

Occurrence of PFAS in Massachusetts and Regulatory Considerations

Presentation to Massachusetts Health Officers Association
Holyoke, MA
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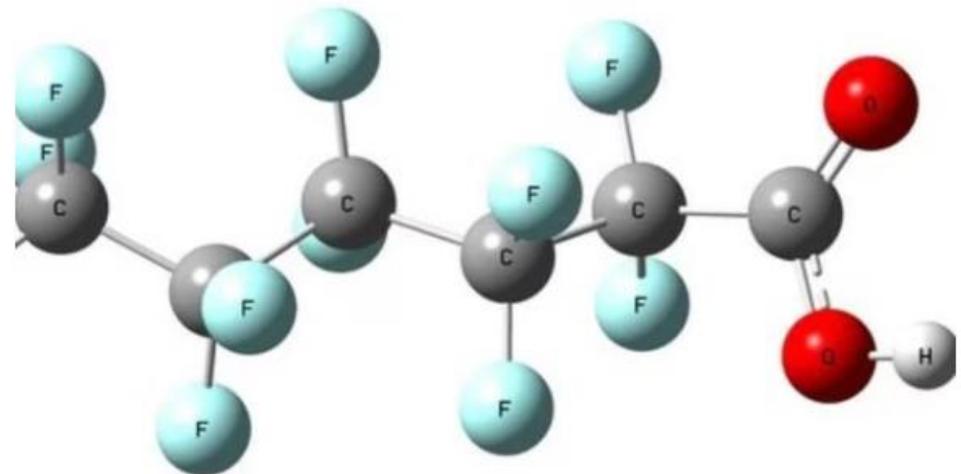
What are PFAS and Why are PFAS of Concern?

What are PFAS?

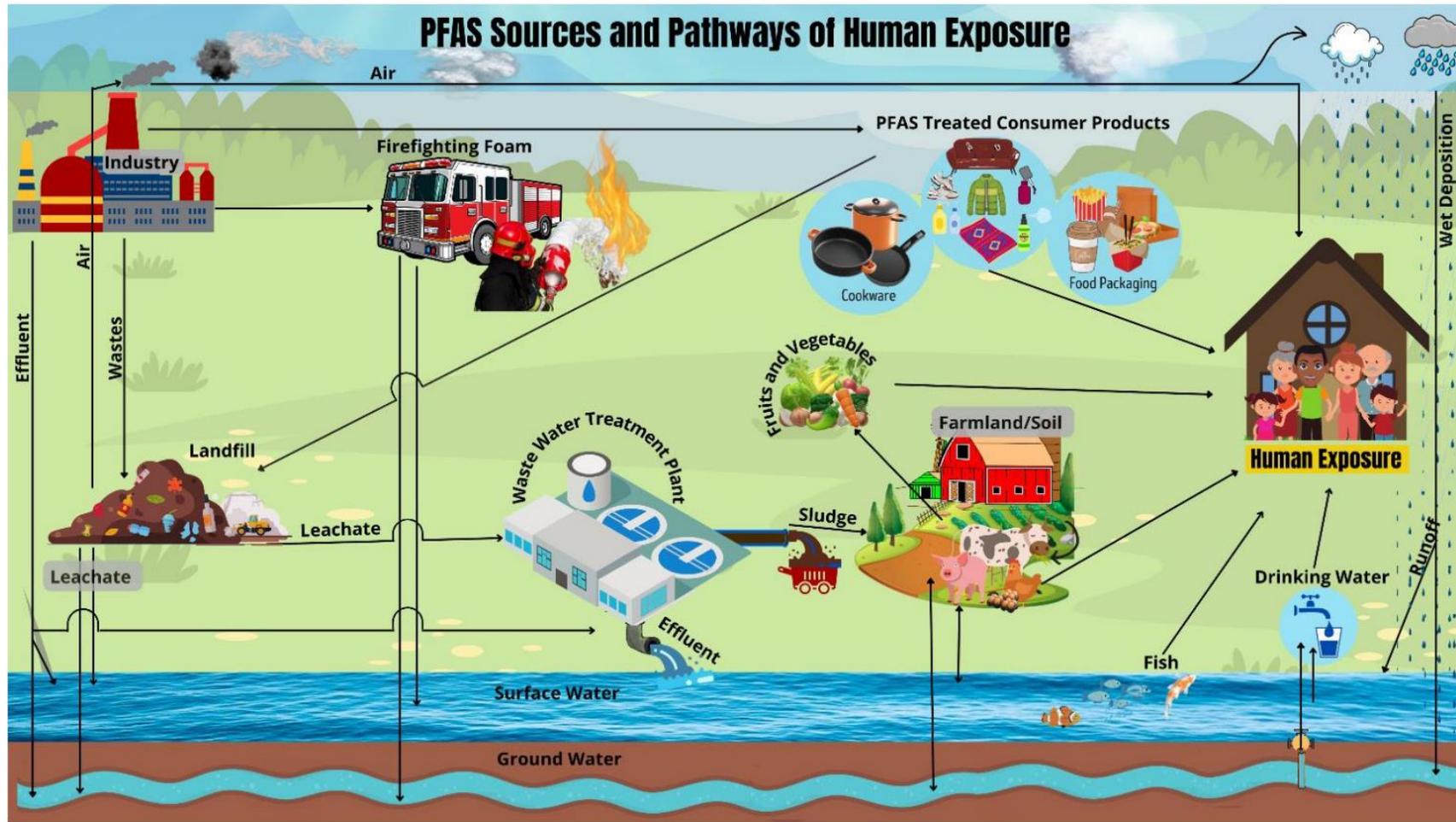
- Per- and polyfluoroalkyl substances (PFAS)
 - PFAS molecules consist of a chain linked carbon and fluorine atoms.
 - Nearly 15,000 synthetic chemicals ([CompTox Chemicals Dashboard](#) maintained by U.S. Environmental Protection Agency)
 - Used in industrial applications, consumer products, and fire fighting foams around the world since about the 1950s

Why are PFAS of Concern?

