



# PFAS in New England:

## Regulatory Status and Considerations for Assessment

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**New England Water Environment  
Association**  
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# Presentation Overview

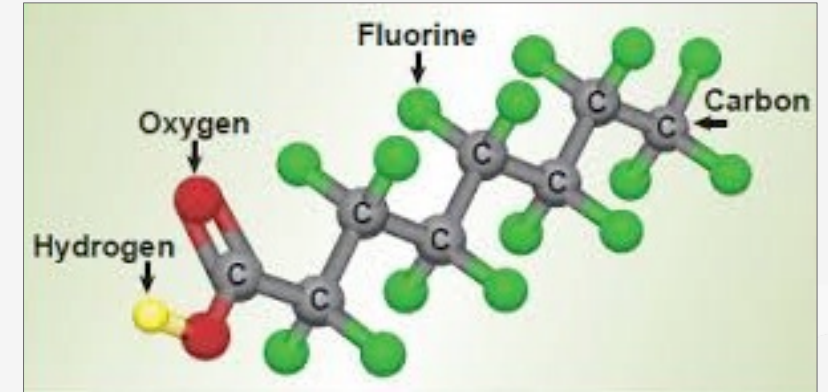
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- PFAS overview
- Regulatory Drivers and Status
- Sampling, Analytical and Data Considerations
- Resources
- Questions

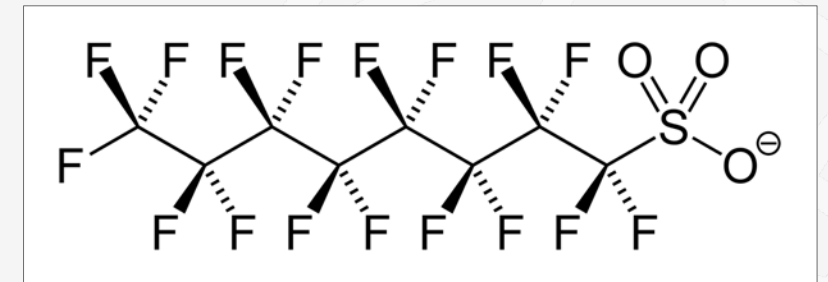


# PFAS- What is it?

- Per- and Polyfluorinated alkyl substances
- Unique chemical/physical properties
  - Very stable, C-F bonds
  - High thermal, chemical stability
  - Soluble
- Use as surfactants, water/stain repellents, etc.



PFOA: Perfluorooctanoic acid (C8)



PFOS: Perfluorooctane sulfonate

# PFAS: Sources in the Environment

- Primary production plants
- Manufacturing sites with PFAS use
- Consumer products
- Fire-fighting foams (e.g., AFFF)
- Municipal solid waste landfills
- Wastewater treatment plants
  - Effluent, biosolids



