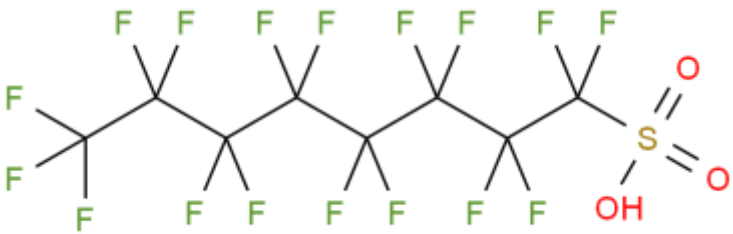
Current Issues in Drinking Water

- PFAS
- Lead in Schools

MassDEP
Drinking Water Program
March 2019
A. Margaret Finn, P.E.



What are PFAS?
Per- and polyfluoroalkyl substances

- Group of Chemicals (approx. 3,000)
- Widely used since the 1950s
- Do not break down easily and stay in the environment for a long time
- PFOA and PFOS were the most widely produced perfluorocarbons and are studied worldwide
- In 2006, major manufacturers agreed to phase out the production of PFOA and PFOS

Sources of PFAS in the Environment

- Firefighting foams
- Consumer products including: carpeting, water-proof clothing, rain gear, Teflon pans, food wrappers

Health Effects and Standards

Health Effects

- Animals exposed to PFAS had changes in the function of the liver, thyroid, pancreas, immune system and experienced developmental effects.

Standards:

- In 2016, EPA issued a Health Advisory for drinking water of 70 parts per trillion (ppt) for the sum of PFOA and PFOS.

- In 2018, MassDEP established an Office of Research and Standards Guideline (ORSG) level for drinking water that extended the EPA advisory to include PFOS, PFOA, PFNA, PFHxS, and PFHpA. MassDEP recommends the following:
  1. Consumers in sensitive subgroups (pregnant women, nursing mothers and infants) not consume water when the level is above 70 ppt.
  2. Public water suppliers take steps expeditiously to lower levels of the five PFAS, to below 70 ppt for all consumers.

- Most states have opted to implement the 2016 EPA Health Advisory. However, many states, in particular in the northeast, have proposed or established their own guidance or regulatory values.

Other States

Standards, Guidelines and Notification levels (parts per trillion)

	PFOS	PFOA	PFNA	PFHxS	PFHpA	Other PFAS
USEPA Health Advisory	70 Sum of both					For PFBS: MN = 2,000 For Gen X: NC Health Advisory = 140
NY Standard	10 Proposed	10 Proposed				
NJ MCL	13 Proposed	14 Proposed	13			
CA Interim Notification Levels	13	14				
VT Groundwater Standard	20 Sum of all five					
MA ORSG (Guideline)	70 Sum of all five					
CT DW Action Levels	70 Sum of all five					
MN Guidelines	27	35		27		
NH Proposed MCLs	70	38	23	85		
	70 Sum of PFOS & PFOA					

