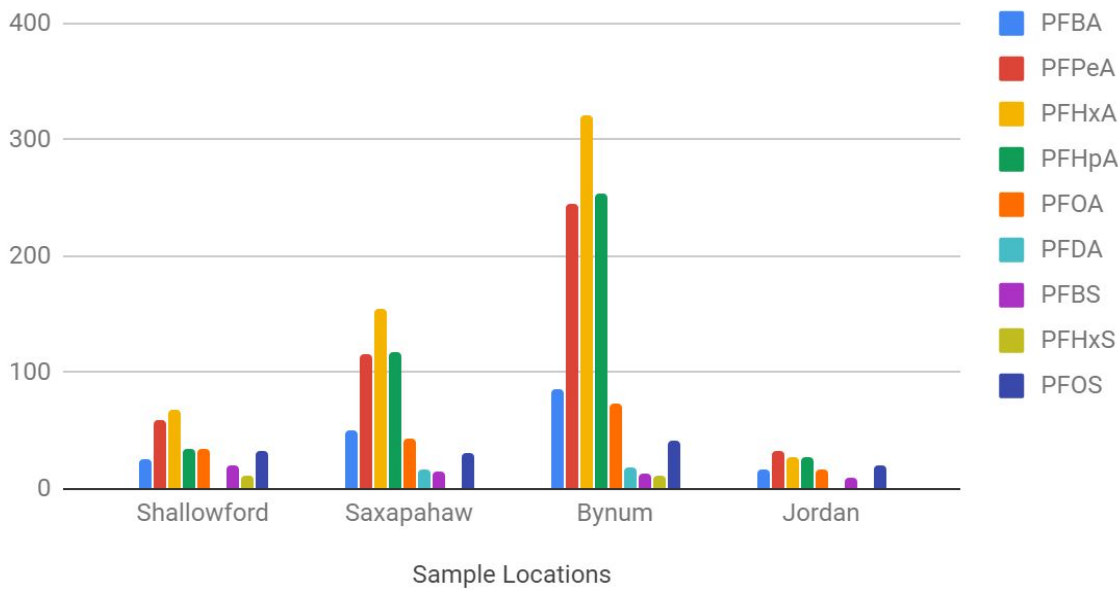


*The following data was collected by Emily Sutton, Haw Riverkeeper, and processed and analyzed by Dr. Detlef Knappe, Ph. D and his team at NCSU.*

*\*All PFAS totals are expressed in ng/L*

PFAS compounds in Haw: Raw Water

Samples taken June 27, 2018



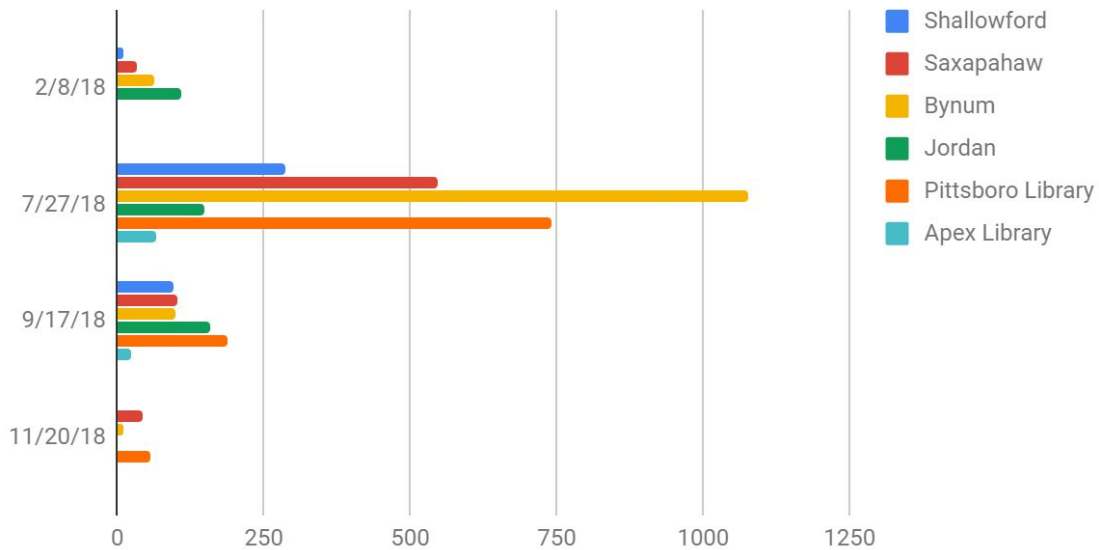
The only PFAS compounds on the path to becoming regulated are PFOA and PFOS, which are two legacy compounds that have been voluntarily excluded from manufacturing processes. The rest of these compounds shown in this chart are just seven of the compounds targeted in our sampling<sup>1</sup>. Similar to GenX, these newer compounds are replacements to those two regulated compounds. This has often been referred to as a game of “Whack-a-mole”- when one compound is regulated, another similar compound appears in its place. These compounds are used in varying manufacturing processes, but most have similar properties. They are used for waterproofing material, flame retardants, and specialty textile fabrics which are heavily produced in the Haw River basin. Bynum is consistently highest in our sampling events. The only potential sources between Saxapahaw and Bynum are sludge fields, most of which is sourced from Burlington’s wastewater treatment plants.

