



# PFAS Today, Tomorrow, and Forever

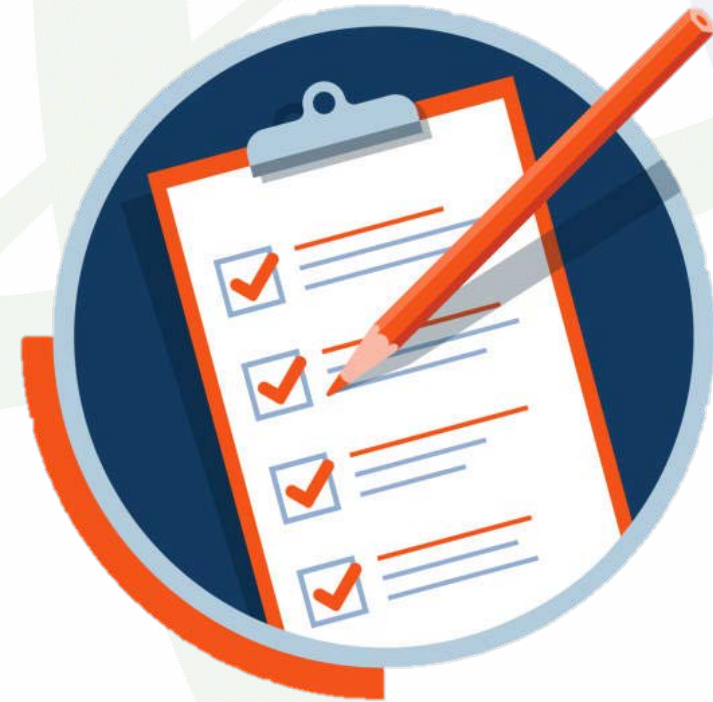
## MCLs are Here...What Now?

Will Shaffer, PE

June 11, 2024

# Agenda

- Introduction
- Regulatory Overview
- UCMR5 Results
- Final MCLs
- Regulatory Requirements
- Funding Options
- Impact on POTWs



The background of the slide is a 3D molecular model. It consists of numerous blue, reflective spheres representing atoms, connected by thin, metallic-looking rods representing chemical bonds. The structure is complex and interconnected, filling the entire frame. The lighting creates highlights and shadows on the spheres, giving it a three-dimensional appearance.

# **Introduction**

# Introduction

## EEC Environmental

- National environmental engineering consultant
- Chemists, engineers, geologists, hydrogeologists, regulatory and compliance specialists
- PFAS treatment experts

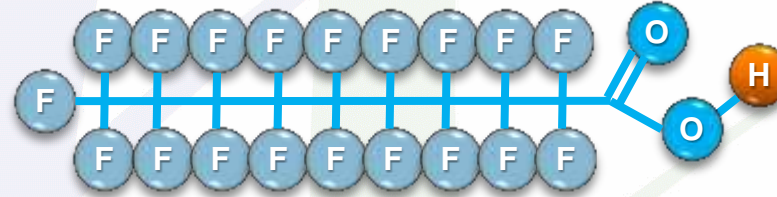
## PFAS Services

- Site assessment and remediation
- PFAS characterization and planning
- Treatment system design
- Owner's representative consultant
- Expert witness



