

# MassDEP Waste Site Cleanup Advisory Committee

June 24, 2021, 9:00 am

## Notes on this ZOOM Webinar:

- To control background noise, please remain on mute unless you are specifically speaking.
- Advisory Committee Members and speakers (collectively known as “panelists”) may unmute themselves.
- The general audience (“attendees”) may ask to be unmuted for questions & comments – raise your digital hand to be recognized
- You may also submit questions & comments using the Q&A
- Please limit CHAT to issues about the ZOOM meeting (e.g., bad sound)
- The meeting and Q&A are being recorded and will be available on the DEP YouTube channel ([www.YouTube.com/MassDEP](http://www.YouTube.com/MassDEP)) within a few days



# MassDEP Waste Site Cleanup Advisory Committee

June 24, 2021, 9:00 am

*(times are approximate)*

- 9:00 General Update, *post*-COVID State-of-Emergency Operations
  - Paul Locke
- 9:20 MCP Amendments, CAM Method Revisions, Data Quality Follow-up
  - Liz Callahan
- 9:30 Grant Updates
  - Technical Assistance Grants – Nancy Fitzpatrick
  - Marine Oil Spill Act Grant Awards – Julie Hutcheson
- 9:45 Assessing Climate Vulnerability at 21E Sites
  - Susan Chapnick & Marilyn Wade, LSPA Climate Change Subcommittee
- 10:15 Commonwealth's Efforts to Address PFAS & Relationship to Work at 21E Sites - Paul Locke

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*(Each item followed by opportunity for comments & questions)*



# Program Updates

Paul Locke

Assistant Commissioner

MassDEP Bureau of Waste Site Cleanup

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# Program Updates

- COVID-19 Pandemic
  - End of State of Emergency
  - Now what?
- Budget
- Other...





# Regional Updates

## SERO

- Gerard Martin is now Deputy Regional Director (DRD) for the Water Programs (Bureau of Water Resources)
- John Handrahan is the acting DRD for Waste Site Cleanup
- NEW – a PFAS branch under Angela Gallagher with Jennifer Wharff and Navpreet Brolowski

## NERO

- Kingsley Ndi, longtime Emergency Response (ER) section chief has retired
- Andrew Clark is now ER section chief

## CERO

- NEW - a PFAS branch under Paul Vigeant with Timothy Maus and Rachel Stevens
- Amy Sullivan is now Technical Support branch chief role (formerly Paul V.)  
(Technical support branch manages Tier 1 sites, soil reclamation, EPA removal projects, and non-responder enforcement. )

## WERO

- Cyndi Pawloski is retiring in July. Cyndi is the Section Chief for the Risk Reduction/Site Discovery/Brownfields section.  
(This section works on vapor intrusion and PFAS sites, Brownfields redevelopment, EPA removal actions. )



# Questions or Comments?

- Advisory Committee members may unmute yourself
- Audience members may digitally raise your hand



# MCP Amendments, CAM Method Revisions, & Data Quality Follow-up

Elizabeth Callahan

Director – Division of Policy & Program Development

MassDEP Bureau of Waste Site Cleanup



# Regulations

- MCP final amendments
- Natural Resource Damages
- Other MassDEP program regulations
  - Underground Storage Tank Systems public hearing draft. Public comment deadline July 2, 2021.

<https://www.mass.gov/service-details/massdep-public-hearings-comment-opportunities>



NOTICE MassDEP's office buildings are currently closed to the public.

PART OF [MassDEP Operating Permit & Compliance Program](#) [Show 3 more](#)

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# MassDEP Public Hearings & Comment Opportunities

Attend a public hearing or provide comment on an environmental regulation, permit, or report.

## MassDEP Regulations & Policies

### [310 CMR 9.00: Waterways](#)

Virtual Public Hearings (2): July 27, 2021

Public Comment Period Ends: August 6, 2021

Comment via: [dep.waterways@mass.gov](mailto:dep.waterways@mass.gov)

### [310 CMR 80.00: Proposed Underground Storage Tank Amendments](#)

Notice: [English](#) | [Español](#) | [中文](#) | [ភាសាខ្មែរ](#) | [Kreyòl Ayisyen](#) | [Português](#) | [Tiếng Việt](#)

Public Comment Period: Ends July 2, 2021

### [310 CMR 36.00: Water Management Act](#)

Virtual Public Hearings: July 7 & 16, 2021

Public Comment Period: Ends July 19, 2021

Comment via: [dep.talks@mass.gov](mailto:dep.talks@mass.gov)

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# Compendium of Analytical Method (CAM) Updates

- Revised CAM protocols for 8260 (Volatile Organic Compounds) and 8270 (Semivolatiles)
- Update references to latest EPA methods (to 8260D & 8270E, respectively), other revisions to QC requirements and clarifications
- Revised protocols to be posted July 6, 2021; become effective October 29, 2021



# Data Quality Discussion

- Discussion of recommendations for continued data quality improvement from MassDEP's data quality audit
- Meeting date: July 26, 2021, 10 am to noon
- Interesting in attending? Email [BWSC.CAM@mass.gov](mailto:BWSC.CAM@mass.gov)



# Questions or Comments?

- Advisory Committee members may unmute yourself
- Audience members may digitally raise your hand





# Technical Assistance Grants

Nancy Fitzpatrick

MassDEP BWSC – Policy & Program Development

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# Technical Assistance Grants

- Public information meeting held April 29, 2021
- MassDEP's Official Answers to Questions for the Technical Assistance Grant Opportunity - posted on the TAG Webpage on June 16, 2021

<https://www.mass.gov/service-details/technical-assistance-grants-waste-site-cleanup>



# Technical Assistance Grants

**Deadline for TAG Applications is 5:00 PM on Friday, July 16, 2021.** Submit electronically to:

[Nancy.Fitzpatrick@mass.gov](mailto:Nancy.Fitzpatrick@mass.gov)

## **Next Steps:**

- TAG Review Team will review & score applications.
- TAG awards will be posted on TAG Webpage on **August 20, 2021**



# Questions or Comments?

- Advisory Committee members may unmute yourself
- Audience members may digitally raise your hand



# MOSPRA Grant Program Premier

Julie Hutcheson

Marine Oil Spill Prevention & Response Program

Massachusetts Marine Oil Spill Prevention & Response Act

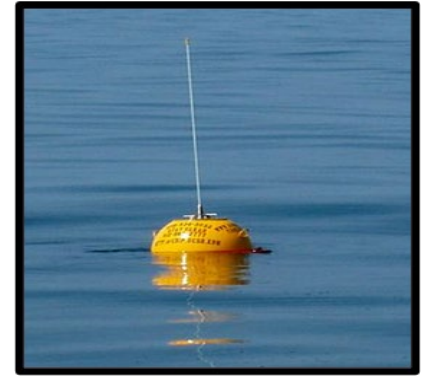


# MOSPRA Background

- **2003:** Bouchard Barge -120 spilled 100,000+ gallons of thick #6 oil in Buzzards Bay
- Event identified significant gaps in the Commonwealth's spill prevention & response capability
- **2004:** MOSPRA & MGL. c. 21M enacted  
Massachusetts Oil Spill Prevention & Response Act
- Established MOSPRA Trust Fund



# MOSPRA Trust Fund



- Oil Spill Response Trailers -83
- Geographic Response Strategies Developed - 160
- First Responder Training & GRS Testing Exercises - 74
- 1st Responders Trained – 1,900+
- Conex boxes staged at MMA & New Bedford
- Foam Filled Boom Acquisition
- Wave Sensor Buoy Cape Cod Bay (future BBB)
- **NEW** Grant Program



# GRANT PROGRAM

## Objective:

- Support projects that advance MOSPRA Goals
- Undertake new projects / new perspective

## Criteria:

- Spill prevention / detection,
- Vessel navigational safety improvements,
- Sensitive area data management & mapping,
- R&D projects, Wildlife rehabilitation training





# GRANT PROGRAM

## Criteria:

- Exercising of response equipment and/or Geographic Response Strategies to support USCG Area Contingency Plans,
- Research & improvements on climate change resiliency in oil & hazardous materials marine transportation and/or storage.



# GRANT PROGRAM

## Eligibility:

- Projects in line with MOSPRA goals and community benefit
- Coastal cities/towns,
- State agencies, Academia, Non-profits ...

## Amount:

- Total of \$500,000
- Most projects < \$50,000



# 1<sup>st</sup> Round GRANT PROGRAM

## Status:

- Once upon a time, the process began...
- New Website Developed
- Zoom informational Meeting - Sept 2020
- Grant announcement – Oct 2020
- Applications Due – Nov 2020
- Received 10 applications (13 projects)
- [Award Notifications made on June 8, 2021](#)



# GRANT AWARDS

- **New England Wildlife Center-** Provide training for oiled wildlife rehabilitation; purchase a limited number of wildlife response kits; and form a preparedness working group that encourages information and equipment sharing across local stakeholder organizations.
  - ***Total grant funding: \$23,596.90***
- **Town of Plymouth-** Provide funds for the replacement of a heavily used waste oil tank that has started to deteriorate. The tank offers a convenient way for commercial boats to dispose of waste oil.
  - ***Total grant funding requested: \$12,525.00***



# GRANT AWARDS

- **Town of Scituate-** Scituate fire department seeks funds to start a drone program to enhance their capability to respond to spill emergencies. The program would include the drone and associated hardware, the Federal Aviation Administration (FAA) Small UAS Rule (Part 107) compliance certifications, and a training program.
- ***Total grant funding: \$30,458.00***
  
- **Massachusetts Maritime Academy-** funds for a fluorescent dissolved organic matter (fDOM) sensor to assess the effect of oil on aquatic vegetation. The proposed project includes incorporating the instrument into class instruction and 2 co-op positions for the start of the project.
- ***Total grant funding: \$47,233.69***



# GRANT AWARDS

- **City of Fall River-** Fall River's fire department is proposing additional oil spill response training for all of the firefighters at the Center Fire Station, which is the designated Station that would be responsible for the deployment of MassDEP's spill response trailer during a spill in the Taunton River.
  - *Total grant funding requested: \$10,800.00*
- **Town of Marion-** Marion's fire department is proposing to start a drone program. The requested funds would be used for the purchase of a drone and training for certification.
  - *Total grant funding requested: \$14,200.00*



# GRANT AWARDS

- **Town of Scituate-** Scituate's fire department is proposing to purchase a FLIR camera to be installed on a newly purchased vessel for identifying oil (or hazmat) spills at night or in the fog.
  - ***Total grant funding requested: \$19,495.00***
- **Town of Marion-** Marion's fire department is proposing to hire a contractor to prepare an Oil Spill Detection & Preparedness Plan that would inventory likely sources of oil spills and identify preferential pathways.
  - ***Total grant funding requested: \$6,000.00***



# GRANT AWARDS

- **City of Everett-** Everett's fire department is proposing to install 3 optical sensors within the Mystic River that would provide early detection and notification in the event of an oil spill.
- *Total grant funding: \$50,000.00*

Nine Grant Awards for total of \$214,308.59





# GRANT PROGRAM

Ready for Round 2!

