking bottled water, despite living in the city where we should expect to have good clean water. Chemours needs to bear the entire financial responsibility to clean up the mess they made and that includes treatment plants, etc.

--

Tom

**From:** Greg Martin  
**To:** [comments.chemours](#)  
**Subject:** [External] Chemours  
**Date:** Wednesday, July 11, 2018 5:09:59 PM

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To Whom It May Concern,

Chemours is an important industry in Bladen County that employs hundreds of people. Chemours officials are taking environmental concerns seriously. They have demonstrated a commitment to address the GenX matter and to comply with DEQ related requirements. For example, wastewater discharge into the Cape Fear River has been discontinued and plans are in place to invest \$100 million to greatly improve the quality of air emissions.

It is requested that DEQ provide an opportunity for Chemours to continue operations while implementing new state of the art emissions technology.

Thank you for your consideration in this matter.

Sincerely,  
Greg Martin

---

Gregory J. Martin  
County Manager  
County of Bladen  
PO Box 1048  
Elizabethtown, NC 28337  
E-Mail: [gmartin@bladenco.org](mailto:gmartin@bladenco.org)  
Phone: (910)-862-6701  
Fax: (910)-862-6767

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=====

**From:** Michele Zapple  
**To:** [comments.chemours](#)  
**Subject:** [External] DuPont/Chemours/Kuraray  
**Date:** Wednesday, July 11, 2018 4:47:15 PM

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To Whom It May Concern:

Please hold the offending companies and businesses fully accountable for the poisoning of our drinking water. I moved my family 21 years ago from Los Angeles to Wilmington, NC, hoping to find a more healthy environment for my children. Instead, I filled them with water that was filled with chemicals, and now have an adult daughter with an uncontrolled thyroid disease and infertility issues, and my husband and I both have unexplained dangerously high cholesterol, despite having the most healthy plant based diet for the past 30 years.

I am tired of agencies falling back on the outdated excuse that they can't enforce anything because there are no "safe levels" of these "emerging contaminants". The safe level is zero, and emerging means they were just discovered last month. Please hold DuPont/Chemours responsible for cleaning up the river, enforce a cease and desist order because they can't be trusted to capture 100% of the chemical contaminants and will use mental gymnastics to insist that they are. require that DuPont/Chemours provide RO systems for all households in New Hanover County, and require that DuPont/Chemours pay for the new system to upgrade the CFPUA to filter out ALL known contaminants.

Thank you,  
Michele Zapple



**From:** Nathan Jones  
**To:** [comments.chemours](https://comments.chemours.com)  
**Subject:** [External] Chemours Public Comment  
**Date:** Wednesday, July 11, 2018 4:33:25 PM

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To Whom It May Concern,

As a father of small children living in the Wilmington area I am concerned about DEQ's inaction on this issue over the last decade. The fact that it took Chemours just days to reduce their emissions almost 10x and they are now willing to spend millions to correct their pollution problem, speaks volumes about what a bad neighbor they are. It just took a little action on DEQ's part to get a change.

I encourage NC DEQ to do everything in their power to force all companies (Chemours, DuPont, and Kuraray) that operate at the Fayetteville Works site to contain ALL PFAS air emissions that pose a serious, or even unintended, threat to our public health and environment.

Many of these compounds change properties and become increasingly toxic the moment they interact with simple water molecules. The burden of proof should fall solely on the shoulders of Chemours/DuPont/Kuraray to communicate to DEQ that every compound released does not create byproducts that are toxic or can cause widespread harm to our public health, ecosystem, and food supply.

I also request DEQ require Chemours to pay for split water sample testing between DEQ and an independent third party for all waster water and surface water discharge--as well as private wells impacted by air emissions.

Lastly, the cost associated with all remediation, municipal water improvements, and private well solutions should be solely the responsibility of Chemours/DuPont/Kuraray.

Sincerely,

N. Jones

**From:** Hassett, Matthew J.  
**To:** [comments.chemours](#)  
**Subject:** [External]  
**Date:** Wednesday, July 11, 2018 4:17:47 PM

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To Whom It May Concern:

I am a resident of Brunswick County and have lived in the area for over twenty years. I am an environmental historian at UNCW and CCU. I am concerned about the long term consequences of chemicals in our drinking water.

I encourage NC DEQ to do everything in their power to force all companies (Chemours, DuPont, and Kuraray) that operate at the Fayetteville Works site to contain ALL PFAS air emissions that pose a serious, or even unintended, threat to our public health and environment.

I also request DEQ require Chemours to pay for split water sample testing between DEQ and an independent third party for all wastewater and surface water discharge--as well as private wells impacted by air emissions.

Lastly, the cost associated with all remediation, municipal water improvements, and private well solutions should be solely the responsibility of Chemours/DuPont/Kuraray.

Sincerely,

Matt Hassett

Leland NC

**From:** Maria Edwards  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] DRGooden Chemours support 07112018.pdf  
**Date:** Wednesday, July 11, 2018 4:08:45 PM  
**Attachments:** [DRGooden Chemours support 07112018.pdf](#)

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**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

Good afternoon,

Please find attached scanned correspondence from Commissioner Gooden in support of allowing Chemours time to construct a new facility.

Thank you,

*--Maria*

Maria C. Edwards  
Clerk to the Board  
COUNTY OF BLADEN  
PO Box 1048  
Elizabethtown, NC 28337  
910 862-6702 Voice  
910 862-6767 Fax

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=====

**From:** dalejrfanbudd  
**To:** [comments.chemours](#)  
**Subject:** [External] Genx  
**Date:** Wednesday, July 11, 2018 4:02:22 PM

---

**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

Shut them down to emissions are at zero. Too many people are sick from this. Animals are dying . Everyone in this area has been sick and most immune systems are compromised

Sent from my Verizon, Samsung Galaxy smartphone

**From:** Maria Edwards  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Chemours support  
**Date:** Wednesday, July 11, 2018 3:48:05 PM

---

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Good afternoon.

I know that we are dealing with safety, welfare, safe water, jobs, property tax income, families' livelihoods, etc.

I would like to request that DEQ allow Chemours time to implement their plan with the addition of scrubbers for their steam stacks, filtration systems for neighboring households and the upfit of the plant to be state-of-the-art using cutting edge technology.

Thank you for consideration.

*--Maria*

Maria C. Edwards  
Clerk to the Board/Assistant to the County Manager  
COUNTY OF BLADEN  
PO Box 1048  
Elizabethtown, NC 28337  
910 862-6702 Voice  
910 862-6767 Fax

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=====

**From:** Maria Edwards  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] DRD Chemours support 07112018.pdf  
**Date:** Wednesday, July 11, 2018 3:44:18 PM  
**Attachments:** [DRD Chemours support 07112018.pdf](#)

---

**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

Please find attached scanned correspondence from Commissioner Daniel Dowless in support of Chemours.

Thank you,

*--Maria*

Maria C. Edwards  
Clerk to the Board  
COUNTY OF BLADEN  
PO Box 1048  
Elizabethtown, NC 28337  
910 862-6702 Voice  
910 862-6767 Fax

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=====

**From:** Maria Edwards  
**To:** [comments.chemours](#)  
**Subject:** [External] RB Chemours support 07112018.pdf  
**Date:** Wednesday, July 11, 2018 3:20:41 PM  
**Attachments:** [RB Chemours support 07112018.pdf](#)

---

**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

Please find attached scanned correspondence submitted by the Chairman of the Board of County Commissioners in support of Chemours' efforts.

Thank you,

*--Maria*

Maria C. Edwards  
Clerk to the Board  
COUNTY OF BLADEN  
PO Box 1048  
Elizabethtown, NC 28337  
910 862-6702 Voice  
910 862-6767 Fax

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=====

**From:** Charles Peterson  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] CRP Chemours Support 07112018.pdf  
**Date:** Wednesday, July 11, 2018 3:19:40 PM  
**Attachments:** [CRP Chemours Support 07112018.pdf](#)

---

**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

Please find attached a letter in support of allowing Chemours time to fix issues.

Thank you.

***Charles R. Peterson***

County of Bladen  
PO Box 1048  
Elizabethtown, NC 28337  
910 862-6700 voice  
910 862-6767 fax

=====  
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=====



**From:** Shew, Roger D.  
**To:** [comments.chemours](#)  
**Cc:** [Shew, Roger D.](#)  
**Subject:** [External] Public Comments on NCDEQ Case No. 17 CVS 580  
**Date:** Wednesday, July 11, 2018 3:09:56 PM  
**Attachments:** [DEQ Public Comment Case No. 17 CVS580.pdf](#)

---

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Assistant Secretary Holman,  
Please find attached my comments regarding the NCDEQ Proposed Order for Preliminary Injunctive Relief in Bladen County Case No. 17 CVS 580.

Thank you for your service and work to guarantee clean air and water for our state.

Roger D. Shew  
4910 Park Ave.  
Wilmington, NC.

**From:** Emily Donovan  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Public Comment Regarding Chemours Draft Proposal  
**Date:** Wednesday, July 11, 2018 3:07:40 PM

---

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To Whom It May Concern:

As a founding member of Clean Cape Fear, I fully support all comments submitted by Dana Sargent. I am the mother of 9 year old twins who have spent their entire lives drinking contaminated water from the Cape Fear River.

I encourage NC DEQ to do everything in their power to force all companies (Chemours, DuPont, and Kuraray) that operate at the Fayetteville Works site to contain ALL PFAS air emissions that pose a serious, or even unintended, threat to our public health and environment. Many of these compounds change properties and become increasingly toxic the moment they interact with simple water molecules. The burden of proof should fall solely on the shoulders of Chemours/DuPont/Kuraray to communicate that every compound released does not create byproducts that are toxic and can cause widespread harm to our public health and ecosystem.

I also request DEQ require Chemours to pay for split water sample testing between DEQ and an independent third party for all waster water and surface water discharge--as well as private wells impacted by air emissions.

Lastly, the cost associated with all remediation, municipal water improvements, and private well solutions should be solely the responsibility of Chemours/DuPont/Kuraray.

Sincerely,

Emily Donovan  
Clean Cape Fear  
[www.cleancapefear.org](http://www.cleancapefear.org)

--

**Emily Donovan**  
704.491.6635

**From:** danny b  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Chemours water crisis  
**Date:** Wednesday, July 11, 2018 2:17:29 PM

---

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Hey, we need clean water and air! I'm not asking for them to get shut down I would hate to see people without a job! But they should be held responsible for the problem and get it clean up! If it means running county water they should have to pay for it instead of the people like me with the genx in our water. I think it's time to get something done and not filters that reduce water pressure is not a fix either if the company that makes filter is owned by chemours is not a resolution they are profiting on what the caused to start with. I can't even sell my house now no one wants to pay for it because of the water problem!

Sincerely

Daniel Bunnell III & Jennifer Romano  
5985 Shiloah Church Road  
Fayetteville NC 28306

**From:** Rachel Sutton  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Clean water crisis  
**Date:** Wednesday, July 11, 2018 2:13:25 PM

---

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Hello,

I am writing to support your efforts to regulate and enforce much stricter policies on Chemours waste and general practices. Clean and safe drinking water is vital for the livelihood of all living species, and clean and safe waterways is part of the lifeblood of southeastern NC's economy and appeal.

Chemours has more than enough money to invest in righting their wrongs, cleaning up the damage they have caused, and contribute to updating local water facilities to provide safe water for the communities they have damaged. But because they are unwilling to invest, we must, with your authority, create strict guidelines about their waste limitation and hold them accountable on a weekly basis for adhering to the rules and regulations.

Thank you for doing all that you can possibly think of to keep people and the environment safe now and in the future.

Rachel Sutton

Sent from my iPhone

**From:** Mike Watters  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Fwd: Please Copy and Send Comments to DEQ on the Proposed Draft Order.  
**Date:** Wednesday, July 11, 2018 2:06:32 PM

**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

----- Forwarded message -----

**From:** **Christine Whipkey** <[cgwhipkey@gmail.com](mailto:cgwhipkey@gmail.com)>  
**Date:** Wed, Jul 11, 2018, 1:56 PM  
**Subject:** Re: Please Copy and Send Comments to DEQ on the Proposed Draft Order.  
**To:** <[dmartin166@nc.rr.com](mailto:dmartin166@nc.rr.com)>  
**Cc:** Anthony Lenard <[alenard1960@yahoo.com](mailto:alenard1960@yahoo.com)>, Barnes, Greg <[gbarnes@fayobserver.com](mailto:gbarnes@fayobserver.com)>, Beth Markesino <[bethamarkesino@yahoo.com](mailto:bethamarkesino@yahoo.com)>, Bobby Swilley <[bobby@carolinaspecialties.com](mailto:bobby@carolinaspecialties.com)>, Catherine Clabby <[catherine.clabby@gmail.com](mailto:catherine.clabby@gmail.com)>, Dedra Haire <[dedrahaire@gmail.com](mailto:dedrahaire@gmail.com)>, Devane, Steve <[sdevane@fayobserver.com](mailto:sdevane@fayobserver.com)>, Donna F. Inman <[donni0202@aol.com](mailto:donni0202@aol.com)>, Emma Smith <[poppysmith760@gmail.com](mailto:poppysmith760@gmail.com)>, Francis Minshew <[fmnfkn@embarqmail.com](mailto:fmnfkn@embarqmail.com)>, Gene <[Gene@fulcherelectric.com](mailto:Gene@fulcherelectric.com)>, Gene Inman <[geno0625@aol.com](mailto:geno0625@aol.com)>, Gene Swinson <[gswinson1@icloud.com](mailto:gswinson1@icloud.com)>, George Hart <[ghart35@yahoo.com](mailto:ghart35@yahoo.com)>, H T <[ht690189@yahoo.com](mailto:ht690189@yahoo.com)>, Helen Brockett <[helenbrockett@gmail.com](mailto:helenbrockett@gmail.com)>, Ivey, David M <[David.Ivey@charter.com](mailto:David.Ivey@charter.com)>, Jacobs, Rusty <[rjacobs@wunc.org](mailto:rjacobs@wunc.org)>, James Paradise <[jameswparadise@yahoo.com](mailto:jameswparadise@yahoo.com)>, Jody Jernigan <[jody\\_mac@yahoo.com](mailto:jody_mac@yahoo.com)>, Jonathan Swilley <[jdswilley7@gmail.com](mailto:jdswilley7@gmail.com)>, Kathleen Gallagher <[gallagherkm1@gmail.com](mailto:gallagherkm1@gmail.com)>, Kenneth Cannon <[kcann9@aol.com](mailto:kcann9@aol.com)>, Keri Carelas <[keribrockett@gmail.com](mailto:keribrockett@gmail.com)>, Larry Lancaster <[lll@nc.rr.com](mailto:lll@nc.rr.com)>, Linda <[Linda@fulcherelectric.com](mailto:Linda@fulcherelectric.com)>, Martha Bennett <[foxycherokeelady@gmail.com](mailto:foxycherokeelady@gmail.com)>, Michelle Key <[michellekey69@gmail.com](mailto:michellekey69@gmail.com)>, Mike Watters <[wattersm@gmail.com](mailto:wattersm@gmail.com)>, Randa Dunn <[REDRANDA1@aol.com](mailto:REDRANDA1@aol.com)>, Regan, Michael S <[michael.regan@ncdenr.gov](mailto:michael.regan@ncdenr.gov)>, Richard Essex <[REssex@cbs17.com](mailto:REssex@cbs17.com)>, Robert Wesselman <[Danwes5@gmail.com](mailto:Danwes5@gmail.com)>, Scott, Michael <[michael.scott@ncdenr.gov](mailto:michael.scott@ncdenr.gov)>, Stephen Haire <[stephen@carolinaspecialties.com](mailto:stephen@carolinaspecialties.com)>, brett hardy <[creekipirate69@gmail.com](mailto:creekipirate69@gmail.com)>, davejordanwitn <[dave.jordan@witn.com](mailto:dave.jordan@witn.com)>, jeannette rose <[slyrose6963@aol.com](mailto:slyrose6963@aol.com)>, laura booth <[laura.r.booth@gmail.com](mailto:laura.r.booth@gmail.com)>, tracy eaton <[teaton214@yahoo.com](mailto:teaton214@yahoo.com)>, <[webers@wnet.org](mailto:webers@wnet.org)>

**My name is Christine Whipkey and I live at 995 Point Hill Dr [Point East](#) Subdivision, Gray's Creek, Fayetteville, NC 28306 and we totally, 100%, agree with Mr. Mike Waters regarding the comments and especially 67, 69, and 70. I stand united!**

**Christine Whipkey**  
**995 Point Hill Dr**

On Tue, Jul 10, 2018 at 5:21 PM <[dmartin166@nc.rr.com](mailto:dmartin166@nc.rr.com)> wrote:

---- Mike Watters <[wattersm@gmail.com](mailto:wattersm@gmail.com)> wrote:  
> URGENCY  
>

> Good morning members,

> Point of contact Derrick Martin

> 6990 Point East Dr

> Fayetteville, NC 28306

> [dmartin166@nc.rr.com](mailto:dmartin166@nc.rr.com)

> 910-495-5153

>

> Department of Environmental Quality

> [comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

> Assistant Secretary's Office

> RE: Chemours Public Comment

> 1601 Mail Service Center

> Raleigh, N.C. 27699-1601

>

> SUBJECT: Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY

> FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY

> SUPERIOR COURT, Case No. 17 CVS 580.

>

> 1. We the Residents within the "affected households" that live within the

> geographical area of the Chemours managed Fayetteville Works facility

> (Cumberland, Bladen & Robeson Counties) are requesting modification of the

> N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR

> PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17

> CVS 580.

>

> 2. In the absence of evidence to the contrary, ATSDR assumes that humans

> are more sensitive to the effects of hazardous substance than animals and

> that certain persons may be particularly sensitive, the report notes. Thus,

> the resulting MRL may be as much as 100-fold below levels that have been

> shown to be nontoxic in laboratory animals. This federal study is deeply

> concerning because it demonstrates that PFAS chemicals are more dangerous

> to human health than the EPA has previously acknowledged. We are requesting

> the Department of Environmental Quality address these PFAS contaminations

> with more urgency. We must ensure that families exposed to these dangerous

> chemicals receive municipal water, cost to the Company that caused the

> contamination should not be a factor in decision making.

>

> 3. This request is signed by the "affected households" that have wells that

> are exceedance of the Practical Quantitative Limit (PQL) for any PFAS

> constituents in violation of 15A NCAC 02L .0202. These are not naturally

> occurring substances and no standard has been so the permitted

> concentration requires that they be below the Practical Quantitative limit

> for Class GA or Class GSA groundwaters pursuant to 15A NCAC 2L .0202(c).

> This changes the cost per household to approximately \$24k per household for

- > the Cumberland county homes west of the Cape Fear River as presented by
- > Chemours-Parsons developed plan. Why use the Practical Quantitative Limit
- > for all PFAS detected instead of single GENX health goal?
- >
- > a. According to environmental chemists, the proposed ATSDR "minimum risk
- > levels" or MRLs, translate roughly to 7-ppt for PFOS and 11-ppt for PFOA --
- > the two PFAS compounds which the state of Michigan has established cleanup
- > standards for groundwater that people drink.
- >
- > b. A 7-ppt MRL level for PFOS exposure is lower than Michigan's 12-ppt
- > enforceable standard for that compound in surface water, a rule developed
- > to account for bioaccumulation in fish. The U.S. Environmental Protection
- > Agency health advisory level for PFOS and PFOA is a combined 70-ppt, a
- > level some researchers call inadequate to protect public health. We know
- > fish in Marshwood lake did show bioaccumulation of PFAS in fish tested.
- >
- > c. PFAS have been "extensively evaluated in humans and laboratory animals,"
- > the study notes, but says comparing toxicity across species is problematic
- > because, among other things, humans take much longer to purge the chemicals
- > from their bodies. The chemicals also cause different health problems in
- > humans versus animals.
- >
- > d. The ATSDR proposes MRLs translating to about 70-ppt for PFHxS and 10.5
- > ppt for PFNA, two PFAS compounds for which there are no federal Standards.
- > These are found in many of the wells surrounding the facility as well as in
- > the plume contaminating the aquifer under the facility. Refer to the Dec 16
- > Corrective Measure Study that is in DEQ public edocs site for proof.
- >
- > e. "This study confirms that the EPA's guidelines for PFAS levels in
- > drinking water woefully underestimate risks to human health," said Olga
- > Naidenko, a senior science advisor at the nonprofit Environmental Working
- > Group. "We urge EPA to collect and publish all water results showing PFAS
- > contamination at any level, so Americans across the country can take
- > immediate steps to protect themselves and their families."
- >
- > 4. Reasons why Granular Activated Carbon systems should not be option over
- > PWC Municipal Water for Cumberland County residents or Bladen county water
- > for Bladen county residents are as follows:
- >
- > a. Many data points about installing municipal water lines in Cumberland
- > county are inaccurate based on 9 year old data. There is a new 12" pipe
- > being installed off Thrower road with planned extension along Hwy97 to
- > homes near the Alderman Hwy 87 intersection. The Water Replacement plan
- > costing data is inaccurate and needs review by Cumberland and Bladen County
- > commissions. This should also be measured as inst all home found in
- > violation of the Groundwater Rules not just the exceedance of health
- > goal. The cost presented in Nov 2017 to the Bladen County Commission was
- > far less for West of Cape Fear than presented in the plan, the data for
- > Cumberland county is based on 9 year old data and does not take into
- > account the massive growth in the areas south of Sandhill Road all the way

> along Hwy 87 to the Bladen County line.

>

> b. Incomplete Data has been provided by Chemours to DEQ for the tests every other week. This is very important in making decisions such as if Granular Activated Carbon systems are viable and the full cost including operation and maintenance costs. It was presented as a one time cost of \$10K to install, that is not correct data when comparing GAC to municipal water options and taints decision points.

>

> c. The data provided by Chemours (not complete or actual lab results) does indicate that trace chemicals are getting thru the Granular Activated Carbon systems. This would be a violation of 15A NCAC 02L .0202. The full set of data including all of the lab results on all samples taken, as well as the additional field data, such as frequency of sediment filter & iron filter replacement was withheld by Chemours from the well owners and DEQ. Not enough information has been properly reviewed to determine effectiveness, but the data from Chemours indicated that they would be in violation the Groundwater rules/Standards of 15A NCAC 02L .0202.

>

> d. The Swedish study on Granular Activated Carbon systems found them to be inefficient after a 140 day study. The study was to investigate the removal efficiency of PFASs in water using two treatment techniques; granular activated carbon (GAC), type Filtrasorb 400®, and anion exchange (AE), type Purolite A-600. Additionally, the effect of dissolved organic carbon (DOC) on removal efficiency was studied. The removal efficiency of PFASs was studied in pilot-scale column experiments at Bäcklösa drinking water treatment plant (DWTP) in Uppsala, Sweden. The laboratory batch experiments were performed at Swedish University of Agricultural Sciences (SLU), Uppsala. The results from the column experiment indicated a decrease in removal efficiency with increasing number of bed volumes (BVs) for both GAC and AE. The average removal efficiency of all PFASs (n=14) during the 140 day column study was 65% for both GAC and AE. At the end of the column experiment, the average removal efficiency of all PFASs was 49% for GAC and 53% for AE. Removal efficiency was influenced by functional group; perfluoroalkane (-alkyl) sulfonic acids (PFASs) were more efficiently removed than perfluoroalkyl carboxylic acids (PFCAs) (on average 56% vs 38% for GAC, respectively, and 82% vs 28% for AE, respectively). In addition, the perfluorocarbon chain length influenced the removal efficiency. Results from the column experiment indicated higher removal efficiency as the perfluorocarbon chain length increased. In contrast, the results from the batch experiments indicated the opposite; decreasing adsorption to GAC and AE as the chain length increased. Furthermore, presence of DOC in the water affected the removal efficiency of the investigated PFASs. However, the results indicated, contrary to the few studies previously performed on DOC and removal efficiency of PFASs, enhanced sorption of PFASs to GAC with increasing DOC concentration, and decreased PFAS sorption to AE as the DOC concentration increased. In addition, the removal efficiency of GAC and AE varied using water types with different DOC origin, indicating that DOC characteristics influence the removal efficiency of PFASs in water. The six pilot tests are using Filtrasorb 600, but Brunswick county did test



> Filtrasorb 400 and it was not fully effective. There is not enough data yet  
> for filtratorb 600, but initial Chemours data show that Chemicals do get  
> thru in less than the 120 day point.  
>  
> e. Department of Environmental Quality cannot use this set of rules to  
> violate in one instance and not use it as a determination point on who  
> should be provided municipal or filtration systems. The test data provided  
> by Chemours of the Granular Activated Carbon systems proves that the  
> systems allow trace amounts of chemicals to pass through the system. The 12  
> April, 26 April and 10 May Chemours results for Site 48 prove this to be  
> fact. Thus the results are in violation as there is an exceedance of the  
> Practical Quantitative Limit (PQL) for PFAs constituents in violation of  
> 15A NCAC 02L .0202. The DEQ test results from the 3 May test indicates a  
> 106.03 ng/L of combined PFAs breakthrough and this is in less than 1 month  
> of use for this specific test system.  
>  
> f. Maintenance of the system as noted on site 48 that on 5 July could cause  
> contamination as occurred when Parsons found that the Iron filter allowed  
> iron to get into the GAC canisters. This was rectified by doing a backflush  
> running the water onto the soil. This backflush would wash the contaminants  
> that were captured out to the soil that is less than 30 feet from the well.  
> This is no different then an inadvertent spill while filling a truck with  
> contaminated water and should be a violation and reported as a minor  
> reported spill.  
>  
> 5. We request the following three areas to be modified:  
>  
> Line 67 Listed as: Health Studies  
> Line 69 listed as: COMPLIANCE MEASURES – GROUNDWATER  
> Line 70 listed as: Re-Testing of Private Wells  
>  
> 6. The verbiage that we believe should be present is listed below and  
> referenced to the sections we desire to see modification. We have also  
> included a modified PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF  
IN  
> BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580 with the highlighted  
> changes inserted. This is in compliance with the standards used by the  
> Division of Waste Management in the 11 June 2018 Notice of Violation. We  
> the “affected households” request municipal water to be run at Chemours  
> expense. We have included an area on the signature pages attached to  
> indicate who would prefer Municipal water and who would prefer the  
> filtration option to answer that portion in one submission.  
>  
> Section 67 Health Studies  
> It is our belief and desire that part of the health studies should include  
> testing of the members blood & urine of all members of the households that  
> have wells that test or tested with any exceedance of any Practical  
> Quantitative Limit as defined by North Carolina Administrative Code (NCAC)  
> Subchapter 02L .0202 Ground water Standards. Chemours has stated that these  
> chemicals harm nobody, it is time they prove it and in good faith or under

- > court order they should be compelled to do this as part of the health
- > studies. The harm to not only human or aquatic life needs to be researched,
- > but also animals, such as Dogs, Cats, Birds and Farm animals.

>

> MODIFIED TO READ

> COMPLIANCE MEASURES – GROUNDWATER

- > 69. Permanent Replacement of Private Drinking Water Supplies: By no later
- > than twelve (12) months after issuance of this Order, Chemours shall
- > establish permanent replacement water supplies for each household with a
- > water supply well contaminated by any PFAS (“affected households”) PFBS
- > CAS# 375-73-5, PFDA CAS# 335-76-2, PFDoA CAS# 307-55-1, PFHpA CAS#
- > 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1,
- > PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3,
- PFMOAA
- > CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFo3OA
- > CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA
- > Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or
- > additionally discovered PFAS in exceedance of the practical quantitative
- > limit (PQL). The authority provided under Title 15A of the North Carolina
- > Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards.
- > Pursuant to 15A NCAC 2L .0202(c), “substances which are not naturally
- > occurring and which no standard is specified shall not be permitted in
- > concentrations at or above the practical quantitation limit in class GA or
- > Class GSA groundwaters. The replacement water supply shall be established
- > by connection to a public water supply, except that an affected household
- > may elect to receive a filtration system approved by DEQ in lieu of a
- > connection to public water supply, in which case Chemours shall install a
- > filtration system. For affected households Chemours shall be liable for any
- > water bills from public utilities and for periodic required maintenance for
- > any home that requested the DEQ approved filtration system. Chemours shall
- > submit a plan for compliance with this provision, including a detailed
- > schedule with milestones, no later than sixty (60) days after entry of this
- > Order. This provision shall supplement any prior requirements regarding the
- > provision of permanent replacement water supplies. Upon failure to comply
- > with installation of municipal water to all homes with groundwater wells in
- > exceedance of the Groundwater rules DEQ to find Chemours in violation of
- > Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L
- > .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), “substances
- > which are not naturally occurring and which no standard is specified shall
- > not be permitted in concentrations at or above the practical quantitation
- > limit in class GA or Class GSA groundwaters. DEQ will assess penalties
- > under NCGS 143-215.6A (a)(1) of not more than \$25,000 per day for each
- > groundwater well that has been tested and been found to exceedance of the
- > practical quantitative limit for any PFAs constituents. Multiple found PFAs
- > constituents will be considered as separate violations of the North
- > Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water
- > Standards. Pursuant to 15A NCAC 2L .0202(c) and deemed a violation pursuant
- > to G.S. 143-214-1.

>

> MODIFIED to READ

- > 70. Re-Testing of Private Wells: Chemours shall conduct testing of private
- > drinking water supply wells as follows: for wells with test results showing
- > no detectable concentrations of PFAS Compounds, Chemours shall re-test for
- > PFPrOPrA CAS# 62037-80-3, PFOA CAS# 335-67-1, PFOS CAS# 1763-23-1, PFBS
- > CAS# 375-73-5, PFDA CAS# 335-76-2, PFDoA CAS# 307-55-1, PFHpA CAS#
- > 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1,
- > PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3,
- PFMOAA
- > CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFo3OA
- > CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA
- > Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or
- > additionally discovered PFAS in exceedance of the practical quantitative
- > limit (PQL) on an annual basis until sampling shows no detectable
- > concentrations of any PFAS constituents for two consecutive sampling
- > events. Chemours shall provide to DEQ a list of residents within these
- > sampling ranges, identified by both their address and sample ID. Chemours
- > shall also provide to DEQ a list of wells (identified by address) targeted
- > for testing that have not yet been tested and verifying its efforts to test
- > these wells.

**From:** Kim Poetzscher  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Chemours needs to be held accountable!  
**Date:** Wednesday, July 11, 2018 1:53:07 PM

---

**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

It's plain and simple, Chemours is polluting and poisoning N.C. it's affecting not only residents, but plant and animal life. I am held accountable if I pollute, so why shouldn't a company? Please stop putting greed before the health and concerns of N.C. residents. Besides the requests below, ***please lower the PPT from 140 to 0***. Poisoning is poisoning, plain and simple. There should be no hypothetical limit. Reduce it to zero now!!

- Reduce facility-wide air emissions of GenX compounds by at least 97 percent by Aug. 31, 2018, with a 99 percent reduction required by Dec. 31, 2019.
- Conduct re-testing of private drinking wells on a quarterly, semi-annual or annual basis, depending on the level of GenX compounds detected in the initial round of testing.
- ***Provide permanent alternative water supplies or treatment systems to households impacted by groundwater contamination!!!!!! Not everyone can afford home systems and buying bottled water to avoid this mess you made!!!***
- Conduct toxicity studies relating to human health and aquatic life impacts from chemicals at the facility.
- Notify and coordinate with downstream public water utilities when an event at the facility has the potential to cause a discharge of GenX compounds into the Cape Fear River above the health goal of 140 parts per trillion.

Thank you for your consideration.

Kim  
A concerned Wilmington resident

**From:** Doktor Z  
**To:** [comments.chemours](#)  
**Subject:** [External] GenX public comment  
**Date:** Wednesday, July 11, 2018 1:11:11 PM

---

**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

I agree with the proposed court order and all points should be enforced.

Sincerely,  
Diana Zaccaria

Sent from [Mail](#) for Windows 10

**From:** murraysb  
**To:** [comments.chemours](#)  
**Subject:** [External] Chemours  
**Date:** Wednesday, July 11, 2018 1:09:06 PM

---

**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

Support these measures to clean up our river and drinking water. Corporations should NOT be able to put resilient, untested, emerging contaminants in the drinking water of innocent people just to make non stick cookware

Sent from my Verizon, Samsung Galaxy smartphone

**From:** Elli Klein  
**To:** [comments.chemours](https://www.chemours.com/comments)  
**Subject:** [External] NO Compromise w/ Chemours; Relief for US!  
**Date:** Wednesday, July 11, 2018 12:51:08 PM

---

**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

Dear DEQ:

Thank you for continuing to work, even under unwarranted pressure to turn your efforts away from keeping our water, air, environment safe. Please do Not allow Chemours to wiggle out of their accountability for poisoning our water, air, and people!

Please use every means possiblecan to stop Chemours from polluting and to force them to pay for clean water and to lean up their mess Now!

Thank you,  
Elli Klein, Wilmington NC

**From:** redranda1@aol.com  
**To:** [comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)  
**Subject:** [External] Chemours contamination  
**Date:** Wednesday, July 11, 2018 12:39:34 PM

---

**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

I previously sent comments to you.  
We are Herman and Randa Dunn  
904 Circle Point Court  
Fayetteville, NC Gray's Creek

I am sure no one in this contaminated area will accept well filtration systems. They are not a permanent solution to this contamination. We need Chemours to pay for public water being run to our contaminated homes. This means all contaminations at every level.



**From:** aliceann@ec.rr.com  
**To:** [comments.chemours](#)  
**Subject:** [External] Chemours  
**Date:** Wednesday, July 11, 2018 12:38:09 PM

---

CAUTION: External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to Report Spam.<<mailto:report.spam@nc.gov>>

Chemours should not be allowed to emit ANY pollutants into our air and water. It is their responsibility to pay for cleaning up their toxins already polluting our environment.

Sent from my iPhone

**From:** Nina Marable  
**To:** [comments.chemours](https://comments.chemours.com)  
**Subject:** [External] Support for DEQ proposed court order  
**Date:** Wednesday, July 11, 2018 12:18:27 PM

---

**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

I fully support the proposed court order to require Chemours to clean up Cape Fear River water.

Clean water is a right. Big business should not be allowed to endanger the public's health.

**From:** Kathleen Gallagher  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Fwd: Please Copy and Send Comments to DEQ on the Proposed Draft Order.  
**Date:** Wednesday, July 11, 2018 10:11:23 AM

---

**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

----- Forwarded message -----

**From:** <[dmartin166@nc.rr.com](mailto:dmartin166@nc.rr.com)>  
**Date:** Tue, Jul 10, 2018, 5:21 PM  
**Subject:** Re: Please Copy and Send Comments to DEQ on the Proposed Draft Order.  
**To:** Donna F. Inman <[donni0202@aol.com](mailto:donni0202@aol.com)>, James Paradise <[jameswparadise@yahoo.com](mailto:jameswparadise@yahoo.com)>, davejordanwitn <[dave.jordan@witn.com](mailto:dave.jordan@witn.com)>, Robert Wesselman <[Danwes5@gmail.com](mailto:Danwes5@gmail.com)>, Gene <[Gene@fulcherelectric.com](mailto:Gene@fulcherelectric.com)>, Jody Jernigan <[jody\\_mac@yahoo.com](mailto:jody_mac@yahoo.com)>, brett hardy <[creekpirate69@gmail.com](mailto:creekpirate69@gmail.com)>, Michelle Key <[michellekey69@gmail.com](mailto:michellekey69@gmail.com)>, tracy eaton <[teaton214@yahoo.com](mailto:teaton214@yahoo.com)>, Dedra Haire <[dedrahaire@gmail.com](mailto:dedrahaire@gmail.com)>, H T <[ht690189@yahoo.com](mailto:ht690189@yahoo.com)>, Francis Minshew <[fmnfkn@embarqmail.com](mailto:fmnfkn@embarqmail.com)>, Beth Markesino <[bethamarkesino@yahoo.com](mailto:bethamarkesino@yahoo.com)>, jeannette rose <[slyrose6963@aol.com](mailto:slyrose6963@aol.com)>, Keri Carelas <[keribrockett@gmail.com](mailto:keribrockett@gmail.com)>, Helen Brockett <[helenbrockett@gmail.com](mailto:helenbrockett@gmail.com)>, Bobby Swilley <[bobby@carolinaspecialties.com](mailto:bobby@carolinaspecialties.com)>, Kathleen Gallagher <[gallagherkm1@gmail.com](mailto:gallagherkm1@gmail.com)>, Barnes, Greg <[gbarnes@fayobserver.com](mailto:gbarnes@fayobserver.com)>, Regan, Michael S <[michael.regan@ncdenr.gov](mailto:michael.regan@ncdenr.gov)>, Randa Dunn <[REDRANDA1@aol.com](mailto:REDRANDA1@aol.com)>, Anthony Lenard <[alenard1960@yahoo.com](mailto:alenard1960@yahoo.com)>, Ivey, David M <[David.Ivey@charter.com](mailto:David.Ivey@charter.com)>, Linda <[Linda@fulcherelectric.com](mailto:Linda@fulcherelectric.com)>, Christine Whipkey <[cgwhipkey@gmail.com](mailto:cgwhipkey@gmail.com)>, laura booth <[laura.r.booth@gmail.com](mailto:laura.r.booth@gmail.com)>, Devane, Steve <[sdevane@fayobserver.com](mailto:sdevane@fayobserver.com)>, Gene Inman <[geno0625@aol.com](mailto:geno0625@aol.com)>, Martha Bennett <[foxycherokeelady@gmail.com](mailto:foxycherokeelady@gmail.com)>, <[webers@wnet.org](mailto:webers@wnet.org)>, Jonathan Swilley <[jdswilley7@gmail.com](mailto:jdswilley7@gmail.com)>, Emma Smith <[poppysmith760@gmail.com](mailto:poppysmith760@gmail.com)>, Scott, Michael <[michael.scott@ncdenr.gov](mailto:michael.scott@ncdenr.gov)>, George Hart <[ghart35@yahoo.com](mailto:ghart35@yahoo.com)>, Gene Swinson <[gswinson1@icloud.com](mailto:gswinson1@icloud.com)>, Catherine Clabby <[catherine.clabby@gmail.com](mailto:catherine.clabby@gmail.com)>, Stephen Haire <[stephen@carolinaspecialties.com](mailto:stephen@carolinaspecialties.com)>, Richard Essex <[REssex@cbs17.com](mailto:REssex@cbs17.com)>, Mike Watters <[wattersm@gmail.com](mailto:wattersm@gmail.com)>, Jacobs, Rusty <[rjacobs@wunc.org](mailto:rjacobs@wunc.org)>, Larry Lancaster <[lll@nc.rr.com](mailto:lll@nc.rr.com)>, Kenneth Cannon <[kcann9@aol.com](mailto:kcann9@aol.com)>

--- Mike Watters <[wattersm@gmail.com](mailto:wattersm@gmail.com)> wrote:

> URGENCY

>

> Good morning members,

> Point of contact Derrick Martin

> 6990 Point East Dr

> Fayetteville, NC 28306

> [dmartin166@nc.rr.com](mailto:dmartin166@nc.rr.com)

> 910-495-5153

>

> Department of Environmental Quality

> [comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

- > Assistant Secretary's Office
- > RE: Chemours Public Comment
- > 1601 Mail Service Center
- > Raleigh, N.C. 27699-1601
- >
- > SUBJECT: Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY
- > FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY
- > SUPERIOR COURT, Case No. 17 CVS 580.
- >
- > 1. We the Residents within the "affected households" that live within the
- > geographical area of the Chemours managed Fayetteville Works facility
- > (Cumberland, Bladen & Robeson Counties) are requesting modification of the
- > N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR
- > PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT,
- > Case No. 17
- > CVS 580.
- >
- > 2. In the absence of evidence to the contrary, ATSDR assumes that humans
- > are more sensitive to the effects of hazardous substance than animals and
- > that certain persons may be particularly sensitive, the report notes. Thus,
- > the resulting MRL may be as much as 100-fold below levels that have been
- > shown to be nontoxic in laboratory animals. This federal study is deeply
- > concerning because it demonstrates that PFAS chemicals are more dangerous
- > to human health than the EPA has previously acknowledged. We are requesting
- > the Department of Environmental Quality address these PFAS contaminations
- > with more urgency. We must ensure that families exposed to these dangerous
- > chemicals receive municipal water, cost to the Company that caused the
- > contamination should not be a factor in decision making.
- >
- > 3. This request is signed by the "affected households" that have wells that
- > are exceedance of the Practical Quantitative Limit (PQL) for any PFAS
- > constituents in violation of 15A NCAC 02L .0202. These are not naturally
- > occurring substances and no standard has been so the permitted
- > concentration requires that they be below the Practical Quantitative limit
- > for Class GA or Class GSA groundwaters pursuant to 15A NCAC 2L .0202(c).
- > This changes the cost per household to approximately \$24k per household for
- > the Cumberland county homes west of the Cape Fear River as presented by
- > Chemours-Parsons developed plan. Why use the Practical Quantitative Limit
- > for all PFAS detected instead of single GENX health goal?
- >
- > a. According to environmental chemists, the proposed ATSDR "minimum risk
- > levels" or MRLs, translate roughly to 7-ppt for PFOS and 11-ppt for PFOA --
- > the two PFAS compounds which the state of Michigan has established cleanup
- > standards for groundwater that people drink.
- >
- > b. A 7-ppt MRL level for PFOS exposure is lower than Michigan's 12-ppt
- > enforceable standard for that compound in surface water, a rule developed

- > to account for bioaccumulation in fish. The U.S. Environmental Protection Agency health advisory level for PFOS and PFOA is a combined 70-ppt, a level some researchers call inadequate to protect public health. We know fish in Marshwood lake did show bioaccumulation of PFAS in fish tested.
- >
- > c. PFAS have been "extensively evaluated in humans and laboratory animals," the study notes, but says comparing toxicity across species is problematic because, among other things, humans take much longer to purge the chemicals from their bodies. The chemicals also cause different health problems in humans versus animals.
- >
- > d. The ATSDR proposes MRLs translating to about 70-ppt for PFHxS and 10.5 ppt for PFNA, two PFAS compounds for which there are no federal Standards. These are found in many of the wells surrounding the facility as well as in the plume contaminating the aquifer under the facility. Refer to the Dec 16 Corrective Measure Study that is in DEQ public edocs site for proof.
- >
- > e. "This study confirms that the EPA's guidelines for PFAS levels in drinking water woefully underestimate risks to human health," said Olga Naidenko, a senior science advisor at the nonprofit Environmental Working Group. "We urge EPA to collect and publish all water results showing PFAS contamination at any level, so Americans across the country can take immediate steps to protect themselves and their families."
- >
- > 4. Reasons why Granular Activated Carbon systems should not be option over PWC Municipal Water for Cumberland County residents or Bladen county water for Bladen county residents are as follows:
- >
- > a. Many data points about installing municipal water lines in Cumberland county are inaccurate based on 9 year old data. There is a new 12" pipe being installed off Thrower road with planned extension along Hwy97 to homes near the Alderman Hwy 87 intersection. The Water Replacement plan costing data is inaccurate and needs review by Cumberland and Bladen County commissions. This should also be measured as inst all home found in violati ok n of the Groundwater Rules not just the exceedance of health goal. The cost presented in Nov 2017 to the Bladen County Commission was far less for West of Cape Fear than presented in the plan, the data for Cumberland county is based on 9 year old data and does not take into account the massive growth in the areas south of Sandhill Road all the way along Hwy 87 to the Bladen County line.
- >
- > b. Incomplete Data has been provided by Chemours to DEQ for the tests every other week. This is very important in making decisions such as if Granular Activated Carbon systems are viable and the full cost including operation and maintenance costs. It was presented as a one time cost of \$10K to install, that is not correct data when comparing GAC to municipal water options and taints decision points.
- >
- > c. The data provided by Chemours (not complete or actual lab results) does indicate that trace chemicals are getting thru the Granular Activated

> Carbon systems. This would be a violation of 15A NCAC 02L .0202. The full  
> set of data including all of the lab results on all samples taken, as well  
> as the additional field data, such as frequency of sediment filter & iron  
> filter replacement was withheld by Chemours from the well owners and DEQ.  
> Not enough information has been properly reviewed to determine  
> effectiveness, but the data from Chemours indicated that they would be in  
> violation the Groundwater rules/Standards of 15A NCAC 02L .0202.  
>  
> d. The Swedish study on Granular Activated Carbon systems found them to be  
> inefficient after a 140 day study. The study was to investigate the  
> removal efficiency of PFASs in water using two treatment techniques;  
> granular activated carbon (GAC), type Filtrasorb 400®, and anion exchange  
> (AE), type Purolite A-600. Additionally, the effect of dissolved organic  
> carbon (DOC) on removal efficiency was studied. The removal efficiency of  
> PFASs was studied in pilot-scale column experiments at Bäcklösa drinking  
> water treatment plant (DWTP) in Uppsala, Sweden. The laboratory batch  
> experiments were performed at Swedish University of Agricultural Sciences  
> (SLU), Uppsala. The results from the column experiment indicated a decrease  
> in removal efficiency with increasing number of bed volumes (BVs) for both  
> GAC and AE. The average removal efficiency of all PFASs (n=14) during the  
> 140 day column study was 65% for both GAC and AE. At the end of the column  
> experiment, the average removal efficiency of all PFASs was 49% for GAC and  
> 53% for AE. Removal efficiency was influenced by functional group;  
> perfluoroalkane (-alkyl) sulfonic acids (PFSAs) were more efficiently  
> removed than perfluoroalkyl carboxylic acids (PFCAs) (on average 56% vs 38%  
> for GAC, respectively, and 82% vs 28% for AE, respectively). In addition,  
> the perfluorocarbon chain length influenced the removal efficiency. Results  
> from the column experiment indicated higher removal efficiency as the  
> perfluorocarbon chain length increased. In contrast, the results from the  
> batch experiments indicated the opposite; decreasing adsorption to GAC and  
> AE as the chain length increased. Furthermore, presence of DOC in the water  
> affected the removal efficiency of the investigated PFASs. However, the  
> results indicated, contrary to the few studies previously performed on DOC  
> and removal efficiency of PFASs, enhanced sorption of PFASs to GAC with  
> increasing DOC concentration, and decreased PFAS sorption to AE as the DOC  
> concentration increased. In addition, the removal efficiency of GAC and AE  
> varied using water types with different DOC origin, indicating that DOC  
> characteristics influence the removal efficiency of PFASs in water. The six  
> pilot tests are using Filtrasorb 600, but Brunswick county did test  
> Filtrasorb 400 and it was not fully effective. There is not enough data yet  
> for Filtrasorb 600, but initial Chemours data show that Chemicals do get  
> thru in less than the 120 day point.  
>  
> e. Department of Environmental Quality cannot use this set of rules to  
> violate in one instance and not use it as a determination point on who  
> should be provided municipal or filtration systems. The test data provided  
> by Chemours of the Granular Activated Carbon systems proves that the  
> systems allow trace amounts of chemicals to pass through the system. The 12  
> April, 26 April and 10 May Chemours results for Site 48 prove this to be  
> fact. Thus the results are in violation as there is an exceedance of the

- > Practical Quantitative Limit (PQL) for PFAs constituents in violation of
- > 15A NCAC 02L .0202. The DEQ test results from the 3 May test indicates a
- > 106.03 ng/L of combined PFAs breakthrough and this is in less than 1 month
- > of use for this specific test system.
- >
- > f. Maintenance of the system as noted on site 48 that on 5 July could cause
- > contamination as occurred when Parsons found that the Iron filter allowed
- > iron to get into the GAC canisters. This was rectified by doing a backflush
- > running the water onto the soil. This backflush would wash the contaminants
- > that were captured out to the soil that is less than 30 feet from the well.
- > This is no different then an inadvertent spill while filling a truck with
- > contaminated water and should be a violation and reported as a minor
- > reported spill.
- >
- > 5. We request the following three areas to be modified:
- >
- > Line 67 Listed as: Health Studies
- > Line 69 listed as: COMPLIANCE MEASURES – GROUNDWATER
- > Line 70 listed as: Re-Testing of Private Wells
- >
- > 6. The verbiage that we believe should be present is listed below and
- > referenced to the sections we desire to see modification. We have also
- > included a modified PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF
- IN
- > BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580 with the highlighted
- > changes inserted. This is in compliance with the standards used by the
- > Division of Waste Management in the 11 June 2018 Notice of Violation. We
- > the “affected households” request municipal water to be run at Chemours
- > expense. We have included an area on the signature pages attached to
- > indicate who would prefer Municipal water and who would prefer the
- > filtration option to answer that portion in one submission.
- >
- > Section 67 Health Studies
- > It is our belief and desire that part of the health studies should include
- > testing of the members blood & urine of all members of the households that
- > have wells that test or tested with any exceedance of any Practical
- > Quantitative Limit as defined by North Carolina Administrative Code (NCAC)
- > Subchapter 02L .0202 Ground water Standards. Chemours has stated that these
- > chemicals harm nobody, it is time they prove it and in good faith or under
- > court order they should be compelled to do this as part of the health
- > studies. The harm to not only human or aquatic life needs to be researched,
- > but also animals, such as Dogs, Cats, Birds and Farm animals.
- >
- > MODIFIED TO READ
- > COMPLIANCE MEASURES – GROUNDWATER
- > 69. Permanent Replacement of Private Drinking Water Supplies: By no later
- > than twelve (18) months after issuance of this Order, Chemours shall
- > establish permanent replacement water supplies for each household with a
- > water supply well contaminated by any PFAS (“affected households”) PFBS
- > CAS# 375-73-5, PFDA CAS# 335-76-2, PFDa CAS# 307-55-1, PFHpA CAS#

> 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1,  
> PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3, PFMOAA  
> CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFo3OA  
> CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA  
> Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or  
> additionally discovered PFAS in exceedance of the practical quantitative  
> limit (PQL). The authority provided under Title 15A of the North Carolina  
> Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards.  
> Pursuant to 15A NCAC 2L .0202(c), “substances which are not naturally  
> occurring and which no standard is specified shall not be permitted in  
> concentrations at or above the practical quantitation limit in class GA or  
> Class GSA groundwaters. The replacement water supply shall be established  
> by connection to a public water supply, except that an affected household  
> may elect to receive a filtration system approved by DEQ in lieu of a  
> connection to public water supply, in which case Chemours shall install a  
> filtration system. For affected households Chemours shall be liable for any  
> water bills from public utilities and for periodic required maintenance for  
> any home that requested the DEQ approved filtration system. Chemours shall  
> submit a plan for compliance with this provision, including a detailed  
> schedule with milestones, no later than sixty (60) days after entry of this  
> Order. This provision shall supplement any prior requirements regarding the  
> provision of permanent replacement water supplies. Upon failure to comply  
> with installation of municipal water to all homes with groundwater wells in  
> exceedance of the Groundwater rules DEQ to find Chemours in violation of  
> Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L  
> .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), “substances  
> which are not naturally occurring and which no standard is specified shall  
> not be permitted in concentrations at or above the practical quantitation  
> limit in class GA or Class GSA groundwaters. DEQ will assess penalties  
> under NCGS 143-215.6A (a)(1) of not more than \$25,000 per day for each  
> groundwater well that has been tested and been found to exceedance of the  
> practical quantitative limit for any PFAs constituents. Multiple found PFAs  
> constituents will be considered as separate violations of the North  
> Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water  
> Standards. Pursuant to 15A NCAC 2L .0202(c) and deemed a violation pursuant  
> to G.S. 143-214-1.

>

> **MODIFIED to READ**

> 70. Re-Testing of Private Wells: Chemours shall conduct testing of private  
> drinking water supply wells as follows: for wells with test results showing  
> no detectable concentrations of PFAS Compounds, Chemours shall re-test for  
> PFPrOPrA CAS# 62037-80-3, PFOA CAS# 335-67-1, PFOS CAS# 1763-23-1, PFBS  
> CAS# 375-73-5, PFDA CAS# 335-76-2, PFDoA CAS# 307-55-1, PFHpA CAS#  
> 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1,  
> PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3, PFMOAA  
> CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFo3OA  
> CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA  
> Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or  
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- > shall also provide to DEQ a list of wells (identified by address) targeted
- > for testing that have not yet been tested and verifying its efforts to test
- > these wells.

**From:** Inman, Donna F.  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External]  
**Date:** Wednesday, July 11, 2018 8:09:53 AM

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**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

Point of contact:  
Gene & Donna Inman  
6995 Point East Drive  
Fayetteville, NC 28306  
910-484-9285

Department of Environmental Quality  
[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)  
Assistant Secretary's Office  
RE: Chemours Public Comment  
1601 Mail Service Center  
Raleigh, N.C. 27699-1601

SUBJECT: Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

1. We the Residents within the “affected households” that live within the geographical area of the Chemours managed Fayetteville Works facility (Cumberland, Bladen & Robeson Counties) are requesting modification of the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

2. In the absence of evidence to the contrary, ATSDR assumes that humans are more sensitive to the effects of hazardous substance than animals and that certain persons may be particularly sensitive, the report notes. Thus, the resulting MRL may be as much as 100-fold below levels that have been shown to be nontoxic in laboratory animals. This federal study is deeply concerning because it demonstrates that PFAS chemicals are more dangerous to human health than the EPA has previously acknowledged. We are requesting the Department of Environmental Quality address these PFAS contaminations with more urgency. We must ensure that families exposed to these dangerous chemicals receive municipal water, cost to the Company that caused the contamination should not be a factor in decision making.

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Line 67 Listed as: Health Studies

Line 69 listed as: COMPLIANCE MEASURES – GROUNDWATER

Line 70 listed as: Re-Testing of Private Wells

6. The verbiage that we believe should be present is listed below and referenced to the sections we desire to see modification. We have also included a modified PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580 with the highlighted changes inserted. This is in compliance with the standards used by the Division of Waste Management in the 11 June 2018 Notice of Violation. We the “affected households” request municipal water to be run at Chemours expense. We have included an area on the signature pages attached to indicate who would prefer Municipal water and who would prefer the filtration option to answer that portion in one submission.

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It is our belief and desire that part of the health studies should include testing of the members blood & urine of all members of the households that

have wells that test or tested with any exceedance of any Practical Quantitative Limit as defined by North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Chemours has stated that these chemicals harm nobody, it is time they prove it and in good faith or under court order they should be compelled to do this as part of the health studies. The harm to not only human or aquatic life needs to be researched, but also animals, such as Dogs, Cats, Birds and Farm animals.

#### MODIFIED TO READ

#### COMPLIANCE MEASURES – GROUNDWATER

69. Permanent Replacement of Private Drinking Water Supplies: By no later than twelve (12) months after issuance of this Order, Chemours shall establish permanent replacement water supplies for each household with a water supply well contaminated by any PFAS (“affected households”) PFBS CAS# 375-73-5, PFDA CAS# 335-76-2, PFDa CAS# 307-55-1, PFHpA CAS# 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1, PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3, PFMOAA CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFo3OA CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or additionally discovered PFAS in exceedance of the practical quantitative limit (PQL). The authority provided under Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), “substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. The replacement water supply shall be established by connection to a public water supply, except that an affected household may elect to receive a filtration system approved by DEQ in lieu of a connection to public water supply, in which case Chemours shall install a filtration system. For affected households Chemours shall be liable for any water bills from public utilities and for periodic required maintenance for any home that requested the DEQ approved filtration system. Chemours shall submit a plan for compliance with this provision, including a detailed schedule with milestones, no later than sixty (60) days after entry of this Order. This provision shall supplement any prior requirements regarding the provision of permanent replacement water supplies. Upon failure to comply with installation of municipal water to all homes with groundwater wells in exceedance of the Groundwater rules DEQ to find Chemours in violation of Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), “substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. DEQ will assess penalties under NCGS 143-215.6A (a)(1) of not more than \$25,000 per day for each groundwater well that has been tested and been found to exceedance of the practical quantitative limit for any PFAs constituents. Multiple found PFAs constituents will be considered as separate violations of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c) and deemed a violation pursuant

to G.S. 143-214-1.

MODIFIED to READ

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E-mail correspondence to and from this address may be subject to the North Carolina public records laws and if so, may be disclosed.

**From:** Jody Jernigan  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Comments to DEQ on the Proposed Draft Order  
**Date:** Wednesday, July 11, 2018 8:06:23 AM

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**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

Department of Environmental Quality  
[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)  
Assistant Secretary's Office  
RE: Chemours Public Comment  
1601 Mail Service Center  
Raleigh, N.C. 27699-1601

We demand our lawful and rightful help from the State of North Carolina and DEQ, including national and federal levels. We have spent too many years being poisoned by contaminated air and water.

We are in agreement with Mike Watters' assessment which resulted from extensive, in-depth investigation and proven scientific research. We know that there are ways the State can STOP DuPont/Chemours and help the residents achieve a clean air and clean water solution. With the new ASTDR study, we are aware that we are at risk at much lower numbers than previously shown.

The solution should not be dictated by, or for the benefit of, Chemours. We, the neighborhood Chemours professed to protect from such dangers in the past while dumping into the river, are being contaminated!

Even though you cannot undo the detriments to our health thus far, further contamination CAN AND MUST be stopped.

Thank you for protecting our families from this point forward.

*Jody & Leon Jernigan  
6948 Point East Dr.  
Fayetteville, NC 28306*

SUBJECT: Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

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**From:** Richard Brightman  
**To:** [comments.chemours](#)  
**Subject:** [External] Chemours Comments  
**Date:** Wednesday, July 11, 2018 7:14:19 AM

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Dear Assistant Secretary Holman,

Please accept the following comment in response to the NC DEQ Proposal for Injunctive Relief against Chemours:

DEQ, please do everything in your power to immediately stop Chemours from emitting and discharging PFAS into our environment and to ensure they clean up the messes they've already made.

Respectfully submitted,

The Brightman Family, Wilmington, NC

**From:** Porters  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] RE: Comment on Proposed Order for Preliminary Injunctive Relief  
**Date:** Tuesday, July 10, 2018 11:43:55 PM

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I am a scientist and former federal water regulator. I am also a mother of a family who unknowingly consumed water, seafood products, and had wide exposure to the chemicals from Chemours discharges for nearly two decades.

The draft order reports that the Fayetteville works plant on the Cape Fear is in significant violation of its suite of permits to pollute. The draft further outlines that despite repeated attempts to require corrective action, Chemours violations, amounting to significant poisoning of a major ecosystem and a water supply for the Cape Fear region, persists in its polluting activities and has been largely unsuccessful at abating existing pollutants despite prior orders from NC DENR.

The recalcitrant inaction at conducting successful remediation by Chemours cannot be tolerated. I recommend you serve Chemours with a cease and desist notice to accompany your recommendations for remediation.

Until Chemours can demonstrate and prove that they are not contaminating our water further and they have remediated the existing contamination, they should not have the privilege of operating and polluting in our dear state.

You may contact me for further information.

Thank you for the opportunity to comment.  
Elizabeth Porter, MSSM, GISP  
Health \* Environment \* Justice

Sent from my iPad

**From:** Mike Watters  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Fwd: Please Copy and Send Comments to DEQ on the Proposed Draft Order.  
**Date:** Tuesday, July 10, 2018 10:34:26 PM

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----- Forwarded message -----

From: <[dmartin166@nc.rr.com](mailto:dmartin166@nc.rr.com)>  
Date: Tue, Jul 10, 2018, 5:21 PM  
Subject: Re: Please Copy and Send Comments to DEQ on the Proposed Draft Order.  
To: Donna F. Inman <[donni0202@aol.com](mailto:donni0202@aol.com)>, James Paradise <[jameswparadise@yahoo.com](mailto:jameswparadise@yahoo.com)>, davejordanwitn <[dave.jordan@witn.com](mailto:dave.jordan@witn.com)>, Robert Wesselman <[Danwes5@gmail.com](mailto:Danwes5@gmail.com)>, Gene <[Gene@fulcherelectric.com](mailto:Gene@fulcherelectric.com)>, Jody Jernigan <[jody\\_mac@yahoo.com](mailto:jody_mac@yahoo.com)>, brett hardy <[creekpirate69@gmail.com](mailto:creekpirate69@gmail.com)>, Michelle Key <[michellekey69@gmail.com](mailto:michellekey69@gmail.com)>, tracy eaton <[teaton214@yahoo.com](mailto:teaton214@yahoo.com)>, Dedra Haire <[dedrahaire@gmail.com](mailto:dedrahaire@gmail.com)>, H T <[ht690189@yahoo.com](mailto:ht690189@yahoo.com)>, Francis Minshew <[fmnfkn@embarqmail.com](mailto:fmnfkn@embarqmail.com)>, Beth Markesino <[bethamarkesino@yahoo.com](mailto:bethamarkesino@yahoo.com)>, jeannette rose <[slyrose6963@aol.com](mailto:slyrose6963@aol.com)>, Keri Carelas <[keribrockett@gmail.com](mailto:keribrockett@gmail.com)>, Helen Brockett <[helenbrockett@gmail.com](mailto:helenbrockett@gmail.com)>, Bobby Swilley <[bobby@carolinaspecialties.com](mailto:bobby@carolinaspecialties.com)>, Kathleen Gallagher <[gallagherkm1@gmail.com](mailto:gallagherkm1@gmail.com)>, Barnes, Greg <[gbarnes@fayobserver.com](mailto:gbarnes@fayobserver.com)>, Regan, Michael S <[michael.regan@ncdenr.gov](mailto:michael.regan@ncdenr.gov)>, Randa Dunn <[REDRANDA1@aol.com](mailto:REDRANDA1@aol.com)>, Anthony Lenard <[alenard1960@yahoo.com](mailto:alenard1960@yahoo.com)>, Ivey, David M <[David.Ivey@charter.com](mailto:David.Ivey@charter.com)>, Linda <[Linda@fulcherelectric.com](mailto:Linda@fulcherelectric.com)>, Christine Whipkey <[cgwhipkey@gmail.com](mailto:cgwhipkey@gmail.com)>, laura booth <[laura.r.booth@gmail.com](mailto:laura.r.booth@gmail.com)>, Devane, Steve <[sdevane@fayobserver.com](mailto:sdevane@fayobserver.com)>, Gene Inman <[geno0625@aol.com](mailto:geno0625@aol.com)>, Martha Bennett <[foxycherokeelady@gmail.com](mailto:foxycherokeelady@gmail.com)>, <[webers@wnet.org](mailto:webers@wnet.org)>, Jonathan Swilley <[jdswilley7@gmail.com](mailto:jdswilley7@gmail.com)>, Emma Smith <[poppysmith760@gmail.com](mailto:poppysmith760@gmail.com)>, Scott, Michael <[michael.scott@ncdenr.gov](mailto:michael.scott@ncdenr.gov)>, George Hart <[ghart35@yahoo.com](mailto:ghart35@yahoo.com)>, Gene Swinson <[gswinson1@icloud.com](mailto:gswinson1@icloud.com)>, Catherine Clabby <[catherine.clabby@gmail.com](mailto:catherine.clabby@gmail.com)>, Stephen Haire <[stephen@carolinaspecialties.com](mailto:stephen@carolinaspecialties.com)>, Richard Essex <[REssex@cbs17.com](mailto:REssex@cbs17.com)>, Mike Watters <[wattersm@gmail.com](mailto:wattersm@gmail.com)>, Jacobs, Rusty <[rjacobs@wunc.org](mailto:rjacobs@wunc.org)>, Larry Lancaster <[lll@nc.rr.com](mailto:lll@nc.rr.com)>, Kenneth Cannon <[kcann9@aol.com](mailto:kcann9@aol.com)>

--- Mike Watters <[wattersm@gmail.com](mailto:wattersm@gmail.com)> wrote:

> URGENCY

>

> Good morning members,

> Point of contact Derrick Martin

> 6990 Point East Dr

> Fayetteville, NC 28306

> [dmartin166@nc.rr.com](mailto:dmartin166@nc.rr.com)

> 910-495-5153

>

> Department of Environmental Quality

> [comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

- > Assistant Secretary's Office
- > RE: Chemours Public Comment
- > 1601 Mail Service Center
- > Raleigh, N.C. 27699-1601
- >
- > SUBJECT: Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY
- > FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY
- > SUPERIOR COURT, Case No. 17 CVS 580.
- >
- > 1. We the Residents within the "affected households" that live within the
- > geographical area of the Chemours managed Fayetteville Works facility
- > (Cumberland, Bladen & Robeson Counties) are requesting modification of the
- > N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR
- > PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT,
- > Case No. 17
- > CVS 580.
- >
- > 2. In the absence of evidence to the contrary, ATSDR assumes that humans
- > are more sensitive to the effects of hazardous substance than animals and
- > that certain persons may be particularly sensitive, the report notes. Thus,
- > the resulting MRL may be as much as 100-fold below levels that have been
- > shown to be nontoxic in laboratory animals. This federal study is deeply
- > concerning because it demonstrates that PFAS chemicals are more dangerous
- > to human health than the EPA has previously acknowledged. We are requesting
- > the Department of Environmental Quality address these PFAS contaminations
- > with more urgency. We must ensure that families exposed to these dangerous
- > chemicals receive municipal water, cost to the Company that caused the
- > contamination should not be a factor in decision making.
- >
- > 3. This request is signed by the "affected households" that have wells that
- > are exceedance of the Practical Quantitative Limit (PQL) for any PFAS
- > constituents in violation of 15A NCAC 02L .0202. These are not naturally
- > occurring substances and no standard has been so the permitted
- > concentration requires that they be below the Practical Quantitative limit
- > for Class GA or Class GSA groundwaters pursuant to 15A NCAC 2L .0202(c).
- > This changes the cost per household to approximately \$24k per household for
- > the Cumberland county homes west of the Cape Fear River as presented by
- > Chemours-Parsons developed plan. Why use the Practical Quantitative Limit
- > for all PFAS detected instead of single GENX health goal?
- >
- > a. According to environmental chemists, the proposed ATSDR "minimum risk
- > levels" or MRLs, translate roughly to 7-ppt for PFOS and 11-ppt for PFOA --
- > the two PFAS compounds which the state of Michigan has established cleanup
- > standards for groundwater that people drink.
- >
- > b. A 7-ppt MRL level for PFOS exposure is lower than Michigan's 12-ppt
- > enforceable standard for that compound in surface water, a rule developed



- > to account for bioaccumulation in fish. The U.S. Environmental Protection Agency health advisory level for PFOS and PFOA is a combined 70-ppt, a level some researchers call inadequate to protect public health. We know fish in Marshwood lake did show bioaccumulation of PFAS in fish tested.
- >
- > c. PFAS have been "extensively evaluated in humans and laboratory animals," the study notes, but says comparing toxicity across species is problematic because, among other things, humans take much longer to purge the chemicals from their bodies. The chemicals also cause different health problems in humans versus animals.
- >
- > d. The ATSDR proposes MRLs translating to about 70-ppt for PFHxS and 10.5 ppt for PFNA, two PFAS compounds for which there are no federal Standards. These are found in many of the wells surrounding the facility as well as in the plume contaminating the aquifer under the facility. Refer to the Dec 16 Corrective Measure Study that is in DEQ public edocs site for proof.
- >
- > e. "This study confirms that the EPA's guidelines for PFAS levels in drinking water woefully underestimate risks to human health," said Olga Naidenko, a senior science advisor at the nonprofit Environmental Working Group. "We urge EPA to collect and publish all water results showing PFAS contamination at any level, so Americans across the country can take immediate steps to protect themselves and their families."
- >
- > 4. Reasons why Granular Activated Carbon systems should not be option over PWC Municipal Water for Cumberland County residents or Bladen county water for Bladen county residents are as follows:
- >
- > a. Many data points about installing municipal water lines in Cumberland county are inaccurate based on 9 year old data. There is a new 12" pipe being installed off Thrower road with planned extension along Hwy97 to homes near the Alderman Hwy 87 intersection. The Water Replacement plan costing data is inaccurate and needs review by Cumberland and Bladen County commissions. This should also be measured as inst all home found in violati ok n of the Groundwater Rules not just the exceedance of health goal. The cost presented in Nov 2017 to the Bladen County Commission was far less for West of Cape Fear than presented in the plan, the data for Cumberland county is based on 9 year old data and does not take into account the massive growth in the areas south of Sandhill Road all the way along Hwy 87 to the Bladen County line.
- >
- > b. Incomplete Data has been provided by Chemours to DEQ for the tests every other week. This is very important in making decisions such as if Granular Activated Carbon systems are viable and the full cost including operation and maintenance costs. It was presented as a one time cost of \$10K to install, that is not correct data when comparing GAC to municipal water options and taints decision points.
- >
- > c. The data provided by Chemours (not complete or actual lab results) does indicate that trace chemicals are getting thru the Granular Activated

> Carbon systems. This would be a violation of 15A NCAC 02L .0202. The full  
> set of data including all of the lab results on all samples taken, as well  
> as the additional field data, such as frequency of sediment filter & iron  
> filter replacement was withheld by Chemours from the well owners and DEQ.  
> Not enough information has been properly reviewed to determine  
> effectiveness, but the data from Chemours indicated that they would be in  
> violation the Groundwater rules/Standards of 15A NCAC 02L .0202.  
>  
> d. The Swedish study on Granular Activated Carbon systems found them to be  
> inefficient after a 140 day study. The study was to investigate the  
> removal efficiency of PFASs in water using two treatment techniques;  
> granular activated carbon (GAC), type Filtrasorb 400®, and anion exchange  
> (AE), type Purolite A-600. Additionally, the effect of dissolved organic  
> carbon (DOC) on removal efficiency was studied. The removal efficiency of  
> PFASs was studied in pilot-scale column experiments at Bäcklösa drinking  
> water treatment plant (DWTP) in Uppsala, Sweden. The laboratory batch  
> experiments were performed at Swedish University of Agricultural Sciences  
> (SLU), Uppsala. The results from the column experiment indicated a decrease  
> in removal efficiency with increasing number of bed volumes (BVs) for both  
> GAC and AE. The average removal efficiency of all PFASs (n=14) during the  
> 140 day column study was 65% for both GAC and AE. At the end of the column  
> experiment, the average removal efficiency of all PFASs was 49% for GAC and  
> 53% for AE. Removal efficiency was influenced by functional group;  
> perfluoroalkane (-alkyl) sulfonic acids (PFSAs) were more efficiently  
> removed than perfluoroalkyl carboxylic acids (PFCAs) (on average 56% vs 38%  
> for GAC, respectively, and 82% vs 28% for AE, respectively). In addition,  
> the perfluorocarbon chain length influenced the removal efficiency. Results  
> from the column experiment indicated higher removal efficiency as the  
> perfluorocarbon chain length increased. In contrast, the results from the  
> batch experiments indicated the opposite; decreasing adsorption to GAC and  
> AE as the chain length increased. Furthermore, presence of DOC in the water  
> affected the removal efficiency of the investigated PFASs. However, the  
> results indicated, contrary to the few studies previously performed on DOC  
> and removal efficiency of PFASs, enhanced sorption of PFASs to GAC with  
> increasing DOC concentration, and decreased PFAS sorption to AE as the DOC  
> concentration increased. In addition, the removal efficiency of GAC and AE  
> varied using water types with different DOC origin, indicating that DOC  
> characteristics influence the removal efficiency of PFASs in water. The six  
> pilot tests are using Filtrasorb 600, but Brunswick county did test  
> Filtrasorb 400 and it was not fully effective. There is not enough data yet  
> for Filtrasorb 600, but initial Chemours data show that Chemicals do get  
> thru in less than the 120 day point.  
>  
> e. Department of Environmental Quality cannot use this set of rules to  
> violate in one instance and not use it as a determination point on who  
> should be provided municipal or filtration systems. The test data provided  
> by Chemours of the Granular Activated Carbon systems proves that the  
> systems allow trace amounts of chemicals to pass through the system. The 12  
> April, 26 April and 10 May Chemours results for Site 48 prove this to be  
> fact. Thus the results are in violation as there is an exceedance of the

- > Practical Quantitative Limit (PQL) for PFAs constituents in violation of
- > 15A NCAC 02L .0202. The DEQ test results from the 3 May test indicates a
- > 106.03 ng/L of combined PFAs breakthrough and this is in less than 1 month
- > of use for this specific test system.
- >
- > f. Maintenance of the system as noted on site 48 that on 5 July could cause
- > contamination as occurred when Parsons found that the Iron filter allowed
- > iron to get into the GAC canisters. This was rectified by doing a backflush
- > running the water onto the soil. This backflush would wash the contaminants
- > that were captured out to the soil that is less than 30 feet from the well.
- > This is no different then an inadvertent spill while filling a truck with
- > contaminated water and should be a violation and reported as a minor
- > reported spill.
- >
- > 5. We request the following three areas to be modified:
- >
- > Line 67 Listed as: Health Studies
- > Line 69 listed as: COMPLIANCE MEASURES – GROUNDWATER
- > Line 70 listed as: Re-Testing of Private Wells
- >
- > 6. The verbiage that we believe should be present is listed below and
- > referenced to the sections we desire to see modification. We have also
- > included a modified PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF
- IN
- > BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580 with the highlighted
- > changes inserted. This is in compliance with the standards used by the
- > Division of Waste Management in the 11 June 2018 Notice of Violation. We
- > the “affected households” request municipal water to be run at Chemours
- > expense. We have included an area on the signature pages attached to
- > indicate who would prefer Municipal water and who would prefer the
- > filtration option to answer that portion in one submission.
- >
- > Section 67 Health Studies
- > It is our belief and desire that part of the health studies should include
- > testing of the members blood & urine of all members of the households that
- > have wells that test or tested with any exceedance of any Practical
- > Quantitative Limit as defined by North Carolina Administrative Code (NCAC)
- > Subchapter 02L .0202 Ground water Standards. Chemours has stated that these
- > chemicals harm nobody, it is time they prove it and in good faith or under
- > court order they should be compelled to do this as part of the health
- > studies. The harm to not only human or aquatic life needs to be researched,
- > but also animals, such as Dogs, Cats, Birds and Farm animals.
- >
- > MODIFIED TO READ
- > COMPLIANCE MEASURES – GROUNDWATER
- > 69. Permanent Replacement of Private Drinking Water Supplies: By no later
- > than twelve (18) months after issuance of this Order, Chemours shall
- > establish permanent replacement water supplies for each household with a
- > water supply well contaminated by any PFAS (“affected households”) PFBS
- > CAS# 375-73-5, PFDA CAS# 335-76-2, PFDa CAS# 307-55-1, PFHpA CAS#

> 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1,  
> PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3, PFMOAA  
> CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFo3OA  
> CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA  
> Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or  
> additionally discovered PFAS in exceedance of the practical quantitative  
> limit (PQL). The authority provided under Title 15A of the North Carolina  
> Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards.  
> Pursuant to 15A NCAC 2L .0202(c), “substances which are not naturally  
> occurring and which no standard is specified shall not be permitted in  
> concentrations at or above the practical quantitation limit in class GA or  
> Class GSA groundwaters. The replacement water supply shall be established  
> by connection to a public water supply, except that an affected household  
> may elect to receive a filtration system approved by DEQ in lieu of a  
> connection to public water supply, in which case Chemours shall install a  
> filtration system. For affected households Chemours shall be liable for any  
> water bills from public utilities and for periodic required maintenance for  
> any home that requested the DEQ approved filtration system. Chemours shall  
> submit a plan for compliance with this provision, including a detailed  
> schedule with milestones, no later than sixty (60) days after entry of this  
> Order. This provision shall supplement any prior requirements regarding the  
> provision of permanent replacement water supplies. Upon failure to comply  
> with installation of municipal water to all homes with groundwater wells in  
> exceedance of the Groundwater rules DEQ to find Chemours in violation of  
> Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L  
> .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), “substances  
> which are not naturally occurring and which no standard is specified shall  
> not be permitted in concentrations at or above the practical quantitation  
> limit in class GA or Class GSA groundwaters. DEQ will assess penalties  
> under NCGS 143-215.6A (a)(1) of not more than \$25,000 per day for each  
> groundwater well that has been tested and been found to exceedance of the  
> practical quantitative limit for any PFAs constituents. Multiple found PFAs  
> constituents will be considered as separate violations of the North  
> Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water  
> Standards. Pursuant to 15A NCAC 2L .0202(c) and deemed a violation pursuant  
> to G.S. 143-214-1.