Will Shaffer, PE  
Project Engineer

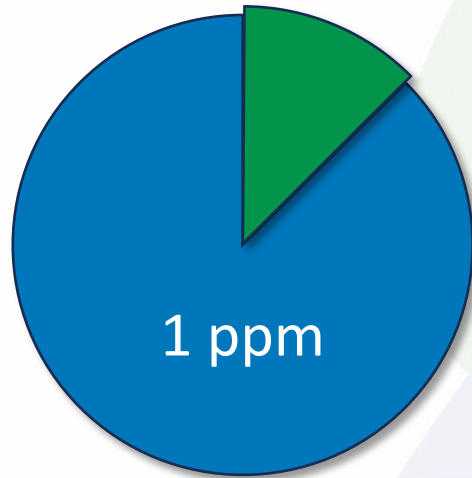
# PFAS 101



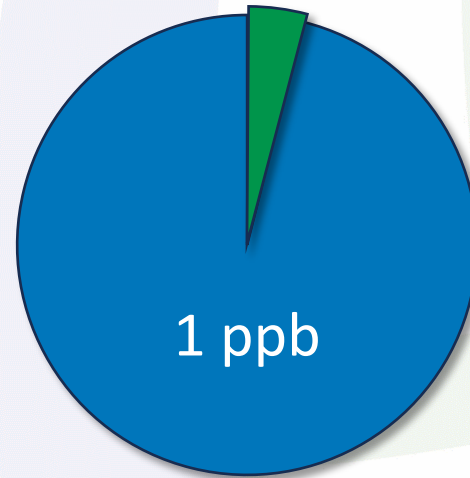
- Broad class of manufactured chemicals used to make products that resist heat, oils, grease, stains, & water
- Teflon™ coated cookware, carpets, clothing, paper packaging for food, fire retardants, AFFF
- First developed in 1940s
- Over 5,000 PFAS compounds (terminal and precursors)
- Extremely stable in environment and can be found in soil, air, dust, surface water, groundwater, wastewater plant effluent, sewage sludge and landfills **“Forever Chemicals”**



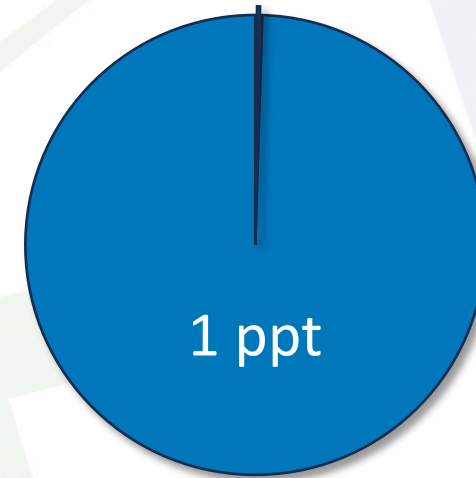
# PFAS Concentration Units: ppt



1 ppm (part per million)  
1 milligram per liter, mg/L  
1 second in 11.5 days



1 ppb (part per billion)  
1 microgram per liter,  $\mu\text{g/L}$   
1 second in 31.7 years

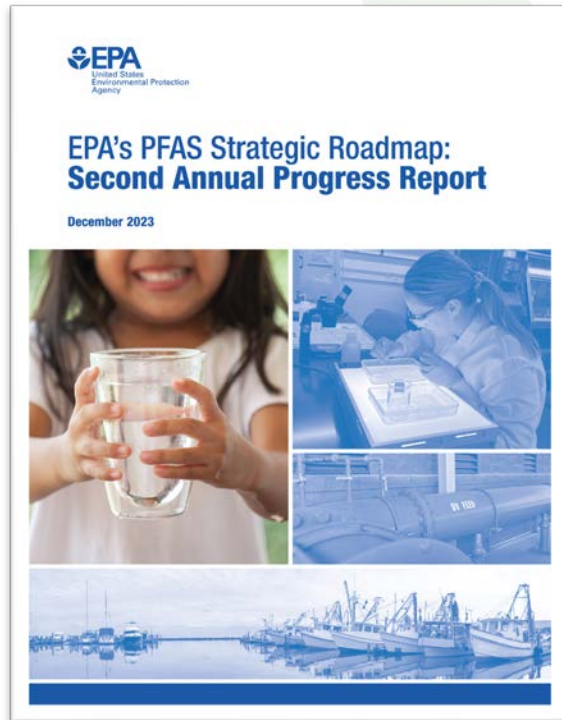


1 ppt (part per trillion)  
1 nanogram per liter, ng/L  
1 second in 31,700 years  
1 drop in 20 Olympic pools  
 $\frac{1}{2}$  tsp in SoFi Stadium



# **Regulatory Overview**

# EPA PFAS Strategic Roadmap





# EPA PFAS Strategic Roadmap

## Key Actions



Fall  
2021

Nationwide  
monitoring  
(UCMR5)

March  
2023

Propose PFAS  
MCLs for six  
constituents

January  
2024

Propose nine  
PFAS as RCRA  
hazardous  
constituents

April  
2024

Adopted  
PFAS MCLs  
for five  
constituents<sup>1</sup>

April  
2024

Adopted  
PFOS and  
PFOA as  
hazardous  
substances  
(CERCLA)

Summer  
2024

Adopt  
Effluent  
Limitation  
Guidelines  
(ELGs) for  
nine  
industrial  
categories  
and landfills.