Testing Drinking Water for PFAS

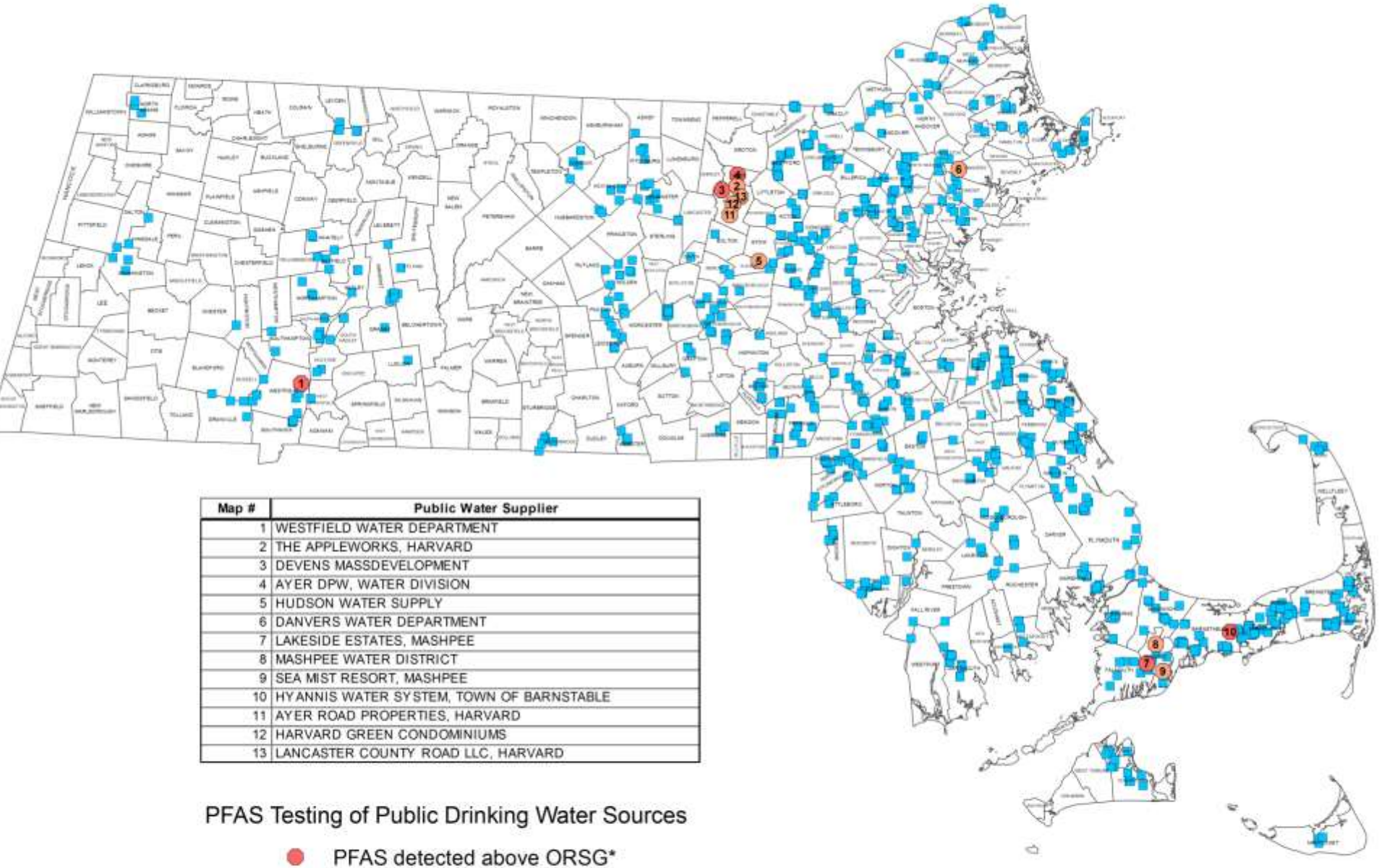
EPA Method 537.1 is capable of measuring the levels of 18 PFAS chemicals.

Because of the potential presence of PFAS in common consumer products and in equipment as well as the need for very low reporting limits, special handling and care must be taken when collecting samples. See the MassDEP webpage for a field sampling guide.

MassDEP has not yet begun certifying labs for PFAS analysis. We recommend that private well owners use a lab certified by another state or certification authority. See the National Environmental Laboratory Accreditation Management System to find a certified lab. Ask the lab to use the lowest reporting level available (5 ppt or lower).

PFAS in MA Public Water Supplies

- PWS where PFAS was over the MassDEP ORSG:
  - Hyannis, Westfield, Ayer, Mass Development (Devens), and Lakeside Estates (Mashpee)
  - (9 other PWS have detected PFAS below the ORSG)
- Various responses from PWS: installation of treatment; shutting off wells; modified well usage; connected to municipal water; and purchased water from adjacent communities.
- Firefighting foam (AFFF) appears to be primary source (with one likely manufacturing source and one source under investigation)
- All PWS PFAS results are posted on Mass.Gov



