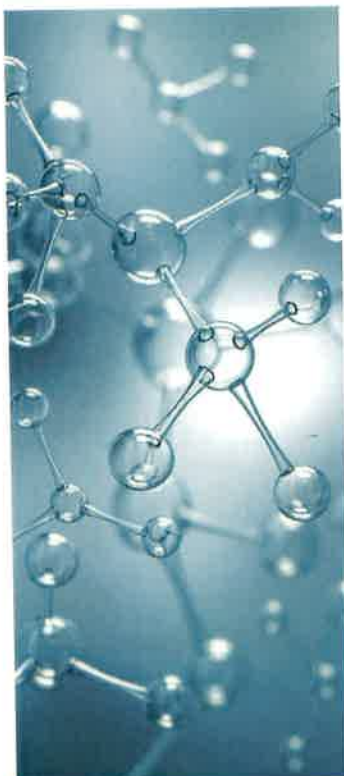




What You Need to
Know About PFAS,
PFOA, PFOS & PFNA

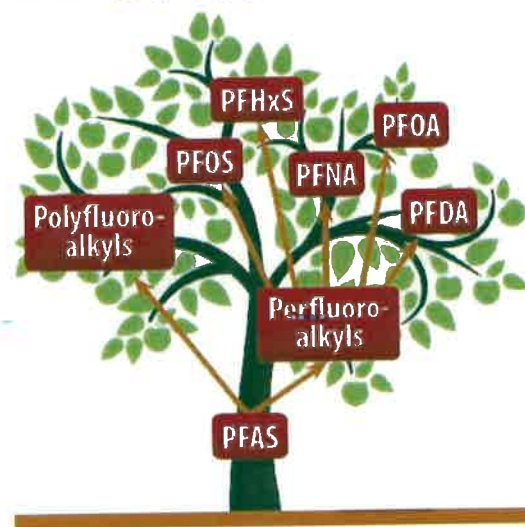


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What are PFAS, PFOA, PFOS and PFNA

- **Per- and Polyfluoroalkyl Substances (PFAS)** refers to more than 4,000 man-made chemicals
- Created by joining carbon and fluorine, one of the strongest bonds that can be made in organic chemistry.
- **Perfluorooctanoic Acid (PFOA)** and **Perfluorooctane Sulfonate (PFOS)** are two of the most widely used and studied chemicals in the PFAS group
- Known as “legacy chemicals” or “forever chemicals” because their degradation periods can be decades or more under natural conditions



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Agency for Toxic Substances and Disease Registry



Where did PFAS come from?



- PFAS are not naturally found in the environment.
- PFAS are human-made. They enter the environment through the manufacturing of certain products and have been in use since the 1950s.



What Products contain PFAS?

- Surface repellant to used to make everyday items resistant to heat, oil, stains, grease, and water.
- Non-stick cookware and Food Packaging
- Fire Fighting Foam (Aqueous Film Forming Foam or AFFF)
- Cosmetics
- Cleaning Supplies, Paints, Pesticides