>

> **MODIFIED to READ**

> 70. Re-Testing of Private Wells: Chemours shall conduct testing of private  
> drinking water supply wells as follows: for wells with test results showing  
> no detectable concentrations of PFAS Compounds, Chemours shall re-test for  
> PFPrOPrA CAS# 62037-80-3, PFOA CAS# 335-67-1, PFOS CAS# 1763-23-1, PFBS  
> CAS# 375-73-5, PFDA CAS# 335-76-2, PFDoA CAS# 307-55-1, PFHpA CAS#  
> 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1,  
> PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3, PFMOAA  
> CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFo3OA  
> CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA  
> Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or  
> additionally discovered PFAS in exceedance of the practical quantitative  
> limit (PQL) on an annual basis until sampling shows no detectable

- > concentrations of any PFAS constituents for two consecutive sampling
- > events. Chemours shall provide to DEQ a list of residents within these
- > sampling ranges, identified by both their address and sample ID. Chemours
- > shall also provide to DEQ a list of wells (identified by address) targeted
- > for testing that have not yet been tested and verifying its efforts to test
- > these wells.

**From:** H T  
**To:** [comments.chemours](#)  
**Subject:** [External] Trutenko 6964 point east dr  
**Date:** Tuesday, July 10, 2018 7:21:00 PM

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**My name is Harvey Trutenko and we live at 6964 point east dr in the point [East](#) Subdivision, Gray's Creek, [Fayetteville, NC 28306](#) and we totally, 100%, agree with Mr. Mike Waters regarding the comments and especially 67, 69, and 70. We stand united! My well is above the state health goal. I am currently not even staying in the property so I don't have to deal with the water problem.**

Sincerely,

**Harvey Trutenko**

**6964 point east dr**

[Sent from Yahoo Mail for iPhone](#)

**From:** Annetta Cobb  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Chemours  
**Date:** Tuesday, July 10, 2018 6:56:44 PM

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I live in the area where Chemours dumping has damaged our water supply.

This company has proven they cannot be trusted to prevent accidents that pollute our water supply nor to let the public know when these accidents happen. They have shown time and again that they don't have the public's interests at heart.

Children are particularly vulnerable to these kinds of pollution and the company has not made any overtures to provide our schools and families in these contaminated counties with fresh, uncontaminated water since this travesty was discovered.

I want this company shut down as soon as possible!! They have used up any entitlement to the public's trust.

Annetta J. Cobb  
1472 Magnolia St. SW  
Shallotte, NC 28470  
(Mailing address: PO Box 859, Shallotte, NC 28459)

Sent from my iPad

**From:** Mary Catherine Ballou  
**To:** [comments.chemours](#)  
**Subject:** [External] Chemours Public Comment  
**Date:** Tuesday, July 10, 2018 6:20:22 PM

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I recently moved to Wilmington and one of my first concerns was whether or not our drinking water is potable, based on the fact that we are so close to the river and ocean. Hearing this story about Chemours dumping dangerous chemicals, specifically GenX, into the Cape Fear River and contaminating the drinking water borders on the criminal. The delay and lack of transparency about the company's practices and the effects on the people of Wilmington dependent on the Cape Fear River for drinking water is more than disturbing, it is an endangerment of the citizens of North Carolina. I support any steps taken to ensure the safety of our drinking water, and Chemour's accountability for their life-threatening practices. I also support the cessation of all dumping operations from the Chemours Fayetteville plant until it is firmly established that our water is safe to drink. Where have the officials in charge of ensuring the safety of our drinking water been?

Thank you,  
Mary Catherine Ballou



**From:** Patty Kelley  
**To:** [comments.chemours](#)  
**Subject:** [External] Chemours  
**Date:** Tuesday, July 10, 2018 5:57:13 PM

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We are writing to add our comments to NC DEQ's proposed order against Chemours.

1. First, the EPA has recently released the study of PFOS, et al, and exposure is much less than what NC allows. NC needs to move quickly to reduce the exposure allowed in NC as 140 ppt is way too high. ALL emissions from Chemours, whether they are in the water or in the air, needs to cease ASAP.
2. Chemours has purposely dumped their chemicals into the air and into the drinking water for 30 years. THEY should be required to clean up their mess. The cost of cleaning up their pollution should be their responsibility, not the responsibility of the people.

My husband and I are both retired from the military. Neither one of us ever expected to be poisoned by a company in our own country. If Chemours wants to be a good neighbor as they say, they should step up and pay for the clean up. NC should require them to pay for the clean up if they don't do it on their own.

Chemours should also pay for clean water for those people whose wells are polluted.

If they have a spill in the air or in the water, they should be fined so it hurts. Their profits are very high and they can afford it. If not, leave NC and go elsewhere.

Sincerely,

Kobe and Patricia Kelley  
1228 N Sleepy Oak Ln  
Leland, NC 28451

910-622-2995

**From:** Terry Reilly  
**To:** [comments.chemours](#)  
**Subject:** [External] Chemours Legal Action  
**Date:** Tuesday, July 10, 2018 5:15:26 PM

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I find the proposed draft order regarding the regulation of the release of GenX by Chemours completely inadequate.

The company has proven to have:

- blatantly disregarded the public health by discharging a known carcinogen into the Cape Fear for decades.
- provided false and misleading reports to state and federal authorities.
- lied about the ongoing release of GenX into land, water and air.

The company has forfeited it's right to operate a business in North Carolina. **Nothing short of a permanent injunction against Chemours to cease all operations is acceptable.**

The company has betrayed the trust and health of the community. If government agencies fail to shut down the facility immediately, they risk complicity and legal damages.

Sincerely,

Terry Reilly  
2016 Scrimshaw Place  
Wilmington, NC 28405

**From:** barbarahill7  
**To:** [comments.chemours](#)  
**Subject:** [External] Cape Fear Public Utility water and Chemours  
**Date:** Tuesday, July 10, 2018 4:39:29 PM

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I have lived in Wilmington or New Hanover County for 41 years, most of which resulted in drinking polluted water from duPont/Chemours. My child grew up here drinking it.

For the past year I've spent about \$400 to buy water for my dogs and me in order to avoid Genx and related chemicals in our water.

Chemours should be made to stop polluting the Cape Fear River with chemicals that don't have safe levels established due to lack of human health studies. Even if it means closing them down.

They have thumbed their nose at state and local regulators, as though they are too big to have to comply or even respond.

Please show us the state has more concern for the public's health than for a company that has lied and polluted the water, ground and air for so many.

Sent from my Verizon, Samsung Galaxy smartphone

**From:** Dana Sargent  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Chemours Comments - Dana Sargent  
**Date:** Tuesday, July 10, 2018 4:29:40 PM  
**Attachments:** [Dana Sargent Comments RE -DEQ Proposed Order for Preliminary Injunctive Relief \(2\) \(1\).pdf](#)

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Dear Assistant Secretary Holman,

Please accept these comments (attached and copied below) in response to the NC DEQ Proposal for Injunctive Relief against Chemours.

Sincerely,

Dana Sargent  
910-444-8080  
[newsongs5@gmail.com](mailto:newsongs5@gmail.com)  
[www.cleanwatermattersnc.org](http://www.cleanwatermattersnc.org)

July 6, 2018

*Submitted via: [comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)*

NC Department of Environmental Quality  
Assistant Secretary's Office  
1601 Mail Service Center  
Raleigh, N.C., 27699-1601

**Re: Public Comment - N.C Department of Environmental Quality Proposed Order for Preliminary Injunctive Relief in Bladen County Superior Court, Case No. 17 CVS 580**

Dear Assistant Secretary Holman:

Thank you for the opportunity to submit comments in response to the Draft Proposed Order for Preliminary Injunctive Relief against The Chemours Company, FC, LLC.

I serve as the President of the Board of Directors at Cape Fear River Watch, and also coordinate a campaign for that organization on water quality issues affecting our region, so I have been following this crisis closely. However, I am submitting these comments on behalf of myself, as a citizen of New Hanover County and the mother of two girls.

***Comments in response to Compliance Measures: Air Emissions***

[Section 63: Air emissions](#)

1. DEQ data indicates the air emissions are currently the primary source of area-wide pollution
2. Toxicologist have stated publicly that longer chain PFAS are likely more toxic than shorter chain PFAS
3. Therefore, the long-chain Nafion byproduct 2 is likely more toxic than PFOA (C8)
4. Health studies for PFOA (C8) prove [\[1\]](#) links to the following health issues:
  - i. Kidney Cancer
  - ii. Testicular Cancer
  - iii. Ulcerative Colitis
  - iv. Thyroid Disease
  - v. Pregnancy Induced Hypertension (including preeclampsia)
  - vi. Hypercholesterolemia, and;
5. Chemours' ongoing contamination of air and water from Fayetteville to Wilmington is causing imminent danger to the health and safety of the public and constitutes "a generalized condition of water or air pollution," and;
6. N.C. Gen. Stat. § 143-215.3(a)(12). gives DEQ the authority and obligation to order Chemours to "discontinue immediately" its emissions and discharges of PFAS compounds, including GenX;

Due to these facts, NC DEQ should amend this section to replace the deadlines for emission reductions with the following:

*Chemours shall immediately halt production of all processes that release air emissions containing PFAS compounds or compounds that may react with the environment to form PFAS compounds, until such time as Chemours has in place the technology to ensure the chemicals are not released into the environment from their manufacturing processes.*

#### Section 64: Disclosure of PFAS emissions

Since data has proven that air emissions have reacted with water to form GenX and it is yet unknown how other found or yet, unreported compounds may react with water, or other molecules in the environment, this section should be amended to require that:

*Chemours purchase necessary equipment to allow the company to adequately test samples of all emissions and discharge from all manufacturing processes, including byproducts. In addition to identifying any and all chemicals discharged and emitted from their manufacturing processes, Chemours will test how these chemicals react with other molecules in the environment. Chemours will then report their findings to DEQ per the requirements of current law under NPDES, and those listed in this draft proposal.*

#### **Comments in response to Compliance Measures: Surface Water**

#### Section 66: Characterization of PFAS in process and non-process wastewater and stormwater at the

Facility:

In addition to the draft requirements with regards to sampling of process and non-process wastewater and stormwater:

- 1). *All samples should be split and the duplicate sent to NC DEQ so that DEQ may test in-house or submit to partners for testing.*
- 2). *DEQ shall submit quarterly statements for any cost incurred for these tests to which Chemours has 30 days to respond with full payment.*

Section 68: Notice to and Coordination with Water Utilities:

Due to the fact that water supply for public water utilities may be contaminated through any number of sources, and the fact that there is new data from the federal government on health protective levels of PFAS found in our utilities' drinking water supply, the first sentence should be amended to state:

*In the event of an upset or other condition at the Facility that has the potential to cause a discharge of PFAS Compounds into the Cape Fear River through Outfall 002, or any other manner, at concentrations exceeding 7 ng/L, Chemours shall provide notice to downstream public water utilities within one (1) hour of knowledge of the condition.*

[The 7 ng/L concentration is based on the most protective level provided for PFAS compounds by the [Agency for Toxic Substances and Disease Registry \(ATSDR\) in their draft toxicological profile for Perfluoroalkyl Substances](#), where Minimal Risk Levels provided in the report for four PFAS that have been found in our drinking water have been translated <sup>[2]</sup> to ng/L as such:

- PFOA – 11 ng/L
- PFOS – 7 ng/L
- PFHxS – 74 ng/L
- PFNA – 11 ng/L]

***Comments in response to Compliance Measures: Surface Water***

Section 69: Permanent Replacement of Private Drinking Water Supplies

In accordance with 15A NCAC 02L.0202(c) Groundwater Quality Standards, which states, "...substances which are not naturally occurring and for which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in Class GA or Class GSA groundwaters", the first sentence of this section should be amended to state:

*By no later than twelve (12) months after issuance of this Order, Chemours shall establish permanent replacement water supplies for each household with a water supply well contaminated by any PFAS in exceedance of the practical quantitation limit, ('affected households').*

## Section 70. Re-Testing of Private Wells

This section should be amended to state:

*Chemours shall conduct testing of private drinking water supply wells as follows:*

- a. for all wells previously tested and/or slated to be tested, that did not receive results of the full suite of PFAS compounds for which test standards and procedures exist, Chemours shall re-test for the full suite of PFAS compounds for which current test standards and procedures exist;*
- b. at any time that new PFAS compounds are found, or test standards and procedures become available, Chemours shall re-test all wells for concentration levels of the new compound(s);*
- c. for wells with test results for PFAS compounds above the practical quantitation limit, Chemours shall re-test on a quarterly basis until sampling shows that results of less than the practical quantitation limit for eight consecutive sampling events;*
- d. for wells with test results showing no detectable concentrations of PFAS compounds, Chemours shall re-test on an annual basis until sampling shows no detectable concentrations of GenX Compounds for two consecutive sampling events.*

## Section 71: Geographic Extent of Private Well Testing

This sentence should be amended to state:

*Chemours shall continue to sample drinking water wells for a distance of at least one quarter (1/4) mile beyond the nearest well with test results showing a detectable level of PFAS compounds.*

## Section 76: Public Meetings

This sentence should be amended to state:

*Whenever Chemours proposes to make a material change to its facility operations, including but not limited to a change that results in the use, production, or release into the environment of a previously undisclosed PFAS, Chemours shall conduct at least two public meetings – one near the facility, and one in Wilmington, and at least 2 weeks prior to the meetings, notify DEQ when and where the meetings will occur.*

In addition to the sections included in the draft, please consider requiring that:

- 1). Chemours submit to all utilities the funds necessary to install advanced filtration systems

at the facilities by December 31, 2019

2). Chemours begin sampling of sludge within 30 days of the order and submitting initial results by December 1, 2019

3). Chemours pay for and conduct sampling of soil, aquatic life and vegetation in and around the facility, including home farms and large-scale agriculture and submit initial findings to DEQ by December 31, 2019

4). Chemours pay for and conduct sampling of food products packaged at Smithfield packaging plant and submit initial results to DEQ by December 31, 2019.

Thank you for your consideration of these comments.

Sincerely,

Dana Sargent  
Wilmington, NC  
910-444-8080  
[newsongs5@gmail.com](mailto:newsongs5@gmail.com)

---

[1] C8 Science Panel. Links to individual health risk studies at: [http://www.c8sciencepanel.org/prob\\_link.html](http://www.c8sciencepanel.org/prob_link.html)

[2] Association of State Drinking Water Administrators: <https://www.asdwa.org/2018/06/21/atsdr-releases-draft-toxicological-profile-for-pfas/>



**From:** Joseph A. Ponzi  
**To:** [comments.chemours](#)  
**Cc:** [Lane, Bill F.](#); [Frank Benzoni](#); [George House](#)  
**Subject:** [External] CFPUA Comments to DEQ Proposed Order  
**Date:** Tuesday, July 10, 2018 4:15:37 PM  
**Attachments:** [CFPUA Comments to DEQ Order.pdf](#)

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**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

Please find attached Cape Fear Public Utility Authority's comments to DEQ's proposed order for injunctive relief. Thank you for your consideration of the Authority's comments.

Joey

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**Joseph A. Ponzi**, Partner



t: 336.271.2560  
f: 336.232.9060

2000 Renaissance Plaza  
230 North Elm Street  
Greensboro, NC 27401  
P.O. Box 26000 (27420)

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This email has been scanned for viruses and malware by Mimecast Ltd.

**From:** Gene Swinson  
**To:** [comments.chemours](mailto:comments.chemours)  
**Cc:** [alenard1960@yahoo.com](mailto:alenard1960@yahoo.com); [kcann9@aol.com](mailto:kcann9@aol.com); [geno0625@aol.com](mailto:geno0625@aol.com); [donni0202@aol.com](mailto:donni0202@aol.com); [helenbrockett@gmail.com](mailto:helenbrockett@gmail.com); [bethamarkesino@yahoo.com](mailto:bethamarkesino@yahoo.com); [gbarnes@fayobserver.com](mailto:gbarnes@fayobserver.com); [sdevane@fayobserver.com](mailto:sdevane@fayobserver.com); [teaton214@yahoo.com](mailto:teaton214@yahoo.com); [catherine.clabby@gmail.com](mailto:catherine.clabby@gmail.com); [David.Ivey@charter.com](mailto:David.Ivey@charter.com); [dmartin166@nc.rr.com](mailto:dmartin166@nc.rr.com); [dave.jordan@witn.com](mailto:dave.jordan@witn.com); [Danwes5@gmail.com](mailto:Danwes5@gmail.com); [REssex@cbs17.com](mailto:REssex@cbs17.com); [fmnfkn@embarqmail.com](mailto:fmnfkn@embarqmail.com); [poppysmith760@gmail.com](mailto:poppysmith760@gmail.com); [foxycherokeelady@gmail.com](mailto:foxycherokeelady@gmail.com); [Linda@fulcherelectric.com](mailto:Linda@fulcherelectric.com); Scott, Michael; Regan, Michael S; [gallagherkm1@gmail.com](mailto:gallagherkm1@gmail.com); [ht690189@yahoo.com](mailto:ht690189@yahoo.com); [ghart35@yahoo.com](mailto:ghart35@yahoo.com); [creekipirate69@gmail.com](mailto:creekipirate69@gmail.com); [dedrahaire@gmail.com](mailto:dedrahaire@gmail.com); [stephen@carolinaspecialties.com](mailto:stephen@carolinaspecialties.com); [gswinson1@icloud.com](mailto:gswinson1@icloud.com); [jody\\_mac@yahoo.com](mailto:jody_mac@yahoo.com); [jdswilley7@gmail.com](mailto:jdswilley7@gmail.com); [slyrose6963@aol.com](mailto:slyrose6963@aol.com); [rjacobs](mailto:rjacobs); [jameswparadise@yahoo.com](mailto:jameswparadise@yahoo.com); [michellekey69@gmail.com](mailto:michellekey69@gmail.com); [keribrockett@gmail.com](mailto:keribrockett@gmail.com); [laura\\_r.booth@gmail.com](mailto:laura_r.booth@gmail.com); [webers@wnet.org](mailto:webers@wnet.org); [cgwhipkey@gmail.com](mailto:cgwhipkey@gmail.com); [bobby@carolinaspecialties.com](mailto:bobby@carolinaspecialties.com); [LII@nc.rr.com](mailto:LII@nc.rr.com); [wattersm@gmail.com](mailto:wattersm@gmail.com); [bamarkesino@gmail.com](mailto:bamarkesino@gmail.com)  
**Subject:** [External] RE: Comments to DEQ on the Proposed Draft Order.  
**Date:** Tuesday, July 10, 2018 3:11:15 PM

**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

**Our names are Gene and Linda Swinson and we live at 6967 Point East Drive, Point East Subdivision, Gray's Creek, Fayetteville, NC 28306 and we totally, 100%, agree with Mr. Mike Waters regarding the comments and especially 67, 69, and 70. We stand united!**

**Sincerely,  
Gene and Linda Swinson  
6967 Point East Drive  
Fayetteville, NC 28306**

-----Original Message-----

From: Bobby Swilley <[bobby@carolinaspecialties.com](mailto:bobby@carolinaspecialties.com)>  
To: 'Larry Lancaster' <[LII@nc.rr.com](mailto:LII@nc.rr.com)>; 'Mike Watters' <[wattersm@gmail.com](mailto:wattersm@gmail.com)>  
Cc: 'Randa Dunn' <[REDRANDA1@aol.com](mailto:REDRANDA1@aol.com)>; 'Anthony Lenard' <[alenard1960@yahoo.com](mailto:alenard1960@yahoo.com)>; 'Kenneth Cannon' <[kcann9@aol.com](mailto:kcann9@aol.com)>; 'Gene Inman' <[geno0625@aol.com](mailto:geno0625@aol.com)>; 'Donna F. Inman' <[donni0202@aol.com](mailto:donni0202@aol.com)>; 'Helen Brockett' <[helenbrockett@gmail.com](mailto:helenbrockett@gmail.com)>; 'Beth Markesino' <[bethamarkesino@yahoo.com](mailto:bethamarkesino@yahoo.com)>; 'Barnes, Greg' <[gbarnes@fayobserver.com](mailto:gbarnes@fayobserver.com)>; 'Devane, Steve' <[sdevane@fayobserver.com](mailto:sdevane@fayobserver.com)>; 'tracy eaton' <[teaton214@yahoo.com](mailto:teaton214@yahoo.com)>; 'Catherine Clabby' <[catherine.clabby@gmail.com](mailto:catherine.clabby@gmail.com)>; 'Ivey, David M' <[David.Ivey@charter.com](mailto:David.Ivey@charter.com)>; 'Derrick Martin' <[dmartin166@nc.rr.com](mailto:dmartin166@nc.rr.com)>; 'davejordanwitn' <[dave.jordan@witn.com](mailto:dave.jordan@witn.com)>; 'Robert Wesselman' <[Danwes5@gmail.com](mailto:Danwes5@gmail.com)>; 'Richard Essex' <[REssex@cbs17.com](mailto:REssex@cbs17.com)>; 'Francis Minshew' <[fmnfkn@embarqmail.com](mailto:fmnfkn@embarqmail.com)>; 'Emma Smith' <[poppysmith760@gmail.com](mailto:poppysmith760@gmail.com)>; 'Martha Bennett' <[foxycherokeelady@gmail.com](mailto:foxycherokeelady@gmail.com)>; 'Linda' <[Linda@fulcherelectric.com](mailto:Linda@fulcherelectric.com)>; 'Gene' <[Gene@fulcherelectric.com](mailto:Gene@fulcherelectric.com)>; 'Scott, Michael' <[michael.scott@ncdenr.gov](mailto:michael.scott@ncdenr.gov)>; 'Regan, Michael S' <[michael.regan@ncdenr.gov](mailto:michael.regan@ncdenr.gov)>; 'Kathleen Gallagher' <[gallagherkm1@gmail.com](mailto:gallagherkm1@gmail.com)>; 'H T' <[ht690189@yahoo.com](mailto:ht690189@yahoo.com)>; 'George Hart' <[ghart35@yahoo.com](mailto:ghart35@yahoo.com)>; 'brett hardy' <[creekipirate69@gmail.com](mailto:creekipirate69@gmail.com)>; 'Dedra Haire' <[dedrahaire@gmail.com](mailto:dedrahaire@gmail.com)>; 'Stephen Haire' <[stephen@carolinaspecialties.com](mailto:stephen@carolinaspecialties.com)>; 'Gene Swinson' <[gswinson1@icloud.com](mailto:gswinson1@icloud.com)>; 'Jody Jernigan' <[jody\\_mac@yahoo.com](mailto:jody_mac@yahoo.com)>; 'Jonathan Swilley' <[jdswilley7@gmail.com](mailto:jdswilley7@gmail.com)>; 'jeannette rose'

<[slyrose6963@aol.com](mailto:slyrose6963@aol.com)>; 'Jacobs, Rusty' <[rjacobs@wunc.org](mailto:rjacobs@wunc.org)>; 'James Paradise' <[jameswparadise@yahoo.com](mailto:jameswparadise@yahoo.com)>; 'Michelle Key' <[michellekey69@gmail.com](mailto:michellekey69@gmail.com)>; 'Keri Carelas' <[keribrockett@gmail.com](mailto:keribrockett@gmail.com)>; 'laura booth' <[laura.r.booth@gmail.com](mailto:laura.r.booth@gmail.com)>; webers <[webers@wnet.org](mailto:webers@wnet.org)>; 'Christine Whipkey' <[cgwhipkey@gmail.com](mailto:cgwhipkey@gmail.com)>  
Sent: Mon, Jul 9, 2018 2:49 pm  
Subject: RE: Please Copy and Send Comments to DEQ on the Proposed Draft Order.

**My name is Bobby J. Swilley and we live at 1904 Nantuckett Court , Point East Subdivision, Gray's Creek, Fayetteville, NC 28306 and we totally, 100%, agree with Mr. Mike Waters regarding the comments and especially 67, 69, and 70. We stand united!**

**Sincerely,**

**Bobby J. and Ann Marie Swilley**

**1904 Nantuckett Court**

**Fayetteville, NC 28306**

---

**From:** Larry Lancaster [<mailto:Ll@nc.rr.com>]

**Sent:** Monday, July 09, 2018 2:32 PM

**To:** Mike Watters

**Cc:** Randa Dunn; Anthony Lenard; Kenneth Cannon; Gene Inman; Donna F. Inman; Helen Brockett; Bobby Swilley; Beth Markesino; Barnes, Greg; Devane, Steve; Tracy Eaton; Catherine Clabby; Ivey, David M; Derrick Martin; davejordanwitn; Robert Wesselman; Richard Essex; Francis Minsheu; Emma Smith; Martha Bennett; Linda; Gene; Scott, Michael; Regan, Michael S; Kathleen Gallagher; H T; George Hart; Brett Hardy; Dedra Haire; Stephen Haire; Gene Swinson; Jody Jernigan; Jonathan Swilley; Jeannette Rose; Jacobs, Rusty; James Paradise; Michelle Key; Keri Carelas; Laura Booth; [webers@wnet.org](mailto:webers@wnet.org); Christine Whipkey

**Subject:** Re: Please Copy and Send Comments to DEQ on the Proposed Draft Order.

Thanks to all for taking time to respond

**Larry Lancaster**

*Chairman, Cumberland County Board of Commissioners*

*Home: 910-484-2774*

*Cell: 910-308-9285*

On Jul 9, 2018, at 1:43 PM, Mike Watters <[wattersm@gmail.com](mailto:wattersm@gmail.com)> wrote:

URGENCY

Good morning members,

We have until Wednesday, July 11th to put in our comments on the Draft Court order

If there was ever a moment that you took the time to write, now is the time. Please don't hesitate, your comments are very important to your rights if a well owner. Specifically section 67, 69 & 70

If a well owner in Cumberland, Bladen or Robeson county or any other county affected by PFAS contamination from Fayetteville works. Copy text below or enter your own and email to:

[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

by 11 July.

If you want to use this template change to your Contact information and copy it to the email. I gathered information that is pertinent backed by law or studies to justify the reasons for modification.

Point of contact Michael Watters

6975 Point East Dr

Fayetteville, NC 28306

[wattersm@gmail.com](mailto:wattersm@gmail.com)

910-424-2162

Department of Environmental Quality

[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

Assistant Secretary's Office

RE: Chemours Public Comment

1601 Mail Service Center

Raleigh, N.C. 27699-1601

SUBJECT: Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

1. We the Residents within the "affected households" that live within the geographical area of the Chemours managed Fayetteville Works facility (Cumberland, Bladen & Robeson Counties) are requesting modification of the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

2. In the absence of evidence to the contrary, ATSDR assumes that humans are more sensitive to the effects of hazardous substance than animals and that certain persons may be particularly sensitive, the report notes. Thus, the resulting MRL may be as much as 100-fold below levels that have been shown to be nontoxic in laboratory animals. This federal study is deeply concerning because it demonstrates that PFAS chemicals are more dangerous to human health than the EPA has previously acknowledged. We are requesting the Department of Environmental Quality address these PFAS contaminations with more urgency. We must ensure that families exposed to these dangerous chemicals receive municipal water, cost to the Company that caused the contamination should not be a factor in decision making.

3. This request is signed by the "affected households" that have wells that are exceedance of the Practical Quantitative Limit (PQL) for any PFAS constituents in violation of 15A NCAC 02L .0202. These are not naturally occurring substances and no standard has been so the permitted concentration requires that they be below the Practical Quantitative limit for Class GA or Class GSA groundwaters pursuant to 15A NCAC 2L .0202(c). This changes the cost per household to approximately \$24k per household for the Cumberland county homes west of the Cape Fear River as presented by Chemours-Parsons developed plan. Why use the Practical Quantitative Limit for all PFAS detected instead of single GENX health goal?

a. According to environmental chemists, the proposed ATSDR "minimum risk levels" or MRLs, translate roughly to 7-ppt for PFOS and 11-ppt for PFOA -- the two PFAS compounds which the state of Michigan has established cleanup standards for groundwater that people drink.

b. A 7-ppt MRL level for PFOS exposure is lower than Michigan's 12-ppt enforceable standard for that compound in surface water, a rule developed to account for bioaccumulation in fish. The U.S. Environmental Protection Agency health advisory level for PFOS and PFOA is a combined 70-ppt, a level some researchers call inadequate to protect public health. We know fish in Marshwood lake did show bioaccumulation of PFAS in fish tested.

c. PFAS have been "extensively evaluated in humans and laboratory animals," the study notes, but says comparing toxicity across species is problematic because, among other things, humans take much longer to purge the chemicals from their bodies. The chemicals also cause different health problems in humans versus animals.

d. The ATSDR proposes MRLs translating to about 70-ppt for PFHxS and 10.5 ppt for PFNA, two PFAS compounds for which there are no federal Standards. These are found in

many if the wells surrounding the facility as well as in the plume contaminating the aquifer under the facility. Refer to the Dec 16 Corrective Measure Study that is in DEQ public edocs site for proof.

e. "This study confirms that the EPA's guidelines for PFAS levels in drinking water woefully underestimate risks to human health," said Olga Naidenko, a senior science advisor at the nonprofit Environmental Working Group. "We urge EPA to collect and publish all water results showing PFAS contamination at any level, so Americans across the country can take immediate steps to protect themselves and their families."

4. Reasons why Granular Activated Carbon systems should not be option over PWC Municipal Water for Cumberland County residents or Bladen county water for Bladen county residents are as follows:

a. Many data points about installing municipal water lines in Cumberland county are inaccurate based on 9 year old data. There is a new 12" pipe being installed off Thrower road with planned extension along Hwy97 to homes near the Alderman Hwy 87 intersection. The Water Replacement plan costing data is inaccurate and needs review by Cumberland and Bladen County commissions. This should also be measured as all home found in violation of the Groundwater Rules not just the exceedance of health goal. The cost presented in Nov 2017 to the Bladen County Commission was far less for West of Cape Fear than presented in the plan, the data for Cumberland county is based on 9 year old data and does not take into account the massive growth in the areas south of Sandhill Road all the way along Hwy 87 to the Bladen County line.

b. Incomplete Data has been provided by Chemours to DEQ for the tests every other week. This is very important in making decisions such as if Granular Activated Carbon systems are viable and the full cost including operation and maintenance costs. It was presented as a one time cost of \$10K to install, that is not correct data when comparing GAC to municipal water options and taints decision points.

c. The data provided by Chemours (not complete or actual lab results) does indicate that trace chemicals are getting thru the Granular Activated Carbon systems. This would be a violation of 15A NCAC 02L .0202. The full set of data including all of the lab results on all samples taken, as well as the additional field data, such as frequency of sediment filter & iron filter replacement was withheld by Chemours from the well owners and DEQ. Not enough information has been properly reviewed to determine effectiveness, but the data from Chemours indicated that they would be in violation the Groundwater rules/Standards of 15A NCAC 02L .0202.

d. The Swedish study on Granular Activated Carbon systems found them to be inefficient after a 140 day study. The study was to investigate the removal efficiency of PFASs in water using two treatment techniques; granular activated carbon (GAC), type Filtrasorb 400®, and anion exchange (AE), type Purolite A-600. Additionally, the effect of dissolved organic carbon (DOC) on removal efficiency was studied. The removal efficiency of PFASs was studied in pilot-scale column experiments at Bäcklösa drinking water treatment plant (DWTP) in Uppsala, Sweden. The laboratory batch experiments were performed at Swedish University of Agricultural Sciences (SLU), Uppsala. The results from the column experiment indicated a decrease in removal efficiency with increasing number of bed volumes (BVs) for both GAC and AE. The average removal efficiency of all PFASs (n=14) during the 140 day column study was 65% for both GAC and AE. At the end of the column experiment, the average removal efficiency of all PFASs was 49% for GAC and 53% for AE. Removal efficiency was influenced by functional group; perfluoroalkane (-alkyl) sulfonic acids (PFASs) were more efficiently removed than perfluoroalkyl carboxylic acids (PFCAs) (on average 56% vs 38% for GAC, respectively, and 82% vs 28% for AE, respectively). In addition, the perfluorocarbon chain length influenced the removal efficiency. Results from the column experiment indicated higher removal efficiency as the perfluorocarbon chain length increased. In contrast, the results from the batch experiments indicated the opposite; decreasing adsorption to GAC and AE as the chain length increased. Furthermore, presence of DOC in the water affected the removal efficiency of the investigated PFASs. However, the results indicated, contrary to the few studies previously performed on DOC and removal efficiency of PFASs, enhanced sorption of PFASs to GAC with increasing DOC concentration, and decreased PFAS sorption to AE as the DOC concentration

increased. In addition, the removal efficiency of GAC and AE varied using water types with different DOC origin, indicating that DOC characteristics influence the removal efficiency of PFASs in water. The six pilot tests are using Filtrasorb 600, but Brunswick county did test Filtrasorb 400 and it was not fully effective. There is not enough data yet for Filtrasorb 600, but initial Chemours data show that Chemicals do get thru in less than the 120 day point.

e. Department of Environmental Quality cannot use this set of rules to violate in one instance and not use it as a determination point on who should be provided municipal or filtration systems. The test data provided by Chemours of the Granular Activated Carbon systems proves that the systems allow trace amounts of chemicals to pass through the system. The 12 April, 26 April and 10 May Chemours results for Site 48 prove this to be fact. Thus the results are in violation as there is an exceedance of the Practical Quantitative Limit (PQL) for PFAs constituents in violation of 15A NCAC 02L .0202. The DEQ test results from the 3 May test indicates a 106.03 ng/L of combined PFAs breakthrough and this is in less than 1 month of use for this specific test system.

f. Maintenance of the system as noted on site 48 that on 5 July could cause contamination as occurred when Parsons found that the Iron filter allowed iron to get into the GAC canisters. This was rectified by doing a backflush running the water onto the soil. This backflush would wash the contaminants that were captured out to the soil that is less than 30 feet from the well. This is no different then an inadvertent spill while filling a truck with contaminated water and should be a violation and reported as a minor reported spill.

5. We request the following three areas to be modified:

Line 67 Listed as: Health Studies

Line 69 listed as: COMPLIANCE MEASURES – GROUNDWATER

Line 70 listed as: Re-Testing of Private Wells

6. The verbiage that we believe should be present is listed below and referenced to the sections we desire to see modification. We have also included a modified PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580 with the highlighted changes inserted. This is in compliance with the standards used by the Division of Waste Management in the 11 June 2018 Notice of Violation. We the “affected households” request municipal water to be run at Chemours expense. We have included an area on the signature pages attached to indicate who would prefer Municipal water and who would prefer the filtration option to answer that portion in one submission.

Section 67 Health Studies

It is our belief and desire that part of the health studies should include testing of the members blood & urine of all members of the households that have wells that test or tested with any exceedance of any Practical Quantitative Limit as defined by North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Chemours has stated that these chemicals harm nobody, it is time they prove it and in good faith or under court order they should be compelled to do this as part of the health studies. The harm to not only human or aquatic life needs to be researched, but also animals, such as Dogs, Cats, Birds and Farm animals.

MODIFIED TO READ

COMPLIANCE MEASURES – GROUNDWATER

69. Permanent Replacement of Private Drinking Water Supplies: By no later than twelve (18) months after issuance of this Order, Chemours shall establish permanent replacement water supplies for each household with a water supply well contaminated by any PFAS (“affected households”) PFBS CAS# 375-73-5, PFDA CAS# 335-76-2, PFDaA CAS# 307-55-1, PFHpA CAS# 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1, PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3, PFMOAA CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFo3OA CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or additionally discovered PFAS in exceedance of the practical quantitative limit (PQL). The authority provided under Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), “substances which are not naturally occurring and which no standard is specified shall not

be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. The replacement water supply shall be established by connection to a public water supply, except that an affected household may elect to receive a filtration system approved by DEQ in lieu of a connection to public water supply, in which case Chemours shall install a filtration system. For affected households Chemours shall be liable for any water bills from public utilities and for periodic required maintenance for any home that requested the DEQ approved filtration system. Chemours shall submit a plan for compliance with this provision, including a detailed schedule with milestones, no later than sixty (60) days after entry of this Order. This provision shall supplement any prior requirements regarding the provision of permanent replacement water supplies. Upon failure to comply with installation of municipal water to all homes with groundwater wells in exceedance of the Groundwater rules DEQ to find Chemours in violation of Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), "substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. DEQ will access penalties under NCGS 143-215.6A (a)(1) of not more than \$25,000 per day for each groundwater well that has been tested and been found to exceedance of the practical quantitative limit for any PFAs constituents. Multiple found PFAs constituents will be considered as separate violations of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c) and deemed a violation pursuant to G.S. 143-214-1.

MODIFIED to READ

70. Re-Testing of Private Wells: Chemours shall conduct testing of private drinking water supply wells as follows: for wells with test results showing no detectable concentrations of PFAS Compounds, Chemours shall re-test for PFPrOPrA CAS# 62037-80-3, PFOA CAS# 335-67-1, PFOS CAS# 1763-23-1, PFBS CAS# 375-73-5, PFDA CAS# 335-76-2, PFDoA CAS# 307-55-1, PFHpA CAS# 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1, PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3, PFMOAA CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFo3OA CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or additionally discovered PFAS in exceedance of the practical quantitative limit (PQL) on an annual basis until sampling shows no detectable concentrations of any PFAS constituents for two consecutive sampling events. Chemours shall provide to DEQ a list of residents within these sampling ranges, identified by both their address and sample ID. Chemours shall also provide to DEQ a list of wells (identified by address) targeted for testing that have not yet been tested and verifying its efforts to test these wells.

**From:** OLIVIA MCKELLAR  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] RE: Comment on Proposed Order for Preliminary Injunctive Relief  
**Date:** Tuesday, July 10, 2018 1:35:36 PM

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CAUTION: External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to Report Spam.<<mailto:report.spam@nc.gov>>

As a property owner impacted by the Chemours release of GenX, I am very concerned about the court order recommendations provided by DEQ.

I am pleased that Chemours has taken responsibility and the steps to reduce emissions of GenX in both the air and water. Fortunately the testing of my water was below the recommended levels established by DEQ. But I am very concerned that the level could change at some point and time and I would not be aware of that.

I am in agreement that periodic testing should be ongoing by DEQ to monitor compliance with established guidelines and standards.

In addition to research by GenX r/t safety, independent testing and research should also be required.

I would like to see routine testing of private wells in the surrounding area to ensure safety of our water - for property owners with both high and low levels of detected GenX.

If public water systems are provided for property owners with high levels of GenX, I would want those surrounding property owners with lower levels of detected GenX, also included in the installation of a public water system.

While testing of the water in my private well showed low levels of GenX, GenX should not be in my water supply at any level. It is due to the actions at Chemours that the chemical is there. And I want my water free of GenX now and in the future. I believe Chemours has a responsibility to correct that for anyone with testing of any level of GenX in their water.

Thank you for your consideration  
Olivia C. McKellar  
7761 NC Highway 87 S  
Fayetteville NC 28306



**From:** redranda1@aol.com [mailto:redranda1@aol.com]

**Sent:** Tuesday, July 10, 2018 11:22 AM

**To:** comments.chemours@ncdenr.gov

**Cc:** alenard1960@yahoo.com; kcann9@aol.com; geno0625@aol.com; donni0202@aol.com; helenbrockett@gmail.com; bethamarkesino@yahoo.com; gbarnes@fayobserver.com; sdevane@fayobserver.com; teaton214@yahoo.com; catherine.clabby@gmail.com; David.Ivey@charter.com; dmartin166@nc.rr.com; dave.jordan@witn.com; Danwes5@gmail.com; Richard Essex <REssex@cbs17.com>; fmnfkn@embarqmail.com; poppysmith760@gmail.com; foxycherokeelady@gmail.com; Linda@fulcherelectric.com; Gene@fulcherelectric.com; michael.scott@ncdenr.gov; michael.regan@ncdenr.gov; gallagherkm1@gmail.com; ht690189@yahoo.com; ghart35@yahoo.com; creekipirate69@gmail.com; dedrahaire@gmail.com; stephen@carolinaspecialties.com; gswinson1@icloud.com; jody\_mac@yahoo.com; jdswilley7@gmail.com; slyrose6963@aol.com; rjacobs@wunc.org; jameswparadise@yahoo.com; michellekey69@gmail.com; keribrockett@gmail.com; laura.r.booth@gmail.com; webers@wnet.org; cgwhipkey@gmail.com; bobby@carolinaspecialties.com; Lll@nc.rr.com; wattersm@gmail.com; bamarkesino@gmail.com

**Subject:** Comments to DEQ on the Proposed Draft Order.

We are Herman and Randa Dunn  
904 Circle Point Court  
Fayetteville, NC 28306  
Point East Subdivision, Gray's Creek, one mile north of Chemours

We have spent too many years being poisoned by contaminated air and water. We demand our lawful and rightful help from the State of North Carolina and DEQ, including national and federal levels. We are in agreement with Mike Watters' assessment which resulted from extensive, in-depth investigation and proven scientific research.

There are ways the State can STOP DuPont/Chemours and help the residents achieve a clean air and clean water solution. With the new ASTDR study, we know that we are at risk at much lower numbers than previously shown.

This solution should not be dictated by, or for the benefit of, Chemours. We, the people, are being contaminated!

You may not get comments from every household - for various reasons - but, know, that our communities are standing together on this issue. We cannot undo the detriments to our health thus far, which, as

scientifically proven, may continue into the future, but further contamination MUST be stopped.  
Thank you for having a lawful and moral responsibility.

Herman and Randa Dunn

-----Original Message-----

From: Bobby Swilley <[bobby@carolinaspecialties.com](mailto:bobby@carolinaspecialties.com)>

To: 'Larry Lancaster' <[LlI@nc.rr.com](mailto:LlI@nc.rr.com)>; 'Mike Watters' <[wattersm@gmail.com](mailto:wattersm@gmail.com)>

Cc: 'Randa Dunn' <[REDRANDA1@aol.com](mailto:REDRANDA1@aol.com)>; 'Anthony Lenard' <[alenard1960@yahoo.com](mailto:alenard1960@yahoo.com)>; 'Kenneth Cannon' <[kcann9@aol.com](mailto:kcann9@aol.com)>; 'Gene Inman' <[geno0625@aol.com](mailto:geno0625@aol.com)>; 'Donna F. Inman' <[donni0202@aol.com](mailto:donni0202@aol.com)>; 'Helen Brockett' <[helenbrockett@gmail.com](mailto:helenbrockett@gmail.com)>; 'Beth Markesino' <[bethamarkesino@yahoo.com](mailto:bethamarkesino@yahoo.com)>; 'Barnes, Greg' <[gbarnes@fayobserver.com](mailto:gbarnes@fayobserver.com)>; 'Devane, Steve' <[sdevane@fayobserver.com](mailto:sdevane@fayobserver.com)>; 'tracy eaton' <[teaton214@yahoo.com](mailto:teaton214@yahoo.com)>; 'Catherine Clabby' <[catherine.clabby@gmail.com](mailto:catherine.clabby@gmail.com)>; 'Ivey, David M' <[David.Ivey@charter.com](mailto:David.Ivey@charter.com)>; 'Derrick Martin' <[dmartin166@nc.rr.com](mailto:dmartin166@nc.rr.com)>; 'davejordanwitn' <[dave.jordan@witn.com](mailto:dave.jordan@witn.com)>; 'Robert Wesselman' <[Danwes5@gmail.com](mailto:Danwes5@gmail.com)>; 'Richard Essex' <[REssex@cbs17.com](mailto:REssex@cbs17.com)>; 'Francis Minshew' <[fmnfkn@embarqmail.com](mailto:fmnfkn@embarqmail.com)>; 'Emma Smith' <[poppysmith760@gmail.com](mailto:poppysmith760@gmail.com)>; 'Martha Bennett' <[foxycherokeelady@gmail.com](mailto:foxycherokeelady@gmail.com)>; 'Linda' <[Linda@fulcherelectric.com](mailto:Linda@fulcherelectric.com)>; 'Gene' <[Gene@fulcherelectric.com](mailto:Gene@fulcherelectric.com)>; 'Scott, Michael' <[michael.scott@ncdenr.gov](mailto:michael.scott@ncdenr.gov)>; 'Regan, Michael S' <[michael.regan@ncdenr.gov](mailto:michael.regan@ncdenr.gov)>; 'Kathleen Gallagher' <[gallagherkm1@gmail.com](mailto:gallagherkm1@gmail.com)>; 'H T' <[ht690189@yahoo.com](mailto:ht690189@yahoo.com)>; 'George Hart' <[ghart35@yahoo.com](mailto:ghart35@yahoo.com)>; 'brett hardy' <[creekipirate69@gmail.com](mailto:creekipirate69@gmail.com)>; 'Dedra Haire' <[dedrahaire@gmail.com](mailto:dedrahaire@gmail.com)>; 'Stephen Haire' <[stephen@carolinaspecialties.com](mailto:stephen@carolinaspecialties.com)>; 'Gene Swinson' <[gswinson1@icloud.com](mailto:gswinson1@icloud.com)>; 'Jody Jernigan' <[jody\\_mac@yahoo.com](mailto:jody_mac@yahoo.com)>; 'Jonathan Swilley' <[jdswilley7@gmail.com](mailto:jdswilley7@gmail.com)>; 'jeannette rose' <[slyrose6963@aol.com](mailto:slyrose6963@aol.com)>; 'Jacobs, Rusty' <[rjacobs@wunc.org](mailto:rjacobs@wunc.org)>; 'James Paradise' <[jameswparadise@yahoo.com](mailto:jameswparadise@yahoo.com)>; 'Michelle Key' <[michellekey69@gmail.com](mailto:michellekey69@gmail.com)>; 'Keri Carelas' <[keribrockett@gmail.com](mailto:keribrockett@gmail.com)>; 'laura booth' <[laura.r.booth@gmail.com](mailto:laura.r.booth@gmail.com)>; webers <[webers@wnet.org](mailto:webers@wnet.org)>; 'Christine Whipkey' <[cgwhipkey@gmail.com](mailto:cgwhipkey@gmail.com)>

Sent: Mon, Jul 9, 2018 2:49 pm

Subject: RE: Please Copy and Send Comments to DEQ on the Proposed Draft Order.

**My name is Bobby J. Swilley and we live at 1904 Nantuckett Court ,  
Point East Subdivision, Gray's Creek, Fayetteville, NC 28306 and we  
totally, 100%, agree with Mr. Mike Waters regarding the comments  
and especially 67, 69, and 70. We stand united!**

**Sincerely,**

**Bobby J. and Ann Marie Swilley**

**1904 Nantuckett Court**

**Fayetteville, NC 28306**

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**From:** Larry Lancaster [<mailto:LlI@nc.rr.com>]

**Sent:** Monday, July 09, 2018 2:32 PM

**To:** Mike Watters

**Cc:** Randa Dunn; Anthony Lenard; Kenneth Cannon; Gene Inman; Donna F. Inman; Helen Brockett; Bobby Swilley; Beth Markesino; Barnes, Greg; Devane, Steve; tracy eaton; Catherine Clabby; Ivey, David M; Derrick Martin; davejordanwitn; Robert Wesselman; Richard Essex; Francis Minshew; Emma Smith; Martha Bennett; Linda; Gene; Scott, Michael; Regan, Michael S; Kathleen Gallagher; H T; George Hart; brett hardy; Dedra Haire; Stephen Haire; Gene Swinson; Jody Jernigan; Jonathan Swilley; jeannette rose;

Jacobs, Rusty; James Paradise; Michelle Key; Keri Carelas; laura booth; [webers@wnet.org](mailto:webers@wnet.org); Christine Whipkey

**Subject:** Re: Please Copy and Send Comments to DEQ on the Proposed Draft Order.

Thanks to all for taking time to respond

**Larry Lancaster**

*Chairman, Cumberland County Board of Commissioners*

*Home: 910-484-2774*

*Cell: 910-308-9285*

On Jul 9, 2018, at 1:43 PM, Mike Watters <[wattersm@gmail.com](mailto:wattersm@gmail.com)> wrote:

URGENCY

Good morning members,

We have until Wednesday, July 11th to put in our comments on the Draft Court order

If there was ever a moment that you took the time to write, now is the time. Please don't hesitate, your comments are very important to your rights if a well owner. Specifically section 67, 69 & 70

If a well owner in Cumberland, Bladen or Robeson county or any other county affected by PFAS contamination from Fayetteville works. Copy text below or enter you own and email to:

[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

by 11 July.

If you want to use this template change to your Contact information and copy it to the email. I gathered information that is pertinent backed by law or studies to justify the reasons for modification.

Point of contact Michael Watters

6975 Point East Dr

Fayetteville, NC 28306

[wattersm@gmail.com](mailto:wattersm@gmail.com)

910-424-2162

Department of Environmental Quality

[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

Assistant Secretary's Office

RE: Chemours Public Comment

1601 Mail Service Center

Raleigh, N.C. 27699-1601

SUBJECT: Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

1. We the Residents within the "affected households" that live within the geographical area of the Chemours managed Fayetteville Works facility (Cumberland, Bladen & Robeson Counties) are requesting modification of the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

2. In the absence of evidence to the contrary, ATSDR assumes that humans are more sensitive to the effects of hazardous substance than animals and that certain persons may be particularly sensitive, the report notes. Thus, the resulting MRL may be as much as 100-fold below levels that have been shown to be nontoxic in laboratory animals. This federal study is deeply concerning because it demonstrates that PFAS chemicals are more dangerous to human health than the EPA has previously acknowledged. We are requesting the Department of Environmental Quality address these PFAS contaminations with more urgency. We must ensure that families exposed to these dangerous chemicals receive municipal water, cost to the Company that caused the contamination should not be a factor

in decision making.

3. This request is signed by the "affected households" that have wells that are in exceedance of the Practical Quantitative Limit (PQL) for any PFAS constituents in violation of 15A NCAC 02L .0202. These are not naturally occurring substances and no standard has been so the permitted concentration requires that they be below the Practical Quantitative limit for Class GA or Class GSA groundwaters pursuant to 15A NCAC 2L .0202(c). This changes the cost per household to approximately \$24k per household for the Cumberland county homes west of the Cape Fear River as presented by Chemours-Parsons developed plan. Why use the Practical Quantitative Limit for all PFAS detected instead of single GENX health goal?

a. According to environmental chemists, the proposed ATSDR "minimum risk levels" or MRLs, translate roughly to 7-ppt for PFOS and 11-ppt for PFOA -- the two PFAS compounds which the state of Michigan has established cleanup standards for groundwater that people drink.

b. A 7-ppt MRL level for PFOS exposure is lower than Michigan's 12-ppt enforceable standard for that compound in surface water, a rule developed to account for bioaccumulation in fish. The U.S. Environmental Protection Agency health advisory level for PFOS and PFOA is a combined 70-ppt, a level some researchers call inadequate to protect public health. We know fish in Marshwood lake did show bioaccumulation of PFAS in fish tested.

c. PFAS have been "extensively evaluated in humans and laboratory animals," the study notes, but says comparing toxicity across species is problematic because, among other things, humans take much longer to purge the chemicals from their bodies. The chemicals also cause different health problems in humans versus animals.

d. The ATSDR proposes MRLs translating to about 70-ppt for PFHxS and 10.5 ppt for PFNA, two PFAS compounds for which there are no federal Standards. These are found in many if the wells surrounding the facility as well as in the plume contaminating the aquifer under the facility. Refer to the Dec 16 Corrective Measure Study that is in DEQ public edocs site for proof.

e. "This study confirms that the EPA's guidelines for PFAS levels in drinking water woefully underestimate risks to human health," said Olga Naidenko, a senior science advisor at the nonprofit Environmental Working Group. "We urge EPA to collect and publish all water results showing PFAS contamination at any level, so Americans across the country can take immediate steps to protect themselves and their families."

4. Reasons why Granular Activated Carbon systems should not be option over PWC Municipal Water for Cumberland County residents or Bladen county water for Bladen county residents are as follows:

a. Many data points about installing municipal water lines in Cumberland county are inaccurate based on 9 year old data. There is a new 12" pipe being installed off Thrower road with planned extension along Hwy97 to homes near the Alderman Hwy 87 intersection. The Water Replacement plan costing data is inaccurate and needs review by Cumberland and Bladen County commissions. This should also be measured as all home found in violation of the Groundwater Rules not just the exceedance of health goal. The cost presented in Nov 2017 to the Bladen County Commission was far less for West of Cape Fear than presented in the plan, the data for Cumberland county is based on 9 year old data and does not take into account the massive growth in the areas south of Sandhill Road all the way along Hwy 87 to the Bladen County line.

b. Incomplete Data has been provided by Chemours to DEQ for the tests every other week. This is very important in making decisions such as if Granular Activated Carbon systems are viable and the full cost including operation and maintenance costs. It was presented as a one time cost of \$10K to install, that is not correct data when comparing GAC to municipal water options and taints decision points.

c. The data provided by Chemours (not complete or actual lab results) does indicate that trace chemicals are getting thru the Granular Activated Carbon systems. This would be a violation of 15A NCAC 02L .0202. The full set of data including all of the lab results on all samples taken, as well as the additional field data, such as frequency of sediment filter & iron filter replacement was withheld by Chemours from the well owners and DEQ. Not

enough information has been properly reviewed to determine effectiveness, but the data from Chemours indicated that they would be in violation the Groundwater rules/Standards of 15A NCAC 02L .0202.

d. The Swedish study on Granular Activated Carbon systems found them to be inefficient after a 140 day study. The study was to investigate the removal efficiency of PFASs in water using two treatment techniques; granular activated carbon (GAC), type Filtrasorb 400®, and anion exchange (AE), type Purolite A-600. Additionally, the effect of dissolved organic carbon (DOC) on removal efficiency was studied. The removal efficiency of PFASs was studied in pilot-scale column experiments at Bäcklösa drinking water treatment plant (DWTP) in Uppsala, Sweden. The laboratory batch experiments were performed at Swedish University of Agricultural Sciences (SLU), Uppsala. The results from the column experiment indicated a decrease in removal efficiency with increasing number of bed volumes (BVs) for both GAC and AE. The average removal efficiency of all PFASs (n=14) during the 140 day column study was 65% for both GAC and AE. At the end of the column experiment, the average removal efficiency of all PFASs was 49% for GAC and 53% for AE. Removal efficiency was influenced by functional group; perfluoroalkane (-alkyl) sulfonic acids (PFSAs) were more efficiently removed than perfluoroalkyl carboxylic acids (PFCAs) (on average 56% vs 38% for GAC, respectively, and 82% vs 28% for AE, respectively). In addition, the perfluorocarbon chain length influenced the removal efficiency. Results from the column experiment indicated higher removal efficiency as the perfluorocarbon chain length increased. In contrast, the results from the batch experiments indicated the opposite; decreasing adsorption to GAC and AE as the chain length increased. Furthermore, presence of DOC in the water affected the removal efficiency of the investigated PFASs. However, the results indicated, contrary to the few studies previously performed on DOC and removal efficiency of PFASs, enhanced sorption of PFASs to GAC with increasing DOC concentration, and decreased PFAS sorption to AE as the DOC concentration increased. In addition, the removal efficiency of GAC and AE varied using water types with different DOC origin, indicating that DOC characteristics influence the removal efficiency of PFASs in water. The six pilot tests are using Filtrasorb 600, but Brunswick county did test Filtrasorb 400 and it was not fully effective. There is not enough data yet for Filtrasorb 600, but initial Chemours data show that Chemicals do get thru in less than the 120 day point.

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prefer Municipal water and who would prefer the filtration option to answer that portion in one submission.

#### Section 67 Health Studies

It is our belief and desire that part of the health studies should include testing of the members blood & urine of all members of the households that have wells that test or tested with any exceedance of any Practical Quantitative Limit as defined by North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Chemours has stated that these chemicals harm nobody, it is time they prove it and in good faith or under court order they should be compelled to do this as part of the health studies. The harm to not only human or aquatic life needs to be researched, but also animals, such as Dogs, Cats, Birds and Farm animals.

MODIFIED TO READ

#### COMPLIANCE MEASURES – GROUNDWATER

69. Permanent Replacement of Private Drinking Water Supplies: By no later than twelve (18) months after issuance of this Order, Chemours shall establish permanent replacement water supplies for each household with a water supply well contaminated by any PFAS (“affected households”) PFBS CAS# 375-73-5, PFDA CAS# 335-76-2, PFDaA CAS# 307-55-1, PFHpA CAS# 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1, PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3, PFMOAA CAS# 39492-89-2, PFCECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFO3OA CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or additionally discovered PFAS in exceedance of the practical quantitative limit (PQL). The authority provided under Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), “substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. The replacement water supply shall be established by connection to a public water supply, except that an affected household may elect to receive a filtration system approved by DEQ in lieu of a connection to public water supply, in which case Chemours shall install a filtration system. For affected households Chemours shall be liable for any water bills from public utilities and for periodic required maintenance for any home that requested the DEQ approved filtration system. Chemours shall submit a plan for compliance with this provision, including a detailed schedule with milestones, no later than sixty (60) days after entry of this Order. This provision shall supplement any prior requirements regarding the provision of permanent replacement water supplies. Upon failure to comply with installation of municipal water to all homes with groundwater wells in exceedance of the Groundwater rules DEQ to find Chemours in violation of Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), “substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. DEQ will access penalties under NCGS 143-215.6A (a)(1) of not more than \$25,000 per day for each groundwater well that has been tested and been found to exceedance of the practical quantitative limit for any PFAs constituents. Multiple found PFAs constituents will be considered as separate violations of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c) and deemed a violation pursuant to G.S. 143-214-1.

MODIFIED to READ

70. Re-Testing of Private Wells: Chemours shall conduct testing of private drinking water supply wells as follows: for wells with test results showing no detectable concentrations of PFAS Compounds, Chemours shall re-test for PFPrOPrA CAS# 62037-80-3, PFOA CAS# 335-67-1, PFOS CAS# 1763-23-1, PFBS CAS# 375-73-5, PFDA CAS# 335-76-2, PFDaA CAS# 307-55-1, PFHpA CAS# 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1, PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3, PFMOAA CAS# 39492-89-2, PFCECA\_F CAS# 377-73-1, PF02HxA CAS#

39492-88-1, PFO3OA CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or additionally discovered PFAS in exceedance of the practical quantitative limit (PQL) on an annual basis until sampling shows no detectable concentrations of any PFAS constituents for two consecutive sampling events. Chemours shall provide to DEQ a list of residents within these sampling ranges, identified by both their address and sample ID. Chemours shall also provide to DEQ a list of wells (identified by address) targeted for testing that have not yet been tested and verifying its efforts to test these wells.

**From:** LaDonna Coates  
**To:** [comments.chemours](#)  
**Subject:** [External] Chemours  
**Date:** Tuesday, July 10, 2018 1:28:03 PM

---

**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

Good afternoon,

I live and taught in Bladen county. I had students in my classroom that were seriously impacted by the contamination. I teach science. This is the first year I have had good students explain that their conservation efforts and acts of good environmental stewardship didn't matter because the government allowed companies to contaminate our water and land anyway. These were students that couldn't use the well water on their property due to extreme levels of Gen-X and then had the county explain they wouldn't run water lines to the northern part of the county due to cost. My students are smart and this year taught them that government doesn't care about people only money, and companies are allowed to ruin water and land, so why does it matter if they try to conserve water or reduce litter.....

This is Chemours and Bladen county's lessons to our future leaders.....

Sad



**From:** Michael Cobleigh  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Comments about reducing of Gen X and holding Chemours responsible  
**Date:** Tuesday, July 10, 2018 12:41:05 PM

---

CAUTION: External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to Report Spam.<<mailto:report.spam@nc.gov>>

My name is Michael and I moved to the Leland area with my wife Megan back in March. I am really sadden to learn more and more about the gen x that is just being care free released into our air and water. I just don't understand how nothing major is being done and how long it has been going on. I am pretty sure there must be some sort of corrupt special interest going on and someone's pockets are getting filled. I hope I am wrong.

I am emailing this as I saw on a gen x page I follow I have until tomorrow to submit something for the court. Please hold Chemours responsible to finding another way to get rid of there products so it does not affect our air and water quality. I support any action taken against them and I think they should clean it up affective ASAP or by the end of the calendar years as the bill is being proposed. I also feel h2o2go water here in Leland needs to drill its own well and RO if something doesn't change but that hasn't happen yet.

Thank you much for your time and for reading this. I really hope someone does and this helps convey thousands of people's message.

Thanks,

Michael Cobleigh

**From:** Jean Zhuang  
**To:** [Holman, Sheila](#); [comments.chemours](#)  
**Cc:** [Geoff Gisler](#); [Kemp Burdette](#)  
**Subject:** [External] Chemours Public Comment  
**Date:** Tuesday, July 10, 2018 11:49:27 AM  
**Attachments:** [2018\\_07\\_10 SELC Comments on DEQ's Proposed Order.pdf](#)

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Dear Ms. Holman:

On behalf of Cape Fear River Watch, please accept the attached comments on the Department of Environmental Quality's June 11, 2018 proposed order in N.C. Dept. of Environmental Quality v. Chemours in the Bladen County Superior Court.

Regards,

**Jean Zhuang**

Associate Attorney | [Southern Environmental Law Center](#)  
601 West Rosemary Street, Suite 220 | Chapel Hill, NC 27516-2356  
T: 919-967-1450 | F: 919-929-9421 | Email: [jzhuang@selcnc.org](mailto:jzhuang@selcnc.org)

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#### **Disclaimer**

The information contained in this communication from the sender is confidential.

