

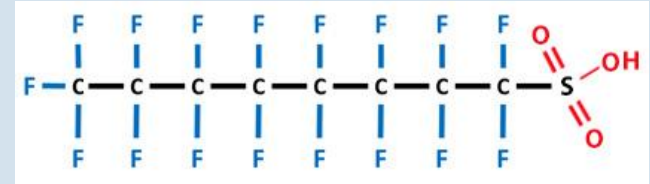
PFAS in Drinking Water Update

MHOA Seminar
March 2023

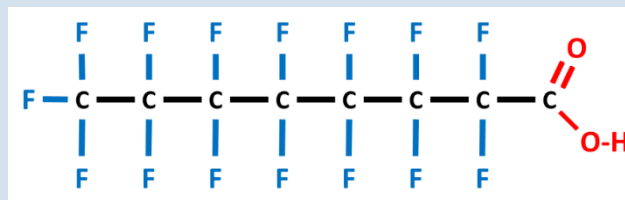


A. Margaret Finn, P.E.
Environmental Engineer
MassDEP Drinking Water Program

What Are PFAS?



- **Per and polyfluoroalkyl Substances**
- Family of thousands of compounds
- **Extremely stable** - Heat & stain resistant, water repellant
- **“Forever chemicals”** - Very persistent, do not biodegrade
- **Water Soluble** – Travel easily in water



Uses of PFAS

- Aqueous film-forming foam (AFFF)
- Textile and leather treatments
 - stain resistance/water repellency
- Paper coatings - grease resistant
- “Waxes” - floor, car, ski
- Manufacturing





PFAS in the Environment

- Manufactured chemicals, widely used since the 1950s
- Now found in water, air, fish, and soil at locations across the nation and the globe
- CDC conducted a study between 2000-2014 and found 98% of Americans have some amount of PFAS in their blood.
- Long-chain PFAS are voluntarily being phased out by industry but are often replaced by short-chain PFAS.
- Blood Levels of PFOS and PFOA (the two most common PFAS) have been dropping.

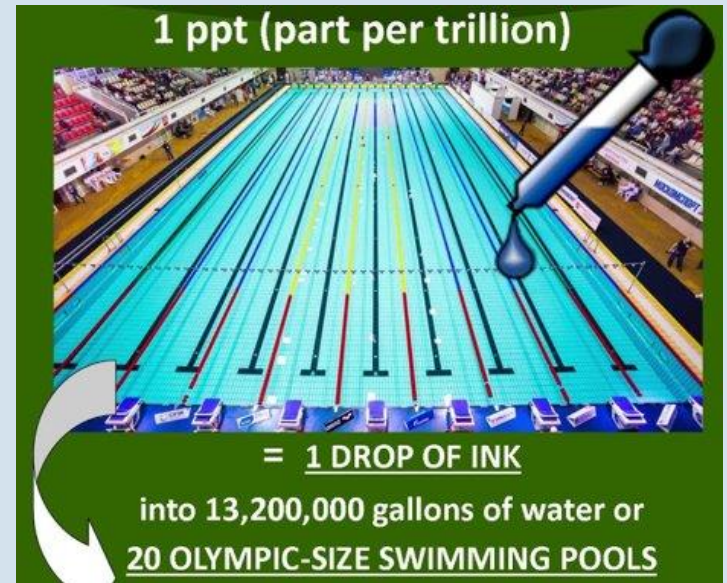
Potential Health Effects



- Effects on the
 - Liver
 - Blood
 - Immune system
- Endocrine disruption – thyroid hormone effects
- Developmental risks to fetus/infants
 - Neurotoxicity, bone, mammary gland, birth weight
- Possibly cancers – kidney; testes; pancreas; liver

Low Levels are a Concern

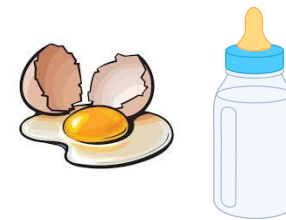
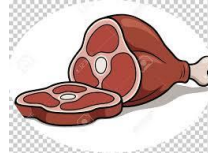
- PFAS bioaccumulates
- Primarily in the blood, liver and kidney
- People exposed to parts-per-trillion levels of PFAS have measured blood levels of in the parts-per-billion range
- We also know that ppt levels of some chemicals in blood have significant effects



| Chemical | Levels |
|--|--------------|
| Normal estradiol in women of child-bearing age | 15-350 ppt |
| Normal insulin in adults | 56 - 560 ppt |

Why Focus on Drinking Water and Not Food?