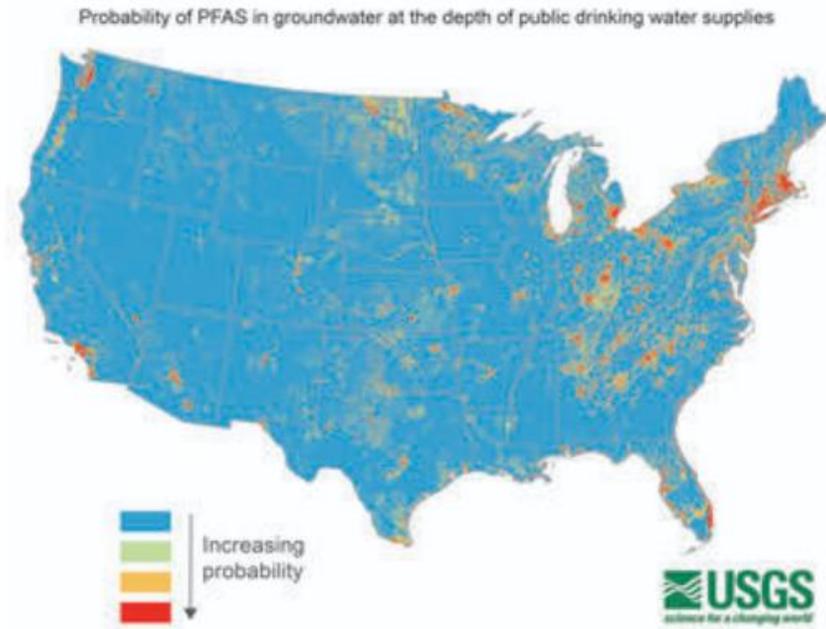
- Widespread
- Persistent
- Bioaccumulate
- Multiple health effects



PFAS Sources and Exposure Pathways



PFAS, Its Everywhere?



Sources/Usage: Public Domain. [View Media Details](#)

USGS national estimates of the probability for PFAS in groundwater at the depth of public drinking water supply.

At least 45% of the nation's tap water is estimated to have one or more types of PFAS. (USGS, <https://www.usgs.gov/news/national-news-release/tap-water-study-detects-pfas-forever-chemicals-across-us>)



PFAS in Public Water Supplies

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

PFAS detected in drinking water supplies in Massachusetts

[TOP](#) [Table of Contents](#)

Public Water System PFAS Detection and Response Actions

Public Water Systems (PWS) who detected PFAS6 over the Maximum Contaminant Level (MCL) in their finished water and the...

LEGEND

Public Water Systems type

- Community water system
- Non-transient Non-community Water System
- Transient Non-community Water System

PWS detected PFAS6 above 20 ppt

- Chelmsford Water District
- Easton Water Div
- Egremont Town Hall
- Fern's Country Store Carlisle
- First Congregational Church of Princeton
- First Parish Church of

Feedback

1 Introduction

2 Testing

3 PFAS detections and responses by public water systems

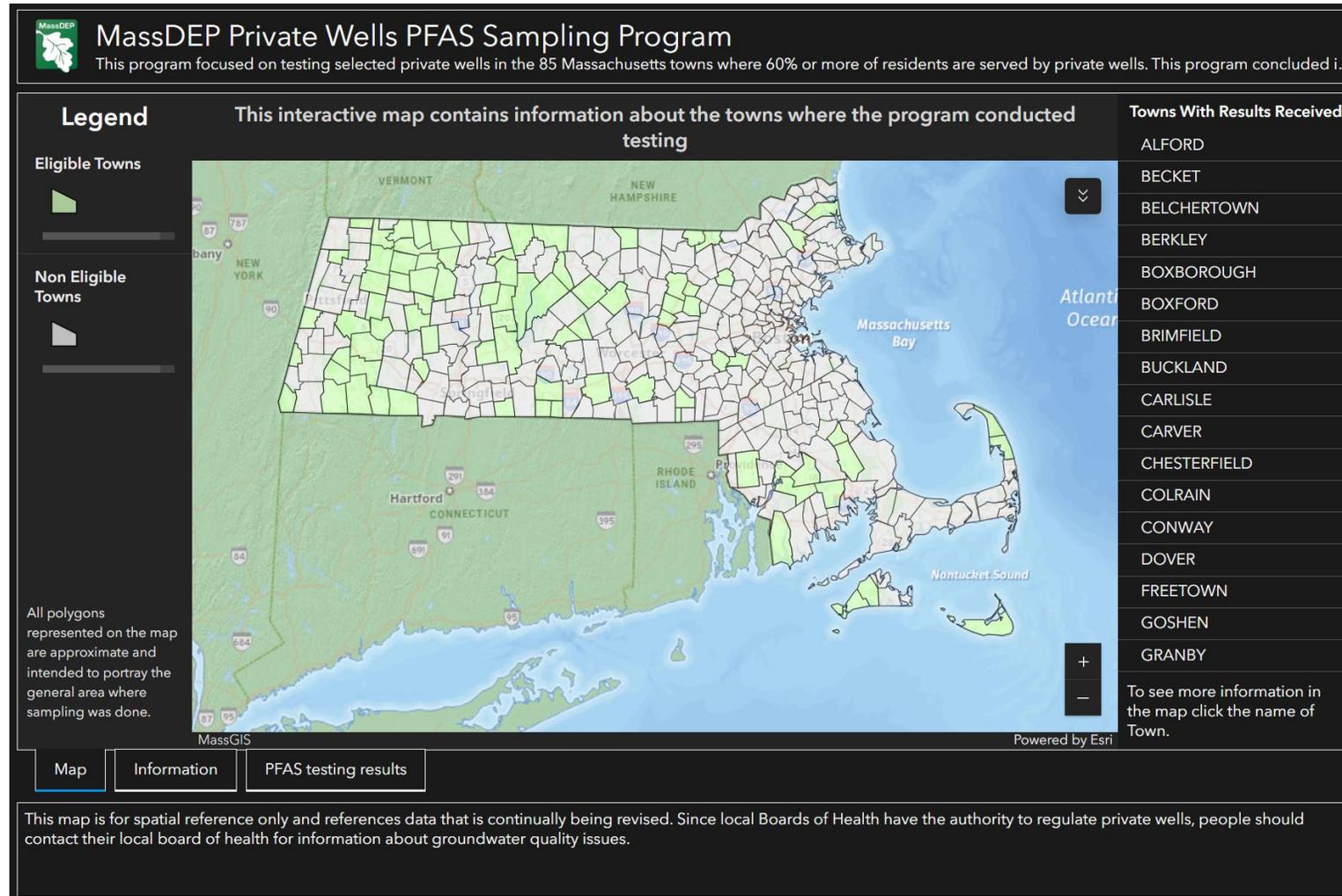
MassDEP recently adopted a drinking water standard limiting the sum of six specific PFAS to no more than 20 parts per trillion. Together, these six PFAS are referred to as "PFAS6." The following interactive map displays locations where public water systems have detected the sum of these six state-regulated PFAS at levels over 20 parts per trillion in "finished" water, or in water that is made available for public use.

Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, NPS, USFWS | MassGIS Powered by Esri



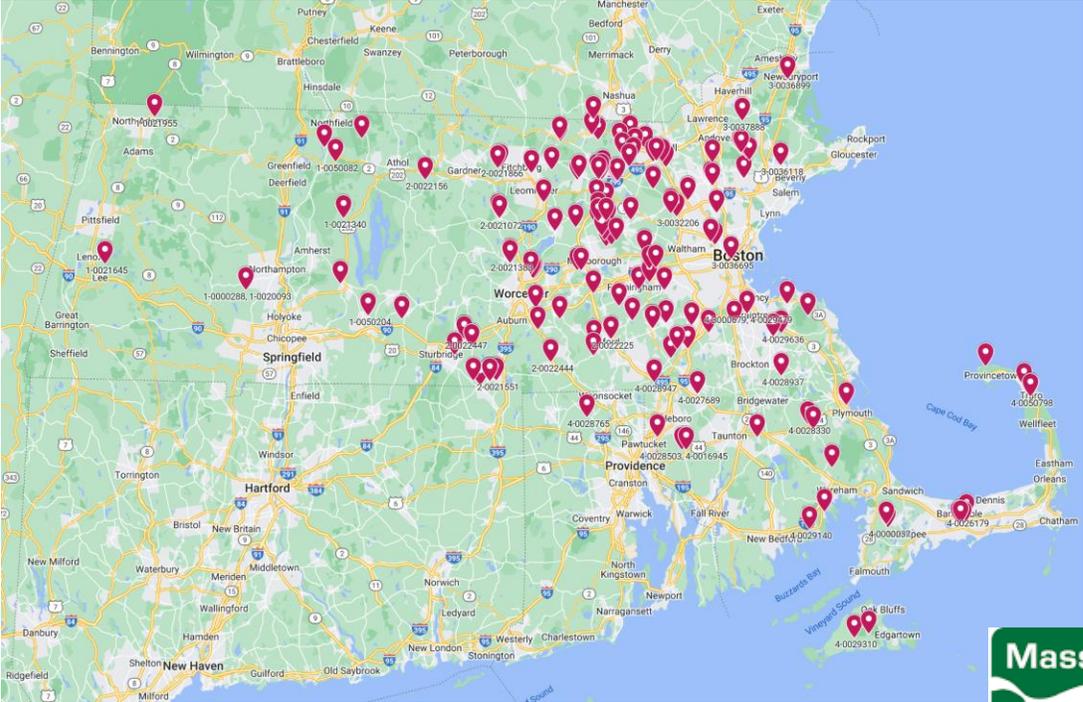
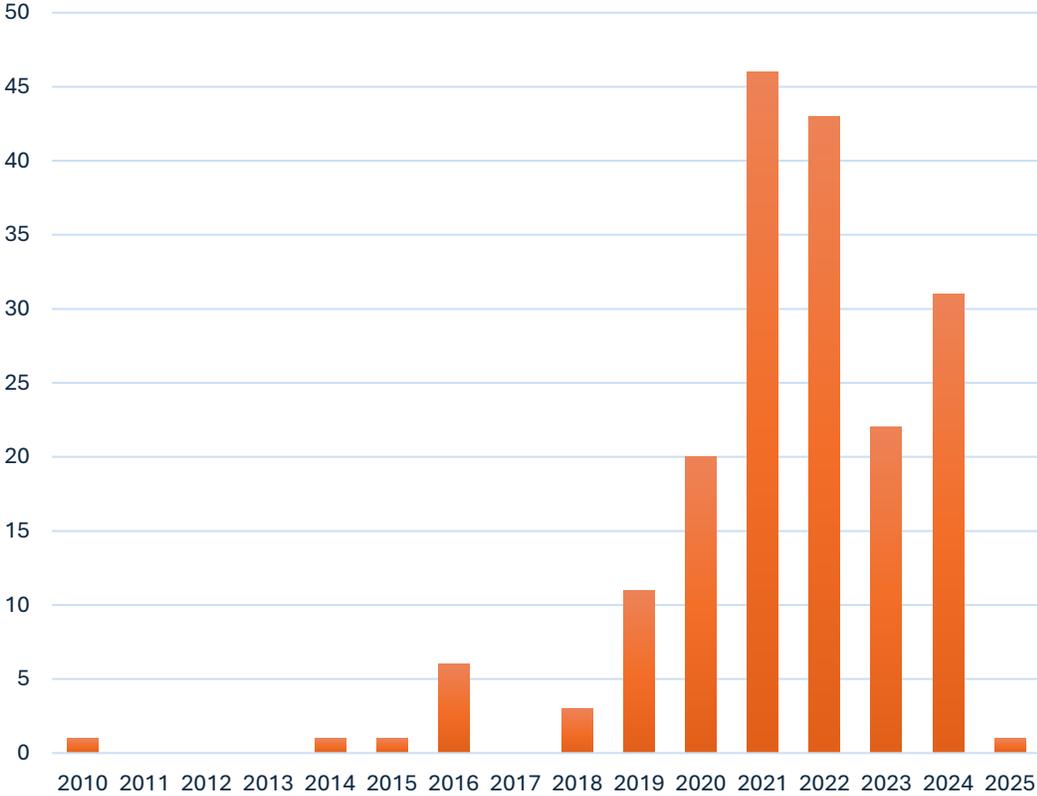
PFAS In Private Water Supplies