**From:** Mike Watters  
**To:** [Richard Essex](mailto:Richard_Essex)  
**Cc:** [Randa Dunn](mailto:Randa_Dunn); [comments.chemours](mailto:comments.chemours); [alenard1960@yahoo.com](mailto:alenard1960@yahoo.com); [kcann9@aol.com](mailto:kcann9@aol.com); [geno0625@aol.com](mailto:geno0625@aol.com); [donni0202@aol.com](mailto:donni0202@aol.com); [helenbrockett@gmail.com](mailto:helenbrockett@gmail.com); [bethamarkesino@yahoo.com](mailto:bethamarkesino@yahoo.com); [teaton214@yahoo.com](mailto:teaton214@yahoo.com); [catherine.clabby@gmail.com](mailto:catherine.clabby@gmail.com); [dmartin166@nc.rr.com](mailto:dmartin166@nc.rr.com); [Danwes5@gmail.com](mailto:Danwes5@gmail.com); [fmnfkn@embarqmail.com](mailto:fmnfkn@embarqmail.com); [poppysmith760@gmail.com](mailto:poppysmith760@gmail.com); [foxycherokeelady@gmail.com](mailto:foxycherokeelady@gmail.com); [Linda@fulcherelectric.com](mailto:Linda@fulcherelectric.com); [Gene@fulcherelectric.com](mailto:Gene@fulcherelectric.com); [Scott, Michael](mailto:Scott_Michael); [Regan, Michael S](mailto:Regan_Michael_S); [gallagherkm1@gmail.com](mailto:gallagherkm1@gmail.com); [ht690189@yahoo.com](mailto:ht690189@yahoo.com); [ghart35@yahoo.com](mailto:ghart35@yahoo.com); [creekpirate69@gmail.com](mailto:creekpirate69@gmail.com); [dedrahaire@gmail.com](mailto:dedrahaire@gmail.com); [stephen@carolinaspecialties.com](mailto:stephen@carolinaspecialties.com); [gswinson1@icloud.com](mailto:gswinson1@icloud.com); [jody\\_mac@yahoo.com](mailto:jody_mac@yahoo.com); [jdswwilley7@gmail.com](mailto:jdswwilley7@gmail.com); [slyrose6963@aol.com](mailto:slyrose6963@aol.com); [rjacobs](mailto:rjacobs); [jameswparadise@yahoo.com](mailto:jameswparadise@yahoo.com); [michellekey69@gmail.com](mailto:michellekey69@gmail.com); [keribrockett@gmail.com](mailto:keribrockett@gmail.com); [laura\\_r\\_booth@gmail.com](mailto:laura_r_booth@gmail.com); [cqwhipkey@gmail.com](mailto:cqwhipkey@gmail.com); [bobby@carolinaspecialties.com](mailto:bobby@carolinaspecialties.com); [Lll@nc.rr.com](mailto:Lll@nc.rr.com); [bamarkesino@gmail.com](mailto:bamarkesino@gmail.com)  
**Subject:** [External] Re: Comments to DEQ on the Proposed Draft Order.  
**Date:** Tuesday, July 10, 2018 11:41:15 AM  
**Attachments:** [image002.png](#)

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Yes, i would

On Tue, Jul 10, 2018, 11:34 AM Richard Essex <[REssex@cbs17.com](mailto:REssex@cbs17.com)> wrote:

Good Morning

I apologize for contacting all of you at once. In case we have not met my name is Richard Essex and I'm the Investigative Reporter at CBS 17 in Raleigh. Would any of you be available Wednesday morning to talk about the Proposed Draft, specifically the comments ?

Please feel free to contact me at [ressex@cbs17.com](mailto:ressex@cbs17.com) or mobile 317-965-1161 (Yes this is an Indianapolis area number, but I work in Raleigh)... We would like to schedule a couple interviews mid-morning...

Best Regards

Richard Essex

---

Richard Essex

Investigative Reporter

CBS 17

1205 FRONT ST. RALEIGH, NC 27609

919-835-6358 Office

317-965-1161 Mobile

[ressex@cbs17.com](mailto:ressex@cbs17.com)

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**From:** [redrandal@aol.com](mailto:redrandal@aol.com) [mailto:[redrandal@aol.com](mailto:redrandal@aol.com)]  
**Sent:** Tuesday, July 10, 2018 11:22 AM  
**To:** [comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)  
**Cc:** [alenard1960@yahoo.com](mailto:alenard1960@yahoo.com); [kcann9@aol.com](mailto:kcann9@aol.com); [geno0625@aol.com](mailto:geno0625@aol.com);  
[donni0202@aol.com](mailto:donni0202@aol.com); [helenbrockett@gmail.com](mailto:helenbrockett@gmail.com); [bethamarkesino@yahoo.com](mailto:bethamarkesino@yahoo.com);  
[gbarnes@fayobserver.com](mailto:gbarnes@fayobserver.com); [sdevane@fayobserver.com](mailto:sdevane@fayobserver.com); [teaton214@yahoo.com](mailto:teaton214@yahoo.com);  
[catherine.clabby@gmail.com](mailto:catherine.clabby@gmail.com); [David.Ivey@charter.com](mailto:David.Ivey@charter.com); [dmartin166@nc.rr.com](mailto:dmartin166@nc.rr.com);  
[dave.jordan@witn.com](mailto:dave.jordan@witn.com); [Danwes5@gmail.com](mailto:Danwes5@gmail.com); Richard Essex <[REssex@cbs17.com](mailto:REssex@cbs17.com)>;  
[fmnfkn@embarqmail.com](mailto:fmnfkn@embarqmail.com); [poppysmith760@gmail.com](mailto:poppysmith760@gmail.com); [foxycherokeelady@gmail.com](mailto:foxycherokeelady@gmail.com);  
[Linda@fulcherelectric.com](mailto:Linda@fulcherelectric.com); [Gene@fulcherelectric.com](mailto:Gene@fulcherelectric.com); [michael.scott@ncdenr.gov](mailto:michael.scott@ncdenr.gov);  
[michael.regan@ncdenr.gov](mailto:michael.regan@ncdenr.gov); [gallagherkm1@gmail.com](mailto:gallagherkm1@gmail.com); [ht690189@yahoo.com](mailto:ht690189@yahoo.com);  
[ghart35@yahoo.com](mailto:ghart35@yahoo.com); [creekpirate69@gmail.com](mailto:creekpirate69@gmail.com); [dedrahaire@gmail.com](mailto:dedrahaire@gmail.com);  
[stephen@carolinaspecialties.com](mailto:stephen@carolinaspecialties.com); [gswinson1@icloud.com](mailto:gswinson1@icloud.com); [jody\\_mac@yahoo.com](mailto:jody_mac@yahoo.com);  
[jdsWilley7@gmail.com](mailto:jdsWilley7@gmail.com); [slyrose6963@aol.com](mailto:slyrose6963@aol.com); [rjacobs@wunc.org](mailto:rjacobs@wunc.org);  
[jameswparadise@yahoo.com](mailto:jameswparadise@yahoo.com); [michellekey69@gmail.com](mailto:michellekey69@gmail.com); [keribrockett@gmail.com](mailto:keribrockett@gmail.com);  
[laura.r.booth@gmail.com](mailto:laura.r.booth@gmail.com); [webers@wnet.org](mailto:webers@wnet.org); [cgwhipkey@gmail.com](mailto:cgwhipkey@gmail.com);  
[bobby@carolinaspecialties.com](mailto:bobby@carolinaspecialties.com); [LJl@nc.rr.com](mailto:LJl@nc.rr.com); [wattersm@gmail.com](mailto:wattersm@gmail.com);  
[bamarkesino@gmail.com](mailto:bamarkesino@gmail.com)  
**Subject:** Comments to DEQ on the Proposed Draft Order.

We are Herman and Randa Dunn

904 Circle Point Court

Fayetteville, NC 28306

Point East Subdivision, Gray's Creek, one mile north of Chemours

We have spent too many years being poisoned by contaminated air and water. We demand our lawful and rightful help from the State of North Carolina and DEQ, including national and federal levels.

We are in agreement with Mike Watters' assessment which resulted from extensive, in-depth investigation and proven scientific research.

There are ways the State can STOP DuPont/Chemours and help the residents achieve a clean air and clean water solution. With the new ASTDR study, we know that we are at risk at much lower numbers than previously shown.

This solution should not be dictated by, or for the benefit of, Chemours. We, the people, are being contaminated!

You may not get comments from every household - for various reasons - but, know, that our communities are standing together on this issue. We cannot undo the detriments to our health thus far, which, as scientifically proven, may continue into the future, but further contamination MUST be stopped.

Thank you for having a lawful and moral responsibility.

Herman and Randa Dunn

-----Original Message-----

From: Bobby Swilley <[bobby@carolinaspecialties.com](mailto:bobby@carolinaspecialties.com)>

To: 'Larry Lancaster' <[Ll@nc.rr.com](mailto:Ll@nc.rr.com)>; 'Mike Watters' <[wattersm@gmail.com](mailto:wattersm@gmail.com)>

Cc: 'Randa Dunn' <[REDRANDA1@aol.com](mailto:REDRANDA1@aol.com)>; 'Anthony Lenard' <[alenard1960@yahoo.com](mailto:alenard1960@yahoo.com)>; 'Kenneth Cannon' <[kcann9@aol.com](mailto:kcann9@aol.com)>; 'Gene Inman' <[geno0625@aol.com](mailto:geno0625@aol.com)>; 'Donna F. Inman' <[donni0202@aol.com](mailto:donni0202@aol.com)>; 'Helen Brockett' <[helenbrockett@gmail.com](mailto:helenbrockett@gmail.com)>; 'Beth Markesino' <[bethamarkesino@yahoo.com](mailto:bethamarkesino@yahoo.com)>; 'Barnes, Greg' <[gbarnes@fayobserver.com](mailto:gbarnes@fayobserver.com)>; 'Devane, Steve' <[sdevane@fayobserver.com](mailto:sdevane@fayobserver.com)>; 'tracy eaton' <[teaton214@yahoo.com](mailto:teaton214@yahoo.com)>; 'Catherine Clabby' <[catherine.clabby@gmail.com](mailto:catherine.clabby@gmail.com)>; 'Ivey, David M' <[David.Ivey@charter.com](mailto:David.Ivey@charter.com)>; 'Derrick Martin' <[dmartin166@nc.rr.com](mailto:dmartin166@nc.rr.com)>; 'davejordanwitn' <[dave.jordan@witn.com](mailto:dave.jordan@witn.com)>; 'Robert Wesselman' <[Danwes5@gmail.com](mailto:Danwes5@gmail.com)>; 'Richard Essex' <[REssex@cbs17.com](mailto:REssex@cbs17.com)>; 'Francis Minshew' <[fmnfkn@embarqmail.com](mailto:fmnfkn@embarqmail.com)>; 'Emma Smith' <[poppysmith760@gmail.com](mailto:poppysmith760@gmail.com)>; 'Martha Bennett' <[foxycherokeelady@gmail.com](mailto:foxycherokeelady@gmail.com)>; 'Linda' <[Linda@fulcherelectric.com](mailto:Linda@fulcherelectric.com)>; 'Gene' <[Gene@fulcherelectric.com](mailto:Gene@fulcherelectric.com)>; 'Scott, Michael' <[michael.scott@ncdenr.gov](mailto:michael.scott@ncdenr.gov)>; 'Regan, Michael S' <[michael.regan@ncdenr.gov](mailto:michael.regan@ncdenr.gov)>; 'Kathleen Gallagher' <[gallagherkm1@gmail.com](mailto:gallagherkm1@gmail.com)>; 'H T' <[ht690189@yahoo.com](mailto:ht690189@yahoo.com)>; 'George Hart' <[ghart35@yahoo.com](mailto:ghart35@yahoo.com)>; 'brett hardy' <[creekpirate69@gmail.com](mailto:creekpirate69@gmail.com)>; 'Dedra Haire' <[dedrahaire@gmail.com](mailto:dedrahaire@gmail.com)>; 'Stephen Haire' <[stephen@carolinaspecialties.com](mailto:stephen@carolinaspecialties.com)>; 'Gene Swinson' <[gswinson1@icloud.com](mailto:gswinson1@icloud.com)>; 'Jody Jernigan' <[jody\\_mac@yahoo.com](mailto:jody_mac@yahoo.com)>; 'Jonathan Swilley' <[jdswilley7@gmail.com](mailto:jdswilley7@gmail.com)>; 'jeannette rose' <[slyrose6963@aol.com](mailto:slyrose6963@aol.com)>; 'Jacobs, Rusty' <[rjacobs@wunc.org](mailto:rjacobs@wunc.org)>; 'James Paradise'

<[jameswparadise@yahoo.com](mailto:jameswparadise@yahoo.com)>; 'Michelle Key' <[michellekey69@gmail.com](mailto:michellekey69@gmail.com)>; 'Keri Carelas' <[keribrockett@gmail.com](mailto:keribrockett@gmail.com)>; 'laura booth' <[laura.r.booth@gmail.com](mailto:laura.r.booth@gmail.com)>; webers <[webers@wnet.org](mailto:webers@wnet.org)>; 'Christine Whipkey' <[cgwhipkey@gmail.com](mailto:cgwhipkey@gmail.com)>  
Sent: Mon, Jul 9, 2018 2:49 pm  
Subject: RE: Please Copy and Send Comments to DEQ on the Proposed Draft Order.

**My name is Bobby J. Swilley and we live at 1904 Nantuckett Court , Point East Subdivision, Gray's Creek, Fayetteville, NC 28306 and we totally, 100%, agree with Mr. Mike Waters regarding the comments and especially 67, 69, and 70. We stand united!**

**Sincerely,**

**Bobby J. and Ann Marie Swilley**

**1904 Nantuckett Court**

**Fayetteville, NC 28306**

---

**From:** Larry Lancaster [<mailto:Ll@nc.rr.com>]

**Sent:** Monday, July 09, 2018 2:32 PM

**To:** Mike Watters

**Cc:** Randa Dunn; Anthony Lenard; Kenneth Cannon; Gene Inman; Donna F. Inman; Helen Brockett; Bobby Swilley; Beth Markesino; Barnes, Greg; Devane, Steve; Tracy Eaton; Catherine Clabby; Ivey, David M; Derrick Martin; davejordanwitn; Robert Wesselman; Richard Essex; Francis Minshew; Emma Smith; Martha Bennett; Linda; Gene; Scott, Michael; Regan, Michael S; Kathleen Gallagher; H T; George Hart; Brett Hardy; Dedra Haire; Stephen Haire; Gene Swinson; Jody Jernigan; Jonathan Swilley; Jeannette Rose; Jacobs, Rusty; James Paradise; Michelle Key; Keri Carelas; Laura Booth; [webers@wnet.org](mailto:webers@wnet.org); Christine Whipkey

**Subject:** Re: Please Copy and Send Comments to DEQ on the Proposed Draft Order.

Thanks to all for taking time to respond

**Larry Lancaster**

*Chairman, Cumberland County Board of Commissioners*

*Home: 910-484-2774*

*Cell: 910-308-9285*

On Jul 9, 2018, at 1:43 PM, Mike Watters <[wattersm@gmail.com](mailto:wattersm@gmail.com)> wrote:

## URGENCY

Good morning members,

We have until Wednesday, July 11th to put in our comments on the Draft Court order

If there was ever a moment that you took the time to write, now is the time. Please don't hesitate, your comments are very important to your rights if a well owner. Specifically section 67, 69 & 70

If a well owner in Cumberland, Bladen or Robeson county or any other county affected by PFAS contamination from Fayetteville works. Copy text below or enter you own and email to:

[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

by 11 July.

If you want to use this template change to your Contact information and copy it to the email. I gathered information that is pertinent backed by law or studies to justify the reasons for modification.

Point of contact Michael Watters  
6975 Point East Dr  
Fayetteville, NC 28306  
[wattersm@gmail.com](mailto:wattersm@gmail.com)  
910-424-2162

Department of Environmental Quality  
[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)  
Assistant Secretary's Office  
RE: Chemours Public Comment  
1601 Mail Service Center  
Raleigh, N.C. 27699-1601

SUBJECT: Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

1. We the Residents within the "affected households" that live within the geographical area of the Chemours managed Fayetteville Works facility (Cumberland, Bladen & Robeson Counties) are requesting modification of the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

2. In the absence of evidence to the contrary, ATSDR assumes that humans are more sensitive to the effects of hazardous substance than animals and that certain persons may be particularly sensitive, the report notes. Thus, the resulting MRL may be as much as 100-fold below levels that have been shown to be nontoxic in laboratory animals. This federal study is deeply concerning because it demonstrates that PFAS chemicals are more dangerous to human health than the EPA has previously acknowledged. We are requesting the Department of Environmental Quality address these PFAS contaminations with more urgency. We must ensure that families exposed to these dangerous chemicals receive municipal water, cost to the Company that caused the contamination should not be a factor in decision making.

3. This request is signed by the "affected households" that have wells that are exceedance of the Practical Quantitative Limit (PQL) for any PFAS constituents in violation of 15A NCAC 02L .0202. These are not naturally occurring substances and no standard has been so the permitted concentration requires that they be below the Practical Quantitative limit for Class GA or Class GSA groundwaters pursuant to 15A NCAC 2L .0202(c). This changes the cost per household to approximately \$24k per household for the Cumberland county homes west of the Cape Fear River as presented by Chemours-Parsons developed plan. Why use the Practical Quantitative Limit for all PFAS detected instead of single GENX health goal?

a. According to environmental chemists, the proposed ATSDR "minimum risk levels" or MRLs, translate roughly to 7-ppt for PFOS and 11-ppt for PFOA -- the two PFAS compounds which the state of Michigan has established cleanup standards for groundwater that people drink.

b. A 7-ppt MRL level for PFOS exposure is lower than Michigan's 12-ppt enforceable standard for that compound in surface water, a rule developed to account for bioaccumulation in fish. The U.S. Environmental Protection Agency health advisory level for PFOS and PFOA is a combined 70-ppt, a level some researchers call inadequate to protect public health. We know fish in Marshwood lake did show bioaccumulation of PFAS in fish tested.

c. PFAS have been "extensively evaluated in humans and laboratory animals," the study notes, but says comparing toxicity across species is problematic because, among other things, humans take much longer to purge the chemicals from their bodies. The chemicals also cause different health problems in humans versus animals.

d. The ATSDR proposes MRLs translating to about 70-ppt for PFHxS and 10.5 ppt for PFNA, two PFAS compounds for which there are no federal Standards. These are found in many of the wells surrounding the facility as well as in the plume contaminating the aquifer under the facility. Refer to the Dec 16 Corrective Measure Study that is in DEQ public edocs site for proof.

e. "This study confirms that the EPA's guidelines for PFAS levels in drinking water woefully underestimate risks to human health," said Olga Naidenko, a senior science advisor at the nonprofit Environmental Working Group. "We urge EPA to collect and publish all water results showing PFAS contamination at any level, so Americans across the country can take immediate steps to protect themselves and their families."

4. Reasons why Granular Activated Carbon systems should not be option over PWC Municipal Water for Cumberland County residents or Bladen county water for Bladen county residents are as follows:

a. Many data points about installing municipal water lines in Cumberland county are inaccurate based on 9 year old data. There is a new 12" pipe being installed off Throver road with planned extension along Hwy97 to homes near the Alderman Hwy 87 intersection. The Water Replacement plan costing data is inaccurate and needs review by Cumberland and Bladen County commissions. This should also be measured as if all home found in violation of the Groundwater Rules not just the exceedance of health goal. The cost presented in Nov 2017 to the Bladen County Commission was far less for West of Cape Fear than presented in the plan, the data for Cumberland county is based on 9 year old data and does not take into account the massive growth in the areas south of Sandhill Road all the way along Hwy 87 to the Bladen County line.

b. Incomplete Data has been provided by Chemours to DEQ for the tests every other week. This is very important in making decisions such as if Granular Activated Carbon systems are viable and the full cost including operation and maintenance costs. It was



presented as a one time cost of \$10K to install, that is not correct data when comparing GAC to municipal water options and taints decision points.

c. The data provided by Chemours (not complete or actual lab results) does indicate that trace chemicals are getting thru the Granular Activated Carbon systems. This would be a violation of 15A NCAC 02L .0202. The full set of data including all of the lab results on all samples taken, as well as the additional field data, such as frequency of sediment filter & iron filter replacement was withheld by Chemours from the well owners and DEQ. Not enough information has been properly reviewed to determine effectiveness, but the data from Chemours indicated that they would be in violation the Groundwater rules/Standards of 15A NCAC 02L .0202.

d. The Swedish study on Granular Activated Carbon systems found them to be inefficient after a 140 day study. The study was to investigate the removal efficiency of PFASs in water using two treatment techniques; granular activated carbon (GAC), type Filtrasorb 400®, and anion exchange (AE), type Purolite A-600. Additionally, the effect of dissolved organic carbon (DOC) on removal efficiency was studied. The removal efficiency of PFASs was studied in pilot-scale column experiments at Bäcklösa drinking water treatment plant (DWTP) in Uppsala, Sweden. The laboratory batch experiments were performed at Swedish University of Agricultural Sciences (SLU), Uppsala. The results from the column experiment indicated a decrease in removal efficiency with increasing number of bed volumes (BVs) for both GAC and AE. The average removal efficiency of all PFASs (n=14) during the 140 day column study was 65% for both GAC and AE. At the end of the column experiment, the average removal efficiency of all PFASs was 49% for GAC and 53% for AE. Removal efficiency was influenced by functional group; perfluoroalkane (-alkyl) sulfonic acids (PFSAs) were more efficiently removed than perfluoroalkyl carboxylic acids (PFCAs) (on average 56% vs 38% for GAC, respectively, and 82% vs 28% for AE, respectively). In addition, the perfluorocarbon chain length influenced the removal efficiency. Results from the column experiment indicated higher removal efficiency as the perfluorocarbon chain length increased. In contrast, the results from the batch experiments indicated the opposite; decreasing adsorption to GAC and AE as the chain length increased. Furthermore, presence of DOC in the water affected the removal efficiency of the investigated PFASs. However, the results indicated, contrary to the few studies previously performed on DOC and removal efficiency of PFASs, enhanced sorption of PFASs to GAC with increasing DOC concentration, and decreased PFAS sorption to AE as the DOC concentration increased. In addition, the removal efficiency of GAC and AE varied using water types with different DOC origin, indicating that DOC characteristics influence the removal efficiency of PFASs in water. The six pilot tests are using Filtrasorb 600, but Brunswick county did test Filtrasorb 400 and it was not fully effective. There is not enough data yet for filtrasorb 600, but initial Chemours data show that Chemicals do get thru in less than the 120 day point.

e. Department of Environmental Quality cannot use this set of rules to violate in one instance and not use it as a determination point on who should be provided municipal or filtration systems. The test data provided by Chemours of the Granular Activated Carbon systems proves that the systems allow trace amounts of chemicals to pass through the system. The 12 April, 26 April and 10 May Chemours results for Site 48 prove this to be fact. Thus the results are in violation as there is an exceedance of the Practical Quantitative Limit (PQL) for PFAs constituents in violation of 15A NCAC 02L .0202. The DEQ test results from the 3 May test indicates a 106.03 ng/L of combined PFAs breakthrough and this is in less than 1 month of use for this specific test system.

f. Maintenance of the system as noted on site 48 that on 5 July could cause contamination as occurred when Parsons found that the Iron filter allowed iron to get into the GAC canisters. This was rectified by doing a backflush running the water onto the soil. This backflush would wash the contaminants that were captured out to the soil that is less than 30 feet from the well. This is no different then an inadvertent spill while filling a

truck with contaminated water and should be a violation and reported as a minor reported spill.

5. We request the following three areas to be modified:

Line 67 Listed as: Health Studies

Line 69 listed as: COMPLIANCE MEASURES – GROUNDWATER

Line 70 listed as: Re-Testing of Private Wells

6. The verbiage that we believe should be present is listed below and referenced to the sections we desire to see modification. We have also included a modified PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580 with the highlighted changes inserted. This is in compliance with the standards used by the Division of Waste Management in the 11 June 2018 Notice of Violation. We the “affected households” request municipal water to be run at Chemours expense. We have included an area on the signature pages attached to indicate who would prefer Municipal water and who would prefer the filtration option to answer that portion in one submission.

#### Section 67 Health Studies

It is our belief and desire that part of the health studies should include testing of the members blood & urine of all members of the households that have wells that test or tested with any exceedance of any Practical Quantitative Limit as defined by North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Chemours has stated that these chemicals harm nobody, it is time they prove it and in good faith or under court order they should be compelled to do this as part of the health studies. The harm to not only human or aquatic life needs to be researched, but also animals, such as Dogs, Cats, Birds and Farm animals.

#### MODIFIED TO READ

##### COMPLIANCE MEASURES – GROUNDWATER

69. Permanent Replacement of Private Drinking Water Supplies: By no later than twelve (18) months after issuance of this Order, Chemours shall establish permanent replacement water supplies for each household with a water supply well contaminated by any PFAS (“affected households”) PFBS CAS# 375-73-5, PFDA CAS# 335-76-2, PFDaA CAS# 307-55-1, PFHpA CAS# 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1, PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3, PFMOAA CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PF03OA CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or additionally discovered PFAS in exceedance of the practical quantitative limit (PQL). The authority provided under Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), “substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. The replacement water supply shall be established by connection to a public water supply, except that an affected household may elect to receive a filtration system approved by DEQ in lieu of a connection to public water supply, in which case Chemours shall install a filtration system. For affected households Chemours shall be liable for any water bills from public utilities and for periodic required maintenance for any home that requested the DEQ approved filtration system. Chemours shall submit a plan for compliance with this provision, including a detailed schedule with milestones, no later than sixty (60) days after entry of this Order. This provision shall supplement any prior requirements regarding the provision of permanent replacement water supplies. Upon failure to comply with installation of municipal water to all homes with groundwater wells in exceedance of the Groundwater rules DEQ to find Chemours in violation of Title 15A of the North Carolina

Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), "substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. DEQ will assess penalties under NCGS 143-215.6A (a)(1) of not more than \$25,000 per day for each groundwater well that has been tested and been found to exceedance of the practical quantitative limit for any PFAs constituents. Multiple found PFAs constituents will be considered as separate violations of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c) and deemed a violation pursuant to G.S. 143-214-1.

MODIFIED to READ

70. Re-Testing of Private Wells: Chemours shall conduct testing of private drinking water supply wells as follows: for wells with test results showing no detectable concentrations of PFAS Compounds, Chemours shall re-test for PFPrOPrA CAS# 62037-80-3, PFOA CAS# 335-67-1, PFOS CAS# 1763-23-1, PFBS CAS# 375-73-5, PFDA CAS# 335-76-2, PFDoA CAS# 307-55-1, PFHpA CAS# 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1, PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3, PFMOAA CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFo3OA CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or additionally discovered PFAS in exceedance of the practical quantitative limit (PQL) on an annual basis until sampling shows no detectable concentrations of any PFAS constituents for two consecutive sampling events. Chemours shall provide to DEQ a list of residents within these sampling ranges, identified by both their address and sample ID. Chemours shall also provide to DEQ a list of wells (identified by address) targeted for testing that have not yet been tested and verifying its efforts to test these wells.

**From:** Richard Essex  
**To:** [redranda1@aol.com](mailto:redranda1@aol.com); [comments.chemours](mailto:comments.chemours)  
**Cc:** [alenard1960@yahoo.com](mailto:alenard1960@yahoo.com); [kcann9@aol.com](mailto:kcann9@aol.com); [geno0625@aol.com](mailto:geno0625@aol.com); [donni0202@aol.com](mailto:donni0202@aol.com); [helenbrockett@gmail.com](mailto:helenbrockett@gmail.com); [bethamarkesino@yahoo.com](mailto:bethamarkesino@yahoo.com); [teaton214@yahoo.com](mailto:teaton214@yahoo.com); [catherine.clabby@gmail.com](mailto:catherine.clabby@gmail.com); [dmartin166@nc.rr.com](mailto:dmartin166@nc.rr.com); [Danwes5@gmail.com](mailto:Danwes5@gmail.com); [fmnfkn@embarqmail.com](mailto:fmnfkn@embarqmail.com); [poppysmith760@gmail.com](mailto:poppysmith760@gmail.com); [foxycherokeelady@gmail.com](mailto:foxycherokeelady@gmail.com); [Linda@fulcherelectric.com](mailto:Linda@fulcherelectric.com); [Gene@fulcherelectric.com](mailto:Gene@fulcherelectric.com); [Scott.Michael.Regan.Michael.S@gallagherkm1@gmail.com](mailto:Scott.Michael.Regan.Michael.S@gallagherkm1@gmail.com); [ht690189@yahoo.com](mailto:ht690189@yahoo.com); [ghart35@yahoo.com](mailto:ghart35@yahoo.com); [creekpirate69@gmail.com](mailto:creekpirate69@gmail.com); [dedrahaire@gmail.com](mailto:dedrahaire@gmail.com); [stephen@carolinaspecialties.com](mailto:stephen@carolinaspecialties.com); [gswinson1@icloud.com](mailto:gswinson1@icloud.com); [jody\\_mac@yahoo.com](mailto:jody_mac@yahoo.com); [jdswilley7@gmail.com](mailto:jdswilley7@gmail.com); [slyrose6963@aol.com](mailto:slyrose6963@aol.com); [rjacobs](mailto:rjacobs); [jameswparadise@yahoo.com](mailto:jameswparadise@yahoo.com); [michellekey69@gmail.com](mailto:michellekey69@gmail.com); [keribrockett@gmail.com](mailto:keribrockett@gmail.com); [laura.r.booth@gmail.com](mailto:laura.r.booth@gmail.com); [cgwhipkey@gmail.com](mailto:cgwhipkey@gmail.com); [bobby@carolinaspecialties.com](mailto:bobby@carolinaspecialties.com); [LL@nc.rr.com](mailto:LL@nc.rr.com); [wattersm@gmail.com](mailto:wattersm@gmail.com); [bamarkesino@gmail.com](mailto:bamarkesino@gmail.com)  
**Subject:** [External] RE: Comments to DEQ on the Proposed Draft Order.  
**Date:** Tuesday, July 10, 2018 11:34:44 AM  
**Attachments:** [image002.png](#)

**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

Good Morning

I apologize for contacting all of you at once. In case we have not met my name is Richard Essex and I'm the Investigative Reporter at CBS 17 in Raleigh. Would any of you be available Wednesday morning to talk about the Proposed Draft, specifically the comments ?

Please feel free to contact me at [ressex@cbs17.com](mailto:ressex@cbs17.com) or mobile 317-965-1161 (Yes this is an Indianapolis area number, but I work in Raleigh)...We would like to schedule a couple interviews mid-morning...

Best Regards

Richard Essex

---

## Richard Essex

Investigative Reporter  
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1205 FRONT ST. RALEIGH, NC 27609  
919-835-6358 Office  
317-965-1161 Mobile  
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**From:** [redranda1@aol.com](mailto:redranda1@aol.com) [mailto:[redranda1@aol.com](mailto:redranda1@aol.com)]

**Sent:** Tuesday, July 10, 2018 11:22 AM

**To:** comments.chemours@ncdenr.gov

**Cc:** alenard1960@yahoo.com; kcann9@aol.com; geno0625@aol.com; donni0202@aol.com; helenbrockett@gmail.com; bethamarkesino@yahoo.com; gbarnes@fayobserver.com; sdevane@fayobserver.com; teaton214@yahoo.com; catherine.clabby@gmail.com; David.lvey@charter.com; dmartin166@nc.rr.com; dave.jordan@witn.com; Danwes5@gmail.com; Richard Essex <REssex@cbs17.com>; fmnfkn@embarqmail.com; poppysmith760@gmail.com; foxycherokeelady@gmail.com; Linda@fulcherelectric.com; Gene@fulcherelectric.com; michael.scott@ncdenr.gov; michael.regan@ncdenr.gov; gallagherkm1@gmail.com; ht690189@yahoo.com; ghart35@yahoo.com; creeppirate69@gmail.com; dedrahaire@gmail.com; stephen@carolinaspecialties.com; gswinson1@icloud.com; jody\_mac@yahoo.com; jdswilley7@gmail.com; slyrose6963@aol.com; rjacobs@wunc.org; jameswparadise@yahoo.com; michellekey69@gmail.com; keribrockett@gmail.com; laura.r.booth@gmail.com; webers@wnet.org; cgwhipkey@gmail.com; bobby@carolinaspecialties.com; Lll@nc.rr.com; wattersm@gmail.com; bamarkesino@gmail.com

**Subject:** Comments to DEQ on the Proposed Draft Order.

We are Herman and Randa Dunn  
904 Circle Point Court  
Fayetteville, NC 28306  
Point East Subdivision, Gray's Creek, one mile north of Chemours

We have spent too many years being poisoned by contaminated air and water. We demand our lawful and rightful help from the State of North Carolina and DEQ, including national and federal levels. We are in agreement with Mike Watters' assessment which resulted from extensive, in-depth investigation and proven scientific research.

There are ways the State can STOP DuPont/Chemours and help the residents achieve a clean air and clean water solution. With the new ASTDR study, we know that we are at risk at much lower numbers than previously shown.

This solution should not be dictated by, or for the benefit of, Chemours. We, the people, are being contaminated!

You may not get comments from every household - for various reasons - but, know, that our communities are standing together on this issue. We cannot undo the detriments to our health thus far, which, as scientifically proven, may continue into the future, but further contamination MUST be stopped.

Thank you for having a lawful and moral responsibility.

Herman and Randa Dunn

-----Original Message-----

From: Bobby Swilley <[bobby@carolinaspecialties.com](mailto:bobby@carolinaspecialties.com)>

To: 'Larry Lancaster' <[Lll@nc.rr.com](mailto:Lll@nc.rr.com)>; 'Mike Watters' <[wattersm@gmail.com](mailto:wattersm@gmail.com)>

Cc: 'Randa Dunn' <[REDRANDA1@aol.com](mailto:REDRANDA1@aol.com)>; 'Anthony Lenard' <[alenard1960@yahoo.com](mailto:alenard1960@yahoo.com)>; 'Kenneth Cannon' <[kcann9@aol.com](mailto:kcann9@aol.com)>; 'Gene Inman' <[geno0625@aol.com](mailto:geno0625@aol.com)>; 'Donna F. Inman' <[donni0202@aol.com](mailto:donni0202@aol.com)>; 'Helen Brockett' <[helenbrockett@gmail.com](mailto:helenbrockett@gmail.com)>; 'Beth Markesino' <[bethamarkesino@yahoo.com](mailto:bethamarkesino@yahoo.com)>; 'Barnes, Greg' <[gbarnes@fayobserver.com](mailto:gbarnes@fayobserver.com)>; 'Devane, Steve' <[sdevane@fayobserver.com](mailto:sdevane@fayobserver.com)>; 'tracy eaton' <[teaton214@yahoo.com](mailto:teaton214@yahoo.com)>; 'Catherine Clabby' <[catherine.clabby@gmail.com](mailto:catherine.clabby@gmail.com)>; 'Ivey, David M' <[David.lvey@charter.com](mailto:David.lvey@charter.com)>; 'Derrick Martin' <[dmartin166@nc.rr.com](mailto:dmartin166@nc.rr.com)>; 'davejordanwitn' <[dave.jordan@witn.com](mailto:dave.jordan@witn.com)>; 'Robert Wesselman' <[Danwes5@gmail.com](mailto:Danwes5@gmail.com)>; 'Richard Essex' <[REssex@cbs17.com](mailto:REssex@cbs17.com)>; 'Francis Minshew' <[fmnfkn@embarqmail.com](mailto:fmnfkn@embarqmail.com)>; 'Emma Smith' <[poppysmith760@gmail.com](mailto:poppysmith760@gmail.com)>; 'Martha Bennett' <[foxycherokeelady@gmail.com](mailto:foxycherokeelady@gmail.com)>; 'Linda' <[Linda@fulcherelectric.com](mailto:Linda@fulcherelectric.com)>; 'Gene'

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Sent: Mon, Jul 9, 2018 2:49 pm  
Subject: RE: Please Copy and Send Comments to DEQ on the Proposed Draft Order.

**My name is Bobby J. Swilley and we live at 1904 Nantuckett Court , Point East Subdivision, Gray's Creek, Fayetteville, NC 28306 and we totally, 100%, agree with Mr. Mike Waters regarding the comments and especially 67, 69, and 70. We stand united!**

**Sincerely,**

**Bobby J. and Ann Marie Swilley**

**1904 Nantuckett Court**

**Fayetteville, NC 28306**

---

**From:** Larry Lancaster [<mailto:LlL@nc.rr.com>]

**Sent:** Monday, July 09, 2018 2:32 PM

**To:** Mike Watters

**Cc:** Randa Dunn; Anthony Lenard; Kenneth Cannon; Gene Inman; Donna F. Inman; Helen Brockett; Bobby Swilley; Beth Markesino; Barnes, Greg; Devane, Steve; tracy eaton; Catherine Clabby; Ivey, David M; Derrick Martin; davejordanwitn; Robert Wesselman; Richard Essex; Francis Minshew; Emma Smith; Martha Bennett; Linda; Gene; Scott, Michael; Regan, Michael S; Kathleen Gallagher; H T; George Hart; brett hardy; Dedra Haire; Stephen Haire; Gene Swinson; Jody Jernigan; Jonathan Swilley; jeannette rose; Jacobs, Rusty; James Paradise; Michelle Key; Keri Carelas; laura booth; [webers@wnet.org](mailto:webers@wnet.org); Christine Whipkey

**Subject:** Re: Please Copy and Send Comments to DEQ on the Proposed Draft Order.

Thanks to all for taking time to respond

**Larry Lancaster**

*Chairman, Cumberland County Board of Commissioners*

*Home: 910-484-2774*

*Cell: 910-308-9285*

On Jul 9, 2018, at 1:43 PM, Mike Watters <[wattersm@gmail.com](mailto:wattersm@gmail.com)> wrote:

URGENCY

Good morning members,

We have until Wednesday, July 11th to put in our comments on the Draft Court order

If there was ever a moment that you took the time to write, now is the time. Please don't hesitate, your comments are very important to your rights if a well owner. Specifically

section 67, 69 & 70

If a well owner in Cumberland, Bladen or Robeson county or any other county affected by PFAS contamination from Fayetteville works. Copy text below or enter you own and email to:

[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

by 11 July.

If you want to use this template change to your Contact information and copy it to the email. I gathered information that is pertinent backed by law or studies to justify the reasons for modification.

Point of contact Michael Watters

6975 Point East Dr

Fayetteville, NC 28306

[wattersm@gmail.com](mailto:wattersm@gmail.com)

910-424-2162

Department of Environmental Quality

[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

Assistant Secretary's Office

RE: Chemours Public Comment

1601 Mail Service Center

Raleigh, N.C. 27699-1601

SUBJECT: Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

1. We the Residents within the "affected households" that live within the geographical area of the Chemours managed Fayetteville Works facility (Cumberland, Bladen & Robeson Counties) are requesting modification of the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

2. In the absence of evidence to the contrary, ATSDR assumes that humans are more sensitive to the effects of hazardous substance than animals and that certain persons may be particularly sensitive, the report notes. Thus, the resulting MRL may be as much as 100-fold below levels that have been shown to be nontoxic in laboratory animals. This federal study is deeply concerning because it demonstrates that PFAS chemicals are more dangerous to human health than the EPA has previously acknowledged. We are requesting the Department of Environmental Quality address these PFAS contaminations with more urgency. We must ensure that families exposed to these dangerous chemicals receive municipal water, cost to the Company that caused the contamination should not be a factor in decision making.

3. This request is signed by the "affected households" that have wells that are exceedance of the Practical Quantitative Limit (PQL) for any PFAS constituents in violation of 15A NCAC 02L .0202. These are not naturally occurring substances and no standard has been so the permitted concentration requires that they be below the Practical Quantitative limit for Class GA or Class GSA groundwaters pursuant to 15A NCAC 2L .0202(c). This changes the cost per household to approximately \$24k per household for the Cumberland county homes west of the Cape Fear River as presented by Chemours-Parsons developed plan. Why use the Practical Quantitative Limit for all PFAS detected instead of single GENX health goal?

a. According to environmental chemists, the proposed ATSDR "minimum risk levels" or MRLs, translate roughly to 7-ppt for PFOS and 11-ppt for PFOA -- the two PFAS compounds which the state of Michigan has established cleanup standards for groundwater that people drink.

b. A 7-ppt MRL level for PFOS exposure is lower than Michigan's 12-ppt enforceable standard for that compound in surface water, a rule developed to account for bioaccumulation in fish. The U.S. Environmental Protection Agency health advisory level for PFOS and PFOA is a combined 70-ppt, a level some researchers call inadequate to protect public health. We know fish in Marshwood lake did show bioaccumulation of PFAS in fish tested.

c. PFAS have been "extensively evaluated in humans and laboratory animals," the study notes, but says comparing toxicity across species is problematic because, among other things, humans take much longer to purge the chemicals from their bodies. The chemicals also cause different health problems in humans versus animals.

d. The ATSDR proposes MRLs translating to about 70-ppt for PFHxS and 10.5 ppt for PFNA, two PFAS compounds for which there are no federal Standards. These are found in many of the wells surrounding the facility as well as in the plume contaminating the aquifer under the facility. Refer to the Dec 16 Corrective Measure Study that is in DEQ public edocs site for proof.

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4. Reasons why Granular Activated Carbon systems should not be option over PWC Municipal Water for Cumberland County residents or Bladen county water for Bladen county residents are as follows:

a. Many data points about installing municipal water lines in Cumberland county are inaccurate based on 9 year old data. There is a new 12" pipe being installed off Thrower road with planned extension along Hwy97 to homes near the Alderman Hwy 87 intersection. The Water Replacement plan costing data is inaccurate and needs review by Cumberland and Bladen County commissions. This should also be measured as all home found in violation of the Groundwater Rules not just the exceedance of health goal. The cost presented in Nov 2017 to the Bladen County Commission was far less for West of Cape Fear than presented in the plan, the data for Cumberland county is based on 9 year old data and does not take into account the massive growth in the areas south of Sandhill Road all the way along Hwy 87 to the Bladen County line.

b. Incomplete Data has been provided by Chemours to DEQ for the tests every other week. This is very important in making decisions such as if Granular Activated Carbon systems are viable and the full cost including operation and maintenance costs. It was presented as a one time cost of \$10K to install, that is not correct data when comparing GAC to municipal water options and taints decision points.

c. The data provided by Chemours (not complete or actual lab results) does indicate that trace chemicals are getting thru the Granular Activated Carbon systems. This would be a violation of 15A NCAC 02L .0202. The full set of data including all of the lab results on all samples taken, as well as the additional field data, such as frequency of sediment filter & iron filter replacement was withheld by Chemours from the well owners and DEQ. Not enough information has been properly reviewed to determine effectiveness, but the data from Chemours indicated that they would be in violation the Groundwater rules/Standards of 15A NCAC 02L .0202.

d. The Swedish study on Granular Activated Carbon systems found them to be inefficient after a 140 day study. The study was to investigate the removal efficiency of PFASs in water using two treatment techniques; granular activated carbon (GAC), type Filtrasorb 400®, and anion exchange (AE), type Purolite A-600. Additionally, the effect of dissolved organic carbon (DOC) on removal efficiency was studied. The removal efficiency of PFASs was studied in pilot-scale column experiments at Bäcklösa drinking water treatment plant (DWTP) in Uppsala, Sweden. The laboratory batch experiments were performed at Swedish University of Agricultural Sciences (SLU), Uppsala. The results from the column experiment indicated a decrease in removal efficiency with increasing number of bed volumes (BVs) for both GAC and AE. The average removal efficiency of all PFASs (n=14) during the 140 day column study was 65% for both GAC and AE. At the end of the column experiment, the average removal efficiency of all PFASs was 49% for GAC and 53% for AE. Removal efficiency was influenced by functional group; perfluoroalkane (-alkyl) sulfonic acids (PFASs) were more efficiently removed than perfluoroalkyl carboxylic acids (PFCAs) (on average 56% vs 38% for GAC, respectively, and 82% vs 28% for AE, respectively). In addition, the perfluorocarbon chain length influenced the removal efficiency. Results from the column experiment indicated higher removal efficiency as the perfluorocarbon chain



length increased. In contrast, the results from the batch experiments indicated the opposite; decreasing adsorption to GAC and AE as the chain length increased. Furthermore, presence of DOC in the water affected the removal efficiency of the investigated PFASs. However, the results indicated, contrary to the few studies previously performed on DOC and removal efficiency of PFASs, enhanced sorption of PFASs to GAC with increasing DOC concentration, and decreased PFAS sorption to AE as the DOC concentration increased. In addition, the removal efficiency of GAC and AE varied using water types with different DOC origin, indicating that DOC characteristics influence the removal efficiency of PFASs in water. The six pilot tests are using Filtrasorb 600, but Brunswick county did test Filtrasorb 400 and it was not fully effective. There is not enough data yet for Filtrasorb 600, but initial Chemours data show that chemicals do get thru in less than the 120 day point.

e. Department of Environmental Quality cannot use this set of rules to violate in one instance and not use it as a determination point on who should be provided municipal or filtration systems. The test data provided by Chemours of the Granular Activated Carbon systems proves that the systems allow trace amounts of chemicals to pass through the system. The 12 April, 26 April and 10 May Chemours results for Site 48 prove this to be fact. Thus the results are in violation as there is an exceedance of the Practical Quantitative Limit (PQL) for PFAs constituents in violation of 15A NCAC 02L .0202. The DEQ test results from the 3 May test indicates a 106.03 ng/L of combined PFAs breakthrough and this is in less than 1 month of use for this specific test system.

f. Maintenance of the system as noted on site 48 that on 5 July could cause contamination as occurred when Parsons found that the Iron filter allowed iron to get into the GAC canisters. This was rectified by doing a backflush running the water onto the soil. This backflush would wash the contaminants that were captured out to the soil that is less than 30 feet from the well. This is no different then an inadvertent spill while filling a truck with contaminated water and should be a violation and reported as a minor reported spill.

5. We request the following three areas to be modified:

Line 67 Listed as: Health Studies

Line 69 listed as: COMPLIANCE MEASURES – GROUNDWATER

Line 70 listed as: Re-Testing of Private Wells

6. The verbiage that we believe should be present is listed below and referenced to the sections we desire to see modification. We have also included a modified PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580 with the highlighted changes inserted. This is in compliance with the standards used by the Division of Waste Management in the 11 June 2018 Notice of Violation. We the “affected households” request municipal water to be run at Chemours expense. We have included an area on the signature pages attached to indicate who would prefer Municipal water and who would prefer the filtration option to answer that portion in one submission.

Section 67 Health Studies

It is our belief and desire that part of the health studies should include testing of the members blood & urine of all members of the households that have wells that test or tested with any exceedance of any Practical Quantitative Limit as defined by North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Chemours has stated that these chemicals harm nobody, it is time they prove it and in good faith or under court order they should be compelled to do this as part of the health studies. The harm to not only human or aquatic life needs to be researched, but also animals, such as Dogs, Cats, Birds and Farm animals.

MODIFIED TO READ

COMPLIANCE MEASURES – GROUNDWATER

69. Permanent Replacement of Private Drinking Water Supplies: By no later than twelve (18) months after issuance of this Order, Chemours shall establish permanent replacement water supplies for each household with a water supply well contaminated by any PFAS (“affected households”) PFBS CAS# 375-73-5, PFDA CAS# 335-76-2, PFDaA CAS# 307-55-1, PFHpA CAS# 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1, PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3, PFMOAA CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-

1, PFO3OA CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or additionally discovered PFAS in exceedance of the practical quantitative limit (PQL). The authority provided under Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), "substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. The replacement water supply shall be established by connection to a public water supply, except that an affected household may elect to receive a filtration system approved by DEQ in lieu of a connection to public water supply, in which case Chemours shall install a filtration system. For affected households Chemours shall be liable for any water bills from public utilities and for periodic required maintenance for any home that requested the DEQ approved filtration system. Chemours shall submit a plan for compliance with this provision, including a detailed schedule with milestones, no later than sixty (60) days after entry of this Order. This provision shall supplement any prior requirements regarding the provision of permanent replacement water supplies. Upon failure to comply with installation of municipal water to all homes with groundwater wells in exceedance of the Groundwater rules DEQ to find Chemours in violation of Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), "substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. DEQ will access penalties under NCGS 143-215.6A (a)(1) of not more than \$25,000 per day for each groundwater well that has been tested and been found to exceedance of the practical quantitative limit for any PFAs constituents. Multiple found PFAs constituents will be considered as separate violations of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c) and deemed a violation pursuant to G.S. 143-214-1.

MODIFIED to READ

70. Re-Testing of Private Wells: Chemours shall conduct testing of private drinking water supply wells as follows: for wells with test results showing no detectable concentrations of PFAS Compounds, Chemours shall re-test for PFPrOPrA CAS# 62037-80-3, PFOA CAS# 335-67-1, PFOS CAS# 1763-23-1, PFBS CAS# 375-73-5, PFDA CAS# 335-76-2, PFDoA CAS# 307-55-1, PFHpA CAS# 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1, PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3, PFMOAA CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFO3OA CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or additionally discovered PFAS in exceedance of the practical quantitative limit (PQL) on an annual basis until sampling shows no detectable concentrations of any PFAS constituents for two consecutive sampling events. Chemours shall provide to DEQ a list of residents within these sampling ranges, identified by both their address and sample ID. Chemours shall also provide to DEQ a list of wells (identified by address) targeted for testing that have not yet been tested and verifying its efforts to test these wells.

**From:** redranda1@aol.com  
**To:** [comments.chemours](mailto:comments.chemours)  
**Cc:** [alenard1960@yahoo.com](mailto:alenard1960@yahoo.com); [kcann9@aol.com](mailto:kcann9@aol.com); [geno0625@aol.com](mailto:geno0625@aol.com); [donni0202@aol.com](mailto:donni0202@aol.com); [helenbrockett@gmail.com](mailto:helenbrockett@gmail.com); [bethamarkesino@yahoo.com](mailto:bethamarkesino@yahoo.com); [gbarnes@fayobserver.com](mailto:gbarnes@fayobserver.com); [sdevane@fayobserver.com](mailto:sdevane@fayobserver.com); [teaton214@yahoo.com](mailto:teaton214@yahoo.com); [catherine.clabby@gmail.com](mailto:catherine.clabby@gmail.com); [David.Ivey@charter.com](mailto:David.Ivey@charter.com); [dmartin166@nc.rr.com](mailto:dmartin166@nc.rr.com); [dave.jordan@witn.com](mailto:dave.jordan@witn.com); [Danwes5@gmail.com](mailto:Danwes5@gmail.com); [REssex@cbs17.com](mailto:REssex@cbs17.com); [fmnfkn@embarqmail.com](mailto:fmnfkn@embarqmail.com); [poppysmith760@gmail.com](mailto:poppysmith760@gmail.com); [foxycherokeelady@gmail.com](mailto:foxycherokeelady@gmail.com); [Linda@fulcherelectric.com](mailto:Linda@fulcherelectric.com); [Gene@fulcherelectric.com](mailto:Gene@fulcherelectric.com); [Scott, Michael](mailto:Scott.Michael); [Regan, Michael S](mailto:Regan.Michael.S); [gallagherkm1@gmail.com](mailto:gallagherkm1@gmail.com); [ht690189@yahoo.com](mailto:ht690189@yahoo.com); [ghart35@yahoo.com](mailto:ghart35@yahoo.com); [creekpirate69@gmail.com](mailto:creekpirate69@gmail.com); [dedrahaire@gmail.com](mailto:dedrahaire@gmail.com); [stephen@carolinaspecialties.com](mailto:stephen@carolinaspecialties.com); [gswinson1@icloud.com](mailto:gswinson1@icloud.com); [jody\\_mac@yahoo.com](mailto:jody_mac@yahoo.com); [jdsuille7@gmail.com](mailto:jdsuille7@gmail.com); [slyrose6963@aol.com](mailto:slyrose6963@aol.com); [rjacobs](mailto:rjacobs); [jameswparadise@yahoo.com](mailto:jameswparadise@yahoo.com); [michellekey69@gmail.com](mailto:michellekey69@gmail.com); [keribrockett@gmail.com](mailto:keribrockett@gmail.com); [laura.r.booth@gmail.com](mailto:laura.r.booth@gmail.com); [webers@wnet.org](http://webers@wnet.org); [cgwhipkey@gmail.com](mailto:cgwhipkey@gmail.com); [bobby@carolinaspecialties.com](mailto:bobby@carolinaspecialties.com); [LII@nc.rr.com](mailto:LII@nc.rr.com); [wattersm@gmail.com](mailto:wattersm@gmail.com); [bamarkesino@gmail.com](mailto:bamarkesino@gmail.com)  
**Subject:** [External] Comments to DEQ on the Proposed Draft Order.  
**Date:** Tuesday, July 10, 2018 11:22:30 AM

**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

We are Herman and Randa Dunn  
904 Circle Point Court  
Fayetteville, NC 28306  
Point East Subdivision, Gray's Creek, one mile north of Chemours

We have spent too many years being poisoned by contaminated air and water. We demand our lawful and rightful help from the State of North Carolina and DEQ, including national and federal levels. We are in agreement with Mike Watters' assessment which resulted from extensive, in-depth investigation and proven scientific research.

There are ways the State can STOP DuPont/Chemours and help the residents achieve a clean air and clean water solution. With the new ASTDR study, we know that we are at risk at much lower numbers than previously shown.

This solution should not be dictated by, or for the benefit of, Chemours. We, the people, are being contaminated!

You may not get comments from every household - for various reasons - but, know, that our communities are standing together on this issue. We cannot undo the detriments to our health thus far, which, as scientifically proven, may continue into the future, but further contamination MUST be stopped.

Thank you for having a lawful and moral responsibility.

Herman and Randa Dunn

-----Original Message-----

From: Bobby Swilley <bobby@carolinaspecialties.com>  
To: 'Larry Lancaster' <LII@nc.rr.com>; 'Mike Watters' <wattersm@gmail.com>  
Cc: 'Randa Dunn' <REDRANDA1@aol.com>; 'Anthony Lenard' <alenard1960@yahoo.com>; 'Kenneth Cannon' <kcann9@aol.com>; 'Gene Inman' <geno0625@aol.com>; 'Donna F. Inman' <donni0202@aol.com>; 'Helen Brockett' <helenbrockett@gmail.com>; 'Beth Markesino' <bethamarkesino@yahoo.com>; 'Barnes, Greg' <gbarnes@fayobserver.com>; 'Devane, Steve' <sdevane@fayobserver.com>; 'tracy eaton' <teaton214@yahoo.com>; 'Catherine Clabby' <catherine.clabby@gmail.com>; 'Ivey, David M' <David.Ivey@charter.com>; 'Derrick Martin' <dmartin166@nc.rr.com>; 'davejordanwitn' <dave.jordan@witn.com>; 'Robert Wesselman' <Danwes5@gmail.com>; 'Richard Essex' <REssex@cbs17.com>; 'Francis Minshew' <fmnfkn@embarqmail.com>; 'Emma Smith' <poppysmith760@gmail.com>; 'Martha Bennett' <foxycherokeelady@gmail.com>; 'Linda' <Linda@fulcherelectric.com>; 'Gene' <Gene@fulcherelectric.com>; 'Scott, Michael' <michael.scott@ncdenr.gov>; 'Regan, Michael S' <michael.regan@ncdenr.gov>; 'Kathleen Gallagher' <gallagherkm1@gmail.com>; 'H T' <ht690189@yahoo.com>; 'George Hart' <ghart35@yahoo.com>; 'brett hardy'

<creekipirate69@gmail.com>; 'Dedra Haire' <dedrahaire@gmail.com>; 'Stephen Haire' <stephen@carolinaspecialties.com>; 'Gene Swinson' <gswinson1@icloud.com>; 'Jody Jernigan' <jody\_mac@yahoo.com>; 'Jonathan Swilley' <jdswilley7@gmail.com>; 'jeannette rose' <slyrose6963@aol.com>; 'Jacobs, Rusty' <rjacobs@wunc.org>; 'James Paradise' <jameswparadise@yahoo.com>; 'Michelle Key' <michellekey69@gmail.com>; 'Keri Carelas' <keribrockett@gmail.com>; 'laura booth' <laura.r.booth@gmail.com>; webers <webers@wnet.org>; 'Christine Whipkey' <cgwhipkey@gmail.com>

Sent: Mon, Jul 9, 2018 2:49 pm

Subject: RE: Please Copy and Send Comments to DEQ on the Proposed Draft Order.

**My name is Bobby J. Swilley and we live at 1904 Nantuckett Court , Point East Subdivision, Gray's Creek, Fayetteville, NC 28306 and we totally, 100%, agree with Mr. Mike Waters regarding the comments and especially 67, 69, and 70. We stand united!**

**Sincerely,**

**Bobby J. and Ann Marie Swilley**

**1904 Nantuckett Court**

**Fayetteville, NC 28306**

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**From:** Larry Lancaster [<mailto:Ll@nc.rr.com>]

**Sent:** Monday, July 09, 2018 2:32 PM

**To:** Mike Watters

**Cc:** Randa Dunn; Anthony Lenard; Kenneth Cannon; Gene Inman; Donna F. Inman; Helen Brockett; Bobby Swilley; Beth Markesino; Barnes, Greg; Devane, Steve; Tracy Eaton; Catherine Clabby; Ivey, David M; Derrick Martin; davejordanwitn; Robert Wesselman; Richard Essex; Francis Minshew; Emma Smith; Martha Bennett; Linda; Gene; Scott, Michael; Regan, Michael S; Kathleen Gallagher; H T; George Hart; Brett Hardy; Dedra Haire; Stephen Haire; Gene Swinson; Jody Jernigan; Jonathan Swilley; Jeannette Rose; Jacobs, Rusty; James Paradise; Michelle Key; Keri Carelas; Laura Booth; [webers@wnet.org](mailto:webers@wnet.org); Christine Whipkey

**Subject:** Re: Please Copy and Send Comments to DEQ on the Proposed Draft Order.

Thanks to all for taking time to respond

**Larry Lancaster**

*Chairman, Cumberland County Board of Commissioners*

*Home: 910-484-2774*

*Cell: 910-308-9285*

On Jul 9, 2018, at 1:43 PM, Mike Watters <[wattersm@gmail.com](mailto:wattersm@gmail.com)> wrote:

URGENCY

Good morning members,

We have until Wednesday, July 11th to put in our comments on the Draft Court order

If there was ever a moment that you took the time to write, now is the time. Please don't hesitate, your comments are very important to your rights if a well owner. Specifically section 67, 69 & 70

If a well owner in Cumberland, Bladen or Robeson county or any other county affected by PFAS contamination from Fayetteville works. Copy text below or enter your own and email to:

[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

by 11 July.

If you want to use this template change to your Contact information and copy it to the email. I gathered information that is pertinent backed by law or studies to justify the reasons for modification.

Point of contact Michael Watters

6975 Point East Dr

Fayetteville, NC 28306

[wattersm@gmail.com](mailto:wattersm@gmail.com)

910-424-2162

Department of Environmental Quality

[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

Assistant Secretary's Office

RE: Chemours Public Comment

1601 Mail Service Center

Raleigh, N.C. 27699-1601

SUBJECT: Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

1. We the Residents within the "affected households" that live within the geographical area of the Chemours managed Fayetteville Works facility (Cumberland, Bladen & Robeson Counties) are requesting modification of the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

2. In the absence of evidence to the contrary, ATSDR assumes that humans are more sensitive to the effects of hazardous substance than animals and that certain persons may be particularly sensitive, the report notes. Thus, the resulting MRL may be as much as 100-fold below levels that have been shown to be nontoxic in laboratory animals. This federal study is deeply concerning because it demonstrates that PFAS chemicals are more dangerous to human health than the EPA has previously acknowledged. We are requesting the Department of Environmental Quality address these PFAS contaminations with more urgency. We must ensure that families exposed to these dangerous chemicals receive municipal water, cost to the Company that caused the contamination should not be a factor in decision making.

3. This request is signed by the "affected households" that have wells that are exceedance of the Practical Quantitative Limit (PQL) for any PFAS constituents in violation of 15A NCAC 02L .0202. These are not naturally occurring substances and no standard has been so the permitted concentration requires that they be below the Practical Quantitative limit for Class GA or Class GSA groundwaters pursuant to 15A NCAC 2L .0202(c). This changes the cost per household to approximately \$24k per household for the Cumberland county homes west of the Cape Fear River as presented by Chemours-Parsons developed plan. Why use the Practical Quantitative Limit for all PFAS detected instead of single GENX health goal?

a. According to environmental chemists, the proposed ATSDR "minimum risk levels" or MRLs, translate roughly to 7-ppt for PFOS and 11-ppt for PFOA -- the two PFAS compounds which the state of Michigan has established cleanup standards for groundwater that people drink.

b. A 7-ppt MRL level for PFOS exposure is lower than Michigan's 12-ppt enforceable standard for that compound in surface water, a rule developed to account for bioaccumulation in fish. The U.S. Environmental Protection Agency health advisory level for PFOS and PFOA is a combined 70-ppt, a level some researchers call inadequate to protect public health. We know fish in Marshwood lake did show bioaccumulation of PFAS in fish tested.

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5. We request the following three areas to be modified:

Line 67 Listed as: Health Studies

Line 69 listed as: COMPLIANCE MEASURES – GROUNDWATER

Line 70 listed as: Re-Testing of Private Wells

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It is our belief and desire that part of the health studies should include testing of the members blood & urine of all members of the households that have wells that test or tested with any exceedance of any Practical Quantitative Limit as defined by North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Chemours has stated that these chemicals harm nobody, it is time they prove it and in good faith or under court order they should be compelled to do this as part of the health studies. The harm to not only human or aquatic life needs to be researched, but also animals, such as Dogs, Cats, Birds and Farm animals.

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COMPLIANCE MEASURES – GROUNDWATER

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Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), "substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. The replacement water supply shall be established by connection to a public water supply, except that an affected household may elect to receive a filtration system approved by DEQ in lieu of a connection to public water supply, in which case Chemours shall install a filtration system. For affected households Chemours shall be liable for any water bills from public utilities and for periodic required maintenance for any home that requested the DEQ approved filtration system. Chemours shall submit a plan for compliance with this provision, including a detailed schedule with milestones, no later than sixty (60) days after entry of this Order. This provision shall supplement any prior requirements regarding the provision of permanent replacement water supplies. Upon failure to comply with installation of municipal water to all homes with groundwater wells in exceedance of the Groundwater rules DEQ to find Chemours in violation of Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), "substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. DEQ will access penalties under NCGS 143-215.6A (a)(1) of not more than \$25,000 per day for each groundwater well that has been tested and been found to exceedance of the practical quantitative limit for any PFAs constituents. Multiple found PFAs constituents will be considered as separate violations of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c) and deemed a violation pursuant to G.S. 143-214-1.

MODIFIED to READ

70. Re-Testing of Private Wells: Chemours shall conduct testing of private drinking water supply wells as follows: for wells with test results showing no detectable concentrations of PFAS Compounds, Chemours shall re-test for PFPrOPrA CAS# 62037-80-3, PFOA CAS# 335-67-1, PFOS CAS# 1763-23-1, PFBS CAS# 375-73-5, PFDA CAS# 335-76-2, PFDoA CAS# 307-55-1, PFHpA CAS# 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1, PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3, PFMOAA CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFo3OA CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or additionally discovered PFAS in exceedance of the practical quantitative limit (PQL) on an annual basis until sampling shows no detectable concentrations of any PFAS constituents for two consecutive sampling events. Chemours shall provide to DEQ a list of residents within these sampling ranges, identified by both their address and sample ID. Chemours shall also provide to DEQ a list of wells (identified by address) targeted for testing that have not yet been tested and verifying its efforts to test these wells.



**From:** redranda1@aol.com  
**To:** [comments.chemours](#)  
**Subject:** [External] Re: Comments to DEQ on the Proposed Draft Order.  
**Date:** Tuesday, July 10, 2018 11:05:19 AM

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**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

We are Herman and Randa Dunn  
904 Circle Point Court  
Fayetteville, NC 28306  
Point East Subdivision, Gray's Creek, one mile north of Chemours

We have spent too many years being poisoned by contaminated air and water. We demand our lawful and rightful help from the State of North Carolina and DEQ, including national and federal levels. We are in agreement with Mike Watters' assessment which resulted from extensive, in-depth investigation and proven scientific research.

There are ways the State can STOP DuPont/Chemours and help the residents achieve a clean air and clean water solution. With the new ASTDR study, we know that we are at risk at much lower numbers than previously shown.

This solution should not be dictated by, or for the benefit of, Chemours. We, the people, are being contaminated!

You may not get comments from every household - for various reasons - but, know, that our communities are standing together on this issue. We cannot undo the detriments to our health thus far, which, as scientifically proven, may continue into the future, but further contamination MUST be stopped. Thank you for having a lawful and moral responsibility.

Herman and Randa Dunn

-----Original Message-----

From: Bobby Swilley <[bobby@carolinaspecialties.com](mailto:bobby@carolinaspecialties.com)>  
To: 'Larry Lancaster' <[Lil@nc.rr.com](mailto:Lil@nc.rr.com)>; 'Mike Watters' <[wattersm@gmail.com](mailto:wattersm@gmail.com)>  
Cc: 'Randa Dunn' <[REDRANDA1@aol.com](mailto:REDRANDA1@aol.com)>; 'Anthony Lenard' <[alenard1960@yahoo.com](mailto:alenard1960@yahoo.com)>; 'Kenneth Cannon' <[kcann9@aol.com](mailto:kcann9@aol.com)>; 'Gene Inman' <[geno0625@aol.com](mailto:geno0625@aol.com)>; 'Donna F. Inman' <[donni0202@aol.com](mailto:donni0202@aol.com)>; 'Helen Brockett' <[helenbrockett@gmail.com](mailto:helenbrockett@gmail.com)>; 'Beth Markesino' <[bethamarkesino@yahoo.com](mailto:bethamarkesino@yahoo.com)>; 'Barnes, Greg' <[gbarnes@fayobserver.com](mailto:gbarnes@fayobserver.com)>; 'Devane, Steve' <[sdevane@fayobserver.com](mailto:sdevane@fayobserver.com)>; 'tracy eaton' <[teaton214@yahoo.com](mailto:teaton214@yahoo.com)>; 'Catherine Clabby' <[catherine.clabby@gmail.com](mailto:catherine.clabby@gmail.com)>; 'Ivey, David M' <[David.Ivey@charter.com](mailto:David.Ivey@charter.com)>; 'Derrick Martin' <[dmartin166@nc.rr.com](mailto:dmartin166@nc.rr.com)>; 'davejordanwitn' <[dave.jordan@witn.com](mailto:dave.jordan@witn.com)>; 'Robert Wesselman' <[Danwes5@gmail.com](mailto:Danwes5@gmail.com)>; 'Richard Essex' <[REssex@cbs17.com](mailto:REssex@cbs17.com)>; 'Francis Minshew' <[fmnfkn@embarqmail.com](mailto:fmnfkn@embarqmail.com)>; 'Emma Smith' <[poppysmith760@gmail.com](mailto:poppysmith760@gmail.com)>; 'Martha Bennett' <[foxycherokeelady@gmail.com](mailto:foxycherokeelady@gmail.com)>; 'Linda' <[Linda@fulcherelectric.com](mailto:Linda@fulcherelectric.com)>; 'Gene' <[Gene@fulcherelectric.com](mailto:Gene@fulcherelectric.com)>; 'Scott, Michael' <[michael.scott@ncdenr.gov](mailto:michael.scott@ncdenr.gov)>; 'Regan, Michael S' <[michael.regan@ncdenr.gov](mailto:michael.regan@ncdenr.gov)>; 'Kathleen Gallagher' <[gallagherkm1@gmail.com](mailto:gallagherkm1@gmail.com)>; 'H T' <[ht690189@yahoo.com](mailto:ht690189@yahoo.com)>; 'George Hart' <[ghart35@yahoo.com](mailto:ghart35@yahoo.com)>; 'brett hardy' <[creeppirate69@gmail.com](mailto:creeppirate69@gmail.com)>; 'Dedra Haire' <[dedrahaire@gmail.com](mailto:dedrahaire@gmail.com)>; 'Stephen Haire' <[stephen@carolinaspecialties.com](mailto:stephen@carolinaspecialties.com)>; 'Gene Swinson' <[gswinson1@icloud.com](mailto:gswinson1@icloud.com)>; 'Jody Jernigan' <[jody\\_mac@yahoo.com](mailto:jody_mac@yahoo.com)>; 'Jonathan Swilley' <[jdsuilley7@gmail.com](mailto:jdsuilley7@gmail.com)>; 'jeannette rose' <[slyrose6963@aol.com](mailto:slyrose6963@aol.com)>; 'Jacobs, Rusty' <[rjacobs@wunc.org](mailto:rjacobs@wunc.org)>; 'James Paradise' <[jameswparadise@yahoo.com](mailto:jameswparadise@yahoo.com)>; 'Michelle Key' <[michellekey69@gmail.com](mailto:michellekey69@gmail.com)>; 'Keri Carelas' <[keribrockett@gmail.com](mailto:keribrockett@gmail.com)>; 'laura booth' <[laura.r.booth@gmail.com](mailto:laura.r.booth@gmail.com)>; webers <[webers@wnet.org](mailto:webers@wnet.org)>; 'Christine Whipkey' <[cgwhipkey@gmail.com](mailto:cgwhipkey@gmail.com)>  
Sent: Mon, Jul 9, 2018 2:49 pm  
Subject: RE: Please Copy and Send Comments to DEQ on the Proposed Draft Order.