- Diet is the largest source of PFAS exposure.
- Drinking water contributes 20% and up to 75% near contaminated sites.
- Drinking water is main source for infants.



Largest sources in the diet:

- Seafood, meat, milk, eggs, and drinking water

 **Mass.gov**

[Home](#) > [Department of Public Health](#)

 OFFERED BY [Department of Public Health](#)

PRESS RELEASE

Department of Public Health issues new fish consumption advisories based on PFAS in fish at 13 state parks

FOR IMMEDIATE RELEASE:
3/06/2023

Department of Public Health

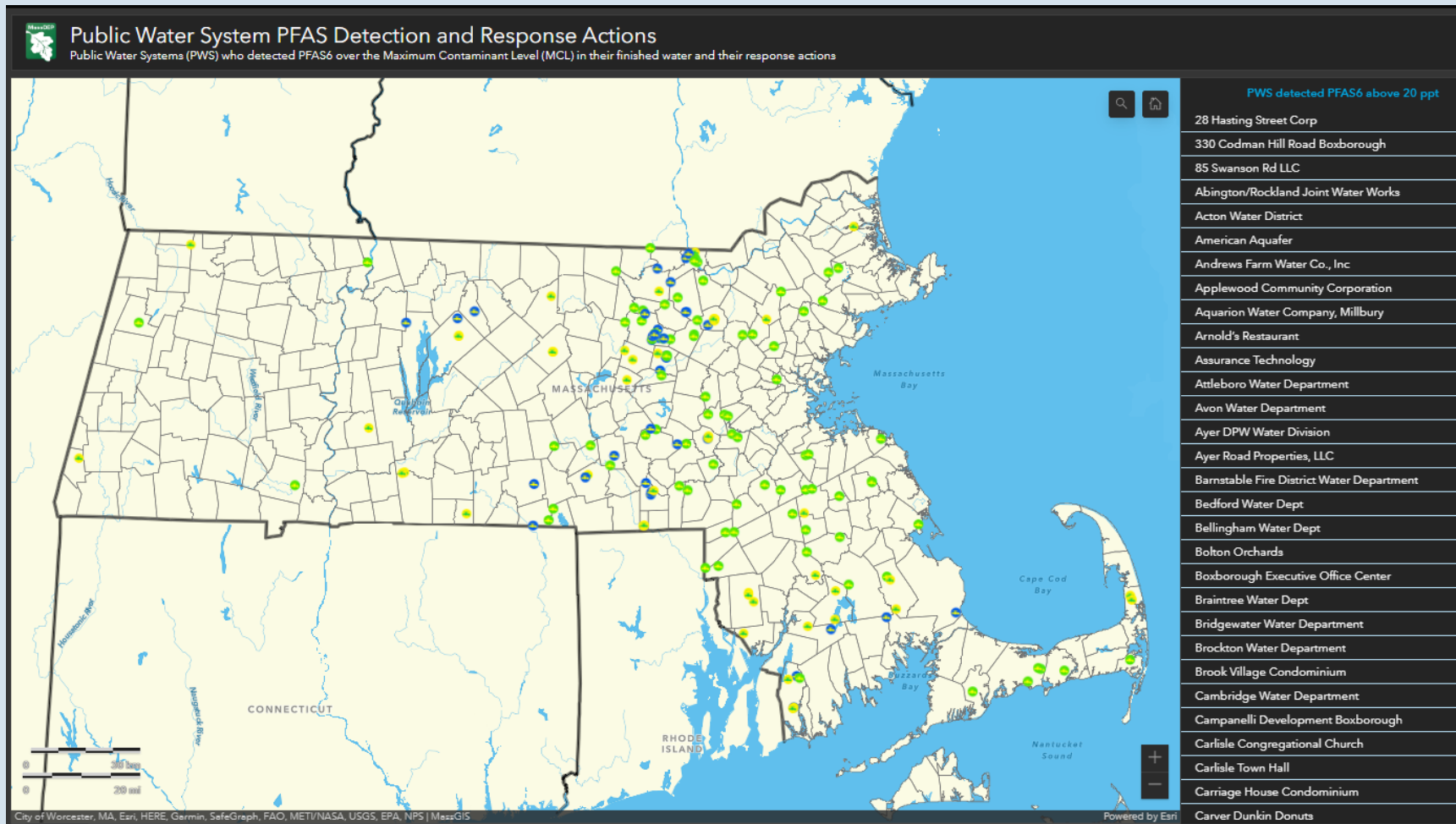
Massachusetts PFAS Drinking Water Standard