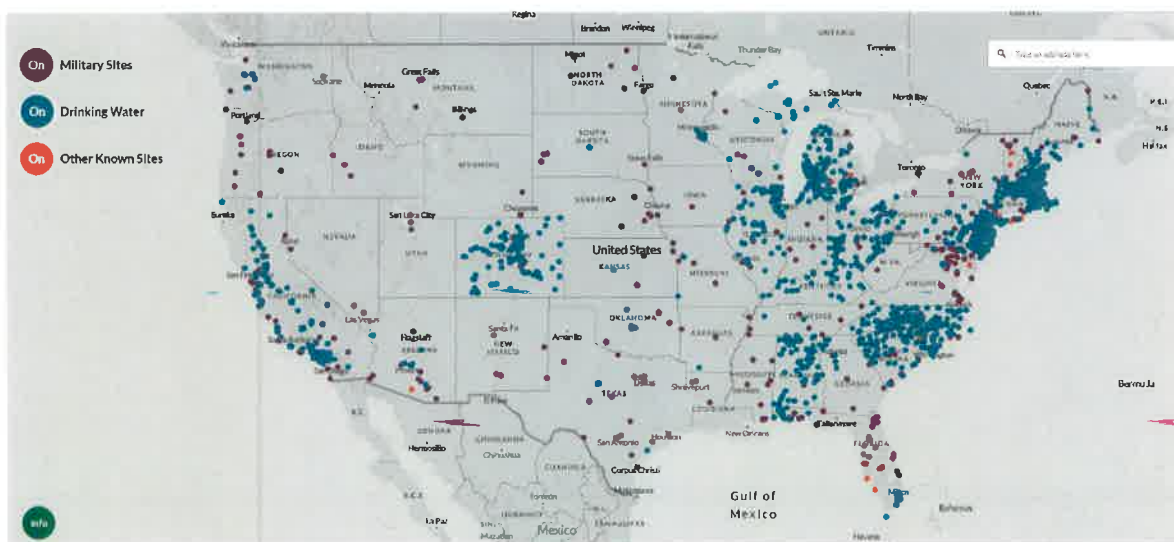
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PFAS in the Environment

- PFAS can be found in groundwater, surface water, drinking water, the soil, air and food.
- Water contamination can occur from stormwater runoff and discharge from wastewater treatment plants.
- Soil contamination can occur from stormwater runoff that migrates through the soil or land application of biosolids or contaminated waste
- Air contamination can occur when PFAS is released from large manufacturing sites.
- PFAS can take hundreds or thousands of years to break down in the environment.

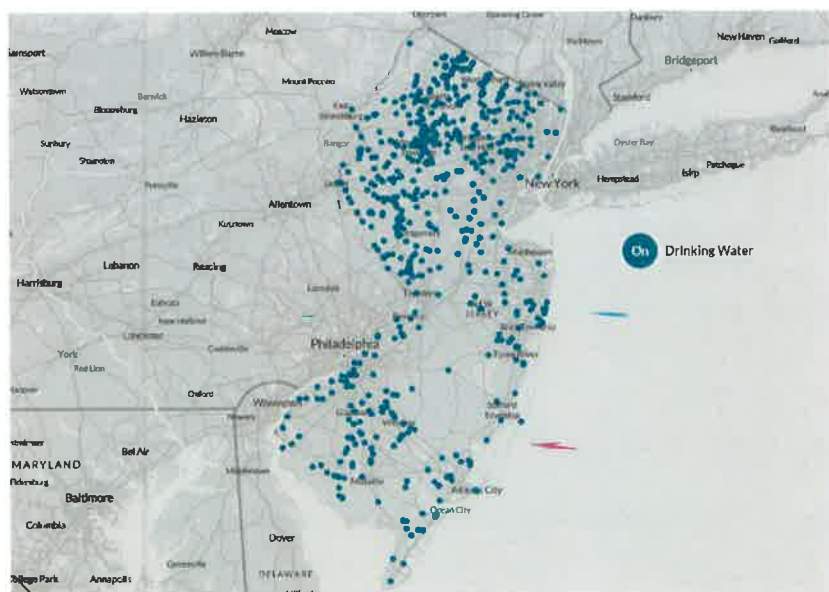


PFAS Contamination in the U.S. (October 4, 2021)

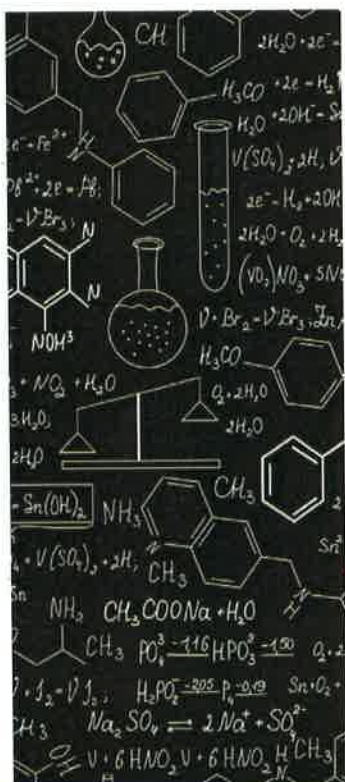


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PFAS Contamination in New Jersey (October 4, 2021)



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How Problematic is PFAS Contamination?