<https://www.mass.gov/info-details/pfas-in-private-well-drinking-water-supplies-faq#pfas-testing-in-private-wells->

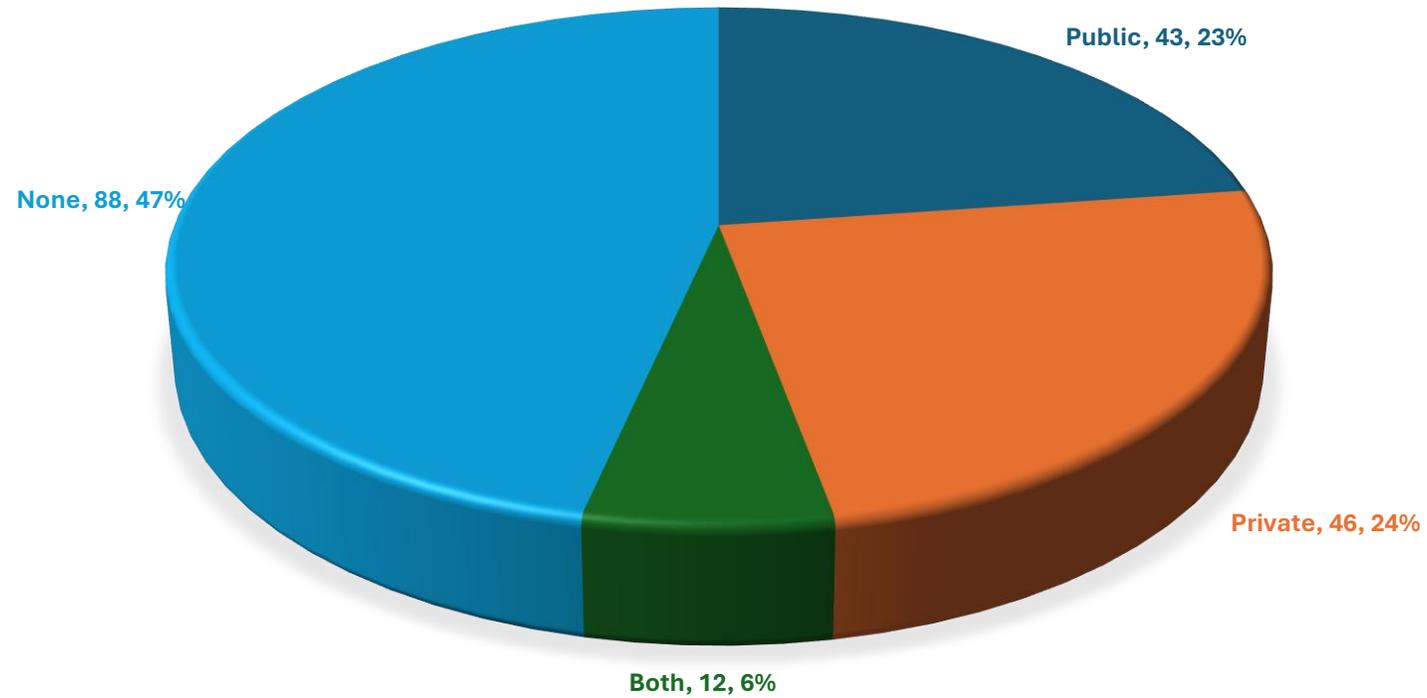


PFAS Disposal Sites

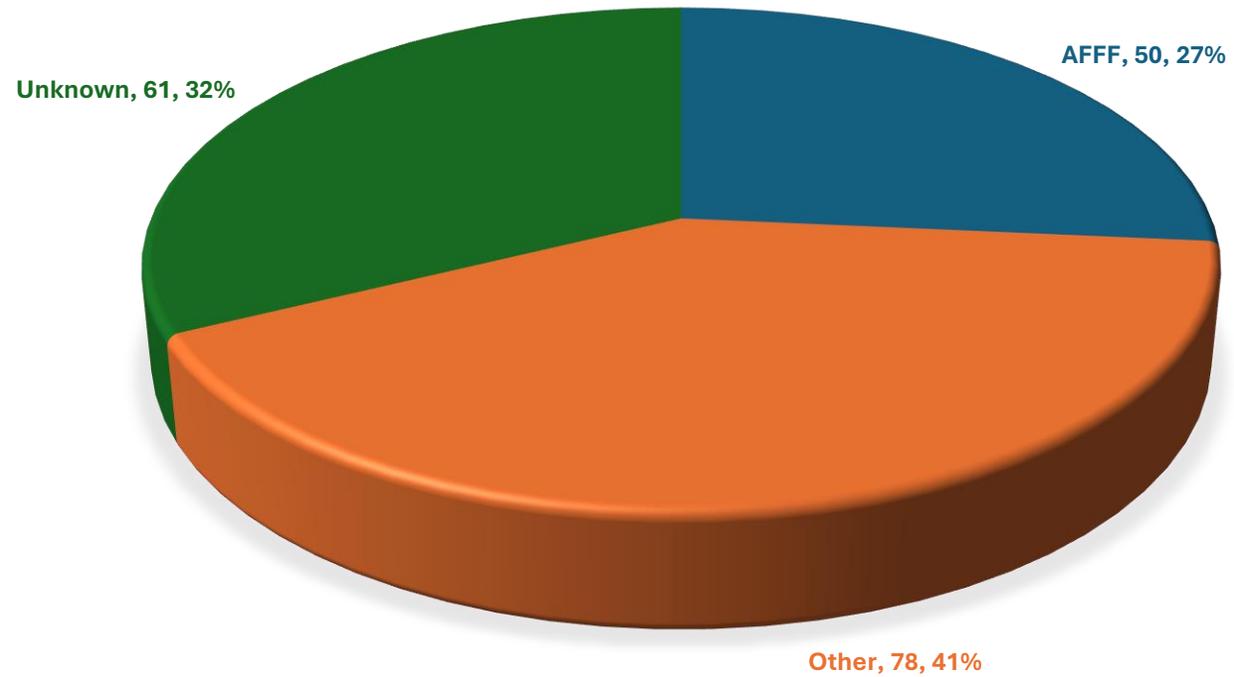
PFAS NOTIFICATIONS BY YEAR



PFAS Impacts to Drinking Water Sources



PFAS Sources of Contamination





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

🔍 SEARCH



Search for Drinking Water Results

Search Criteria Town: [HOLYOKE](#) Contaminant Group: [PFAS](#) Chemical Name: [PFAS6](#)

1/1 25 ▾

1 - 11 of 11 items

ACTION	PWS ID	PWS NAME	TOWN	CLAS...	CONTAMINANT GR...	CHEMICAL NAME ...	COLLECTE...	LOCA...	LOCATION NAME
DETAILS	1137000	HOLYOKE WATER ...	HOLYOKE	COM	PFAS	PFAS6	11/16/2023	10040	WESTFIELD RD ▲
DETAILS	1137000	HOLYOKE WATER ...	HOLYOKE	COM	PFAS	PFAS6	04/08/2021	10042	WESTFIELD RD
DETAILS	1137003	DCR MT TOM STAT...	HOLYOKE	NC	PFAS	PFAS6	04/20/2022	10001	POINT OF ENTI
DETAILS	1137000	HOLYOKE WATER ...	HOLYOKE	COM	PFAS	PFAS6	04/09/2021	10040	WESTFIELD RD
DETAILS	1137000	HOLYOKE WATER ...	HOLYOKE	COM	PFAS	PFAS6	04/25/2023	10042	WESTFIELD RD
DETAILS	1137000	HOLYOKE WATER ...	HOLYOKE	COM	PFAS	PFAS6	01/25/2022	10042	WESTFIELD RD
DETAILS	1137000	HOLYOKE WATER ...	HOLYOKE	COM	PFAS	PFAS6	01/27/2022	10040	WESTFIELD RD
DETAILS	1137000	HOLYOKE WATER ...	HOLYOKE	COM	PFAS	PFAS6	10/13/2021	10040	WESTFIELD RD
DETAILS	1137000	HOLYOKE WATER ...	HOLYOKE	COM	PFAS	PFAS6	04/24/2023	10040	WESTFIELD RD
DETAILS	1137000	HOLYOKE WATER ...	HOLYOKE	COM	PFAS	PFAS6	10/05/2023	10042	WESTFIELD RD
DETAILS	1137000	HOLYOKE WATER ...	HOLYOKE	COM	PFAS	PFAS6	10/13/2021	10042	WESTFIELD RD

1/1 25 ▾

1 - 11 of 11 items

◀ PREVIOUS