# PFAS Characteristics are Regulatory Drivers

## *Persistent Organic Pollutant*

- Persistent
- Bioaccumulative
- Toxic

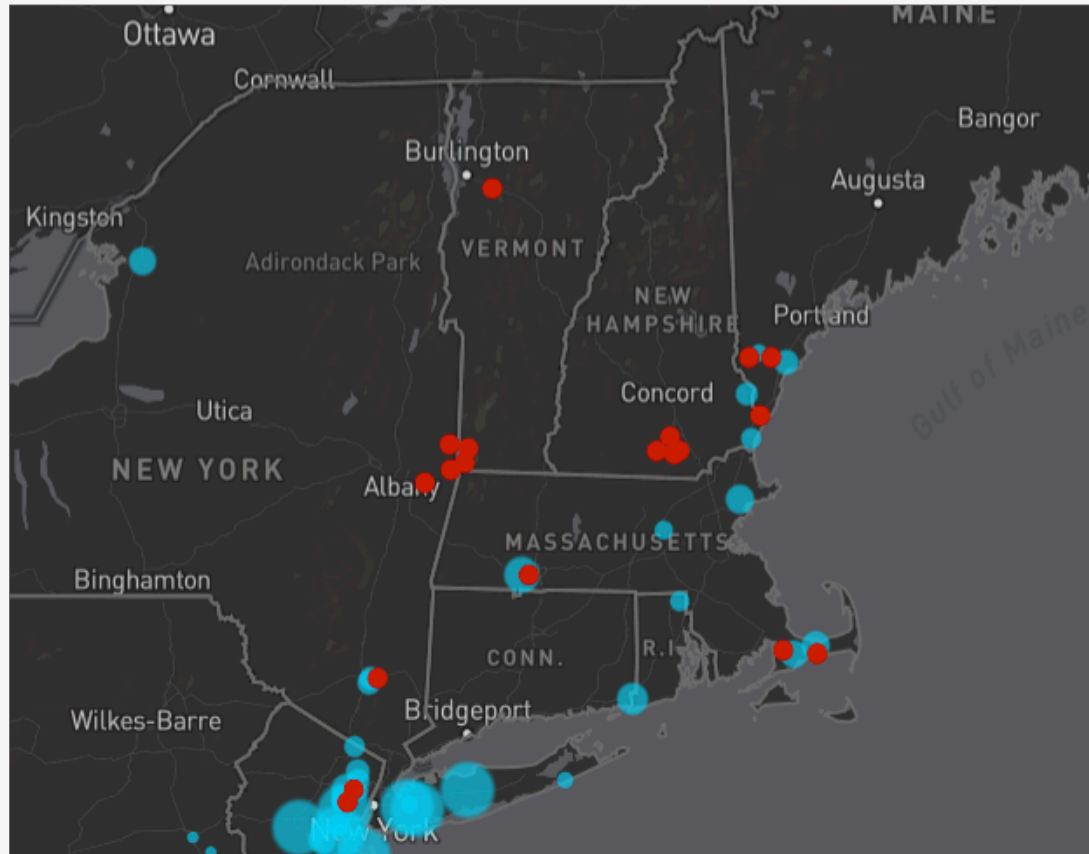


# PFAS are Persistent

- Dispersed globally
  - Soil
  - Groundwater,
  - Sediment and Surface Water
  - Air, dust



# PFAS Sites in New England



Red – PFAS sites/sources

Blue – PFAS detected in water supplies

From: [https://www.ewg.org/interactive-maps/2017\\_pfa/index.php#.WI\\_pjainFPY](https://www.ewg.org/interactive-maps/2017_pfa/index.php#.WI_pjainFPY)

# PFAS are Bioaccumulative

- Bioaccumulative properties
  - Highly variable
  - Biomagnify
- Fish/Wildlife
  - PFOS most common
- Humans
  - 95% population has detectable PFAS blood levels
  - Half-lives of 2-9 years





# PFAS are Toxic

- Developmental, immune effects
- Liver/kidney
- Increased cholesterol, hypertension, thyroid
- Cancers-liver, testicular, pancreatic



**C8 Science Panel**

# Regulatory Status

- Toxic Substances Control Act
  - Significant New Use Rule
- Comprehensive Environmental Response, Compensation and Liability Act
- Safe Drinking Water Act
  - Unregulated Contaminant Monitoring Rule
  - EPA Health Advisories
    - 0.07 ug/L– PFOA, PFOS and the sum of both
- States – varies

# Drinking Water Standards/Guidelines in New England

State	PFOA	PFOS	NOTES	Standard/Guidance**
RI	0.07	0.07	individual/total	Groundwater Quality Standard, GA
CT	0.07	0.07	individual/total for PFOA, PFOS, PFNA, PFHxS, PFHpA	Private well action level
MA	--	--	--	--
ME	0.07	0.07	individual/total	Maximum Exposure Guideline
	0.13	0.56		Remedial Action Guideline-groundwater
NH	0.07	0.07	individual/total	Ambient Groundwater Quality Standard
VT	0.02	0.02	individual/total	Vermont Health Advisory

Units: micrograms per liter (or parts per billion)

\*\*Current as of January 2018

# PFAS Considerations for Assessment

- Regulatory impetus will only increase the scope of sampling and analysis of PFAS
- It is important to understand and set clear sampling and analytical objectives
- It is important to identify sampling issues in designing a sampling and analysis plan to generate reliable data set



# PFAS Sampling Considerations

- Representativeness
  - Representative environmental matrices
  - Spatial, temporal scales
  
- How will sample results be used?