## Future:

- Grant Cycle - Annually to every two years
- Next grant release “summer/fall/winter” 2022
- Equipment issue – boats, motors, maintenance ...
- Getting the word out to eligible applicants
- <https://www.mass.gov/oil-spill-prevention-response>



Recognition must be given to

Steve Mahoney

for bringing the  
MOSPRA Grant Program  
to Life



# Questions or Comments?

- Advisory Committee members may unmute yourself
- Audience members may digitally raise your hand



# Assessing Climate Vulnerability at 21E Sites

June 24, 2021

**Susan Chapnick & Marilyn Wade**

LSPA Climate Change Subcommittee  
and

Massachusetts Department of Environmental Protection  
Bureau of Waste Site Cleanup

# Climate Change and the MCP: Status Update Overview

- 2021 MCP Amendments
- LSPA Climate Change Subcommittee
  - DRAFTS in-progress:*
    - “Q & A”
    - Flow Chart
    - Glossary
    - Updated Tools & Resources
    - ***Vulnerability Assessment Checklist***
    - ***Case Studies***

# 2021 MCP Climate Change Amendments Goal

**To direct persons conducting cleanups to:**

- (1) identify and assess foreseeable climate impacts that may affect the permanency and protectiveness of the cleanup at vulnerable sites; and
  - (2) take reasonable measures to reduce vulnerabilities.
- Definition of Conceptual Site Model (CSM)
  - Response Action Performance Standard (RAPS)
  - Definition of Foreseeable Period of Time for a Permanent Solution

# 2021 MCP Amendments

## 40.0006: Terminology, Definitions and Acronyms

**Conceptual Site Model or CSM** means a site-specific description of how contaminants entered the environment, how contaminants have been and may be transported within the environment, and routes of exposure to human and environmental receptors that provides a dynamic framework for assessing **current and foreseeable future** site characteristics and risk, identifying and addressing data gaps and managing uncertainty, eliminating or controlling contaminant sources, developing and conducting response action strategies, and evaluating whether those strategies have been effective in achieving desired endpoints. At sites at which NAPL is or may be present, this includes the body of fundamental scientific principles describing the behavior of fluid flow in porous media necessary to assess NAPL in subsurface strata.

# 2021 MCP Amendments

## 40.0191: Response Action Performance Standard (RAPS)

- (1) The Response Action Performance Standard (RAPS) is the level of diligence reasonably necessary to obtain the quantity and quality of information adequate to assess a site and evaluate remedial action alternatives, and to design and implement specific remedial actions at a disposal site to achieve a level of No Significant Risk for any **foreseeable period** of time, **as defined at 310 CMR 40.1005**, and, where feasible, to reduce to the extent possible the level of oil and/or hazardous materials in the environment to background levels.
- (2) RAPS shall be employed during the performance of all response actions conducted pursuant to 310 CMR 40.0000, and shall include, without limitation, the following:
  - (a) consideration of relevant policies and guidelines issued by the Department, **EOEEA** and EPA;
  - (b) use of accurate and up-to-date methods, **models**, standards and practices, equipment and technologies which are appropriate, available and generally accepted by the professional and trade communities conducting response actions in accordance with M.G.L. c. 21E and 310 CMR 40.0000 under similar circumstances; and



# 2021 MCP Amendments

## 40.1005: Defining "Foreseeable Period of Time" for Purposes of a Permanent Solution

(1) A Permanent Solution shall ensure a level of control of each identified substance of concern at a site or in the surrounding environment such that no such substance of concern shall present a significant risk of harm to health, safety, public welfare or the environment during any foreseeable period of time, considering existing site conditions and reasonably foreseeable future changes in site conditions, including anticipated impacts associated with climate change.

# LSPA Climate Change Subcommittee

## Participating Committee Members/Guests

|  |                        |  |               |  |                        |
|--|------------------------|--|---------------|--|------------------------|
|  | M Wade (Co-Chair)*     |  | J Grachuk     |  | A Roth                 |
|  | C Rockwell (Co-Chair)* |  | M Greer       |  | W Rundle*              |
|  | D Austin               |  | J Higgins     |  | A Scanlon              |
|  | D Billo                |  | K Marra       |  | I Silverstein          |
|  | C Bois                 |  | D McGlinchy   |  | R Thibault*            |
|  | J Bossange             |  | M Paul        |  | T Wickwire             |
|  | S Chapnick             |  | D Phillips    |  | C Worthy               |
|  | J Doherty              |  | M Ritrosky    |  | Jennifer Hughes (MVPC) |
|  | E Callahan (guest)     |  | EOEEA (guest) |  |                        |

**EMAIL:**

[lspaclimatechangesubcommittee@woodardcurran.com](mailto:lspaclimatechangesubcommittee@woodardcurran.com)

[\\*climatechange@lspa.org](mailto:*climatechange@lspa.org)



# Subcommittee DRAFT “Q&A”

- 1) Why must climate impacts be assessed at 21E sites?
- 2) What are the climate impact assessment requirements in the MCP?
- 3) What timeframe would apply to the requirement for Permanent Solutions to account for “reasonably foreseeable future changes in site conditions, including anticipated impacts associated with climate change”?
- 4) **How is vulnerability to climate impacts at 21E sites to be assessed?**
- 5) Do these climate impact assessment requirements apply to all 21E sites?
- 6) **How should climate-related impacts to groundwater be assessed?**
- 7) **What adaptive/resilience measures should be considered?**
- 8) Does MassDEP plan to re-visit previously closed sites?
- 9) How will AULs be affected by these new requirements?
- 10) What funding sources are available for this work?
- 11) **What technical resources and climate forecasts are recommended for performing these evaluations?**

# Vulnerability

## Exposure

### Climate Changes

#### The Big 4 (from SHMCAP):

- Precipitation
- Sea Level Rise (SLR)
- Temperature
- Extreme weather





## Sensitivity

### Site Characteristics

- Location
- Demographics
- Equipment/structures
- Regulatory status
- Contaminant type, fate & transport

# Climate Change “Exposure” (SHMCAP)

## Climate Change Projections for Massachusetts

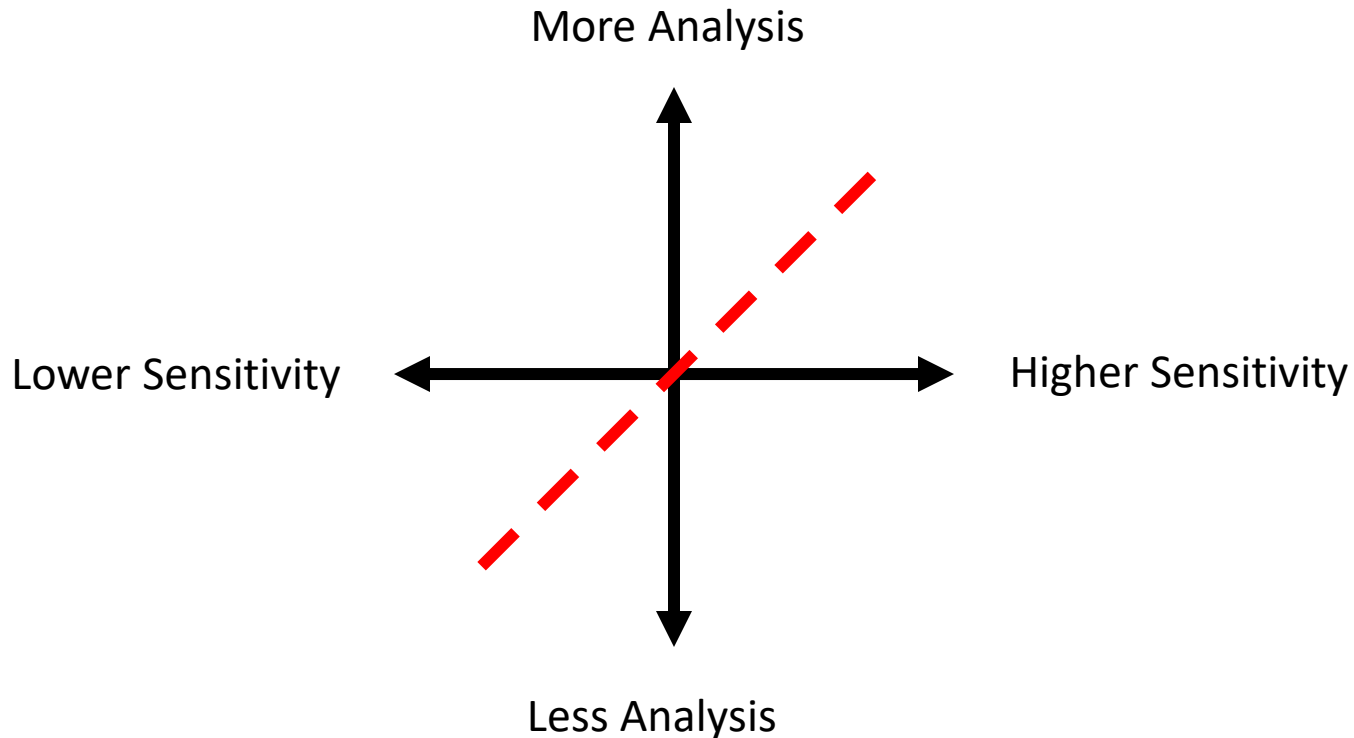
| CLIMATE CHANGES  | RELATED NATURAL HAZARDS   | PROJECTIONS BY THE END OF THIS CENTURY  |
|--|---|---|
| <b>Changes in precipitation</b><br> | <ul style="list-style-type: none"> <li>– Inland flooding</li> <li>– Drought</li> <li>– Landslide</li> </ul>   | <ul style="list-style-type: none"> <li>– Annual precipitation: Increase up to 16% (+7.3 inches)</li> <li>– Days with rainfall accumulation 1+ inch: Increase up to 57% (+4 days)</li> <li>– Consecutive dry days: Increase 18% (+3 days)</li> <li>– Summer precipitation: Decrease</li> </ul>   |
| <b>Sea level rise</b><br>           | <ul style="list-style-type: none"> <li>– Coastal flooding</li> <li>– Coastal erosion</li> <li>– Tsunami</li> </ul>  | <ul style="list-style-type: none"> <li>– Sea level: Increase 4.0 to 10.5 feet along the Massachusetts coast</li> </ul>  |
| <b>Rising temperatures</b><br>      | <ul style="list-style-type: none"> <li>– Average/extreme temperatures</li> <li>– Wildfires</li> <li>– Invasive species</li> </ul>   | <ul style="list-style-type: none"> <li>– Average annual temperature: Increase up to 23% (+10.8 degrees Fahrenheit)</li> <li>– Days/year with daily minimum temperatures below freezing: Decrease up to 42% (-62 days)</li> <li>– Winter temperatures: Increase at a greater rate than spring, summer, or fall</li> <li>– Long-term average minimum winter temperature: Increase up to 66% (+11.4 degrees Fahrenheit)</li> <li>– Days/year with daily maximum temperatures over 90 degrees Fahrenheit: Increase by up to 1,280% (+64 days)</li> <li>– Growing degree days: Increase by 23% to 52%</li> </ul> |
| <b>Extreme weather</b><br>        | <ul style="list-style-type: none"> <li>– Hurricanes/tropical storms</li> <li>– Severe winter storms/nor'easters</li> <li>– Tornadoes</li> <li>– Other severe weather</li> </ul> | <ul style="list-style-type: none"> <li>– Frequency and magnitude: Increase</li> </ul>   |