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Drinking Water Information

Related links

There are no related links for displayed element.

PWS ID [?](#)

1137000

Town [?](#)

HOLYOKE

Contaminant Group [?](#)

PFAS

Collected Date [?](#)

11/16/2023

Location Name

WESTFIELD RD WTP POST TREATMENT

Method [?](#)

EPA 537.1

Maximum Contaminant Level(MCL) [?](#)

20 NG/L

Reporting Limit [?](#)

1.9600 NG/L

Required Detection Limit [?](#)

2.0000

PWS Name [?](#)

HOLYOKE WATER WORKS

Class [?](#)

COM

Chemical Name [?](#)

PFAS6

Location ID

10040

Raw OR Finished [?](#)

F

Result

ND

Result Qualifier and Description [?](#)

Lab Reported Detection Limit [?](#)

0.9790 NG/L

MassDEP Searchable sites



Search for Waste Site & Reportable Releases

Site Type

Select Site Type

City/Town

Select City/Town

Release Tracking Number

Select Release Tracking Number

Zip Code

Select Zip Code

Chemical

Select Chemical Name

Address

Select Address

Site Name

Select Site Name

Licensed Site Professional

Select Licensed Site Professional

Regulatory Status

Select Regulatory Status

PREVIOUS

CLEAR

SEARCH

Please contact BWSC.eDEP@mass.gov with questions
Data is updated once a day

MassDEP Searchable Sites



Search for Waste Site & Reportable Releases

Site Type 

Select Site Type 

Release Tracking Number 

Select Release Tracking Number

Chemical 

PER AND POLYFLUOROALKYL SUBSTANCES (PFAS)

Site Name 

Select Site Name

Regulatory Status 

Select Regulatory Status 

 PREVIOUS

 CLEAR

City/Town 

Select City/Town 

Zip Code 

Select Zip Code 

Address 

Select Address

Licensed Site Professional 

Select Licensed Site Professional 

 SEARCH

Please contact BWSC.eDEP@mass.gov with questions.