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<sup>1</sup> To quantify the compounds, the samples must be run against known standards; although there are tens of thousands of PFAS compounds, our laboratory partners have the capacity to run the samples against 16 standards.

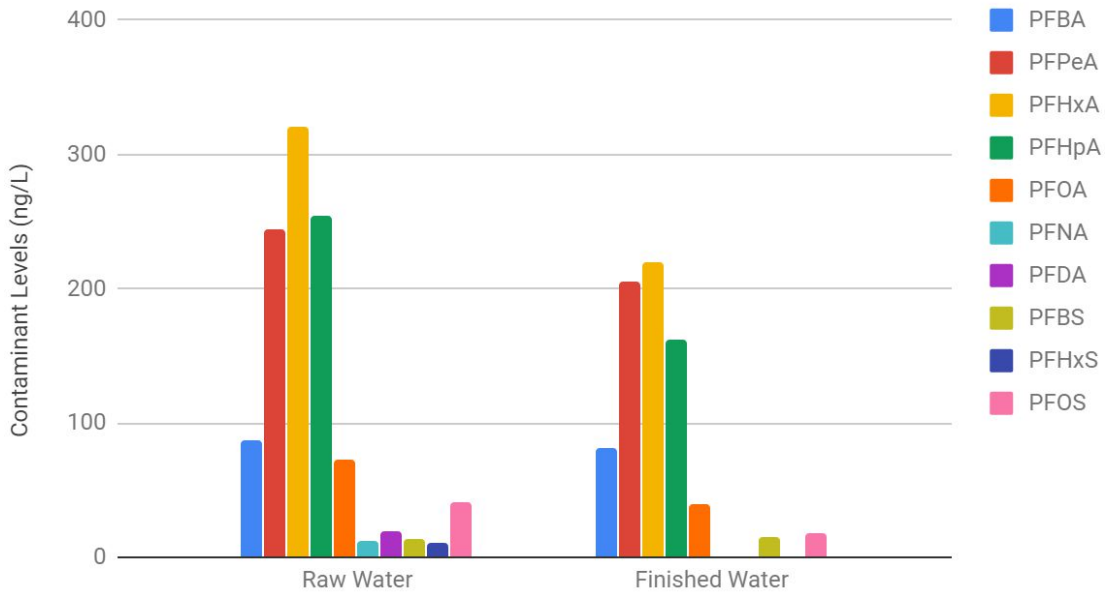
# PFAS Totals

Changes in Season/ CFS

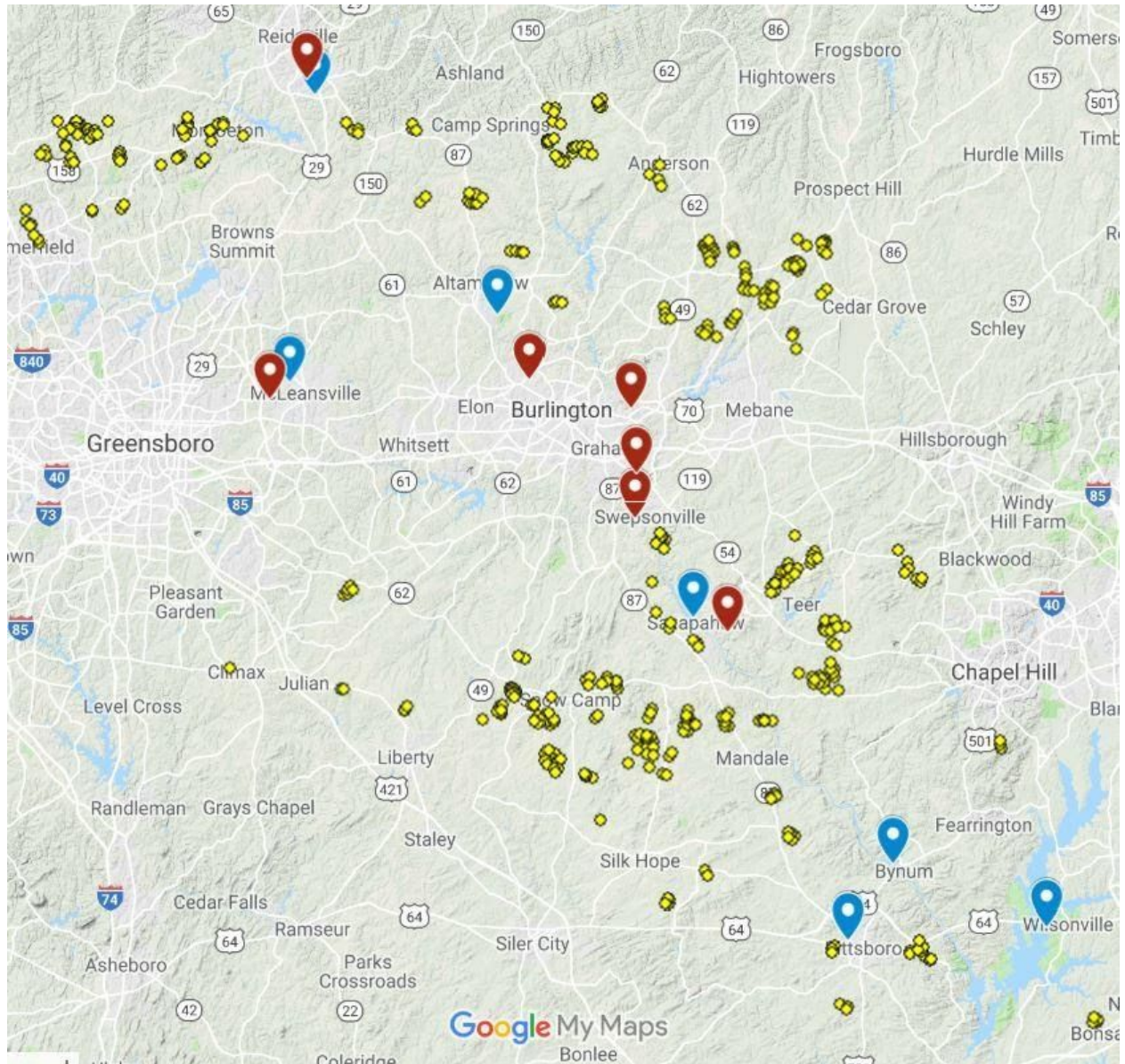


The seasonal variation here is due to the high percentage of effluent in the Haw in times of low flow. Though runoff from sludge application is a main source of these compounds, the concentrations in effluent are highest in times of low flow, when the Haw can be as much as 80% effluent dominated.

## PFAS Levels in Pittsboro



The totals at the Pittsboro Library site reflect the finished, treated water from the source water in Bynum. The Town of Pittsboro does use activated charcoal to treat their drinking water, however this is not an effective treatment for the majority of these PFAS compounds.



The Red icons are potential sources of PFAS discharges. These include wastewater treatment plants and one textile facility in Alamance County. The Blue icons are sampling locations, and the yellow dots are sludge application fields. Many of these are sourced from wastewater treatments plants that have mixed residential and industrial waste streams.