Note: This plan also assesses earthquakes, but there is no established correlation between climate change and earthquakes.

Source of Climate Change Projections: Northeast Climate Adaptation Science Center at the University of Massachusetts, Amherst.

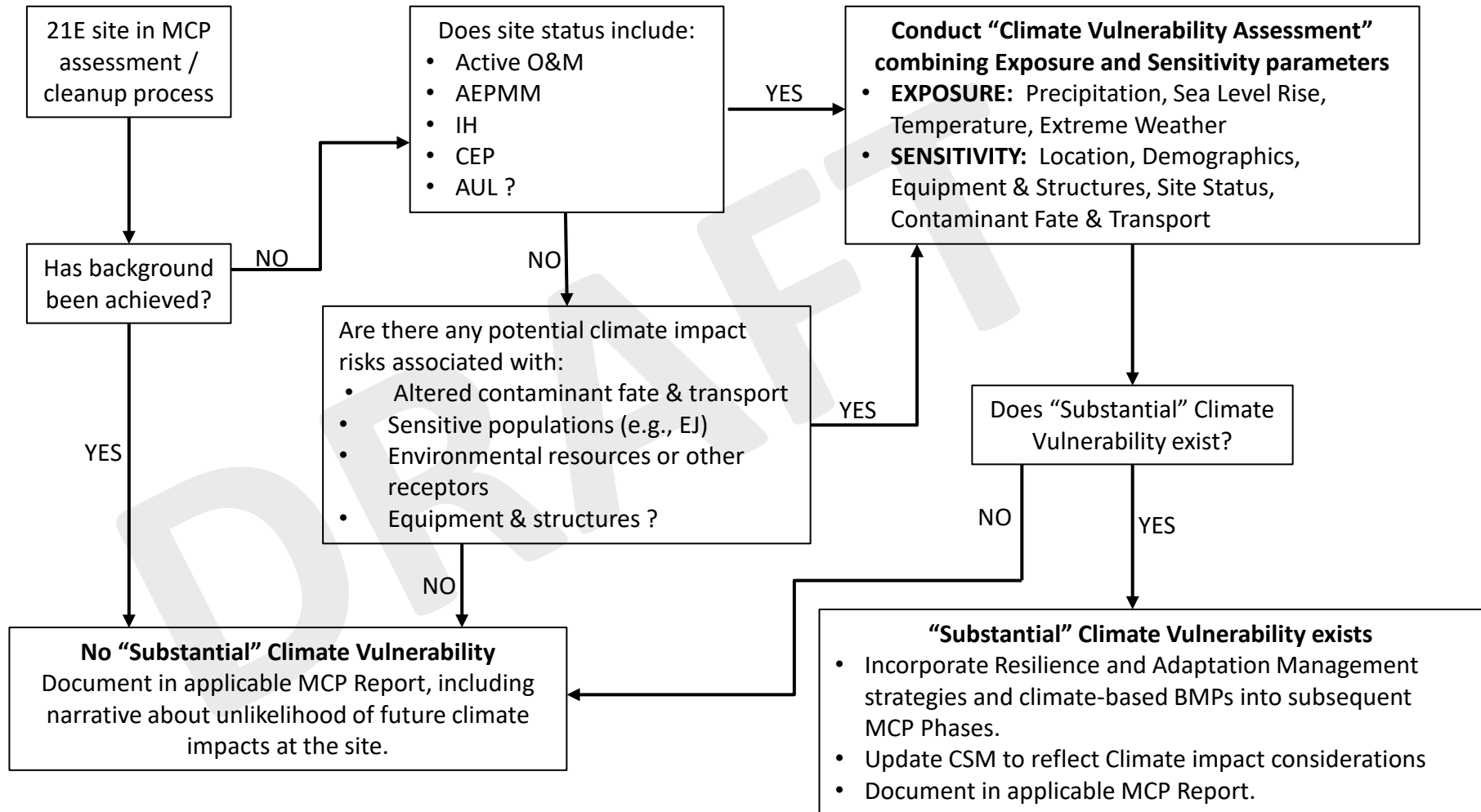


# Vulnerability Assessment Level of Effort



# Subcommittee DRAFT Flow Chart

## Conceptual MCP Climate Impact Evaluation



# Vulnerability Assessment Checklist

| A.                            |  | GENERAL SITE INFORMATION          |                      |                                |  |
|-------------------------------|--|-----------------------------------|----------------------|--------------------------------|--|
| Site Name:                    |  |                                   |                      |                                |  |
| Site RTN(s):                  |  |                                   |                      |                                |  |
| Site Address:                 |  |                                   |                      |                                |  |
| Setting:                      |  | Mark those applicable with an 'X' |                      |                                |  |
| <b>Site Use</b>               |  | <b>GW Category</b>                | <b>OHM Released:</b> | <b>Media Impacted</b>          |  |
| Residential                   |  | GW-1                              | Gasoline             | Soil                           |  |
| School                        |  | GW-2                              | Oil                  | Groundwater                    |  |
| Daycare                       |  | GW-3                              | TCE                  | Sediment                       |  |
| Commercial                    |  |                                   | Chlorinated VOCs     | Indoor Air                     |  |
| Recreational/<br>Open Space   |  | Depth to<br>Groundwater           | Metals               | Surface<br>water               |  |
| Other                         |  | Minimum Maximum                   | PCBs                 | Drinking Water                 |  |
|                               |  |                                   | PFAS                 | Ecologically<br>Sensitive area |  |
|                               |  |                                   | Other                |                                |  |
| <b>Area Use</b>               |  |                                   | Source of OHM:       | <b>Current MCP Phase</b>       |  |
| Mixed                         |  |                                   |                      | Phase 1                        |  |
| Rural                         |  |                                   |                      | Phase 2                        |  |
| Commercial                    |  | <b>Soil Category</b>              |                      | Phase 3                        |  |
| Urban                         |  | S-1                               |                      | Phase 4                        |  |
| Residential                   |  | S-2                               |                      | Phase 5                        |  |
| Suburban                      |  | S-3                               |                      |                                |  |
| Vacant/ Future<br>Development |  |                                   |                      | ROS                            |  |
| Other                         |  |                                   |                      |                                |  |



[Checklist and Instructions](#)

[Glossary](#)

[Resources](#)





# Vulnerability Assessment Checklist

| B. SITE STATUS AND CLIMATE IMPACT RISKS  |  |  |  |  |  |  |  |  |     |    |     |  |
|--|--|--|--|--|--|--|--|--|-----|----|-----|--|
|  |  |  |  |  |  |  |  |  | YES | NO | N/A |  |
| 1  | Is or will the site be cleaned up to background? (If Yes, skip to Section F)                                   |  |  |  |  |  |  |  |     |    |     |  |
| 2  | Is the site in active operation and maintenance (O&M) or ROS?  |  |  |  |  |  |  |  |     |    |     |  |
| 3  | Does the site have or will the site require an AUL?  |  |  |  |  |  |  |  |     |    |     |  |
| 4  | Is there a containment cap/barrier or other engineered control?  |  |  |  |  |  |  |  |     |    |     |  |
| 5  | Does the site have or will the site require an AEPMM?  |  |  |  |  |  |  |  |     |    |     |  |
| 6  | Is the site characterized by an IH condition, a CEP or an SRM?   |  |  |  |  |  |  |  |     |    |     |  |
| 7  | Is the site in an <b>environmental justice</b> location or are sensitive populations present?                  |  |  |  |  |  |  |  |     |    |     |  |
| 8  | Is the site in an ACEC and/or sensitive habitat?   |  |  |  |  |  |  |  |     |    |     |  |
| 9  | Is the site in an inland waterways?  |  |  |  |  |  |  |  |     |    |     |  |
| 10   | Are there essential infrastructure, equipment or structures present and at risk?                               |  |  |  |  |  |  |  |     |    |     |  |
| 11   | Would potential climate impacts substantially alter the fate and transport of site contaminants of concern?    |  |  |  |  |  |  |  |     |    |     |  |
| 12   | Is the anticipated closure a temporary solution?   |  |  |  |  |  |  |  |     |    |     |  |
| 13   | All/a portion of the site has a history of coastal flooding and/or within a potential future storm surge area? |  |  |  |  |  |  |  |     |    |     |  |
| 14   | All/a portion of the site is within an existing FEMA 1% flood hazard area?                                     |  |  |  |  |  |  |  |     |    |     |  |
| 15   | All/a portion of the site has a history of flooding during precipitation events?                               |  |  |  |  |  |  |  |     |    |     |  |
| <p><b>** If any answers to Questions 2 through 15 above are "Yes," proceed to Sections C - E **</b></p> <p><b>** If all answers to Questions 2 through 15 are "No," proceed to Section F to document no anticipated climate change risk **</b></p> |  |  |  |  |  |  |  |  |     |    |     |  |