Map #	Public Water Supplier
1	WESTFIELD WATER DEPARTMENT
2	THE APPLEWORKS, HARVARD
3	DEVENS MASSDEVELOPMENT
4	AYER DPW, WATER DIVISION
5	HUDSON WATER SUPPLY
6	DANVERS WATER DEPARTMENT
7	LAKESIDE ESTATES, MASHPEE
8	MASHPEE WATER DISTRICT
9	SEA MIST RESORT, MASHPEE
10	HYANNIS WATER SYSTEM, TOWN OF BARNSTABLE
11	AYER ROAD PROPERTIES, HARVARD
12	HARVARD GREEN CONDOMINIUMS
13	LANCASTER COUNTY ROAD LLC, HARVARD

PFAS Testing of Public Drinking Water Sources

- PFAS detected above ORSG*
- PFAS detected below ORSG
- Public Water Sources Sampled

* ORSG = MassDEP Office of Research and Standards Guideline 70 ppt (70 nanograms per liter)

MassDEP
Commonwealth of Massachusetts GIS Program
Department of Environmental Protection

Map current as of December 28, 2018

MassDEP Actions to Date

- New public water supply sources are required to be tested for the six UCMR3 PFAS chemicals before they are placed on-line.
- MassDEP has posted statewide PWS testing data for PFAS on the web.
- MassDEP has established "High Priority" status for treatment projects seeking Drinking Water State Revolving Fund financing.
- The Bureau of Waste Site Cleanup issued guidance on sampling at disposal sites regulated under the Massachusetts Contingency Plan.
- Wastewater residuals subject to an Approval of Suitability (renewed every 5 years) are being required to be tested for PFAS.
- Firefighting foam collection & disposal program.
- Request to water bottlers for sampling results.

Firefighting Foam Take-Back Program

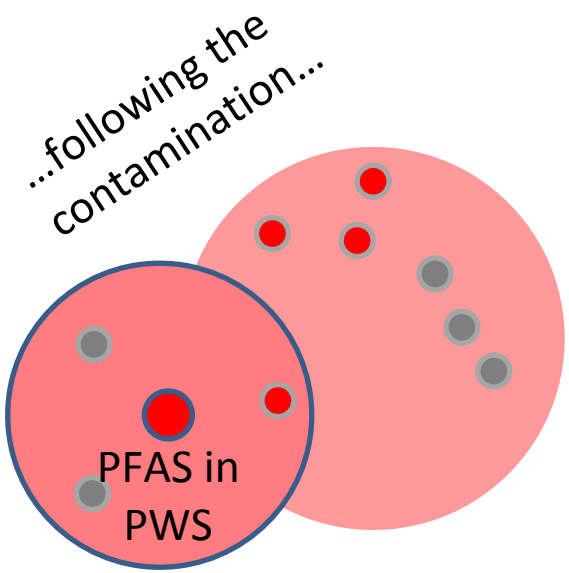
MassDEP and the Department of Fire Services (MassDFS)
Pre-2003 version of "Aqueous Film-Forming Foam" (AFFF).
Collection and destruction program in 2018 that collected 149,000 pounds (17,000 gallons)

Many fire departments have asked whether current Class B AFFF foam is safe. While these foams often contain some amount of PFAS, it is at lower levels than legacy foam and includes PFAS (so-called "short chain") that are expected to have less of an impact on the environment. New "Fluorine Free Foam" aka "3F" foam is entering the market. The cost is comparable per gallon to current foam, but there are questions about its efficacy compared to the current Class B AFFF foams. MassDEP is continuing to evaluate information and ongoing research about impacts of various foams and will continue efforts with the users.

Bottled Water and Home Water Filters

- MassDEP requested that water bottlers voluntarily share the results of any PFAS testing they may have done for posting to the Commonwealth's website. Three have responded.
- There are also home water treatment filters to remove PFAS from drinking water for the countertop or under the sink. Check that the filtration device is certified to remove PFAS.