- Maximum Contaminant Level (MCL) for PFAS6 established in October 2020
- MCL = 20 parts-per-trillion (nanograms per liter)
- “PFAS6” MCL is the sum of six PFAS:
 - PFOS: perfluorooctane sulfonic acid
 - PFOA: perfluorooctanoic acid
 - PFHxS: perfluorohexane sulfonic acid
 - PFNA: perfluorononanoic acid
 - PFHpA: perfluoroheptanoic acid
 - PFDA: perfluorodecanoic acid
- Transient Non-Community PWS are not subject to the MCL but were required to test

Public Water Supply Testing Results

| Type of Public Water Supplier | # PWS (non-consecutive) | # PWS with one or more results over the MCL of 20 ppt | % of PWS |
|-------------------------------|-------------------------|---|----------|
| Community | 449 | 85 | 19% |
| Non-Transient Non-Community | 234 | 38 | 16% |
| Transient Non-Community | 734 | 47 | 6% |
| Total | 1417 | 170 | 12% |

PFAS discovered at 170 PWS Sources



[https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas#pfas-detected-in-drinking-water-supplies-in-massachusetts-](https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas#pfas-detected-in-drinking-water-supplies-in-massachusetts)
or google *MassDEP PFAS* for our webpage w/maps

PWS Testing Results on the Web

< Mass.gov | Executive Office of Energy & Environmental Affairs (EEA)

An official application of the Commonwealth of Massachusetts



Energy & Environmental Affairs
Data Portal

HOME

DASHBOARDS

SEARCH DATA ▼

HELP ▼

Search for Drinking Water

PWS ID ?

PWS Name ?

Town ?

Class ?

Contaminant Group ?

Chemical Name ?

Raw OR Finished ?

Collected Date ?

 to

< PREVIOUS

✕ CLEAR

Q SEARCH

PWS testing results are available in the EEA data portal. Search under the chemical name: "PFAS6" or to see all the PFAS chemicals, search under the contaminant group "PFAS".

<https://eeaonline.eea.state.ma.us/Portal/#!/search/drinking-water>

Actions Being Taken by PWS

- New treatment (most common is GAC but also Ion Exchange Resin being used)
- Shutting off wells
- Interconnections to other PWS
- Blending water from several sources
- New water mains
- New wells