# Vulnerability Assessment Checklist

| C. EXPOSURE CONSIDERATIONS |  |  |  |  |          |  |          |     |          |                       |       |  |
|----------------------------|--|--|--|--|----------|--|----------|-----|----------|-----------------------|-------|--|
| 1                          | Applied forecast duration [check one]:<br><i>Resilientma.org (or other)</i>  |  |  |  | 30 years |  | 50 years |     | 80 years |                       | Other |  |
|                            |  |  |  |  |          |  |          |     |          | Likelihood of impacts |       |  |
| 2                          | SEA LEVEL RISE Impacts<br>(based on resilientma.org climate data)  |  |  |  |          |  |          | LOW | MEDIUM   | HIGH                  | N/A   |  |
| a.                         | All/a portion of the site will change from upland to intertidal conditions (tide   |  |  |  |          |  |          |     |          |                       |       |  |
| b.                         | All/a portion of the site will change from upland to subtidal conditions (tide   |  |  |  |          |  |          |     |          |                       |       |  |
| 3                          | EXTREME WEATHER EVENT impacts<br>(based on resilientma.org climate data)   |  |  |  |          |  |          | LOW | MEDIUM   | HIGH                  | N/A   |  |
| a.                         | Erosion or slope stability damage.   |  |  |  |          |  |          |     |          |                       |       |  |
| b.                         | Ice dams, frozen utilities, snow load damage   |  |  |  |          |  |          |     |          |                       |       |  |
| c.                         | Wind hazards/tree uprooting  |  |  |  |          |  |          |     |          |                       |       |  |
| 4                          | PRECIPITATION<br>(based on resilientma.org climate data)   |  |  |  |          |  |          | LOW | MEDIUM   | HIGH                  | N/A   |  |
| a.                         | All/a portion of the site will in the foreseeable future be within a 1% flood hazard area                                  |  |  |  |          |  |          |     |          |                       |       |  |
| b.                         | Remediation of the site is likely to result in a net increase in impervious area   |  |  |  |          |  |          |     |          |                       |       |  |
| c.                         | All/a portion of the project is within 500 feet of a stream/river at risk of increased flooding in the foreseeable future. |  |  |  |          |  |          |     |          |                       |       |  |
| d.                         | Changes in precipitation leads to drought conditions   |  |  |  |          |  |          |     |          |                       |       |  |
| 5                          | Other based on resilientma.org climate data  |  |  |  |          |  |          | LOW | MEDIUM   | HIGH                  | N/A   |  |
| a.                         | Changes in exposure from vadose zone seasonal temperature increase   |  |  |  |          |  |          |     |          |                       |       |  |
| b.                         | Ecosystem/flora/fauna loss (invasive species)  |  |  |  |          |  |          |     |          |                       |       |  |
| c.                         | Increase in potential for wildfires  |  |  |  |          |  |          |     |          |                       |       |  |
| d.                         | Impact of remedial action on surrounding community related to heat island effects  |  |  |  |          |  |          |     |          |                       |       |  |



# Vulnerability Assessment Checklist

| D.       |  | SENSITIVITY CONSIDERATIONS |               |             |            |
|----------|--|----------------------------|---------------|-------------|------------|
| <b>1</b> | <i>Altered contaminant fate and transport</i>  | <b>LOW</b>                 | <b>MEDIUM</b> | <b>HIGH</b> | <b>N/A</b> |
| a.       | Physical characteristics of site contaminants of concern (CoCs) support increased transport climate risk               |                            |               |             |            |
| b.       | Chemical characteristics of site CoCs support increased transport climate risk   |                            |               |             |            |
| c.       | Site specific physical/chemical/biological traits increase risk of climate enhanced transport?                         |                            |               |             |            |
| d.       | Climate triggered substantial changes in groundwater elevation may impact fate and transport                           |                            |               |             |            |
| e.       | Foreseeable future groundwater elevation changes may increase transport of CoCs (including LNAPL)                      |                            |               |             |            |
| <b>2</b> | <i>Moderate to severe equipment/building/infrastructure impacts</i>  | <b>LOW</b>                 | <b>MEDIUM</b> | <b>HIGH</b> | <b>N/A</b> |
| a.       | Climate impacts may affect/alter the functioning of remedial components  |                            |               |             |            |
| b.       | Impacts to utilities and infrastructure at the site or essential to the remedy   |                            |               |             |            |
| c.       | Site conditions limit ability for adaptive site management to mitigate climate risk                                    |                            |               |             |            |
| <b>3</b> | <i>Moderate to severe human health/demographic impacts</i>   | <b>LOW</b>                 | <b>MEDIUM</b> | <b>HIGH</b> | <b>N/A</b> |
| a.       | Localized impacts to health and safety of site occupants and abutters as a result of climate-based changes at the site |                            |               |             |            |
| b.       | Increase in airborne dust exposure due to drought and/or temperature increase  |                            |               |             |            |
| c.       | Cummulative effects on local environmental justice community as a result of the remedial action                        |                            |               |             |            |
| <b>4</b> | <i>Moderate to severe wildlife/ecosystem impacts</i>   | <b>LOW</b>                 | <b>MEDIUM</b> | <b>HIGH</b> | <b>N/A</b> |
| a.       | A climate impact on the remedial solution may result in new risks to sensitive habitat(s).                             |                            |               |             |            |

# Vulnerability Assessment Checklist

| E. CONSIDERATIONS FOR CLIMATE CHANGE IMPACTS ON GROUNDWATER    |  |     |        |      |     |
|--|--|-----|--------|------|-----|
| 1 Significant impacts to groundwater elevation                 |  | LOW | MEDIUM | HIGH | N/A |
| a.   | Increased or decreased rainfall  |     |        |      |     |
| b.   | Increases/decreases in water levels at hydrologic boundaries                                   |     |        |      |     |
| c.   | Impact of future off-site mitigation measures  |     |        |      |     |
| d.   | Increased Evapotranspiration/decreasing recharge   |     |        |      |     |
| e.   | Episodic elevated groundwater elevation due to high precipitation events                       |     |        |      |     |
| d.   | Impact on groundwater monitoring wells   |     |        |      |     |
| e.   | Saltwater intrusion  |     |        |      |     |
| d.   | Potential long term regional changes   |     |        |      |     |
| 2 Significant impacts to direction of flow                     |  | LOW | MEDIUM | HIGH | N/A |
| a.   | Increases/decreases in water levels at hydrologic boundaries                                   |     |        |      |     |
| b.   | Impact on sources or sinks in area   |     |        |      |     |
| c.   | Creation/elimination of preferential pathways  |     |        |      |     |
| d.   | Impacts of changes in stormwater management  |     |        |      |     |
| 3 Significant impacts to fate and transport of contamination   |  | LOW | MEDIUM | HIGH | N/A |
| a.   | Inundation of previously unsaturated soils   |     |        |      |     |
| b.   | Increased temperatures resulting in enhanced vapor migration                                   |     |        |      |     |
| c.   | Changes in groundwater chemistry   |     |        |      |     |
| 4 Likelihood of significant impacts to effectiveness of remedy |  | LOW | MEDIUM | HIGH | N/A |
| a.   | Impact on capture zone   |     |        |      |     |
| b.   | Changes in effectiveness of vadose zone treatment (SVE, bioventing)                            |     |        |      |     |
| c.   | Impacts on in-situ treatment - groundwater chemistry, saturated thickness, natural attenuation |     |        |      |     |

# Vulnerability Assessment Checklist

| F. CONCLUSION |   |     |    |
|---------------|---|-----|----|
|               | <p>The site <b>"may be"/ "will be"/ "is likely to be"</b> vulnerable to climate change:</p> <p><i>LSP to pick applicable wording; add summary discussion to CSM and other applicable sections in MCP deliverable.</i></p> <p><i>If "Yes," describe any adjustments to the remedy that have been made to address the potential impacts in the appropriate response action submittal.</i></p> | Yes | No |

# Climate Tools & Resources

## Forecasts, Models, Vulnerability Assessments & Resilience BMPs

### State Climate Change Clearinghouse -

#### [ResilientMA.org](http://ResilientMA.org)

- Provides “best science and data on expected climate changes”
- Multi-model climate forecasts developed by Northeast Climate Adaptation Science Center – UMass Amherst (NECASC)
- Links to [SHMCAP](#), [MVP](#) and [Interactive Map](#) (**CTRL F5**) & [Tutorial](#)

### Resilient MA Action Team (RMAT) -

#### [RMAT Home](#) (DRAFT Climate Resilience Design Standards & Guidelines)

- [Project Overview](#) & [RMAT Fact Sheet](#)
- [Project Inputs and Risk Rating Output](#)
- [Climate Resilience Design Standards Outputs and Relationships for Sea Level Rise/Storm Surge, Precipitation, and Heat](#)
- [Guidelines and Best Practices Framework](#)



# Climate Tools & Resources (cont.)

## Forecasts, Models, Vulnerability Assessments & Resilience BMPs

### MA Office of Technical Assistance and Technology (OTA) -

[Mapping Toxics in Communities and Assessing Climate Vulnerability](#)