Data is updated once a day

MassDEP Searchable Sites

Mass.gov | Executive Office of Energy and Environmental Affairs (EEA) [↗](#) An official application of the Commonwealth of Massachusetts

 **Energy & Environmental Affairs Data Portal**

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Waste Site & Reportable Releases Results

[VIEW MAP](#) Displaying 67 Mapped Points out of 72 listed RTN's

Search Criteria: Chemical: PFAS

S...	RTN	CITY/TOWN	RELEASE A...	Zi...	SITE NAME LOC...	REP...	NOTIFICA...	REGULAT...	REG...	PHA...	RAO...	C
<input type="checkbox"/>	4-0029980	YARMOUTH	MULTIPLE L...		MILL CREEK	72 HR	08/28/20...	UNCLASSI...	01/0...			o
<input type="checkbox"/>	4-0029832	CARVER	MULTIPLE L...		CARVER-PLYMPT...	TWO ...	05/31/2023	UNCLASSI...	01/0...			o
<input type="checkbox"/>	4-0029826	CANTON	NEPONSET ...		NEPONSET WELL...	72 HR	05/24/20...	UNCLASSI...	09/...			o
<input type="checkbox"/>	4-0029743	REHOBOTH	27 FRANCIS ...	02...	FRANCIS FARMS ...	72 HR	03/09/20...	UNCLASSI...	01/0...			o
<input type="checkbox"/>	4-0029673	WEST TISBURY	MULTIPLE L...		LANDFILL & EDG...	TWO ...	10/03/20...	UNCLASSI...	01/0...			o
<input type="checkbox"/>	4-0029612	NANTUCKET	MULTIPLE L...		NANTUCKET	TWO ...	11/30/2022	UNCLASSI...	01/0...			o
<input type="checkbox"/>	4-0029606	WESTPORT	569 SANFO...	02...	SANFORD ROAD ...	TWO ...	11/21/2022	UNCLASSI...	08/2...			o
<input type="checkbox"/>	4-0029606	WESTPORT	569 SANFO...	02...	SANFORD ROAD ...	TWO ...	11/21/2022	UNCLASSI...	08/2...			o
<input type="checkbox"/>	4-0029576	ATTLEBORO	MULTIPLE L...		LAKE MIRIMICHI	72 HR	11/21/2022	UNCLASSI...	01/0...			o
<input type="checkbox"/>	4-0029401	CHILMARK	64 STATE RD		RESIDENTIAL DRI...	TWO ...	06/23/20...	UNCLASSI...	01/0...			o
<input type="checkbox"/>	4-0029236	STOUGHTON	MULTIPLE L...		MUDDY POND WE...	72 HR	03/04/2...	UNCLASSI...	01/2...			o
<input type="checkbox"/>	3-0051402	BEDFORD	3 ROBINS S...	017...	HANSCOM AFB - ...	120 DY	02/10/20...	UNCLASSI...	02/1...			o
<input type="checkbox"/>	3-0051400	WOBURN	1071 MAIN S...	01...	UNKNOWN	120 DY	02/05/20...	UNCLASSI...	02/...			o
<input type="checkbox"/>	3-0051398	WESTFORD	NEAR PROV...	01...	PROVIDENCE RD...	TWO ...	02/11/2025	UNCLASSI...	02/1...			o

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Please contact BWSC.eDEP@mass.gov with questions. Data is updated once a day

MassDEP PFAS Strategic Plan

<https://www.mass.gov/doc/ffy2024-27-massdep-final-program-planppa-work-plan/download>

Bureau of Water Resources

- Drinking Water
- Wastewater and Residuals

Bureau of Air & Waste

- Landfills

Office of Research and Standards

- **Standards development**
- **Research treatment and destruction technologies**

Bureau of Waste Site Cleanup

- 21E Sites - PFAS Cleanup
- Source Discovery
- Imminent Hazards in Private Wells
- AFFF Takeback Program



MassDEP's Role

PFAS Releases to the Environment

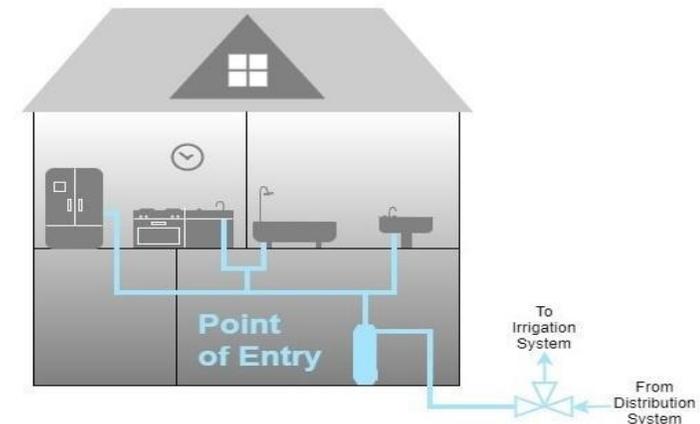
- **Privatized Clean Up Program - Oversight, Compliance Assistance, and Enforcement of c. 21E and the MCP**
 - Releases of PFAS to the environment
 - MassDEP does not regulate private wells; MassDEP does regulate contamination present in private wells
- **Issue Guidance & Conduct Training to LSPs**

Under what circumstances does MassDEP lead response actions at PFAS sites?

- Exposure Mitigation
 - Statutory requirement under MGL c.21E, Sec. 3A(e):

If **significant evidence exists at any time of an imminent hazard** to public health, safety, welfare, or the environment from oil or hazardous materials at or from the disposal site, the **department shall immediately ensure**, using its response powers under section four and its enforcement powers under other sections, that, **at a minimum, action is taken to control the potential for health damage, human exposure, safety hazards and environmental harm through appropriate short term measures** such as, but not limited to, limiting access to the site, evacuating the area or relocating residents, blocking environmental movement of oil or hazardous materials, providing alternative water supplies, or taking other similar temporary action that will remain effective until other remedial measures of the extent described in subsections (f) or (g) of this section can be implemented.