Winter  
2024

Finalize risk  
assessment  
for PFOA and  
PFOS in  
biosolids to  
determine  
whether  
regulation is  
appropriate

<sup>1</sup> PFOA, PFOS, PFNA, PFHxS, HFPO-DA (GenX), Hazard Index  
Value Calculation for PFNA, PFHxS, HFPO-DA and PFBS



## UCMR5 Results

# UCMR5 Scope and Data

## Scope at a Glance

January 2023 – December 2025

29 PFAS analytes

All Large PWS serving > 10,000 customers

All Small PWS serving 3,300 – 10,000 customers

About 800 Small PWS serving < 3,300

## Results at a Glance

Data released quarterly – 35% of data released so far  
UCMR5 Data Finder for latest results

# Drinking Water with PFAS > MCLs

As of April 2024

	0-10,000 customers Small PWS	10,000+ customers Large PWS
Number of PWS Sampled	2,465	2,410
Number of PWS Total	17,194	4,589
PFOA > MCL	191 (7.7%)	379 (15.7%)
PFOS > MCL	209 (8.5%)	386 (16.0%)
GenX > MCL	2	3
PFNA > MCL	3	3
PFHxS > MCL	33 (1.3%)	58 (2.4%)
Exceedances (Percentage)	<b>283 (11.7%)</b>	<b>501 (20.8%)</b>