*The following data was collected by Emily Sutton, Haw Riverkeeper, and processed and analyzed by Dr. Heather Stapleton, Ph. D at Duke University.*

This sample plan aimed at pinpointing sources with confidence. We sampled above and below suspected sources of PFAS. East Burlington's Wastewater Treatment plant consistently had the highest levels of PFAS. On the second sampling event, there was a unsuspected spike in Jordan Lake. This could be due to a number of factors, which are discussed below.

Site Locations :

EBURLA : Upstream of East Burlington Wastewater Treatment plant

EBURLB : Downstream of East Burlington Wastewater Treatment plant

SBURLA : Upstream of South Burlington Wastewater Treatment plant

SBURLB: Downstream of South Burlington Wastewater Treatment plant

GRAHAMA : Upstream of Graham Wastewater Treatment plant

GRAHAMB : Downstream of Graham Wastewater Treatment plant

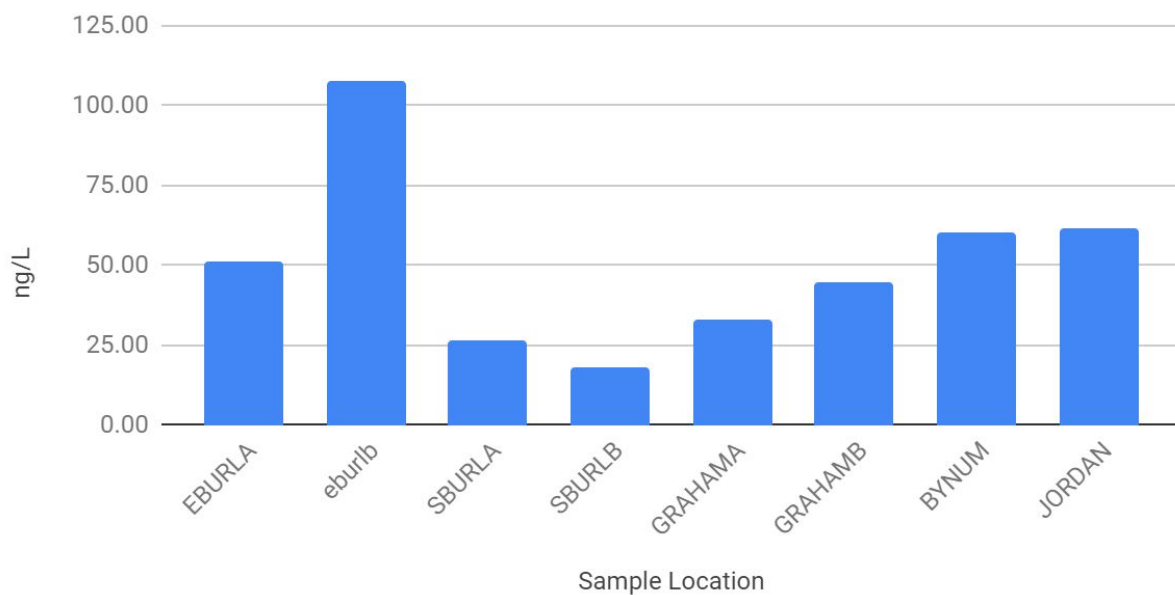
Bynum : Surface water near intake

Jordan : Jordan Lake Near Dam

- JLDam : Jordan Lake Near Dam
- JL64 : Jordan Lake Near 64

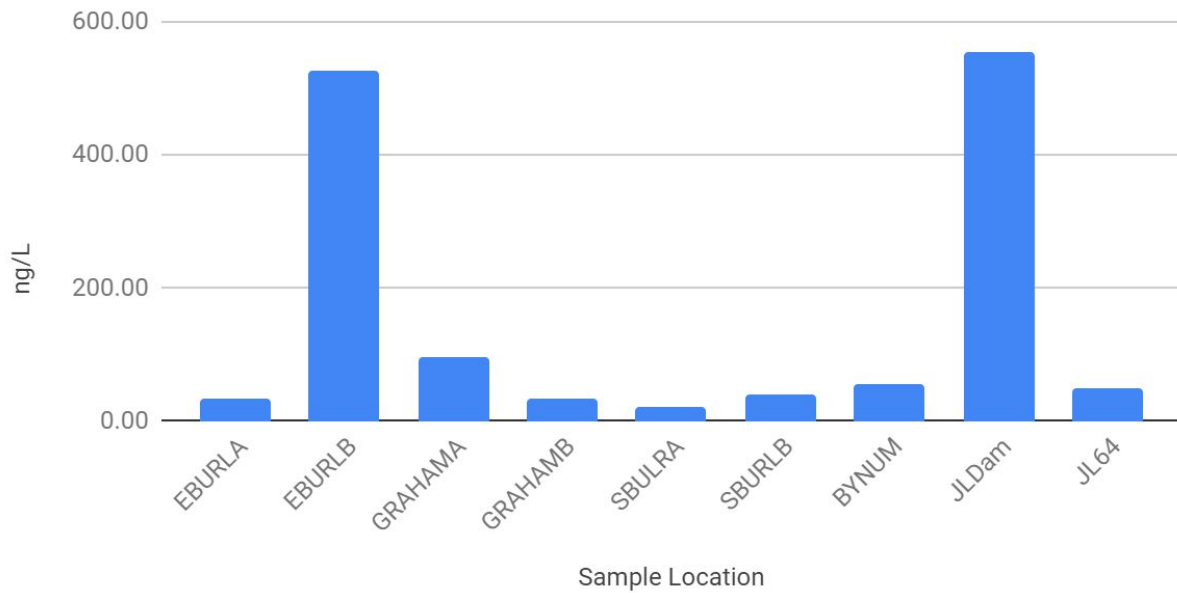
## Total PFAS

Jan 16, 2019



## Total PFAS

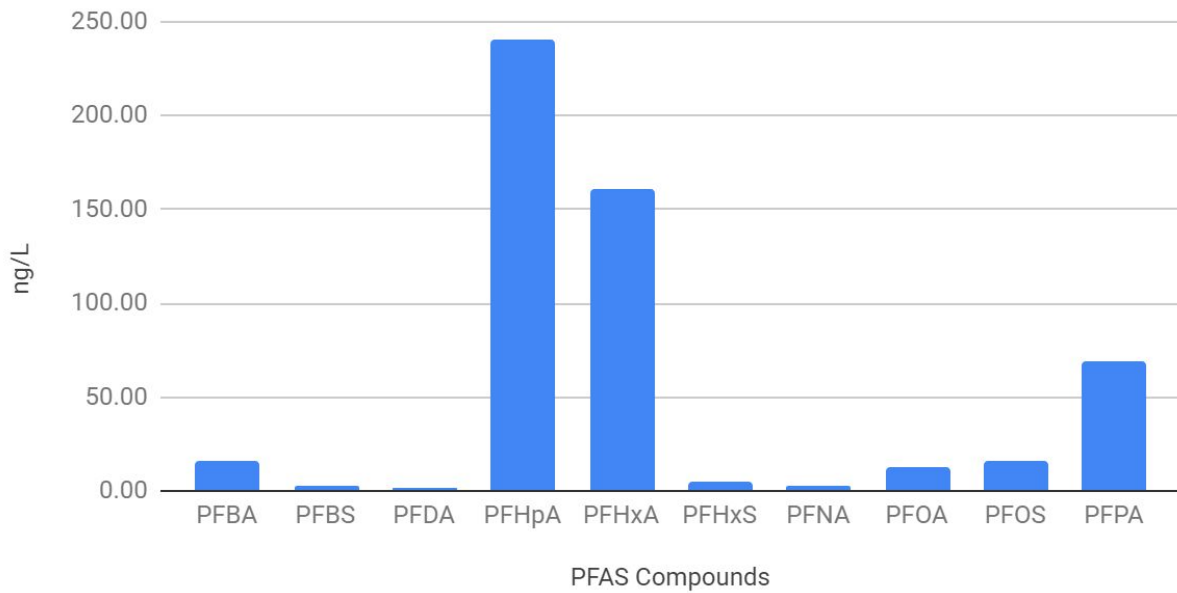
Jan 26, 2019



The two sampling events both show the highest levels below East Burlington's Wastewater treatment plan. The second sampling event shows a spike in PFAS levels in the lower part of Jordan Lake near the dam. This point is heavily influenced by the Haw, due to the fact that the Haw flows into the lake near the lower portion closest to the dam. This spike could be due to a discharge upstream that was held behind the dam. This demonstrates the need for ambient monitoring to confidently identify sources. Repeated monitoring will help to identify and explain repeated trends.