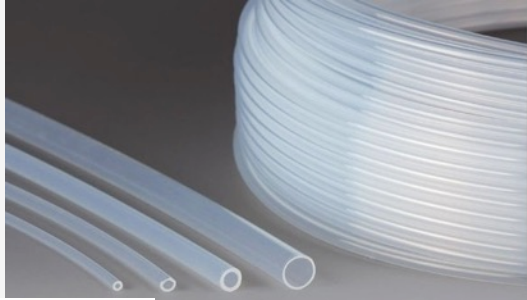


# PFAS Sampling Considerations

- Potential for cross-contamination
  - Low analytical levels
  - Many potential sources of low-level PFAS

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
*	RPD of the LCS and LCSD exceeds the control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

# Potential PFAS Sources in the Field



# PFAS Sampling Considerations

- Use blanks!
  - Trip blanks
  - Field blanks
  - Equipment blanks
  - Lab blanks





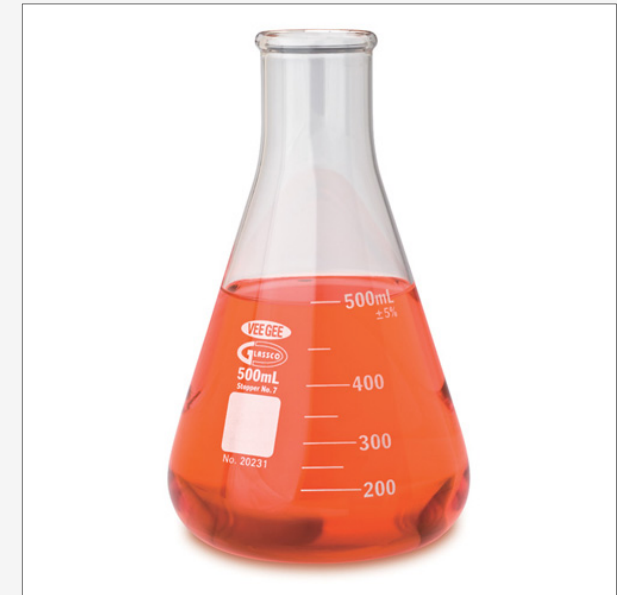
# State-Specific PFAS Guidelines

- MassDEP –
  - Draft Sampling/Analysis memo -14 PFAS
  
- NHDES –
  - Policy requiring sampling
    - Hazardous waste sites/landfills,
    - ESAs where history suggests PFAS may be present
  - Sampling guidance
  - Analytical guidance: linear/branched isomers of PFOA

# PFAS Analytical Considerations

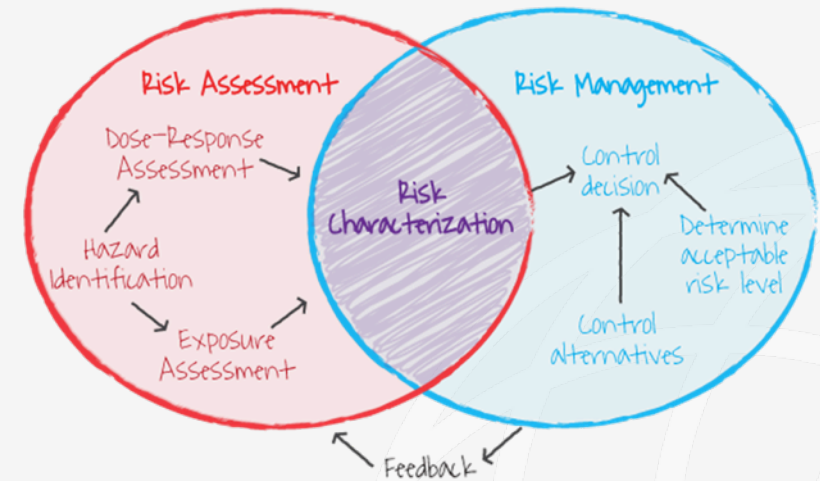
- Laboratory Analysis
  - Methods available
    - EPA Method 537, Rev. 1.1 –drinking water
    - Alternative methods – ASTM D7968, 7979
    - Consider matrix, use of data
- Selecting Analytes