**My name is Bobby J. Swilley and we live at 1904 Nantuckett Court ,  
Point East Subdivision, Gray's Creek, Fayetteville, NC 28306 and we  
totally, 100%, agree with Mr. Mike Waters regarding the comments  
and especially 67, 69, and 70. We stand united!**

**Sincerely,**

**Bobby J. and Ann Marie Swilley**

**1904 Nantuckett Court**

**Fayetteville, NC 28306**

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**From:** Larry Lancaster [<mailto:LlL@nc.rr.com>]

**Sent:** Monday, July 09, 2018 2:32 PM

**To:** Mike Watters

**Cc:** Randa Dunn; Anthony Lenard; Kenneth Cannon; Gene Inman; Donna F. Inman; Helen Brockett; Bobby Swilley; Beth Markesino; Barnes, Greg; Devane, Steve; Tracy Eaton; Catherine Clabby; Ivey, David M; Derrick Martin; davejordanwitn; Robert Wesselman; Richard Essex; Francis Minshew; Emma Smith; Martha Bennett; Linda; Gene; Scott, Michael; Regan, Michael S; Kathleen Gallagher; H T; George Hart; Brett Hardy; Dedra Haire; Stephen Haire; Gene Swinson; Jody Jernigan; Jonathan Swilley; Jeannette Rose; Jacobs, Rusty; James Paradise; Michelle Key; Keri Carelas; Laura Booth; [webers@wnet.org](mailto:webers@wnet.org); Christine Whipkey

**Subject:** Re: Please Copy and Send Comments to DEQ on the Proposed Draft Order.

Thanks to all for taking time to respond

**Larry Lancaster**

*Chairman, Cumberland County Board of Commissioners*

*Home: 910-484-2774*

*Cell: 910-308-9285*

On Jul 9, 2018, at 1:43 PM, Mike Watters <[wattersm@gmail.com](mailto:wattersm@gmail.com)> wrote:

URGENCY

Good morning members,

We have until Wednesday, July 11th to put in our comments on the Draft Court order

If there was ever a moment that you took the time to write, now is the time. Please don't hesitate, your comments are very important to your rights if a well owner. Specifically section 67, 69 & 70

If a well owner in Cumberland, Bladen or Robeson county or any other county affected by PFAS contamination from Fayetteville works. Copy text below or enter your own and email to:

[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

by 11 July.

If you want to use this template change to your Contact information and copy it to the email. I gathered information that is pertinent backed by law or studies to justify the reasons for modification.

Point of contact Michael Watters

6975 Point East Dr

Fayetteville, NC 28306

[wattersm@gmail.com](mailto:wattersm@gmail.com)

910-424-2162

Department of Environmental Quality

[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

Assistant Secretary's Office

RE: Chemours Public Comment

1601 Mail Service Center

Raleigh, N.C. 27699-1601

SUBJECT: Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

1. We the Residents within the "affected households" that live within the geographical area of the Chemours managed Fayetteville Works facility (Cumberland, Bladen & Robeson Counties) are requesting modification of the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

2. In the absence of evidence to the contrary, ATSDR assumes that humans are more sensitive to the effects of hazardous substance than animals and that certain persons may be particularly sensitive, the report notes. Thus, the resulting MRL may be as much as 100-fold below levels that have been shown to be nontoxic in laboratory animals. This federal study is deeply concerning because it demonstrates that PFAS chemicals are more dangerous to human health than the EPA has previously acknowledged. We are requesting the Department of Environmental Quality address these PFAS contaminations with more urgency. We must ensure that families exposed to these dangerous chemicals receive municipal water, cost to the Company that caused the contamination should not be a factor in decision making.

3. This request is signed by the "affected households" that have wells that are exceedance of the Practical Quantitative Limit (PQL) for any PFAS constituents in violation of 15A NCAC 02L .0202. These are not naturally occurring substances and no standard has been so the permitted concentration requires that they be below the Practical Quantitative limit for Class GA or Class GSA groundwaters pursuant to 15A NCAC 2L .0202(c). This changes the cost per household to approximately \$24k per household for the Cumberland county homes west of the Cape Fear River as presented by Chemours-Parsons developed plan. Why use the Practical Quantitative Limit for all PFAS detected instead of single GENX health goal?

a. According to environmental chemists, the proposed ATSDR "minimum risk levels" or MRLs, translate roughly to 7-ppt for PFOS and 11-ppt for PFOA -- the two PFAS compounds which the state of Michigan has established cleanup standards for groundwater that people drink.

b. A 7-ppt MRL level for PFOS exposure is lower than Michigan's 12-ppt enforceable standard for that compound in surface water, a rule developed to account for bioaccumulation in fish. The U.S. Environmental Protection Agency health advisory level for PFOS and PFOA is a combined 70-ppt, a level some researchers call inadequate to protect public health. We know fish in Marshwood lake did show bioaccumulation of PFAS in fish tested.

c. PFAS have been "extensively evaluated in humans and laboratory animals," the study notes, but says comparing toxicity across species is problematic because, among other things, humans take much longer to purge the chemicals from their bodies. The chemicals also cause different health problems in humans versus animals.

d. The ATSDR proposes MRLs translating to about 70-ppt for PFHxS and 10.5 ppt for PFNA, two PFAS compounds for which there are no federal Standards. These are found in many if the wells surrounding the facility as well as in the plume contaminating the aquifer under the facility. Refer to the Dec 16 Corrective Measure Study that is in DEQ public edocs site for proof.

e. "This study confirms that the EPA's guidelines for PFAS levels in drinking water woefully underestimate risks to human health," said Olga Naidenko, a senior science advisor at the nonprofit Environmental Working Group. "We urge EPA to collect and publish all water results showing PFAS contamination at any level, so Americans across the country can

take immediate steps to protect themselves and their families."

4. Reasons why Granular Activated Carbon systems should not be option over PWC Municipal Water for Cumberland County residents or Bladen county water for Bladen county residents are as follows:

a. Many data points about installing municipal water lines in Cumberland county are inaccurate based on 9 year old data. There is a new 12" pipe being installed off Thrower road with planned extension along Hwy97 to homes near the Alderman Hwy 87 intersection. The Water Replacement plan costing data is inaccurate and needs review by Cumberland and Bladen County commissions. This should also be measured as all homes found in violation of the Groundwater Rules not just the exceedance of health goal. The cost presented in Nov 2017 to the Bladen County Commission was far less for West of Cape Fear than presented in the plan, the data for Cumberland county is based on 9 year old data and does not take into account the massive growth in the areas south of Sandhill Road all the way along Hwy 87 to the Bladen County line.

b. Incomplete Data has been provided by Chemours to DEQ for the tests every other week. This is very important in making decisions such as if Granular Activated Carbon systems are viable and the full cost including operation and maintenance costs. It was presented as a one time cost of \$10K to install, that is not correct data when comparing GAC to municipal water options and taints decision points.

c. The data provided by Chemours (not complete or actual lab results) does indicate that trace chemicals are getting thru the Granular Activated Carbon systems. This would be a violation of 15A NCAC 02L .0202. The full set of data including all of the lab results on all samples taken, as well as the additional field data, such as frequency of sediment filter & iron filter replacement was withheld by Chemours from the well owners and DEQ. Not enough information has been properly reviewed to determine effectiveness, but the data from Chemours indicated that they would be in violation the Groundwater rules/Standards of 15A NCAC 02L .0202.

d. The Swedish study on Granular Activated Carbon systems found them to be inefficient after a 140 day study. The study was to investigate the removal efficiency of PFASs in water using two treatment techniques; granular activated carbon (GAC), type Filtrasorb 400®, and anion exchange (AE), type Purolite A-600. Additionally, the effect of dissolved organic carbon (DOC) on removal efficiency was studied. The removal efficiency of PFASs was studied in pilot-scale column experiments at Bäcklösa drinking water treatment plant (DWTP) in Uppsala, Sweden. The laboratory batch experiments were performed at Swedish University of Agricultural Sciences (SLU), Uppsala. The results from the column experiment indicated a decrease in removal efficiency with increasing number of bed volumes (BVs) for both GAC and AE. The average removal efficiency of all PFASs (n=14) during the 140 day column study was 65% for both GAC and AE. At the end of the column experiment, the average removal efficiency of all PFASs was 49% for GAC and 53% for AE. Removal efficiency was influenced by functional group; perfluoroalkane (-alkyl) sulfonic acids (PFASs) were more efficiently removed than perfluoroalkyl carboxylic acids (PFCAs) (on average 56% vs 38% for GAC, respectively, and 82% vs 28% for AE, respectively). In addition, the perfluorocarbon chain length influenced the removal efficiency. Results from the column experiment indicated higher removal efficiency as the perfluorocarbon chain length increased. In contrast, the results from the batch experiments indicated the opposite; decreasing adsorption to GAC and AE as the chain length increased. Furthermore, presence of DOC in the water affected the removal efficiency of the investigated PFASs. However, the results indicated, contrary to the few studies previously performed on DOC and removal efficiency of PFASs, enhanced sorption of PFASs to GAC with increasing DOC concentration, and decreased PFAS sorption to AE as the DOC concentration increased. In addition, the removal efficiency of GAC and AE varied using water types with different DOC origin, indicating that DOC characteristics influence the removal efficiency of PFASs in water. The six pilot tests are using Filtrasorb 600, but Brunswick county did test Filtrasorb 400 and it was not fully effective. There is not enough data yet for Filtrasorb 600, but initial Chemours data show that Chemicals do get thru in less than the 120 day point.

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compliance with this provision, including a detailed schedule with milestones, no later than sixty (60) days after entry of this Order. This provision shall supplement any prior requirements regarding the provision of permanent replacement water supplies. Upon failure to comply with installation of municipal water to all homes with groundwater wells in exceedance of the Groundwater rules DEQ to find Chemours in violation of Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), "substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. DEQ will access penalties under NCGS 143-215.6A (a)(1) of not more than \$25,000 per day for each groundwater well that has been tested and been found to exceedance of the practical quantitative limit for any PFAs constituents. Multiple found PFAs constituents will be considered as separate violations of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c) and deemed a violation pursuant to G.S. 143-214-1.

MODIFIED to READ

70. Re-Testing of Private Wells: Chemours shall conduct testing of private drinking water supply wells as follows: for wells with test results showing no detectable concentrations of PFAS Compounds, Chemours shall re-test for PFPrOPrA CAS# 62037-80-3, PFOA CAS# 335-67-1, PFOS CAS# 1763-23-1, PFBS CAS# 375-73-5, PFDA CAS# 335-76-2, PFDoA CAS# 307-55-1, PFHpA CAS# 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1, PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3, PFMOAA CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFo3OA CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or additionally discovered PFAS in exceedance of the practical quantitative limit (PQL) on an annual basis until sampling shows no detectable concentrations of any PFAS constituents for two consecutive sampling events. Chemours shall provide to DEQ a list of residents within these sampling ranges, identified by both their address and sample ID. Chemours shall also provide to DEQ a list of wells (identified by address) targeted for testing that have not yet been tested and verifying its efforts to test these wells.

**From:** John Bowker  
**To:** [comments.chemours](mailto:comments.chemours)  
**Cc:** [john\\_bowker](mailto:john_bowker)  
**Subject:** [External] Re: Lower the GenX ppt from 140 ppt to 13 ppt for the health standard of the unborn child in its developing stages.  
**Date:** Monday, July 9, 2018 10:32:15 PM

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On Sun, Jul 8, 2018 at 11:33 PM, John Bowker <[jmjbowker@gmail.com](mailto:jmjbowker@gmail.com)> wrote:

Lower the GenX ppt from 140 ppt to 13 ppt for the health standard of the unborn child in its developing stages.

In my opinion, I am demonstrating how flawed the NCDHHS computations are and that just by changing one of the variables such as the body weight demonstrates this finding.

We can also change the variables, Intake of water and Weight of Body.  
We will use the Body weight of 4 kg and Intake of Water of .1375 Litres

if we lower the amount of water ingested from 1.1 L and we give that the unborn baby may ingest an eighth of the water as intake from the mother.

We can compute  $1.1 / 8 = .1375$  Litres

Then if we use the formula the ppt reduces to 13 ppt GenX

Meaning a baby at a body weight of 2 pounds with an intake of .1375 Litres of water received while in the womb of the mother should not receive more than 13 ppt

Formula:  $\text{dose (mg/kg bw/day)} \times \text{body weight (kg)} / \text{intake (L/day)} \times \text{RSC} \times \text{Unit}$

Conversion =

DWEL  $(0.00001 \text{ mg/kg/day}) \times .91 \text{ kg} / (.1375 \text{ L/day}) \times 0.2 \times 10^6$  (which is  $10 \times 10 \times 10 \times 10 \times 10 \times 10$ ) ng/mg so...

.....  
 $(.00001) \times 6.61 \times 200,000 = 13 \text{ ppt}$

However you may like to calculate what percentage of GenX and other PFAS have not been halted through the filtration of mother's body such as the liver, etc and are now entering the baby through the blood.

The umbilical cord develops from and contains remnants of the yolk sac and allantois. It forms by the fifth week of development, replacing the yolk sac as the source of nutrients for the embryo.[2] The cord is not directly connected to the mother's circulatory system, but instead joins the placenta, which transfers materials to and from the maternal blood without allowing direct mixing. The length of the umbilical cord is approximately equal to the crown-rump length of the fetus throughout pregnancy. The umbilical cord in a full term neonate is usually about 50 centimeters (20 in) long and about 2 centimeters (0.75 in) in

diameter. This diameter decreases rapidly within the placenta. The fully patent umbilical artery has two main layers: an outer layer consisting of circularly arranged smooth muscle cells and an inner layer which shows rather irregularly and loosely arranged cells embedded in abundant ground substance staining metachromatic.[3] The smooth muscle cells of the layer are rather poorly differentiated, contain only a few tiny myofilaments and are thereby unlikely to contribute actively to the process of post-natal closure.[3]

The umbilical cord contains Wharton's jelly, a gelatinous substance made largely from mucopolysaccharides which protects the blood vessels inside. It contains one vein, which carries oxygenated, nutrient-rich blood to the fetus, and two arteries that carry deoxygenated, nutrient-depleted blood away.[4] Occasionally, only two vessels (one vein and one artery) are present in the umbilical cord. This is sometimes related to fetal abnormalities, but it may also occur without accompanying problems.

It is unusual for a vein to carry oxygenated blood and for arteries to carry deoxygenated blood (the only other examples being the pulmonary veins and arteries, connecting the lungs to the heart). However, this naming convention reflects the fact that the umbilical vein carries blood towards the fetus's heart, while the umbilical arteries carry blood away.

The blood flow through the umbilical cord is approximately 35 ml / min at 20 weeks, and 240 ml / min at 40 weeks of gestation.[5] Adapted to the weight of the fetus, this corresponds to 115 ml / min / kg at 20 weeks and 64 ml / min / kg at 40 weeks.[5]

[https://en.wikipedia.org/wiki/Umbilical\\_cord](https://en.wikipedia.org/wiki/Umbilical_cord)

Consider the possible deformities of prenatal development, such as organs, to the unborn child when GenX and the other PFAS are in their developing body?

In all seriousness Chemours must "Close Operations" until the EPA gathers all necessary data that conclude the affects on the human body, including unborn babies in their developing stages in the mother.



**From:** Kenneth Cannon  
**To:** [comments.chemours; Lll@nc.rr.com](mailto:comments.chemours; Lll@nc.rr.com)  
**Subject:** [External] Chemours and Gen X  
**Date:** Monday, July 9, 2018 8:56:10 PM

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I certainly concur with Mr. Watters letter, that addresses the issues that we as home owners with wells continually have concerns about such as the overall effects on us, our children, our pets, and even relatives that have visited and drank the water from our well. I lost a sister who had a brain tumor that was cancerous, was that related to her visits to North Carolina and consuming tainted water? I don't feel that anyone has addressed the long term effects from the chemicals contained in our water. Mr. Watters recommended modifications are factors that can be easily addressed within a short period of time, allowing the DEQ to conduct appropriate testing. Again, I strongly endorsed Mr. Watters comments.

Kenneth W & Patricia Cannon  
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kcann9@aol.com  
(910)483-2643 (h)

Department of Environmental Quality  
[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

Assistant Secretary's Office  
RE: Chemours Public Comment  
1601 Mail Service Center  
Raleigh, N.C. 27699-1601

SUBJECT: Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

1. We the Residents within the "affected households" that live within the geographical area of the Chemours managed Fayetteville Works facility (Cumberland, Bladen & Robeson Counties) are requesting modification of the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

2. In the absence of evidence to the contrary, ATSDR assumes that humans are more sensitive to the effects of hazardous substance than animals and that certain persons may be particularly sensitive, the report notes. Thus, the resulting MRL may be as much as 100-fold below levels that have been shown to be nontoxic in laboratory animals. This federal study is deeply concerning because it demonstrates that PFAS chemicals are more dangerous to human health than the EPA has previously acknowledged. We are requesting the Department of Environmental Quality address these PFAS contaminations with more urgency. We must ensure that families exposed to these dangerous chemicals receive municipal water, cost to the Company that caused the contamination should not be a factor in decision making.

3. This request is signed by the "affected households" that have wells that are exceedance of the Practical Quantitative Limit (PQL) for any PFAS constituents in violation of 15A NCAC 02L .0202. These are not naturally occurring substances and no standard has been so the permitted concentration requires that they be below the Practical Quantitative limit for Class GA or Class GSA groundwaters pursuant to 15A NCAC 2L .0202(c). This changes the cost per household to approximately \$24k per household for the Cumberland county homes west of the Cape Fear River as presented by Chemours-Parsons developed plan. Why use the Practical Quantitative Limit for all PFAS detected instead of single GENX health goal?

a. According to environmental chemists, the proposed ATSDR "minimum risk levels" or MRLs, translate roughly to 7-ppt for PFOS and 11-ppt for PFOA -- the two PFAS compounds which the state of Michigan has established cleanup standards for groundwater that people drink.

b. A 7-ppt MRL level for PFOS exposure is lower than Michigan's 12-ppt enforceable standard for that compound in surface water, a rule developed to account for bioaccumulation in fish. The U.S. Environmental Protection Agency health advisory level for PFOS and PFOA is a combined 70-ppt, a level some researchers call inadequate to protect public health. We know fish in Marshwood lake did show bioaccumulation of PFAS in fish tested.

c. PFAS have been "extensively evaluated in humans and laboratory animals," the study notes, but says comparing toxicity across species is problematic because, among other things, humans take much longer to purge the chemicals from their bodies. The chemicals also cause different health problems in humans versus animals.

d. The ATSDR proposes MRLs translating to about 70-ppt for PFHxS and 10.5 ppt for PFNA, two PFAS compounds for which there are no federal Standards. These are found in many of the wells surrounding the facility as well as in the plume contaminating the aquifer under the facility. Refer to the Dec 16 Corrective Measure Study that is in DEQ public edocs site for proof.

e. "This study confirms that the EPA's guidelines for PFAS levels in drinking water woefully underestimate risks to human health," said Olga Naidenko, a senior science advisor at the nonprofit Environmental Working Group. "We urge EPA to collect and publish all water results showing PFAS contamination at any level, so Americans across the country can take immediate steps to protect themselves and their families."

4. Reasons why Granular Activated Carbon systems should not be option over PWC Municipal Water for Cumberland County residents or Bladen county water for Bladen county residents are as follows:

a. Many data points about installing municipal water lines in Cumberland county are inaccurate based on 9 year old data. There is a new 12" pipe being installed off Thrower road with planned extension along Hwy97 to homes near the Alderman Hwy 87 intersection. The Water Replacement plan costing data is inaccurate and needs review by Cumberland and Bladen County commissions. This should also be measured as it is not all home found in violation of the Groundwater Rules not just the exceedance of health goal. The cost presented in Nov 2017 to the Bladen County Commission was far less for West of Cape Fear than presented in the plan, the data for Cumberland county is based on 9 year old data and does not take into account the massive growth in the areas south of Sandhill Road all the way along Hwy 87 to the Bladen County line.

b. Incomplete Data has been provided by Chemours to DEQ for the tests every other week. This is very important in making decisions such as if Granular Activated Carbon systems are viable and the full cost including operation and maintenance costs. It was presented as a one time cost of \$10K to install, that is not correct data when comparing GAC to municipal water options and taints decision points.

c. The data provided by Chemours (not complete or actual lab results) does indicate that trace chemicals are getting thru the Granular Activated Carbon systems. This would be a violation of 15A NCAC 02L .0202. The full set of data including all of the lab results on all samples taken, as well as the additional field data, such as frequency of sediment filter & iron filter replacement was withheld by Chemours from the well owners and DEQ. Not enough information has been properly reviewed to determine effectiveness, but the data from Chemours indicated that they would be in violation the Groundwater rules/Standards of 15A NCAC 02L .0202.

d. The Swedish study on Granular Activated Carbon systems found them to be inefficient after a 140 day study. The study was to investigate the removal efficiency of PFASs in water using two treatment techniques; granular activated carbon (GAC), type Filtrasorb 400®, and anion exchange (AE), type Purolite A-600. Additionally, the effect of dissolved organic carbon (DOC) on removal efficiency was studied. The removal efficiency of PFASs was studied in pilot-scale column experiments at Bäcklösa drinking water treatment plant (DWTP) in Uppsala, Sweden. The laboratory batch experiments were performed at Swedish University of Agricultural Sciences (SLU), Uppsala. The results from the column experiment indicated a decrease in removal efficiency with increasing number of bed volumes (BVs) for both GAC and AE. The average removal efficiency of all PFASs (n=14) during the 140 day column study was 65% for both GAC and AE. At the end of the column experiment, the average removal efficiency of all PFASs was 49% for GAC and 53% for AE. Removal efficiency was influenced by functional group; perfluoroalkane (-alkyl) sulfonic acids (PFASs) were more efficiently removed than perfluoroalkyl carboxylic acids (PFCAs) (on average 56% vs 38% for GAC, respectively, and 82% vs 28% for AE, respectively). In addition, the perfluorocarbon chain length influenced the removal efficiency. Results from the column experiment indicated higher removal efficiency as the perfluorocarbon chain length increased. In contrast, the results from the batch experiments indicated the opposite; decreasing adsorption to GAC and AE as the chain length increased. Furthermore, presence of DOC in the water affected the removal

efficiency of the investigated PFASs. However, the results indicated, contrary to the few studies previously performed on DOC and removal efficiency of PFASs, enhanced sorption of PFASs to GAC with increasing DOC concentration, and decreased PFAS sorption to AE as the DOC concentration increased. In addition, the removal efficiency of GAC and AE varied using water types with different DOC origin, indicating that DOC characteristics influence the removal efficiency of PFASs in water. The six pilot tests are using Filtrasorb 600, but Brunswick county did test Filtrasorb 400 and it was not fully effective. There is not enough data yet for Filtrasorb 600, but initial Chemours data show that Chemicals do get thru in less than the 120 day point.

e. Department of Environmental Quality cannot use this set of rules to violate in one instance and not use it as a determination point on who should be provided municipal or filtration systems. The test data provided by Chemours of the Granular Activated Carbon systems proves that the systems allow trace amounts of chemicals to pass through the system. The 12 April, 26 April and 10 May Chemours results for Site 48 prove this to be fact. Thus the results are in violation as there is an exceedance of the Practical Quantitative Limit (PQL) for PFAs constituents in violation of 15A NCAC 02L .0202. The DEQ test results from the 3 May test indicates a 106.03 ng/L of combined PFAs breakthrough and this is in less than 1 month of use for this specific test system.

f. Maintenance of the system as noted on site 48 that on 5 July could cause contamination as occurred when Parsons found that the Iron filter allowed iron to get into the GAC canisters. This was rectified by doing a backflush running the water onto the soil. This backflush would wash the contaminants that were captured out to the soil that is less than 30 feet from the well. This is no different then an inadvertent spill while filling a truck with contaminated water and should be a violation and reported as a minor reported spill.

5. We request the following three areas to be modified:

Line 67 Listed as: Health Studies

Line 69 listed as: COMPLIANCE MEASURES – GROUNDWATER

Line 70 listed as: Re-Testing of Private Wells

6. The verbiage that we believe should be present is listed below and referenced to the sections we desire to see modification. We have also included a modified PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580 with the highlighted changes inserted. This is in compliance with the standards used by the Division of Waste Management in the 11 June 2018 Notice of Violation. We the “affected households” request municipal water to be run at Chemours expense. We have included an area on the signature pages attached to indicate who would prefer Municipal water and who would prefer the filtration option to answer that portion in one submission.

Section 67 Health Studies

It is our belief and desire that part of the health studies should include testing of the members blood & urine of all members of the households that have wells that test or tested with any exceedance of any Practical Quantitative Limit as defined by North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Chemours has stated that these chemicals harm nobody, it is time they prove it and in good faith or under court order they should be compelled to do this as part of the health studies. The harm to not only human or aquatic life needs to be researched, but also animals, such as Dogs, Cats, Birds and Farm animals.

MODIFIED TO READ

COMPLIANCE MEASURES – GROUNDWATER

69. Permanent Replacement of Private Drinking Water Supplies: By no later than twelve (18) months after issuance of this Order, Chemours shall establish permanent replacement water supplies for each household with a water supply well contaminated by any PFAS (“affected households”) PFBS CAS# 375-73-5, PFDA CAS# 335-76-2, PFDaA CAS# 307-55-1, PFHpA CAS# 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1, PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3, PFMOAA CAS# 39492-89-2, PFCECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFo3OA CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or additionally discovered PFAS in exceedance of the practical quantitative limit (PQL). The authority provided under Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), “substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. The replacement water supply shall be established by

connection to a public water supply, except that an affected household may elect to receive a filtration system approved by DEQ in lieu of a connection to public water supply, in which case Chemours shall install a filtration system. For affected households Chemours shall be liable for any water bills from public utilities and for periodic required maintenance for any home that requested the DEQ approved filtration system. Chemours shall submit a plan for compliance with this provision, including a detailed schedule with milestones, no later than sixty (60) days after entry of this Order. This provision shall supplement any prior requirements regarding the provision of permanent replacement water supplies. Upon failure to comply with installation of municipal water to all homes with groundwater wells in exceedance of the Groundwater rules DEQ to find Chemours in violation of Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), "substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. DEQ will assess penalties under NCGS 143-215.6A (a)(1) of not more than \$25,000 per day for each groundwater well that has been tested and been found to exceedance of the practical quantitative limit for any PFAs constituents. Multiple found PFAs constituents will be considered as separate violations of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c) and deemed a violation pursuant to G.S. 143-214-1.

#### MODIFIED to READ

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**From:** Francis Minshew  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Comment on Draft Court Order  
**Date:** Monday, July 9, 2018 8:32:57 PM

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**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

Point of contact

Frances Minshew  
4301 Munsey Rd  
[Fayetteville, NC 28306](#)  
[910-987-1076](#)

Department of Environmental Quality  
[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)  
Assistant Secretary's Office  
RE: Chemours Public Comment  
[1601 Mail Service Center](#)  
[Raleigh, N.C. 27699-1601](#)

**SUBJECT:** Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

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should be a violation and reported as a minor reported spill.

5. We request the following three areas to be modified:

Line 67 Listed as: Health Studies

Line 69 listed as: COMPLIANCE MEASURES – GROUNDWATER

Line 70 listed as: Re-Testing of Private Wells

6. The verbiage that we believe should be present is listed below and referenced to the sections we desire to see modification. We have also included a modified PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580 with the highlighted changes inserted. This is in compliance with the standards used by the Division of Waste Management in the 11 June 2018 Notice of Violation. We the “affected households” request municipal water to be run at Chemours expense. We have included an area on the signature pages attached to indicate who would prefer Municipal water and who would prefer the filtration option to answer that portion in one submission.

#### Section 67 Health Studies

It is our belief and desire that part of the health studies should include testing of the members blood & urine of all members of the households that have wells that test or tested with any exceedance of any Practical Quantitative Limit as defined by North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Chemours has stated that these chemicals harm nobody, it is time they prove it and in good faith or under court order they should be compelled to do this as part of the health studies. The harm to not only human or aquatic life needs to be researched, but also animals, such as Dogs, Cats, Birds and Farm animals.

#### MODIFIED TO READ

#### COMPLIANCE MEASURES – GROUNDWATER

69. Permanent Replacement of Private Drinking Water Supplies: By no later than twelve (18) months after issuance of this Order, Chemours shall establish permanent replacement water supplies for each household with a water supply well contaminated by any PFAS (“affected households”) PFBS CAS# 375-73-5, PFDA CAS# 335-76-2, PFDoA CAS# 307-55-1, PFHpA CAS# 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1, PFTriA CAS# 72629-94-8, PFUnA CAS# [2058-94-8](#), PFPeA CAS# [2706-90-3](#), PFMOAA CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFo3OA CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or additionally discovered PFAS in exceedance of the practical quantitative limit (PQL). The authority provided under Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), “substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. The replacement water supply shall be established by connection to a public water supply, except that an affected household may elect to receive a filtration system approved by DEQ in lieu of a connection to public water supply, in which case Chemours shall install a filtration system. For affected households Chemours shall be liable for any water bills from public utilities and for periodic required maintenance for any home that requested the DEQ approved filtration system. Chemours shall submit a plan for compliance with this provision, including a detailed schedule with milestones, no later than sixty (60) days after entry of this Order. This provision shall supplement any prior requirements regarding the provision of permanent replacement



water supplies. Upon failure to comply with installation of municipal water to all homes with groundwater wells in exceedance of the Groundwater rules DEQ to find Chemours in violation of Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), “substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. DEQ will access penalties under NCGS 143-215.6A (a)(1) of not more than \$25,000 per day for each groundwater well that has been tested and been found to exceedance of the practical quantitative limit for any PFAs constituents. Multiple found PFAs constituents will be considered as separate violations of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c) and deemed a violation pursuant to G.S. [143-214-1](#).

**MODIFIED to READ**

70. Re-Testing of Private Wells: Chemours shall conduct testing of private drinking water supply wells as follows: for wells with test results showing no detectable concentrations of PFAS Compounds, Chemours shall re-test for PFPrOPrA CAS# 62037-80-3, PFOA CAS# 335-67-1, PFOS CAS# [1763-23-1](#), PFBS CAS# 375-73-5, PFDA CAS# 335-76-2, PFDoA CAS# 307-55-1, PFHpA CAS# 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1, PFTriA CAS# 72629-94-8, PFUnA CAS# [2058-94-8](#), PFPeA CAS# [2706-90-3](#), PFMOAA CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFo3OA CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or additionally discovered PFAS in exceedance of the practical quantitative limit (PQL) on an annual basis until sampling shows no detectable concentrations of any PFAS constituents for two consecutive sampling events. Chemours shall provide to DEQ a list of residents within these sampling ranges, identified by both their address and sample ID. Chemours shall also provide to DEQ a list of wells (identified by address) targeted for testing that have not yet been tested and verifying its efforts to test these wells.

Sent from my iPhone

**From:** Terri Robertson  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External]  
**Date:** Monday, July 9, 2018 8:09:14 PM

---

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Good morning members,

We have until Wednesday, July 11th to put in our comments on the Draft Court order

Specifically section 67, 69 & 70

[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

If you want to use this template change to your Contact information and copy it to the email. I gathered information that is pertinent backed by law or studies to justify the reasons for modification.

Point of contact Terri Robertson  
6629 Matt Hair Rd  
Fayetteville, NC 28312  
[Terrobertson59@hotmail.com](mailto:Terrobertson59@hotmail.com)  
910-624-2251

Department of Environmental Quality  
[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)  
Assistant Secretary's Office  
RE: Chemours Public Comment  
1601 Mail Service Center  
Raleigh, N.C. 27699-1601

**SUBJECT: Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.**

1. We the Residents within the “affected households” that live within the geographical area of the Chemours managed Fayetteville Works facility (Cumberland, Bladen & Robeson Counties) are requesting modification of the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

2. In the absence of evidence to the contrary, ATSDR assumes that humans are more sensitive to the effects of hazardous substance than animals and that certain persons may be particularly sensitive, the report notes. Thus, the resulting MRL may be as much as 100-fold below levels

that have been shown to be nontoxic in laboratory animals. This federal study is deeply concerning because it demonstrates that PFAS chemicals are more dangerous to human health than the EPA has previously acknowledged. We are requesting the Department of Environmental Quality address these PFAS contaminations with more urgency. We must ensure that families exposed to these dangerous chemicals receive municipal water, cost to the Company that caused the contamination should not be a factor in decision making.

3. This request is signed by the “affected households” that have wells that are exceedance of the Practical Quantitative Limit (PQL) for any PFAS constituents in violation of 15A NCAC 02L .0202. These are not naturally occurring substances and no standard has been so the permitted concentration requires that they be below the Practical Quantitative limit for Class GA or Class GSA groundwaters pursuant to 15A NCAC 2L .0202(c). This changes the cost per household to approximately \$24k per household for the Cumberland county homes west of the Cape Fear River as presented by Chemours-Parsons developed plan. Why use the Practical Quantitative Limit for all PFAS detected instead of single GENX health goal?

a. According to environmental chemists, the proposed ATSDR "minimum risk levels" or MRLs, translate roughly to 7-ppt for PFOS and 11-ppt for PFOA -- the two PFAS compounds which the state of Michigan has established cleanup standards for groundwater that people drink.

b. A 7-ppt MRL level for PFOS exposure is lower than Michigan's 12-ppt enforceable standard for that compound in surface water, a rule developed to account for bioaccumulation in fish. The U.S. Environmental Protection Agency health advisory level for PFOS and PFOA is a combined 70-ppt, a level some researchers call inadequate to protect public health. We know fish in Marshwood lake did show bioaccumulation of PFAS in fish tested.

c. PFAS have been "extensively evaluated in humans and laboratory animals," the study notes, but says comparing toxicity across species is problematic because, among other things, humans take much longer to purge the chemicals from their bodies. The chemicals also cause different health problems in humans versus animals.

d. The ATSDR proposes MRLs translating to about 70-ppt for PFHxS and 10.5 ppt for PFNA, two PFAS compounds for which there are no federal Standards. These are found in many of the wells surrounding the facility as well as in the plume contaminating the aquifer under the facility. Refer to the Dec 16 Corrective Measure Study that is in DEQ public edocs site for proof.

e. "This study confirms that the EPA's guidelines for PFAS levels in drinking water woefully underestimate risks to human health," said Olga Naidenko, a senior science advisor at the nonprofit Environmental Working Group. "We urge EPA to collect and publish all water results showing PFAS contamination at any level, so Americans across the country can take immediate steps to protect themselves and their families."

4. Reasons why Granular Activated Carbon systems should not be option over PWC Municipal Water for Cumberland County residents or Bladen county water for Bladen county residents are as follows:

a. Many data points about installing municipal water lines in Cumberland county are inaccurate based on 9 year old data. There is a new 12” pipe being installed off Thrower road

with planned extension along Hwy97 to homes near the Alderman Hwy 87 intersection. The Water Replacement plan costing data is inaccurate and needs review by Cumberland and Bladen County commissions. This should also be measured as not just all homes found in violation of the Groundwater Rules but also the exceedance of health goal. The cost presented in Nov 2017 to the Bladen County Commission was far less for West of Cape Fear than presented in the plan, the data for Cumberland county is based on 9 year old data and does not take into account the massive growth in the areas south of Sandhill Road all the way along Hwy 87 to the Bladen County line.

b. Incomplete Data has been provided by Chemours to DEQ for the tests every other week. This is very important in making decisions such as if Granular Activated Carbon systems are viable and the full cost including operation and maintenance costs. It was presented as a one time cost of \$10K to install, that is not correct data when comparing GAC to municipal water options and taints decision points.

c. The data provided by Chemours (not complete or actual lab results) does indicate that trace chemicals are getting thru the Granular Activated Carbon systems. This would be a violation of 15A NCAC 02L .0202. The full set of data including all of the lab results on all samples taken, as well as the additional field data, such as frequency of sediment filter & iron filter replacement was withheld by Chemours from the well owners and DEQ. Not enough information has been properly reviewed to determine effectiveness, but the data from Chemours indicated that they would be in violation the Groundwater rules/Standards of 15A NCAC 02L .0202.

d. The Swedish study on Granular Activated Carbon systems found them to be inefficient after a 140 day study. The study was to investigate the removal efficiency of PFASs in water using two treatment techniques; granular activated carbon (GAC), type Filtrasorb 400®, and anion exchange (AE), type Purolite A-600. Additionally, the effect of dissolved organic carbon (DOC) on removal efficiency was studied. The removal efficiency of PFASs was studied in pilot-scale column experiments at Bäcklösa drinking water treatment plant (DWTP) in Uppsala, Sweden. The laboratory batch experiments were performed at Swedish University of Agricultural Sciences (SLU), Uppsala. The results from the column experiment indicated a decrease in removal efficiency with increasing number of bed volumes (BVs) for both GAC and AE. The average removal efficiency of all PFASs (n=14) during the 140 day column study was 65% for both GAC and AE. At the end of the column experiment, the average removal efficiency of all PFASs was 49% for GAC and 53% for AE. Removal efficiency was influenced by functional group; perfluoroalkane (-alkyl) sulfonic acids (PFASs) were more efficiently removed than perfluoroalkyl carboxylic acids (PFCAs) (on average 56% vs 38% for GAC, respectively, and 82% vs 28% for AE, respectively). In addition, the perfluorocarbon chain length influenced the removal efficiency. Results from the column experiment indicated higher removal efficiency as the perfluorocarbon chain length increased. In contrast, the results from the batch experiments indicated the opposite; decreasing adsorption to GAC and AE as the chain length increased. Furthermore, presence of DOC in the water affected the removal efficiency of the investigated PFASs. However, the results indicated, contrary to the few studies previously performed on DOC and removal efficiency of PFASs, enhanced sorption of PFASs to GAC with increasing DOC concentration, and decreased PFAS sorption to AE as the DOC concentration increased. In addition, the removal efficiency of GAC and AE varied using water types with different DOC origin, indicating that DOC characteristics influence the removal efficiency of PFASs in water. The six pilot tests are using Filtrasorb 600, but Brunswick county did test Filtrasorb 400 and it was not fully

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Sent from myMail for iOS

**From:** Crystal Young  
**To:** [comments.chemours](#)  
**Subject:** [External] Chemours  
**Date:** Monday, July 9, 2018 8:07:09 PM

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Chemours should be made to pay for connection to city water for all homes affected by gen-x. The radius of well testing needs to be expanded to Thrower Rd to ensure that no wells could have gen-x.



**From:** H T  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Well at 6964 point east dr Fayetteville NC  
**Date:** Monday, July 9, 2018 7:15:41 PM

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**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

## URGENCY

Good morning members,

We have [until Wednesday, July 11th](#) to put in our comments on the Draft Court order

If there was ever a moment that you took the time to write, now is the time. Please don't hesitate, your comments are very important to your rights if a well owner. Specifically section 67, 69 & 70

If a well owner in Cumberland, Bladen or Robeson county or any other county affected by PFAS contamination from Fayetteville works. Copy text below or enter your own and email to:

[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

by [11 July](#).

If you want to use this template change to your Contact information and copy it to the email. I gathered information that is pertinent backed by law or studies to justify the reasons for modification.

Point of contact Michael Watters  
[6975 Point East Dr](#)  
[Fayetteville, NC 28306](#)  
[wattersm@gmail.com](mailto:wattersm@gmail.com)  
[910-424-2162](tel:910-424-2162)

Department of Environmental Quality  
[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)  
Assistant Secretary's Office  
RE: Chemours Public Comment  
[1601 Mail Service Center](#)  
[Raleigh, N.C. 27699-1601](#)

**SUBJECT:** Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

1. We the Residents within the "affected households" that live within the geographical area of the Chemours managed Fayetteville Works facility (Cumberland, Bladen & Robeson Counties) are requesting modification of the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

2. In the absence of evidence to the contrary, ATSDR assumes that humans are more sensitive to the effects of hazardous substance than animals and that certain persons may be particularly sensitive, the report notes. Thus, the resulting MRL may be as much as 100-fold below levels that have been shown to be nontoxic in laboratory animals. This federal study is deeply concerning because it demonstrates that PFAS chemicals are more dangerous to human health than the EPA has previously acknowledged. We are requesting the Department of Environmental Quality address these PFAS contaminations with more urgency. We must ensure that families exposed to these dangerous chemicals receive municipal water, cost to the Company that caused the contamination should not be a factor in decision making.

3. This request is signed by the "affected households" that have wells that are exceedance of the Practical Quantitative Limit (PQL) for any PFAS constituents in violation of 15A NCAC 02L .0202. These are not naturally occurring substances and no standard has been so the permitted concentration requires that they be below the Practical Quantitative limit for Class GA or Class GSA groundwaters pursuant to 15A NCAC 2L .0202(c). This changes the cost per household to approximately \$24k per household for the Cumberland county homes west of the Cape Fear River as presented by Chemours-Parsons developed plan. Why use the Practical Quantitative Limit for all PFAS detected instead of single GENX health goal?

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b. A 7-ppt MRL level for PFOS exposure is lower than Michigan's 12-ppt enforceable standard for that compound in surface water, a rule developed to account for bioaccumulation in fish. The U.S. Environmental Protection Agency health advisory level for PFOS and PFOA is a combined 70-ppt, a level some researchers call inadequate to protect public health. We know fish in Marshwood lake did show bioaccumulation of PFAS in fish tested.

c. PFAS have been "extensively evaluated in humans and laboratory animals," the study notes, but says comparing toxicity across species is problematic because, among other things, humans take much longer to purge the chemicals from their bodies. The chemicals also cause different health problems in humans versus animals.

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e. "This study confirms that the EPA's guidelines for PFAS levels in drinking water woefully underestimate risks to human health," said Olga Naidenko, a senior science advisor at the nonprofit Environmental Working Group. "We urge EPA to collect and publish all water results showing PFAS contamination at any level, so Americans across the country can take immediate steps to protect themselves and their families."

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a. Many data points about installing municipal water lines in Cumberland county are inaccurate based on 9 year old data. There is a new 12" pipe being installed off Thrower road with planned extension along Hwy97 to homes near the Alderman Hwy 87 intersection. The Water Replacement plan costing data is inaccurate and needs review by Cumberland and Bladen County commissions. This should also be measured against all home found in violation of the Groundwater Rules not just the exceedance of health goal. The cost presented in Nov 2017 to the Bladen County Commission was far less for West of Cape Fear than presented in the plan, the data for Cumberland county is based on 9 year old data and does not take into account the massive growth in the areas south of Sandhill Road all the way along Hwy 87 to the Bladen County line.

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c. The data provided by Chemours (not complete or actual lab results) does indicate that trace chemicals are getting thru the Granular Activated Carbon systems. This would be a violation of 15A NCAC 02L .0202. The full set of data including all of the lab results on all samples taken, as well as the additional field data, such as frequency of sediment filter & iron filter replacement was withheld by Chemours from the well owners and DEQ. Not enough information has been properly reviewed to determine effectiveness, but the data from Chemours indicated that they would be in violation the Groundwater rules/Standards of 15A NCAC 02L .0202.

d. The Swedish study on Granular Activated Carbon systems found them to be inefficient after a 140 day study. The study was to investigate the removal efficiency of PFASs in water using two treatment techniques; granular activated carbon (GAC), type Filtrasorb 400®, and anion exchange (AE), type Purolite A-600. Additionally, the effect of dissolved organic carbon (DOC) on removal efficiency was studied. The removal efficiency of PFASs was studied in pilot-scale column experiments at Bäcklösa drinking water treatment plant (DWTP) in Uppsala, Sweden. The laboratory batch experiments were performed at Swedish University of Agricultural Sciences (SLU), Uppsala. The results from the column experiment indicated a decrease in removal efficiency with increasing number of bed volumes (BVs) for both GAC and AE. The average removal efficiency of all PFASs (n=14) during the 140 day column study was 65% for both GAC and AE. At the end of the column experiment, the average removal efficiency of all PFASs was 49% for GAC and 53% for AE. Removal efficiency was influenced by functional group; perfluoroalkane (-alkyl) sulfonic acids (PFASs) were more efficiently removed than perfluoroalkyl carboxylic acids (PFCAs) (on average 56% vs 38% for GAC, respectively, and 82% vs 28% for AE, respectively). In addition, the perfluorocarbon chain length influenced the removal efficiency. Results from the column experiment indicated higher removal efficiency as the perfluorocarbon chain length increased. In contrast, the results from the batch experiments indicated the opposite; decreasing adsorption to GAC and AE as the chain length increased. Furthermore, presence of DOC in the water affected the removal efficiency of the investigated PFASs. However, the results indicated, contrary to the few studies previously performed on DOC and removal efficiency of PFASs, enhanced sorption of PFASs to GAC with increasing DOC concentration, and decreased PFAS sorption to AE as the DOC concentration increased. In addition, the removal efficiency of GAC and AE varied using water types with different DOC origin, indicating that

DOC characteristics influence the removal efficiency of PFASs in water. The six pilot tests are using Filtrasorb 600, but Brunswick county did test Filtrasorb 400 and it was not fully effective. There is not enough data yet for Filtrasorb 600, but initial Chemours data show that Chemicals do get thru in less than the 120 day point.

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5. We request the following three areas to be modified:

Line 67 Listed as: Health Studies

Line 69 listed as: COMPLIANCE MEASURES – GROUNDWATER

Line 70 listed as: Re-Testing of Private Wells

6. The verbiage that we believe should be present is listed below and referenced to the sections we desire to see modification. We have also included a modified PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580 with the highlighted changes inserted. This is in compliance with the standards used by the Division of Waste Management in the 11 June 2018 Notice of Violation. We the “affected households” request municipal water to be run at Chemours expense. We have included an area on the signature pages attached to indicate who would prefer Municipal water and who would prefer the filtration option to answer that portion in one submission.

Section 67 Health Studies

It is our belief and desire that part of the health studies should include testing of the members blood & urine of all members of the households that have wells that test or tested with any exceedance of any Practical Quantitative Limit as defined by North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Chemours has stated that these chemicals harm nobody, it is time they prove it and in good faith or under court order they should be compelled to do this as part of the health studies. The harm to not only human or aquatic life needs to be researched, but also animals, such as Dogs, Cats, Birds and Farm animals.

MODIFIED TO READ

COMPLIANCE MEASURES – GROUNDWATER

69. Permanent Replacement of Private Drinking Water Supplies: By no later than twelve (18) months after issuance of this Order, Chemours shall establish permanent replacement water

supplies for each household with a water supply well contaminated by any PFAS (“affected households”) PFBS CAS# 375-73-5, PFDA CAS# 335-76-2, PFDoA CAS# 307-55-1, PFHpA CAS# 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1, PFTriA CAS# 72629-94-8, PFUnA CAS# [2058-94-8](#), PFPeA CAS# [2706-90-3](#), PFMOAA CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFo3OA CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or additionally discovered PFAS in exceedance of the practical quantitative limit (PQL). The authority provided under Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), “substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. The replacement water supply shall be established by connection to a public water supply, except that an affected household may elect to receive a filtration system approved by DEQ in lieu of a connection to public water supply, in which case Chemours shall install a filtration system. For affected households Chemours shall be liable for any water bills from public utilities and for periodic required maintenance for any home that requested the DEQ approved filtration system. Chemours shall submit a plan for compliance with this provision, including a detailed schedule with milestones, no later than sixty (60) days after entry of this Order. This provision shall supplement any prior requirements regarding the provision of permanent replacement water supplies. Upon failure to comply with installation of municipal water to all homes with groundwater wells in exceedance of the Groundwater rules DEQ to find Chemours in violation of Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), “substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. DEQ will access penalties under NCGS 143-215.6A (a)(1) of not more than \$25,000 per day for each groundwater well that has been tested and been found to exceedance of the practical quantitative limit for any PFAs constituents. Multiple found PFAs constituents will be considered as separate violations of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c) and deemed a violation pursuant to G.S. [143-214-1](#).

#### MODIFIED to READ

70. Re-Testing of Private Wells: Chemours shall conduct testing of private drinking water supply wells as follows: for wells with test results showing no detectable concentrations of PFAS Compounds, Chemours shall re-test for PFPrOPrA CAS# 62037-80-3, PFOA CAS# 335-67-1, PFOS CAS# [1763-23-1](#), PFBS CAS# 375-73-5, PFDA CAS# 335-76-2, PFDoA CAS# 307-55-1, PFHpA CAS# 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1, PFTriA CAS# 72629-94-8, PFUnA CAS# [2058-94-8](#), PFPeA CAS# [2706-90-3](#), PFMOAA CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFo3OA CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or additionally discovered PFAS in exceedance of the practical quantitative limit (PQL) on an annual basis until sampling shows no detectable concentrations of any PFAS constituents for two consecutive sampling events. Chemours shall provide to DEQ a list of residents within these sampling ranges, identified by both their address and sample ID. Chemours shall also provide to DEQ a list of wells (identified by address) targeted for testing that have not yet been tested and verifying its efforts to test these wells.

[Sent from Yahoo Mail for iPhone](#)

**From:** douglasnorton21  
**To:** [comments.chemours](#)  
**Subject:** [External] Fwd: RE: Comment on Proposed Order  
**Date:** Monday, July 9, 2018 4:03:41 PM  
**Attachments:** [RE - Comment on Proposed Order\\_7918.eml](#)

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Sent from my T-Mobile 4G LTE Device

**From:** Mike Watters  
**To:** [Bobby Swilley](#)  
**Cc:** [comments.chemours](#)  
**Subject:** [External] Re: Changes to agreement  
**Date:** Monday, July 9, 2018 2:59:24 PM

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**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

Thanks Bobby

Have been tied up with this and DEQ over last few days. I will come over and see how to the logs for you later this evening.

Mike

On Mon, Jul 9, 2018, 2:55 PM Bobby Swilley <[bobby@carolinaspecialties.com](mailto:bobby@carolinaspecialties.com)> wrote:

**My name is Bobby J. Swilley, a resident of Point East Subdivision, Grays Creek, Fayetteville, NC and we totally agree with the changes requested by Mr. Mike Watters , our neighbor. We want changes he offered and especially numbers 67, 69, and 70. We are 100% in agreement with his proposal so, please add our names to the list requesting changes to this document. BTW, our test came back at 126.**

**Bobby J. and Ann Marie Swilley**

**1904 Nantuckett Court**

**Fayetteville, NC 28306**

**910-964-7562**



**From:** Bobby Swilley  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] FW: Please Copy and Send Comments to DEQ on the Proposed Draft Order.  
**Date:** Monday, July 9, 2018 2:59:14 PM

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**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

**WE AGREE WITH MR. WATTERS TOTALLY, 100 %. PLEASE ADD OUR NAMES TO THE REQUEST FOR CHANGES. WE TESTED AT 126.**

**BOBBY J. AND ANN MARIE SWILLEY**

**1904 NANTUCKETT COURT**

**FAYETTEVILLE, NC 28306**

**910-964-7562**

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**From:** Mike Watters [mailto:wattersm@gmail.com]

**Sent:** Monday, July 09, 2018 1:43 PM

**To:** Randa Dunn; Anthony Lenard; Kenneth Cannon; Gene Inman; Donna F. Inman; Helen Brockett; Bobby Swilley; Beth Markesino; Barnes, Greg; Devane, Steve; Larry Lancaster; tracy eaton; Catherine Clabby; Ivey, David M; Derrick Martin; davejordanwitn; Robert Wesselman; Richard Essex; Francis Minshew; Emma Smith; Martha Bennett; Linda; Gene; Scott, Michael; Regan, Michael S; Kathleen Gallagher; H T; George Hart; brett hardy; Dedra Haire; Stephen Haire; Gene Swinson; Jody Jernigan; Jonathan Swilley; jeannette rose; Jacobs, Rusty; James Paradise; Michelle Key; Keri Carelas; laura booth; webers@wnet.org; Christine Whipkey

**Subject:** Please Copy and Send Comments to DEQ on the Proposed Draft Order.

URGENCY

Good morning members,

We have until Wednesday, July 11th to put in our comments on the Draft Court order

If there was ever a moment that you took the time to write, now is the time. Please don't hesitate, your comments are very important to your rights if a well owner. Specifically section 67, 69 & 70

If a well owner in Cumberland, Bladen or Robeson county or any other county affected by PFAS contamination from Fayetteville works. Copy text below or enter your own and email to:

[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

by 11 July.

If you want to use this template change to your Contact information and copy it to the email. I gathered information that is pertinent backed by law or studies to justify the reasons for modification.

Point of contact Michael Watters  
6975 Point East Dr  
Fayetteville, NC 28306  
[wattersm@gmail.com](mailto:wattersm@gmail.com)  
910-424-2162

Department of Environmental Quality  
[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)  
Assistant Secretary's Office  
RE: Chemours Public Comment  
1601 Mail Service Center  
Raleigh, N.C. 27699-1601

SUBJECT: Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

1. We the Residents within the “affected households” that live within the geographical area of the Chemours managed Fayetteville Works facility (Cumberland, Bladen & Robeson Counties) are requesting modification of the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.
2. In the absence of evidence to the contrary, ATSDR assumes that humans are more sensitive to the effects of hazardous substance than animals and that certain persons may be particularly sensitive, the report notes. Thus, the resulting MRL may be as much as 100-fold below levels that have been shown to be nontoxic in laboratory animals. This federal study is deeply concerning because it demonstrates that PFAS chemicals are more dangerous to human health than the EPA has previously acknowledged. We are requesting the Department of Environmental Quality address these PFAS contaminations with more urgency. We must ensure that families exposed to these dangerous chemicals receive municipal water, cost to the Company that caused the contamination should not be a factor in decision making.
3. This request is signed by the “affected households” that have wells that are exceedance of the Practical Quantitative Limit (PQL) for any PFAS constituents in violation of 15A NCAC 02L .0202. These are not naturally occurring substances and no standard has been so the permitted concentration requires that they be below the Practical Quantitative limit for Class GA or Class GSA groundwaters pursuant to 15A NCAC 2L .0202(c). This changes the cost per household to approximately \$24k per household for the Cumberland county homes west of the Cape Fear River as presented by Chemours-Parsons developed plan. Why use the Practical Quantitative Limit for all PFAS detected instead of single GENX health goal?
  - a. According to environmental chemists, the proposed ATSDR "minimum risk levels" or MRLs, translate roughly to 7-ppt for PFOS and 11-ppt for PFOA -- the two PFAS compounds which the state of Michigan has established cleanup standards for groundwater that people drink.
  - b. A 7-ppt MRL level for PFOS exposure is lower than Michigan's 12-ppt enforceable standard for that compound in surface water, a rule developed to account for bioaccumulation in fish. The U.S. Environmental Protection Agency health advisory level for PFOS and PFOA is a combined 70-ppt, a level some researchers call inadequate to protect public health. We

know fish in Marshwood lake did show bioaccumulation of PFAS in fish tested.

c. PFAS have been "extensively evaluated in humans and laboratory animals," the study notes, but says comparing toxicity across species is problematic because, among other things, humans take much longer to purge the chemicals from their bodies. The chemicals also cause different health problems in humans versus animals.

d. The ATSDR proposes MRLs translating to about 70-ppt for PFHxS and 10.5 ppt for PFNA, two PFAS compounds for which there are no federal Standards. These are found in many of the wells surrounding the facility as well as in the plume contaminating the aquifer under the facility. Refer to the Dec 16 Corrective Measure Study that is in DEQ public edocs site for proof.

e. "This study confirms that the EPA's guidelines for PFAS levels in drinking water woefully underestimate risks to human health," said Olga Naidenko, a senior science advisor at the nonprofit Environmental Working Group. "We urge EPA to collect and publish all water results showing PFAS contamination at any level, so Americans across the country can take immediate steps to protect themselves and their families."

4. Reasons why Granular Activated Carbon systems should not be option over PWC Municipal Water for Cumberland County residents or Bladen county water for Bladen county residents are as follows:

a. Many data points about installing municipal water lines in Cumberland county are inaccurate based on 9 year old data. There is a new 12" pipe being installed off Thrower road with planned extension along Hwy97 to homes near the Alderman Hwy 87 intersection. The Water Replacement plan costing data is inaccurate and needs review by Cumberland and Bladen County commissions. This should also be measured against all home found in violation of the Groundwater Rules not just the exceedance of health goal. The cost presented in Nov 2017 to the Bladen County Commission was far less for West of Cape Fear than presented in the plan, the data for Cumberland county is based on 9 year old data and does not take into account the massive growth in the areas south of Sandhill Road all the way along Hwy 87 to the Bladen County line.

b. Incomplete Data has been provided by Chemours to DEQ for the tests every other week. This is very important in making decisions such as if Granular Activated Carbon systems are viable and the full cost including operation and maintenance costs. It was presented as a one time cost of \$10K to install, that is not correct data when comparing GAC to municipal water options and taints decision points.

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d. The Swedish study on Granular Activated Carbon systems found them to be inefficient after a 140 day study. The study was to investigate the removal efficiency of PFASs in water using

two treatment techniques; granular activated carbon (GAC), type Filtrasorb 400®, and anion exchange (AE), type Purolite A-600. Additionally, the effect of dissolved organic carbon (DOC) on removal efficiency was studied. The removal efficiency of PFASs was studied in pilot-scale column experiments at Bäcklösa drinking water treatment plant (DWTP) in Uppsala, Sweden. The laboratory batch experiments were performed at Swedish University of Agricultural Sciences (SLU), Uppsala. The results from the column experiment indicated a decrease in removal efficiency with increasing number of bed volumes (BVs) for both GAC and AE. The average removal efficiency of all PFASs (n=14) during the 140 day column study was 65% for both GAC and AE. At the end of the column experiment, the average removal efficiency of all PFASs was 49% for GAC and 53% for AE. Removal efficiency was influenced by functional group; perfluoroalkane (-alkyl) sulfonic acids (PFSAs) were more efficiently removed than perfluoroalkyl carboxylic acids (PFCAs) (on average 56% vs 38% for GAC, respectively, and 82% vs 28% for AE, respectively). In addition, the perfluorocarbon chain length influenced the removal efficiency. Results from the column experiment indicated higher removal efficiency as the perfluorocarbon chain length increased. In contrast, the results from the batch experiments indicated the opposite; decreasing adsorption to GAC and AE as the chain length increased. Furthermore, presence of DOC in the water affected the removal efficiency of the investigated PFASs. However, the results indicated, contrary to the few studies previously performed on DOC and removal efficiency of PFASs, enhanced sorption of PFASs to GAC with increasing DOC concentration, and decreased PFAS sorption to AE as the DOC concentration increased. In addition, the removal efficiency of GAC and AE varied using water types with different DOC origin, indicating that DOC characteristics influence the removal efficiency of PFASs in water. The six pilot tests are using Filtrasorb 600, but Brunswick county did test Filtrasorb 400 and it was not fully effective. There is not enough data yet for Filtrasorb 600, but initial Chemours data show that Chemicals do get thru in less than the 120 day point.

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Line 69 listed as: COMPLIANCE MEASURES – GROUNDWATER

Line 70 listed as: Re-Testing of Private Wells

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quantitative limit for any PFAs constituents. Multiple found PFAs constituents will be considered as separate violations of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c) and deemed a violation pursuant to G.S. 143-214-1.

**MODIFIED to READ**

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**From:** Bobby Swilley  
**To:** [comments.chemours](mailto:comments.chemours)  
**Cc:** "Mike Watters"  
**Subject:** [External] Changes to aggrement  
**Date:** Monday, July 9, 2018 2:55:29 PM

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**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

**My name is Bobby J. Swilley, a resident of Point East Subdivision, Grays Creek, Fayetteville, NC and we totally agree with the changes requested by Mr. Mike Watters , our neighbor. We want changes he offered and especially numbers 67, 69, and 70. We are 100% in agreement with his proposal so, please add our names to the list requesting changes to this document. BTW, our test came back at 126.**

**Bobby J. and Ann Marie Swilley  
1904 Nantuckett Court  
Fayetteville, NC 28306  
910-964-7562**

**From:** Mr Bowen  
**To:** [comments.chemours](mailto:comments.chemours)  
**Cc:** [Bill\\_email\\_Bowen](mailto:Bill_email_Bowen)  
**Subject:** [External] Help clean up please  
**Date:** Monday, July 9, 2018 2:29:39 PM

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Dear Chemours,

Please help clean up the pollutants in our river so we can have safe drinking water. Please don't dump anymore chemicals in the cape fear river. Is money that important to you?

Sincerely,  
Bill Bowen



**From:** Joey Hall  
**To:** [comments.chemours](#)  
**Subject:** [External] Poisoned water  
**Date:** Monday, July 9, 2018 2:16:29 PM

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**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

I am very sad that as a Wilmington resident, I have to deal with poisoned water as a result of the actions of Chemours

My cat has had cancer 3 times, and I blame Chemour's shameful actions for that.

Joey Hall

--

DeadMan Productions LLC

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**From:** Mike Watters <wattersm@gmail.com>  
**Sent:** Monday, July 9, 2018 12:28 PM  
**To:** comments.chemours  
**Subject:** [External] Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

**Attachments:** Request for Amendment of N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580..docx; Attachment 3 - Chemours\_Residential Carbon Pilot Data - w Field Blank Data - sent 061518.pdf; Attachment 4 - delvcl107661-449499-4832122\_c050318.pdf; Attachment 5 - Watters Well Side by Side Comparisons by results.pdf

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Here is my comments.

Point of contact Michael Watters 6975 Point East Dr  
Fayetteville, NC 28306  
[wattersm@gmail.com](mailto:wattersm@gmail.com)  
910-424-2162  
Document # \_\_\_\_\_

Department of Environmental Quality  
Assistant Secretary's Office  
RE: Chemours Public Comment  
1601 Mail Service Center  
Raleigh, N.C. 27699-1601

**SUBJECT:** Request amendment to the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

1. We the Residents within the “affected households” that live within the geographical area of the Chemours managed Fayetteville Works facility (Cumberland, Bladen & Robeson Counties) are requesting modification of the N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

2. In the absence of evidence to the contrary, ATSDR assumes that humans are more sensitive to the effects of hazardous substance than animals and that certain persons may be particularly sensitive, the report notes. Thus, the resulting MRL may be as much as 100-fold below levels that have been shown to be nontoxic in laboratory animals. This federal study is deeply concerning because it demonstrates that PFAS chemicals are more dangerous to human health than the EPA has previously acknowledged. We are requesting the Department of Environmental Quality address these PFAS contaminations with more urgency. We must ensure that families exposed to these dangerous chemicals receive municipal water, cost to the Company that caused the contamination should not be a factor in decision making.

3. This request is signed by the “affected households” that have wells that are exceedance of the Practical Quantitative Limit (PQL) for any PFAS constituents in violation of 15A NCAC 02L .0202. These are not naturally occurring substances and no standard has been so the permitted concentration requires that they be below the Practical Quantitative limit for Class GA or Class GSA groundwaters pursuant to 15A NCAC 2L .0202(c). This changes the cost per household to approximately \$24k per household for the Cumberland county homes west of the Cape Fear River as presented by Chemours-Parsons developed plan. Why use the Practical Quantitative Limit for all PFAS detected instead of single GENX health goal?

a. According to environmental chemists, the proposed ATSDR "minimum risk levels" or MRLs, translate roughly to 7-ppt for PFOS and 11-ppt for PFOA -- the two PFAS compounds which the state of Michigan has established cleanup standards for groundwater that people drink.

b. A 7-ppt MRL level for PFOS exposure is lower than Michigan's 12-ppt enforceable standard for that compound in surface water, a rule developed to account for bioaccumulation in fish. The U.S. Environmental Protection Agency health advisory level for PFOS and PFOA is a combined 70-ppt, a level some researchers call inadequate to protect public health. We know fish in Marshwood lake did show bioaccumulation of PFAS in fish tested.

c. PFAS have been "extensively evaluated in humans and laboratory animals," the study notes, but says comparing toxicity across species is problematic because, among other things, humans take much longer to purge the chemicals from their bodies. The chemicals also cause different health problems in humans versus animals.

d. The ATSDR proposes MRLs translating to about 70-ppt for PFHxS and 10.5 ppt for PFNA, two PFAS compounds for which there are no federal Standards. These are found in many of the wells surrounding the facility as well as in the plume contaminating the aquifer under the facility. Refer to the Dec 16 Corrective Measure Study that is in DEQ public edocs site for proof.

e. "This study confirms that the EPA's guidelines for PFAS levels in drinking water woefully underestimate risks to human health," said Olga Naidenko, a senior science advisor at the nonprofit Environmental Working Group. "We urge EPA to collect and publish all water results showing PFAS contamination at any level, so Americans across the country can take immediate steps to protect themselves and their families."

4. Reasons why Granular Activated Carbon systems should not be option over PWC Municipal Water for Cumberland County residents or Bladen county water for Bladen county residents are as follows:

a. Many data points about installing municipal water lines in Cumberland county are inaccurate based on 9 year old data. There is a new 12" pipe being installed off Thrower road with planned extension along Hwy97 to homes near the Alderman Hwy 87 intersection. The Water Replacement plan costing data is inaccurate and needs review by Cumberland and Bladen County commissions. This should also be measured as if all home found in violation of the Groundwater Rules not just the exceedance of health goal. The cost presented in Nov 2017 to the Bladen County Commission was far less for West of Cape Fear than presented in the plan, the data for Cumberland county is based on 9 year old data and does not take into account the massive growth in the areas south of Sandhill Road all the way along Hwy 87 to the Bladen County line.

b. Incomplete Data has been provided by Chemours to DEQ for the tests every other week. This is very important in making decisions such as if Granular Activated Carbon systems are viable and the full cost including operation and maintenance costs. It was presented as a one time cost of \$10K to install, that is not correct data when comparing GAC to municipal water options and taints decision points.

c. The data provided by Chemours (not complete or actual lab results) does indicate that trace chemicals are getting thru the Granular Activated Carbon systems. This would be a violation of 15A NCAC 02L .0202. The full set of data including all of the lab results on all samples taken, as well as the additional field data, such as frequency of sediment filter & iron filter replacement was withheld by Chemours from the well owners and DEQ. Not enough information has been properly reviewed to determine effectiveness, but the data from Chemours indicated that they would be in violation the Groundwater rules/Standards of 15A NCAC 02L .0202.

d. The Swedish study on Granular Activated Carbon systems found them to be inefficient after a 140 day study. The study was to investigate the removal efficiency of PFASs in water using two treatment techniques; granular activated carbon (GAC), type Filtrasorb 400®, and anion exchange (AE), type Purolite A-600. Additionally, the effect of dissolved organic carbon (DOC) on removal efficiency was studied. The removal efficiency of PFASs was studied in pilot-scale column experiments at Bäcklösa drinking water treatment plant (DWTP) in Uppsala, Sweden. The laboratory batch experiments were performed at Swedish University of Agricultural Sciences (SLU), Uppsala. The results from the column experiment indicated a decrease in removal efficiency with increasing number of bed volumes (BVs) for both GAC and AE. The average removal efficiency of all PFASs (n=14) during the 140 day column study was 65% for both GAC and AE. At the end of the column experiment, the average removal efficiency of all PFASs was 49% for GAC and 53% for AE. Removal efficiency was influenced by functional group; perfluoroalkane (-alkyl) sulfonic acids (PFASs) were more efficiently removed than perfluoroalkyl carboxylic acids (PFCAs) (on average 56% vs 38% for GAC, respectively, and 82% vs 28% for AE, respectively). In addition, the perfluorocarbon chain length influenced the removal efficiency. Results from the column experiment indicated higher removal efficiency as the perfluorocarbon chain length increased. In contrast, the results from the batch experiments indicated the opposite; decreasing adsorption to GAC and AE as the chain length increased. Furthermore, presence of DOC in the water affected the removal efficiency of the investigated PFASs. However, the results indicated, contrary to the few studies previously performed on DOC and removal efficiency of PFASs, enhanced sorption of PFASs to GAC with increasing DOC concentration, and decreased PFAS sorption to AE as the DOC concentration increased. In addition, the removal efficiency of GAC and AE varied using water types with different DOC origin, indicating that DOC characteristics influence the removal efficiency of PFASs in water. The six pilot tests are using Filtrasorb 600, but Brunswick county did test Filtrasorb 400 and it was not fully effective. There is not enough data yet for Filtrasorb 600, but initial Chemours data show that Chemicals do get thru in less than the 120 day point.

e. Department of Environmental Quality cannot use this set of rules to violate in one instance and not use it as a determination point on who should be provided municipal or filtration systems. The test data provided by Chemours of the Granular Activated Carbon systems proves that the systems allow trace amounts of chemicals to pass through the system. The 12 April, 26 April and 10 May Chemours results for Site 48 prove this to be fact. Thus the results are in violation as there is an exceedance of the Practical Quantitative Limit (PQL) for PFAs constituents in violation of 15A NCAC 02L .0202. The DEQ test results from the 3 May test indicates a 106.03 ng/L of combined PFAs breakthrough and this is in less than 1 month of use for this specific test system.

f. Maintenance of the system as noted on site 48 that on 5 July could cause contamination as occurred when Parsons found that the Iron filter allowed iron to get into the GAC canisters. This was rectified by doing a backflush running the water onto the soil. This backflush would wash the contaminants that were captured out to the soil that is less than 30 feet from the well. This is no different then an inadvertent spill while filling a truck with contaminated water and should be a violation and reported as a minor reported spill.

5. We request the following three areas to be modified:

Line 67 Listed as: Health Studies

Line 69 listed as: COMPLIANCE MEASURES – GROUNDWATER

Line 70 listed as: Re-Testing of Private Wells

6. The verbiage that we believe should be present is listed below and referenced to the sections we desire to see modification. We have also included a modified PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580 with the highlighted changes inserted. This is in compliance with the standards used by the Division of Waste Management in the 11 June 2018 Notice of Violation. We the “affected households” request municipal water to be run at Chemours expense. We have included an area on the signature pages attached to indicate who would prefer Municipal water and who would prefer the filtration option to answer that portion in one submission.

#### Section 67 Health Studies

It is our belief and desire that part of the health studies should include testing of the members blood & urine of all members of the households that have wells that test or tested with any exceedance of any Practical Quantitative Limit as defined by North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Chemours has stated that these chemicals harm nobody, it is time they prove it and in good faith or under court order they should be compelled to do this as part of the health studies. The harm to not only human or aquatic life needs to be researched, but also animals, such as Dogs, Cats, Birds and Farm animals.