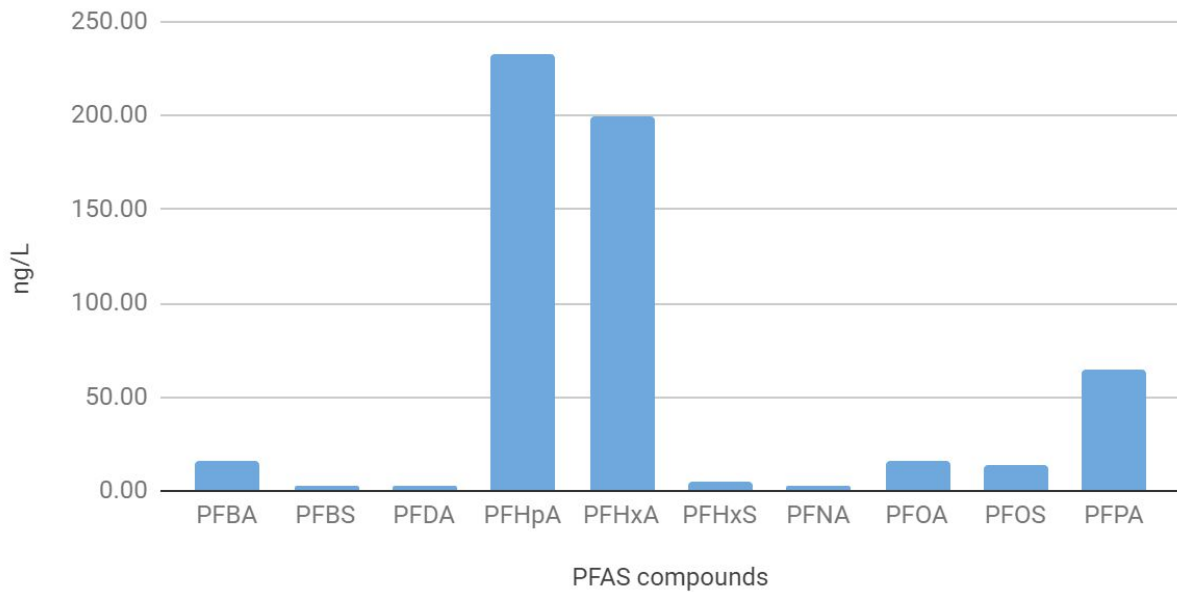
## PFAS Compounds below East Burlington WWTP