- 1999 - national sampling by the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) estimated that 98% of Americans have detectable levels of PFAS in their blood¹
- In 2016, PFASs were detected at or above the EPA's MRLs in 194 of 4864 public water supplies, serving 16.5 million residents in 33 different states, three American territories, and the Salt River Pima-Maricopa Indian Community
- In 2016, it was estimated that more than 6,000,000 Americans were drinking PFAS-contaminated drinking water that exceeded EPA recommendations²

¹Environ Health Perspect. 2007 Nov; 115(11): 1596-1602.

²Environ. Sci. Technol. Lett. 2016, 3, 10, 344-350



Effects on Humans

Health Effects of PFAS are not well studied yet. Some studies have shown that PFAS may cause:

- Changes in Liver enzymes
- Pregnancy-induced hypertension and/or pre-eclampsia
- Decreased antibody responses to vaccines
- Decreased birthweight
- Cancer, particularly prostate, kidney, and testicular
- Increased Cholesterol levels
- Accelerated puberty
- Hormonal imbalances



Reduction of PFAS – PFOA Stewardship Program



- In 2006, the EPA began the PFOA Stewardship Program which invited eight (8) companies (below) to voluntarily phase out PFOA.

Arkema	BASF Corporation (successor to Ciba)	Daikin	DuPont
Asahi	Clariant	3M/Dyneon	Solvay Solexis

- Under the Program, the companies committed to:
 - 95% reduction of PFOA in both emissions and product content levels by 2010
 - 100% reduction of PFOA in both emissions and product content levels by 2015
- These 8 companies met the goals and phased out PFOA; however, some companies developed a new PFAS (GenX) to replace PFOA



Reduction of PFAS – Federal Regulation

- 2009 - EPA published a Provisional Health Advisory for PFOA (400 ppt) and PFOS (200 ppt).
- 2016 - EPA issued a non-enforceable and non-regulatory Lifetime Health Advisory which established maximum exposure levels for PFOA and PFOS at 70 parts per trillion (ppt) or 0.70 micrograms per liter ($\mu\text{g/l}$) individually or when combined.
- 2021
 - EPA advised of its intent to regulate PFOA and PFOS in drinking water.
 - EPA Lifetime Health Advisory is now under review and subject to change
 - EPA **started** the process to designate PFOA and PFOS as hazardous substances
 - EPA proposed regulations that would require all manufacturers of PFAS to report various data to the EPA
 - EPA published its Fifth Unregulated Contaminant Monitoring Rule to regulate the monitoring of PFAS in drinking water (reporting required over 4ppt or 0.004 $\mu\text{g/l}$)



Federal Health Advisories

- 2009 - EPA published a Provisional Health Advisory for PFOA (400 ppt) and PFOS (200 ppt).
- 2016 - EPA issued a non-enforceable and non-regulatory Lifetime Health Advisory which established maximum exposure levels for PFOA and PFOS at 70 parts per trillion (ppt) or 0.070 micrograms per liter ($\mu\text{g}/\text{l}$) individually or when combined.
- 2021 - Advised of its intent to regulate PFOA and PFOS in drinking water; EPA Lifetime Health Advisory is now under review and subject to change