- Emergency Response
 - Response to releases of AFFF
- Source Discovery
 - Identifying potentially responsible parties
 - Requests for Information, Sampling



Point of Entry (POE) Treatment



BWSC Regulatory Authority

- Releases to the Environment
 - Authority established under MGL c. 21E and regulations at 310 CMR 40.0000 (Massachusetts Contingency Plan)
 - **Six PFAS (PFAS6) are specifically included on the Massachusetts Oil and Hazardous Material List (310 CMR 40.1600) with associated Reportable Quantities and Reportable Concentrations. PFAS6 include:**
 - PFOA
 - PFOS
 - PFHxS
 - PFHpA
 - PFDA
 - PFNA

MASSACHUSETTS OIL AND HAZARDOUS MATERIAL LIST
TABLE 1 ALPHABETICAL ORDER

CHEMICAL NAME	CAS NUM.	DEP RQ (Pounds)	NAME SOURCES	Reportable Concentrations			
				GW1 (mg/l)	GW2 (mg/l)	S1 (mg/kg)	S2 (mg/kg)
2-PENTENE, 3,4,4-TRIMETHYL-	00598-96-9	50	7,6	5	50	500	5000
2,4-PENTENEDIONE	00123-54-6	100	7,6	10	100	1000	10000
PENTYL ACETATE	00628-63-7	100	6,1,3	10	100	1000	10000
PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) (sum of constituents listed below)	-	-	-	2E-05	-	-	-
PERFLUORODECANOIC ACID (PFDA)	335-76-2	1		see PFAS	40	3E-04	0.4
PERFLUOROHEPTANOIC ACID (PFHpA)	375-85-9	1		see PFAS	40	5E-04	0.4
PERFLUOROHEXANESULFONIC ACID (PFHxS)	355-46-4	1		see PFAS	0.5	3E-04	0.4
PERFLUORONONANOIC ACID (PFNA)	375-95-1	1		see PFAS	40	3.2E-04	0.4
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	1		see PFAS	0.5	2E-03	0.4
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	1		see PFAS	40	7.2E-04	0.4
PERACETIC ACID	00079-21-0	1	4,6,8,1	0.1	1	10	100
PERCHLORATE COMPOUNDS, NOS		10	6,10,	002	1	0.1	6
PERCHLORIC ACID	07601-90-3	10	6,1,7	(See RCs of any listed constituents)			

3/1/24



Notification - PFAS Reportable Concentrations and Reportable Quantities (effective December 27, 2019)

	RQ (lb)	RCGW-1	RCGW-2 mg/l	RCS-1 mg/kg	RCS-2 mg/kg
PERFLUORODECANOIC ACID (PFDA)	1	*	40	3E-04 (300 ng/kg)	0.4
PERFLUOROHEPTANOIC ACID (PFHpA)	1	*	40	5E-04 (500 ng/kg)	0.4
PERFLUOROHEXANESULFONIC ACID (PFHxS)	1	*	0.5	3E-04 (300 ng/kg)	0.4
PERFLUORONONANOIC ACID (PFNA)	1	*	40	3.2E-04 (320 ng/kg)	0.4
PERFLUOROOCTANESULFONIC ACID (PFOS)	1	*	0.5	2E-03 (2,000 ng/kg)	0.4
PERFLUOROOCTANOIC ACID (PFOA)	1	*	40	7.2E-04 (720 ng/kg)	0.4

20 ng/l
* Sum of PFAS6



Notification Criteria relevant to PFAS

2-Hour Notification (40.0311)

- **PFAS6 \geq 20 ng/l in a private water supply well**
 - PFAS6 Imminent Hazard \geq **90 ng/l**
- PFAS sudden release \geq 1 pound in 24-hour period (Reportable Quantity)

72-Hour Notification (40.0313)

- PFAS6 \geq 20 ng/L within protective radius of public water supply well, or **500 feet** of private water supply well
- Release to groundwater that has or is likely within one year to be detected in a public or private water supply well
 - applies if associated with an otherwise notified/notifiable release



MassDEP and Private Wells

Sampling a private well may trigger a legal notification obligation [on the part of the homeowner](#) if the result is equal to or greater than the RCGW-1 Reportable Concentration (currently 20 ng/L for PFAS6)

MassDEP can help!

- Discuss potential implications *before* sampling occurs
- Clarify potential liability/obligations once PFAS is discovered
- Determine status under site cleanup regulations (Massachusetts Contingency Plan, 310 CMR 40.0000)
- Advise on potential health risks, both short- and long-term
- Advise on potential treatment options
- Ensure that Imminent Hazards are eliminated/mitigated

MassDEP can't...

- Pay for treatment at all PFAS-contaminated private wells



After Notification

- Source property – MassDEP does not expect PFAS detected in private well to be the source property; MassDEP will assign a Release Tracking Number (RTN) and will give site name as general location (e.g., Near Intersection of Main Street and State Street)
- Issue Notice of Responsibility to source property, if known, and require Immediate Response Action
- If source property unknown, MassDEP may conduct source discovery aimed at identifying responsible party
- If PFAS at concentrations in private well that represent an Imminent Hazard, MassDEP will provide bottled water until treatment or connection to public water is made



Source Discovery/MCP Oversight

- 189 Sites
- Approximately 1/3 with no known source!