\*UCMR5 only applies to Non-Transient non-community systems

**Of those systems tested so far**

**1 in 5** Large PWS & **1 in 10** Small PWS nationally test above PFAS MCLs

or

**16.1%** of all PWS nationally currently test above PFAS MCLs

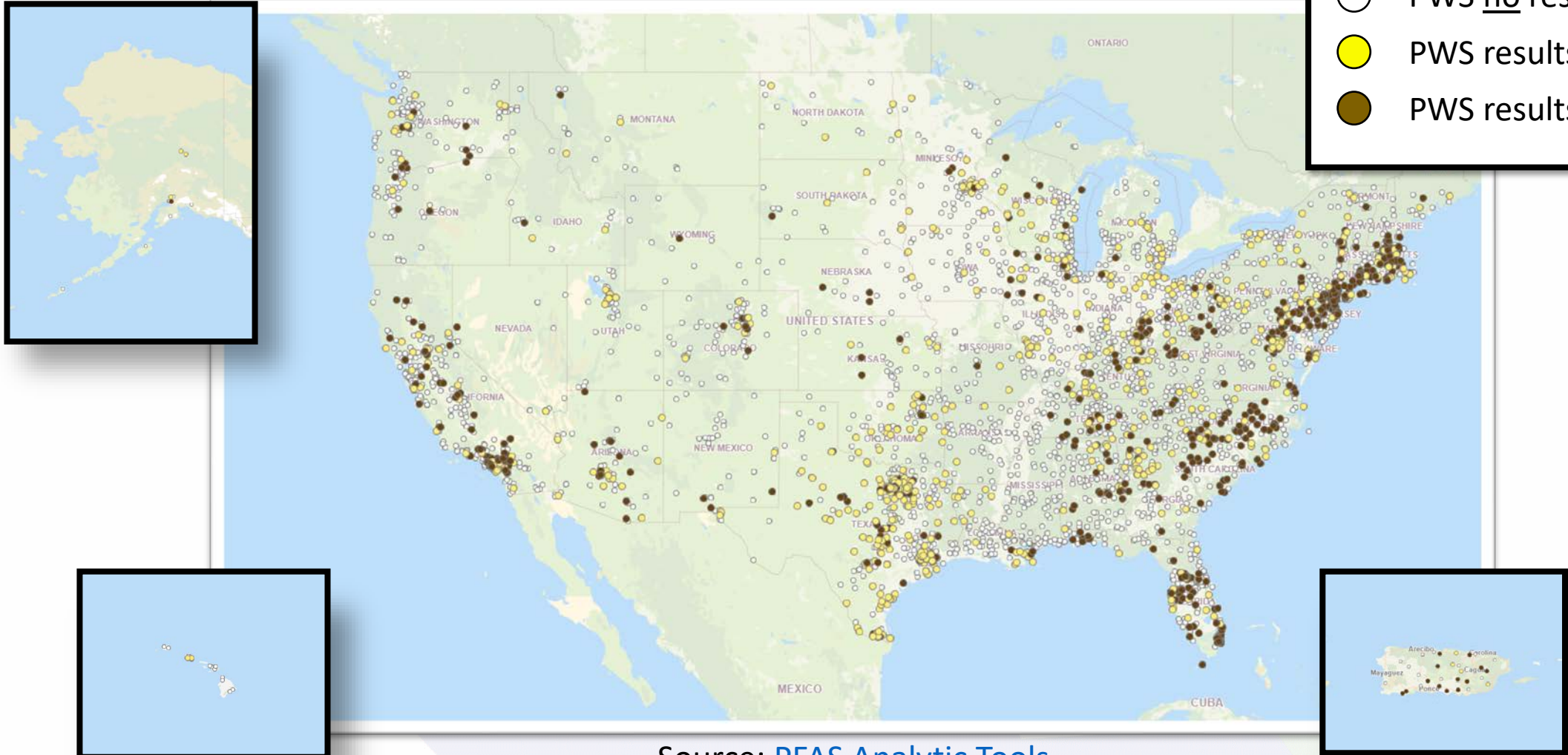


# Drinking Water with PFAS > MRLs

## As of April 2024

**Legend**

- PWS no results  $\geq$  MRL
- PWS results  $\geq$  MRL
- PWS results  $>$  HAL



Source: [PFAS Analytic Tools](#)



## Strategic Roadmap

Whole of government approach

## Key Regulations

Federal Drinking Water MCLs

CERCLA for PFOS/PFOA

## Impact

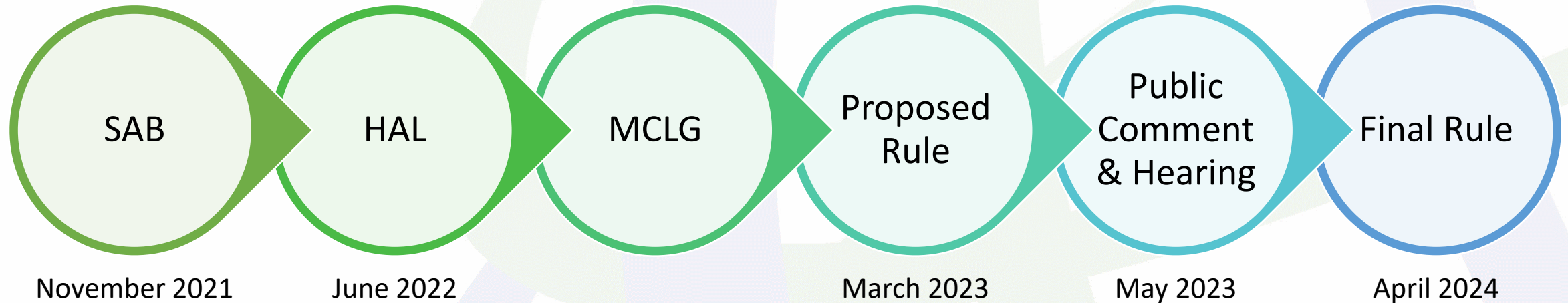
10-20% of PWS nationally

Potential Haz. Waste Liability



**Final MCLs**

# Flow of NPDWR Regulatory Processes



## **SAB: Science Advisory Board Review**

- Over 400 health studies found association of PFOA/PFOS exposure to adverse health effects