Vessels containing GAC at a school

Financial Investment by PWS and the Commonwealth

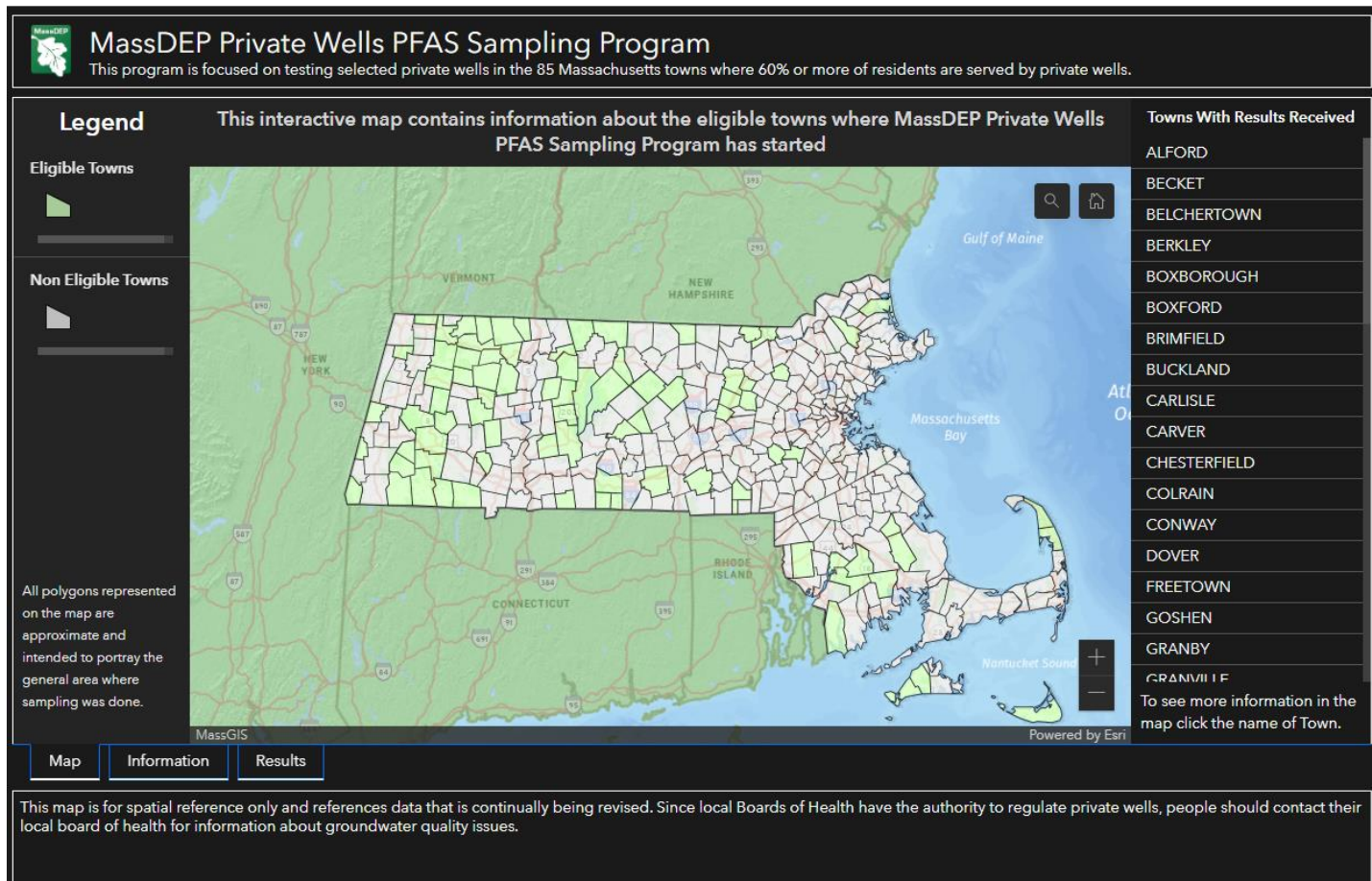


- 36 new water treatment facilities or additions to existing WTFs have been constructed and activated by our PWS to remove PFAS (temporary and permanent systems)
- \$10 million in grants awarded to PWS for the design and planning of treatment
- MassDEP and the Clean Water Trust have issued 24 loans or loan commitments totaling over \$200 million at 0% interest rate for construction projects to address PFAS contamination
- The 2023 Draft Intended Use Plan (IUP) for the Drinking Water State Revolving Loan Fund includes 25 projects to address PFAS contamination.

Private Well Testing Results from the MassDEP-UMass Program

- Meetings/outreach were held with town and state officials in the 85 selected communities with > 60% residents served by private wells.
- 1,668 homeowners sampled.
- 95% were below the MCL.
- 10 private wells had results above the 90 ppt imminent hazard.
- There are approximately 200,000 private wells in Massachusetts serving 600,000 residents.