- Provides maps with various “sensitivity” layers

### Sustainable Remediation Forum (SURF)(EcoAdapt, BU, MassDEP) -

[Massachusetts Climate Change and Hazardous Waste Site Screening](#),  
2019

- “Exposure” models for floods, hurricanes, SLR (FEMA, NOAA)
- Incorporated environmental, demographic and 21E site-specific “Sensitivity” parameters (e.g., Open, Active, AEPMM, IH, CEP, AUL)

### Interstate Technology & Regulatory Council (ITRC) -

[Sustainable and Resilient Remediation \(SRR\) Team](#)

- [Final Guidance](#) published 4/28/21
- Resilience BMPs

# Climate Tools & Resources (cont.)

## Forecasts, Models, Vulnerability Assessments & Resilience BMPs

### USEPA -

[Superfund Climate Resilience webpage](#)

- Vulnerability Assessment
- Resilience Measures
- Adaptive Capacity

[Climate Smart Brownfields Manual](#) 6/21, EPA 560-F-21-002

### MassDOT-FHWA (WoodsHole, UMassB, UNH) -

[Pilot Project Report](#): Climate Change and Extreme Weather Vulnerability Assessments And Adaptation Options for the Central Artery, 2015

- Probabilistic Hydrodynamic Modeling (ADCIRC, SWAN)

### First Street Foundation -

[Defining America's Flood Risk](#)

- Collaboration of 80 of the world's leading hydrologists, researchers and data scientists
- Property-by-property flood forecast maps for whole country (LISFLOOD-FP, GeoCLAW, ADCIRC-SWAN)





# Climate Tools & Resources (cont.)

## Forecasts, Models, Vulnerability Assessments & Resilience BMPs

### FEMA -

#### [National Risk Index](#)

- Natural hazard risk metrics for 18 natural hazards
- County and census tract level

### CZM -

#### [Massachusetts Sea Level Affecting Marshes Model \(SLAMM\) Viewer](#)

- Effects of SLR on marshes

### ASTM -

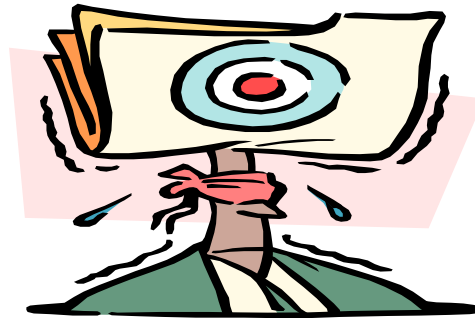
#### [Standard Guide for Remedial Action Resiliency to Climate Impacts](#)

ASTM E3249 - 21

# Next Steps

- Finalize MCP Amendments (Fall 2021)
- LSPA Climate Change Subcommittee: Q&A, Flow Chart, Glossary, Checklist (public comment)  
(next meeting Tues June 29 at 8:30am)
- Continue engagement with EOEEA and technical developers (RMAT Tools & Training coming Summer/Fall 2021)
- 21E Case Studies

# Climate Change and the MCP: Status Update Questions?



[climatechange@lspa.org](mailto:climatechange@lspa.org)

[lspacimatechangesubcommittee@woodardcurran.com](mailto:lspacimatechangesubcommittee@woodardcurran.com)

Ken Marra, PE

Massachusetts Department of Environmental Protection  
Bureau of Waste Site Cleanup

[Kendall.Marra@mass.gov](mailto:Kendall.Marra@mass.gov)

# MassDEP Waste Site Cleanup Advisory Committee

June 24, 2021, 9:00 am

*(times are approximate)*

- 9:00 General Update, *post*-COVID State-of-Emergency Operations  
- Paul Locke
- 9:20 MCP Amendments, CAM Method Revisions, Data Quality Follow-up  
- Liz Callahan
- 9:30 Grant Updates
  - Technical Assistance Grants – Nancy Fitzpatrick
  - Marine Oil Spill Act Grant Awards – Julie Hutcheson
- 9:45 Assessing Climate Vulnerability at 21E Sites  
- Susan Chapnick & Marilyn Wade, LSPA Climate Change Subcommittee
- 10:15 Commonwealth's Efforts to Address PFAS & Relationship to Work at 21E Sites - Paul Locke

---

*(Each item followed by opportunity for comments & questions)*



# Summer Schedule\*

## LSPA Climate Change Subcommittee

- Tuesday June 29<sup>th</sup> @ 8:30am
- See [https://www.lspa.org/technical-practices#climate\\_change](https://www.lspa.org/technical-practices#climate_change)

## Data Quality Discussion

- Monday, July 26<sup>th</sup> @10:00
- Interesting in attending? Email [BWSC.CAM@mass.gov](mailto:BWSC.CAM@mass.gov)

## BWSC Office Hours

- Thursday, July 29<sup>th</sup> @ 9:00 am
- Thursday, August 26<sup>th</sup> @ 9:00 am
- See:  
<https://www.mass.gov/how-to/attend-the-next-massdep-bwsc-office-hours>

## BWSC Advisory Committee

- Thursday, September 23<sup>rd</sup> @ 9:00 am
- See:  
<https://www.mass.gov/how-to/attend-the-next-massdep-bwsc-advisory-committee-meeting>

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\*See also: <https://www.mass.gov/massdep-meetings-events-hearings>



# PFAS in Massachusetts

*June 24, 2021*

*Overview of some of the things we're working on*

Paul Locke

Assistant Commissioner

MassDEP Bureau of Waste Site Cleanup



# Many of The Basic Questions Remain

- What's out there?
- Where did it come from?
- Who is being exposed?
- What can we do about it?

MassDEP is participating in the Legislature's **PFAS Interagency Task Force** efforts to address PFAS in Massachusetts in a thoughtful, consistent and protective way.



[Bills & Laws](#)[Budget](#)[Legislators](#)[Hearings & Events](#)[Committees & Commissions](#)[State House](#)

## PFAS INTERAGENCY TASK FORCE



### Address

24 Beacon St. [📍](#)  
Boston, MA 02133

### UPCOMING HEARINGS

No Upcoming Hearings.

[Members](#)[Hearings](#)[Documents](#)

|   | Date      | Time     | Topic   | Location        | Status    | Bills |
|---|-----------|----------|---|-----------------|-----------|-------|
| ★ | 6/1/2021  | 10:00 AM | PUBLIC HEARING NOTICE Inaugural meeting of the PFAS Interagency Task Force, including a briefing from the Massachusetts Department of Environmental Protection.   | Virtual Hearing | Completed |       |
| ★ | 6/15/2021 | 10:00 AM | PUBLIC HEARING NOTICE Second meeting of the PFAS Interagency Task Force to discuss "What PFAS chemicals are and where they are found" Including presentations by the American Chemistry Council, Professor Alicia Timme-Laragy (UMass Amherst), | Virtual Hearing | Completed |       |

<https://malegislature.gov/Commissions/Detail/556>

MassDEP

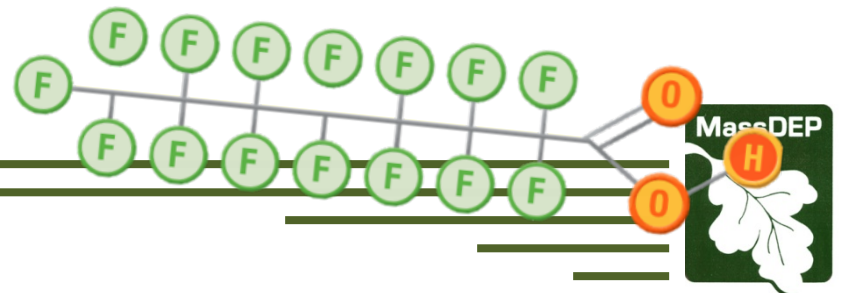




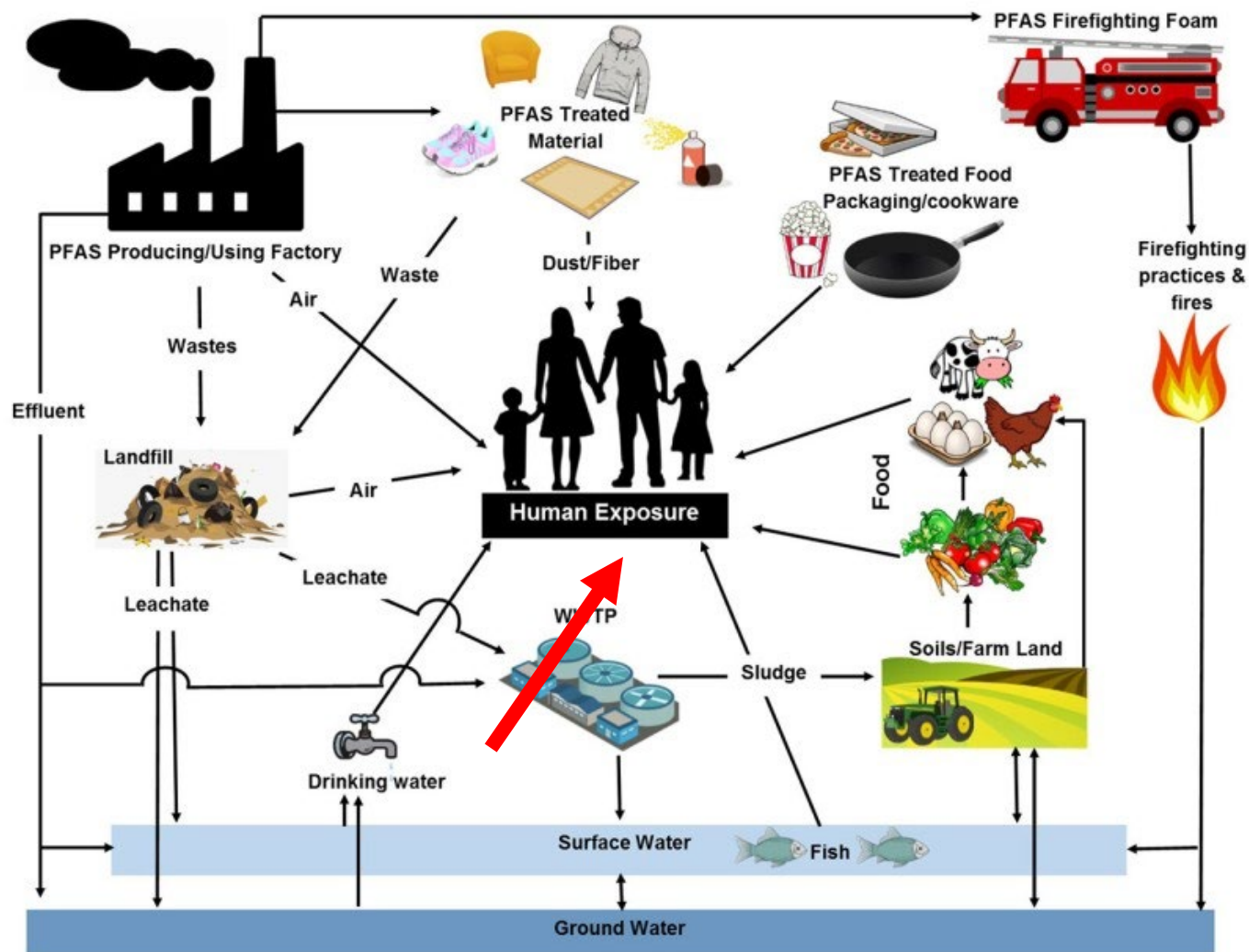
# What are PFAS?