## **HAL: Health Advisory Level**

- PFOA = 0.004 ppt, PFOS = 0.02 ppt based on health effects

## **MCLG: Maximum Contaminant Level Goal**

- Public health goal without considering detection limits or treatment

## **Final Rule**

- As close to MCLG as possible while considering detection limits and treatment



# Drinking Water Standards in the US

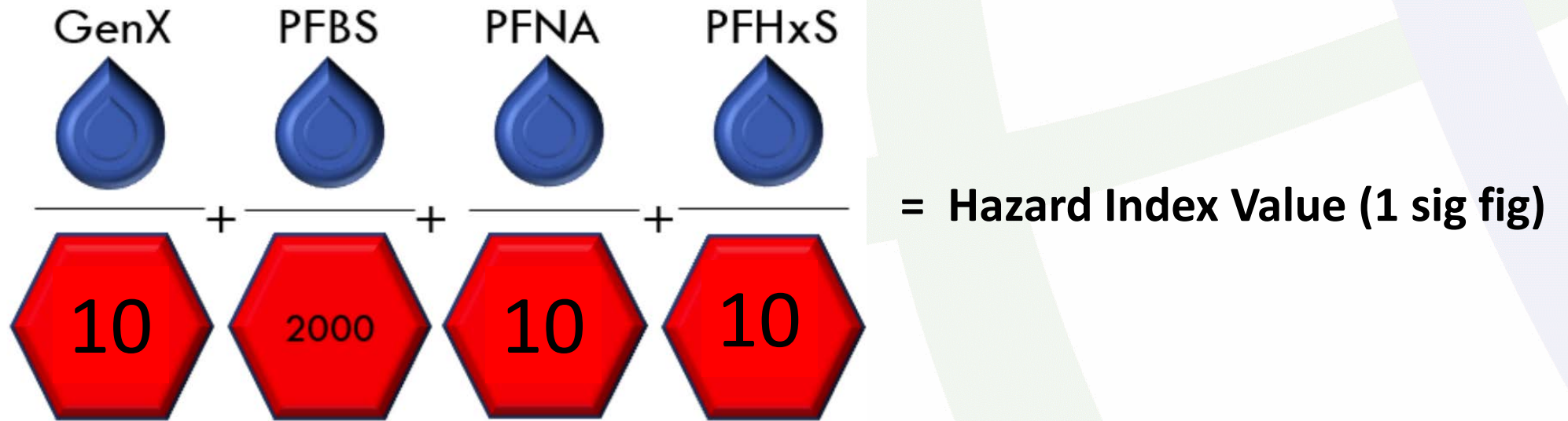
State	PFOS	PFOA	PFNA	PFHxS	HFPO-DA (GenX)	PFBS	PFHpA	PFHxA	PFDA
Massachusetts (MCL)	20	20	20	20			20		20
Michigan (MCL)	16	8	6	51	370	420		400,000	
New Hampshire (MCL)	15	12	11	18					
New Jersey (MCL)	13	14	13						
New York (MCL)	10	10							
Pennsylvania (MCL)	18	14							
Vermont (MCL)	20	20	20	20			20		
Wisconsin (MCL)	70	70							
<b>USEPA (MCL)</b>	<b>4.0</b>	<b>4.0</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>2000 *</b>			

Values in parts per trillion (ppt) or ng/L

This list is not exhaustive

\*No MCL for PFBS, but it is included along with PFNA, PFHxS, and HFPO-DA in a Hazard Index MCL calculation: Sum of fractions must not exceed 1

# Hazard Index (HI)



# Hazard Index (HI) MCL Calculation

## Examples

	<u>HFPO-DA</u>	<u>PFBS</u>	<u>PFNA</u>	<u>PFHxS</u>	<u>HI</u>	
Example 1:	$\left(\frac{0 \text{ ppt}}{10 \text{ ppt}}\right)$	$+$ $\left(\frac{200 \text{ ppt}}{2000 \text{ ppt}}\right)$	$+$ $\left(\frac{4 \text{ ppt}}{10 \text{ ppt}}\right)$	$+$ $\left(\frac{4 \text{ ppt}}{10 \text{ ppt}}\right)$	$= 0.9 = 0.9$	No exceedance of final Hazard Index MCL
Example 2:	$\left(\frac{5 \text{ ppt}}{10 \text{ ppt}}\right)$	$+$ $\left(\frac{200 \text{ ppt}}{2000 \text{ ppt}}\right)$	$+$ $\left(\frac{6 \text{ ppt}}{10 \text{ ppt}}\right)$	$+$ $\left(\frac{15 \text{ ppt}}{10 \text{ ppt}}\right)$	$= 2.7 = 3$	Exceedance of final Hazard Index MCL (and PFHxS MCL exceedance)
Example 3:	$\left(\frac{14 \text{ ppt}}{10 \text{ ppt}}\right)$	$+$ $\left(\frac{0 \text{ ppt}}{2000 \text{ ppt}}\right)$	$+$ $\left(\frac{0 \text{ ppt}}{10 \text{ ppt}}\right)$	$+$ $\left(\frac{0 \text{ ppt}}{10 \text{ ppt}}\right)$	$= 1.4 = 1$	No exceedance of final Hazard Index MCL
Example 4:	$\left(\frac{9 \text{ ppt}}{10 \text{ ppt}}\right)$	$+$ $\left(\frac{100 \text{ ppt}}{2000 \text{ ppt}}\right)$	$+$ $\left(\frac{4 \text{ ppt}}{10 \text{ ppt}}\right)$	$+$ $\left(\frac{3 \text{ ppt}}{10 \text{ ppt}}\right)$	$= 1.65 = 2$	Exceedance of final Hazard Index MCL (no individual MCL exceedance)

