

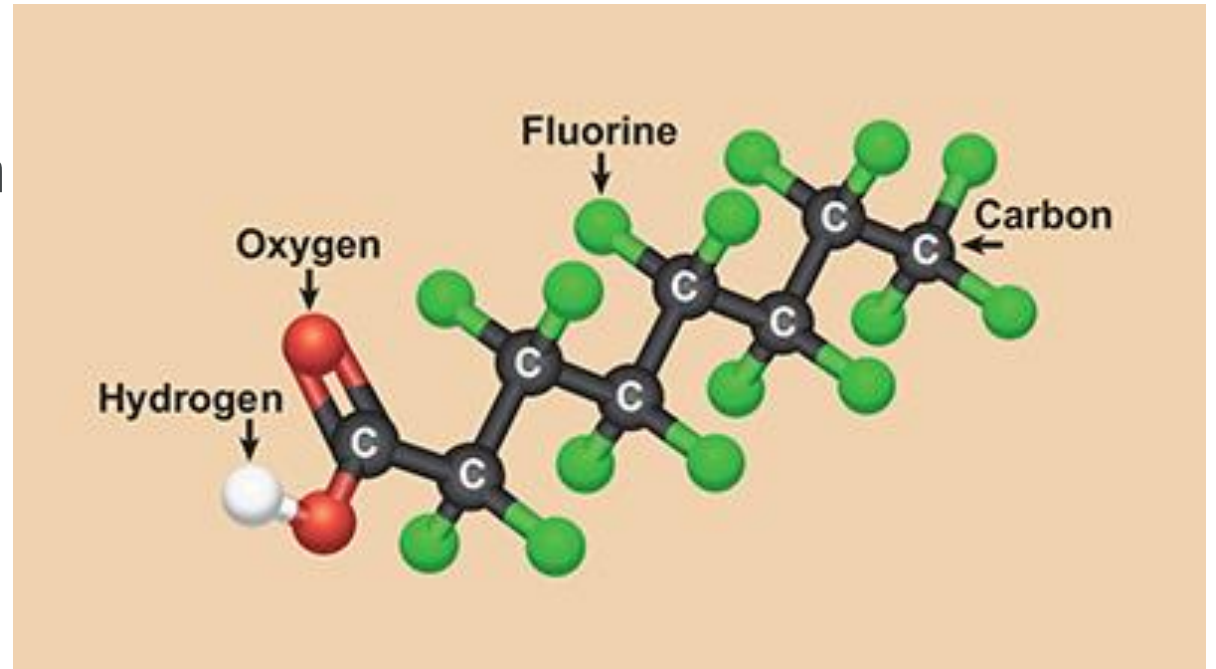
PFAS and Your Drinking Water



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PFAS - Per- and PolyFluoroAlkyl Substances

- What are they?
 - A class of chemicals engineered for use in commercial and industrial applications since the late 1940s.
 - Chemical properties make it an effective surfactant (*they reduce friction*) for stain-resistant, water repellent, and non-stick coatings.
 - “Forever Chemical” – water soluble and non-reactive
 - PFOA, PFOS and GEN-X



PFOA Chemical Structure

Source: National Institute of Environmental Health Sciences

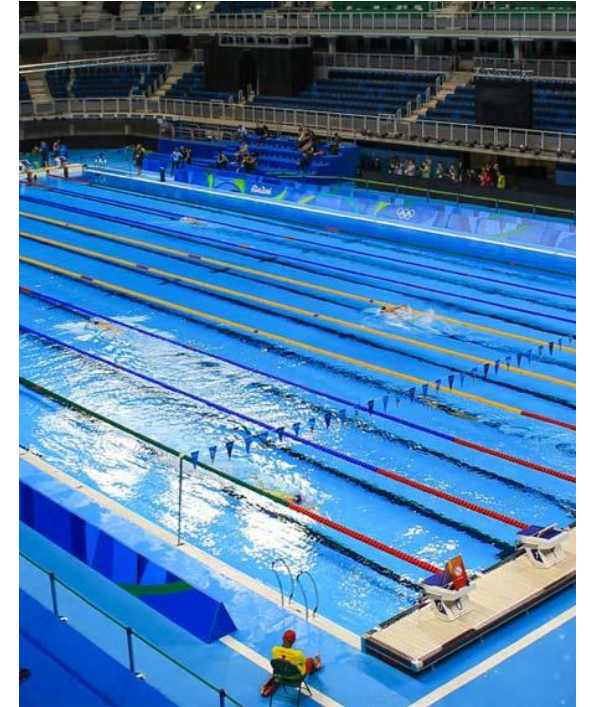
PFAS - What are they used in?