MassDEP PFAS Site Cleanup Activities



- **Source Discovery**
  Issue Requests for Information (RFIs) and
  Notices of Responsibility (NORs)
- **Sampling private wells**
  near known PFAS-contaminated public wells
  (Potential Responsible Party (PRP)-lead or MassDEP-lead)
- **Working w/EPA and Department of Defense**
  cleanup & funding issues

MassDEP has issued guidance to Licensed Site Professionals (LSPs) for PFAS investigations
Proposing draft MCP Method 1 cleanup standards for soil and groundwater: Draft regulations in 2019
Will include Reportable Concentrations (RCs)

See the Army Corps of Engineers' website for the testing data and clean-up plans for Fort Devens.

MassDEP Planned Actions

- The DW Program will develop a targeted sampling program to test drinking water sources near potential PFAS sources that were: not previously sampled or were sampled at higher detection limits.
- The MassDEP WES Laboratory will establish regulations and begin laboratory certification for PFAS analysis.
- The Office of Research and Standards will update their guideline (ORSG).
- The DW Program will propose an MCL for those PFAS where a threat to human health has been identified, analytical methods exist for their detection, and appropriate treatment technologies are available.
- BWSC will initiate the process to propose reportable concentrations and cleanup standards for PFAS as revisions to the Massachusetts Contingency Plan.

Lead in School Drinking Water

MassDEP Drinking Water Program

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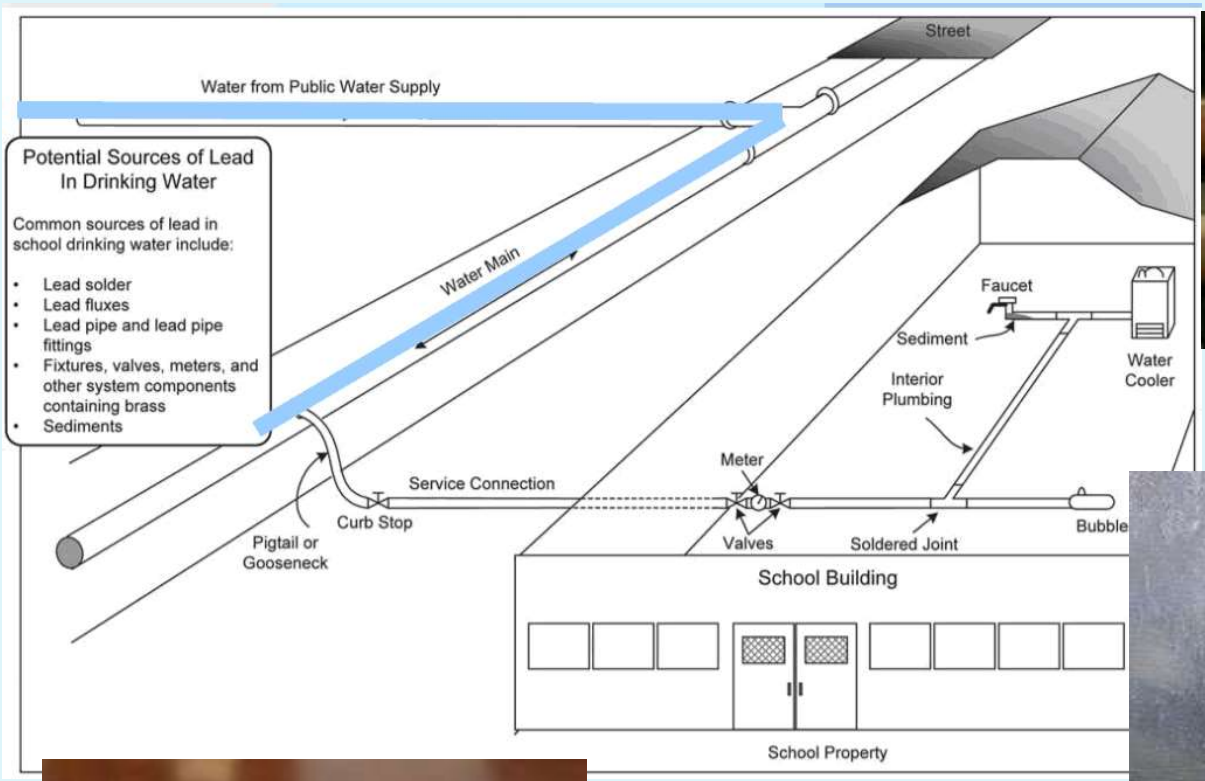
Sources of Lead Exposure for Children

- Lead paint is the primary source
- Past use of leaded gasoline and lead paint resulted in high lead levels in soil and dust
- Drinking water is a component

EPA estimates that drinking water can make up 20 percent or more of a person's total exposure to lead. (more for infants).