\*MCL compliance is determined by running annual averages at the sampling point



# **Regulatory Requirements**

# Drinking Water Analytical Methods

## EPA Method 537.1

- 18 PFAS Compounds

## EPA Method 533

- 25 PFAS Compounds

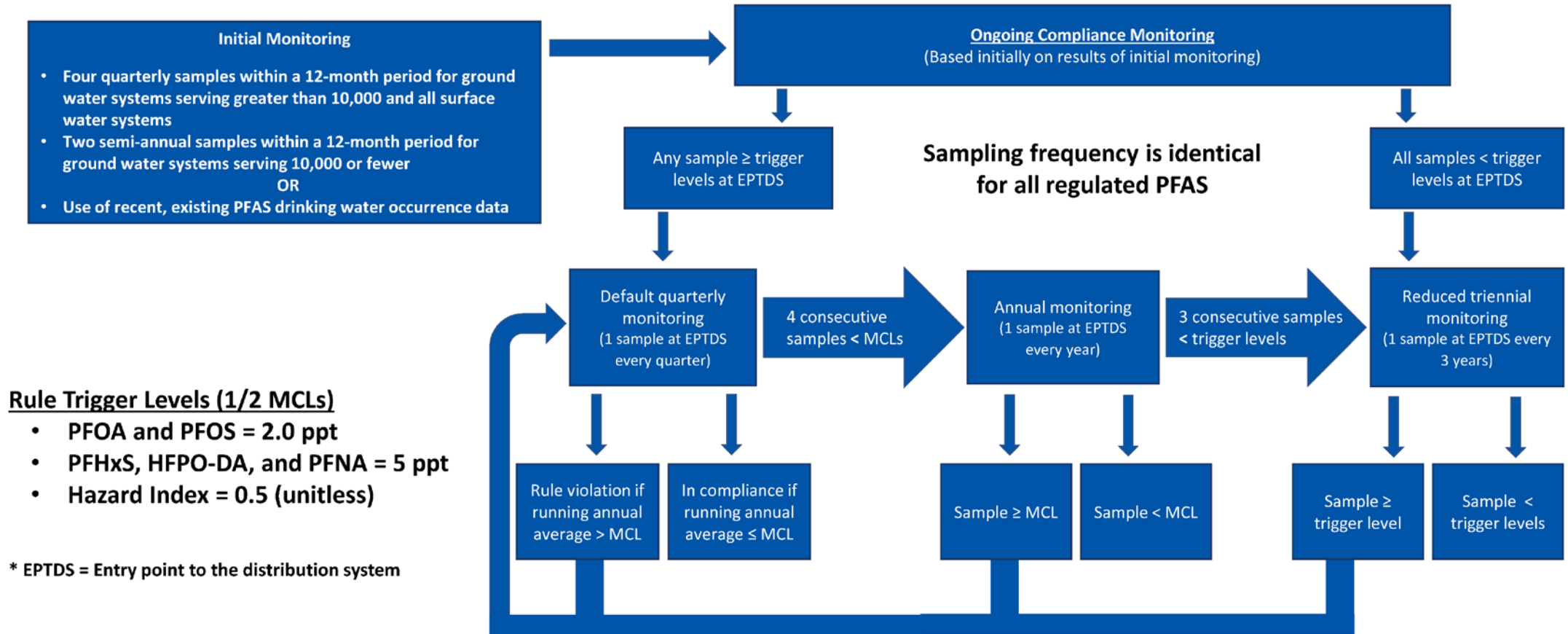
Both include PFOA, PFOS, GenX, PFNA, PFBS and PFHxS