PFAS are Per- and polyfluoroalkyl substances:

- Man-made chemicals
- Used in stain-resistant, water-resistant, and non-stick products, firefighting foams, food packaging, outdoor clothing, carpets, leather goods, ski waxes, and more.
- Persistent in the environment, leaching into groundwater from spills, landfills, air deposition.
- Linked to health risks, particularly in immunocompromised individuals, women who are pregnant or nursing, and infants



# Environment & Human Exposure to PFAS



*Human Exposure and sources of PFAS  
Image: DWP, adapted from Oliaei et al. 2013.*

# MassDEP Addressing PFAS

## May 2016

USEPA issued a health advisory of 70 ppt for the sum of two PFAS compounds in drinking water

## June 2018

MassDEP ORS issued a drinking water guidance for the sum of five PFAS compounds of 70 ppt

## January 2019

MassDEP revised the ORS Guideline for the sum of six PFAS compounds to 20 ppt to align with anticipated regulations

## December 2019

MassDEP issues final rules for soil & groundwater cleanup under the Massachusetts Contingency Plan (MCP)

## October 2020

MassDEP issues final drinking water regulations establishing a Maximum Contaminant Level (MCL) of 20 ppt

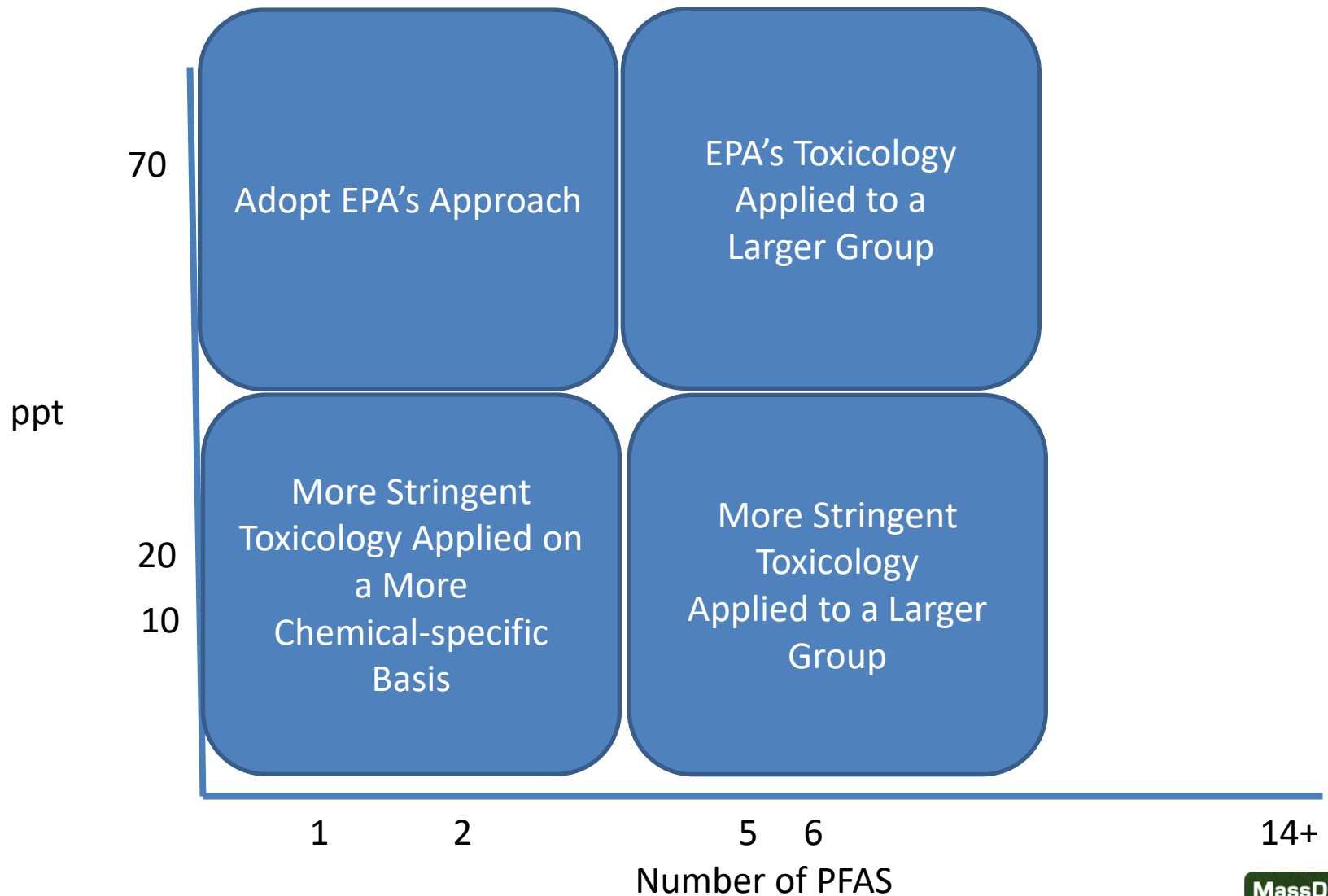


# Drinking Water Values for PFAS (ppt) by state

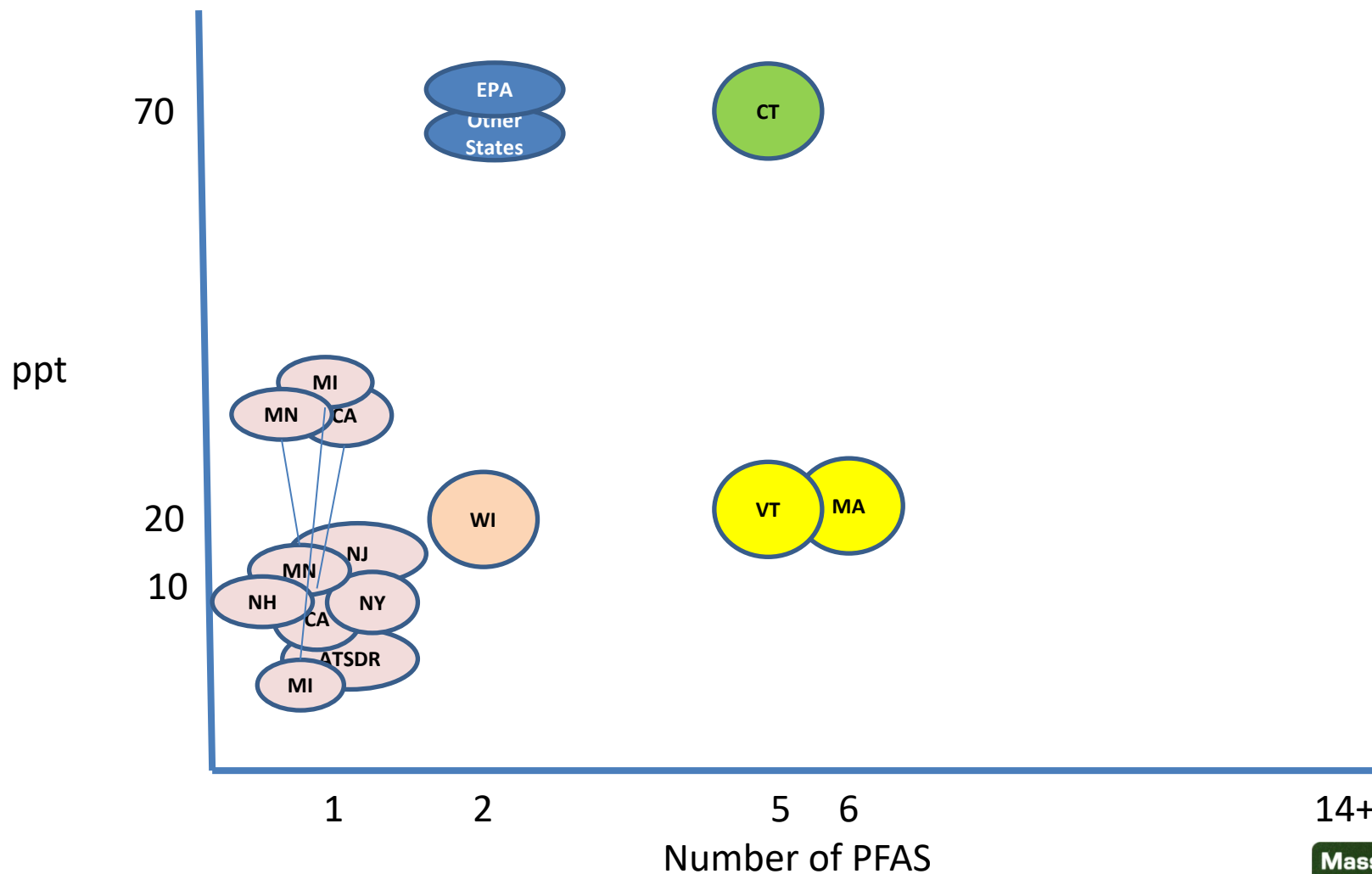
|   | PFOS   | PFOA                      | PFNA      | PFHxS     | PFHpA     | PFDA                          |
|---|--|---------------------------|-----------|-----------|-----------|-------------------------------|
| <b>U.S. EPA</b>   | <b>70</b>  |                           | <b>NA</b> | <b>NA</b> | <b>NA</b> | <b>NA</b>                     |
| Health Advisory   | Sum of two   |                           |           |           |           |                               |
| <b>MA MCL, GW standard</b>  | <b>70 (2018 ORSG) → 20 (MCL; MCP GW standard)</b><br><b>Sum of five → Sum of six (add PFDA)</b><br><b>MCL October 2020: Sum of six PFAS = 20</b> |                           |           |           |           |                               |
| <b>VT MCL</b>   | <b>20 Sum of five</b>  |                           |           |           |           | <b>NA</b>                     |
| <b>CT Action Levels</b>   | <b>70 Sum of five</b>  |                           |           |           |           | <b>NA</b>                     |
| <b>WI Recommended GW standard</b>   | <b>20</b>  |                           |           |           |           |                               |
| <b>ATSDR</b> Based on draft ATSDR toxicity values and EPA exposure parameters | <b>7</b>   | <b>11</b>                 | <b>10</b> | <b>70</b> | <b>NA</b> | <b>NA</b>                     |
| <b>NY MCL</b>   | <b>10</b>  | <b>10</b>                 | <b>NA</b> | <b>NA</b> | <b>NA</b> | <b>NA</b>                     |
| <b>NJ MCL</b>   | <b>13</b>  | <b>14</b>                 | <b>13</b> | <b>NA</b> | <b>NA</b> | <b>NA</b>                     |
| <b>CA Notification levels</b><br>(Response Levels)                            | <b>6.5</b><br><b>(40)</b>  | <b>5.1</b><br><b>(10)</b> | <b>NA</b> | <b>NA</b> | <b>NA</b> | <b>NA</b>                     |
| <b>MI MCL</b>   | <b>16</b>  | <b>8</b>                  | <b>6</b>  | <b>51</b> | <b>NA</b> | <b>PFNA value recommended</b> |
| <b>MN guidelines</b>  | <b>15</b>  | <b>35</b>                 | <b>NA</b> | <b>47</b> | <b>NA</b> | <b>NA</b>                     |
| <b>NH MCL</b>   | <b>15</b>  | <b>12</b>                 | <b>11</b> | <b>18</b> | <b>NA</b> | <b>NA</b>                     |
| <b>Most other states (EPA value by default)</b>                               | <b>70</b>  |                           | <b>NA</b> | <b>NA</b> | <b>NA</b> | <b>NA</b>                     |