Jan 26, 2019



## PFAS Compounds in Jordan Lake near Dam

Jan 26, 2019



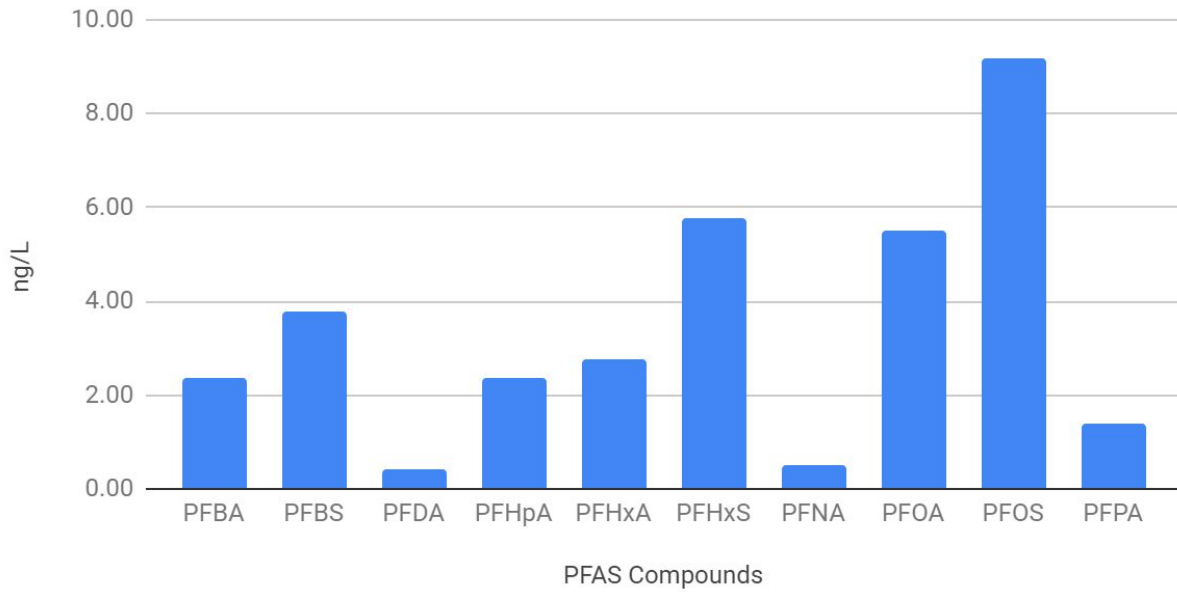
These two charts show the make up of the PFAS compounds found in both spike on January 26th. The signature for the sample taken below East Burlington's Wastewater treatment plant is

nearly identical to the signature for the sample taken in Jordan Lake near the dam. This leads us to believe that the sample taken in Jordan Lake was actually capturing a discharge from East Burlington wastewater treatment plant released upstream days before.

This signature is specific to the East Burlington wastewater treatment plant. Below, I have compared other signatures on from the previous sample date.