- Aqueous Film-Forming Foam (AFFF)
- Non-stick cookware (Teflon)
- Textiles (Gore-Tex and Tyvek®)
- Furniture and Carpets/Rugs (Stainmaster® and Scotchguard™)
- Food packaging (popcorn bags)
- Consumer care products (cosmetics, dental floss)
- Plumbing products (Teflon tubing and tape)
- Bio-solids – Land Applications – Fertilizers - Compost



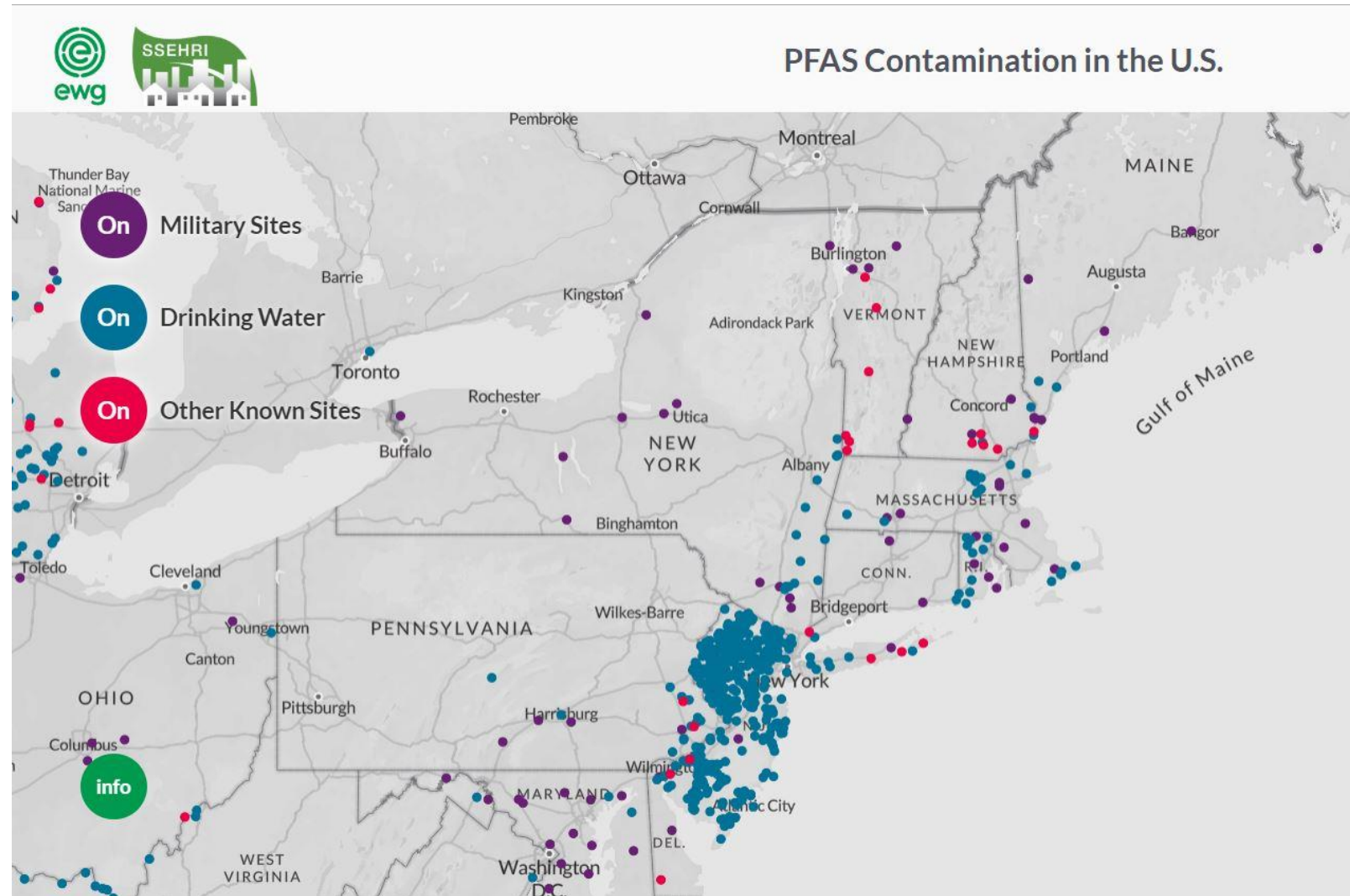
Parts per Trillion (ppt) How much is this

- One drop to 660,250 gallons of water equals 1 ppt
- In order to be exposed to 1 ppt you would have to consume 10.5 million 8 oz glasses of water.
- If you drink 16 oz of water everyday, with a life expectancy of 75 years you will have consumed 438,000 gallons of water



PFAS - Common Sources in the Environment

- Releases to Air, Groundwater, and Surface Water
- Industrial/Manufacturing Sites
- Fire Fighting Training Sites
- Airports
- Dept. of Defense Sites
- Landfills
- Biosolids/Residuals Land Application Sites



Source: https://www.ewg.org/interactive-maps/2019_pfas_contamination/map/, December 3, 2019.