#### MODIFIED TO READ

##### COMPLIANCE MEASURES – GROUNDWATER

69. Permanent Replacement of Private Drinking Water Supplies: By no later than twelve (18) months after issuance of this Order, Chemours shall establish permanent replacement water supplies for each household with a water supply well contaminated by any PFAS (“affected households”) PFBS CAS# 375-73-5, PFDA CAS# 335-76-2, PFDa CAS# 307-55-1, PFHpA CAS# 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1, PFTrIA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3, PFMOAA CAS# 39492-89-2, PFCECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PF03OA CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or additionally discovered PFAS in exceedance of the practical quantitative limit (PQL). The authority provided under Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), “substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. The replacement water supply shall be established by connection to a public water supply, except that an affected household may elect to receive a filtration system approved by DEQ in lieu of a connection to public water supply, in which case Chemours shall install a filtration system. For affected households Chemours shall be liable for any water bills from public utilities and for periodic required maintenance for any home that requested the DEQ approved filtration system. Chemours shall submit a plan for compliance with this provision, including a detailed schedule with milestones, no later than sixty (60) days after entry of this Order. This provision shall supplement any prior requirements regarding the provision of permanent replacement water supplies. Upon failure to comply with installation of municipal water to all homes with groundwater wells in exceedance of the Groundwater rules DEQ to find Chemours in violation of Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c), “substances which are not naturally occurring and which no standard is specified shall not be permitted in concentrations at or above the practical quantitation limit in class GA or Class GSA groundwaters. DEQ will assess penalties under NCGS 143-215.6A (a)(1) of not more than \$25,000 per day for each groundwater well that has been tested and been found to exceedance of the practical quantitative limit for any PFAs constituents. Multiple found PFAs constituents will be considered as separate violations of the North Carolina Administrative Code (NCAC) Subchapter 02L .0202 Ground water Standards. Pursuant to 15A NCAC 2L .0202(c) and deemed a violation pursuant to G.S. 143-214-1.

MODIFIED to READ

70. Re-Testing of Private Wells: Chemours shall conduct testing of private drinking water supply wells as follows: for wells with test results showing no detectable concentrations of PFAS Compounds, Chemours shall re-test for PFBS CAS# 375-73-5, PFDA CAS# 335-76-2, PFDoA CAS# 307-55-1, PFHpA CAS# 375-85-9, PFHxS CAS# 335-46-4, PFHxA CAS# 307-24-4, PFNA CAS# 375-95-1, PFTriA CAS# 72629-94-8, PFUnA CAS# 2058-94-8, PFPeA CAS# 2706-90-3, PFMOAA CAS# 39492-89-2, PFECA\_F CAS# 377-73-1, PF02HxA CAS# 39492-88-1, PFo3OA CAS# 39492-89-2, PFO4DA CAS# 39492-90-5, PFO5DA CAS# 39492-91-6, PFESA Byproduct 1 CAS# 66796-30-3, and PFESA Byproduct 2 CAS# 749836-20-2 or additionally discovered PFAS in exceedance of the practical quantitative limit (PQL) on an annual basis until sampling shows no detectable concentrations of any PFAS constituents for two consecutive sampling events. Chemours shall provide to DEQ a list of residents within these sampling ranges, identified by both their address and sample ID. Chemours shall also provide to DEQ a list of wells (identified by address) targeted for testing that have not yet been tested and verifying its efforts to test these wells.

Attachment 1 - Modified version of N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

Attachment 2 -Affected Households Signatures requesting Changes to N.C. DEPARTMENT OF ENVIRONMENTAL QUALITY FILES PROPOSED ORDER FOR PRELIMINARY INJUNCTIVE RELIEF IN BLADEN COUNTY SUPERIOR COURT, Case No. 17 CVS 580.

Attachment 3 – Chemours Data listed as Chemours Residential Carbon Pilot Data - w Field Blank Data - sent 061518.pdf

Attachment 4 – DEQ 3 May 18 (GEL Lab report delvcL107661-449499-4832122\_c050318.pdf)

Attachment 5 - Watters Well Side by Side Comparisons by results.pdf

Attachment 3 – Chemours Data listed as Chemours Residential Carbon Pilot Data - w Field Blank Data - sent 061518

TABLE 1  
1649 BLADEN UNION CHURCH ROAD  
RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS  
Chemours Fayetteville Works, North Carolina

Reporting to MDL / PQL		MDL	MDL	MDL	MDL	MDL
Data Status		Final Data	Final Data	Final Data	Final Data	Final Data
Location		1649 Bladen Union Church Road	1649 Bladen Union Church Road	1649 Bladen Union Church Road	1649 Bladen Union Church Road	1649 Bladen Union Church Road
Field Sample		1649BLADE-042018-W1-1R	1649BLADE-042018-W1-1B	1649BLADE-042018-W1-1M	1649BLADE-042018-W1-1A	1649BLADE-042618-W1-1R
Sample Location		Raw Water	After Iron Filter	After First Carbon Canister	After Second Carbon Canister	Raw Water
Date Sampled		20-Apr-18	20-Apr-18	20-Apr-18	20-Apr-18	26-Apr-18
HFPO-DA	CAS Number					
HFPO-DA	13252-13-6	1300	37	2.5 B	0.28 U	1,600
Table 3 Compounds (ng/L)†						
PEPA		600 B	200 U	200 U	200 U	500
PFECA-G	174767-10-3; 801212-59-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U	200 U	200 U	200 U
PFMOAA	674-13-5	200 U	200 U	200 U	200 U	300
PFO2HXA	39492-88-1	750 B	200 U	200 U	200 U	800
PFO3OA	39492-89-2	200 U	200 U	200 U	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U	200 U	200 U	200 U
PMPA	13140-29-9	2,000 B	200 B	200 U	200 U	2,000
TAFN4	39492-91-6	200 U	200 U	200 U	200 U	200 U
PFAS (ng/L)†						
10:2-fluorotelomersulfonic acid	120226-60-0	2.8 U	2.8 U	2.8 U	2.7 U	2.8 UJ
4:2-fluorotelomersulfonic acid	757124-72-4	0.92 UJ	0.92 UJ	0.93 UJ	0.91 U	0.92 U
6:2-fluorotelomersulfonic acid	27619-97-2	0.92 UJ	0.92 U	0.93 U	0.91 U	0.92 UJ
8:2-fluorotelomersulfonic acid	39108-34-4	1.8 U	1.8 U	1.9 U	1.8 U	1.8 UJ
NEtFOSAA	2991-50-6	0.92 UJ	0.92 U	0.93 UJ	0.91 UJ	0.92 UJ
NEtPFOSA	4151-50-2	2.8 UJ	2.8 UJ	2.8 UJ	2.7 UJ	2.8 UJ
NEtPFOSAE	1691-99-2	0.92 UJ	0.92 U	0.93 U	0.91 UJ	0.92 UJ
NMeFOSAA	2355-31-9	0.92 UJ	0.92 UJ	0.93 U	0.91 UJ	0.92 UJ
NMePFOSA	31506-32-8	2.8 UJ	2.8 UJ	2.8 UJ	2.7 U	2.8 UJ
NMePFOSAE	24448-09-7	0.92 UJ	0.92 UJ	0.93 U	0.91 UJ	0.92 UJ
Perfluorobutanesulfonic acid	375-73-5	4.2 J	0.28 U	0.28 U	0.27 U	4.2 J
Perfluorobutanoic acid	375-22-4	18 J	1.8 U	1.9 U	1.8 U	19
Perfluorodecanesulfonic acid	335-77-3	0.55 U	0.55 U	0.56 U	0.55 U	0.55 U
Perfluorodecanoic acid	335-76-2	0.92 U	0.92 U	0.93 U	0.91 U	0.92 U
Perfluorododecanesulfonic acid	79780-39-5	0.28 U	0.28 U	0.28 U	0.27 U	0.28 U
Perfluorododecanoic acid	307-55-1	0.28 U	0.28 U	0.28 U	0.27 U	0.28 U
Perfluoroheptanesulfonic acid	375-92-8	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Perfluoroheptanoic acid	375-85-9	2.8	0.28 U	0.28 U	0.27 U	2.9
Perfluorohexadecanoic acid	67905-19-5	0.28 U	0.28 U	0.28 U	0.27 U	0.28 U
Perfluorohexanesulfonic acid	355-46-4	1.1 J	0.37 U	0.37 U	0.37 U	1.2 J
Perfluorohexanoic acid	307-24-4	4.2	0.37 U	0.37 U	0.37 U	4.6 J
Perfluorononanesulfonic acid	68259-12-1	0.55 U	0.55 U	0.56 U	0.55 U	0.55 U
Perfluorononanoic acid	375-95-1	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Perfluorooctadecanoic acid	376-06-7	0.28 U	0.28 U	0.28 U	0.27 U	0.28 U
Perfluorooctanesulfonamide	754-91-6	0.92 U	0.92 U	0.93 U	0.91 U	0.92 UJ
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.62 J	0.37 U	0.37 U	0.37 U	0.61 J
Perfluorooctanoic acid (PFOA)	335-67-1	3.2	0.28 U	0.28 U	0.27 U	3.4 J
Perfluoropentanesulfonic acid	2706-91-4	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Perfluoropentanoic acid	2706-90-3	17 J	1.8 U	1.9 U	1.8 U	18
Perfluorotetradecanoic acid	376-06-7	0.28 U	0.28 U	0.28 U	0.27 U	0.28 U
Perfluorotridecanoic acid	72629-94-8	0.28 U	0.28 U	0.28 U	0.27 U	0.28 U
Perfluoroundecanoic acid	2058-94-8	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U

**Notes:**  
 -- - compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
 B - compound detected in method blank PQL - practical quantitation limit  
 J - indicates estimated value U - compound not detected  
 MDL - method detection limit  
 ng/L - nanogram per liter \* data has not be validated  
 Z - lab control spike compound recovery is outside the QC acceptance limit  
 † nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).

**Legend:**  
 Detected above the quantitation limit  
 Non-detect in samples after canisters  
 Detected in laboratory method blank

**TABLE 1**  
**1649 BLADEN UNION CHURCH ROAD**  
**RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		MDL	MDL	MDL	PQL	PQL
Data Status		Final Data	Final Data	Final Data	Final Data	Final Data
Location		1649 Bladen Union Church Road	1649 Bladen Union Church Road	1649 Bladen Union Church Road	1649 Bladen Union Church Road	1649 Bladen Union Church Road
Field Sample		1649BLADE-042618-W1-1B	1649BLADE-042618-W1-1M	1649BLADE-042618-W1-1A	1649BLADE-051018-W1-1R	1649BLADE-051018-W1-1B
Sample Location		After Iron Filter	After First Carbon Canister	After Second Carbon Canister	Raw Water	After Iron Filter
Date Sampled		26-Apr-18	26-Apr-18	26-Apr-18	10-May-18	10-May-18
HFPO-DA	CAS Number					
HFPO-DA	13252-13-6	1,600	0.26 U	0.26 U	1,700	1,400
<b>Table 3 Compounds (ng/L)†</b>						
PEPA		500 B	200 U	200 U	500	450
PFECA-G	174767-10-3; 801212-59-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U	200 U	200 U	200 U
PFMOAA	674-13-5	300 B	200 U	200 U	400	300
PFO2HXA	39492-88-1	800 B	200 U	200 U	800	800
PFO3OA	39492-89-2	200 U	200 U	200 U	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U	200 U	200 U	200 U
PMPA	13140-29-9	2,000 B	200 U	200 U	200	200
TAFN4	39492-91-6	200 U	200 U	200 U	200 U	200 U
<b>PFAS (ng/L)†</b>						
10:2-fluorotelomersulfonic acid	120226-60-0	2.8 U	2.8 U	2.8 U	8.3 U	8.4 UZ
4:2-fluorotelomersulfonic acid	757124-72-4	0.92 UJ	0.93 UJ	0.93 UJ	2.8 U	2.8 U
6:2-fluorotelomersulfonic acid	27619-97-2	0.92 UJ	0.93 UJ	0.93 UJ	1.9 U	1.9 U
8:2-fluorotelomersulfonic acid	39108-34-4	1.8 UJ	1.9 UJ	1.9 UJ	5.6 U	5.6 U
NEtFOSAA	2991-50-6	0.92 UJ	0.93 UJ	0.93 UJ	2.8 U	2.8 U
NEtPFOSA	4151-50-2	2.8 UJ	2.8 UJ	2.8 UJ	8.3 U	8.4 U
NEtPFOSAE	1691-99-2	0.92 UJ	0.93 UJ	0.93 UJ	2.8 U	2.8 U
NMeFOSAA	2355-31-9	0.92 UJ	0.93 UJ	0.93 UJ	2.8 U	2.8 U
NMePFOSA	31506-32-8	2.8 UJ	2.8 UJ	2.8 UJ	8.3 U	8.4 U
NMePFOSAE	24448-09-7	0.92 UJ	0.93 UJ	0.93 UJ	2.8 U	2.8 U
Perfluorobutanesulfonic acid	375-73-5	3.8 J	0.28 U	0.28 U	4.2	4
Perfluorobutanoic acid	375-22-4	19	1.9 U	1.9 U	18	17
Perfluorodecanesulfonic acid	335-77-3	0.55 U	0.56 U	0.56 U	1.9 U	1.9 U
Perfluorodecanoic acid	335-76-2	0.92 U	0.93 U	0.93 U	1.9 U	1.9 U
Perfluorododecanesulfonic acid	79780-39-5	0.28 U	0.28 U	0.28 U	0.93 U	0.93 U
Perfluorododecanoic acid	307-55-1	0.28 U	0.28 U	0.28 U	0.93 U	0.93 U
Perfluoroheptanesulfonic acid	375-92-8	0.37 U	0.37 U	0.37 U	1.9 U	1.9 U
Perfluoroheptanoic acid	375-85-9	2.6	0.28 U	0.28 U	2.8	2.8
Perfluorohexadecanoic acid	67905-19-5	0.28 U	0.28 U	0.29 J	0.93 U	0.93 U
Perfluorohexanesulfonic acid	355-46-4	0.87 J	0.37 U	0.37 U	1.9 U	1.9 U
Perfluorohexanoic acid	307-24-4	4.1	0.37 U	0.37 U	4.1	4
Perfluorononanesulfonic acid	68259-12-1	0.55 U	0.56 U	0.56 U	1.9 U	1.9 U
Perfluorononanoic acid	375-95-1	0.37 U	0.37 U	0.37 U	1.9 U	1.9 U
Perfluorooctadecanoic acid	376-06-7	0.28 U	0.28 U	0.28 U	0.93 U	0.93 U
Perfluorooctanesulfonamide	754-91-6	0.92 UJ	0.93 UJ	0.93 UJ	2.8 U	2.8 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.67 J	0.37 U	0.37 U	1.9 U	1.9 U
Perfluorooctanoic acid (PFOA)	335-67-1	2.7	0.28 U	0.28 U	3.3	3.3
Perfluoropentanesulfonic acid	2706-91-4	0.37 U	0.37 U	0.37 U	1.9 U	1.9 U
Perfluoropentanoic acid	2706-90-3	18 J	1.9 U	1.9 U	17	17
Perfluorotetradecanoic acid	376-06-7	0.28 U	0.28 U	0.46 J	0.93 U	0.93 U
Perfluorotridecanoic acid	72629-94-8	0.28 U	0.28 U	0.28 U	0.93 U	0.93 UZ
Perfluoroundecanoic acid	2058-94-8	0.37 U	0.37 U	0.37 U	1.9 U	1.9 U

**Notes:**  
-- - compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
B - compound detected in method blank PQL - practical quantitation limit  
J - indicates estimated value U - compound not detected  
MDL - method detection limit  
ng/L - nanogram per liter \* data has not be validated  
Z - lab control spike compound recovery is outside the QC acceptance limit  
† nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).

**Legend:**  
Detected above the quantitation limit  
Non-detect in samples after canisters  
Detected in laboratory method blank



**TABLE 1**  
**1649 BLADEN UNION CHURCH ROAD**  
**RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		PQL	PQL
<b>Data Status</b>		Final Data	Final Data
<b>Location</b>		1649 Bladen Union Church Road	1649 Bladen Union Church Road
<b>Field Sample</b>		1649BLADE-051018-W1-1M	1649BLADE-051018-W1-1A
<b>Sample Location</b>		After First Carbon Canister	After Second Carbon Canister
<b>Date Sampled</b>		10-May-18	10-May-18
<b>HFPO-DA</b>	<b>CAS Number</b>		
HFPO-DA	13252-13-6	0.96 U	0.97 UJ
<b>Table 3 Compounds (ng/L)†</b>			
PEPA		200 U	200 U
PFECA-G	174767-10-3; 801212-59-9	200 U	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U
PFMOAA	674-13-5	200 U	200 U
PFO2HXA	39492-88-1	200 U	200 U
PFO3OA	39492-89-2	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U
PMPA	13140-29-9	200 U	200 U
TAFN4	39492-91-6	200 U	200 U
<b>PFAS (ng/L)†</b>			
10:2-fluorotelomersulfonic acid	120226-60-0	8.3 UZ	8.2 UZ
4:2-fluorotelomersulfonic acid	757124-72-4	2.8 U	2.7 U
6:2-fluorotelomersulfonic acid	27619-97-2	1.8 U	1.8 U
8:2-fluorotelomersulfonic acid	39108-34-4	5.5 U	5.5 U
NEtFOSAA	2991-50-6	2.8 U	2.7 U
NEtPFOSA	4151-50-2	8.3 UJ	8.2 UJ
NEtPFOSAE	1691-99-2	2.8 U	2.7 UJ
NMeFOSAA	2355-31-9	2.8 U	2.7 U
NMePFOSA	31506-32-8	8.3 UJ	8.2 UJ
NMePFOSAE	24448-09-7	2.8 U	2.7 UJ
Perfluorobutanesulfonic acid	375-73-5	0.92 U	0.91 U
Perfluorobutanoic acid	375-22-4	5.5 U	5.5 U
Perfluorodecanesulfonic acid	335-77-3	1.8 U	1.8 U
Perfluorodecanoic acid	335-76-2	1.8 U	1.8 U
Perfluorododecanesulfonic acid	79780-39-5	0.92 U	0.91 U
Perfluorododecanoic acid	307-55-1	0.92 U	0.91 U
Perfluoroheptanesulfonic acid	375-92-8	1.8 U	1.8 U
Perfluoroheptanoic acid	375-85-9	0.92 U	0.91 U
Perfluorohexadecanoic acid	67905-19-5	0.92 U	0.91 U
Perfluorohexanesulfonic acid	355-46-4	1.8 U	1.8 U
Perfluorohexanoic acid	307-24-4	1.8 U	1.8 U
Perfluorononanesulfonic acid	68259-12-1	1.8 U	1.8 U
Perfluorononanoic acid	375-95-1	1.8 U	1.8 U
Perfluorooctadecanoic acid	376-06-7	0.92 U	0.91 U
Perfluorooctanesulfonamide	754-91-6	2.8 U	2.7 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	1.8 U	1.8 U
Perfluorooctanoic acid (PFOA)	335-67-1	0.92 U	0.91 U
Perfluoropentanesulfonic acid	2706-91-4	1.8 U	1.8 U
Perfluoropentanoic acid	2706-90-3	5.5 U	5.5 U
Perfluorotetradecanoic acid	376-06-7	0.92 U	0.91 U
Perfluorotridecanoic acid	72629-94-8	0.92 UZ	0.91 UZ
Perfluoroundecanoic acid	2058-94-8	1.8 U	1.8 U

**Notes:**

-- - compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
B - compound detected in method blank PQL - practical quantitation limit  
J - indicates estimated value U - compound not detected  
MDL - method detection limit  
ng/L - nanogram per liter \* data has not be validated  
Z - lab control spike compound recovery is outside the QC acceptance limit  
† nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).

**Legend:**

Detected above the quantitation limit  
Non-detect in samples after canisters  
Detected in laboratory method blank

**TABLE 2**  
**3628 COUNTY LINE ROAD**  
**RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		MDL	MDL	MDL	MDL	MDL
Data Status		Final Data	Final Data	Final Data	Final Data	Final Data
Location		3628 County Line Road	3628 County Line Road	3628 County Line Road	3628 County Line Road	3628 County Line Road
Field Sample		3628COUNT-041218-W1-1R	3628COUNT-041218-W1-1B	3628COUNT-041218-W1-1M	3628COUNT-041218-W1-1A	3628COUNT-042618-W1-1O‡
Sample Location		Raw Water	After Iron Filter	After First Carbon Canister	After Second Carbon Canister	Raw Water
Date Sampled		12-Apr-18	12-Apr-18	12-Apr-18	12-Apr-18	26-Apr-18
HFPO-DA	CAS Number					
HFPO-DA	13252-13-6	930	18	0.28 U	0.87 J	870
Table 3 Compounds (ng/L)						
PEPA		400	200 U		200 U	400
PFECA-G	174767-10-3; 801212-59-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U	200 U	200 U	200 U
PFMOAA	674-13-5	200 U	200 U	200 U	200 U	200 U
PFO2HXA	39492-88-1	650	200 U	200 U	200 U	700
PFO3OA	39492-89-2	200 U	200 U	200 U	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U	200 U	200 U	200 U
PMPA	13140-29-9	2,000	200 U	200 U	200 U	2,000
TAFN4	39492-91-6	200 U	200 U	200 U	200 U	200 U
PFAS (ng/L)†				200 U		
10:2-fluorotelomersulfonic acid	120226-60-0	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U
4:2 fluorotelomersulfonic acid	757124-72-4	0.93 U	0.93 U	0.93 U	0.92 U	0.92 U
6:2 fluorotelomersulfonic acid	27619-97-2	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U
8:2 fluorotelomersulfonic acid	39108-34-4	1.9 U	1.9 U	1.9 U	1.8 U	1.8 U
NEtFOSAA	2991-50-6	0.93 UJ	0.93 U	0.93 UJ	0.92 U	0.92 UJ
NEtPFOSA	4151-50-2	2.8 UJ	2.8 U	2.8 UJ	2.8 UJ	2.8 UJ
NEtPFOSAE	1691-99-2	0.93 UJ	0.93 U	0.93 UJ	0.92 UJ	0.92 UJ
NMeFOSAA	2355-31-9	0.93 UJ	0.93 U	0.93 UJ	0.92 UJ	0.92 UJ
NMePFOSA	31506-32-8	2.8 UJ	2.8 U	2.8 UJ	2.8 UJ	2.8 UJ
NMePFOSAE	24448-09-7	0.93 UJ	0.93 U	0.93 UJ	0.92 UJ	0.92 UJ
Perfluorobutanesulfonic acid	375-73-5	1.8	0.28 U	0.28 U	0.28 U	2
Perfluorobutanoic acid	375-22-4	12	1.9 U	1.9 U	1.8 U	12
Perfluorodecanesulfonic acid	335-77-3	0.56 U	0.56 U	0.56 U	0.55 U	0.55 U
Perfluorodecanoic acid	335-76-2	0.93 U	0.93 U	0.93 U	0.92 U	0.92 U
Perfluorododecanesulfonic acid	79780-39-5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Perfluorododecanoic acid	307-55-1	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Perfluoroheptanesulfonic acid	375-92-8	0.45 J	0.37 U	0.37 U	0.37 U	0.45 J
Perfluoroheptanoic acid	375-85-9	3.4	0.28 U	0.28 U	0.28 U	3.3
Perfluorohexadecanoic acid	67905-19-5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Perfluorohexanesulfonic acid	355-46-4	1.7 J	0.37 U	0.37 U	0.37 U	1.6 J
Perfluorohexanoic acid	307-24-4	6.1	0.37 U	0.37 U	0.37 U	6.3
Perfluorononanesulfonic acid	68259-12-1	0.56 U	0.56 U	0.56 U	0.55 U	0.55 U
Perfluorononanoic acid	375-95-1	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Perfluorooctadecanoic acid	376-06-7	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Perfluorooctanesulfonamide	754-91-6	0.93 U	0.93 U	0.93 UJ	0.92 UJ	0.92 UJ
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4.9	0.37 U	0.37 U	0.37 U	5.6
Perfluorooctanoic acid (PFOA)	335-67-1	4.7	0.28 U	0.28 U	0.28 U	4.7
Perfluoropentanesulfonic acid	2706-91-4	0.52 J	0.37 U	0.37 U	0.37 U	0.53 J
Perfluoropentanoic acid	2706-90-3	17	1.9 U	1.9 U	1.8 U	18
Perfluorotetradecanoic acid	376-06-7	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Perfluorotridecanoic acid	72629-94-8	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Perfluoroundecanoic acid	2058-94-8	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U

**Notes:**  
-- - compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
B - compound detected in method blank PQL - practical quantitation limit  
J - indicates estimated value U - compound not detected  
MDL - method detection limit \* data has not be validated  
ng/L - nanogram per liter  
† nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).  
‡ Raw water sample ID labeled with "O" rather than "R" at end of sample name.

**Legend:**  
Detected above the quantitation limit  
Non-detect in samples after canisters

**TABLE 2**  
**3628 COUNTY LINE ROAD**  
**RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		MDL	MDL	MDL	PQL	PQL
Data Status		Final Data	Final Data	Final Data	Final Data	Final Data
Location		3628 County Line Road	3628 County Line Road	3628 County Line Road	3628 County Line Road	3628 County Line Road
Field Sample		3628COUNT-042618-W1-1B	3628COUNT-042618-W1-1M	3628COUNT-042618-W1-1A	PRELIM-3628COUNT-051018-W1-1R	PRELIM-3628COUNT-051018-W1-1B
Sample Location		After Iron Filter	After First Carbon Canister	After Second Carbon Canister	Raw Water	After Iron Filter
Date Sampled		26-Apr-18	26-Apr-18	26-Apr-18	10-May-18	10-May-18
HFPO-DA	CAS Number					
HFPO-DA	13252-13-6	930	0.27 U	1.1	910	950
<b>Table 3 Compounds (ng/L)</b>						
PEPA		400	200 U	200 U	300	300
PFECA-G	174767-10-3; 801212-59-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U	200 U	200 U	200 U
PFMOAA	674-13-5	200 U	200 U	200 U	200	200
PFO2HXA	39492-88-1	700	200 U	200 U	700	750
PFO3OA	39492-89-2	200 U	200 U	200 U	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U	200 U	200 U	200 U
PMPA	13140-29-9	2,000	200 U	200 U	1,000	1,000
TAFN4	39492-91-6	200 U	200 U	200 U	200 U	200 U
<b>PFAS (ng/L)†</b>						
10:2-fluorotelomersulfonic acid	120226-60-0	2.8 U	2.8 U	2.8 U	8.3 U	8.3 U
4:2 fluorotelomersulfonic acid	757124-72-4	0.93 U	0.93 U	0.93 U	2.8 U	2.8 U
6:2 fluorotelomersulfonic acid	27619-97-2	2.8 U	2.8 U	2.8 U	1.8 U	1.8 U
8:2 fluorotelomersulfonic acid	39108-34-4	1.9 U	1.9 U	1.9 U	5.5 U	5.5 U
NEtFOSAA	2991-50-6	0.94 U	0.93 UJ	0.93 UJ	2.8 U	2.8 U
NEtPFOSA	4151-50-2	2.8 U	2.8 UJ	2.8 UJ	8.3 UJ	8.3 U
NEtPFOSAE	1691-99-2	0.94 U	0.93 UJ	0.93 UJ	2.8 UJ	2.8 U
NMeFOSAA	2355-31-9	0.94 U	0.93 UJ	0.93 UJ	2.8 U	2.8 U
NMePFOSA	31506-32-8	2.8 U	2.8 UJ	2.8 UJ	8.3 UJ	8.3 U
NMePFOSAE	24448-09-7	0.94 U	0.93 UJ	0.93 UJ	2.8 UJ	2.8 U
Perfluorobutanesulfonic acid	375-73-5	1.9	0.28 U	0.28 U	1.9 J	1.9
Perfluorobutanoic acid	375-22-4	12	1.9 U	1.9 U	12	11
Perfluorodecanesulfonic acid	335-77-3	0.56 U	0.56 U	0.56 U	1.8 U	1.8 U
Perfluorodecanoic acid	335-76-2	0.94 U	0.93 U	0.93 U	1.8 U	1.8 U
Perfluorododecanesulfonic acid	79780-39-5	0.28 U	0.28 U	0.28 U	0.92 U	0.92 U
Perfluorododecanoic acid	307-55-1	0.28 U	0.28 U	0.28 U	0.92 U	0.92 U
Perfluoroheptanesulfonic acid	375-92-8	0.52 J	0.37 U	0.37 U	1.8 U	1.8 U
Perfluoroheptanoic acid	375-85-9	3.8	0.28 U	0.28 U	3.3	3.2
Perfluorohexadecanoic acid	67905-19-5	0.28 U	0.28 U	0.28 U	0.92 U	0.92 U
Perfluorohexanesulfonic acid	355-46-4	1.6 J	0.37 U	0.37 U	1.8 U	1.8 U
Perfluorohexanoic acid	307-24-4	6.1	0.37 U	0.37 U	6.5	6
Perfluorononanesulfonic acid	68259-12-1	0.56 U	0.56 U	0.56 U	1.8 U	1.8 U
Perfluorononanoic acid	375-95-1	0.38 U	0.37 U	0.37 U	1.8 U	1.8 U
Perfluorooctadecanoic acid	376-06-7	0.28 U	0.28 U	0.28 U	0.92 U	0.92 U
Perfluorooctanesulfonamide	754-91-6	0.94 U	0.93 U	0.93 UJ	2.8 U	2.8 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4.8	0.37 U	0.37 U	18	9.9
Perfluorooctanoic acid (PFOA)	335-67-1	4.5	0.28 U	0.28 U	14	7.1
Perfluoropentanesulfonic acid	2706-91-4	0.5 J	0.37 U	0.37 U	1.8 U	1.8 U
Perfluoropentanoic acid	2706-90-3	17	1.9 U	1.9 U	18	16
Perfluorotetradecanoic acid	376-06-7	0.28 U	0.28 U	0.28 U	5.6	10
Perfluorotridecanoic acid	72629-94-8	0.28 U	0.28 U	0.28 U	0.92 U	0.92 U
Perfluoroundecanoic acid	2058-94-8	0.38 U	0.37 U	0.37 U	1.8 U	1.8 U

**Notes:**  
 -- - compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
 B - compound detected in method blank PQL - practical quantitation limit  
 J - indicates estimated value U - compound not detected  
 MDL - method detection limit \* data has not be validated  
 ng/L - nanogram per liter  
 † nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).  
 ‡ Raw water sample ID labeled with "O" rather than "R" at end of sample name.

**Legend:**  
 Detected above the quantitation limit  
 Non-detect in samples after canisters

**TABLE 2**  
**3628 COUNTY LINE ROAD**  
**RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		PQL	PQL
<b>Data Status</b>		Final Data	Final Data
<b>Location</b>		3628 County Line Road	3628 County Line Road
<b>Field Sample</b>		PRELIM-3628COUNT-051018-W1-1M	PRELIM-3628COUNT-051018-W1-1A
<b>Sample Location</b>		After First Carbon Canister	After Second Carbon Canister
<b>Date Sampled</b>		10-May-18	10-May-18
<b>HFPO-DA</b>	<b>CAS Number</b>		
HFPO-DA	13252-13-6	0.92 U	0.95 U
<b>Table 3 Compounds (ng/L)</b>			
PEPA		200 U	200 U
PFECA-G	174767-10-3; 801212-59-9	200 U	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U
PFMOAA	674-13-5	200 U	200 U
PFO2HXA	39492-88-1	200 U	200 U
PFO3OA	39492-89-2	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U
PMPA	13140-29-9	200 U	200 U
TAFN4	39492-91-6	200 U	200 U
<b>PFAS (ng/L)†</b>			
10:2-fluorotelomersulfonic acid	120226-60-0	8.2 U	8.2 U
4:2-fluorotelomersulfonic acid	757124-72-4	2.7 U	2.7 U
6:2-fluorotelomersulfonic acid	27619-97-2	1.8 U	1.8 U
8:2-fluorotelomersulfonic acid	39108-34-4	5.5 U	5.5 U
NEtFOSAA	2991-50-6	2.7 U	2.7 U
NEtPFOSA	4151-50-2	8.2 UJ	8.2 UJ
NEtPFOSAE	1691-99-2	2.7 UJ	2.7 UJ
NMeFOSAA	2355-31-9	2.7 U	2.7 U
NMePFOSA	31506-32-8	8.2 UJ	8.2 UJ
NMePFOSAE	24448-09-7	2.7 UJ	2.7 UJ
Perfluorobutanesulfonic acid	375-73-5	0.91 U	0.91 U
Perfluorobutanoic acid	375-22-4	5.5 U	5.5 U
Perfluorodecanesulfonic acid	335-77-3	1.8 U	1.8 U
Perfluorodecanoic acid	335-76-2	1.8 U	1.8 U
Perfluorododecanesulfonic acid	79780-39-5	0.91 U	0.91 U
Perfluorododecanoic acid	307-55-1	0.91 U	0.91 U
Perfluoroheptanesulfonic acid	375-92-8	1.8 U	1.8 U
Perfluoroheptanoic acid	375-85-9	0.91 U	0.91 U
Perfluorohexadecanoic acid	67905-19-5	0.91 U	0.91 U
Perfluorohexanesulfonic acid	355-46-4	1.8 U	1.8 U
Perfluorohexanoic acid	307-24-4	1.8 U	1.8 U
Perfluorononanesulfonic acid	68259-12-1	1.8 U	1.8 U
Perfluorononanoic acid	375-95-1	1.8 U	1.8 U
Perfluorooctadecanoic acid	376-06-7	0.91 U	0.91 U
Perfluorooctanesulfonamide	754-91-6	2.7 U	2.7 UJ
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	1.8 U	1.8 U
Perfluorooctanoic acid (PFOA)	335-67-1	0.91 U	0.91 U
Perfluoropentanesulfonic acid	2706-91-4	1.8 U	1.8 U
Perfluoropentanoic acid	2706-90-3	5.5 U	5.5 U
Perfluorotetradecanoic acid	376-06-7	0.91 U	0.91 U
Perfluorotridecanoic acid	72629-94-8	0.91 U	0.91 U
Perfluoroundecanoic acid	2058-94-8	1.8 U	1.8 U

**Notes:**

-- - compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
B - compound detected in method blank PQL - practical quantitation limit  
J - indicates estimated value U - compound not detected  
MDL - method detection limit \* data has not be validated  
ng/L - nanogram per liter  
† nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).  
‡ Raw water sample ID labeled with "O" rather than "R" at end of sample name.

**Legend:**

Detected above the quantitation limit  
Non-detect in samples after canisters

**TABLE 3**  
**4301 MUNSEY ROAD**  
**RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		MDL	MDL	MDL	MDL	MDL
Data Status		Final Data	Final Data	Final Data	Final Data	Final Data
Location		4301 Munsey Road	4301 Munsey Road	4301 Munsey Road	4301 Munsey Road	4301 Munsey Road
Field Sample		4301MUNSE-041318-W1-1R	4301MUNSE-041318-W1-1B	4301MUNSE-041318-W1-1M	4301MUNSE-041318-W1-1A	4301MUNSE-042618-W1-1O‡
Sample Location		Raw Water	After Iron Filter	After First Carbon Canister	After Second Carbon Canister	Raw Water
Date Sampled		13-Apr-18	13-Apr-18	13-Apr-18	13-Apr-18	26-Apr-18
HFPO-DA	CAS Number					
HFPO-DA	13252-13-6	1,000 J	33 J	0.28 U	0.27 U	1,100
Table 3 Compounds (ng/L)						
PEPA		400	200 U	200 U	200 U	400
PFECA-G	174767-10-3; 801212-59-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U	200 U	200 U	200 U
PFMOAA	674-13-5	200 U	200 U	200 U	200 U	200 U
PFO2HXA	39492-88-1	600	200 U	200 U	200 U	550
PFO3OA	39492-89-2	200 U	200 U	200 U	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U	200 U	200 U	200 U
PMPA	13140-29-9	2,000	200 U	200 U	200 U	2,000
TAFN4	39492-91-6	200 U	200 U	200 U	200 U	200 U
PFAS (ng/L)†						
10:2-fluorotelomersulfonic acid	120226-60-0	2.7 U	2.8 U	2.8 U	2.8 U	2.8 U
4:2 fluorotelomersulfonic acid	757124-72-4	0.92 U	0.93 U	0.92 U	0.93 U	0.94 U
6:2 fluorotelomersulfonic acid	27619-97-2	2.7 U	2.8 U	2.8 U	2.8 U	2.8 U
8:2 fluorotelomersulfonic acid	39108-34-4	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U
NEtFOSAA	2991-50-6	0.92 UJ	0.93 UJ	0.92 UJ	0.93 UJ	0.94 UJ
NEtPFOSA	4151-50-2	2.7 UJ	2.8 UJ	2.8 UJ	2.8 UJ	2.8 UJ
NEtPFOSAE	1691-99-2	0.92 UJ	0.93 UJ	0.92 UJ	0.93 UJ	0.94 UJ
NMeFOSAA	2355-31-9	0.92 UJ	0.93 UJ	0.92 UJ	0.93 UJ	0.94 U
NMePFOSA	31506-32-8	2.7 UJ	2.8 UJ	2.8 UJ	2.8 UJ	2.8 UJ
NMePFOSAE	24448-09-7	0.92 UJ	0.93 UJ	0.92 UJ	0.93 UJ	0.94 UJ
Perfluorobutanesulfonic acid	375-73-5	1.7	0.28 U	0.28 U	0.28 U	1.6
Perfluorobutanoic acid	375-22-4	9.2	1.9 U	1.8 U	1.9 U	9.7
Perfluorodecanesulfonic acid	335-77-3	0.55 U	0.56 U	0.55 U	0.56 U	0.57 U
Perfluorodecanoic acid	335-76-2	0.92 U	0.93 U	0.92 U	0.93 U	0.94 U
Perfluorododecanesulfonic acid	79780-39-5	0.27 U	0.28 U	0.28 U	0.28 U	0.28 U
Perfluorododecanoic acid	307-55-1	0.27 U	0.28 U	0.28 U	0.28 U	0.28 U
Perfluoroheptanesulfonic acid	375-92-8	0.37 U	0.37 U	0.37 U	0.37 U	0.38 U
Perfluoroheptanoic acid	375-85-9	3.3 J	0.28 U	0.28 U	0.28 U	3.3
Perfluorohexadecanoic acid	67905-19-5	0.27 U	0.28 U	0.28 U	0.28 U	0.28 U
Perfluorohexanesulfonic acid	355-46-4	1.6 J	0.37 U	0.37 U	0.37 U	1.6 J
Perfluorohexanoic acid	307-24-4	4.8 J	0.37 U	0.37 U	0.37 U	4.8
Perfluorononanesulfonic acid	68259-12-1	0.55 U	0.56 U	0.55 U	0.56 U	0.57 U
Perfluorononanoic acid	375-95-1	0.37 U	0.37 U	0.37 U	0.37 U	0.38 U
Perfluorooctadecanoic acid	376-06-7	0.27 U	0.28 U	0.28 U	0.28 U	0.28 U
Perfluorooctanesulfonamide	754-91-6	0.92 UJ	0.93 U	0.92 U	0.93 U	0.94 UJ
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.54 J	0.37 U	0.37 U	0.37 U	0.64 J
Perfluorooctanoic acid (PFOA)	335-67-1	5 J	0.28 U	0.28 U	0.28 U	6.4
Perfluoropentanesulfonic acid	2706-91-4	0.37 U	0.37 U	0.37 U	0.37 U	0.38 U
Perfluoropentanoic acid	2706-90-3	15 J	1.9 U	1.8 U	1.9 U	15
Perfluorotetradecanoic acid	376-06-7	0.27 U	0.28 U	0.28 U	0.28 U	0.28 U
Perfluorotridecanoic acid	72629-94-8	0.27 U	0.28 U	0.28 U	0.28 U	0.28 U
Perfluoroundecanoic acid	2058-94-8	0.37 U	0.37 U	0.37 U	0.37 U	0.38 U

**Notes:**  
 --- compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
 B - compound detected in method blank PQL - practical quantitation limit  
 J - indicates estimated value U - compound not detected  
 MDL - method detection limit \* data has not be validated  
 ng/L - nanogram per liter  
 † nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).  
 ‡ Raw water sample ID labeled with "O" rather than "R" at end of sample name.

**Legend:**  
 Detected above the quantitation limit  
 Non-detect in samples after canisters

**TABLE 3**  
**4301 MUNSEY ROAD**  
**RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		MDL	MDL	MDL	PQL	PQL
Data Status		Final Data	Final Data	Final Data	Final Data	Final Data
Location		4301 Munsey Road	4301 Munsey Road	4301 Munsey Road	4301 Munsey Road	4301 Munsey Road
Field Sample		4301MUNSE-042618-W1-1B	4301MUNSE-042618-W1-1M	4301MUNSE-042618-W1-1A	PRELIM-4301MUNSE-051018-W1-1R	PRELIM-4301MUNSE-051018-W1-1B
Sample Location		After Iron Filter	After First Carbon Canister	After Second Carbon Canister	Raw Water	After Iron Filter
Date Sampled		26-Apr-18	26-Apr-18	26-Apr-18	10-May-18	10-May-18
HFPO-DA	CAS Number					
HFPO-DA	13252-13-6	1,100 J	0.58 J	32 J	1,500 J	1,500 J
Table 3 Compounds (ng/L)						
PEPA		400	200 U	200 U	400	400
PFECA-G	174767-10-3; 801212-59-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U	200 U	200 U	200 U
PFMOAA	674-13-5	200 U	200 U	200 U	200	200
PFO2HXA	39492-88-1	550	200 U	200 U	700	700
PFO3OA	39492-89-2	200 U	200 U	200 U	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U	200 U	200 U	200 U
PMPA	13140-29-9	2,000	200 U	200 U	2,000	2,000
TAFN4	39492-91-6	200 U	200 U	200 U	200 U	200 U
PFAS (ng/L)†						
10:2-fluorotelomersulfonic acid	120226-60-0	2.8 U	2.8 U	2.7 U	8.2 U	8.3 U
4:2 fluorotelomersulfonic acid	757124-72-4	0.94 U	0.93 U	0.92 U	2.7 U	2.8 U
6:2 fluorotelomersulfonic acid	27619-97-2	2.8 U	2.8 U	2.7 U	1.8 U	1.8 U
8:2 fluorotelomersulfonic acid	39108-34-4	1.9 U	1.9 U	1.8 U	5.5 U	5.5 U
NEtFOSAA	2991-50-6	0.94 UJ	0.93 UJ	0.92 UJ	2.7 UJ	2.8 UJ
NEtPFOSA	4151-50-2	2.8 UJ	2.8 UJ	2.7 UJ	8.2 UJ	8.3 UJ
NEtPFOSAE	1691-99-2	0.94 UJ	0.93 UJ	0.92 UJ	2.7 UJ	2.8 UJ
NMeFOSAA	2355-31-9	0.94 UJ	0.93 UJ	0.92 UJ	2.7 UJ	2.8 UJ
NMePFOSA	31506-32-8	2.8 UJ	2.8 UJ	2.7 UJ	8.2 UJ	8.3 UJ
NMePFOSAE	24448-09-7	0.94 UJ	0.93 UJ	0.92 UJ	2.7 UJ	2.8 UJ
Perfluorobutanesulfonic acid	375-73-5	1.8	0.28 U	0.27 U	1.9	2
Perfluorobutanoic acid	375-22-4	9.8	1.9 U	1.8 U	11	11
Perfluorodecanesulfonic acid	335-77-3	0.56 U	0.56 U	0.55 U	1.8 U	1.8 U
Perfluorodecanoic acid	335-76-2	0.94 U	0.93 U	0.92 U	1.8 U	1.8 U
Perfluorododecanesulfonic acid	79780-39-5	0.28 U	0.28 U	0.27 U	0.91 U	0.92 U
Perfluorododecanoic acid	307-55-1	0.28 U	0.28 U	0.27 U	0.91 U	0.92 U
Perfluoroheptanesulfonic acid	375-92-8	0.38 U	0.37 U	0.37 U	1.8 U	1.8 U
Perfluoroheptanoic acid	375-85-9	3.4	0.28 U	0.27 U	3.6	3.4
Perfluorohexadecanoic acid	67905-19-5	0.28 U	0.28 U	0.27 U	0.91 U	0.92 U
Perfluorohexanesulfonic acid	355-46-4	1.8 J	0.37 U	0.37 U	1.8 U	1.8 U
Perfluorohexanoic acid	307-24-4	5.1	0.37 U	0.37 U	5.9	5.5
Perfluorononanesulfonic acid	68259-12-1	0.56 U	0.56 U	0.55 U	1.8 U	1.8 U
Perfluorononanoic acid	375-95-1	0.38 U	0.37 U	0.37 U	1.8 U	1.8 U
Perfluorooctadecanoic acid	376-06-7	0.28 U	0.28 U	0.27 U	0.91 U	0.92 U
Perfluorooctanesulfonamide	754-91-6	0.94 UJ	0.93 U	0.92 U	2.7 UJ	2.8 UJ
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.96 J	0.37 U	0.37 U	1.8 U	1.8 U
Perfluorooctanoic acid (PFOA)	335-67-1	6.2	0.28 U	0.27 U	7.4	6.6
Perfluoropentanesulfonic acid	2706-91-4	0.38 U	0.37 U	0.37 U	1.8 U	1.8 U
Perfluoropentanoic acid	2706-90-3	15	1.9 U	1.8 U	18	17
Perfluorotetradecanoic acid	376-06-7	0.28 U	0.28 U	0.27 U	0.91 U	0.92 U
Perfluorotridecanoic acid	72629-94-8	0.28 U	0.28 U	0.27 U	0.91 U	0.92 U
Perfluoroundecanoic acid	2058-94-8	0.38 U	0.37 U	0.37 U	1.8 U	1.8 U

**Notes:**  
-- - compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
B - compound detected in method blank PQL - practical quantitation limit  
J - indicates estimated value U - compound not detected  
MDL - method detection limit \* data has not be validated  
ng/L - nanogram per liter  
† nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).  
‡ Raw water sample ID labeled with "O" rather than "R" at end of sample name.

**Legend:**  
  Detected above the quantitation limit  
  Non-detect in samples after canisters

**TABLE 3**  
**4301 MUNSEY ROAD**  
**RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		PQL	PQL
<b>Data Status</b>		Final Data	Final Data
<b>Location</b>		4301 Munsey Road	4301 Munsey Road
<b>Field Sample</b>		PRELIM-4301MUNSE-051018-W1-1M	PRELIM-4301MUNSE-051018-W1-1A
<b>Sample Location</b>		After First Carbon Canister	After Second Carbon Canister
<b>Date Sampled</b>		10-May-18	10-May-18
<b>HFPO-DA</b>	<b>CAS Number</b>		
HFPO-DA	13252-13-6	0.94 UJ	0.95 U
<b>Table 3 Compounds (ng/L)</b>			
PEPA		200 U	200 U
PFECA-G	174767-10-3; 801212-59-9	200 U	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U
PFMOAA	674-13-5	200 U	200 U
PFO2HXA	39492-88-1	200 U	200 U
PFO3OA	39492-89-2	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U
PMPA	13140-29-9	200 U	200 U
TAFN4	39492-91-6	200 U	200 U
<b>PFAS (ng/L)†</b>			
10:2-fluorotelomersulfonic acid	120226-60-0	7.9 U	8.2 U
4:2-fluorotelomersulfonic acid	757124-72-4	2.6 U	2.7 U
6:2-fluorotelomersulfonic acid	27619-97-2	1.8 U	1.8 U
8:2-fluorotelomersulfonic acid	39108-34-4	5.3 U	5.5 U
NEtFOSAA	2991-50-6	2.6 UJ	2.7 UJ
NEtPFOSA	4151-50-2	7.9 UJ	8.2 UJ
NEtPFOSAE	1691-99-2	2.6 UJ	2.7 UJ
NMeFOSAA	2355-31-9	2.6 UJ	2.7 UJ
NMePFOSA	31506-32-8	7.9 UJ	8.2 UJ
NMePFOSAE	24448-09-7	2.6 UJ	2.7 UJ
Perfluorobutanesulfonic acid	375-73-5	0.88 U	0.91 U
Perfluorobutanoic acid	375-22-4	5.3 U	5.5 U
Perfluorodecanesulfonic acid	335-77-3	1.8 U	1.8 U
Perfluorodecanoic acid	335-76-2	1.8 U	1.8 U
Perfluorododecanesulfonic acid	79780-39-5	0.88 U	0.91 U
Perfluorododecanoic acid	307-55-1	0.88 U	0.91 U
Perfluoroheptanesulfonic acid	375-92-8	1.8 U	1.8 U
Perfluoroheptanoic acid	375-85-9	0.88 U	0.91 U
Perfluorohexadecanoic acid	67905-19-5	0.88 U	0.91 U
Perfluorohexanesulfonic acid	355-46-4	1.8 U	1.8 U
Perfluorohexanoic acid	307-24-4	1.8 U	1.8 U
Perfluorononanesulfonic acid	68259-12-1	1.8 U	1.8 U
Perfluorononanoic acid	375-95-1	1.8 U	1.8 U
Perfluorooctadecanoic acid	376-06-7	0.88 U	0.91 U
Perfluorooctanesulfonamide	754-91-6	2.6 UJ	2.7 UJ
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	1.8 U	1.8 U
Perfluorooctanoic acid (PFOA)	335-67-1	0.88 U	0.91 U
Perfluoropentanesulfonic acid	2706-91-4	1.8 U	1.8 U
Perfluoropentanoic acid	2706-90-3	5.3 U	5.5 U
Perfluorotetradecanoic acid	376-06-7	0.88 U	0.91 U
Perfluorotridecanoic acid	72629-94-8	0.88 U	0.91 U
Perfluoroundecanoic acid	2058-94-8	1.8 U	1.8 U

**Notes:**  
 -- - compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
 B - compound detected in method blank PQL - practical quantitation limit  
 J - indicates estimated value U - compound not detected  
 MDL - method detection limit \* data has not be validated  
 ng/L - nanogram per liter  
 † nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).  
 ‡ Raw water sample ID labeled with "O" rather than "R" at end of sample name.

**Legend:**  
 Detected above the quantitation limit  
 Non-detect in samples after canisters



**TABLE 4**  
**4328 MARSHWOOD LAKE ROAD**  
**RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		MDL	MDL	MDL	MDL	PQL
Data Status		Final Data	Final Data	Final Data	Final Data	Final Data
Location		4328 Marshwood Lake Road	4328 Marshwood Lake Road	4328 Marshwood Lake Road	4328 Marshwood Lake Road	4328 Marshwood Lake Road
Field Sample		4328MRSHW-042418-W1-1O‡	4328MRSHW-042418-W1-1B	4328MRSHW-042418-W1-1M	4328MRSHW-042418-W1-1A	4328MRSHMW-051018-W1-1R
Sample Location		Raw Water	After Iron Filter	After First Carbon Canister	After Second Carbon Canister	Raw Water
Date Sampled		24-Apr-18	24-Apr-18	24-Apr-18	24-Apr-18	10-May-18
HFPO-DA	CAS Number					
HFPO-DA	13252-13-6	830 J	170 J	0.91 J	0.27 UJ	1,200
Table 3 Compounds (ng/L)						
PEPA		400 B	200 U	200 U	200 U	300
PFECA-G	174767-10-3; 801212-59-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U	200 U	200 U	200 U
PFMOAA	674-13-5	200 U	200 U	200 U	200 U	300
PFO2HXA	39492-88-1	700 B	200 U	200 U	200 U	700
PFO3OA	39492-89-2	200 U	200 U	200 U	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U	200 U	200 U	200 U
PMPA	13140-29-9	2,000 B	200	200 U	200 U	1,000
TAFN4	39492-91-6	200 U	200 U	200 U	200 U	200 U
PFAS (ng/L)†						
10:2-fluorotelomersulfonic acid	120226-60-0	2.8 U	2.8 U	2.8 U	2.8 U	23 U
4:2-fluorotelomersulfonic acid	757124-72-4	0.93 U	0.93 UJ	0.93 U	0.94 U	7.5 UJ
6:2-fluorotelomersulfonic acid	27619-97-2	2.8 UJ	2.8 U	2.8 U	2.8 U	5.0 U
8:2-fluorotelomersulfonic acid	39108-34-4	1.9 U	1.9 U	1.9 U	1.9 U	15 U
NEtFOSAA	2991-50-6	0.93 UJ	0.93 UJ	0.93 UJ	0.94 UJ	7.5 UJ
NEtPFOSA	4151-50-2	2.8 UJ	2.8 UJ	2.8 UJ	2.8 UJ	23 UJ
NEtPFOSAE	1691-99-2	0.93 UJ	0.93 UJ	0.93 UJ	0.94 UJ	7.5 UJ
NMeFOSAA	2355-31-9	0.93 UJ	0.93 UJ	0.93 UJ	0.94 UJ	7.5 UJ
NMePFOSA	31506-32-8	2.8 UJ	2.8 UJ	2.8 UJ	2.8 UJ	23 UJ
NMePFOSAE	24448-09-7	0.93 UJ	0.93 UJ	0.93 UJ	0.94 UJ	7.5 UJ
Perfluorobutanesulfonic acid	375-73-5	1.2 J	0.28 U	0.28 UJ	0.28 UJ	2.5 U
Perfluorobutanoic acid	375-22-4	9.6 J	1.9 UJ	1.9 U	1.9 UJ	15 U
Perfluorodecanesulfonic acid	335-77-3	0.56 U	0.56 U	0.56 U	0.56 U	5.0 U
Perfluorodecanoic acid	335-76-2	0.93 U	0.93 U	0.93 U	0.94 U	5.0 U
Perfluorododecanesulfonic acid	79780-39-5	0.28 U	0.28 U	0.28 U	0.28 U	2.5 U
Perfluorododecanoic acid	307-55-1	0.28 U	0.28 U	0.28 U	0.28 U	2.5 U
Perfluoroheptanesulfonic acid	375-92-8	0.37 U	0.37 U	0.37 U	0.37 U	5.0 U
Perfluoroheptanoic acid	375-85-9	2.4 J	0.28 U	0.28 U	0.28 U	2.5 U
Perfluorohexadecanoic acid	67905-19-5	0.28 U	0.28 U	0.28 U	0.28 U	2.5 U
Perfluorohexanesulfonic acid	355-46-4	0.75 J	0.37 U	0.37 U	0.37 U	5.0 U
Perfluorohexanoic acid	307-24-4	4.1 J	0.37 U	0.37 U	0.37 U	5.0 U
Perfluorononanesulfonic acid	68259-12-1	0.56 U	0.56 U	0.56 U	0.56 U	5.0 U
Perfluorononanoic acid	375-95-1	0.43 J	0.37 U	0.37 U	0.37 U	5.0 U
Perfluorooctadecanoic acid	376-06-7	0.28 U	0.28 U	0.28 U	0.28 U	2.5 U
Perfluorooctanesulfonamide	754-91-6	0.93 UJ	0.93 UJ	0.93 UJ	0.94 UJ	7.5 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.77 J	0.37 U	0.37 U	0.37 U	5.0 U
Perfluorooctanoic acid (PFOA)	335-67-1	11 J	1.1	0.28 U	0.28 U	10
Perfluoropentanesulfonic acid	2706-91-4	0.37 U	0.37 UJ	0.37 U	0.37 U	5.0 U
Perfluoropentanoic acid	2706-90-3	14 J	1.9 U	1.9 UJ	1.9 U	15 U
Perfluorotetradecanoic acid	376-06-7	0.28 U	0.28 U	0.28 U	0.28 U	2.5 U
Perfluorotridecanoic acid	72629-94-8	0.28 U	0.28 U	0.28 U	0.28 U	2.5 U
Perfluoroundecanoic acid	2058-94-8	0.37 U	0.37 U	0.37 U	0.37 U	5.0 U

**Notes:**  
-- - compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
B - compound detected in method blank PQL - practical quantitation limit  
J - indicates estimated value U - compound not detected  
MDL - method detection limit \* data has not be validated  
ng/L - nanogram per liter  
† nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).  
‡ Raw water sample ID labeled with "O" rather than "R" at end of sample name.

**Legend:**  
Detected above the quantitation limit  
Non-detect in samples after canisters  
Detected in laboratory method blank



**TABLE 4**  
**4328 MARSHWOOD LAKE ROAD**  
**RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		PQL	PQL	PQL
Data Status		Final Data	Final Data	Final Data
Location		4328 Marshwood Lake Road	4328 Marshwood Lake Road	4328 Marshwood Lake Road
Field Sample		4328MRSHMW-051018-W1-1B	4328MRSHMW-051018-W1-1M	4328MRSHMW-051018-W1-1A
Sample Location		After Iron Filter	After First Carbon Canister	After Second Carbon Canister
Date Sampled		10-May-18	10-May-18	10-May-18
HFPO-DA	CAS Number			
HFPO-DA	13252-13-6	1,000	0.95 U	0.94 UJ
Table 3 Compounds (ng/L)				
PEPA		300	200 U	200 U
PFECA-G	174767-10-3; 801212-59-9	200 U	200 U	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U	200 U
PFMOAA	674-13-5	300	200 U	200 U
PFO2HXA	39492-88-1	700	200 U	200 U
PFO3OA	39492-89-2	200 U	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U	200 U
PMPA	13140-29-9	1,000	200 U	200 U
TAFN4	39492-91-6	200 U	200 U	200 U
PFAS (ng/L)†				
10:2-fluorotelomersulfonic acid	120226-60-0	8.2 U	8.2 U	8.3 U
4:2-fluorotelomersulfonic acid	757124-72-4	2.7 UJ	2.7 U	2.8 U
6:2-fluorotelomersulfonic acid	27619-97-2	1.8 UJ	1.8 U	1.8 U
8:2-fluorotelomersulfonic acid	39108-34-4	5.4 U	5.5 U	5.5 U
NEtFOSAA	2991-50-6	2.7 UJ	2.7 UJ	2.8 UJ
NEtPFOSA	4151-50-2	8.2 UJ	8.2 UJ	8.3 UJ
NEtPFOSAE	1691-99-2	2.7 UJ	2.7 UJ	2.8 UJ
NMeFOSAA	2355-31-9	2.7 UJ	2.7 UJ	2.8 UJ
NMePFOSA	31506-32-8	8.2 UJ	8.2 UJ	8.3 UJ
NMePFOSAE	24448-09-7	2.7 UJ	2.7 UJ	2.8 UJ
Perfluorobutanesulfonic acid	375-73-5	1.3J	0.91 U	0.92 U
Perfluorobutanoic acid	375-22-4	9.0	5.5 U	5.5 U
Perfluorodecanesulfonic acid	335-77-3	1.8 U	1.8 U	1.8 U
Perfluorodecanoic acid	335-76-2	1.8 U	1.8 U	1.8 U
Perfluorododecanesulfonic acid	79780-39-5	0.91 U	0.91 U	0.92 U
Perfluorododecanoic acid	307-55-1	0.91 U	0.91 U	0.92 U
Perfluoroheptanesulfonic acid	375-92-8	1.8 U	1.8 U	1.8 U
Perfluoroheptanoic acid	375-85-9	2.5	0.91 U	0.92 U
Perfluorohexadecanoic acid	67905-19-5	0.91 U	0.91 U	0.92 U
Perfluorohexanesulfonic acid	355-46-4	1.8 U	1.8 U	1.8 U
Perfluorohexanoic acid	307-24-4	4.0	1.8 U	1.8 U
Perfluorononanesulfonic acid	68259-12-1	1.8 U	1.8 U	1.8 U
Perfluorononanoic acid	375-95-1	1.8 U	1.8 U	1.8 U
Perfluorooctadecanoic acid	376-06-7	0.91 U	0.91 U	0.92 U
Perfluorooctanesulfonamide	754-91-6	2.7 UJ	2.7 UJ	2.8 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	1.8 U	1.8 U	1.8 U
Perfluorooctanoic acid (PFOA)	335-67-1	10	0.91 U	0.92 U
Perfluoropentanesulfonic acid	2706-91-4	1.8 U	1.8 U	1.8 U
Perfluoropentanoic acid	2706-90-3	14 J	5.5 U	5.5 U
Perfluorotetradecanoic acid	376-06-7	0.91 U	0.91 U	0.92 U
Perfluorotridecanoic acid	72629-94-8	0.91 U	0.91 U	0.92 U
Perfluoroundecanoic acid	2058-94-8	1.8 U	1.8 U	1.8 U

**Notes:**

-- - compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
B - compound detected in method blank PQL - practical quantitation limit  
J - indicates estimated value U - compound not detected  
MDL - method detection limit \* data has not be validated  
ng/L - nanogram per liter

† nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).

‡ Raw water sample ID labeled with "O" rather than "R" at end of sample name.

**Legend:**

Detected above the quantitation limit  
Non-detect in samples after canisters  
Detected in laboratory method blank

**TABLE 5**  
**4649 JACKIE HOOD LANE**  
**RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		MDL	MDL	MDL	MDL	MDL
Data Status		Final Data	Final Data	Final Data	Final Data	Final Data
Location		4649 Jackie Hood Lane	4649 Jackie Hood Lane	4649 Jackie Hood Lane	4649 Jackie Hood Lane	4649 Jackie Hood Lane
Field Sample		4649JACKI-032318-W1-1R	4649JACKI-032318-W1-1DUP	4649JACKI-032318-W1-1B	4649JACKI-032318-W1-1M	4649JACKI-032318-W1-1A
Sample Location		Raw Water	Raw Water	After Iron Filter	After First Carbon Canister	After Second Carbon Canister
Date Sampled		23-Mar-18	23-Mar-18	23-Mar-18	23-Mar-18	23-Mar-18
HFPO-DA	CAS Number					
HFPO-DA	13252-13-6	1,600	1,200	120	0.29 U	1.6
Table 3 Compounds (ng/L)						
PEPA		800 B	800 B	200 U	200 U	200 U
PFECA-G	174767-10-3; 801212-59-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U	200 U	200 U	200 U
PFMOAA	674-13-5	200 U	200 U	200 U	200 U	200 U
PFO2HXA	39492-88-1	700 B	650 B	200 U	200 U	200 U
PFO3OA	39492-89-2	200 U	200 U	200 U	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U	200 U	200 U	200 U
PMPA	13140-29-9	3,500 B	4,000 B	650 B	200 U	200 U
TAFN4	39492-91-6	200 U	200 U	200 U	200 U	200 U
PFAS (ng/L)†						
10:2-fluorotelomersulfonic acid	120226-60-0	2.9 U	2.8 U	2.7 U	2.9 U	2.8 U
4:2 fluorotelomersulfonic acid	757124-72-4	0.98 U	0.94 U	0.91 U	0.96 U	0.92 U
6:2 fluorotelomersulfonic acid	27619-97-2	2.9 U	2.8 U	2.7 U	2.9 U	2.8 U
8:2 fluorotelomersulfonic acid	39108-34-4	2 U	1.9 U	1.8 U	1.9 U	1.8 U
NEtFOSAA	2991-50-6	0.98 UJ	0.94 UJ	0.91 UJ	0.96 UJ	0.92 UJ
NEtPFOSA	4151-50-2	2.9 UJ	2.8 UJ	2.7 UJ	2.9 UJ	2.8 UJ
NEtPFOSAE	1691-99-2	0.98 UJ	0.94 UJ	0.91 UJ	0.96 UJ	0.92 UJ
NMeFOSAA	2355-31-9	0.98 UJ	0.94 UJ	0.91 UJ	0.96 UJ	0.92 UJ
NMePFOSA	31506-32-8	2.9 UJ	2.8 UJ	2.7 UJ	2.9 UJ	2.8 UJ
NMePFOSAE	24448-09-7	0.98 UJ	0.94 UJ	0.91 UJ	0.96 UJ	0.92 UJ
Perfluorobutanesulfonic acid	375-73-5	0.84 J	0.89 J	0.27 U	0.29 U	0.28 U
Perfluorobutanoic acid	375-22-4	12	13	1.8 U	1.9 U	1.8 U
Perfluorodecanesulfonic acid	335-77-3	0.59 U	0.56 U	0.55 U	0.58 U	0.55 U
Perfluorodecanoic acid	335-76-2	0.98 U	0.94 U	0.91 U	0.96 U	0.92 U
Perfluorododecanesulfonic acid	79780-39-5	0.29 U	0.28 U	0.27 U	0.29 U	0.28 U
Perfluorododecanoic acid	307-55-1	0.29 U	0.28 U	0.27 U	0.29 U	0.28 U
Perfluoroheptanesulfonic acid	375-92-8	0.39 U	0.38 U	0.37 U	0.38 U	0.37 U
Perfluoroheptanoic acid	375-85-9	1.9	2.2	0.27 U	0.29 U	0.28 U
Perfluorohexadecanoic acid	67905-19-5	0.29 U	0.28 U	0.27 U	0.29 U	0.28 U
Perfluorohexanesulfonic acid	355-46-4	0.48 J	0.52 J	0.37 U	0.38 U	0.37 U
Perfluorohexanoic acid	307-24-4	2.4	2.4	0.37 U	0.38 U	0.37 U
Perfluorononanesulfonic acid	68259-12-1	0.59 U	0.56 U	0.55 U	0.58 U	0.55 U
Perfluorononanoic acid	375-95-1	0.39 U	0.38 U	0.37 U	0.38 U	0.37 U
Perfluorooctadecanoic acid	376-06-7	0.29 U	0.28 U	0.27 U	0.29 U	0.28 U
Perfluorooctanesulfonamide	754-91-6	0.98 U	0.94 U	0.91 U	0.96 U	0.92 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.77 J	0.84 J	0.37 U	0.38 U	0.37 U
Perfluorooctanoic acid (PFOA)	335-67-1	4.8 B	5.1 B	1.3 B	1.1 B	1.1 B
Perfluoropentanesulfonic acid	2706-91-4	0.39 U	0.38 U	0.37 U	0.38 U	0.37 U
Perfluoropentanoic acid	2706-90-3	13	13	1.8 U	1.9 U	1.8 U
Perfluorotetradecanoic acid	376-06-7	0.29 U	0.28 U	0.27 U	0.29 U	0.28 U
Perfluorotridecanoic acid	72629-94-8	0.29 U	0.28 U	0.27 U	0.29 U	0.28 U
Perfluoroundecanoic acid	2058-94-8	0.39 U	0.38 U	0.37 U	0.38 U	0.37 U

**Notes:**  
 -- - compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
 B - compound detected in method blank PQL - practical quantitation limit  
 J - indicates estimated value U - compound not detected  
 MDL - method detection limit \* data has not be validated  
 ng/L - nanogram per liter  
 Z - lab control spike compound recovery is outside the QC acceptance limit  
 † nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).