Practical Quantitation Limit (PQL) for 6 PFAS between 2 – 4 ppt

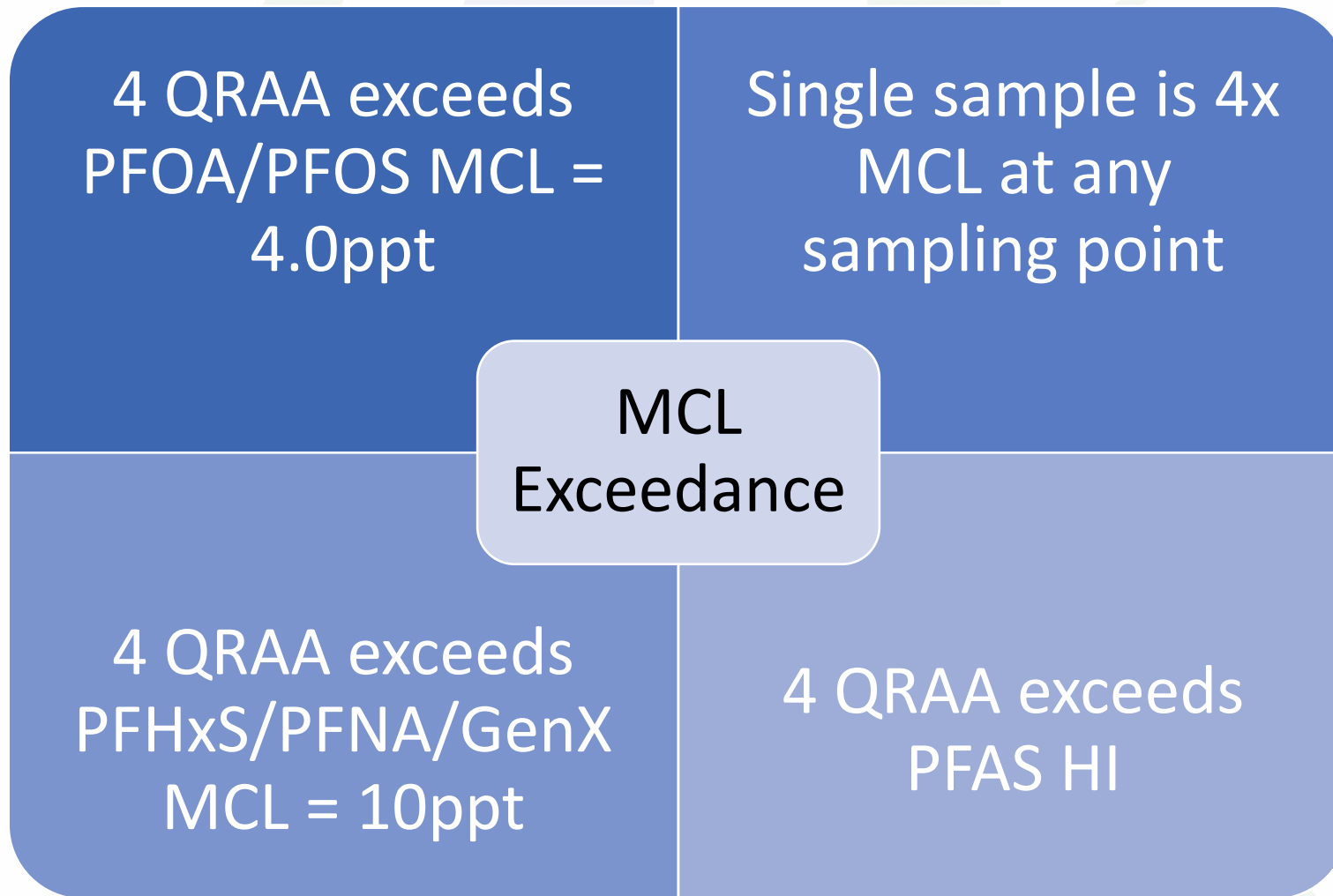


# Monitoring Requirements

## Implementation: Monitoring Requirements Summary



# What Constitutes an MCL Exceedance?



QRAA = Quarterly Running Annual Average

# Implementation Timeframes

**WITHIN  
3 YEARS**  
(By 2027)



- PWS must conduct initial monitoring or obtain approval to use previously collected monitoring data (e.g., UCMR5)

**AT  
3 YEARS**  
(Starting 2027)



- PWS must start ongoing compliance monitoring
- PWS must include results of their monitoring for regulated PFAS in the Consumer Confidence Reports (CCRs)
- PWS must start issuing public notification for any monitoring and testing procedure violations