***It is imperative to understand  
how data will be used!***



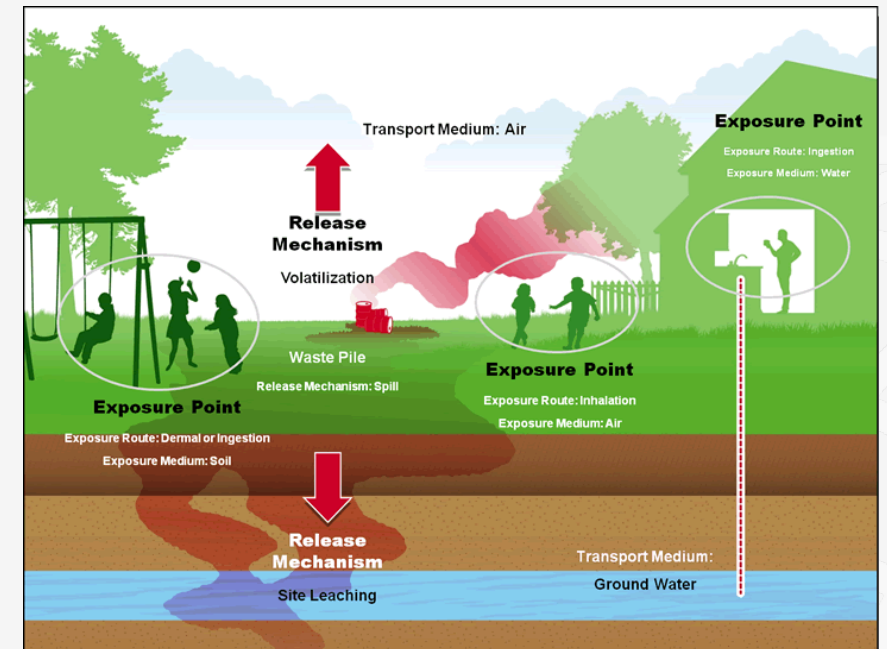
# Understanding your Data

- Standards/Criteria
- Site-specific Risk Assessment
  - Evaluates distinct exposures
  - Receptors
  - Exposure pathways
  - Toxicity
- Communication of Results



# Develop the Conceptual Site Model

- The CSM pulls together information about the constituent to understand its origin and ultimate fate
- Source of PFAS
- Migration pathways
- Exposure pathways
- Human and environmental receptors



Source: EPA.

<https://www.epa.gov/sites/production/files/styles/large/public/2015-04/se-exposuresetting.gif>



# Regulatory Status – Where's it going?

- Focus on drinking water supplies
  - Diet is primary pathway of concern
  - Need to understand prevalence in environment
- Future promulgation of standards
  - Focus on other PFAS
    - Replacement compounds – GenX, ADONA
    - Precursors
- Evaluation of other pathways (soils, fish etc.)
- Ecological receptors



“Etc.”

# PFAS Resources

- United States Environmental Protection Agency
  - <https://www.epa.gov/pfas>
  - [https://clu-in.org/contaminantfocus/default.focus/sec/Per and Polyfluoroalkyl Substances \(PFASs\)/cat/Policy and Guidance/](https://clu-in.org/contaminantfocus/default.focus/sec/Per_and_Polyfluoroalkyl_Substances_(PFASs)/cat/Policy_and_Guidance/)
- Department of the Navy
  - <http://www.secnave.navy.mil/eie/pages/pfc-pfas.aspx>
- Interstate Technology and Regulatory Council
  - Six Fact Sheets – all available by March 2018
    - <http://pfas-1.itrcweb.org/>
  - Web-based training – available in 2019
- National Groundwater Association
  - *Groundwater and PFAS: State of Knowledge and Practice*
  - <http://www.ngwa.org/Media-Center/news/Pages/Groundwater-and-PFAS-State-of-Knowledge.aspx>
- Northeast Waste Management Officials' Association
  - <http://www.newmoa.org/cleanup/projects/pfas.cfm>





# THANK YOU!!

## Questions?

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