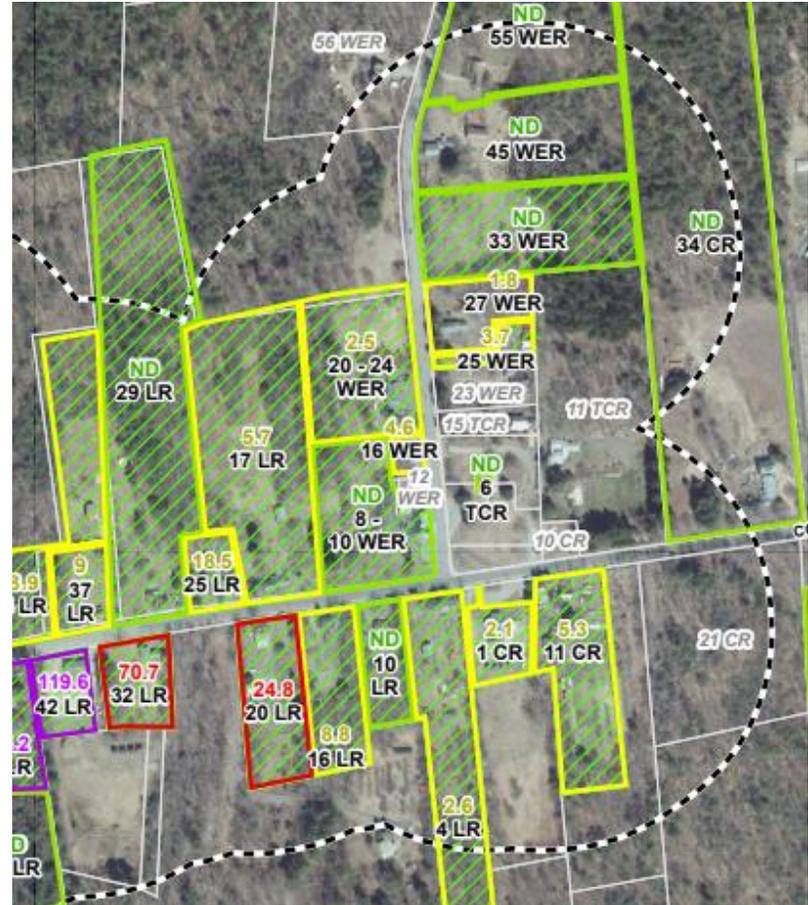
Work Completed in Regional Offices

- Desktop surveys of nearby potential sources
- Collecting samples
- Issuing requests for information on PFAS uses and eventually Notices of Responsibility
- Reviewing and approving plans prepared by LSPs on behalf of responsible parties



Immediate Response Actions

- **Required for 2-Hour & 72-Hour Notifications**
- **Immediately Mitigate Exposure, And**
 - Provide bottled water until Point of Entry Treatment (POET) System installed and working or connection to public water supply, if available
 - Point of Use (POU) Treatment?
- **Then, Conduct Assessment of Surrounding Area**
 - Water supplies within 500-foot radius
 - CEP – any measurable concentration



Imminent Hazard Mitigation – Private Wells

- **Point of Entry Treatment (POET) Systems – MassDEP approach**
 - **Whole house treatment**
 - **Requires filter media to be replaced periodically**
 - **Data have shown systems to be highly effective (treat to less than laboratory detection limits)**
 - **Must be installed by professional**
 - **Thousand of dollars**
- **Point of Use**
 - Simple to use; homeowner can install
 - Only treats at water source (i.e., each water source needs a POU)
 - Unclear if can treat to Massachusetts MCL or EPA MCL (NSF certification > MCLs)
 - Hundreds of dollars
 - Requires filter media to be replaced periodically



Point of Use Treatment Systems

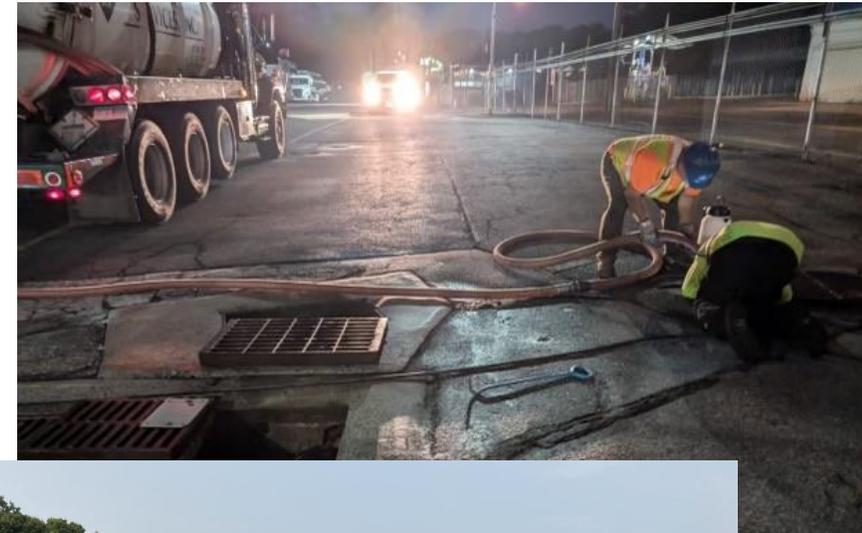
- MassDEP Installed POET Systems
 - Address Imminent Hazards ≥ 90 ng/L PFAS6
 - 60 systems
 - Bottled water at additional 32 sites
 - MassDEP operates for two years
- POET System Typical Design
 - Baseline testing – radon issue
 - 2 vessel GAC – bituminous coal
 - 2 sediment filters, flow meter, and UV disinfection



BWSC PFAS OPERATIONAL APPROACH

Emergency Response

- MassDEP and Massachusetts Department of Fire Services issued joint AFFF advisory August 2021 (<https://www.mass.gov/doc/pfas-foam-advisory/download>)
 - Discontinue use of legacy PFOA and legacy fluorotelomer foams (pre-2003)
 - Use modern fluorinated foams when absolutely tactically necessary
 - Discontinue use of modern fluorinated foam for training
 - Notification to MassDEP ER
 - Replace current PFAS foams with Fluorine Free Foam
 - AFFF Takeback Program



PFAS AFFF Foam Take-Back Program Continues

- Legacy Foam Collection & Destruction Since 2018
 - Partnership w/ Mass Dept. of Fire Services
 - Capital fund-supported / \$250K allocation by legislature (FY23)
- Modern Foams Collection Added (Low Levels of PFAS Compounds)
- 157 Participants / 47,171 gallons Collected / \$784,308 Total Cost
- Recent Program Re-Launch Efforts
- Ongoing Communication with Other NE States
- <https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas#pfas-in-fire-fighting-foam->



PFAS Omnibus Bill, *An Act to protect Massachusetts public health from PFAS* <https://malegislature.gov/Bills/193/H2197>

- **Bill Anticipated to be Filed Again by Rep. Hogan & Sen. Cyr for Consideration in January 2025**
- Establishes PFAS Remediation Trust Fund
- Reduces PFAS in Wastewater
- Regulates PFAS in Food Packaging & Consumer Products
- **Protects Firefighters from Exposure to PFAS in Turn Out Gear – signed in to law August 15, 2024**

PFAS in the Commonwealth of Massachusetts

FINAL REPORT OF THE PFAS INTERAGENCY TASK FORCE

APRIL 2022



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Thank You!
Questions?