**Legend:**  
 Detected above the quantitation limit  
 Non-detect in samples after canisters  
 Detected in laboratory method blank

**TABLE 5**  
**4649 JACKIE HOOD LANE**  
**RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		MDL	MDL	MDL	MDL	MDL
Data Status		Final Data	Final Data	Final Data	Final Data	Final Data
Location		4649 Jackie Hood Lane	4649 Jackie Hood Lane	4649 Jackie Hood Lane	4649 Jackie Hood Lane	4649 Jackie Hood Lane
Field Sample		4649JACKI-040518-W1-1R	4649JACKI-040518-W1-1B	4649JACKI-040518-W1-1M	4649JACKI-040518-W1-1A	4649-JACKI-041918-W1-1R
Sample Location		Raw Water	After Iron Filter	After First Carbon Canister	After Second Carbon Canister	Raw Water
Date Sampled		05-Apr-18	05-Apr-18	05-Apr-18	05-Apr-18	19-Apr-18
HFPO-DA	CAS Number					
HFPO-DA	13252-13-6	1,400 J	850 J	0.28 UJ	0.28 UJ	1,200 B
Table 3 Compounds (ng/L)						
PEPA		700 B	500 B	200 U	200 U	750 B
PFECA-G	174767-10-3; 801212-59-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U	200 U	200 U	200 U
PFMOAA	674-13-5	200 U	200 U	200 U	200 U	200 U
PFO2HXA	39492-88-1	700 B	200 U	200 U	200 U	700 B
PFO3OA	39492-89-2	200 U	200 U	200 U	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U	200 U	200 U	200 U
PMPA	13140-29-9	3,000 B	3,000 B	200 U	200 U	3,000 B
TAFN4	39492-91-6	200 U	200 U	200 U	200 U	200 U
PFAS (ng/L)†						
10:2-fluorotelomersulfonic acid	120226-60-0	2.8 U	2.8 U	2.8 U	2.8 U	2.7 U
4:2 fluorotelomersulfonic acid	757124-72-4	0.95 U	0.94 U	0.94 U	0.94 U	0.91 UJ
6:2 fluorotelomersulfonic acid	27619-97-2	2.8 U	2.8 U	2.8 U	2.8 U	0.91 UJ
8:2 fluorotelomersulfonic acid	39108-34-4	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U
NEtFOSAA	2991-50-6	0.95 UJ	0.94 UJ	0.94 UJ	0.94 UJ	0.91 UJ
NEtPFOSA	4151-50-2	2.8 UJ	2.8 UJ	2.8 UJ	2.8 UJ	2.7 UJ
NEtPFOSAE	1691-99-2	0.95 UJ	0.94 UJ	0.94 UJ	0.94 UJ	0.91 UJ
NMeFOSAA	2355-31-9	0.95 UJ	0.94 UJ	0.94 UJ	0.94 UJ	0.91 UJ
NMePFOSA	31506-32-8	2.8 UJ	2.8 UJ	2.8 UJ	2.8 UJ	2.7 UJ
NMePFOSAE	24448-09-7	0.95 UJ	0.94 UJ	0.94 UJ	0.94 UJ	0.91 UJ
Perfluorobutanesulfonic acid	375-73-5	0.85 J	0.29 J	0.28 U	0.28 U	0.83 J
Perfluorobutanoic acid	375-22-4	12 J	8.3 J	1.9 U	1.9 U	12 J
Perfluorodecanesulfonic acid	335-77-3	0.57 U	0.57 U	0.57 U	0.57 U	0.54 U
Perfluorodecanoic acid	335-76-2	0.95 U	0.94 U	0.94 U	0.94 U	0.91 U
Perfluorododecanesulfonic acid	79780-39-5	0.28 U	0.28 U	0.28 U	0.28 U	0.27 U
Perfluorododecanoic acid	307-55-1	0.28 U	0.28 U	0.28 U	0.28 U	0.27 U
Perfluoroheptanesulfonic acid	375-92-8	0.38 U	0.38 U	0.38 U	0.38 U	0.36 U
Perfluoroheptanoic acid	375-85-9	1.8 J	0.82 J	0.28 U	0.28 U	1.9 J
Perfluorohexadecanoic acid	67905-19-5	0.28 U	0.28 U	0.28 U	0.28 U	0.27 U
Perfluorohexanesulfonic acid	355-46-4	0.62 J	0.38 U	0.38 U	0.38 U	0.58 J
Perfluorohexanoic acid	307-24-4	2.2	1 J	0.38 U	0.38 U	2.6 J
Perfluorononanesulfonic acid	68259-12-1	0.57 U	0.57 U	0.57 U	0.57 U	0.54 U
Perfluorononanoic acid	375-95-1	0.38 U	0.38 U	0.38 U	0.38 U	0.36 U
Perfluorooctadecanoic acid	376-06-7	0.28 U	0.28 U	0.28 U	0.28 U	0.27 UJ
Perfluorooctanesulfonamide	754-91-6	0.95 UJ	0.94 UJ	0.94 UJ	0.94 UJ	0.91 UJ
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.65 J	0.38 U	0.38 U	0.38 U	0.65 J
Perfluorooctanoic acid (PFOA)	335-67-1	3.6 J	1.5 J	0.28 U	0.28 U	3.8 J
Perfluoropentanesulfonic acid	2706-91-4	0.38 U	0.38 U	0.38 U	0.38 U	0.36 U
Perfluoropentanoic acid	2706-90-3	14 J	6.7 J	1.9 U	1.9 U	14 J
Perfluorotetradecanoic acid	376-06-7	0.28 U	0.28 U	0.28 U	0.28 U	0.27 U
Perfluorotridecanoic acid	72629-94-8	0.28 U	0.28 U	0.28 U	0.28 U	0.27 U
Perfluoroundecanoic acid	2058-94-8	0.38 U	0.38 U	0.38 U	0.38 U	0.36 U

**Notes:**  
 -- - compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
 B - compound detected in method blank PQL - practical quantitation limit  
 J - indicates estimated value U - compound not detected  
 MDL - method detection limit \* data has not be validated  
 ng/L - nanogram per liter  
 Z - lab control spike compound recovery is outside the QC acceptance limit  
 † nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).

**Legend:**  
 Detected above the quantitation limit  
 Non-detect in samples after canisters  
 Detected in laboratory method blank

**TABLE 5**  
**4649 JACKIE HOOD LANE**  
**RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		MDL	MDL	MDL	PQL	PQL
Data Status		Final Data	Final Data	Final Data	Final Data	Final Data
Location		4649 Jackie Hood Lane	4649 Jackie Hood Lane	4649 Jackie Hood Lane	4649 Jackie Hood Lane	4649 Jackie Hood Lane
Field Sample		4649-JACKI-041918-W1-1B	4649-JACKI-041918-W1-1M	4649-JACKI-041918-W1-1A	4649JACKI-042618-W1-1R	4649JACKI-042618-W1-1B
Sample Location		After Iron Filter	After First Carbon Canister	After Second Carbon Canister	Raw Water	After Iron Filter
Date Sampled		19-Apr-18	19-Apr-18	19-Apr-18	26-Apr-18	26-Apr-18
HFPO-DA	CAS Number					
HFPO-DA	13252-13-6	1,100 B	0.78 J	0.35 J	1,600	1,400
Table 3 Compounds (ng/L)						
PEPA		750 B	200 U	200 U	700	700
PFECA-G	174767-10-3; 801212-59-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U	200 U	200 U	200 U
PFMOAA	674-13-5	200 U	200 U	200 U	300	300
PFO2HXA	39492-88-1	500 B	200 U	200 U	800	800
PFO3OA	39492-89-2	200 U	200 U	200 U	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U	200 U	200 U	200 U
PMPA	13140-29-9	4,000 B	200 U	200 U	3,000	3,000
TAFN4	39492-91-6	200 U	200 U	200 U	200 U	200 U
PFAS (ng/L)†						
10:2-fluorotelomersulfonic acid	120226-60-0	2.8 U	2.8 U	2.7 U	8.3 U	8.4 U
4:2 fluorotelomersulfonic acid	757124-72-4	0.92 U	0.92 UJ	0.92 U	2.8 UJ	2.8 U
6:2 fluorotelomersulfonic acid	27619-97-2	0.92 U	0.92 U	0.92 U	1.8 UJ	1.9 UJ
8:2 fluorotelomersulfonic acid	39108-34-4	1.8 U	1.8 U	1.8 U	5.5 UJ	5.6 UJ
NEtFOSAA	2991-50-6	0.92 UJ	0.92 UJ	0.92 UJ	2.8 UJ	2.8 UJ
NEtPFOSA	4151-50-2	2.8 UJ	2.8 UJ	2.7 UJ	8.3 UJ	8.4 UJ
NEtPFOSAE	1691-99-2	0.92 UJ	0.92 UJ	0.92 UJ	2.8 UJ	2.8 UJ
NMeFOSAA	2355-31-9	0.92 UJ	0.92 UJ	0.92 UJ	2.8 UJ	2.8 UJ
NMePFOSA	31506-32-8	2.8 UJ	2.8 UJ	2.7 UJ	8.3 UJ	8.4 UJ
NMePFOSAE	24448-09-7	0.92 UJ	0.92 UJ	0.92 UJ	2.8 UJ	2.8 UJ
Perfluorobutanesulfonic acid	375-73-5	0.57 J	0.28 U	0.27 U	0.92 UJ	0.93 UJ
Perfluorobutanoic acid	375-22-4	13 J	1.8 U	1.8 U	12 J	14
Perfluorodecanesulfonic acid	335-77-3	0.55 U	0.55 U	0.55 U	1.8 U	1.9 U
Perfluorodecanoic acid	335-76-2	0.92 U	0.92 U	0.92 U	1.8 U	1.9 U
Perfluorododecanesulfonic acid	79780-39-5	0.28 U	0.28 U	0.27 U	0.92 U	0.93 U
Perfluorododecanoic acid	307-55-1	0.28 U	0.28 U	0.27 U	0.92 U	0.93 U
Perfluoroheptanesulfonic acid	375-92-8	0.37 U	0.37 U	0.37 U	1.8 U	1.9 U
Perfluoroheptanoic acid	375-85-9	1.5 J	0.28 U	0.27 U	1.9	2.3
Perfluorohexadecanoic acid	67905-19-5	0.28 U	0.28 U	0.27 U	0.92 U	0.93 U
Perfluorohexanesulfonic acid	355-46-4	0.37 U	0.37 U	0.37 U	1.8 U	1.9 U
Perfluorohexanoic acid	307-24-4	1.7 J	0.37 U	0.37 U	2.4	2.9
Perfluorononanesulfonic acid	68259-12-1	0.55 U	0.55 U	0.55 U	1.8 U	1.9 U
Perfluorononanoic acid	375-95-1	0.37 U	0.37 U	0.37 U	1.8 U	1.9 U
Perfluorooctadecanoic acid	376-06-7	0.28 U	0.28 U	0.27 U	0.92 U	0.93 U
Perfluorooctanesulfonamide	754-91-6	0.92 UJ	0.92 U	0.92 U	2.8 UJ	2.8 UJ
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.38 J	0.37 U	0.37 U	1.8 U	1.9 U
Perfluorooctanoic acid (PFOA)	335-67-1	2.1 J	0.28 U	0.27 U	3.8	4.2
Perfluoropentanesulfonic acid	2706-91-4	0.37 U	0.37 U	0.37 U	1.8 U	1.9 U
Perfluoropentanoic acid	2706-90-3	12 J	1.8 U	1.8 U	13 J	15 J
Perfluorotetradecanoic acid	376-06-7	0.28 U	0.28 U	0.27 U	0.92 U	0.93 U
Perfluorotridecanoic acid	72629-94-8	0.28 U	0.28 U	0.27 U	0.92 U	0.93 U
Perfluoroundecanoic acid	2058-94-8	0.37 U	0.37 U	0.37 U	1.8 U	1.9 U

**Notes:**  
-- - compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
B - compound detected in method blank PQL - practical quantitation limit  
J - indicates estimated value U - compound not detected  
MDL - method detection limit \* data has not be validated  
ng/L - nanogram per liter  
Z - lab control spike compound recovery is outside the QC acceptance limit  
† nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).

**Legend:**  
  Detected above the quantitation limit  
  Non-detect in samples after canisters  
  Detected in laboratory method blank

**TABLE 5**  
**4649 JACKIE HOOD LANE**  
**RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		PQL	PQL	PQL	PQL	PQL
Data Status		Final Data	Final Data	Final Data	Preliminary Data	Preliminary Data
Location		4649 Jackie Hood Lane	4649 Jackie Hood Lane	4649 Jackie Hood Lane	4649 Jackie Hood Lane	4649 Jackie Hood Lane
Field Sample		4649JACKI-042618-W1-1M	4649JACKI-042618-W1-1A	4649JACKI-051018-W1-1R	4649JACKI-051018-W1-1B	4649JACKI-051018-W1-1M
Sample Location		After First Carbon Canister	After Second Carbon Canister	Raw Water	After Iron Filter	After First Carbon Canister
Date Sampled		26-Apr-18	26-Apr-18	10-May-18	10-May-18	10-May-18
HFPO-DA	CAS Number					
HFPO-DA	13252-13-6	0.26 U	0.87 U	1,400 J	1,800	0.94 U
Table 3 Compounds (ng/L)						
PEPA		200 U	200 U	650	550	200 U
PFECA-G	174767-10-3; 801212-59-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U	200 U	200 U	200 U
PFMOAA	674-13-5	200 U	200 U	300	350	200 U
PFO2HXA	39492-88-1	200 U	200 U	700	700	200 U
PFO3OA	39492-89-2	200 U	200 U	200 U	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U	200 U	200 U	200 U
PMPA	13140-29-9	200 U	200 U	3,000	3,000	200 U
TAFN4	39492-91-6	200 U	200 U	200 U	200 U	200 U
PFAS (ng/L)†						
10:2-fluorotelomersulfonic acid	120226-60-0	2.8 U	8.3 U	8.3 UZ	8.4 U	8.4 U
4:2 fluorotelomersulfonic acid	757124-72-4	0.92 UJ	2.8 U	2.8 U	2.8 U	2.8 U
6:2 fluorotelomersulfonic acid	27619-97-2	0.92 U	1.8 U	1.8 U	1.9 U	1.9 U
8:2 fluorotelomersulfonic acid	39108-34-4	1.8 U	5.5 U	5.5 U	5.6 U	5.6 U
NEtFOSAA	2991-50-6	0.92 UJ	2.8 UJ	2.8 UJ	2.8 UJ	2.8 UJ
NEtPFOSA	4151-50-2	2.8 UJ	8.3 UJ	8.3 UJ	8.4 UJ	8.4 UJ
NEtPFOSAE	1691-99-2	0.92 UJ	2.8 UJ	2.8 UJ	2.8 UJ	2.8 UJ
NMeFOSAA	2355-31-9	0.92 UJ	2.8 UJ	2.8 UJ	2.8 UJ	2.8 UJ
NMePFOSA	31506-32-8	2.8 UJ	8.3 UJ	8.3 UJ	8.4 UJ	8.4 UJ
NMePFOSAE	24448-09-7	0.92 UJ	2.8 UJ	2.8 UJ	2.8 UJ	2.8 UJ
Perfluorobutanesulfonic acid	375-73-5	0.28 U	0.92 U	0.92 UJ	0.94 U	0.93 U
Perfluorobutanoic acid	375-22-4	1.8 U	5.5 U	12 J	12	5.6 U
Perfluorodecanesulfonic acid	335-77-3	0.55 U	1.8 U	1.8 U	1.9 U	1.9 U
Perfluorodecanoic acid	335-76-2	0.92 U	1.8 U	1.8 U	1.9 U	1.9 U
Perfluorododecanesulfonic acid	79780-39-5	0.28 U	0.92 U	0.92 U	0.94 U	0.93 U
Perfluorododecanoic acid	307-55-1	0.28 U	0.92 U	0.92 U	0.94 U	0.93 U
Perfluoroheptanesulfonic acid	375-92-8	0.37 U	1.8 U	1.8 U	1.9 U	1.9 U
Perfluoroheptanoic acid	375-85-9	0.28 U	0.92 U	1.8	1.9	0.93 U
Perfluorohexadecanoic acid	67905-19-5	0.28 U	0.92 U	0.92 U	0.94 U	0.93 U
Perfluorohexanesulfonic acid	355-46-4	0.37 U	1.8 U	1.8 U	1.9 U	1.9 U
Perfluorohexanoic acid	307-24-4	0.37 U	1.8 U	2.4	2.5	1.9 U
Perfluorononanesulfonic acid	68259-12-1	0.55 U	1.8 U	1.8 U	1.9 U	1.9 U
Perfluorononanoic acid	375-95-1	0.37 U	1.8 U	1.8 U	1.9 U	1.9 U
Perfluorooctadecanoic acid	376-06-7	0.28 U	0.92 U	0.92 U	0.94 U	0.93 U
Perfluorooctanesulfonamide	754-91-6	0.92 UJ	2.8 U	2.8 U	2.8 U	2.8 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.37 U	1.8 U	1.8 U	1.9 U	9.4
Perfluorooctanoic acid (PFOA)	335-67-1	0.28 U	0.92 U	3.7	4.2	6.8
Perfluoropentanesulfonic acid	2706-91-4	0.37 U	1.8 U	1.8 U	1.9 U	1.9 U
Perfluoropentanoic acid	2706-90-3	1.8 U	5.5 U	14 J	15	5.6 U
Perfluorotetradecanoic acid	376-06-7	0.28 U	0.92 U	0.92 U	0.94 U	2.3
Perfluorotridecanoic acid	72629-94-8	0.28 U	0.92 U	0.92 UZ	0.94 UZ	0.93 UZ
Perfluoroundecanoic acid	2058-94-8	0.37 U	1.8 U	1.8 U	1.9 U	1.9 U

**Notes:**  
 --- compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
 B - compound detected in method blank PQL - practical quantitation limit  
 J - indicates estimated value U - compound not detected  
 MDL - method detection limit \* data has not be validated  
 ng/L - nanogram per liter  
 Z - lab control spike compound recovery is outside the QC acceptance limit  
 † nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).

**Legend:**  
 Detected above the quantitation limit  
 Non-detect in samples after canisters  
 Detected in laboratory method blank

**TABLE 5**  
**4649 JACKIE HOOD LANE**  
**RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		PQL
Data Status		Preliminary Data
Location		4649 Jackie Hood Lane
Field Sample		4649JACKI-051018-W1-1A
Sample Location		After Second Carbon Canister
Date Sampled		10-May-18
<b>HFPO-DA</b>	<b>CAS Number</b>	
HFPO-DA	13252-13-6	0.94 U
<b>Table 3 Compounds (ng/L)</b>		
PEPA		200 U
PFECA-G	174767-10-3; 801212-59-9	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U
PFESA-BP2	749836-20-2	200 U
PFMOAA	674-13-5	200 U
PFO2HXA	39492-88-1	200 U
PFO3OA	39492-89-2	200 U
PFO4DA	39492-90-5	200 U
PMPA	13140-29-9	200 U
TAFN4	39492-91-6	200 U
<b>PFAS (ng/L)†</b>		
10:2-fluorotelomersulfonic acid	120226-60-0	8.3 U
4:2 fluorotelomersulfonic acid	757124-72-4	2.8 U
6:2 fluorotelomersulfonic acid	27619-97-2	1.9 U
8:2 fluorotelomersulfonic acid	39108-34-4	5.6 U
NEtFOSAA	2991-50-6	2.8 UJ
NEtPFOSA	4151-50-2	8.3 UJ
NEtPFOSAE	1691-99-2	2.8 UJ
NMeFOSAA	2355-31-9	2.8 UJ
NMePFOSA	31506-32-8	8.3 UJ
NMePFOSAE	24448-09-7	2.8 UJ
Perfluorobutanesulfonic acid	375-73-5	0.93 U
Perfluorobutanoic acid	375-22-4	5.6 U
Perfluorodecanesulfonic acid	335-77-3	1.9 U
Perfluorodecanoic acid	335-76-2	1.9 U
Perfluorododecanesulfonic acid	79780-39-5	0.93 U
Perfluorododecanoic acid	307-55-1	0.93 U
Perfluoroheptanesulfonic acid	375-92-8	1.9 U
Perfluoroheptanoic acid	375-85-9	0.93 U
Perfluorohexadecanoic acid	67905-19-5	0.93 U
Perfluorohexanesulfonic acid	355-46-4	1.9 U
Perfluorohexanoic acid	307-24-4	1.9 U
Perfluorononanesulfonic acid	68259-12-1	1.9 U
Perfluorononanoic acid	375-95-1	1.9 U
Perfluorooctadecanoic acid	376-06-7	0.93 U
Perfluorooctanesulfonamide	754-91-6	2.8 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	1.9 U
Perfluorooctanoic acid (PFOA)	335-67-1	0.93 U
Perfluoropentanesulfonic acid	2706-91-4	1.9 U
Perfluoropentanoic acid	2706-90-3	5.6 U
Perfluorotetradecanoic acid	376-06-7	0.93 U
Perfluorotridecanoic acid	72629-94-8	0.93 U
Perfluoroundecanoic acid	2058-94-8	1.9 U

**Notes:**  
-- - compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
B - compound detected in method blank PQL - practical quantitation limit  
J - indicates estimated value U - compound not detected  
MDL - method detection limit \* data has not be validated  
ng/L - nanogram per liter  
Z - lab control spike compound recovery is outside the QC acceptance limit  
† nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).

**Legend:**  
Detected above the quantitation limit  
Non-detect in samples after canisters  
Detected in laboratory method blank



**TABLE 6**  
**6975 POINT EAST DRIVE**  
**RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		Reporting to the MDL	Reporting to the MDL	Reporting to the MDL	Reporting to the MDL	MDL
Data Status		Final Data	Final Data	Final Data	Final Data	Final Data
Location		6975 Point East Drive	6975 Point East Drive	6975 Point East Drive	6975 Point East Drive	6975 Point East Drive
Field Sample		6975PONTE-041218-W1-1R	6975PONTE-041218-W1-1B	6975PONTE-041218-W1-1M	6975PONTE-041218-W1-1A	6975PONTE-042618-W1-1O‡
Sample Location		Raw Water	After Iron Filter	After First Carbon Canister	After Second Carbon Canister	Raw Water
Date Sampled		12-Apr-18	12-Apr-18	12-Apr-18	12-Apr-18	26-Apr-18
HFPO-DA	CAS Number					
HFPO-DA	13252-13-6	170 J	11	0.28 U	1.3 J	170
<b>Table 3 Compounds (ng/L)</b>						
PEPA		200 U	200 U	200 U	200 U	200 U
PFECA-G	174767-10-3; 801212-59-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U	200 U	200 U	200 U
PFMOAA	674-13-5	200 U	200 U	200 U	200 U	200 U
PFO2HXA	39492-88-1	200 U	200 U	200 U	200 U	200 U
PFO3OA	39492-89-2	200 U	200 U	200 U	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U	200 U	200 U	200 U
PMPA	13140-29-9	500	200 U	200 U	200 U	600
TAFN4	39492-91-6	200 U	200 U	200 U	200 U	200 U
<b>PFAS (ng/L)†</b>						
10:2-fluorotelomersulfonic acid	120226-60-0	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U
4:2 fluorotelomersulfonic acid	757124-72-4	0.93 U	0.92 U	0.93 U	0.92 U	0.93 UJ
6:2 fluorotelomersulfonic acid	27619-97-2	2.8 U	2.8 U	2.8 U	2.8 U	0.93 U
8:2 fluorotelomersulfonic acid	39108-34-4	1.9 U	1.8 U	1.9 U	1.8 U	1.9 U
NEtFOSAA	2991-50-6	0.93 U	0.92 U	0.93 U	0.92 U	0.93 U
NEtPFOSA	4151-50-2	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U
NEtPFOSAE	1691-99-2	0.93 U	0.92 U	0.93 U	0.92 U	0.93 U
NMeFOSAA	2355-31-9	0.93 U	0.92 U	0.93 U	0.92 U	0.93 U
NMePFOSA	31506-32-8	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U
NMePFOSAE	24448-09-7	0.93 U	0.92 U	0.93 U	0.92 U	0.93 U
Perfluorobutanesulfonic acid	375-73-5	5.4	0.28 U	0.28 U	0.28 U	6.1
Perfluorobutanoic acid	375-22-4	6.4	1.8 U	1.9 U	1.8 U	7.1
Perfluorodecanesulfonic acid	335-77-3	0.56 U	0.55 U	0.56 U	0.55 U	0.56 U
Perfluorodecanoic acid	335-76-2	0.93 U	0.92 U	0.93 U	0.92 U	0.93 U
Perfluorododecanesulfonic acid	79780-39-5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Perfluorododecanoic acid	307-55-1	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Perfluoroheptanesulfonic acid	375-92-8	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Perfluoroheptanoic acid	375-85-9	1.2	0.28 U	0.28 U	0.28 U	1.2
Perfluorohexadecanoic acid	67905-19-5	0.28 U	0.39 J	0.28 U	0.28 U	0.28 U
Perfluorohexanesulfonic acid	355-46-4	4.2	0.37 U	0.37 U	0.37 U	4.4
Perfluorohexanoic acid	307-24-4	3.5	0.37 U	0.37 U	0.37 U	4.1
Perfluorononanesulfonic acid	68259-12-1	0.56 U	0.55 U	0.56 U	0.55 U	0.56 U
Perfluorononanoic acid	375-95-1	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Perfluorooctadecanoic acid	376-06-7	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Perfluorooctanesulfonamide	754-91-6	0.93 UJ	0.92 UJ	0.93 U	0.92 UJ	0.93 UJ
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Perfluorooctanoic acid (PFOA)	335-67-1	1.6	0.28 U	0.28 U	0.28 U	1.7
Perfluoropentanesulfonic acid	2706-91-4	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Perfluoropentanoic acid	2706-90-3	8.1	1.8 U	1.9 U	1.8 U	8.9
Perfluorotetradecanoic acid	376-06-7	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Perfluorotridecanoic acid	72629-94-8	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Perfluoroundecanoic acid	2058-94-8	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U

**Notes:**  
-- - compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
B - compound detected in method blank PQL - practical quantitation limit  
J - indicates estimated value U - compound not detected  
MDL - method detection limit \* data has not be validated  
ng/L - nanogram per liter  
† nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).  
‡ Raw water sample ID labeled with "O" rather than "R" at end of sample name.

**Legend:**  
  Detected above the quantitation limit  
  Non-detect in samples after canisters

**TABLE 6**  
**6975 POINT EAST DRIVE**  
**RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		MDL	MDL	MDL	PQL	PQL
Data Status		Final Data	Final Data	Final Data	Final Data	Final Data
Location		6975 Point East Drive	6975 Point East Drive	6975 Point East Drive	6975 Point East Drive	6975 Point East Drive
Field Sample		6975PONTE-042618-W1-1B	6975PONTE-042618-W1-1M	6975PONTE-042618-W1-1A	PRELIM-6975PONTE-051018-W1-1R	PRELIM-6975PONTE-051018-W1-1B
Sample Location		After Iron Filter	After First Carbon Canister	After Second Carbon Canister	Raw Water	After Iron Filter
Date Sampled		26-Apr-18	26-Apr-18	26-Apr-18	10-May-18	10-May-18
HFPO-DA	CAS Number					
HFPO-DA	13252-13-6	170	0.59 J	0.52 J	190 J	210
<b>Table 3 Compounds (ng/L)</b>						
PEPA		200 U	200 U	200 U	200 U	200 U
PFECA-G	174767-10-3; 801212-59-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U	200 U	200 U	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U	200 U	200 U	200 U
PFMOAA	674-13-5	200 U	200 U	200 U	200 U	200 U
PFO2HXA	39492-88-1	200 U	200 U	200 U	200	200
PFO3OA	39492-89-2	200 U	200 U	200 U	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U	200 U	200 U	200 U
PMPA	13140-29-9	500	200 U	200 U	500	500
TAFN4	39492-91-6	200 U	200 U	200 U	200 U	200 U
<b>PFAS (ng/L)†</b>						
10:2-fluorotelomersulfonic acid	120226-60-0	2.8 U	2.7 U	2.8 U	8.2 U	8.2 U
4:2 fluorotelomersulfonic acid	757124-72-4	0.93 U	0.89 U	0.93 U	2.7 U	2.7 U
6:2 fluorotelomersulfonic acid	27619-97-2	2.8 U	2.7 U	2.8 U	1.8 U	1.8 U
8:2 fluorotelomersulfonic acid	39108-34-4	1.9 U	1.8 U	1.9 U	5.5 U	5.5 U
NEtFOSAA	2991-50-6	0.93 U	0.89 U	0.93 U	2.7 U	2.7 U
NEtPFOSA	4151-50-2	2.8 U	2.7 U	2.8 U	8.2 U	8.2 U
NEtPFOSAE	1691-99-2	0.93 U	0.89 U	0.93 U	2.7 U	2.7 U
NMeFOSAA	2355-31-9	0.93 U	0.89 U	0.93 U	2.7 U	2.7 U
NMePFOSA	31506-32-8	2.8 U	2.7 U	2.8 U	8.2 U	8.2 U
NMePFOSAE	24448-09-7	0.93 U	0.89 U	0.93 U	2.7 U	2.7 U
Perfluorobutanesulfonic acid	375-73-5	5.3	0.27 U	0.28 U	5.5	6.1
Perfluorobutanoic acid	375-22-4	6.2	1.8 U	1.9 U	6.7	7.1
Perfluorodecanesulfonic acid	335-77-3	0.56 U	0.54 U	0.56 U	1.8 U	1.8 U
Perfluorodecanoic acid	335-76-2	0.93 U	0.89 U	0.93 U	1.8 U	1.8 U
Perfluorododecanesulfonic acid	79780-39-5	0.28 U	0.27 U	0.28 U	0.91 U	0.91 U
Perfluorododecanoic acid	307-55-1	0.28 U	0.27 U	0.28 U	0.91 U	0.91 U
Perfluoroheptanesulfonic acid	375-92-8	0.37 U	0.36 U	0.37 U	1.8 U	1.8 U
Perfluoroheptanoic acid	375-85-9	1.2	0.27 U	0.28 U	1.2	1.4
Perfluorohexadecanoic acid	67905-19-5	0.28 U	0.27 U	0.28 U	0.91 U	0.91 U
Perfluorohexanesulfonic acid	355-46-4	3.9	0.36 U	0.37 U	3.7	4.3
Perfluorohexanoic acid	307-24-4	3.6	0.36 U	0.37 U	3.6	4
Perfluorononanesulfonic acid	68259-12-1	0.56 U	0.54 U	0.56 U	1.8 U	1.8 U
Perfluorononanoic acid	375-95-1	0.37 U	0.36 U	0.37 U	1.8 U	1.8 U
Perfluorooctadecanoic acid	376-06-7	0.28 U	0.27 U	0.28 U	0.91 U	0.91 U
Perfluorooctanesulfonamide	754-91-6	0.93 U	0.89 UJ	0.93 UJ	2.7 U	2.7 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.37 U	0.36 U	0.37 U	1.8 U	1.8 U
Perfluorooctanoic acid (PFOA)	335-67-1	1.7	0.27 U	0.28 U	1.7	1.9
Perfluoropentanesulfonic acid	2706-91-4	0.37 U	0.36 U	0.37 U	1.8 U	1.8 U
Perfluoropentanoic acid	2706-90-3	7.7	1.8 U	1.9 U	8.2	9.5
Perfluorotetradecanoic acid	376-06-7	0.28 U	0.27 U	0.28 U	0.91 U	0.91 U
Perfluorotridecanoic acid	72629-94-8	0.28 U	0.27 U	0.28 U	0.91 U	0.91 U
Perfluoroundecanoic acid	2058-94-8	0.37 U	0.36 U	0.37 U	1.8 U	1.8 U

**Notes:**  
-- - compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
B - compound detected in method blank PQL - practical quantitation limit  
J - indicates estimated value U - compound not detected  
MDL - method detection limit \* data has not be validated  
ng/L - nanogram per liter  
† nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).  
‡ Raw water sample ID labeled with "O" rather than "R" at end of sample name.

**Legend:**  
Detected above the quantitation limit  
Non-detect in samples after canisters



**TABLE 6**  
**6975 POINT EAST DRIVE**  
**RESIDENTIAL WELL CARBON PILOT TABLE 3 and PFAS CONCENTRATIONS**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		PQL	PQL
<b>Data Status</b>		Final Data	Final Data
<b>Location</b>		6975 Point East Drive	6975 Point East Drive
<b>Field Sample</b>		PRELIM-6975PONTE-051018-W1-1M	PRELIM-6975PONTE-051018-W1-1A
<b>Sample Location</b>		After First Carbon Canister	After Second Carbon Canister
<b>Date Sampled</b>		10-May-18	10-May-18
<b>HFPO-DA</b>	<b>CAS Number</b>		
HFPO-DA	13252-13-6	0.97 UJ	0.96 UJ
<b>Table 3 Compounds (ng/L)</b>			
PEPA		200 U	200 U
PFECA-G	174767-10-3; 801212-59-9	200 U	200 U
PFESA-BP1	66796-30-3; 29311-67-9	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U
PFMOAA	674-13-5	200 U	200 U
PFO2HXA	39492-88-1	200 U	200 U
PFO3OA	39492-89-2	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U
PMPA	13140-29-9	200 U	200 U
TAFN4	39492-91-6	200 U	200 U
<b>PFAS (ng/L)†</b>			
10:2-fluorotelomersulfonic acid	120226-60-0	8.3 U	8 U
4:2-fluorotelomersulfonic acid	757124-72-4	2.8 U	2.7 U
6:2-fluorotelomersulfonic acid	27619-97-2	1.8 U	1.8 U
8:2-fluorotelomersulfonic acid	39108-34-4	5.5 U	5.3 U
NEtFOSAA	2991-50-6	2.8 U	2.7 U
NEtPFOSA	4151-50-2	8.3 U	8 U
NEtPFOSAE	1691-99-2	2.8 U	2.7 U
NMeFOSAA	2355-31-9	2.8 U	2.7 U
NMePFOSA	31506-32-8	8.3 U	8 U
NMePFOSAE	24448-09-7	2.8 U	2.7 U
Perfluorobutanesulfonic acid	375-73-5	0.92 U	0.89 U
Perfluorobutanoic acid	375-22-4	5.5 U	5.3 U
Perfluorodecanesulfonic acid	335-77-3	1.8 U	1.8 U
Perfluorodecanoic acid	335-76-2	1.8 U	1.8 U
Perfluorododecanesulfonic acid	79780-39-5	0.92 U	0.89 U
Perfluorododecanoic acid	307-55-1	0.92 U	0.89 U
Perfluoroheptanesulfonic acid	375-92-8	1.8 U	1.8 U
Perfluoroheptanoic acid	375-85-9	0.92 U	0.89 U
Perfluorohexadecanoic acid	67905-19-5	0.92 U	0.89 U
Perfluorohexanesulfonic acid	355-46-4	1.8 U	1.8 U
Perfluorohexanoic acid	307-24-4	1.8 U	1.8 U
Perfluorononanesulfonic acid	68259-12-1	1.8 U	1.8 U
Perfluorononanoic acid	375-95-1	1.8 U	1.8 U
Perfluorooctadecanoic acid	376-06-7	0.92 U	0.89 U
Perfluorooctanesulfonamide	754-91-6	2.8 U	2.7 UJ
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	1.8 U	2
Perfluorooctanoic acid (PFOA)	335-67-1	0.92 U	1.4
Perfluoropentanesulfonic acid	2706-91-4	1.8 U	1.8 U
Perfluoropentanoic acid	2706-90-3	5.5 U	5.3 U
Perfluorotetradecanoic acid	376-06-7	0.92 U	2
Perfluorotridecanoic acid	72629-94-8	0.92 U	0.89 U
Perfluoroundecanoic acid	2058-94-8	1.8 U	1.8 U

**Notes:**  
 -- - compound not analyzed for PFAS - per- and polyfluoroalkyl substances  
 B - compound detected in method blank PQL - practical quantitation limit  
 J - indicates estimated value U - compound not detected  
 MDL - method detection limit \* data has not be validated  
 ng/L - nanogram per liter

† nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).  
 ‡ Raw water sample ID labeled with "O" rather than "R" at end of sample name.

**Legend:**  
 Detected above the quantitation limit  
 Non-detect in samples after canisters

**TABLE 7**  
**TABLE 3 and PFAS CONCENTRATIONS IN FIELD BLANK SAMPLES**  
**Chemours Fayetteville Works, North Carolina**

Reporting to MDL / PQL		PQL	PQL	PQL	PQL	PQL	PQL	PQL	PQL	PQL	PQL	MDL
Data Status		Final Data	Final Data	Final Data	Final Data	Final Data	Final Data	Final Data	Final Data	Final Data	Final Data	Final Data
Location		Fay D FB	Fay D FB	Fay D FB	Fay D FB	Fay D FB	Fay D FB	Fay D FB	Fay D FB	Fay D FB	Fay D FB	Fay D FB
Field Sample		FAY-D-FB-032318	FAY-D-FB-040518	FAY-D-FB-041318	FAY-D-FB-041318	FAY-D-FB-041318	FAY-D-FB-041918	FAY-D-FB-042018	FAY-D-FB-042318	FAY-D-FB-042618	FAY-D-FB-02-042618	FAY-D-FB-02-051018
Date Sampled		23-Mar-18	05-Apr-18	13-Apr-18	13-Apr-18	13-Apr-18	19-Apr-18	20-Apr-18	23-Apr-18	26-Apr-18	26-Apr-18	10-May-18
HFPO-DA	CAS Number											
HFPO-DA	13252-13-6	0.29 U	0.28 U	0.28 U	0.27 U	0.28 U	<b>1</b>	<b>1.6</b>	0.27 U	<b>0.4 J</b>	<b>0.35 J</b>	0.94 U
<b>Table 3 Compounds (ng/L)</b>												
PEPA		200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U
PFESA-G	174767-10-3; 801212-59-9	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U
PFESA-BP1	66796-30-3; 293111-67-9	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U
PFESA-BP2	749836-20-2	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U
PFMOAA	674-13-5	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U
PFO2HXA	39492-88-1	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U
PFO3OA	39492-89-2	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U
PFO4DA	39492-90-5	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U
PMPA	13140-29-9	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U
TAFN4	39492-91-6	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U
<b>PFAS (ng/L)†</b>												
10:2-fluorotelomersulfonic acid	120226-60-0	2.9 U	2.9 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.9 U	2.8 U	2.8 U	8.4 U
4:2 fluorotelomersulfonic acid	757124-72-4	0.97 U	0.97 U	0.92 U	0.94 U	0.94 U	0.92 U	0.92 U	0.98 U	0.93 U	0.92 U	2.8 U
6:2 fluorotelomersulfonic acid	27619-97-2	2.9 U	2.9 U	2.8 U	2.8 U	2.8 U	0.92 U	0.92 U	2.9 U	0.93 U	0.92 U	1.9 U
8:2 fluorotelomersulfonic acid	39108-34-4	1.9 U	1.9 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	2 U	1.9 U	1.8 U	5.6 U
NEtFOSAA	2991-50-6	0.97 U	0.97 U	0.92 U	0.94 U	0.94 U	0.92 U	0.92 U	0.98 U	0.93 U	0.92 U	2.8 U
NEtPFOSA	4151-50-2	2.9 U	2.9 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.9 U	2.8 U	2.8 U	8.4 U
NEtPFOSAE	1691-99-2	0.97 U	0.97 U	0.92 U	0.94 U	0.94 U	0.92 U	0.92 U	0.98 U	0.93 U	0.92 U	2.8 U
NMeFOSAA	2991-50-6	0.97 U	0.97 U	0.92 U	0.94 U	0.94 U	0.92 U	0.92 U	0.98 U	0.93 U	0.92 U	2.8 U
NMePFOSA	31506-32-8	2.9 U	2.9 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.9 U	2.8 U	2.8 U	8.4 U
NMePFOSAE	24448-09-7	0.97 U	0.97 U	0.92 U	0.94 U	0.94 U	0.92 U	0.92 U	0.98 U	0.93 U	0.92 U	2.8 U
Perfluorobutanesulfonic acid	375-73-5	0.29 U	0.29 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.29 U	0.28 U	0.28 U	0.93 U
Perfluorobutanoic acid	375-22-4	1.9 U	1.9 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	2 U	1.9 U	1.8 U	5.6 U
Perfluorodecanesulfonic acid	335-77-3	0.58 U	0.58 U	0.55 U	0.57 U	0.56 U	0.55 U	0.55 U	0.59 U	0.56 U	0.55 U	1.9 U
Perfluorodecanoic acid	335-76-2	0.97 U	0.97 U	0.92 U	0.94 U	0.94 U	0.92 U	0.92 U	0.98 U	0.93 U	0.92 U	1.9 U
Perfluorododecanesulfonic acid	79780-39-5	0.29 U	0.29 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.29 U	0.28 U	0.28 U	0.93 U
Perfluorododecanoic acid	307-55-1	0.29 U	0.29 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.29 U	0.28 U	0.28 U	0.93 U
Perfluoroheptanesulfonic acid	375-92-8	0.39 U	0.39 U	0.37 U	0.38 U	0.37 U	0.37 U	0.37 U	0.39 U	0.37 U	0.37 U	1.9 U
Perfluoroheptanoic acid	375-85-9	0.29 U	0.29 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.29 U	0.28 U	0.28 U	0.93 U
Perfluorohexadecanoic acid	67905-19-5	0.29 U	0.29 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.29 U	0.28 U	0.28 U	0.93 U
Perfluorohexanesulfonic acid	355-46-4	0.39 U	0.39 U	0.37 U	0.38 U	0.37 U	0.37 U	0.37 U	0.39 U	0.37 U	0.37 U	1.9 U
Perfluorohexanoic acid	307-24-4	0.39 U	0.39 U	0.37 U	0.38 U	0.37 U	0.37 U	0.37 U	0.39 U	0.37 U	0.37 U	1.9 U
Perfluorononanesulfonic acid	68259-12-1	0.58 U	0.58 U	0.55 U	0.57 U	0.56 U	0.55 U	0.55 U	0.59 U	0.56 U	0.55 U	1.9 U
Perfluorononanoic acid	375-95-1	0.39 U	0.39 U	0.37 U	0.38 U	0.37 U	0.37 U	0.37 U	0.39 U	0.37 U	0.37 U	1.9 U
Perfluorooctadecanoic acid	376-06-7	0.29 U	0.29 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.29 U	0.28 U	0.28 U	0.93 U
Perfluorooctanesulfonamide	754-91-6	0.97 U	0.97 U	0.92 U	0.94 U	0.94 U	0.92 U	0.92 U	0.98 U	0.93 U	0.92 U	2.8 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.39 U	0.39 U	0.37 U	0.38 U	0.37 U	0.37 U	0.37 U	0.39 U	0.37 U	0.37 U	<b>62</b>
Perfluorooctanoic acid (PFOA)	335-67-1	--	0.29 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.29 U	0.28 U	0.28 U	<b>2.0</b>
Perfluoropentanesulfonic acid	2706-91-4	0.39 U	0.39 U	0.37 U	0.38 U	0.39 U	0.37 U	0.37 U	0.39 U	0.37 U	0.37 U	1.9 U
Perfluoropentanoic acid	2706-90-3	1.9 U	1.9 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	2 U	1.9 U	1.8 U	5.6 U
Perfluorotetradecanoic acid	376-06-7	0.29 U	0.29 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.29 U	0.28 U	0.28 U	<b>4.5</b>
Perfluorotridecanoic acid	72629-94-8	0.29 U	0.29 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.29 U	0.28 U	0.28 U	0.93 UZ
Perfluoroundecanoic acid	2058-94-8	0.39 U	0.39 U	0.37 U	0.38 U	0.37 U	0.37 U	0.37 U	0.39 U	0.37 U	0.37 U	1.9 U

**Notes:**  
-- - compound not analyzed for  
B - compound detected in method blank  
J - indicates estimated value  
MDL - method detection limit  
ng/L - nanogram per liter  
PFAS - per- and polyfluoroalkyl substances

PQL - practical quantitation limit  
U - compound not detected  
Z - lab control spike compound recovery is outside the QC acceptance limit  
\* data has not be validated  
† nanograms per liter (ng/L) are equivalent to parts per trillion (ppt).

**Legend:**  
**Bold - Detected**



a member of **The GEL Group** INC



PO Box 30712 Charleston, SC 29417  
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June 06, 2018

Ms. Sandy Mort  
NC Dept Environmental Quality  
1646 Mail Service Center  
Raleigh, North Carolina 27699

Re: Routine Analysis  
Work Order: 449499

Dear Ms. Mort:

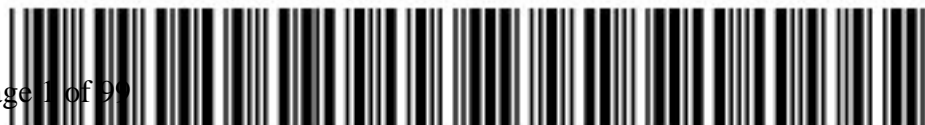
GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on May 04, 2018. This revised data report has been prepared and reviewed in accordance with GEL's standard operating procedures. This package has been revised to reflect an updated Case Narrative and corrected data reports.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4778.

Sincerely,

Valerie Davis for  
Hope Taylor  
Project Manager

Purchase Order: SIGNED QUOTE  
Enclosures



# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

## Certificate of Analysis Report for

NCDQ001 NC Dept Environmental Quality  
Client SDG: 449499 GEL Work Order: 449499

**The Qualifiers in this report are defined as follows:**

- \* A quality control analyte recovery is outside of specified acceptance criteria
- \*\* Analyte is a Tracer compound
- \*\* Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Hope Taylor.

Reviewed by \_\_\_\_\_

*Valerie Davis*

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 77 Raw	Project: NCDQ00117
Sample ID: 449499001	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 08:35	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.33	3.83	ng/L	0.0201	1	JLS	05/09/18	2235	1762030	1
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.33	3.87	ng/L	0.0201	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.33	4.03	ng/L	0.0201	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.33	4.03	ng/L	0.0201	1					
Perfluorobutanesulfonate (PFBS)	J	0.881	0.665	1.79	ng/L	0.0201	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.665	1.95	ng/L	0.0201	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.665	2.01	ng/L	0.0201	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.665	2.01	ng/L	0.0201	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.665	1.91	ng/L	0.0201	1					
Perfluoroheptanoic acid (PFHpA)		2.02	0.665	2.01	ng/L	0.0201	1					
Perfluorohexanesulfonate (PFHxS)	U	ND	0.665	1.83	ng/L	0.0201	1					
Perfluorohexanoic acid (PFHxA)		2.64	0.665	2.01	ng/L	0.0201	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.665	1.93	ng/L	0.0201	1					
Perfluorononanoic acid (PFNA)	U	ND	0.665	2.01	ng/L	0.0201	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.665	1.87	ng/L	0.0201	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.665	2.01	ng/L	0.0201	1					
Perfluorooctanoic acid (PFOA)		4.48	0.665	2.01	ng/L	0.0201	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.665	1.89	ng/L	0.0201	1					
Perfluoropentanoic acid (PFPeA)		14.0	0.665	2.01	ng/L	0.0201	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.665	2.01	ng/L	0.0201	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.665	2.01	ng/L	0.0201	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.665	2.01	ng/L	0.0201	1					
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)		1310	33.2	101	ng/L	0.0201	50	JLS	05/10/18	0859	1762030	2
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	66.5	189	ng/L	0.0201	50					
Perfluorobutyric acid (PFBA)	U	ND	33.2	101	ng/L	0.0201	50					
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	2.01	2.01	ng/L	0.0201	1	JLS	05/09/18	2235	1762030	3

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 77 Raw	Project: NCDQ00117
Sample ID: 449499001	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	X	59.9	2.01	2.01	ng/L	0.0201	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	X	29.7	2.01	2.01	ng/L	0.0201	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	UX	ND	101	101	ng/L	0.0201	50	JLS	05/10/18	0859	1762030	4
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	X	345	101	101	ng/L	0.0201	50					
Perfluoro-2-methoxyacetic acid (PFMOAA)	X	306	101	101	ng/L	0.0201	50					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	X	2940	101	101	ng/L	0.0201	50					
Perfluoro-4-methoxybutanic acid (PFMOBA)	X	791	101	101	ng/L	0.0201	50					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/08/18	0946	1762029

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	
3	EPA 537	
4	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.27 ng/L	5.03	85	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	5.35 ng/L	5.03	106	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.58 ng/L	5.03	111	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	4.57 ng/L	5.03	91	(70%-130%)

**Notes:**

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699  
Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 77 Raw  
Sample ID: 449499001

Project: NCDQ00117  
Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 77 Pre	Project: NCDQ00117
Sample ID: 449499002	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 08:35	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.34	3.82	ng/L	0.0203	1	JLS	05/09/18	2253	1762030	1
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.34	3.86	ng/L	0.0203	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.34	3.90	ng/L	0.0203	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.34	4.07	ng/L	0.0203	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.34	4.07	ng/L	0.0203	1					
Perfluorobutanesulfonate (PFBS)	J	0.793	0.671	1.81	ng/L	0.0203	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.671	1.97	ng/L	0.0203	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.671	2.03	ng/L	0.0203	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.671	2.03	ng/L	0.0203	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.671	1.93	ng/L	0.0203	1					
Perfluoroheptanoic acid (PFHpA)		2.05	0.671	2.03	ng/L	0.0203	1					
Perfluorohexanesulfonate (PFHxS)	U	ND	0.671	1.85	ng/L	0.0203	1					
Perfluorohexanoic acid (PFHxA)		2.65	0.671	2.03	ng/L	0.0203	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.671	1.95	ng/L	0.0203	1					
Perfluorononanoic acid (PFNA)	U	ND	0.671	2.03	ng/L	0.0203	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.671	1.89	ng/L	0.0203	1					
Perfluorooctanesulfonate (PFOS)	J	1.40	0.671	2.03	ng/L	0.0203	1					
Perfluorooctanoic acid (PFOA)		3.91	0.671	2.03	ng/L	0.0203	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.671	1.91	ng/L	0.0203	1					
Perfluoropentanoic acid (PFPeA)		13.4	0.671	2.03	ng/L	0.0203	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.671	2.03	ng/L	0.0203	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.671	2.03	ng/L	0.0203	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.671	2.03	ng/L	0.0203	1					
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)		1340	33.6	102	ng/L	0.0203	50	JLS	05/10/18	0917	1762030	2
Perfluorobutyric acid (PFBA)	U	ND	33.6	102	ng/L	0.0203	50					
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	2.03	2.03	ng/L	0.0203	1	JLS	05/09/18	2253	1762030	3



# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 77 Pre

Project: NCDQ00117

Sample ID: 449499002

Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	X	57.6	2.03	2.03	ng/L	0.0203	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	X	24.9	2.03	2.03	ng/L	0.0203	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	X	76.5	2.03	2.03	ng/L	0.0203	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	X	388	102	102	ng/L	0.0203	50	JLS	05/10/18	0917	1762030	4
Perfluoro-2-methoxyacetic acid (PFMOAA)	X	300	102	102	ng/L	0.0203	50					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	X	2870	102	102	ng/L	0.0203	50					
Perfluoro-4-methoxybutanic acid (PFMOBA)	X	905	102	102	ng/L	0.0203	50					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/08/18	0946	1762029

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	
3	EPA 537	
4	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.96 ng/L	5.08	97	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	5.20 ng/L	5.08	102	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.46 ng/L	5.08	107	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	4.85 ng/L	5.08	95	(70%-130%)

**Notes:**

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699  
Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 77 Pre  
Sample ID: 449499002

Project: NCDQ00117  
Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 77 Mid	Project: NCDQ00117
Sample ID: 449499003	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 08:35	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)	U	ND	0.704	2.13	ng/L	0.0213	1	JLS	05/09/18	2345	1762030	1
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.41	4.01	ng/L	0.0213	1					
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.41	4.06	ng/L	0.0213	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.41	4.10	ng/L	0.0213	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.41	4.27	ng/L	0.0213	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.41	4.27	ng/L	0.0213	1					
Perfluorobutanesulfonate (PFBS)	U	ND	0.704	1.90	ng/L	0.0213	1					
Perfluorobutyric acid (PFBA)	U	ND	0.704	2.13	ng/L	0.0213	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.704	2.07	ng/L	0.0213	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.704	2.13	ng/L	0.0213	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.704	2.13	ng/L	0.0213	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.704	2.03	ng/L	0.0213	1					
Perfluoroheptanoic acid (PFHpA)	U	ND	0.704	2.13	ng/L	0.0213	1					
Perfluorohexanesulfonate (PFHxS)	U	ND	0.704	1.94	ng/L	0.0213	1					
Perfluorohexanoic acid (PFHxA)	U	ND	0.704	2.13	ng/L	0.0213	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.704	2.05	ng/L	0.0213	1					
Perfluorononanoic acid (PFNA)	U	ND	0.704	2.13	ng/L	0.0213	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.704	1.99	ng/L	0.0213	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.704	2.13	ng/L	0.0213	1					
Perfluorooctanoic acid (PFOA)	U	ND	0.704	2.13	ng/L	0.0213	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.704	2.01	ng/L	0.0213	1					
Perfluoropentanoic acid (PFPeA)	U	ND	0.704	2.13	ng/L	0.0213	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.704	2.13	ng/L	0.0213	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.704	2.13	ng/L	0.0213	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.704	2.13	ng/L	0.0213	1					
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	2.13	2.13	ng/L	0.0213	1	JLS	05/09/18	2345	1762030	2

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 77 Mid	Project: NCDQ00117
Sample ID: 449499003	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	UX	ND	2.13	2.13	ng/L	0.0213	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	UX	ND	2.13	2.13	ng/L	0.0213	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	UX	ND	2.13	2.13	ng/L	0.0213	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	UX	ND	2.13	2.13	ng/L	0.0213	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	UX	ND	2.13	2.13	ng/L	0.0213	1					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	UX	ND	2.13	2.13	ng/L	0.0213	1					
Perfluoro-4-methoxybutanic acid (PFMOBA)	UX	ND	2.13	2.13	ng/L	0.0213	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/08/18	0946	1762029

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.54 ng/L	5.34	85	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	5.22 ng/L	5.34	98	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.33 ng/L	5.34	100	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	5.90 ng/L	5.34	111	(70%-130%)

**Notes:**

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 77 Post	Project: NCDQ00117
Sample ID: 449499004	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 08:35	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)	U	ND	0.673	2.04	ng/L	0.0204	1	JLS	05/10/18	0002	1762030	1
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.35	3.83	ng/L	0.0204	1					
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.35	3.88	ng/L	0.0204	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.35	3.92	ng/L	0.0204	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.35	4.08	ng/L	0.0204	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.35	4.08	ng/L	0.0204	1					
Perfluorobutanesulfonate (PFBS)	U	ND	0.673	1.82	ng/L	0.0204	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.673	1.98	ng/L	0.0204	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.673	2.04	ng/L	0.0204	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.673	2.04	ng/L	0.0204	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.673	1.94	ng/L	0.0204	1					
Perfluoroheptanoic acid (PFHpA)	U	ND	0.673	2.04	ng/L	0.0204	1					
Perfluorohexanesulfonate (PFHxS)	U	ND	0.673	1.86	ng/L	0.0204	1					
Perfluorohexanoic acid (PFHxA)	U	ND	0.673	2.04	ng/L	0.0204	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.673	1.96	ng/L	0.0204	1					
Perfluorononanoic acid (PFNA)	U	ND	0.673	2.04	ng/L	0.0204	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.673	1.90	ng/L	0.0204	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.673	2.04	ng/L	0.0204	1					
Perfluorooctanoic acid (PFOA)	U	ND	0.673	2.04	ng/L	0.0204	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.673	1.92	ng/L	0.0204	1					
Perfluoropentanoic acid (PFPeA)	U	ND	0.673	2.04	ng/L	0.0204	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.673	2.04	ng/L	0.0204	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.673	2.04	ng/L	0.0204	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.673	2.04	ng/L	0.0204	1					
Perfluorobutyric acid (PFBA)	U	ND	3.37	10.2	ng/L	0.0204	5	JLS	05/10/18	1532	1762030	2
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	2.04	2.04	ng/L	0.0204	1	JLS	05/10/18	0002	1762030	3

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 77 Post	Project: NCDQ00117
Sample ID: 449499004	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	UX	ND	2.04	2.04	ng/L	0.0204	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	UX	ND	2.04	2.04	ng/L	0.0204	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	UX	ND	2.04	2.04	ng/L	0.0204	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	UX	ND	2.04	2.04	ng/L	0.0204	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	UX	ND	2.04	2.04	ng/L	0.0204	1					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	UX	ND	2.04	2.04	ng/L	0.0204	1					
Perfluoro-4-methoxybutanic acid (PFMOBA)	UX	ND	2.04	2.04	ng/L	0.0204	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/08/18	0946	1762029

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	
3	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.87 ng/L	5.10	96	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	4.89 ng/L	5.10	96	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.64 ng/L	5.10	111	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	5.05 ng/L	5.10	99	(70%-130%)

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699  
Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 77 Post

Sample ID: 449499004

Project: NCDQ00117

Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 77 FB	Project: NCDQ00117
Sample ID: 449499005	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 08:35	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)	U	ND	0.646	1.96	ng/L	0.0196	1	JLS	05/10/18	0019	1762030	1
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.29	3.68	ng/L	0.0196	1					
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.29	3.72	ng/L	0.0196	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.29	3.76	ng/L	0.0196	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.29	3.92	ng/L	0.0196	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.29	3.92	ng/L	0.0196	1					
Perfluorobutanesulfonate (PFBS)	U	ND	0.646	1.74	ng/L	0.0196	1					
Perfluorobutyric acid (PFBA)	U	ND	0.646	1.96	ng/L	0.0196	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.646	1.90	ng/L	0.0196	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.646	1.96	ng/L	0.0196	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.646	1.96	ng/L	0.0196	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.646	1.86	ng/L	0.0196	1					
Perfluoroheptanoic acid (PFHpA)	U	ND	0.646	1.96	ng/L	0.0196	1					
Perfluorohexanesulfonate (PFHxS)	U	ND	0.646	1.78	ng/L	0.0196	1					
Perfluorohexanoic acid (PFHxA)	U	ND	0.646	1.96	ng/L	0.0196	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.646	1.88	ng/L	0.0196	1					
Perfluorononanoic acid (PFNA)	U	ND	0.646	1.96	ng/L	0.0196	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.646	1.82	ng/L	0.0196	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.646	1.96	ng/L	0.0196	1					
Perfluorooctanoic acid (PFOA)	U	ND	0.646	1.96	ng/L	0.0196	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.646	1.84	ng/L	0.0196	1					
Perfluoropentanoic acid (PFPeA)	U	ND	0.646	1.96	ng/L	0.0196	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.646	1.96	ng/L	0.0196	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.646	1.96	ng/L	0.0196	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.646	1.96	ng/L	0.0196	1					
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	1.96	1.96	ng/L	0.0196	1	JLS	05/10/18	0019	1762030	2



# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 77 FB

Project: NCDQ00117

Sample ID: 449499005

Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	UX	ND	1.96	1.96	ng/L	0.0196	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	UX	ND	1.96	1.96	ng/L	0.0196	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	UX	ND	1.96	1.96	ng/L	0.0196	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	UX	ND	1.96	1.96	ng/L	0.0196	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	UX	ND	1.96	1.96	ng/L	0.0196	1					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	UX	ND	1.96	1.96	ng/L	0.0196	1					
Perfluoro-4-methoxybutanic acid (PFMOBA)	UX	ND	1.96	1.96	ng/L	0.0196	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/08/18	0946	1762029

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.00 ng/L	4.90	102	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	5.27 ng/L	4.90	108	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.75 ng/L	4.90	117	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	5.45 ng/L	4.90	111	(70%-130%)

**Notes:**

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 79 Raw	Project: NCDQ00117
Sample ID: 449499006	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 09:40	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.29	3.68	ng/L	0.0196	1	JLS	05/10/18	0037	1762030	1
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.29	3.72	ng/L	0.0196	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.29	3.76	ng/L	0.0196	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.29	3.92	ng/L	0.0196	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.29	3.92	ng/L	0.0196	1					
Perfluorobutanesulfonate (PFBS)		5.75	0.647	1.74	ng/L	0.0196	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.647	1.90	ng/L	0.0196	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.647	1.96	ng/L	0.0196	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.647	1.96	ng/L	0.0196	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.647	1.86	ng/L	0.0196	1					
Perfluoroheptanoic acid (PFHpA)		3.60	0.647	1.96	ng/L	0.0196	1					
Perfluorohexanesulfonate (PFHxS)	J	1.60	0.647	1.78	ng/L	0.0196	1					
Perfluorohexanoic acid (PFHxA)		5.63	0.647	1.96	ng/L	0.0196	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.647	1.88	ng/L	0.0196	1					
Perfluorononanoic acid (PFNA)	U	ND	0.647	1.96	ng/L	0.0196	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.647	1.82	ng/L	0.0196	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.647	1.96	ng/L	0.0196	1					
Perfluorooctanoic acid (PFOA)		3.77	0.647	1.96	ng/L	0.0196	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.647	1.84	ng/L	0.0196	1					
Perfluoropentanoic acid (PFPeA)		21.3	0.647	1.96	ng/L	0.0196	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.647	1.96	ng/L	0.0196	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.647	1.96	ng/L	0.0196	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.647	1.96	ng/L	0.0196	1					
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)		1540	32.3	98.0	ng/L	0.0196	50	JLS	05/10/18	1009	1762030	2
Perfluorobutyric acid (PFBA)	U	ND	32.3	98.0	ng/L	0.0196	50					
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	1.96	1.96	ng/L	0.0196	1	JLS	05/10/18	0037	1762030	3

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 79 Raw	Project: NCDQ00117
Sample ID: 449499006	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	X	47.7	1.96	1.96	ng/L	0.0196	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	X	43.5	1.96	1.96	ng/L	0.0196	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	X	79.4	1.96	1.96	ng/L	0.0196	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	X	467	98.0	98.0	ng/L	0.0196	50	JLS	05/10/18	1009	1762030	4
Perfluoro-2-methoxyacetic acid (PFMOAA)	X	323	98.0	98.0	ng/L	0.0196	50					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	X	1900	98.0	98.0	ng/L	0.0196	50					
Perfluoro-4-methoxybutanic acid (PFMOBA)	X	672	98.0	98.0	ng/L	0.0196	50					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/08/18	0946	1762029

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	
3	EPA 537	
4	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.36 ng/L	4.90	89	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	5.13 ng/L	4.90	105	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	6.07 ng/L	4.90	124	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	4.58 ng/L	4.90	93	(70%-130%)

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699  
Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 79 Raw

Sample ID: 449499006

Project: NCDQ00117

Client ID: NCDQ001

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Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 79 Pre	Project: NCDQ00117
Sample ID: 449499007	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 09:40	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.33	3.80	ng/L	0.0202	1	JLS	05/14/18	1318	1762030	1
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.33	3.84	ng/L	0.0202	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.33	3.88	ng/L	0.0202	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.33	4.04	ng/L	0.0202	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.33	4.04	ng/L	0.0202	1					
Perfluorobutanesulfonate (PFBS)		4.90	0.667	1.80	ng/L	0.0202	1					
Perfluorobutyric acid (PFBA)		21.5	0.667	2.02	ng/L	0.0202	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.667	1.96	ng/L	0.0202	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.667	2.02	ng/L	0.0202	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.667	2.02	ng/L	0.0202	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.667	1.92	ng/L	0.0202	1					
Perfluoroheptanoic acid (PFHpA)		3.11	0.667	2.02	ng/L	0.0202	1					
Perfluorohexanesulfonate (PFHxS)	J	1.18	0.667	1.84	ng/L	0.0202	1					
Perfluorohexanoic acid (PFHxA)		3.99	0.667	2.02	ng/L	0.0202	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.667	1.94	ng/L	0.0202	1					
Perfluorononanoic acid (PFNA)	U	ND	0.667	2.02	ng/L	0.0202	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.667	1.88	ng/L	0.0202	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.667	2.02	ng/L	0.0202	1					
Perfluorooctanoic acid (PFOA)		3.61	0.667	2.02	ng/L	0.0202	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.667	1.90	ng/L	0.0202	1					
Perfluoropentanoic acid (PFPeA)		18.9	0.667	2.02	ng/L	0.0202	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.667	2.02	ng/L	0.0202	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.667	2.02	ng/L	0.0202	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.667	2.02	ng/L	0.0202	1					
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)		1700	33.4	101	ng/L	0.0202	50	JLS	05/10/18	1026	1762030	2
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	2.02	2.02	ng/L	0.0202	1	JLS	05/14/18	1318	1762030	3

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 79 Pre	Project: NCDQ00117
Sample ID: 449499007	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	X	42.4	2.02	2.02	ng/L	0.0202	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	X	42.1	2.02	2.02	ng/L	0.0202	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	X	71.1	2.02	2.02	ng/L	0.0202	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	X	443	101	101	ng/L	0.0202	50	JLS	05/10/18	1026	1762030	4
Perfluoro-2-methoxyacetic acid (PFMOAA)	X	352	101	101	ng/L	0.0202	50					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	X	2190	101	101	ng/L	0.0202	50					
Perfluoro-4-methoxybutanic acid (PFMOBA)	X	701	101	101	ng/L	0.0202	50					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/08/18	0946	1762029

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	
3	EPA 537	
4	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.11 ng/L	5.05	81	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	5.02 ng/L	5.05	99	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.39 ng/L	5.05	107	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	4.56 ng/L	5.05	90	(70%-130%)

**Notes:**

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699  
Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 79 Pre  
Sample ID: 449499007

Project: NCDQ00117  
Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 79 Mid	Project: NCDQ00117
Sample ID: 449499008	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 09:40	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)	U	ND	0.636	1.93	ng/L	0.0193	1	JLS	05/10/18	0146	1762030	1
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.27	3.63	ng/L	0.0193	1					
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.27	3.66	ng/L	0.0193	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.27	3.70	ng/L	0.0193	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.27	3.86	ng/L	0.0193	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.27	3.86	ng/L	0.0193	1					
Perfluorobutanesulfonate (PFBS)	U	ND	0.636	1.72	ng/L	0.0193	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.636	1.87	ng/L	0.0193	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.636	1.83	ng/L	0.0193	1					
Perfluoroheptanoic acid (PFHpA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluorohexanesulfonate (PFHxS)	U	ND	0.636	1.75	ng/L	0.0193	1					
Perfluorohexanoic acid (PFHxA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.636	1.85	ng/L	0.0193	1					
Perfluorononanoic acid (PFNA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.636	1.79	ng/L	0.0193	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluorooctanoic acid (PFOA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.636	1.81	ng/L	0.0193	1					
Perfluoropentanoic acid (PFPeA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluorobutyric acid (PFBA)	U	ND	3.18	9.64	ng/L	0.0193	5	JLS	05/10/18	1550	1762030	2
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	1.93	1.93	ng/L	0.0193	1	JLS	05/10/18	0146	1762030	3



# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 79 Mid	Project: NCDQ00117
Sample ID: 449499008	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	UX	ND	1.93	1.93	ng/L	0.0193	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	UX	ND	1.93	1.93	ng/L	0.0193	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	UX	ND	1.93	1.93	ng/L	0.0193	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	UX	ND	1.93	1.93	ng/L	0.0193	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	UX	ND	1.93	1.93	ng/L	0.0193	1					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	UX	ND	1.93	1.93	ng/L	0.0193	1					
Perfluoro-4-methoxybutanic acid (PFMOBA)	UX	ND	1.93	1.93	ng/L	0.0193	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/08/18	0946	1762029

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	
3	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.82 ng/L	4.82	100	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	4.85 ng/L	4.82	101	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.26 ng/L	4.82	109	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	5.39 ng/L	4.82	112	(70%-130%)

**Notes:**

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699  
Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 79 Mid  
Sample ID: 449499008

Project: NCDQ00117  
Client ID: NCDQ001

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Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID:	79 Post	Project:	NCDQ00117
Sample ID:	449499009	Client ID:	NCDQ001
Matrix:	Ground Water		
Collect Date:	03-MAY-18 09:40		
Receive Date:	04-MAY-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)	U	ND	0.633	1.92	ng/L	0.0192	1	JLS	05/10/18	0203	1762030	1
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.27	3.61	ng/L	0.0192	1					
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.27	3.65	ng/L	0.0192	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.27	3.68	ng/L	0.0192	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.27	3.84	ng/L	0.0192	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.27	3.84	ng/L	0.0192	1					
Perfluorobutanesulfonate (PFBS)	U	ND	0.633	1.71	ng/L	0.0192	1					
Perfluorobutyric acid (PFBA)	U	ND	0.633	1.92	ng/L	0.0192	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.633	1.86	ng/L	0.0192	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.633	1.92	ng/L	0.0192	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.633	1.92	ng/L	0.0192	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.633	1.82	ng/L	0.0192	1					
Perfluoroheptanoic acid (PFHpA)	U	ND	0.633	1.92	ng/L	0.0192	1					
Perfluorohexanesulfonate (PFHxS)	U	ND	0.633	1.75	ng/L	0.0192	1					
Perfluorohexanoic acid (PFHxA)	U	ND	0.633	1.92	ng/L	0.0192	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.633	1.84	ng/L	0.0192	1					
Perfluorononanoic acid (PFNA)	U	ND	0.633	1.92	ng/L	0.0192	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.633	1.78	ng/L	0.0192	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.633	1.92	ng/L	0.0192	1					
Perfluorooctanoic acid (PFOA)	U	ND	0.633	1.92	ng/L	0.0192	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.633	1.80	ng/L	0.0192	1					
Perfluoropentanoic acid (PFPeA)	U	ND	0.633	1.92	ng/L	0.0192	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.633	1.92	ng/L	0.0192	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.633	1.92	ng/L	0.0192	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.633	1.92	ng/L	0.0192	1					
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	1.92	1.92	ng/L	0.0192	1	JLS	05/10/18	0203	1762030	2

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 79 Post	Project: NCDQ00117
Sample ID: 449499009	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	UX	ND	1.92	1.92	ng/L	0.0192	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	UX	ND	1.92	1.92	ng/L	0.0192	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	UX	ND	1.92	1.92	ng/L	0.0192	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	UX	ND	1.92	1.92	ng/L	0.0192	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	UX	ND	1.92	1.92	ng/L	0.0192	1					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	UX	ND	1.92	1.92	ng/L	0.0192	1					
Perfluoro-4-methoxybutanic acid (PFMOBA)	UX	ND	1.92	1.92	ng/L	0.0192	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/08/18	0946	1762029

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.68 ng/L	4.80	97	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	4.79 ng/L	4.80	100	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.09 ng/L	4.80	106	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	4.74 ng/L	4.80	99	(70%-130%)

**Notes:**

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID:	30 Raw	Project:	NCDQ00117
Sample ID:	449499010	Client ID:	NCDQ001
Matrix:	Ground Water		
Collect Date:	03-MAY-18 10:16		
Receive Date:	04-MAY-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.23	3.51	ng/L	0.0187	1	JLS	05/14/18	1410	1762030	1
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.23	3.55	ng/L	0.0187	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.23	3.59	ng/L	0.0187	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.23	3.74	ng/L	0.0187	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.23	3.74	ng/L	0.0187	1					
Perfluorobutanesulfonate (PFBS)		2.10	0.617	1.66	ng/L	0.0187	1					
Perfluorobutyric acid (PFBA)		12.7	0.617	1.87	ng/L	0.0187	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.617	1.81	ng/L	0.0187	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.617	1.87	ng/L	0.0187	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.617	1.87	ng/L	0.0187	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.617	1.78	ng/L	0.0187	1					
Perfluoroheptanoic acid (PFHpA)		3.20	0.617	1.87	ng/L	0.0187	1					
Perfluorohexanesulfonate (PFHxS)	J	1.59	0.617	1.70	ng/L	0.0187	1					
Perfluorohexanoic acid (PFHxA)		6.03	0.617	1.87	ng/L	0.0187	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.617	1.79	ng/L	0.0187	1					
Perfluorononanoic acid (PFNA)	U	ND	0.617	1.87	ng/L	0.0187	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.617	1.74	ng/L	0.0187	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.617	1.87	ng/L	0.0187	1					
Perfluorooctanoic acid (PFOA)		4.54	0.617	1.87	ng/L	0.0187	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.617	1.76	ng/L	0.0187	1					
Perfluoropentanoic acid (PFPeA)		15.9	0.617	1.87	ng/L	0.0187	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.617	1.87	ng/L	0.0187	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.617	1.87	ng/L	0.0187	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.617	1.87	ng/L	0.0187	1					
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)		805	30.8	93.5	ng/L	0.0187	50	JLS	05/10/18	1043	1762030	2
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	1.87	1.87	ng/L	0.0187	1	JLS	05/14/18	1410	1762030	3