# Drinking Water Values for PFAS (ppt) by state



# Drinking Water Values for PFAS (ppt) by state



# MassDEP PFAS Regulations

## Soil & Ground Water (MCP)

[310 CMR 40.0000](#)

Effective 12/27/19

MA is one of a small number of states with comprehensive cleanup standards for both soil and groundwater.

Parties responsible for soil and groundwater contamination will be required to cleanup groundwater that could be used as drinking water to meet the 20 ppt standard

## Drinking Water (MCL)

[310 CMR 22.00](#)

Effective 10/2/20

Establishes a limit of 20 ppt for the sum of six PFAS compounds (PFAS6), providing a higher degree of protection than any other state

Requires public water suppliers to test for PFAS6 on a quarterly basis and act when there is a detection above the limit; implementation staggered based on community public water supplier size





# PFAS & Waste Site Cleanup

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



A tanker truck filled with gasoline crashed on Route 24, Fall River. Fire crews used foam to extinguish the truck fire. (January 27, 2014)





# PFAS – Site Cleanup

- “Normalizing” PFAS-related site work under the Massachusetts Contingency Plan, 310 CMR 40.0000.
  - Promulgated notification criteria & cleanup standards for soil and groundwater (December 2019)
  - Published PFAS Sampling Guidance (2018, revised 10/2020)
- Provided technical & logistical support to MassDEP PFAS-initiatives, including access to contract labs.



# PFAS – Site Discovery & Cleanup

- Sites generally identified either:
  - PWS sampling finds problem, 21E source discovery works backwards to find a source (e.g., Barnstable Fire Training Academy);
  - Known sites start sampling for PFAS and find it (e.g., former Fort Devens); or
  - Property use indicates it is a potential source, *due diligence* sampling identifies PFAS problem (e.g., Martha's Vineyard Airport).
- Predominant sources (so far):
  - AFFF Firefighting Foam
    - Department of Defense (e.g., Joint Base Cape Cod; former Fort Devens; former South Weymouth Naval Air Station)
    - State/Municipal Fire Training & Incident Response (e.g., Massachusetts Firefighting Academy (Stow); Town of Princeton, Revere response to overturned gasoline tanker truck)
    - Airports (Martha's Vineyard, Nantucket, Barnes ANG Base)
  - Commercial/Industrial Sources (Hudson)
  - Unknown (as yet)...



# AFFF Takeback Program 2018 - present

- Partnered with the Department of Fire Services (DFS)
- ~200,000lbs from 75+ public safety agencies (~ \$213,000)
- 149,016 pounds (17,531 gallons) removed and disposed
- Partnered with CT DEEP to research “Fluorine-Free” Foam
- Ongoing work with DFS





# PFAS & Drinking Water

# PFAS6 Drinking Water Standard

- Regulations establish a new MCL: highest level of a contaminant allowed in drinking water. MCLs are enforceable standards
- Program Review: MassDEP required to review regulations every three years to ensure we are incorporating, reflecting, responsive to the latest science.
- “PFAS6” MCL is 20 ppt for the sum of six PFAS compounds
  - PFOS: perfluorooctane sulfonic acid
  - PFOA: perfluorooctanoic acid
  - PFHxS: perfluorohexane sulfonic acid
  - PFNA: perfluorononanoic acid
  - PFHpA: perfluoroheptanoic acid
  - PFDA: perfluorodecanoic acid
- No federal standard: PFOS and PFOA health advisory only





# Ongoing Evaluation

- MCL requires reassessment at least every three years
  - Reflects rapidly expanding scientific data
  - Potential updates to current regulation covering subclass of six PFAS
  - Potential expansion to include guidelines for additional PFAS
    - Some other states have developed, or are considering, values for PFBA; PFBS; PFHxA; GenX
- ORS developing database and tracking scientific developments
  - Including carcinogenicity data



# MCL Applicability to Public Water Systems

## MCL applies to:

- Community Water Systems (year-round residential customers)
- Non-transient, Non-Community Water Systems (NTNCs)
  - Schools/Daycares, Larger Businesses (25+ employees)

## MCL does not apply to:

- Transient, Non-Community Water Systems (TNCs)
  - Recreational Areas, Campgrounds, Hotel/Motels, Small Businesses
  - But they must collect one sample
- Consecutive Systems (those that purchase all their water)



# State Funding for PFAS Remediation

- Funding provided by two supplemental budgets: [Chapter 142 of the Acts of 2019](#) and [Chapter 31 of the Acts of 2020](#))
- \$8.4M for PWS testing and treatment design, including reimbursement for costs already incurred, including three rounds of grant funding:
  - PFAS Design Grants #1 - \$1.98M to 10 PWS
  - PFAS Design Grants #2 - \$3M for 17 PWS
  - 1<sup>st</sup> Interim PFAS6 Response Grants – 7/8/21 application deadline
- State funding for Public Water Supply Testing
- Free Private Well Drinking Water testing -





# State Funding for PFAS Remediation

- Clean Water Trust; State Revolving Fund
  - Priority funding; 0% loans
  - \$180 million in SRF financing for 16 projects to date



# MassDEP PWS Story Map

582/1624 PWS Systems Tested (so far)  
55 PWS (COM, NTNC and TNC) with results >20 ppt

## 2 Testing

## 3 Public Water Systems Free Testing

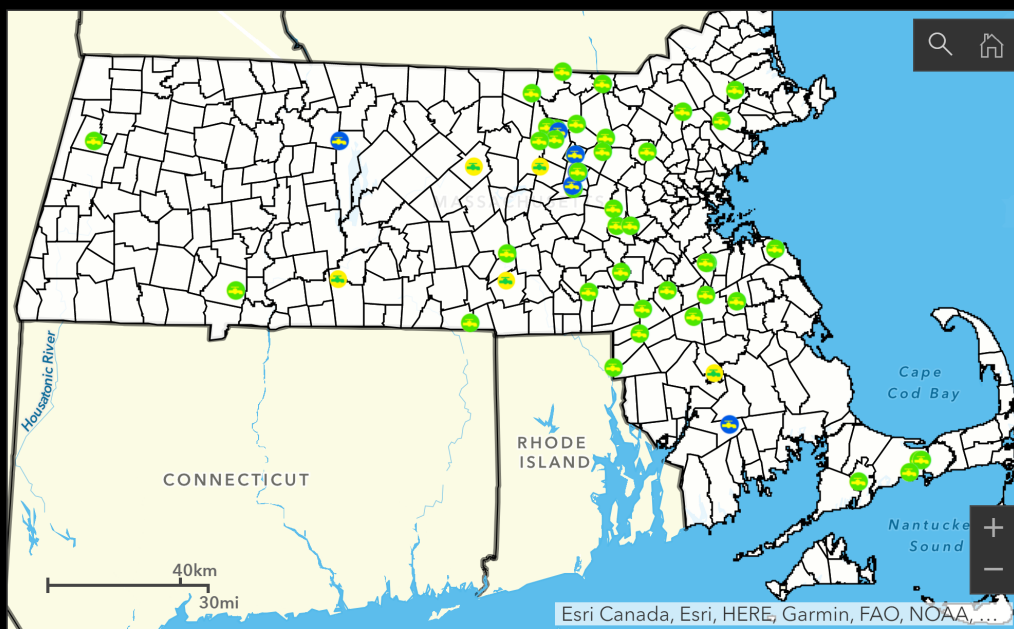
## 4 PFAS detections and responses by public water systems

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.