Reduction of PFAS – Federal Regulation 2021

- EPA restarted the process to designate PFOA and PFOS as hazardous substances
- EPA proposed regulations that would require all manufacturers of PFAS to report various data to the EPA
- EPA published its Fifth Unregulated Contaminant Monitoring Rule to regulate the monitoring of PFAS in drinking water (reporting required over 4ppt or 0.004 µg/l)
- EPA announced the creation of the PFAS Strategic Roadmap: EPA's Commitment to Action 2021-2024 which set forth the actions EPA intends to take to address PFAS.
- EPA's PFAS Strategic Roadmap has 3 goals: (1) Research PFAS; (2) Restrict PFAS; and (3) Remediate PFAS

EPA PFAS STRATEGIC ROADMAP




- Enhanced PFAS reporting requirements are expected in the Spring and Winter of 2022
- Regulation of PFAS under the NPDES Permitting System are expected in 2022
- EPA intends to propose a rule setting forth limits for PFOA and PFOS around fall of 2022 with final adoption anticipated in Fall of 2023
- Publication of final recommended ambient water quality criteria for PFAS for aquatic life and human health is expected in Winter 2022 and Fall 2024
- EPA intends to designate certain PFAS as CERCLA hazardous substances with the proposed rule expected in spring 2022 and final adoption in summer 2023.



Reduction of PFAS – State Regulation

- In 2018, NJ became the first state to establish an enforceable drinking water standard for a PFAS chemical when it set a Maximum Contaminant Level (MCL) for PFNA.
- NJDEP adopted MCLs for PFOA and PFOS in June 2020.
- Current NJDEP regulatory levels for PFAS chemicals are set at:



NJ MCLs for PFAS	
PFNA	13 ppt (0.013 µg/L)
PFOA	14 ppt (0.014 µg/L)
PFOS	13 ppt (0.014 µg/L)

ppt = parts per trillion
µg/l = micrograms per liter



Current Local Litigation

Class Actions against Municipalities/Utility Authorities

- Harris v. Mahwah Township, BER-L-000754-22 (2022)
- Dempsey v. Willingboro Municipal Utilities, BUR-L-000242-22 (2022)

Private Actions against Manufacturers

- Aqua New Jersey, Inc. v. 3M Company, et al., MER-L-000575-21 (2021)
- Ridgewood Water v. 3M Company, et al., BER-L-001447-19 (2019)
- Camden City v. 3M Company, 2:21-cv-1317-RMG (U.S. Dist. S.C. 2021)

State Regulatory Actions

- NJDEP v. Solvay Specialty Polymers USA, GLO-L-001239-20 (2020)
- NJDEP v. El Dupont De Nemours, et al., 1:19-cv-14766 (2019)
 - Removed from NJ Superior Court (SLM-L-000057-19)

There are More Questions than Answers

- Different PFAS compounds have varying effects and toxicity levels
- Research has been limited to better known PFAS compounds.
- Difficult to track and assess exposure and effects.
- Factors contributing to varying effects and toxicity levels of individual PFAS compounds are limited.
- Nearly all available toxicity data is based on laboratory animal studies.
- Limited data exist on health effects associated with inhalation or contact exposure to PFAS; the majority of research is oral (ingestion) exposure (drinking water).





Paulsboro, NJ - PFAS Health Study

- Conducted by Rutgers University Environmental and Occupational Health Sciences Institute
- Studying the health effects from drinking water contaminated by PFAS, specifically PFNA, in Paulsboro, NJ and other sites in Gloucester County.
- Part of a multisite study conducted by the Centers for Disease Control (CDC) and Agency for Toxic Substances and Disease Registry (ATSDR) at 8 locations across the US.
- Participant goal is 1,000 local adults and 300 local children
- Proposed completion date of _____

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How Can You Protect Against PFAS?

- **Educate your Residents/Businesses**
 - Filter water (carbon adsorption, ion exchange resins, and high-pressure membranes)
 - Replace “nonstick” cookware
 - Research takeout containers
- **Municipal Services**
 - Municipal-wide Water Filtration System (for public water)
 - Carbon adsorption or ion exchange resins
 - Monitor all Drinking Water Standards
 - Contingency Plan for Well closures

YOU CANNOT FILTER OUT PFAS BY BOILING WATER



Thank You.



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