## PFAS Compounds Below Graham WWTP

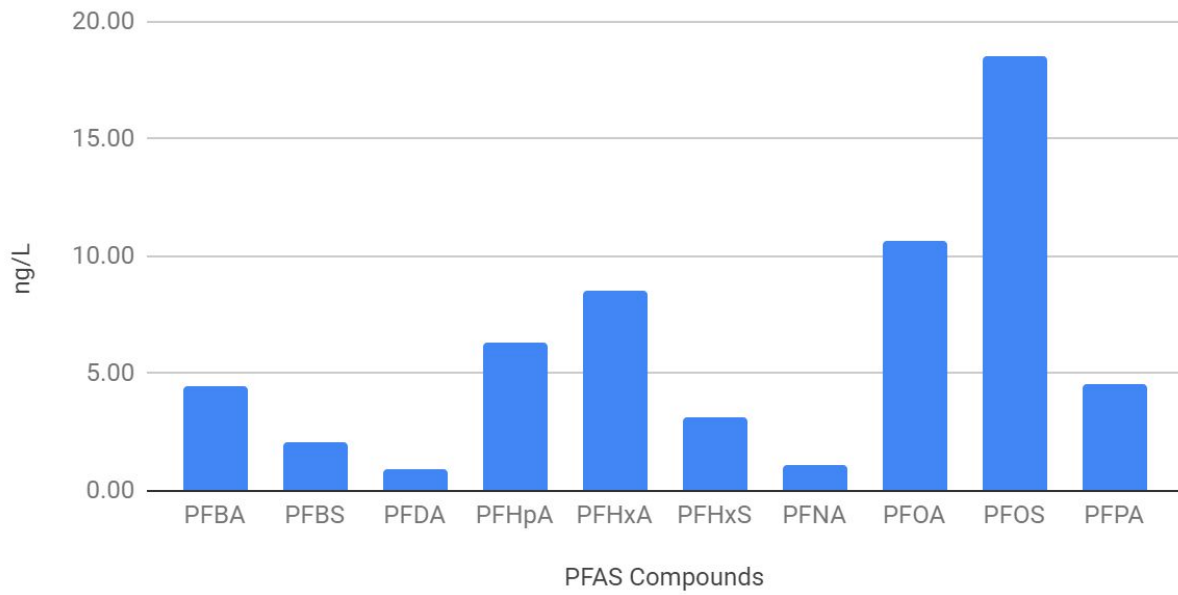
Jan 26, 2016





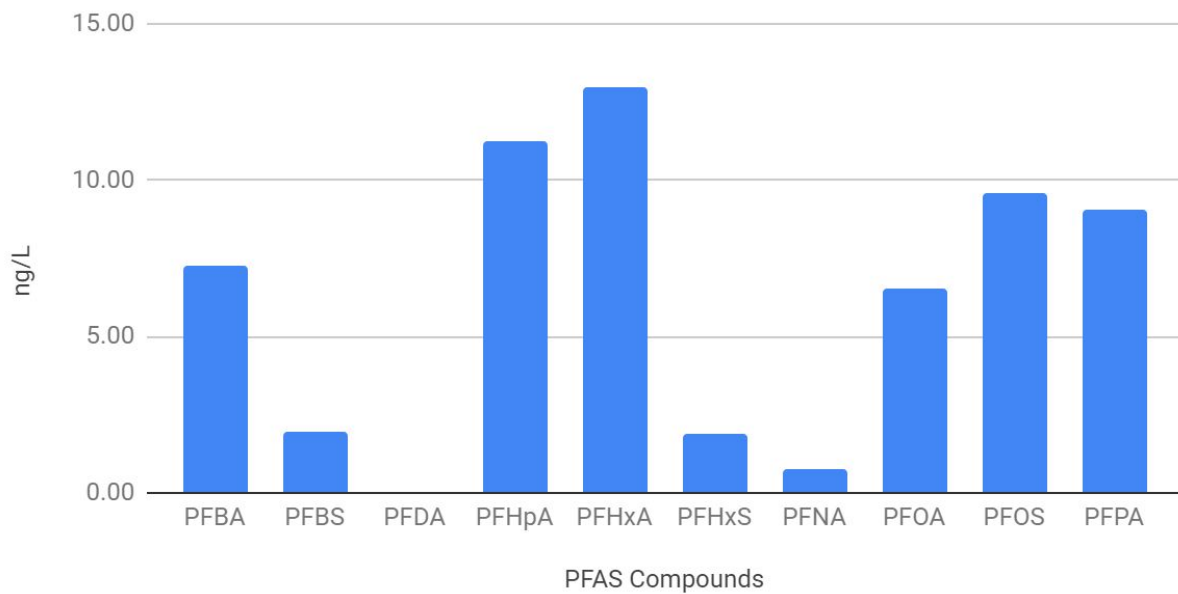
## PFAS Compounds in Bynum

Jan 16, 2019



## PFAS Compounds Jordan Lake Dam

Jan 16, 2019



## **Compounds Identified**

### [PFBA](#)

PFBA is a breakdown product of other PFCs used in stain-resistant fabrics, paper food packaging, and carpets. PFBA was also used for manufacturing photographic film. The 3M Company was once a major manufacturer of PFBA and products containing PFBA but production was phased out in 1998.

### [PFBS](#)

PFBS and related substances are short-chain perfluoroalkyl substances mainly used as surfactants and repellents. Additional applications include: flame retardants, metal plating and pesticides

### [PFDA](#)

Breakdown product of stain- and grease-proof coatings on food packaging, couches, carpets. A 10-carbon version of PFOA; persistent; bioaccumulative.

### [PFHpA](#)

Breakdown product of stain- and grease-proof coatings on food packaging, couches, carpets. A 7-carbon version of PFOA; persistent.

### [PFHxA](#) (Perfluorohexanoic acid)

Breakdown product of stain- and grease-proof coatings on food packaging and household products. Highly persistent in people and the environment.

### [PFHxS](#)

In fire fighting foams and carpet treatments. Phased out of consumer products by 3M in 2000 over health concerns.

### [PFNA](#)

Breakdown product of stain- and grease-proof coatings on food packaging, couches, carpets. A 9-carbon version of PFOA; persistent; bioaccumulative.

### [PFOA](#)

Used to make Teflon pan coatings; breakdown product of stain- and grease-proof coatings. Likely human carcinogen. Found in most people. Being phased out of some products.

### [PFOS](#)

In Scotchgard prior to 2000 - part of the 'PFOS chemistry' phased out of use by 3M in 2000 over health concerns; metabolized into PFOS by the body.