Private Well Testing Results



MassDEP webpage on PFAS in private wells:

<https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas-in-private-well-drinking-water-supplies-faq>

Resources Available

- MassDEP Consumer Fact Sheet

<https://www.mass.gov/doc/massdep-fact-sheet-pfas-in-drinking-water-questions-and-answers-for-consumers>

- MassDEP webpage: PFAS in Private Wells

<https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas-in-private-well-drinking-water-supplies-faq>

- ATSDR/CDC Information for Clinicians and Health Professionals

<https://www.atsdr.cdc.gov/pfas/resources/info-for-health-professionals.html>

General PFAS Questions, email the MassDEP Drinking Water Program:
Program.Director-DWP@mass.gov

Federal Regulations of PFAS in Drinking Water

- **2009** EPA issued provisional guideline of **200 ppt** for PFOS and **400 ppt** PFOA.
- **2016**, based on new research and epidemiological studies, EPA lowered its drinking water Health Advisory to **70 ppt** for sum of PFOS and PFOA.
- **2022** EPA issued new interim Health Advisories for two PFAS: PFOS **0.02 ppt** and PFOA **0.004 ppt**
- **2023** EPA will be issuing draft regulations establishing an MCL

Health Advisories are non-enforceable and non-regulatory and provide technical information to states agencies and other public health officials.

This Just In...

- **March 14, 2023** The USEPA announced proposed Maximum Contaminant Levels for 6 PFAS
 - PFOS = 4 ppt
 - PFOA = 4 ppt
 - PFNA, PFHxS, PFBS and GenX = Hazard Index Calculation (used for mixtures of chemicals)
- **March 29th** there will be a webinar on the proposal and **May 4th** there will be a public hearing
- USEPA anticipates finalizing the regulation by the end of 2023
- More Info: <https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas#>

Identified sources of PFAS contamination of drinking water supplies

- Aqueous film-forming foam - AFFF (airports, fire-fighting training areas, structure and vehicle fires, etc.)
- Manufacturers (Industrial Coatings)
- Composting facility
- Scrap/waste metal distribution facility
- Biosolids application
- Landfills
- Not yet identified

Documents regarding Investigation of PFAS Contaminated Sites

<https://eeaonline.eea.state.ma.us/portal#!/home>

Environmental Data Search

Search for environmental data on permits, facilities, inspections, enforcements, and specific environmental datasets.
You can customize your search results using filters.



Permits



Facilities



Inspections



Enforcements



Waste Site Cleanup File Viewer



Asbestos



Wetlands Notice of Intent Projects



Lead & Copper in Schools/Childcare

[SEE ALL DATA SEARCH CATEGORIES >](#)