PFAS – MassDEP List of Bottled Water Tested for PFAS

Handout Provided



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-282-5500

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Kathleen A. Theoharides
Secretary

Martin Suuberg
Commissioner

Bottled Water Testing

December 18, 2019

The Massachusetts Department of Environmental Protection (MassDEP) surveyed Massachusetts permitted bottled water companies to determine if they sampled their water sources for Per- and Polyfluoroalkyl substances (PFAS) identified by the EPA laboratory Method 537 or 537.1, and to request that they voluntarily share the results of such testing with MassDEP for posting to the Commonwealth's website.

The bottled water companies listed below have tested for PFAS and reported their laboratory results to MassDEP. PFAS was not detected in their water. The last column in the table below is a link to the individual lab reports. When using this information you should check the lab reports to see the Reporting Limit (RL) used by the lab. The Reporting Limit is the lowest concentration at which a chemical can be detected in a sample and its concentration can be reported with a reasonable degree of accuracy and precision. You should also check the individual lab report for the units of measure: parts per trillion (ppt), micrograms per liter (ug/L), or milligrams per liter (mg/L). If you have any questions on a lab report you should contact the company contact.

| Company | Brand Name(s) | Contact Info | Lab Report link |
|--|--|---|--------------------------------------|
| Berkshire Springs Inc. | Berkshire Springs | www.berkshiresprings.com Felix Graham-Jones felixgj@berkshiresprings.com | Lab Report 4-18-2019 |
| Coca Cola Bottling of Northern NE, Needham Heights, MA production center | Dasani | www.ccne.com Konstantinos Zarboutis Kzarboutis@ccne.com | Lab Report 8-23-2018 |
| Coca Cola Bottling of Northern NE, Londonderry, NH production center | Dasani | www.ccne.com Konstantinos Zarboutis Kzarboutis@ccne.com | Lab Report 8-27-2018 |
| Misty Mountain Spring Water | Misty Mountain | www.mistyvh2o.com Joe Wood wjoe@FoodCity.com | Lab Report 4-10-2019 |
| Alpine Water GmbH | Hallstein Artesian Water | www.hallsteinwater.com Jenn Rock contact@hallsteinwater.com | Lab Report 5-21-2019 |
| Poland Spring | Poland Spring Natural Spring Water and Nestle Pure Life Purified Water | www.nestle-watersna.com/en | Lab Report 1-18-2019 |
| Creekside Springs | Propel Electrolyte Water (manufactured for PepsiCo) | https://www.creeksidesprings.com/ Brooke Fazekas brooke.fazekas@creeksidesprings.com | Lab Report 9-6-2019 |
| Crystal Spring Water Co. | Crystal Spring | https://www.crystalspring.net/bottledWater.html Ian Scott ian@crystalspring.net | Lab Report 2-4-2019 |
| Niagara Bottling, LLC | Niagara Purified Water | www.niagarawater.com | Lab Report 1-25-2019 |

This information is available in alternate format. Contact Michelle Walters-Ekanem, Director of Diversity/Civil Rights at 617-282-6761.

TTY# MassRelay Service 1-800-438-2370

MassDEP Website: www.mass.gov/dep

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PFAS - Tri-Town Water Supply – Identification & Immediate Action

- Voluntary sampling of Great Pond Reservoir were conducted as part of conceptual design for new Tri-Town Regional Water Treatment Plant
- The last sample taken January of 2020 revealed a PFAS level of 21 ppt
- We will be sampling for PFAS on a quarterly basis going forward as required by the DEP



PFAS - Adsorption Processes – Activated Carbon

- **Granular Activated Carbon (GAC)**

- Most common treatment technology
- PFAS is adsorbed onto GAC
- Type of GAC is important – Coal based more effective than coconut based
- Adsorption effectiveness depends on PFAS compound – More effective with long chain compounds
- Single-use
- Adsorption competition with organics

Considering further for intermediate solution and for new regional water treatment plant

- **Powder Activated Carbon (PAC)**

- Traditionally been used for taste/odor control and removal of natural organic matter
- Effective for some PFAS compounds
- Less research available

Considering for Immediate Action



Source: <http://www.calgoncarbon.com/>



PFAS - Surface Water Treatment – Tri-Town – Intermediate and Long Term Solution

- **Intermediate Options**
 - Retrofit existing filters with GAC media;
 - Install GAC units post-filtration; and
 - Install ion resin exchange units post-filtration.
- **Long Term Option**
 - PFAS treatment to be integrated into new regional facility





QUESTIONS

THANK YOU FOR ATTENDING

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