Sources of Lead in School Drinking Water



Lead solder

Lead service lines and goosenecks

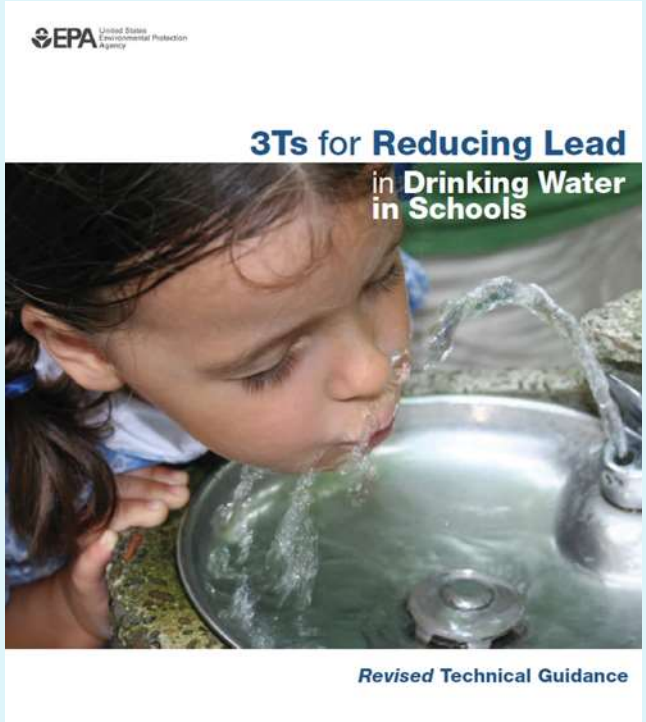
Brass fittings

Assistance Program

- In the 2016-2018 school years, more than 900 schools buildings from more than 150 communities received assistance through the program.
- Technical assistance and lab analysis was provided to help public schools sample their taps and water fountains
- About 70 percent of participating school buildings had one or more fixtures exceeding 15 ppb for lead
- We sampled every fixture that the school wanted tested (including bathroom sinks in a few cases)
- Results are posted on the web (EEA Data Portal)

EPA's revised technical guidance

- Revised October 2018
- No longer specifies an Action Level of 20 ppt for lead.
- EPA agrees with the Centers for Disease Control and Prevention (CDC) that there is no known safe level of lead for children and replaced its' 20 ppb Action Level (AL) for lead with a recommendation that lead be reduced to the lowest possible concentration.



Recommendations for Schools

Lead Level Result at the Tap or Fixture	Follow-up Actions Chart
15 ppb	Taps and fixtures with lead levels over 15ppb should be taken out of service until testing indicate that the problem has been addressed.
Lowest concentration 1 ppb	Short Term steps: ○ Flushing ○ Post signs ○ Bottled water Long term- Permanent steps: ○ Replace taps/fixtures, plumbing material ○ Install filters ○ Use only cold water for food and beverage preparation Routinely test all taps/fixtures
< 1 ppb	Lead was not detected.

MassDEP Planned Actions

- Seeking to offer a grant program for installation of filtered water bottle filling stations at schools (joint program between the Clean Water Trust and MassDEP)

Hoping to offer tech assistance (via UMass Amherst) to help schools with their remediation plans and answer questions about the new EPA 3Ts recommendations

Questions?

Further information available at Mass.gov

- Search for "PFAS" or "Lead in School Drinking Water"
- Search for "EEA Data Portal" for water quality testing results.

Or email the MassDEP Drinking Water Program at Program.Director-DWP@mass.gov