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 30 Raw	Project: NCDQ00117
Sample ID: 449499010	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	X	44.4	1.87	1.87	ng/L	0.0187	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	X	12.2	1.87	1.87	ng/L	0.0187	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	X	56.5	1.87	1.87	ng/L	0.0187	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	X	390	93.5	93.5	ng/L	0.0187	50	JLS	05/10/18	1043	1762030	4
Perfluoro-2-methoxyacetic acid (PFMOAA)	X	215	93.5	93.5	ng/L	0.0187	50					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	X	1120	93.5	93.5	ng/L	0.0187	50					
Perfluoro-4-methoxybutanic acid (PFMOBA)	X	401	93.5	93.5	ng/L	0.0187	50					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/08/18	0946	1762029

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	
3	EPA 537	
4	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.14 ng/L	4.67	89	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	4.93 ng/L	4.67	105	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.84 ng/L	4.67	103	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	4.65 ng/L	4.67	100	(70%-130%)

**Notes:**

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Contact: Raleigh, North Carolina 27699  
Project: Ms. Sandy Mort  
Routine Analysis

Client Sample ID: 30 Raw

Sample ID: 449499010

Project: NCDQ00117

Client ID: NCDQ001

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Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 30 Pre	Project: NCDQ00117
Sample ID: 449499011	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 10:16	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.34	3.83	ng/L	0.0204	1	JLS	05/10/18	0238	1762030	1
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.34	3.87	ng/L	0.0204	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.34	3.91	ng/L	0.0204	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.34	4.07	ng/L	0.0204	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.34	4.07	ng/L	0.0204	1					
Perfluorobutanesulfonate (PFBS)		2.40	0.672	1.81	ng/L	0.0204	1					
Perfluorobutyric acid (PFBA)		13.7	0.672	2.04	ng/L	0.0204	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.672	1.98	ng/L	0.0204	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.672	2.04	ng/L	0.0204	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.672	2.04	ng/L	0.0204	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.672	1.93	ng/L	0.0204	1					
Perfluoroheptanoic acid (PFHpA)		3.53	0.672	2.04	ng/L	0.0204	1					
Perfluorohexanesulfonate (PFHxS)		2.07	0.672	1.85	ng/L	0.0204	1					
Perfluorohexanoic acid (PFHxA)		6.22	0.672	2.04	ng/L	0.0204	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.672	1.95	ng/L	0.0204	1					
Perfluorononanoic acid (PFNA)	U	ND	0.672	2.04	ng/L	0.0204	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.672	1.89	ng/L	0.0204	1					
Perfluorooctanesulfonate (PFOS)		6.12	0.672	2.04	ng/L	0.0204	1					
Perfluorooctanoic acid (PFOA)		4.65	0.672	2.04	ng/L	0.0204	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.672	1.91	ng/L	0.0204	1					
Perfluoropentanoic acid (PFPeA)		19.0	0.672	2.04	ng/L	0.0204	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.672	2.04	ng/L	0.0204	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.672	2.04	ng/L	0.0204	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.672	2.04	ng/L	0.0204	1					
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)		865	33.6	102	ng/L	0.0204	50	JLS	05/10/18	1101	1762030	2
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	2.04	2.04	ng/L	0.0204	1	JLS	05/10/18	0238	1762030	3



# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 30 Pre	Project: NCDQ00117
Sample ID: 449499011	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	X	52.2	2.04	2.04	ng/L	0.0204	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	X	14.8	2.04	2.04	ng/L	0.0204	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	X	61.7	2.04	2.04	ng/L	0.0204	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	X	355	102	102	ng/L	0.0204	50	JLS	05/10/18	1101	1762030	4
Perfluoro-2-methoxyacetic acid (PFMOAA)	X	218	102	102	ng/L	0.0204	50					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	X	1280	102	102	ng/L	0.0204	50					
Perfluoro-4-methoxybutanic acid (PFMOBA)	X	369	102	102	ng/L	0.0204	50					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/08/18	0946	1762029

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	
3	EPA 537	
4	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.88 ng/L	5.09	96	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	5.40 ng/L	5.09	106	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.65 ng/L	5.09	111	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	5.94 ng/L	5.09	117	(70%-130%)

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699  
Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 30 Pre

Sample ID: 449499011

Project: NCDQ00117

Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID:	30 Mid	Project:	NCDQ00117
Sample ID:	449499012	Client ID:	NCDQ001
Matrix:	Ground Water		
Collect Date:	03-MAY-18 10:16		
Receive Date:	04-MAY-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)	U	ND	0.654	1.98	ng/L	0.0198	1	JLS	05/10/18	0255	1762030	1
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.31	3.72	ng/L	0.0198	1					
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.31	3.76	ng/L	0.0198	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.31	3.80	ng/L	0.0198	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.31	3.96	ng/L	0.0198	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.31	3.96	ng/L	0.0198	1					
Perfluorobutanesulfonate (PFBS)	U	ND	0.654	1.76	ng/L	0.0198	1					
Perfluorobutyric acid (PFBA)	U	ND	0.654	1.98	ng/L	0.0198	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.654	1.92	ng/L	0.0198	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.654	1.98	ng/L	0.0198	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.654	1.98	ng/L	0.0198	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.654	1.88	ng/L	0.0198	1					
Perfluoroheptanoic acid (PFHpA)	U	ND	0.654	1.98	ng/L	0.0198	1					
Perfluorohexanesulfonate (PFHxS)	U	ND	0.654	1.80	ng/L	0.0198	1					
Perfluorohexanoic acid (PFHxA)	U	ND	0.654	1.98	ng/L	0.0198	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.654	1.90	ng/L	0.0198	1					
Perfluorononanoic acid (PFNA)	U	ND	0.654	1.98	ng/L	0.0198	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.654	1.84	ng/L	0.0198	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.654	1.98	ng/L	0.0198	1					
Perfluorooctanoic acid (PFOA)	U	ND	0.654	1.98	ng/L	0.0198	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.654	1.86	ng/L	0.0198	1					
Perfluoropentanoic acid (PFPeA)	U	ND	0.654	1.98	ng/L	0.0198	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.654	1.98	ng/L	0.0198	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.654	1.98	ng/L	0.0198	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.654	1.98	ng/L	0.0198	1					
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	1.98	1.98	ng/L	0.0198	1	JLS	05/10/18	0255	1762030	2

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 30 Mid	Project: NCDQ00117
Sample ID: 449499012	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	UX	ND	1.98	1.98	ng/L	0.0198	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	UX	ND	1.98	1.98	ng/L	0.0198	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	UX	ND	1.98	1.98	ng/L	0.0198	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	UX	ND	1.98	1.98	ng/L	0.0198	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	UX	ND	1.98	1.98	ng/L	0.0198	1					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	UX	ND	1.98	1.98	ng/L	0.0198	1					
Perfluoro-4-methoxybutanic acid (PFMOBA)	UX	ND	1.98	1.98	ng/L	0.0198	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/08/18	0946	1762029

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.95 ng/L	4.95	100	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	5.00 ng/L	4.95	101	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.23 ng/L	4.95	106	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	5.12 ng/L	4.95	103	(70%-130%)

**Notes:**

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 30 Post	Project: NCDQ00117
Sample ID: 449499013	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 10:16	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)	U	ND	0.640	1.94	ng/L	0.0194	1	JLS	05/14/18	1035	1762827	1
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.28	3.65	ng/L	0.0194	1					
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.28	3.69	ng/L	0.0194	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.28	3.73	ng/L	0.0194	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.28	3.88	ng/L	0.0194	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.28	3.88	ng/L	0.0194	1					
Perfluorobutanesulfonate (PFBS)	U	ND	0.640	1.73	ng/L	0.0194	1					
Perfluorobutyric acid (PFBA)	U	ND	0.640	1.94	ng/L	0.0194	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.640	1.88	ng/L	0.0194	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.640	1.94	ng/L	0.0194	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.640	1.94	ng/L	0.0194	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.640	1.84	ng/L	0.0194	1					
Perfluoroheptanoic acid (PFHpA)	U	ND	0.640	1.94	ng/L	0.0194	1					
Perfluorohexanesulfonate (PFHxS)	U	ND	0.640	1.77	ng/L	0.0194	1					
Perfluorohexanoic acid (PFHxA)	U	ND	0.640	1.94	ng/L	0.0194	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.640	1.86	ng/L	0.0194	1					
Perfluorononanoic acid (PFNA)	U	ND	0.640	1.94	ng/L	0.0194	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.640	1.80	ng/L	0.0194	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.640	1.94	ng/L	0.0194	1					
Perfluorooctanoic acid (PFOA)	U	ND	0.640	1.94	ng/L	0.0194	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.640	1.82	ng/L	0.0194	1					
Perfluoropentanoic acid (PFPeA)	U	ND	0.640	1.94	ng/L	0.0194	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.640	1.94	ng/L	0.0194	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.640	1.94	ng/L	0.0194	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.640	1.94	ng/L	0.0194	1					
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	1.94	1.94	ng/L	0.0194	1	JLS	05/14/18	1035	1762827	2

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 30 Post

Project: NCDQ00117

Sample ID: 449499013

Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	UX	ND	1.94	1.94	ng/L	0.0194	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	UX	ND	1.94	1.94	ng/L	0.0194	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	UX	ND	1.94	1.94	ng/L	0.0194	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	UX	ND	1.94	1.94	ng/L	0.0194	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	UX	ND	1.94	1.94	ng/L	0.0194	1					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	UX	ND	1.94	1.94	ng/L	0.0194	1					
Perfluoro-4-methoxybutanic acid (PFMOBA)	UX	ND	1.94	1.94	ng/L	0.0194	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/09/18	1020	1762826

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.92 ng/L	4.85	101	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	5.02 ng/L	4.85	104	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.40 ng/L	4.85	111	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	5.65 ng/L	4.85	116	(70%-130%)

**Notes:**

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 48 Raw	Project: NCDQ00117
Sample ID: 449499014	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 10:44	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.20	3.41	ng/L	0.0181	1	JLS	05/10/18	0457	1762827	1
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.20	3.44	ng/L	0.0181	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.20	3.48	ng/L	0.0181	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.20	3.62	ng/L	0.0181	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.20	3.62	ng/L	0.0181	1					
Perfluorobutanesulfonate (PFBS)		6.25	0.598	1.61	ng/L	0.0181	1					
Perfluorobutyric acid (PFBA)		8.42	0.598	1.81	ng/L	0.0181	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.598	1.76	ng/L	0.0181	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.598	1.81	ng/L	0.0181	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.598	1.81	ng/L	0.0181	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.598	1.72	ng/L	0.0181	1					
Perfluoroheptanoic acid (PFHpA)	J	1.31	0.598	1.81	ng/L	0.0181	1					
Perfluorohexanesulfonate (PFHxS)		5.16	0.598	1.65	ng/L	0.0181	1					
Perfluorohexanoic acid (PFHxA)		5.20	0.598	1.81	ng/L	0.0181	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.598	1.74	ng/L	0.0181	1					
Perfluorononanoic acid (PFNA)	U	ND	0.598	1.81	ng/L	0.0181	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.598	1.69	ng/L	0.0181	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.598	1.81	ng/L	0.0181	1					
Perfluorooctanoic acid (PFOA)		1.85	0.598	1.81	ng/L	0.0181	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.598	1.70	ng/L	0.0181	1					
Perfluoropentanoic acid (PFPeA)		9.16	0.598	1.81	ng/L	0.0181	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.598	1.81	ng/L	0.0181	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.598	1.81	ng/L	0.0181	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.598	1.81	ng/L	0.0181	1					
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)		187	5.98	18.1	ng/L	0.0181	10	JLS	05/10/18	1153	1762827	2
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	1.81	1.81	ng/L	0.0181	1	JLS	05/10/18	0457	1762827	3

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 48 Raw	Project: NCDQ00117
Sample ID: 449499014	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	X	9.67	1.81	1.81	ng/L	0.0181	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	UX	ND	1.81	1.81	ng/L	0.0181	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	X	15.1	1.81	1.81	ng/L	0.0181	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	X	78.0	1.81	1.81	ng/L	0.0181	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	X	88.2	18.1	18.1	ng/L	0.0181	10	JLS	05/10/18	1153	1762827	4
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	X	413	18.1	18.1	ng/L	0.0181	10					
Perfluoro-4-methoxybutanic acid (PFMOBA)	X	112	18.1	18.1	ng/L	0.0181	10					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/09/18	1020	1762826

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	
3	EPA 537	
4	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.57 ng/L	4.53	101	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	4.84 ng/L	4.53	107	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.76 ng/L	4.53	105	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	4.78 ng/L	4.53	105	(70%-130%)

**Notes:**



# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699  
Contact: Ms. Sandy Mort  
Project: Routine Analysis

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Client Sample ID:	48 Raw	Project:	NCDQ00117
Sample ID:	449499014	Client ID:	NCDQ001

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Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 48 Pre	Project: NCDQ00117
Sample ID: 449499015	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 10:44	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.27	3.62	ng/L	0.0193	1	JLS	05/10/18	0514	1762827	1
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.27	3.66	ng/L	0.0193	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.27	3.70	ng/L	0.0193	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.27	3.86	ng/L	0.0193	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.27	3.86	ng/L	0.0193	1					
Perfluorobutanesulfonate (PFBS)		6.14	0.636	1.72	ng/L	0.0193	1					
Perfluorobutyric acid (PFBA)		7.58	0.636	1.93	ng/L	0.0193	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.636	1.87	ng/L	0.0193	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.636	1.83	ng/L	0.0193	1					
Perfluoroheptanoic acid (PFHpA)	J	1.39	0.636	1.93	ng/L	0.0193	1					
Perfluorohexanesulfonate (PFHxS)		5.53	0.636	1.75	ng/L	0.0193	1					
Perfluorohexanoic acid (PFHxA)		4.15	0.636	1.93	ng/L	0.0193	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.636	1.85	ng/L	0.0193	1					
Perfluorononanoic acid (PFNA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.636	1.79	ng/L	0.0193	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluorooctanoic acid (PFOA)	J	1.74	0.636	1.93	ng/L	0.0193	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.636	1.81	ng/L	0.0193	1					
Perfluoropentanoic acid (PFPeA)		9.64	0.636	1.93	ng/L	0.0193	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.636	1.93	ng/L	0.0193	1					
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)		185	6.36	19.3	ng/L	0.0193	10	JLS	05/10/18	1210	1762827	2
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	1.93	1.93	ng/L	0.0193	1	JLS	05/10/18	0514	1762827	3

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 48 Pre	Project: NCDQ00117
Sample ID: 449499015	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	X	9.33	1.93	1.93	ng/L	0.0193	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	UX	ND	1.93	1.93	ng/L	0.0193	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	X	13.8	1.93	1.93	ng/L	0.0193	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	X	77.9	1.93	1.93	ng/L	0.0193	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	X	92.2	19.3	19.3	ng/L	0.0193	10	JLS	05/10/18	1210	1762827	4
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	X	408	19.3	19.3	ng/L	0.0193	10					
Perfluoro-4-methoxybutanic acid (PFMOBA)	X	108	19.3	19.3	ng/L	0.0193	10					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/09/18	1020	1762826

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	
3	EPA 537	
4	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.25 ng/L	4.82	109	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	4.69 ng/L	4.82	97	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.14 ng/L	4.82	107	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	5.07 ng/L	4.82	105	(70%-130%)

**Notes:**

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699  
Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 48 Pre

Sample ID: 449499015

Project: NCDQ00117

Client ID: NCDQ001

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Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 48 Mid	Project: NCDQ00117
Sample ID: 449499016	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 10:44	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)	U	ND	0.644	1.95	ng/L	0.0195	1	JLS	05/10/18	0531	1762827	1
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.29	3.67	ng/L	0.0195	1					
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.29	3.71	ng/L	0.0195	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.29	3.75	ng/L	0.0195	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.29	3.91	ng/L	0.0195	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.29	3.91	ng/L	0.0195	1					
Perfluorobutanesulfonate (PFBS)	U	ND	0.644	1.74	ng/L	0.0195	1					
Perfluorodecane sulfonate (PFDS)	U	ND	0.644	1.89	ng/L	0.0195	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.644	1.95	ng/L	0.0195	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.644	1.95	ng/L	0.0195	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.644	1.86	ng/L	0.0195	1					
Perfluoroheptanoic acid (PFHpA)	U	ND	0.644	1.95	ng/L	0.0195	1					
Perfluorohexanesulfonate (PFHxS)	U	ND	0.644	1.78	ng/L	0.0195	1					
Perfluorohexanoic acid (PFHxA)	U	ND	0.644	1.95	ng/L	0.0195	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.644	1.87	ng/L	0.0195	1					
Perfluorononanoic acid (PFNA)	U	ND	0.644	1.95	ng/L	0.0195	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.644	1.82	ng/L	0.0195	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.644	1.95	ng/L	0.0195	1					
Perfluorooctanoic acid (PFOA)	U	ND	0.644	1.95	ng/L	0.0195	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.644	1.84	ng/L	0.0195	1					
Perfluoropentanoic acid (PFPeA)	U	ND	0.644	1.95	ng/L	0.0195	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.644	1.95	ng/L	0.0195	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.644	1.95	ng/L	0.0195	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.644	1.95	ng/L	0.0195	1					
Perfluorobutyric acid (PFBA)	U	ND	3.22	9.76	ng/L	0.0195	5	JLS	05/10/18	1607	1762827	2
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	1.95	1.95	ng/L	0.0195	1	JLS	05/10/18	0531	1762827	3

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 48 Mid	Project: NCDQ00117
Sample ID: 449499016	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	UX	ND	1.95	1.95	ng/L	0.0195	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	UX	ND	1.95	1.95	ng/L	0.0195	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	UX	ND	1.95	1.95	ng/L	0.0195	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	UX	ND	1.95	1.95	ng/L	0.0195	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	UX	ND	1.95	1.95	ng/L	0.0195	1					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	UX	ND	1.95	1.95	ng/L	0.0195	1					
Perfluoro-4-methoxybutanic acid (PFMOBA)	UX	ND	1.95	1.95	ng/L	0.0195	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/09/18	1020	1762826

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	
3	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.70 ng/L	4.88	96	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	5.30 ng/L	4.88	109	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.46 ng/L	4.88	112	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	5.23 ng/L	4.88	107	(70%-130%)

**Notes:**

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699  
Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 48 Mid  
Sample ID: 449499016

Project: NCDQ00117  
Client ID: NCDQ001

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Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 48 Post	Project: NCDQ00117
Sample ID: 449499017	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 10:44	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)	U	ND	0.667	2.02	ng/L	0.0202	1	JLS	05/10/18	0549	1762827	1
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.33	3.80	ng/L	0.0202	1					
Fluorotelomer sulfonate 6:2 (6:2 FTS)		37.0	1.33	3.84	ng/L	0.0202	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	J	2.27	1.33	3.88	ng/L	0.0202	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.33	4.05	ng/L	0.0202	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.33	4.05	ng/L	0.0202	1					
Perfluorobutanesulfonate (PFBS)	J	1.00	0.667	1.80	ng/L	0.0202	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.667	1.96	ng/L	0.0202	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.667	2.02	ng/L	0.0202	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.667	2.02	ng/L	0.0202	1					
Perfluoroheptanesulfonate (PFHpS)	J	0.713	0.667	1.92	ng/L	0.0202	1					
Perfluoroheptanoic acid (PFHpA)	U	ND	0.667	2.02	ng/L	0.0202	1					
Perfluorohexanesulfonate (PFHxS)		6.50	0.667	1.84	ng/L	0.0202	1					
Perfluorohexanoic acid (PFHxA)	J	1.17	0.667	2.02	ng/L	0.0202	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.667	1.94	ng/L	0.0202	1					
Perfluorononanoic acid (PFNA)	U	ND	0.667	2.02	ng/L	0.0202	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.667	1.88	ng/L	0.0202	1					
Perfluorooctanesulfonate (PFOS)		55.7	0.667	2.02	ng/L	0.0202	1					
Perfluorooctanoic acid (PFOA)	J	0.701	0.667	2.02	ng/L	0.0202	1					
Perfluoropentanesulfonate (PFPeS)	J	0.979	0.667	1.90	ng/L	0.0202	1					
Perfluoropentanoic acid (PFPeA)	U	ND	0.667	2.02	ng/L	0.0202	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.667	2.02	ng/L	0.0202	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.667	2.02	ng/L	0.0202	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.667	2.02	ng/L	0.0202	1					
Perfluorobutyric acid (PFBA)	U	ND	3.34	10.1	ng/L	0.0202	5	JLS	05/10/18	1624	1762827	2
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	2.02	2.02	ng/L	0.0202	1	JLS	05/10/18	0549	1762827	3



# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 48 Post	Project: NCDQ00117
Sample ID: 449499017	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	UX	ND	2.02	2.02	ng/L	0.0202	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	UX	ND	2.02	2.02	ng/L	0.0202	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	UX	ND	2.02	2.02	ng/L	0.0202	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	UX	ND	2.02	2.02	ng/L	0.0202	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	UX	ND	2.02	2.02	ng/L	0.0202	1					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	UX	ND	2.02	2.02	ng/L	0.0202	1					
Perfluoro-4-methoxybutanic acid (PFMOBA)	UX	ND	2.02	2.02	ng/L	0.0202	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/09/18	1020	1762826

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	
3	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.96 ng/L	5.06	98	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	4.98 ng/L	5.06	99	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.71 ng/L	5.06	113	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	5.49 ng/L	5.06	109	(70%-130%)

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699  
Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 48 Post

Sample ID: 449499017

Project: NCDQ00117

Client ID: NCDQ001

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Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID:	75 Raw	Project:	NCDQ00117
Sample ID:	449499018	Client ID:	NCDQ001
Matrix:	Ground Water		
Collect Date:	03-MAY-18 11:29		
Receive Date:	04-MAY-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.21	3.49	ng/L	0.0184	1	JLS	05/10/18	0606	1762827	1
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.21	3.53	ng/L	0.0184	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.21	3.68	ng/L	0.0184	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.21	3.68	ng/L	0.0184	1					
Perfluorobutanesulfonate (PFBS)	J	1.20	0.607	1.64	ng/L	0.0184	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.607	1.78	ng/L	0.0184	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.607	1.84	ng/L	0.0184	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.607	1.84	ng/L	0.0184	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.607	1.75	ng/L	0.0184	1					
Perfluoroheptanoic acid (PFHpA)		2.60	0.607	1.84	ng/L	0.0184	1					
Perfluorohexanesulfonate (PFHxS)	J	0.847	0.607	1.67	ng/L	0.0184	1					
Perfluorohexanoic acid (PFHxA)		3.66	0.607	1.84	ng/L	0.0184	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.607	1.77	ng/L	0.0184	1					
Perfluorononanoic acid (PFNA)	U	ND	0.607	1.84	ng/L	0.0184	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.607	1.71	ng/L	0.0184	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.607	1.84	ng/L	0.0184	1					
Perfluorooctanoic acid (PFOA)		9.50	0.607	1.84	ng/L	0.0184	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.607	1.73	ng/L	0.0184	1					
Perfluoropentanoic acid (PFPeA)		13.8	0.607	1.84	ng/L	0.0184	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.607	1.84	ng/L	0.0184	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.607	1.84	ng/L	0.0184	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.607	1.84	ng/L	0.0184	1					
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)		919	30.3	92.0	ng/L	0.0184	50	JLS	05/10/18	1227	1762827	2
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	60.7	173	ng/L	0.0184	50					
Perfluorobutyric acid (PFBA)	U	ND	30.3	92.0	ng/L	0.0184	50					
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	1.84	1.84	ng/L	0.0184	1	JLS	05/10/18	0606	1762827	3

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 75 Raw	Project: NCDQ00117
Sample ID: 449499018	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	X	34.3	1.84	1.84	ng/L	0.0184	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	X	44.0	1.84	1.84	ng/L	0.0184	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	UX	ND	92.0	92.0	ng/L	0.0184	50	JLS	05/10/18	1227	1762827	4
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	X	325	92.0	92.0	ng/L	0.0184	50					
Perfluoro-2-methoxyacetic acid (PFMOAA)	X	233	92.0	92.0	ng/L	0.0184	50					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	X	1190	92.0	92.0	ng/L	0.0184	50					
Perfluoro-4-methoxybutanic acid (PFMOBA)	X	317	92.0	92.0	ng/L	0.0184	50					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/09/18	1020	1762826

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	
3	EPA 537	
4	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	3.97 ng/L	4.60	86	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	4.52 ng/L	4.60	98	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.02 ng/L	4.60	109	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	4.38 ng/L	4.60	95	(70%-130%)

**Notes:**

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699  
Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 75 Raw  
Sample ID: 449499018

Project: NCDQ00117  
Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID:	75 Pre	Project:	NCDQ00117
Sample ID:	449499019	Client ID:	NCDQ001
Matrix:	Ground Water		
Collect Date:	03-MAY-18 11:29		
Receive Date:	04-MAY-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.28	3.69	ng/L	0.0194	1	JLS	05/10/18	0623	1762827	1
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.28	3.73	ng/L	0.0194	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.28	3.88	ng/L	0.0194	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.28	3.88	ng/L	0.0194	1					
Perfluorobutanesulfonate (PFBS)	J	1.11	0.640	1.73	ng/L	0.0194	1					
Perfluorobutyric acid (PFBA)		10.4	0.640	1.94	ng/L	0.0194	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.640	1.88	ng/L	0.0194	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.640	1.94	ng/L	0.0194	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.640	1.94	ng/L	0.0194	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.640	1.84	ng/L	0.0194	1					
Perfluoroheptanoic acid (PFHpA)		2.28	0.640	1.94	ng/L	0.0194	1					
Perfluorohexanesulfonate (PFHxS)	J	0.672	0.640	1.77	ng/L	0.0194	1					
Perfluorohexanoic acid (PFHxA)		3.43	0.640	1.94	ng/L	0.0194	1					
Perfluoronanesulfonate (PFNS)	U	ND	0.640	1.86	ng/L	0.0194	1					
Perfluoronanoic acid (PFNA)	U	ND	0.640	1.94	ng/L	0.0194	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.640	1.80	ng/L	0.0194	1					
Perfluorooctanesulfonate (PFOS)	J	0.896	0.640	1.94	ng/L	0.0194	1					
Perfluorooctanoic acid (PFOA)		8.49	0.640	1.94	ng/L	0.0194	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.640	1.82	ng/L	0.0194	1					
Perfluoropentanoic acid (PFPeA)		13.1	0.640	1.94	ng/L	0.0194	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.640	1.94	ng/L	0.0194	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.640	1.94	ng/L	0.0194	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.640	1.94	ng/L	0.0194	1					
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)		999	32.0	97.0	ng/L	0.0194	50	JLS	05/10/18	1245	1762827	2
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	64.0	182	ng/L	0.0194	50					
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	1.94	1.94	ng/L	0.0194	1	JLS	05/10/18	0623	1762827	3

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 75 Pre	Project: NCDQ00117
Sample ID: 449499019	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	X	30.2	1.94	1.94	ng/L	0.0194	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	X	37.7	1.94	1.94	ng/L	0.0194	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	X	98.9	97.0	97.0	ng/L	0.0194	50	JLS	05/10/18	1245	1762827	4
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	X	385	97.0	97.0	ng/L	0.0194	50					
Perfluoro-2-methoxyacetic acid (PFMOAA)	X	232	97.0	97.0	ng/L	0.0194	50					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	X	1460	97.0	97.0	ng/L	0.0194	50					
Perfluoro-4-methoxybutanic acid (PFMOBA)	X	362	97.0	97.0	ng/L	0.0194	50					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/09/18	1020	1762826

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	
3	EPA 537	
4	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.25 ng/L	4.85	88	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	4.23 ng/L	4.85	87	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.96 ng/L	4.85	102	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	3.64 ng/L	4.85	75	(70%-130%)

**Notes:**

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699  
Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 75 Pre

Sample ID: 449499019

Project: NCDQ00117

Client ID: NCDQ001

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Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit



# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 75 Mid	Project: NCDQ00117
Sample ID: 449499020	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 11:29	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)	U	ND	0.613	1.86	ng/L	0.0186	1	JLS	05/10/18	0641	1762827	1
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.23	3.49	ng/L	0.0186	1					
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.23	3.53	ng/L	0.0186	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.23	3.56	ng/L	0.0186	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.23	3.71	ng/L	0.0186	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.23	3.71	ng/L	0.0186	1					
Perfluorobutanesulfonate (PFBS)	U	ND	0.613	1.65	ng/L	0.0186	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.613	1.80	ng/L	0.0186	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.613	1.86	ng/L	0.0186	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.613	1.86	ng/L	0.0186	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.613	1.76	ng/L	0.0186	1					
Perfluoroheptanoic acid (PFHpA)	U	ND	0.613	1.86	ng/L	0.0186	1					
Perfluorohexanesulfonate (PFHxS)	U	ND	0.613	1.69	ng/L	0.0186	1					
Perfluorohexanoic acid (PFHxA)	U	ND	0.613	1.86	ng/L	0.0186	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.613	1.78	ng/L	0.0186	1					
Perfluorononanoic acid (PFNA)	U	ND	0.613	1.86	ng/L	0.0186	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.613	1.73	ng/L	0.0186	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.613	1.86	ng/L	0.0186	1					
Perfluorooctanoic acid (PFOA)	U	ND	0.613	1.86	ng/L	0.0186	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.613	1.74	ng/L	0.0186	1					
Perfluoropentanoic acid (PFPeA)	U	ND	0.613	1.86	ng/L	0.0186	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.613	1.86	ng/L	0.0186	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.613	1.86	ng/L	0.0186	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.613	1.86	ng/L	0.0186	1					
Perfluorobutyric acid (PFBA)	U	ND	3.06	9.28	ng/L	0.0186	5	JLS	05/10/18	1659	1762827	2
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	1.86	1.86	ng/L	0.0186	1	JLS	05/10/18	0641	1762827	3

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 75 Mid	Project: NCDQ00117
Sample ID: 449499020	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	UX	ND	1.86	1.86	ng/L	0.0186	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	UX	ND	1.86	1.86	ng/L	0.0186	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	UX	ND	1.86	1.86	ng/L	0.0186	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	UX	ND	1.86	1.86	ng/L	0.0186	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	UX	ND	1.86	1.86	ng/L	0.0186	1					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	UX	ND	1.86	1.86	ng/L	0.0186	1					
Perfluoro-4-methoxybutanic acid (PFMOBA)	UX	ND	1.86	1.86	ng/L	0.0186	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/09/18	1020	1762826

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	
3	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.47 ng/L	4.64	96	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	4.89 ng/L	4.64	105	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.32 ng/L	4.64	115	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	4.99 ng/L	4.64	108	(70%-130%)

**Notes:**

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 75 Mid  
Sample ID: 449499020

Project: NCDQ00117  
Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 75 Post	Project: NCDQ00117
Sample ID: 449499021	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 11:29	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)	U	ND	0.666	2.02	ng/L	0.0202	1	JLS	05/10/18	0658	1762827	1
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.33	3.79	ng/L	0.0202	1					
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.33	3.83	ng/L	0.0202	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.33	3.87	ng/L	0.0202	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.33	4.03	ng/L	0.0202	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.33	4.03	ng/L	0.0202	1					
Perfluorobutanesulfonate (PFBS)	U	ND	0.666	1.79	ng/L	0.0202	1					
Perfluorobutyric acid (PFBA)	U	ND	0.666	2.02	ng/L	0.0202	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.666	1.96	ng/L	0.0202	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.666	2.02	ng/L	0.0202	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.666	2.02	ng/L	0.0202	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.666	1.92	ng/L	0.0202	1					
Perfluoroheptanoic acid (PFHpA)	U	ND	0.666	2.02	ng/L	0.0202	1					
Perfluorohexanesulfonate (PFHxS)	U	ND	0.666	1.84	ng/L	0.0202	1					
Perfluorohexanoic acid (PFHxA)	U	ND	0.666	2.02	ng/L	0.0202	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.666	1.94	ng/L	0.0202	1					
Perfluorononanoic acid (PFNA)	U	ND	0.666	2.02	ng/L	0.0202	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.666	1.88	ng/L	0.0202	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.666	2.02	ng/L	0.0202	1					
Perfluorooctanoic acid (PFOA)	U	ND	0.666	2.02	ng/L	0.0202	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.666	1.90	ng/L	0.0202	1					
Perfluoropentanoic acid (PFPeA)	U	ND	0.666	2.02	ng/L	0.0202	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.666	2.02	ng/L	0.0202	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.666	2.02	ng/L	0.0202	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.666	2.02	ng/L	0.0202	1					
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	2.02	2.02	ng/L	0.0202	1	JLS	05/10/18	0658	1762827	2

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 75 Post

Project: NCDQ00117

Sample ID: 449499021

Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	UX	ND	2.02	2.02	ng/L	0.0202	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	UX	ND	2.02	2.02	ng/L	0.0202	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	UX	ND	2.02	2.02	ng/L	0.0202	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	UX	ND	2.02	2.02	ng/L	0.0202	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	UX	ND	2.02	2.02	ng/L	0.0202	1					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	UX	ND	2.02	2.02	ng/L	0.0202	1					
Perfluoro-4-methoxybutanic acid (PFMOBA)	UX	ND	2.02	2.02	ng/L	0.0202	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/09/18	1020	1762826

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.61 ng/L	5.04	92	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	5.28 ng/L	5.04	105	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.53 ng/L	5.04	110	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	5.22 ng/L	5.04	103	(70%-130%)

**Notes:**

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 71 Raw	Project: NCDQ00117
Sample ID: 449499022	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 11:58	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.27	3.63	ng/L	0.0193	1	JLS	05/10/18	0715	1762827	1
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.27	3.66	ng/L	0.0193	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.27	3.70	ng/L	0.0193	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.27	3.86	ng/L	0.0193	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.27	3.86	ng/L	0.0193	1					
Perfluorobutanesulfonate (PFBS)		1.93	0.636	1.72	ng/L	0.0193	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.636	1.87	ng/L	0.0193	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.636	1.83	ng/L	0.0193	1					
Perfluoroheptanoic acid (PFHpA)		3.51	0.636	1.93	ng/L	0.0193	1					
Perfluorohexanesulfonate (PFHxS)	J	1.63	0.636	1.75	ng/L	0.0193	1					
Perfluorohexanoic acid (PFHxA)		5.42	0.636	1.93	ng/L	0.0193	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.636	1.85	ng/L	0.0193	1					
Perfluorononanoic acid (PFNA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.636	1.79	ng/L	0.0193	1					
Perfluorooctanesulfonate (PFOS)	J	1.90	0.636	1.93	ng/L	0.0193	1					
Perfluorooctanoic acid (PFOA)		6.36	0.636	1.93	ng/L	0.0193	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.636	1.81	ng/L	0.0193	1					
Perfluoropentanoic acid (PFPeA)		17.2	0.636	1.93	ng/L	0.0193	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.636	1.93	ng/L	0.0193	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.636	1.93	ng/L	0.0193	1					
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)		1270	31.8	96.4	ng/L	0.0193	50	JLS	05/10/18	1642	1762827	2
Perfluorobutyric acid (PFBA)	U	ND	31.8	96.4	ng/L	0.0193	50					
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	1.93	1.93	ng/L	0.0193	1	JLS	05/10/18	0715	1762827	3

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 71 Raw	Project: NCDQ00117
Sample ID: 449499022	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	X	38.0	1.93	1.93	ng/L	0.0193	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	X	22.5	1.93	1.93	ng/L	0.0193	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	X	81.3	1.93	1.93	ng/L	0.0193	1					
Perfluoro(3,5,7-trioxaocetanoic acid (PFO3OA)	UX	ND	96.4	96.4	ng/L	0.0193	50	JLS	05/10/18	1642	1762827	4
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	X	341	96.4	96.4	ng/L	0.0193	50					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	X	1440	96.4	96.4	ng/L	0.0193	50					
Perfluoro-4-methoxybutanic acid (PFMOBA)	X	429	96.4	96.4	ng/L	0.0193	50					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/09/18	1020	1762826

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	
3	EPA 537	
4	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.20 ng/L	4.82	108	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	5.36 ng/L	4.82	111	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.59 ng/L	4.82	116	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	5.65 ng/L	4.82	117	(70%-130%)

**Notes:**

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699  
Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 71 Raw

Sample ID: 449499022

Project: NCDQ00117

Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit



# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 71 Pre	Project: NCDQ00117
Sample ID: 449499023	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 11:58	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.31	3.75	ng/L	0.0199	1	JLS	05/10/18	0733	1762827	1
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.31	3.79	ng/L	0.0199	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.31	3.83	ng/L	0.0199	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.31	3.98	ng/L	0.0199	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.31	3.98	ng/L	0.0199	1					
Perfluorobutanesulfonate (PFBS)	J	1.63	0.657	1.77	ng/L	0.0199	1					
Perfluorobutyric acid (PFBA)		11.0	0.657	1.99	ng/L	0.0199	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.657	1.93	ng/L	0.0199	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.657	1.99	ng/L	0.0199	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.657	1.99	ng/L	0.0199	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.657	1.89	ng/L	0.0199	1					
Perfluoroheptanoic acid (PFHpA)		3.09	0.657	1.99	ng/L	0.0199	1					
Perfluorohexanesulfonate (PFHxS)	J	1.74	0.657	1.81	ng/L	0.0199	1					
Perfluorohexanoic acid (PFHxA)		5.13	0.657	1.99	ng/L	0.0199	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.657	1.91	ng/L	0.0199	1					
Perfluorononanoic acid (PFNA)	U	ND	0.657	1.99	ng/L	0.0199	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.657	1.85	ng/L	0.0199	1					
Perfluorooctanesulfonate (PFOS)	J	0.940	0.657	1.99	ng/L	0.0199	1					
Perfluorooctanoic acid (PFOA)		6.11	0.657	1.99	ng/L	0.0199	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.657	1.87	ng/L	0.0199	1					
Perfluoropentanoic acid (PFPeA)		14.8	0.657	1.99	ng/L	0.0199	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.657	1.99	ng/L	0.0199	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.657	1.99	ng/L	0.0199	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.657	1.99	ng/L	0.0199	1					
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)		1140	32.9	99.6	ng/L	0.0199	50	JLS	05/10/18	1302	1762827	2
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	1.99	1.99	ng/L	0.0199	1	JLS	05/10/18	0733	1762827	3

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 71 Pre	Project: NCDQ00117
Sample ID: 449499023	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	X	35.3	1.99	1.99	ng/L	0.0199	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	X	20.8	1.99	1.99	ng/L	0.0199	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	UX	ND	99.6	99.6	ng/L	0.0199	50	JLS	05/10/18	1302	1762827	4
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	X	307	99.6	99.6	ng/L	0.0199	50					
Perfluoro-2-methoxyacetic acid (PFMOAA)	X	195	99.6	99.6	ng/L	0.0199	50					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	X	1340	99.6	99.6	ng/L	0.0199	50					
Perfluoro-4-methoxybutanic acid (PFMOBA)	X	434	99.6	99.6	ng/L	0.0199	50					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/09/18	1020	1762826

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	
3	EPA 537	
4	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.18 ng/L	4.98	84	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	5.23 ng/L	4.98	105	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.94 ng/L	4.98	99	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	4.70 ng/L	4.98	94	(70%-130%)

**Notes:**

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699  
Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 71 Pre

Sample ID: 449499023

Project: NCDQ00117

Client ID: NCDQ001

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Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
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Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID:	71 Mid	Project:	NCDQ00117
Sample ID:	449499024	Client ID:	NCDQ001
Matrix:	Ground Water		
Collect Date:	03-MAY-18 11:58		
Receive Date:	04-MAY-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)	U	ND	0.663	2.01	ng/L	0.0201	1	JLS	05/10/18	0825	1762827	1
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.33	3.78	ng/L	0.0201	1					
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.33	3.82	ng/L	0.0201	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.33	3.86	ng/L	0.0201	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.33	4.02	ng/L	0.0201	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.33	4.02	ng/L	0.0201	1					
Perfluorobutanesulfonate (PFBS)	U	ND	0.663	1.79	ng/L	0.0201	1					
Perfluorobutyric acid (PFBA)	U	ND	0.663	2.01	ng/L	0.0201	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.663	1.95	ng/L	0.0201	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.663	2.01	ng/L	0.0201	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.663	2.01	ng/L	0.0201	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.663	1.91	ng/L	0.0201	1					
Perfluoroheptanoic acid (PFHpA)	U	ND	0.663	2.01	ng/L	0.0201	1					
Perfluorohexanesulfonate (PFHxS)	U	ND	0.663	1.83	ng/L	0.0201	1					
Perfluorohexanoic acid (PFHxA)	U	ND	0.663	2.01	ng/L	0.0201	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.663	1.93	ng/L	0.0201	1					
Perfluorononanoic acid (PFNA)	U	ND	0.663	2.01	ng/L	0.0201	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.663	1.87	ng/L	0.0201	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.663	2.01	ng/L	0.0201	1					
Perfluorooctanoic acid (PFOA)	U	ND	0.663	2.01	ng/L	0.0201	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.663	1.89	ng/L	0.0201	1					
Perfluoropentanoic acid (PFPeA)	U	ND	0.663	2.01	ng/L	0.0201	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.663	2.01	ng/L	0.0201	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.663	2.01	ng/L	0.0201	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.663	2.01	ng/L	0.0201	1					
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	2.01	2.01	ng/L	0.0201	1	JLS	05/10/18	0825	1762827	2

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 71 Mid	Project: NCDQ00117
Sample ID: 449499024	Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	UX	ND	2.01	2.01	ng/L	0.0201	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	UX	ND	2.01	2.01	ng/L	0.0201	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	UX	ND	2.01	2.01	ng/L	0.0201	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	UX	ND	2.01	2.01	ng/L	0.0201	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	UX	ND	2.01	2.01	ng/L	0.0201	1					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	UX	ND	2.01	2.01	ng/L	0.0201	1					
Perfluoro-4-methoxybutanic acid (PFMOBA)	UX	ND	2.01	2.01	ng/L	0.0201	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/09/18	1020	1762826

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.36 ng/L	5.03	107	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	5.22 ng/L	5.03	104	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	5.62 ng/L	5.03	112	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	5.29 ng/L	5.03	105	(70%-130%)

**Notes:**

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 71 Post	Project: NCDQ00117
Sample ID: 449499025	Client ID: NCDQ001
Matrix: Ground Water	
Collect Date: 03-MAY-18 11:58	
Receive Date: 04-MAY-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>EPA 537 PFCs by LC-MS/MS "As Received"</b>												
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA)	U	ND	0.639	1.94	ng/L	0.0194	1	JLS	05/10/18	0842	1762827	1
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.28	3.64	ng/L	0.0194	1					
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.28	3.68	ng/L	0.0194	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.28	3.72	ng/L	0.0194	1					
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	U	ND	1.28	3.87	ng/L	0.0194	1					
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	U	ND	1.28	3.87	ng/L	0.0194	1					
Perfluorobutanesulfonate (PFBS)	U	ND	0.639	1.72	ng/L	0.0194	1					
Perfluorobutyric acid (PFBA)	U	ND	0.639	1.94	ng/L	0.0194	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.639	1.88	ng/L	0.0194	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.639	1.94	ng/L	0.0194	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.639	1.94	ng/L	0.0194	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.639	1.84	ng/L	0.0194	1					
Perfluoroheptanoic acid (PFHpA)	U	ND	0.639	1.94	ng/L	0.0194	1					
Perfluorohexanesulfonate (PFHxS)	U	ND	0.639	1.76	ng/L	0.0194	1					
Perfluorohexanoic acid (PFHxA)	U	ND	0.639	1.94	ng/L	0.0194	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.639	1.86	ng/L	0.0194	1					
Perfluorononanoic acid (PFNA)	U	ND	0.639	1.94	ng/L	0.0194	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.639	1.80	ng/L	0.0194	1					
Perfluorooctanesulfonate (PFOS)	J	0.841	0.639	1.94	ng/L	0.0194	1					
Perfluorooctanoic acid (PFOA)	U	ND	0.639	1.94	ng/L	0.0194	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.639	1.82	ng/L	0.0194	1					
Perfluoropentanoic acid (PFPeA)	U	ND	0.639	1.94	ng/L	0.0194	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.639	1.94	ng/L	0.0194	1					
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.639	1.94	ng/L	0.0194	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.639	1.94	ng/L	0.0194	1					
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 1	UX	ND	1.94	1.94	ng/L	0.0194	1	JLS	05/10/18	0842	1762827	2

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 6, 2018

Company : NC Dept Environmental Quality  
Address : 1646 Mail Service Center

Raleigh, North Carolina 27699

Contact: Ms. Sandy Mort  
Project: Routine Analysis

Client Sample ID: 71 Post

Project: NCDQ00117

Sample ID: 449499025

Client ID: NCDQ001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>LCMSMS PFCs</b>												
<b>NC 6 PFCs by LC-MS/MS "As Received"</b>												
Nafion Byproduct 2	UX	ND	1.94	1.94	ng/L	0.0194	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	UX	ND	1.94	1.94	ng/L	0.0194	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	UX	ND	1.94	1.94	ng/L	0.0194	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	UX	ND	1.94	1.94	ng/L	0.0194	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	UX	ND	1.94	1.94	ng/L	0.0194	1					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	UX	ND	1.94	1.94	ng/L	0.0194	1					
Perfluoro-4-methoxybutanic acid (PFMOBA)	UX	ND	1.94	1.94	ng/L	0.0194	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	05/09/18	1020	1762826

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Perfluoro-n-[1,2-13C2] decanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.52 ng/L	4.84	93	(70%-130%)
Perfluoro-n-[1,2-13C2] octanoic acid	EPA 537 PFCs by LC-MS/MS "As Received"	5.16 ng/L	4.84	107	(70%-130%)
Perfluoro-n-[2,3,4-13C3] butanoic aci	EPA 537 PFCs by LC-MS/MS "As Received"	4.97 ng/L	4.84	103	(70%-130%)
Sodium perfluoro-1-[1,2,3,4-13C4]oc	EPA 537 PFCs by LC-MS/MS "As Received"	4.65 ng/L	4.84	96	(70%-130%)

**Notes:**

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## QC Summary

Report Date: June 6, 2018

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NC Dept Environmental Quality  
1646 Mail Service Center  
Raleigh, North Carolina

Contact: Ms. Sandy Mort

Workorder: 449499

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1762030										
QC1204023400	LCS										
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)	19.7			20.0	ng/L		102	(70%-130%)	JLS	05/09/18	22:18
Fluorotelomer sulfonate 4:2 (4:2 FTS)	18.4			19.0	ng/L		103	(70%-130%)			
Fluorotelomer sulfonate 6:2 (6:2 FTS)	18.7			21.4	ng/L		114	(70%-130%)			
Fluorotelomer sulfonate 8:2 (8:2 FTS)	18.9			18.3	ng/L		97	(70%-130%)			
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	19.7			16.5	ng/L		83	(70%-130%)			
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	19.7			17.5	ng/L		89	(70%-130%)			
Nafion Byproduct 1	19.7		X	13.0	ng/L		66	(50%-150%)			
Nafion Byproduct 2	19.7		X	18.5	ng/L		94	(50%-150%)			
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)	19.7		X	23.7	ng/L		120	(50%-150%)			
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)	19.7		X	22.9	ng/L		116	(50%-150%)			
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)	19.7		X	12.1	ng/L		61	(50%-150%)			
Perfluoro-2-methoxyacetic acid (PFMOAA)	19.7		X	17.3	ng/L		88	(50%-150%)			
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	19.7		X	19.6	ng/L		100	(50%-150%)			



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## QC Summary

Workorder: 449499

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1762030										
Perfluoro-4-methoxybutanic acid (PFMOBA)	19.7		X	17.7	ng/L		90	(50%-150%)	JLS	05/09/18	22:18
Perfluorobutanesulfonate (PFBS)	17.5			16.2	ng/L		93	(70%-130%)			
Perfluorobutyric acid (PFBA)	19.7			20.2	ng/L		102	(70%-130%)			
Perfluorodecanesulfonate (PFDS)	19.0			16.5	ng/L		87	(70%-130%)			
Perfluorodecanoic acid (PFDA)	19.7			17.0	ng/L		86	(70%-130%)			
Perfluorododecanoic acid (PFDoA)	19.7			16.9	ng/L		86	(70%-130%)			
Perfluoroheptanesulfonate (PFHpS)	18.7			18.2	ng/L		97	(70%-130%)			
Perfluoroheptanoic acid (PFHpA)	19.7			18.2	ng/L		92	(70%-130%)			
Perfluorohexanesulfonate (PFHxS)	18.0			15.9	ng/L		88	(70%-130%)			
Perfluorohexanoic acid (PFHxA)	19.7			17.9	ng/L		91	(70%-130%)			
Perfluorononanesulfonate (PFNS)	18.9			15.8	ng/L		83	(70%-130%)			
Perfluorononanoic acid (PFNA)	19.7			18.0	ng/L		91	(70%-130%)			
Perfluorooctanesulfonamide (PFOSA)	18.2			17.2	ng/L		94	(70%-130%)			
Perfluorooctanesulfonate (PFOS)	19.7			17.3	ng/L		88	(70%-130%)			
Perfluorooctanoic acid (PFOA)	19.7			17.4	ng/L		88	(70%-130%)			

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## QC Summary

Workorder: 449499

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1762030										
Perfluoropentanesulfonate (PFPeS)	18.5			17.7	ng/L		96	(70%-130%)	JLS	05/09/18	22:18
Perfluoropentanoic acid (PFPeA)	19.7			18.6	ng/L		94	(70%-130%)			
Perfluorotetradecanoic acid (PFTeDA)	19.7			16.6	ng/L		84	(70%-130%)			
Perfluorotridecanoic acid (PFTrDA)	19.7			16.7	ng/L		85	(70%-130%)			
Perfluoroundecanoic acid (PFUdA)	19.7			16.6	ng/L		84	(70%-130%)			
**Perfluoro-n-[1,2-13C2] decanoic acid	4.93			4.97	ng/L		101	(70%-130%)			
**Perfluoro-n-[1,2-13C2] octanoic acid	4.93			4.71	ng/L		96	(70%-130%)			
**Perfluoro-n-[2,3,4-13C3] butanoic acid	4.93			5.32	ng/L		108	(70%-130%)			
**Sodium perfluoro-1-[1,2,3,4-13C4]octanesulfonate	4.93			4.66	ng/L		95	(70%-130%)			
QC1204023399 MB											
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)			U	ND	ng/L					05/09/18	22:01
Fluorotelomer sulfonate 4:2 (4:2 FTS)			U	ND	ng/L						
Fluorotelomer sulfonate 6:2 (6:2 FTS)			U	ND	ng/L						
Fluorotelomer sulfonate 8:2 (8:2 FTS)			U	ND	ng/L						
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)			U	ND	ng/L						
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)			U	ND	ng/L						

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## QC Summary

Workorder: 449499

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1762030										
Nafion Byproduct 1			UX	ND	ng/L				JLS	05/09/18	22:01
Nafion Byproduct 2			UX	ND	ng/L						
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)			UX	ND	ng/L						
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)			UX	ND	ng/L						
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)			UX	ND	ng/L						
Perfluoro-2-methoxyacetic acid (PFMOAA)			UX	ND	ng/L						
Perfluoro-3-methoxypropanoic acid (PFMOPrA)			UX	ND	ng/L						
Perfluoro-4-methoxybutanic acid (PFMOBA)			UX	ND	ng/L						
Perfluorobutanesulfonate (PFBS)			U	ND	ng/L						
Perfluorobutyric acid (PFBA)			U	ND	ng/L						
Perfluorodecanesulfonate (PFDS)			U	ND	ng/L						
Perfluorodecanoic acid (PFDA)			U	ND	ng/L						
Perfluorododecanoic acid (PFDoA)			U	ND	ng/L						
Perfluoroheptanesulfonate (PFHpS)			U	ND	ng/L						
Perfluoroheptanoic acid (PFHpA)			U	ND	ng/L						

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## QC Summary

Workorder: 449499

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1762030										
Perfluorohexanesulfonate (PFHxS)			U	ND	ng/L				JLS	05/09/18	22:01
Perfluorohexanoic acid (PFHxA)			U	ND	ng/L						
Perfluorononanesulfonate (PFNS)			U	ND	ng/L						
Perfluorononanoic acid (PFNA)			U	ND	ng/L						
Perfluorooctanesulfonamide (PFOSA)			U	ND	ng/L						
Perfluorooctanesulfonate (PFOS)			U	ND	ng/L						
Perfluorooctanoic acid (PFOA)			U	ND	ng/L						
Perfluoropentanesulfonate (PFPeS)			U	ND	ng/L						
Perfluoropentanoic acid (PFPeA)			U	ND	ng/L						
Perfluorotetradecanoic acid (PFTeDA)			U	ND	ng/L						
Perfluorotridecanoic acid (PFTrDA)			U	ND	ng/L						
Perfluoroundecanoic acid (PFUdA)			U	ND	ng/L						
**Perfluoro-n-[1,2-13C2] decanoic acid	4.93			5.54	ng/L		112	(70%-130%)			
**Perfluoro-n-[1,2-13C2] octanoic acid	4.93			5.25	ng/L		106	(70%-130%)			
**Perfluoro-n-[2,3,4-13C3] butanoic acid	4.93			4.82	ng/L		98	(70%-130%)			

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## QC Summary

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1762030										
*Sodium perfluoro-1-[1,2,3,4-13C4]octanesulfonate	4.93			5.08	ng/L		103	(70%-130%)	JLS	05/09/18	22:01
QC1204023401 449499002 MS											
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)	19.3	1340		1270	ng/L		N/A	(70%-130%)		05/10/18	09:34
Fluorotelomer sulfonate 4:2 (4:2 FTS)	18.0	U	ND	19.8	ng/L		110	(70%-130%)		05/09/18	23:10
Fluorotelomer sulfonate 6:2 (6:2 FTS)	18.3	U	ND	20.1	ng/L		110	(70%-130%)			
Fluorotelomer sulfonate 8:2 (8:2 FTS)	18.5	U	ND	16.1	ng/L		87	(70%-130%)			
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	19.3	U	ND	18.0	ng/L		94	(70%-130%)			
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	19.3	U	ND	16.4	ng/L		85	(70%-130%)			
Nafion Byproduct 1	19.3	UX	ND X	18.7	ng/L		97	(50%-150%)			
Nafion Byproduct 2	19.3	X	57.6 X	82.7	ng/L		130	(50%-150%)			
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)	19.3	X	24.9 X	56.8	ng/L		165*	(50%-150%)			
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)	19.3	X	76.5 X	106	ng/L		152*	(50%-150%)			
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)	19.3	X	388 X	378	ng/L		N/A	(50%-150%)		05/10/18	09:34
Perfluoro-2-methoxyacetic acid (PFMOAA)	19.3	X	300 X	300	ng/L		N/A	(50%-150%)			
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	19.3	X	2870 X	2770	ng/L		N/A	(50%-150%)			
Perfluoro-4-methoxybutanic acid (PFMOBA)	19.3	X	905 X	835	ng/L		N/A	(50%-150%)			

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## QC Summary

Workorder: 449499

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Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>												
Batch	1762030											
Perfluorobutanesulfonate (PFBS)	17.1	J	0.793		17.5	ng/L		98	(70%-130%)	JLS	05/09/18	23:10
Perfluorobutyric acid (PFBA)	19.3	U	ND	U	ND	ng/L		0*	(70%-130%)		05/10/18	09:34
Perfluorodecanesulfonate (PFDS)	18.6	U	ND		16.5	ng/L		89	(70%-130%)		05/09/18	23:10
Perfluorodecanoic acid (PFDA)	19.3	U	ND		18.4	ng/L		95	(70%-130%)			
Perfluorododecanoic acid (PFDoA)	19.3	U	ND		15.7	ng/L		81	(70%-130%)			
Perfluoroheptanesulfonate (PFHpS)	18.3	U	ND		19.1	ng/L		104	(70%-130%)			
Perfluoroheptanoic acid (PFHpA)	19.3		2.05		21.8	ng/L		103	(70%-130%)			
Perfluorohexanesulfonate (PFHxS)	17.6	U	ND		18.4	ng/L		101	(70%-130%)			
Perfluorohexanoic acid (PFHxA)	19.3		2.65		20.8	ng/L		94	(70%-130%)			
Perfluorononanesulfonate (PFNS)	18.5	U	ND		17.6	ng/L		95	(70%-130%)			
Perfluorononanoic acid (PFNA)	19.3	U	ND		20.3	ng/L		104	(70%-130%)			
Perfluorooctanesulfonamide (PFOSA)	17.9	U	ND		16.5	ng/L		92	(70%-130%)			
Perfluorooctanesulfonate (PFOS)	19.3	J	1.40		17.2	ng/L		82	(70%-130%)			
Perfluorooctanoic acid (PFOA)	19.3		3.91		22.2	ng/L		95	(70%-130%)			
Perfluoropentanesulfonate (PFPeS)	18.1	U	ND		19.3	ng/L		105	(70%-130%)			

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## QC Summary

Workorder: 449499

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Parname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>												
Batch	1762030											
Perfluoropentanoic acid (PFPeA)	19.3		13.4		33.4	ng/L		104	(70%-130%)	JLS	05/09/18	23:10
Perfluorotetradecanoic acid (PFTeDA)	19.3	U	ND		17.4	ng/L		90	(70%-130%)			
Perfluorotridecanoic acid (PFTrDA)	19.3	U	ND		16.0	ng/L		83	(70%-130%)			
Perfluoroundecanoic acid (PFUdA)	19.3	U	ND		19.2	ng/L		100	(70%-130%)			
**Perfluoro-n-[1,2-13C2] decanoic acid	4.82		4.96		4.49	ng/L		93	(70%-130%)			
**Perfluoro-n-[1,2-13C2] octanoic acid	4.82		5.20		4.78	ng/L		99	(70%-130%)			
**Perfluoro-n-[2,3,4-13C3] butanoic acid	4.82		5.46		5.31	ng/L		110	(70%-130%)			
**Sodium perfluoro-1-[1,2,3,4-13C4]octanesulfonate	4.82		4.85		3.98	ng/L		83	(70%-130%)			
QC1204023402 449499002 MSD												
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)	19.4		1340		1250	ng/L	2	N/A	(0%-30%)		05/10/18	09:51
Fluorotelomer sulfonate 4:2 (4:2 FTS)	18.2	U	ND		22.3	ng/L	12	123	(0%-30%)		05/09/18	23:27
Fluorotelomer sulfonate 6:2 (6:2 FTS)	18.5	U	ND		21.6	ng/L	7	117	(0%-30%)			
Fluorotelomer sulfonate 8:2 (8:2 FTS)	18.7	U	ND		19.1	ng/L	17	102	(0%-30%)			
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	19.4	U	ND		18.2	ng/L	1	94	(0%-30%)			
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	19.4	U	ND		18.6	ng/L	13	96	(0%-30%)			
Nafion Byproduct 1	19.4	UX	ND	X	21.2	ng/L	13	109	(0%-30%)			

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## QC Summary

Workorder: 449499

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1762030										
Nafion Byproduct 2	19.4	X	57.6	X	89.6	ng/L	8	165*	(0%-30%)	JLS	05/09/18 23:27
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	19.4	X	24.9	X	48.1	ng/L	16*	120	(50%-150%)		
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	19.4	X	76.5	X	135	ng/L	24*	299*	(50%-150%)		
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	19.4	X	388	X	362	ng/L	4*	N/A	(50%-150%)		05/10/18 09:51
Perfluoro-2-methoxyacetic acid (PFMOAA)	19.4	X	300	X	320	ng/L	6*	N/A	(50%-150%)		
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	19.4	X	2870	X	2770	ng/L	0*	N/A	(50%-150%)		
Perfluoro-4-methoxybutanic acid (PFMOBA)	19.4	X	905	X	861	ng/L	3*	N/A	(50%-150%)		
Perfluorobutanesulfonate (PFBS)	17.2	J	0.793		20.4	ng/L	15	114	(0%-30%)		05/09/18 23:27
Perfluorobutyric acid (PFBA)	19.4	U	ND	J	34.7	ng/L	200*	96	(0%-30%)		05/10/18 09:51
Perfluorodecanesulfonate (PFDS)	18.7	U	ND		20.1	ng/L	20	107	(0%-30%)		05/09/18 23:27
Perfluorodecanoic acid (PFDA)	19.4	U	ND		17.7	ng/L	4	91	(0%-30%)		
Perfluorododecanoic acid (PFDoA)	19.4	U	ND		18.4	ng/L	16	95	(0%-30%)		
Perfluoroheptanesulfonate (PFHpS)	18.5	U	ND		22.5	ng/L	17	122	(0%-30%)		
Perfluoroheptanoic acid (PFHpA)	19.4		2.05		23.3	ng/L	7	109	(0%-30%)		
Perfluorohexanesulfonate (PFHxS)	17.7	U	ND		21.5	ng/L	16	118	(0%-30%)		



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## QC Summary

Workorder: 449499

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Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>												
Batch	1762030											
Perfluorohexanoic acid (PFHxA)	19.4		2.65		26.6	ng/L	24	123	(0%-30%)	JLS	05/09/18	23:27
Perfluorononanesulfonate (PFNS)	18.7	U	ND		18.8	ng/L	6	101	(0%-30%)			
Perfluorononanoic acid (PFNA)	19.4	U	ND		22.0	ng/L	8	112	(0%-30%)			
Perfluorooctanesulfonamide (PFOSA)	18.0	U	ND		17.3	ng/L	5	96	(0%-30%)			
Perfluorooctanesulfonate (PFOS)	19.4	J	1.40		21.4	ng/L	22	103	(0%-30%)			
Perfluorooctanoic acid (PFOA)	19.4		3.91		27.2	ng/L	20	120	(0%-30%)			
Perfluoropentanesulfonate (PFPeS)	18.3	U	ND		22.0	ng/L	13	119	(0%-30%)			
Perfluoropentanoic acid (PFPeA)	19.4		13.4		36.6	ng/L	9	119	(0%-30%)			
Perfluorotetradecanoic acid (PFTeDA)	19.4	U	ND		19.5	ng/L	11	100	(0%-30%)			
Perfluorotridecanoic acid (PFTrDA)	19.4	U	ND		15.7	ng/L	2	81	(0%-30%)			
Perfluoroundecanoic acid (PFUdA)	19.4	U	ND		18.1	ng/L	6	93	(0%-30%)			
**Perfluoro-n-[1,2-13C2] decanoic acid	4.86		4.96		4.38	ng/L		90	(70%-130%)			
**Perfluoro-n-[1,2-13C2] octanoic acid	4.86		5.20		5.53	ng/L		114	(70%-130%)			
**Perfluoro-n-[2,3,4-13C3] butanoic acid	4.86		5.46		5.73	ng/L		118	(70%-130%)			
**Sodium perfluoro-1-[1,2,3,4-13C4]octanesulfonate	4.86		4.85		5.34	ng/L		110	(70%-130%)			

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## QC Summary

Workorder: 449499

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1762827										
QC1204025059	LCS										
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)	19.7			23.0	ng/L		117	(70%-130%)	JLS	05/10/18	03:30
Fluorotelomer sulfonate 4:2 (4:2 FTS)	18.4			22.0	ng/L		120	(70%-130%)			
Fluorotelomer sulfonate 6:2 (6:2 FTS)	18.7			23.1	ng/L		124	(70%-130%)			
Fluorotelomer sulfonate 8:2 (8:2 FTS)	18.9			22.6	ng/L		120	(70%-130%)			
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	19.7			22.4	ng/L		114	(70%-130%)			
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	19.7			24.0	ng/L		122	(70%-130%)			
Nafion Byproduct 1	19.7		X	16.6	ng/L		85	(50%-150%)			
Nafion Byproduct 2	19.7		X	21.5	ng/L		109	(50%-150%)			
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)	19.7		X	20.9	ng/L		106	(50%-150%)			
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)	19.7		X	20.6	ng/L		105	(50%-150%)			
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)	19.7		X	12.0	ng/L		61	(50%-150%)			
Perfluoro-2-methoxyacetic acid (PFMOAA)	19.7		X	17.8	ng/L		91	(50%-150%)			
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	19.7		X	22.5	ng/L		114	(50%-150%)			
Perfluoro-4-methoxybutanic acid (PFMOBA)	19.7		X	22.3	ng/L		113	(50%-150%)			
Perfluorobutanesulfonate (PFBS)	17.4			18.4	ng/L		106	(70%-130%)			

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## QC Summary

Workorder: 449499

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1762827										
Perfluorobutyric acid (PFBA)	19.7			24.4	ng/L		124	(70%-130%)	JLS	05/10/18	03:30
Perfluorodecanesulfonate (PFDS)	19.0			21.4	ng/L		113	(70%-130%)			
Perfluorodecanoic acid (PFDA)	19.7			23.1	ng/L		118	(70%-130%)			
Perfluorododecanoic acid (PFDoA)	19.7			22.1	ng/L		112	(70%-130%)			
Perfluoroheptanesulfonate (PFHpS)	18.7			22.8	ng/L		122	(70%-130%)			
Perfluoroheptanoic acid (PFHpA)	19.7			23.2	ng/L		118	(70%-130%)			
Perfluorohexanesulfonate (PFHxS)	17.9			20.8	ng/L		116	(70%-130%)			
Perfluorohexanoic acid (PFHxA)	19.7			23.5	ng/L		120	(70%-130%)			
Perfluorononanesulfonate (PFNS)	18.9			22.0	ng/L		116	(70%-130%)			
Perfluorononanoic acid (PFNA)	19.7			21.8	ng/L		111	(70%-130%)			
Perfluorooctanesulfonamide (PFOSA)	18.2			21.3	ng/L		117	(70%-130%)			
Perfluorooctanesulfonate (PFOS)	19.7			21.5	ng/L		109	(70%-130%)			
Perfluorooctanoic acid (PFOA)	19.7			21.5	ng/L		109	(70%-130%)			
Perfluoropentanesulfonate (PFPeS)	18.5			22.5	ng/L		122	(70%-130%)			
Perfluoropentanoic acid (PFPeA)	19.7			23.1	ng/L		117	(70%-130%)			

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## QC Summary

Workorder: 449499

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1762827										
Perfluorotetradecanoic acid (PFTeDA)	19.7			17.9	ng/L		91	(70%-130%)	JLS	05/10/18	03:30
Perfluorotridecanoic acid (PFTTrDA)	19.7			20.0	ng/L		101	(70%-130%)			
Perfluoroundecanoic acid (PFUdA)	19.7			22.3	ng/L		113	(70%-130%)			
**Perfluoro-n-[1,2-13C2] decanoic acid	4.92			5.24	ng/L		107	(70%-130%)			
**Perfluoro-n-[1,2-13C2] octanoic acid	4.92			4.76	ng/L		97	(70%-130%)			
**Perfluoro-n-[2,3,4-13C3] butanoic acid	4.92			5.77	ng/L		117	(70%-130%)			
**Sodium perfluoro-1-[1,2,3,4-13C4]octanesulfonate	4.92			4.72	ng/L		96	(70%-130%)			
QC1204025060 LCSD											
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)	19.8			24.1	ng/L	5	122	(0%-30%)		05/10/18	03:47
Fluorotelomer sulfonate 4:2 (4:2 FTS)	18.5			25.5	ng/L	15	138*	(0%-30%)			
Fluorotelomer sulfonate 6:2 (6:2 FTS)	18.8			23.5	ng/L	2	125	(0%-30%)			
Fluorotelomer sulfonate 8:2 (8:2 FTS)	19.0			20.6	ng/L	9	108	(0%-30%)			
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	19.8			22.1	ng/L	2	112	(0%-30%)			
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	19.8			21.0	ng/L	13	106	(0%-30%)			
Nafion Byproduct 1	19.8		X	17.8	ng/L	7	90	(0%-30%)			
Nafion Byproduct 2	19.8		X	22.8	ng/L	6	115	(0%-30%)			

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## QC Summary

Workorder: 449499

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1762827										
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA))	19.8		X	26.5	ng/L	23	134	(0%-30%)	JLS	05/10/18	03:47
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA))	19.8		X	26.8	ng/L	26	136	(0%-30%)			
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA))	19.8		X	13.1	ng/L	9	66	(0%-30%)			
Perfluoro-2-methoxyacetic acid (PFMOAA)	19.8		X	18.8	ng/L	5	95	(0%-30%)			
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	19.8		X	24.5	ng/L	8	124	(0%-30%)			
Perfluoro-4-methoxybutanic acid (PFMOBA)	19.8		X	26.6	ng/L	18	135	(0%-30%)			
Perfluorobutanesulfonate (PFBS)	17.5			17.7	ng/L	4	101	(0%-30%)			
Perfluorobutyric acid (PFBA)	19.8			24.0	ng/L	2	121	(0%-30%)			
Perfluorodecanesulfonate (PFDS)	19.1			19.8	ng/L	8	104	(0%-30%)			
Perfluorodecanoic acid (PFDA)	19.8			20.9	ng/L	10	106	(0%-30%)			
Perfluorododecanoic acid (PFDoA)	19.8			21.6	ng/L	2	110	(0%-30%)			
Perfluoroheptanesulfonate (PFHpS)	18.8			24.0	ng/L	5	128	(0%-30%)			
Perfluoroheptanoic acid (PFHpA)	19.8			22.2	ng/L	4	112	(0%-30%)			
Perfluorohexanesulfonate (PFHxS)	18.0			20.5	ng/L	2	114	(0%-30%)			
Perfluorohexanoic acid (PFHxA)	19.8			20.1	ng/L	16	102	(0%-30%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1762827										
Perfluorononanesulfonate (PFNS)	19.0			19.8	ng/L	10	104	(0%-30%)	JLS	05/10/18	03:47
Perfluorononanoic acid (PFNA)	19.8			22.5	ng/L	3	114	(0%-30%)			
Perfluorooctanesulfonamide (PFOSA)	18.3			21.6	ng/L	1	118	(0%-30%)			
Perfluorooctanesulfonate (PFOS)	19.8			20.6	ng/L	4	104	(0%-30%)			
Perfluorooctanoic acid (PFOA)	19.8			20.9	ng/L	3	106	(0%-30%)			
Perfluoropentanesulfonate (PFPeS)	18.6			22.1	ng/L	2	119	(0%-30%)			
Perfluoropentanoic acid (PFPeA)	19.8			22.7	ng/L	2	115	(0%-30%)			
Perfluorotetradecanoic acid (PFTeDA)	19.8			20.2	ng/L	12	102	(0%-30%)			
Perfluorotridecanoic acid (PFTrDA)	19.8			22.8	ng/L	13	116	(0%-30%)			
Perfluoroundecanoic acid (PFUdA)	19.8			21.0	ng/L	6	107	(0%-30%)			
**Perfluoro-n-[1,2-13C2] decanoic acid	4.94			5.19	ng/L		105	(70%-130%)			
**Perfluoro-n-[1,2-13C2] octanoic acid	4.94			5.04	ng/L		102	(70%-130%)			
**Perfluoro-n-[2,3,4-13C3] butanoic acid	4.94			5.32	ng/L		108	(70%-130%)			
**Sodium perfluoro-1-[1,2,3,4-13C4]octanesulfonate	4.94			5.24	ng/L		106	(70%-130%)			
QC1204025058 MB 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)			U	ND	ng/L					05/10/18	03:13

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1762827										
Fluorotelomer sulfonate 4:2 (4:2 FTS)			U	ND	ng/L				JLS	05/10/18	03:13
Fluorotelomer sulfonate 6:2 (6:2 FTS)			U	ND	ng/L						
Fluorotelomer sulfonate 8:2 (8:2 FTS)			U	ND	ng/L						
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)			U	ND	ng/L						
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)			U	ND	ng/L						
Nafion Byproduct 1			UX	ND	ng/L						
Nafion Byproduct 2			UX	ND	ng/L						
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)			UX	ND	ng/L						
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)			UX	ND	ng/L						
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)			UX	ND	ng/L						
Perfluoro-2-methoxyacetic acid (PFMOAA)			UX	ND	ng/L						
Perfluoro-3-methoxypropanoic acid (PFMOPrA)			UX	ND	ng/L						
Perfluoro-4-methoxybutanic acid (PFMOBA)			UX	ND	ng/L						
Perfluorobutanesulfonate (PFBS)			U	ND	ng/L						
Perfluorobutyric acid (PFBA)			U	ND	ng/L						

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## QC Summary

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<u>Parname</u>	<u>NOM</u>	<u>Sample</u>	<u>Qual</u>	<u>QC</u>	<u>Units</u>	<u>RPD%</u>	<u>REC%</u>	<u>Range</u>	<u>Anlst</u>	<u>Date</u>	<u>Time</u>
<b>Perfluorinated Compounds</b>											
Batch	1762827										
Perfluorodecanesulfonate (PFDS)			U	ND	ng/L				JLS	05/10/18	03:13
Perfluorodecanoic acid (PFDA)			U	ND	ng/L						
Perfluorododecanoic acid (PFDoA)			U	ND	ng/L						
Perfluoroheptanesulfonate (PFHpS)			U	ND	ng/L						
Perfluoroheptanoic acid (PFHpA)			U	ND	ng/L						
Perfluorohexanesulfonate (PFHxS)			U	ND	ng/L						
Perfluorohexanoic acid (PFHxA)			U	ND	ng/L						
Perfluorononanesulfonate (PFNS)			U	ND	ng/L						
Perfluorononanoic acid (PFNA)			U	ND	ng/L						
Perfluorooctanesulfonamide (PFOSA)			U	ND	ng/L						
Perfluorooctanesulfonate (PFOS)			U	ND	ng/L						
Perfluorooctanoic acid (PFOA)			U	ND	ng/L						
Perfluoropentanesulfonate (PFPeS)			U	ND	ng/L						
Perfluoropentanoic acid (PFPeA)			U	ND	ng/L						
Perfluorotetradecanoic acid (PFTeDA)			U	ND	ng/L						



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## QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1762827										
Perfluorotridecanoic acid (PFTrDA)			U	ND	ng/L				JLS	05/10/18	03:13
Perfluoroundecanoic acid (PFUdA)			U	ND	ng/L						
**Perfluoro-n-[1,2-13C2] decanoic acid	4.95			5.12	ng/L		103	(70%-130%)			
**Perfluoro-n-[1,2-13C2] octanoic acid	4.95			5.03	ng/L		102	(70%-130%)			
**Perfluoro-n-[2,3,4-13C3] butanoic acid	4.95			5.29	ng/L		107	(70%-130%)			
**Sodium perfluoro-1-[1,2,3,4-13C4]octanesulfonate	4.95			4.82	ng/L		97	(70%-130%)			

**Notes:**

The Qualifiers in this report are defined as follows:

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B The target analyte was detected in the associated blank.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- E Concentration of the target analyte exceeds the instrument calibration range
- H Analytical holding time was exceeded
- J Value is estimated
- JNX Non Calibrated Compound
- N Organics--Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
- N Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- P Organics--The concentrations between the primary and confirmation columns/detectors is >40% different. For HPLC, the difference is >70%.