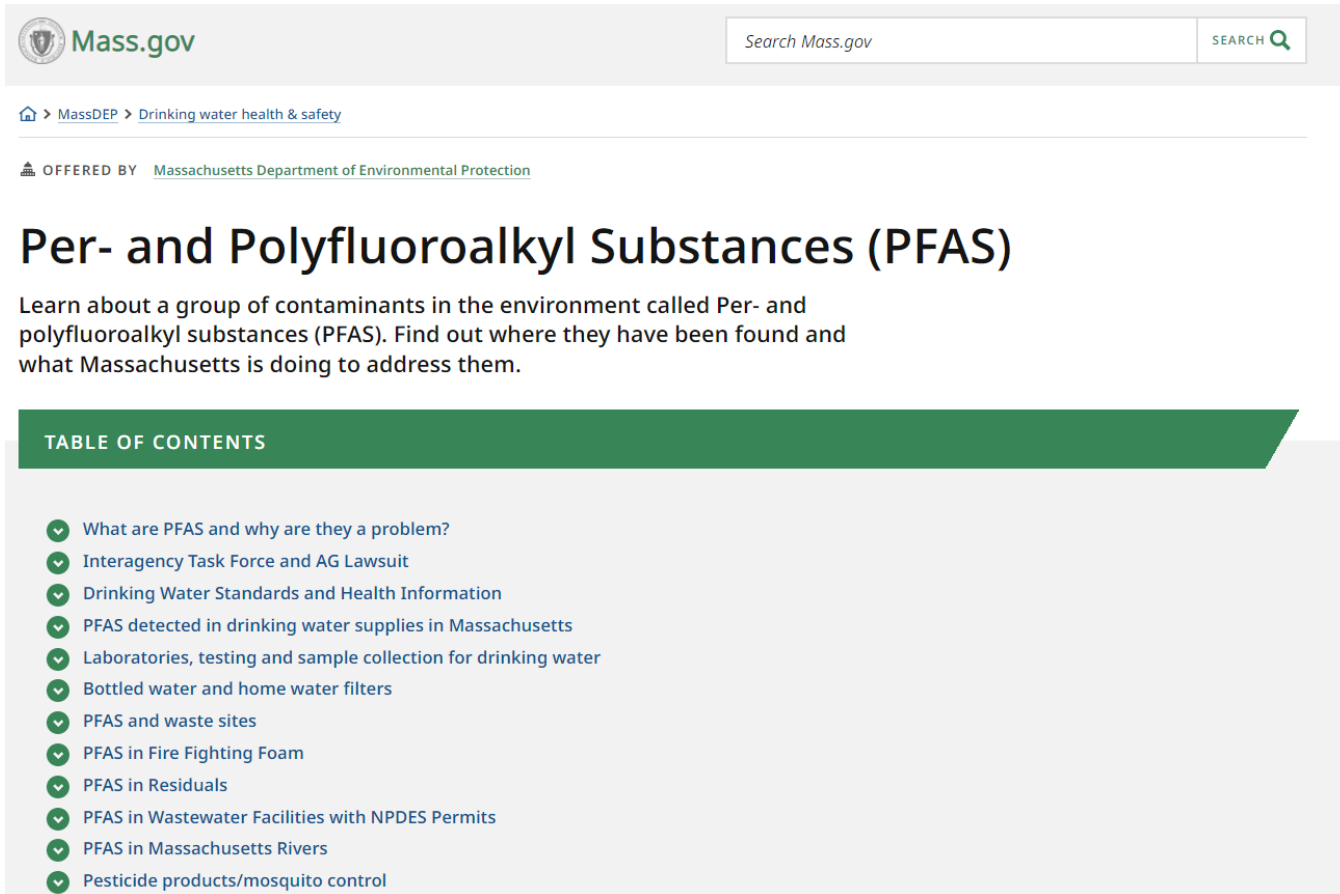
MassDEP



More Information on our PFAS webpage

<https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas>

or just google *MassDEP PFAS*



The screenshot shows the Mass.gov website interface. At the top is the Mass.gov logo and a search bar. Below the header is a breadcrumb trail: Home > MassDEP > Drinking water health & safety. Underneath, it says 'OFFERED BY Massachusetts Department of Environmental Protection'. The main heading is 'Per- and Polyfluoroalkyl Substances (PFAS)'. A paragraph follows: 'Learn about a group of contaminants in the environment called Per- and polyfluoroalkyl substances (PFAS). Find out where they have been found and what Massachusetts is doing to address them.' Below this is a green 'TABLE OF CONTENTS' bar. A list of topics with green checkmark icons follows: What are PFAS and why are they a problem?, Interagency Task Force and AG Lawsuit, Drinking Water Standards and Health Information, PFAS detected in drinking water supplies in Massachusetts, Laboratories, testing and sample collection for drinking water, Bottled water and home water filters, PFAS and waste sites, PFAS in Fire Fighting Foam, PFAS in Residuals, PFAS in Wastewater Facilities with NPDES Permits, PFAS in Massachusetts Rivers, and Pesticide products/mosquito control.

Mass.gov

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SEARCH

Home > MassDEP > Drinking water health & safety

OFFERED BY Massachusetts Department of Environmental Protection

Per- and Polyfluoroalkyl Substances (PFAS)

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TABLE OF CONTENTS

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