### 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 th...



#### PWS detected PFAS6 above 20 ppt

Abington/Rockland Joint Water Works

Acton Water District

Aquarion Water Company, Millbury

Ayer DPW Water Division

Ayer Road Properties, LLC

Barnstable Fire District Water Department

Bedford Water Dept

Bellingham Water Dept

Bolton Orchards

Braintree Water Dept

Brockton Water Department

Last update: a few seconds ago

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



# Private Wells PFAS Sampling Program

- Announced in November 2020, a free sampling and analysis program for PFAS in 84 communities where 60% or more of residents are served by private wells
- Private wells are regulated by local Boards of Health (overseen by MassDPH) – MassDEP partnering with BOHs, municipal officials, and UMass for the program
- 1,480 homeowners in 63 communities have applied for free sampling; 95% of the results are below the MCL



# Private Wells PFAS Sampling Program

Alford  
Aquinnah  
Ashby  
Ashfield  
Becket  
Belchertown  
Berkley  
Berlin  
Bolton  
Boxborough  
Boxford  
Brimfield  
Buckland  
Carlisle  
Carver  
Charlemont  
Charlton  
Chesterfield  
Clarksburg  
Colrain  
Conway  
Dover\*  
Dunstable

Erving  
Florida  
Freetown  
Goshen  
Granby  
Granville  
Hampden  
Harvard  
Hawley  
Heath  
Holland  
Hubbardston  
Lakeville  
Leverett  
Leyden  
Mendon  
Middlefield  
Millville  
Monterey  
Montgomery  
Mount Washington  
Nantucket  
New Ashford

New Braintree  
New Marlborough  
New Salem  
Newbury  
Oakham  
Otis  
Pelham  
Peru  
Petersham  
Phillipston  
Plainfield  
Plympton  
Princeton  
Rehoboth  
Richmond  
Rochester  
Rowe  
Royalston  
Sandisfield  
Savoy  
Shelburne  
Sherborn  
Shutesbury

Stow  
Sutton  
Tolland  
Truro  
Tyngsborough  
Tyringham  
Wales  
Warwick  
Washington  
Wellfleet  
Wendell  
West Tisbury  
Westhampton  
Westport  
Windsor

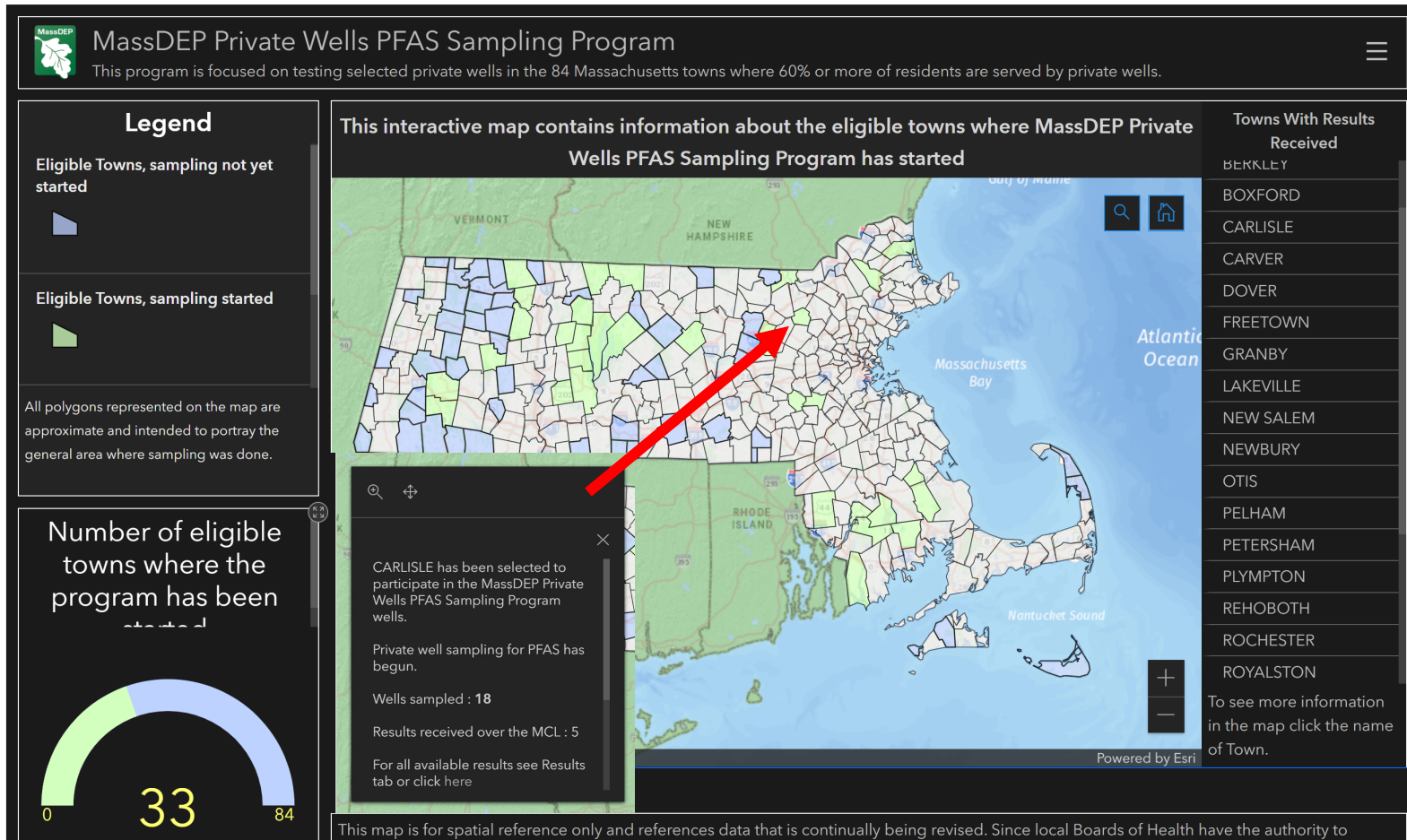


# MassDEP Private Well Story Map

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

234 results/ 1,820 homeowners applied (so far)

65% ND ... 23% <10 ppt; ... 7% ,<20 ppt; ... 5% >20 ppt





# PFAS & Wastewater

# EPA/MassDEP PFAS Permit Requirements for Municipal and Industrial Discharges

- Monitoring
  - Municipal WWTPs
    - Quarterly influent, effluent, and sludge samples
    - Annual effluent samples from industrial facilities discharging to WWTP
  - Industrial
    - Quarterly effluent samples
- EPA Timing
  - Conditions go into effect 6 months after EPA's multi-lab validated method for PFAS in wastewater is made available



# MassDEP's Additional PFAS Conditions in Wastewater Permits

- Industrial Dischargers' Permit Source Reduction
  - Within 6 months of effective date of permit must evaluate use of PFAS-containing products and whether use can be reduced or eliminated
  - EEA Office of Technical Assistance to work directly with industrial dischargers and industrial facilities discharging into municipal WWTPs
- MassDEP Timing
  - Most facilities: monitoring begins 6 months after EPA's multi-lab validated method for PFAS in wastewater is available, **or 2 years from the effective date of the permit**, whichever is earlier
  - For facilities discharging upstream of drinking water intakes, effluent monitoring begins **180 days** after the effective date of the permit







# PFAS & Residuals

# PFAS in Residuals: Context

- Wastewater residuals: 38% reused as fertilizer in MA
- MassDEP regulates 35 entities that land apply residuals
- PFAS Testing: quarterly requirement for residuals that are land applied (as of July 2020)
- No EPA lab method; MassDEP approves individual methods
- No land application standards; MassDEP evaluating options and consulting with stakeholders
- Alternative disposal alternatives include landfill, incineration, export
- Policy issues
  - Impacts of PFAS on water, crops, biota
  - Impacts of regulating reuse and reuse market disruption



# PFAS in Residuals: MassDEP Actions

- Stakeholder Process
  - Industry groups, AOS holders, environmental advocacy organizations, health advocacy organizations, academic researchers, agriculture groups, and other state agencies
  - First meeting held in September. Gathering information and perspectives
- Technical work underway
  - Leachate model
  - Review of others' research/coordination with other states
  - Technical subcommittee meeting
  - Establish screening values
- Goal: develop interim screening levels







# PFAS & Surface Waters



# PFAS in Rivers: Monitoring & Characterization

- MassDEP partnering with U.S. Geological Survey
- Collected and analyzed riverine water samples for 24 PFAS compounds
- Sampling sites upstream and downstream of wastewater treatment facilities, downstream of industrial areas, and where no known PFAS sources are expected
- 3 rounds of monthly sample collection
- Report expected mid-year in 2021





al away from the water in order to

**ACTIVE INGREDIENTS:**

3-Phenoxybenzyl-(1RS, 3RS; 1RS, 3SR)-2,2-dimethyl-3-(2-methylprop-1-enyl) cyclopropanecarboxylate .. 100

\* Piperonyl Butoxide, Technical.....

**\*\* OTHER INGREDIENTS**

\* Equivalent to 8.00% (butylcarbityl) (6-propylpiperidine) 2.00% related compounds

\*\* Contains a petroleum distillate

Contains 0.74 pounds of Technical S

Technical Piperonyl Butoxide/Chlorpyrifos

SUMITHRIN®- Registered trade

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

**Product Name: Anvil 10+10 ULV**

**EPA Registration Number: 8329-62**



# PFAS in Pesticide Containers

# Anvil 10+10 and Other PFAS Testing

- Adult mosquitocide used for EEE spraying
- PEER (NGO) tested samples and detected PFAS; MassDEP followed with its own testing in fall 2020
- EPA conducted testing on containers, which were determined to be the source
- Spring 2021: MassDEP working with MDAR to test other pesticide products



# Questions or Comments?

- Advisory Committee members may unmute yourself
- Audience members may digitally raise your hand