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## QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Q											
R											
U											
UJ											
X											
Y											
^											
h											

Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.

R Sample results are rejected

U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

UJ Compound cannot be extracted

X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

Y QC Samples were not spiked with this compound

^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.

h Preparation or preservation holding time was exceeded

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

\* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

**LCMSMS-Misc  
 Technical Case Narrative  
 NC Dept Environmental Quality (PFAS)  
 SDG #: 449499**

**Product:** The Extraction and Analysis of Per and Polyfluoroalkyl Substances Using LCMSMS

**Analytical Method:** EPA 537

**Analytical Procedure:** GL-OA-E-076 REV# 6

**Analytical Batches:** 1762030 and 1762029

The following samples were analyzed using the above methods and analytical procedure(s).

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
449499001	77 Raw
449499002	77 Pre
449499003	77 Mid
449499004	77 Post
449499005	77 FB
449499006	79 Raw
449499007	79 Pre
449499008	79 Mid
449499009	79 Post
449499010	30 Raw
449499011	30 Pre
449499012	30 Mid
1204023399	Method Blank (MB)
1204023400	Laboratory Control Sample (LCS)
1204023401	449499002(77 Pre) Matrix Spike (MS)
1204023402	449499002(77 Pre) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

**Data Summary:**

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

**Quality Control (QC) Information**

**Matrix Spike (MS) Recovery Statement**

One or more of the required spiking analytes were not within the acceptance limits in the matrix spike (MS) and/or matrix spike duplicate (MSD). The parent sample, matrix spike (MS) and matrix spike duplicate (MSD) were diluted. The recoveries may not fall within the acceptance range.

<b>Sample</b>	<b>Analyte</b>	<b>Value</b>
1204023401 (77 PreMS)	Perfluoro(3, 5, 7, 9-tetraoxadecanoic) acid (PFO4DA)	165* (50%-150%)
	Perfluorobutyric acid (PFBA)	0* (70%-130%)
1204023402 (77 PreMSD)	Nafion Byproduct 2	165* (50%-150%)

Both 1204023401 (77 PreMS) and 1204023402 (77 PreMSD) recovered spiked analytes outside of the established acceptance limits for PFO3OA. The noted exceptions are attributed to concentrations in both the MS and MSD that exceeded the calibration range due to a background concentration of PFO3OA in the parent sample. The data are considered unaffected and are reported.

**MS/MSD Relative Percent Difference (RPD) Statement**

One or more of the required spiking analytes were not within the acceptance limits in the matrix spike (MS). The parent sample, matrix spike (MS) and matrix spike duplicate (MSD) were diluted. The recoveries may not fall within the acceptance range.

Sample	Analyte	Value
1204023401MS and 1204023402MSD (77 Pre)	Perfluoro(3, 5, 7, 9-tetraoxadecanoic) acid (PFO4DA)	RPD 16* (50%-150%)
	Perfluoro(3, 5-dioxahehexanoic) acid (PFO2HxA)	RPD 4* (50%-150%)
	Perfluoro-2-methoxyacetic acid (PFMOAA)	RPD 6* (50%-150%)
	Perfluoro-3-methoxypropanoic acid (PFMOPrA)	RPD 0* (50%-150%)
	Perfluoro-4-methoxybutanic acid (PFMOBA)	RPD 3* (50%-150%)
	Perfluorobutyric acid (PFBA)	RPD 200* (0%-30%)

The RPD values between 1204023401 (77 PreMS) and 1204023402 (77 PreMSD) for PFO3OA were not within the acceptance limits. The noted exceptions are attributed to concentrations in both the MS and MSD that exceeded the calibration range due to a background concentration of PFO3OA in the parent sample. The data are considered unaffected and are reported.

**Miscellaneous Information**

**Additional Comments**

Some results are X qualified because the standard used to calibrate the instrument did not meet the ISO 17025 requirements. These are the only standards available for these analytes. Sample 449499002 (77 Pre) was not reported correctly for PFO3OA in the initial report. The detection observed in the undiluted analysis was within the calibration range, and therefore should have been reported. The sample was subsequently diluted for MS and MSD recoveries that exceeded the calibration range. The data report was corrected to report only the initial undiluted analysis which provides the best value added information to the client.

**Product: The Extraction and Analysis of Per and Polyfluoroalkyl Substances Using LCMSMS**

**Analytical Method:** EPA 537

**Analytical Procedure:** GL-OA-E-076 REV# 6

**Analytical Batches:** 1762827 and 1762826

The following samples were analyzed using the above methods and analytical procedure(s).

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
449499013	30 Post
449499014	48 Raw
449499015	48 Pre

449499016	48 Mid
449499017	48 Post
449499018	75 Raw
449499019	75 Pre
449499020	75 Mid
449499021	75 Post
449499022	71 Raw
449499023	71 Pre
449499024	71 Mid
449499025	71 Post
1204025058	Method Blank (MB)
1204025059	Laboratory Control Sample (LCS)
1204025060	Laboratory Control Sample Duplicate (LCSD)

The samples in this SDG were analyzed on an "as received" basis.

**Data Summary:**

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

**Quality Control (QC) Information**

**Laboratory Control Sample (LCS) Recovery**

The LCS and/or LCSD (See Below) did not meet the spike recovery acceptance limits with a positive bias. As target analytes were not detected in the associated samples, the data were not adversely impacted.

Sample	Analyte	Value
1204025060 (LCSD)	Fluorotelomer sulfonate 4:2 (4:2 FTS)	138* (70%-130%)

**Technical Information**

**Sample Dilutions**

The following samples and/or QC were diluted due to matrix interference. 449499016 (48 Mid), 449499017 (48 Post), 449499018 (75 Raw), 449499019 (75 Pre), 449499020 (75 Mid ) and 449499022 (71 Raw). The following samples were diluted to bring the over range concentrations within the calibration range. 449499014 (48 Raw), 449499015 (48 Pre), 449499018 (75 Raw), 449499019 (75 Pre), 449499022 (71 Raw) and 449499023 (71 Pre).

Analyte	449499								
	014	015	016	017	018	019	020	022	023
Several	10X 1X	10X 1X	5X 1X	5X 1X	50X 1X	50X 1X	5X 1X	50X 1X	50X 1X

**Miscellaneous Information**

**Additional Comments**

Some results are X qualified because the standards used to calibrate the instrument did not meet ISO 17025 requirements. It is the only standard available for these compounds.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**GEL Chain of Custody and Analytical Request**

Client Name: NC DEQ DWM Phone #: 919 707 8217  
 Project/Site Name: Chemours Fax #:  
 Address:

Collected by: Brian Folk/Ham Send Results To: Sandy Mort

\* For composites - indicate start and stop date/time

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (b)	Field Filtered (b)	Sample Matrix (a)	Should this sample be considered:	Total number of containers	Sample Analysis Requested (5) (Fill in the number of containers for each test)	Comments
						Radioactive			
77 RAW	05-03-18	08:35	N	N	GW		2		
77 PRE-MS	05-03-18	08:35	MS	N	GW		2		
77 PRE-MSD	05-03-18	08:35	MSD	N	GW		2		
77 Mid	05-03-18	08:35	N	N	GW		2		
77 Post	05-03-18	08:35	N	N	GW		2		
77 FB	05-03-18	08:35	FB	N	W		1		
79 RAW	05-03-18	09:40	N	N	GW		2		
79 PRE	05-03-18	09:40	N	N	GW		2		
79 Mid	05-03-18	09:40	N	N	GW		2		
79 Post	05-03-18	09:40	N	N	GW		2		

TAT Requested: Normal: Rush: Specify: (Subject to Surcharge) Fax Results: Yes / No  
 Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Sample Collection Time Zone: Eastern Pacific Central Other

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Chain of Custody Signatures

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
Gene Swartzler	05-03-18	14:05	[Signature]	5/4/18	850

GEL PM: Method of Shipment: Date Shipped:  
 Airbill #: Airbill #:

For Lab Receiving Use Only

Custody Seal Intact? YES NO  
 Cooler Temp: C

Chain of Custody Number = Client Determined  
 1.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite  
 2.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.  
 3.) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal  
 4.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).  
 5.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank  
 6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank

WHITE = LABORATORY  
 YELLOW = FILE  
 PINK = CLIENT  
 FB = Field Blank

Page: 2 of 3  
 Project #: GELP17-0929  
 GEL Quote #: GELP17-0929  
 QCOC Number (1): \_\_\_\_\_  
 PO Number: \_\_\_\_\_

GEL Laboratories, LLC  
 2040 Savage Road  
 Charleston, SC 29407  
 Phone: (843) 556-8171  
 Fax: (843) 766-1178

**GEL Chain of Custody and Analytical Request**

GEL Work Order Number: \_\_\_\_\_

Client Name: NCDEO - DWM Phone #: 919.707.8217  
 Project/Site Name: Chemous Fax #: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Collected by: H. Polk Cooper Send Results To: Sandy Mort

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (1)	Field Filtered (2)	Sample Matrix (4)	Should this sample be considered:		Total number of containers	Sample Analysis Requested (5) (Fill in the number of containers for each test)	Comments
						Radioactive	TSCA Regulated			
30 Raw	05-03-18	10:16	N	N	GW			2		
30 PRE	05-03-18	10:16	N	N	GW			2		
30 Mid	05-03-18	10:16	N	N	GW			2		
30 Post	05-03-18	10:16	N	N	GW			2		
48 Raw	05-03-18	10:44	N	N	GW			2		
48 PRE	05-03-18	10:44	N	N	GW			2		
48 Mid	05-03-18	10:44	N	N	GW			2		
48 Post	05-03-18	10:44	N	N	GW			2		
75 Raw	05-03-18	11:29	N	N	GW			2		
75 PRE	05-03-18	11:29	N	N	GW			2		

TAT Requested: Normal: \_\_\_\_\_ Rush: \_\_\_\_\_ Specify: \_\_\_\_\_ (Subject to Surcharge) Fax Results: Yes / No  
 Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Chain of Custody Signatures			Sample Shipping and Delivery Details		
Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
<u>[Signature]</u>	05/03/18	14:05	<u>[Signature]</u>	5/4/18	08:50

GEL PM: \_\_\_\_\_  
 Method of Shipment: \_\_\_\_\_ Date Shipped: \_\_\_\_\_  
 Airbill #: \_\_\_\_\_  
 Airbill #: \_\_\_\_\_

1.) Chain of Custody Number = Client Determined  
 2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite  
 3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.  
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 5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).  
 6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank

For Lab Receiving Use Only  
 Custody Seal Intact? YES NO  
 Cooler Temp: C

WHITE = LABORATORY  
 YELLOW = FILE  
 PINK = CLIENT



Page: 3 of 3  
 Project #: GELP17-0929  
 GEL Quote #: GELP17-0929  
 COC Number (1): \_\_\_\_\_  
 PO Number: \_\_\_\_\_

GEL Laboratories, LLC  
 2040 Savage Road  
 Charleston, SC 29407  
 Phone: (843) 556-8171  
 Fax: (843) 766-1178

# GEL Chain of Custody and Analytical Request

GEL Work Order Number: \_\_\_\_\_

Client Name: NCDEQ DWM Phone #: 919707-8217  
 Project/Site Name: Chemours Fax #: \_\_\_\_\_  
 Address: \_\_\_\_\_

Collected by: B Polk, H Cooper Send Results To: Sandy Mort

Sample ID <i>* For composites - indicate start and stop date/time</i>	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (1)	Field Filtered (2)	Sample Matrix (4)	Should this sample be considered:		Total number of containers	Sample Analysis Requested (5) (Fill in the number of containers for each test)	Comments
						Radioactive	TSCA Regulated			
75 mid	05-03-18	11:29	N	N	GW			2		Note: extra sample is required for sample specific QC
75 post	05-03-18	11:29	N	N	GW			2		
71 Raw	05-03-18	11:58	N	N	GW			2		
71 PRE	05-03-18	11:58	N	N	GW			2		
71 Mid	05-03-18	11:58	N	N	GW			2		
71 Post	05-03-18	11:58	N	N	GW			2		

TAT Requested: Normal: \_\_\_\_\_ Rush: \_\_\_\_\_ Specify: \_\_\_\_\_ (Subject to Surcharge) Fax Results: Yes / No  
 Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4  
 Remarks: *Are there any known hazards applicable to these samples? If so, please list the hazards*

Chain of Custody Signatures		Sample Shipping and Delivery Details	
Relinquished By (Signed)	Date	GEL PM:	Date Shipped:
<u>[Signature]</u>	<u>05/03/18 14:05</u>		

Method of Shipment: \_\_\_\_\_  
 Airbill #: \_\_\_\_\_  
 Airbill #: \_\_\_\_\_

For Lab Receiving Use Only  
 Custody Seal Intact?  
 YES NO  
 Cooler Temp:  
C

1.) Chain of Custody Number = Client Determined  
 2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite  
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 5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).  
 6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank  
**WHITE = LABORATORY**  
**YELLOW = FILE**  
**PINK = CLIENT**



**Subject:** Re: [External] Samples received at GEL 5/4/18

**From:** "Cooper, Harvi C" <harvi.cooper@ncdenr.gov>

**Date:** 5/4/2018 11:59 AM

**To:** "taylor.cannon@gel.com" <taylor.cannon@gel.com>


**CC:** "Wilkins, Mark" <mark.wilkins@ncdenr.gov>, "Walker, Jenne" <jenne.walker@ncdenr.gov>, "Mort, Sandra L" <sandy.mort@ncdenr.gov>

Dear Taylor,

This oversight was totally my fault. Since 250 mls is filtered for each sample and the 4 bottles are all from the same collection port, please use one of the bottles designated for either the 77 Pre MS or MSD to use for the 77 Pre that I omitted. Please call my cell if you have any questions.

Sincerely,  
Harvi

Harvi Cooper  
Environmental Chemist  
Hazardous Waste Section – Division of Waste Management  
NC Department of Environmental Quality  
P.O. Box 1848  
Pittsboro, NC 27312  
(919)642-0098 office  
harvi.cooper@ncdenr.gov  
http://portal.ncdenr.org

 cid:image001.png@01D10765.7992A500

*Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties unless the content is exempt by statute or other regulation.*

On May 4, 2018, at 11:37 AM, Mort, Sandra L <[sandy.mort@ncdenr.gov](mailto:sandy.mort@ncdenr.gov)> wrote:

Can one of you respond to this question from GEL regarding the samples shipped yesterday?

---

**Sandy Mort, M.S., Ph.D.**  
Environmental Toxicologist  
Division of Waste Management  
NC Department of Environmental Quality

(919) 707-8217 - Direct Line & Fax  
[sandy.mort@ncdenr.gov](mailto:sandy.mort@ncdenr.gov)

1646 Mail Service Center  
Raleigh, NC 27699-1646



Nothing Compares

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**From:** Taylor Cannon [<mailto:taylor.cannon@gel.com>]  
**Sent:** Friday, May 4, 2018 11:34 AM  
**To:** Mort, Sandra L <[sandy.mort@ncdenr.gov](mailto:sandy.mort@ncdenr.gov)>  
**Cc:** [team.taylor@gel.com](mailto:team.taylor@gel.com)  
**Subject:** [External] Samples received at GEL 5/4/18

External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

Good morning,

The chain of custody we received this morning contains MS/MSD sample IDs for 77 Pre, however there is no corresponding 77 Pre sample ID in the samples sent. Please advise as to how you would like for us to proceed with these samples. I have attached the page of the corresponding chain of custody in question.

Thanks,

Taylor

--

**Taylor Cannon**  
**Project Manager Assistant**



2040 Savage Road, Charleston, SC 29407 | PO Box 30712, Charleston, SC 29417  
Office Main: 843.556.8171 ext. 4708 | Fax: 843.766.1178  
E-Mail: [taylor.cannon@gel.com](mailto:taylor.cannon@gel.com) | Website: [www.gel.com](http://www.gel.com)

**Analytical Testing | Environmental | Engineering | Surveying**



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**List of current GEL Certifications as of 06 June 2018**

<b>State</b>	<b>Certification</b>
Alaska	17-018
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA180011
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122018-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-18-13
Utah NELAP	SC000122018-26
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Date of Sampling	Lab Results Prior To Gac Implementation				GAC Samples 12 Apr (Unverified No Lab Reports)				Chemours GAC Samples 26 April (Unverified no Lab Reports)				DEQ GAC Samples Verified				GAC Samples 10 May (Unverified)				DEQ GAC Samples 16 May (Verified)				Verified													
	8 38	29 Sep 38	29 Sep 38	29 Sep 38	12-Apr 38	12-Apr 38	12-Apr 38	12-Apr 38	26-Apr 38	26-Apr 38	26-Apr 38	26-Apr 38	26-Apr 38	26-Apr 38	3-Mav 38	3-Mav 38	3-Mav 38	3-Mav 38.00	10-May 38	10-May 38	10-May 38	10-May 38	16-May 38	16-May 38	16-May 38	16-May 38	16-May 38	16-May 38	24-May 38	24-May 38								
Well Depth	Chemo	DEO	DEO	PVT TEST	Chemours	Chemours	Chemours	Chemours	Chemours	Chemours	Chemours	Chemours	Chemours	DEO	DEO	DEO	DEO	Chemours	Chemours	Chemours	Chemours	Chemours	DEO	DEO	DEO	DEO	DEO	DEO	DEO	Baron & Budd								
Address	6975 Pt East Dr	6975 Pt East Dr	6975 Pt East Dr	6975 Pt East Dr	MDL	MDL	MDL	MDL	MDL	MDL	MDL	MDL	MDL	6975 Pt East Dr	6975 Pt East Dr	6975 Pt East Dr	6975 Pt East Dr	PQL	PQL	PQL	PQL	MDL	6975 Pt East Dr	6975 Pt East Dr	6975 Pt East Dr	6975 Pt East Dr	6975 Pt East Dr	6975 Pt East Dr	6975 Pt East Dr									
Stage	RAW	RAW	RAW	RAW	RAW	POST IRON	MID	POST	RAW	POST IRON	MID	POST	FB	FB	RAW	PRE	MID	POST	RAW	POST IRON	MID	POST	TB	RAW	RAW - DUP	PRE	MID	POST	TB	RAW	POST							
Chemical	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters	Watters							
PFCA																																						
PFECA-G																																						
PMPA					500				600	500								500	500																			
TAFN4																																						
Nafion Byproduct 1 (PFESA BP1)				ND																																		
Nafion Byproduct 2 (PFESA BP2)				16.9																																		
Perfluoro(3,5,7,9-tetraoxadecanoic acid)(PFO4DA)				0.0458																																		
Perfluoro(3,5,7-trioxaoctanoic acid)(PFO3OA)				7.6																																		
Perfluoro-2-methoxyacetic acid(PFMOAA)				0.322																																		
Perfluoro-4-methoxybutanoic acid (PFMOBA)				24.9																																		
Perfluoro(3,5-dioxahexanoic acid)(PFO2HxA)				70.9																																		
Perfluoro-3-methoxypropanoic acid (PFMOPrA)				120																																		
Fluorotelomer sulfonate 4:2 (4:2 FTS)				ND																																		
Fluorotelomer sulfonate 6:2 (6:2 FTS)				ND																																		
Fluorotelomer sulfonate 8:2 (8:2 FTS)				ND																																		
N-ethylperfluoro-1-octanesulfonamidoacetic acid (NEFOSAA)																																						
N-methylperfluoro-1-octanesulfonamidoacetic acid (NMeFOSAA)																																						
Perfluorobutanesulfonate(PFBs)				6.07																																		
Perfluorobutyric acid (PFBA)				7.86																																		
Perfluorodecanesulfonate(PFDS)				ND																																		
Perfluorodecanoic acid (PFDA)				ND																																		
Perfluorobutanesulfonic acid					5.40				6.1	5.3																												
Perfluorobutyric acid					6.40				7.1	6.2																												
Perfluorodecanesulfonic acid																																						
Perfluorododecanoic acid(PFDoA)				ND																																		
Perfluoroheptanesulfonate(PFHs)				ND																																		
Perfluoroheptanesulfonic acid																																						
Perfluoroheptanoic acid(PFHpA)				ND	1.20				1.2	1.2																												
Perfluorohexanesulfonate (PFHxS)				4.35																																		
Perfluorohexadecanoic acid						0.39																																
Perfluorohexanesulfonic acid					4.2				4.4	3.9																												
Perfluorohexanoic acid (PFHxA)				3.97					4.1	3.6																												
Perfluorononanesulfonate(PFNs)				ND																																		
Perfluorononanesulfonic acid																																						
Perfluorononanoic acid (PFNA)				ND																																		
Perfluorooctanesulfonamide(PFOSA)				ND																																		
Perfluorooctanesulfonic acid																																						
Perfluorooctanesulfonate (PFOS)				ND																																		
Perfluorooctanoic acid (PFOA)				2.08	1.95	2.02		1.6			1.7	1.7																										
Perfluoropentanesulfonate(PFPeS)				ND																																		
Perfluoropentanoic acid(PFPeA)				9.48				8.1			8.9	7.7																										
Perfluorotetradecanoic acid (PFTeDA)																																						
Perfluorotridecanoic acid(PFTrDA)																																						
Perfluoroundecanoic acid(PFUdA)																																						
2,3,3,3 Tetrafluoro 2 (1,1,2,2,3,3,3 heptafluoropropoxy) propanoic acid (PFPOPrA) (GEN-X)	220	220	198	236	170.0	11		1.3	170.0	170.0	0.59	0.52	0.40	0.35	187	185	ND	ND	190	210																		
Totals PFAS Constituents of Concern	220	222.08	199.95	510.4178	700.40	11.39	0	1.3	203.5	199.6	0.59	0.52	0.4	0.35	1265.12	930.38	0	106.03	420.6	444.3	0	5.4	65.4	749.02	749.02	762.47	0	0.00	0.00	263.2	ND							

**From:** Edwin Bebb  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] RE: Comment on Proposed Order for Preliminary Injunctive Relief  
**Date:** Monday, July 9, 2018 12:14:36 PM

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Dear Sir or Madam:

North Carolina DEQ and the courts must make a stand for the people of this state. Chemours, and their predecessor, DuPont have, by their own admission, polluted the air, soil, and waters of this state for too long. They have fought every recommendation from DEQ, save those that did not alter their bottom line. Health and safety should come before corporate profits. This whole debacle, admittedly politicized, is shameful. We know who put the contaminants in our environment, hold them accountable. They have wantonly destroyed a public trust resource, while arguing in court that they will reduce their emissions to a corporate-friendly amount in the future. What about the damage that has already occurred and that yet to be discovered? It's time to serve the people first.

Sincerely,

Edwin S. Bebb  
526 Ashley Rd.  
Red Springs, NC 28377

**From:** Catherine LaNunziata  
**To:** [comments.chemours](#)  
**Subject:** [External]  
**Date:** Monday, July 9, 2018 11:38:53 AM

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Forget you saying all is fine. No it's not. Toxic is toxic! What safe level? Toxic means no safe level. Please do the right thing. Save our water and our generations.



**From:** Walter F. Rauch  
**To:** [comments.chemours](#)  
**Subject:** [External] Chemours" contamination of our drinking water  
**Date:** Monday, July 9, 2018 6:06:59 AM

---

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To whom it may concern,

I find it unbelievable that a corporation is allowed to contaminate our drinking water without having health studies performed on all of the contaminants and like to ask for an immediate stop of all contamination of our water, air and soil.

I believe Chemours acted irresponsible in discharging contaminants while knowing their health impact on people, live stock and environment consuming the contaminated water. There has been plenty of studies at other related facilities, e.g. DuPont.

I'm a home owner in New Hanover county and just can't believe that our state government allows for contaminating the drinking water and air of hundred of thousand of it's people.

I'd like to see Chemours' business licence revoked with a fine of \$1000 bill for cleaning up our waterways.

Thank you,  
Walter F Rauch

**From:** John Bowker  
**To:** [comments.chemours](mailto:comments.chemours)  
**Cc:** [john\\_bowker](mailto:john_bowker)  
**Subject:** [External] Lower the GenX ppt from 140 ppt to 13 ppt for the health standard of the unborn child in its developing stages.  
**Date:** Sunday, July 8, 2018 11:34:02 PM

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Lower the GenX ppt from 140 ppt to 13 ppt for the health standard of the unborn child in its developing stages.

In my opinion, I am demonstrating how flawed the NCDHHS computations are and that just by changing one of the variables such as the body weight demonstrates this finding.

We can also change the variables, Intake of water and Weight of Body.  
We will use the Body weight of 4 kg and Intake of Water of .1375 Litres

if we lower the amount of water ingested from 1.1 L and we give that the unborn baby may ingest an eighth of the water as intake from the mother.  
We can compute  $1.1 / 8 = .1375$  Litres

Then if we use the formula the ppt reduces to 13 ppt GenX

Meaning a baby at a body weight of 2 pounds with an intake of .1375 Litres of water received while in the womb of the mother should not receive more than 13 ppt  
Formula: dose (mg/kg bw/day) X body weight (kg)/intake (L/day) X RSC X Unit Conversion =  
DWEL (0.00001 mg/kg/day) X .91kg/(.1375L/day) X 0.2 X 10<sup>6</sup>(which is 10X10X10X10X10x10)ng/mg so...  
.....  
(.00001) X 6.61 X 200,000 =13 ppt

However you may like to calculate what percentage of GenX and other PFAS have not been halted through the filtration of mothers body such as the liver, etc and are now entering the baby through the blood .

The umbilical cord develops from and contains remnants of the yolk sac and allantois. It forms by the fifth week of development, replacing the yolk sac as the source of nutrients for the embryo.[2] The cord is not directly connected to the mother's circulatory system, but instead joins the placenta, which transfers materials to and from the maternal blood without allowing direct mixing. The length of the umbilical cord is approximately equal to the crown-rump length of the fetus throughout pregnancy. The umbilical cord in a full term neonate is usually about 50 centimeters (20 in) long and about 2 centimeters (0.75 in) in diameter. This diameter decreases rapidly within the placenta. The fully patent umbilical artery has two main layers: an outer layer consisting of circularly arranged smooth muscle cells and an inner layer which shows rather irregularly and loosely arranged cells embedded in abundant ground substance staining metachromatic.[3] The smooth muscle cells of the layer are rather poorly

differentiated, contain only a few tiny myofilaments and are thereby unlikely to contribute actively to the process of post-natal closure.[3]

The umbilical cord contains Wharton's jelly, a gelatinous substance made largely from mucopolysaccharides which protects the blood vessels inside. It contains one vein, which carries oxygenated, nutrient-rich blood to the fetus, and two arteries that carry deoxygenated, nutrient-depleted blood away.[4] Occasionally, only two vessels (one vein and one artery) are present in the umbilical cord. This is sometimes related to fetal abnormalities, but it may also occur without accompanying problems.

It is unusual for a vein to carry oxygenated blood and for arteries to carry deoxygenated blood (the only other examples being the pulmonary veins and arteries, connecting the lungs to the heart). However, this naming convention reflects the fact that the umbilical vein carries blood towards the fetus's heart, while the umbilical arteries carry blood away.

The blood flow through the umbilical cord is approximately 35 ml / min at 20 weeks, and 240 ml / min at 40 weeks of gestation.[5] Adapted to the weight of the fetus, this corresponds to 115 ml / min / kg at 20 weeks and 64 ml / min / kg at 40 weeks.[5]

[https://en.wikipedia.org/wiki/Umbilical\\_cord](https://en.wikipedia.org/wiki/Umbilical_cord)

Consider the possible deformities of prenatal development, such as organs, to the unborn child when GenX and the other PFAS are in their developing body?

In all seriousness Chemours must "Close Operations" until the EPA gathers all necessary data that conclude the affects on the human body, including unborn babies in their developing stages in the mother.

**From:** Leo Lemmond  
**To:** [comments.chemours](#)  
**Subject:** [External] GenX  
**Date:** Sunday, July 8, 2018 6:29:05 PM

---

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It appears that nothing of any consequence has happened to rectify this problem since the onset of this pollution of our waters.

Of course the plant should be shut down. Even when all of the meetings and talking and promising went on, it should have been shut down until some effective solutions were found. Even now, probably more years will go by, and they will still do the same thing and we will continue to bear the consequences. It's time for the talking to stop and action begin.

Chemours should pay for installation of filtration systems to all who have been affected. Chemours should pay CFPUA for anything they are going to have to do to clean up this mess. CFPUA customers are NOT responsible for causing it and they should not be held responsible for any expenses. We should see NO rise in water rates.

Chemours should be fined so much they will have to go out of business. But better yet, they need to be shut down.

**From:** Gaeten Lowrie  
**To:** [comments.chemours](#)  
**Subject:** [External] Enough is enough; Shut them down  
**Date:** Sunday, July 8, 2018 3:46:52 PM

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**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

Please take the time to read my letter to the end, and allow the staff to read it as well.

To whom it may concern,

This injunction is utter nonsense. It will not solve any of the criminal actions freely being committed by Chemours. Self-regulation has and will continue to fail. Having them reduce all air emissions by 99.99% is an absolutely asinine proposal. The wastewater discharge permit is tragically flawed and only protects the polluter, at a cost of about \$10/day. Here is a feasible solution: Shut them down.

I am appalled and angry at the lack of concern and action against this deceitfully heinous corporation, which is an intentional spinoff from its parent, DuPont, created precisely for the purpose of avoiding litigation and bankruptcy.

As a civilization, we need to look at previous examples in history and learn from our mistakes or we will never progress.

DuPont/Chemours has committed the criminal action of polluting/discharging via water, air and soil - for decades all across the planet. How was their original PFOA dumping discovered? A fishing boat pulled up barrels from a river - DuPont had been filling drums with this chemical, weighed them down with rocks, and was dumping them in the water. Today, this company reiterates "they don't feel the chemicals are harming anybody." The science is there, these chemicals are PBTs. They will not go away. They are harmful to our people, our unborn babies, our ecosystem, wildlife, et al. With the recently released toxicological study on PFAS showing health concerns of PFOA as low as 11ppt, what further studies are you waiting for? In the last year, PFOA has been regularly detected at 130 ppt in drinking water over 100 miles away (as reported by NCDEQ) - and this is only ONE of the PFCs out of an incredibly alarming cocktail of these closely-related chemicals.

For decades, DuPont has been sued for exactly what is happening here. Even after court-ordered action, their remediation efforts are inconsequential at best. Monetarily-speaking, they spend the absolute bare minimum on remediation while simultaneously yielding record-breaking profits, solidifying their spot in the Fortune 500 echelon. Even in other states when they claim to do the right thing by providing filters to less than .1% of the population affected (a bandaid where a tourniquet is needed), citizens become hugely disappointed when the company fails to replace the filters, as promised, over time - again, placing the financial and health burden on the people. [If you follow closely, you will begin to see the intent behind their actions: Kuraray America, operating at the same site with same wastewater permit, purchased Calgon Carbon on September 21st, 2017. Chemours has recently touted installing GAC filters to affected residents as a "solution." Who manufactures these GACs? Surprise, it's Calgon Carbon. ]

Chemours claims they will reduce emissions. This is a bold-faced lie. Name one time in Dupont's long, deceitful history where they successfully followed through. You can't. Nobody can. They have lied about emission amounts and been caught red-handed. Then we find out they are emitting different chemicals which "become Genx" when exposed to water i.e. moisture in the air. More deception by way of semantics. Look at other Superfund sites - has remediation been successful? No. Entire townships have essentially collapsed, leaving citizens devastated, property values decimated, and a wake of death and illness. Want to slowly choke out our coastal towns until tourism shifts to other states entirely while our property values plummet? Then capitulate to Chemours; Allow them to continue self-regulation with unsubstantial fines for all of their spills and violations - most of which they have lied about in their disclosures to the state, or attempted to ignore reporting altogether.

However, it appears that you, the DEQ, EPA, and our legislators are all invertebrates owned by DuPont. We

witnessed in the Town Hall meeting last month (in a church, no less) that Chemours has even retained our law enforcement officers. It is profit over people, and we the people have lost all faith in the institutions which are supposed to protect us. We are not stupid; We have eyes and ears.

You can no longer simply wag a finger at the child with a hand in the cookie jar. Chemours/DuPont are chronic bad actors. You know this. We all know this. They will do everything in their power to keep their shares robust and thriving, and their CEOs have NO investment in the state of North Carolina whatsoever. A few thousand dollars in campaign contributions is not worth the systematic raping of our land, water, air, flora, fauna, and our people's health. Their PR team will continue to spew "forward-looking statements," dodge legitimate questions, and hide behind their proverbial stacks of money, tucked away safely in the state of Delaware.

It's high time to step up to the plate and swing. Don't strike out. We are counting on you. Don't compromise with these habitual liars. Complicity, by design, puts those involved at fault. This is a global crisis, and you have the chance to send a global message of integrity; Enough is enough; Shut them down.

And don't just let them pack up and move to another state to poison a different unsuspecting population for four decades. Make them pay for toxicity studies in our people, livestock, wildlife, marine life, and crops. Make them provide medical monitoring for all affected citizens. Make them cover the crushing costs that our Water Utilities have forcibly passed down to us - crippling rate increases which we, the taxpayer, will unwillingly experience for the next three decades, at least.

Shut them down. Otherwise, it's an unmistakable declaration of where your allegiance truly lies.

Sincerely,  
A terribly concerned NC resident sick of being poisoned for profit,  
Gaeten Lowrie

**From:** Zachary Puer  
**To:** [comments.chemours](#)  
**Subject:** [External] Chemours  
**Date:** Sunday, July 8, 2018 2:30:24 PM

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To whom it may concern,

Please let my voice be heard with sincere concern over the recent findings of the Gen X studies.

I moved from Milwaukee, WI 3 years ago, a city with beautiful rivers and on the shores of Lake Michigan. Due to negligent waste practices over the course of a century, those waterways, while beautiful, were completely inaccessible to citizens because of their filth. When we moved to NC, our beautiful waterways and coast were the complete selling point.

Needless to say, the abuses by a multi-national corporation, polluting *these* waterways and pocketing oodles of cash, is concerning; downright disgusting.

Please hear our voices, punish Chemours and clean up our natural resources. The fact that this is even a debate is enraging enough. Corporate greed has no place in nature's territory.

Do the right thing, for the love of God.

Zachary Puer  
2112 Barnett Ave.  
Wilmington, NC 28403

**From:** Melissa Hill  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Contaminated drinking water  
**Date:** Sunday, July 8, 2018 11:10:51 AM

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My family and I have been required to use bottle water for almost a year. We have to use bottle water for everything. The sad part is when you're on vacation and your child states "you don't know how good it feels to use running water to brush your teeth".

I have two dogs, that have developed cancerous tumors, which is documented through are vet because they have been through several surgeries in attempt to remove, but Chemours doesn't think there is a problem with the water. Those who continuously state the water is safe aren't the ones drinking it.

I fear for my family's wellbeing and health because we stay directly beside of Chemours, but there has not been anything offered to help my family.

My pond, which separates my property and duponts is full of chemicals, my pool and my well.

As a Bladen County residence we have been told by the county commissioners that they will not run us water lines because it's too expensive. But yet dupont has a waterline ran to them.

I beg you to help us force this company to do what's right and clean up their mess. My property is useless at this point, but hopefully we still have a chance at a healthy life.

Melissa Hill

Sent from my iPhone



**From:** Melissa Hill  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Contaminated drinking water  
**Date:** Sunday, July 8, 2018 11:10:34 AM

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CAUTION: External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to Report Spam.<<mailto:report.spam@nc.gov>>

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I fear for my family's wellbeing and health because we stay directly beside of Chemours, but there has not been anything offered to help my family.

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As a Bladen County residence we have been told by the county commissioners that they will not run us water lines because it's too expensive. But yet dupont has a waterline ran to them.

I beg you to help us force this company to do what's right and clean up their mess. My property is useless at this point, but hopefully we still have a chance at a healthy life.

Melissa Hill

Sent from my iPhone

**From:** Laura Kellogg  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Public Comment Chemours  
**Date:** Sunday, July 8, 2018 10:13:07 AM

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As an advocate and mother of 3 children with asthma, <http://www.lung.org/about-us/shared-stories/laura-k-nc.html>

I support the NC DEQ advocating to:

- Reduce facility-wide air emissions of GenX compounds by at least 97 percent by Aug. 31, 2018, with a 99 percent reduction required by Dec. 31, 2019.
- Conduct re-testing of private drinking wells on a quarterly, semi-annual or annual basis, depending on the level of GenX compounds detected in the initial round of testing.
- Provide permanent alternative water supplies or treatment systems to households impacted by groundwater contamination.
- Conduct toxicity studies relating to human health and aquatic life impacts from chemicals at the facility.
- Notify and coordinate with downstream public water utilities when an event at the facility has the potential to cause a discharge of GenX compounds into the Cape Fear River above the health goal of 140 parts per trillion.

Clean air and water are essential to life. Period. This is nonnegotiable.

“If you really think the environment is less important than the economy, try holding your breath while counting your money.”

Respectfully,

Laura Kellogg, RN, AE-C  
The Kellogg's Care Asthma Advocacy  
Cell [413-335-3937](tel:413-335-3937)  
[www.facebook.com/Kelloggscare](http://www.facebook.com/Kelloggscare)  
[attackasthma@gmail.com](mailto:attackasthma@gmail.com)



**From:** Stan Bozarth  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] GenX and other toxins related by Chemours  
**Date:** Sunday, July 8, 2018 10:10:51 AM

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I'm a resident of Wilmington, NC. As a result of Chemours poisoning of our waters, my wife and I have to filter all our drinking and cooking water every day. While that's an inconvenience, expensive, and perhaps ineffective, it's what we have to do to feel even partially safe. Worse, is that we've been subjected, unknowingly, to these toxins for years and we are seeing the effects, or what we may assume are the effects of this purposeful and criminal act of irresponsibility. In the past year we've had multiple animals/pets afflicted with pancreatitis and liver problems. Our animals get excellent care. One, recently, after a normal vet exam and blood work, mysteriously died of an inexplicable and rapidly growing g tumor. Our neighbors are experiencing the same problems. I realize this is anecdotal rather than proven evidence, but it fits the profile of the known results of these toxins.

I ask that you shut Chemours down completely and take steps to hold them financially and criminally liable for their egregious irresponsibility. I ask that you force them to pay for all water system improvements required to deliver a GenX-free public water supply, and their management and executives be prosecuted for knowingly poisoning our community and others. I request they be required to payoff all equipment and personnel (salaries and benefits) required to monitor our water supply and any other costs associated.

Thank you for your attention.

Stan Bozarth  
1310 Legacy Lane  
Wilmington, MNC 28411

**From:** Lauren Krouse  
**To:** [comments.chemours](#)  
**Subject:** [External] Comment on Water Crisis  
**Date:** Sunday, July 8, 2018 8:58:52 AM

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You, Chemours, should be ashamed of yourself. You have poisoned the residents of Wilmington and proceeded to do nothing about it. I drank, bathed in, showered in, and cooked with your water. I gave your water to children. You knew it was toxic and you did nothing about it. What you have committed is a crime against humanity. By pumping chemicals into the water of unknowing citizens, you have knowingly threatened to destroy them. I am disgusted by your company and by the many companies like yours. I went to my sister's graduation at UT and who did I see speak? A head of Dupont. He talked about chemical engineering and the necessity of ethics. He said students would be required to make tough ethical decisions. What has he done? Poisoned people! I wanted to scream it loud for everyone there to hear: Wilmington's water is poisoned. Wilmington's water is poisoned. Wilmington's water is poisoned. I will tell everyone I know as long as I can speak: Your company is disgusting. What you did is unforgivable. How can you sleep at night? How can you look at your kids and family members? How about you look at them and tell them the truth? You poisoned a whole city. You continue to poison cities. You do not care about humanity as long as it is beneath your feet. Well, we are rising up. We are rising up to crush businesses like yours. Shame on you, shame on you, shame on you.

Who knows how long our water has been poisoned? Only you. Who should fix it? You.

You should be required to give all of us access to clean water. This should have happened months ago. You should be required to pay for the countless bottles of water I've had to buy because I can't drink the water that comes out of my tap. I do not have a lot of money, and I have had to spend far more just to have one of the most basic human rights: clean drinking water. You should be required to pay for the medical bills for all of us who develop disorders and diseases due to the poisoned water we've been drinking. (But you'll say it's untraceable!) You should be shut down for good, but you won't, because governments like mine protect businesses like yours. Someday, you will face your due. I hope it's soon.

Cheers to the fall of Chemours and destructive companies like it,  
Lauren Krouse

**From:** wendy mayo  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Chemours  
**Date:** Sunday, July 8, 2018 8:51:05 AM

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My name is Wendy Mayo. Our 12 year old son died from liver cancer. He drank water from cape fear river in Wilmington for 11 years of his life. We cannot help but think there is a link to his rare cancer and the poison water. Please eliminate the presence of GenX and other related compounds in the water and air emissions. Our children deserve (we all do) drinking water we can trust and clean air to breathe.

Wendy Mayo  
Wilmington NC  
910-431-2094

Sent from my iPad

**From:** Terry Hopkins  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Comment re: GenX  
**Date:** Sunday, July 8, 2018 8:32:01 AM

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Here we are a year later, and we are still at the beginning of problem solving for all practical purposes. Those who have the resources do what they can to avoid the water. Those who don't have the resources drink the water, and I imagine there are plenty of children and older adults who don't even know about the problem, much less have a choice on what to do. Why can Chemours not be closed, CLOSED, still required to pay their workers, until they are fully ready with a well-tested system to operate with an environmentally friendly and safe operation? Why do we continue to lose our health and sometimes our lives while their pockets stay full and our wonderful resources are made toxic? Shouldn't that be the order for Chemours?  
Thank you for your consideration.

Sent from my iPhone

**From:** Cindy Hartling  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Chemours  
**Date:** Sunday, July 8, 2018 8:22:43 AM

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Please put the health and safety of the people above your financial interests. Where is your conscience? What has happened to our souls? How did we get this far, where profits are all that matters? Enough is enough.

Cindy Hartling  
Sent from my iPhone

**From:** Jocelyn Sharpe  
**To:** [comments.chemours](#)  
**Subject:** [External] RE: Comment on Proposed Order for Preliminary Injunctive Relief  
**Date:** Sunday, July 8, 2018 6:53:32 AM

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Honorable Douglas B. Sasser, Senior Resident Superior Court Judge

I am a 63-year-old single female who is retired with stage IV metastatic breast cancer who has been a tar heel all of her life. I ask that you consider some additional issues.

Require that all state funds no longer buy stock in Dupont or Chemours or any of their subsidiaries and this should include your own portfolio as well as the portfolio of any politicians involved in the process including those who sit on any advisory boards.

Please require that all of these advisory board experts stop trying to sell reverse osmosis or the system of their choice. Your honor, they are not educating people about the downside of RO and mineralizing the water is one of them. People just know that if one of the professors that did the study recommends RO, then that's all they need to know.

I have to buy my water for drinking and cooking. I spent the 4<sup>th</sup> of July as a road trip for water from the mountains. My water authority in Wilmington spent one morning standing outside my home with the CFPUA car in the street to let the whole neighborhood see that they needed a dunning fee from me when the bill had been paid. I ask that you please ask the authorities to stop dunning those of us who have to pay for safer water. We all know that CFPUA is not the villain but they surely didn't tell us what they were running through the pipes. If I had been the people involved in any of this process, I would have been fired a long time ago.

I do not understand how Chemours can supply bottled water to private wells around the plant, and not provide water to the residents of Wilmington, NC. Penalize them to do that and watch how much faster systems are put into place in the plant to provide clean, safe water to drink. Allow me to deduct the amount from the water bill and watch them start serving the citizens with respect. I have never been treated better than a second class citizen.

Thank you for my exercise program. I cannot lift a 5-gallon container of water; therefore, I have to have it half full and I can balance two jugs. Do not wish to have to pick up water from other people who I do not know (you've never worked in fast food). Rolling the container is not advisable and kicking it is definitely out of the question.

I ask that the news stations in the affected area report on these issues as well as the newspapers. It seems that the only paper that wishes to talk about this is the Fayetteville Observer. No one wants tourists to know there is a water problem on the coast. The people who own our news stations do not live here so it is not important to their editors.



Respectfully submitted,  
Debbie Jocelyn Sharpe  
910-769-5406

PS The number of people leaving the area and the state is not being documented. For the first time in my life, I am no longer proud to call North Carolina home.

**From:** Jennifer Taylor  
**To:** [comments.chemours](#)  
**Subject:** [External] RE: Improvement in our Water Quality  
**Date:** Saturday, July 7, 2018 11:40:02 PM

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My family and my daughter's family with three young children have had our lives completely turned upside down by this poisoned water since we have been living in Leland. We refuse to drink or use water contaminated with known carcinogenics in it in any way, and in order to do that, we have been forced to purchase clean water for everything we do. This has been expensive and severely problematic to our families because a company is being allowed to continue polluting OUR water even after KNOWING these chemicals are harmful to us!! IT MUST STOP NOW! THERE IS NO EXCUSE.

**From:** ellen connor  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External]  
**Date:** Saturday, July 7, 2018 10:13:53 PM

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Our air is polluted, our drinking water is toxic, the water we bathe/shower in is toxic, the water from our kitchen sinks is toxic so we can't clean our fruits or vegetables with it, the water we irrigate our lawns and vegetable gardens is toxic. We all want the same result.. we want Chemours to be accountable - be shut down, and fined.

Sent from my iPad

**From:** Kay Hamilton  
**To:** [comments.chemours](#)  
**Subject:** [External] Order  
**Date:** Saturday, July 7, 2018 6:36:30 PM

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We should be careful not to trust them at any point. They are blatantly selfish and deceitful and should be required to provide filtration systems to ALL those affected and reimbursement to those who have purchased systems.

**From:** Robin Blackburn  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Proposed order against Chemours  
**Date:** Saturday, July 7, 2018 5:58:16 PM

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Yes, the proposed order about Gen X should absolutely go forward!

Thank you,  
Robin Blackburn

Sent from my iPad

**From:** Kerry Rini  
**To:** [comments.chemours](#)  
**Subject:** [External] Court order against Chemours  
**Date:** Saturday, July 7, 2018 4:00:21 PM

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I am very concerned about the presence of "GenX" and other related compounds in my family's drinking water and the air we breathe. We are purchasing bottled water for ourselves and our pets, on top of paying for water from CFPUA. This is very expensive, and I am concerned about the people who are unable to afford this additional burden. I believe that all the measures the DEQ is asking Chemours to take are totally justifiable and would support any additional measures that were requested by DEQ. This problem has gone on far too long already.

Kerry Rini  
1320 Chestnut St.  
Wilmington, NC 28401

**From:** wilddaisydeb@aol.com  
**To:** [comments.chemours](#)  
**Subject:** [External] Public Comment regarding the case against Chemours  
**Date:** Saturday, July 7, 2018 3:33:40 PM

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To Whom this may concern,

Chemours is still conducting their own testing. An independent non-biased agency should be conducting these emissions tests. Also, every person in Grays Creek especially children who attended schools that had tainted water should have blood work conducted to determine their level of PFAS/PFOA saturation. All children along the Cape Fear River Basin should be evaluated for behavioral developmental problems and Autism. All pets and livestock in the Grays Creek community should be tested as well. All wells in Grays Creek need to be tested and routinely retested, because of the widespread contamination of the aquifers and seepage from rainwater. Mostly tho, this plant needs to cease all operations. As news breaks daily with more communities, states, and countries coming forward with concerns of widespread PFOA/PFAS contamination.

Debra Stewart

Grays Creek Resident

2462 & 2494 Factory Lane

St Pauls, NC 28384

910-527-1003 (cell)

**From:** Dan Toulan  
**To:** [comments.chemours](#)  
**Subject:** [External] Comment and actions against Chemours  
**Date:** Saturday, July 7, 2018 10:59:07 AM

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DEQ needs to request Chemours to do more then what DEQ is requesting.

They need to be testing and reducing both air emissions and ground water contamination for more then just GenX. It needs to measure, reduce, and stop the contamination for all emerging chemicals, toxins, etc.. Their is a list of over 30 chemicals that have been detected.

They should be paying for the weekly testing for CFPUA, Brunswick utility, and H2Go. They should be responsible for the cost of the GAC filtration CFPUA needs to put in place, the RO Brunswick County municipal utility, and H2Go need to build and put in place to reduce the contamination of the Cape Fear River Chemours has caused.

The need to pay for the systems customers of the Cape Fear region have put in place in their homes to protect their families from the contamination Chemour has done to the Cape Fear River and their drinking water.

They need to provide permanent alternative water supplies or treatment systems to households impacted by more then groundwater contamination. This should cover anyone who is provided drinking water from the Cape Fear River, or other water sources their plant has contaminated.

They need to Notify and coordinate with downstream public water utilities when an event at the facility has the potential to cause a discharge of GenX compounds, and any of the other 30+ contaminants that have been detected in the Cape Fear river.

Chemours, and any company operating along the Cape Fear River need to not be allowed to release / dump any chemicals into our drinking water source.

--

Thanks...  
Dan Toulan



**From:** Michelle Gatewood  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] GenX  
**Date:** Saturday, July 7, 2018 10:40:34 AM

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As a newer resident of Wilmington I am greatly saddened that Chemours has failed to protect and respect the Cape Fear river and wonderful people of this area! The fact we aren't able to have safe drinking water is something Chemours should be ashamed of and held responsible for. I firmly believe that if they are not able to remove completely stop the addition of genx into our water supply they should be shut down.

Michelle Gatewood

Sent via the Samsung Galaxy S@6 active, an AT&T 4G LTE smartphone

**From:** V Hall  
**To:** [comments.chemours](#)  
**Subject:** [External] CHEMOURS POLLUTION  
**Date:** Saturday, July 7, 2018 10:36:11 AM

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Hello

I am not even sure Chemours can fix the destruction that they have done to the environment. The air is toxic up there. You do not see any wildlife in the woods near/around the plant, no birds flying over head, it reminds me of watching Chernobyl videos. They cannot be trusted to not be watched constantly and should have their testing done outside the plant to avoid any mis handling/misinterpretation of results. There also needs to be something done to all the communities that have to purchase water from alternative sources. I highly doubt your meager fines are impacting their bottom line. They are not taking the NCDEQ seriously. They don't care about the community, citizens or environmental impact. If someone told me I was doing something wrong and I knew very well I wasn't I would do everything to prove my innocence. Yet, they say it is not harmful but need to spend 100 million dollars to fix a problem that is not harmful .

So among the things you want from them (listed below).. .....please read my above comments and really think about them!

Reduce facility-wide air emissions of GenX compounds by at least 97 percent by Aug. 31, 2018, with a 99 percent reduction required by Dec. 31, 2019.

Conduct re-testing of private drinking wells on a quarterly, semi-annual or annual basis, depending on the level of GenX compounds detected in the initial round of testing.

Provide permanent alternative water supplies or treatment systems to households impacted by groundwater contamination.

Conduct toxicity studies relating to human health and aquatic life impacts from chemicals at the facility.

Notify and coordinate with downstream public water utilities when an event at the facility has the potential to cause a discharge of GenX compounds into the Cape Fear River above the health goal of 140 parts per trillion.

Respectfully

Vanessa Hall  
910-507-2284

**From:** Gary Roberts  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Clean air and water  
**Date:** Saturday, July 7, 2018 9:49:07 AM

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We had clean air and water before Dupont and it's friends polluted it Please protect our families and community from thoughtless polluters Who wants our future controlled by these polluters Save Bladen and surrounding friends from this man made disaster

**From:** Ellen Allen  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Chemours Comment  
**Date:** Saturday, July 7, 2018 8:16:45 AM  
**Attachments:** [Blank 3.pdf](#)

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Sent from my iPad

**From:** Jeff Bresler  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Clean - Safe Water  
**Date:** Saturday, July 7, 2018 7:57:00 AM

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CAUTION: External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to Report Spam.<<mailto:report.spam@nc.gov>>

Clean and safe drinking water is not a privilege; it is a right! There is no longer a debate as to whether Chemours has contaminated our water. The only questions that remain are how we stop it and what punishment should be delivered and to whom!

Stop the pollution and stop those who allow it. That includes any politician who offers support or protection to the polluters at Chemours and any other company.

Jeff Bresler  
Sent from my iPad

**From:** Gary Wainwright  
**To:** [comments.chemours](#)  
**Subject:** [External]  
**Date:** Friday, July 6, 2018 6:35:31 PM

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Why would anyone let them put any poisons in our waters and now let them to continue! What is wrong with our Justice? And common sense? Sad!!

**From:** Chuck Heustess  
**To:** [comments.chemours](#)  
**Cc:** "Greg Martin"  
**Subject:** [External] Comments concerning Chemours  
**Date:** Thursday, July 5, 2018 3:59:24 PM

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To whom it may concern,

1. Chemours has taken their wastewater discharge completely out of the Cape Fear River.
2. Chemours has agreed to spend over \$100 million to build an on-site incinerator to capture and eliminate over 99% of their wastewater and air emissions.
3. Chemours has cut their air emissions by 40% already and can cut their emissions by more than 70% by October 2018 and by better than 99% by the end of 2019.
4. What DEQ is asking Chemours to do in the given time is impossible. The state should take a more reasonable approach to establishing a time line for Chemours to make their investment to contain their emissions. This first of its kind plant cannot be constructed and brought online overnight, but it is in everyone's best interest for the investment to be made. Work with the company to establish a reasonable timeline so the plant can be built correctly and safely.
5. Due to advances in detection and measuring technology the emerging contaminants issue is going to become a much more significant issue for business and industry around our state and country. The new Chemours incinerator will serve as a model for other industries to study in looking at handling their emerging contaminants.
6. We do not have to choose between saving jobs and hundreds of millions of dollars of local economic impact or having a clean environment. We can have both. We should not risk shutting down three industries and losing hundreds of great jobs when the company has already committed to drastically cutting their environmental footprint and implementing state-of-the-art technology to capture and eliminate over 99% of their emissions.

Please feel free to contact me if you have questions or require additional information. Thank you for your concern for our community.

Chuck Heustess, Executive Director  
Bladen County Economic Development Commission

=====  
This message has been scanned for viruses and dangerous content by MailScanner believed to be clean.

=====  
Pursuant to North Carolina General Statutes Chapter 132, Public Records, this electronic mail message and any attachments hereto, as well as any electronic mail message(s) that may be sent in response to it may be considered public record and as such are subject to request and review by third parties.  
=====



**From:** Jill Breslauer  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External]  
**Date:** Tuesday, June 19, 2018 10:26:08 PM

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To Whom it May Concern:

I am writing in response to Department of Environmental Quality's (DEQ) "Draft Proposed Order for Preliminary Injunction Relief" versus The Chemours Company LLC. I would like to thank DEQ for preparing this very complete document. I hope it is approved and put into effect immediately! I do have a few specific comments outlined below:

Section 64. What is the time frame on the disclosure of test methods and lab standards? Since this is keeping laboratory from analyzing samples that would allow scientist to understand emissions, I think this should be done by August 31, 2018. I think Chemours should also provide laboratory standards to any commercial lab interested in providing private sample analysis.

Section 66a. I think Chemours should also provide laboratory standards to any commercial lab interested in providing private sample analysis. Since this is keeping laboratory from analyzing samples that would allow scientist to understand emissions, I think this should be done by August 31, 2018.

Section 67. Please specify that the toxicology studies need to be rodent toxicology studies.

Thanks you for your attention to this critical matter,

Jill Breslauer  
106 Ramgate Road  
Castle Hayne, NC 28429

**From:** Bob Hoecke  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Chemours Comment  
**Date:** Tuesday, June 19, 2018 8:34:40 AM

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To Whom it May Concern:

I am writing in response to Department of Environmental Quality's (DEQ) "Draft Proposed Order for Preliminary Injunction Relief" versus The Chemours Company LLC. I would like to thank DEQ for preparing this very complete document. I hope it is approved and put into effect immediately. I do have a few specific comments outlined below:

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Section 67. Please specify that the toxicology studies need to be rodent toxicology studies.

Thanks,  
Robert Hoecke  
1107 Stanfield Ct  
Leland, NC 28451

703-489-9306

**From:** Johnsie Lang  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Injunction Comments  
**Date:** Saturday, June 16, 2018 7:45:45 AM

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[comments.chemours@ncdenr.gov](mailto:comments.chemours@ncdenr.gov)

To Whom it May Concern:

I am writing in response to Department of Environmental Quality's (DEQ) "Draft Proposed Order for Preliminary Injunction Relief" versus The Chemours Company LLC. I would like to thank DEQ for preparing this very complete document. I hope it is approved and put into effect immediately. I do have a few specific comments outlined below:

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Section 66a. I think Chemours should also provide laboratory standards to any commercial lab interested in providing private sample analysis. Since this is keeping laboratory from analyzing samples that would allow scientist to understand emissions, I think this should be done by August 31, 2018.

Section 67. Please specify that the toxicology studies need to be rodent toxicology studies.

Thanks,

Johnsie Lang

**From:** Mike Watters  
**To:** [comments.chemours](mailto:comments.chemours)  
**Subject:** [External] Comment on proposed Court Order  
**Date:** Tuesday, June 12, 2018 1:21:18 PM

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----- Forwarded message -----

**From:** Bobby Swilley <[bobby@carolinaspecialties.com](mailto:bobby@carolinaspecialties.com)>  
**Date:** Tue, Jun 12, 2018, 1:15 PM  
**Subject:** FW: GenX  
**To:** Mike Watters <[wattersm@gmail.com](mailto:wattersm@gmail.com)>

**Sent today.**

**BJS**

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**From:** Bobby Swilley [mailto:[bobby@carolinaspecialties.com](mailto:bobby@carolinaspecialties.com)]  
**Sent:** Tuesday, June 12, 2018 1:15 PM  
**To:** 'michael.scott@ncdenr.gov'  
**Subject:** GenX

**Dear Sir,**

**I live in Point East Subdivision, 1904 Nantuckett Court, Fayetteville, Cumberland County, NC 28306 and I have a contaminated well tested by Chemours at 126 and tested by the state at 84. I am not in agreement with the 140 level you propose and I am strongly in favor of supplying water to all residents of Cumberland and Bladen County who have any level of contamination to our well water. Your job and your duty is to PROTECT THE CITIZENS OF NORTH CAROLINA AND THAT IS WHAT YOU ARE PAID BY US TO DO, NOT TO BARGAIN WITH THE PEOPLE WHO CONTAMINATED OUR WELLS. BTW, and my property value is probably zero. Any change in your property value? I can't sell my house. Can you sell**

**yours? My family is at risk. Is your family at risk? I do not give you my permission to put my life, family, pets, property, and well being at risk. I DO NOT!!!!**

**Sincerely,**

**Bobby J. Swilley**

**1904 Nantuckett Court**

**Fayetteville, NC 28306**

**From:** [Peele, Pam](#)  
**To:** [comments.chemours](#)  
**Subject:** Test  
**Date:** Monday, June 11, 2018 3:28:31 PM  
**Attachments:** [image001.png](#)

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Test email

Pamela Peele  
North Carolina Department of Information Technology  
919-754-6000  
[Pamela.Peele@nc.gov](mailto:Pamela.Peele@nc.gov)  
[Website](#) [Twitter](#) [Facebook](#) [LinkedIn](#) [YouTube](#) [Flickr](#)



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GERARD J. WEINDEL  
MAYOR

GARRIS NEIL YARBOROUGH  
ATTORNEY

J.R. STEIGERWALD  
TOWN ADMINISTRATOR



COMMISSIONERS  
ELBERT GIBSON  
DEBORAH INMAN  
W. EVANS JACKSON  
DONNA PATTERSON  
JERRY M. QUICK  
ANNIE LAURA STEPHENS

DEBRA McNEILL  
TOWN CLERK

R. THOMAS HAGENS  
CHIEF OF POLICE

DANIEL L. HOLLOMAN  
PUBLIC WORKS DIRECTOR

July 9, 2018

ST. PAULS, N.C. 28384

Assistant Secretary's Office  
DEQ  
RE: Chemours Public Comment  
1601 Mail Service Center  
Raleigh, NC 27699-1601

OFFICE OF GENERAL COUNSEL  
JUL 12 2018  
DEPARTMENT OF  
ENVIRONMENTAL QUALITY

To Whom It May Concern:

I strongly support the Chemours plant staying in operation due to its huge economic impact with employees and purchases of goods within the region. I strongly believe that if the company installs the water purification systems at all the residences that have higher reading of Gen X than the level is set at currently. As I understand it, the ability to test for concentrations to this level just became available within the last 5 years. It is not fair to accuse a company of hiding something when the level was not detectable as recent as 5 years ago. I believe that the company has installed on scrubber and intends to add a second scrubber shortly. I would ask that DEQ provide the company the opportunity to comply with the requested levels. It appears that it takes \$100 million to reach the desired levels that have been stipulated. If the company moves quickly and attempts to cooperate with DEQ, what is the harm in giving them that opportunity?

I do not see that the company has been anything except cooperative. As the Town Administrator for St. Pauls, we have a number of current and former employees who reside in this town. As the company has agreed to comply with the water quality and the air quality standards as fast as it can, I strongly support the Chemours Plant be allowed to continue to operate.

Sincerely,

J.R. Steigerwald, Town Administrator

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**From:** Doktor Z [mailto:drzac@bellsouth.net]  
**Sent:** Wednesday, July 11, 2018 1:15 PM  
**To:** Leonard, Laura <laura.leonard@ncdenr.gov>  
**Subject:** [External] GenX public comments

**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

Dear Ms. Leonard,

I have found it quite difficult to locate the link for public comments. When I did find it, it did not work.

My comment on this proposed court order is to fully enforce all points of this proposed order.

Thank you.

Diana Zaccaria

Sent from [Mail](#) for Windows 10



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**From:** Merrill Locke [mailto:mlocke48@hotmail.com]  
**Sent:** Wednesday, July 11, 2018 4:35 PM  
**To:** Leonard, Laura <laura.leonard@ncdenr.gov>  
**Subject:** [External] public comment on Chemours/Gen X deadline 07/11/2018

**CAUTION:** External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

Thank you for providing your email address in order that I can comment on the proposed order.

At a minimum, I support the implementation of the measures in the proposed order. In actuality, Chemours should be closed down until all matters surrounding PFOAs and Gen X are resolved to the satisfaction of consumers,

I spent a significant amount of time attempting to navigate NC DEQ' website, that provided an inaccurate telephone information for you. In addition, when I clicked on the link provided, I was notified that the email address was inaccurate. I accessed your office number by going to the employee directory. Your voice message on your office line did give an accurate mobile telephone number (the prefix was inaccurate on the web site); however, your mobile number had no voice mail set up, so I was unable to leave a message.

Not knowing if I would hear back from you, I called Michael Regan's telephone number and spoke to Mr. McGee. Although I explained my dilemma, he offered only to transfer me to your voice mail. Once again, I explained that I had left you a message on your office line; however was unable to leave a message on your mobile. He said that he was unable to remedy the inaccurate phone number on the web page. He unsuccessfully attempted to transfer me to "Meghan (last name unknown), Communications Director. He took my name and number and stated that he would pass on my contact information to her. At this

point in time, I have not heard from the communications director.

I do appreciate your responding to me.

I feel confident that others encountered the same obstacles when attempting to leave a public comment. I doubt that others were as persistent as I.

Merrily Locke  
325 South 3rd Street  
Wilmington, NC 28401  
(910) 470-7295