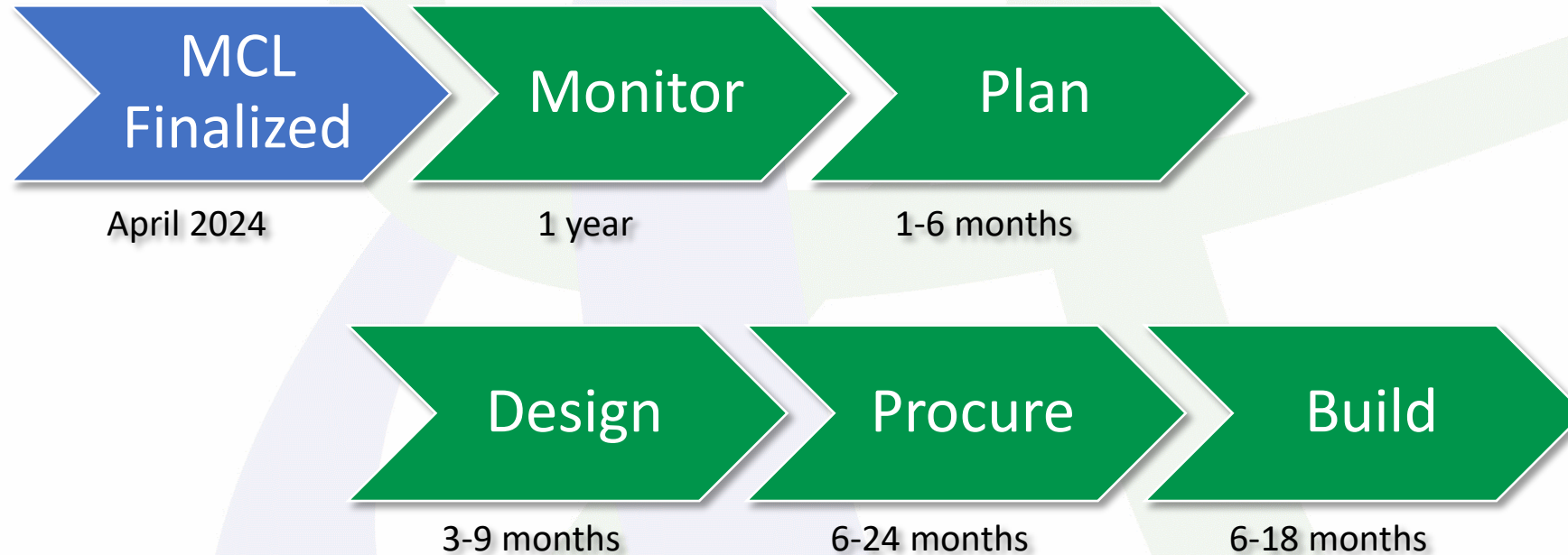
**AT  
5 YEARS**  
(Starting 2029)



- PWS must comply with all regulated PFAS MCLs
- PWS must provide public notification for violations of the PFAS MCLs



# Compliance Timeline



- 5 years to comply with MCL, additional extension(s) possible
- Equipment lead time up to 24 months (vessels, electrical)
- Continue to make notification if > MCL

# Compliance Extensions

- All systems - 2 additional years for capital improvements
- Compelling factors (disadvantaged community) – 3 additional years
- Small systems (< 3,300 people) which need financial assistance for improvements
  - Up to three additional 2-year exemptions

**Don't  
count on it**



**Act  
Now**

# Primacy Requirements

Primacy = States or Indian Tribes

## Primary enforcement responsibilities:

- ☑ Adopt MCLs no less stringent
- ☑ Enforce
- ☑ Recordkeeping
- ☑ Issue variances and exemptions\*
- ☑ Emergency planning\*
- ☑ Revised program to EPA for approval within 2 years

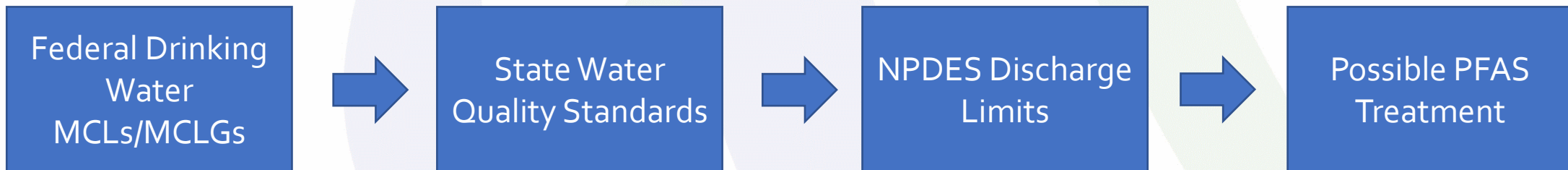


**\*May require unique knowledge of PFAS concerns not typical for other MCLs**

# MCL Impact on POTWs

## If a POTW Discharges Directly or Indirectly to a Drinking Water Source:

- The federal PFAS drinking water MCLs/MCLGs will likely be the primary criteria for new State PFAS Water Quality Standards
- The Water Quality Standards will dictate new POTW NPDES discharge limits
- Those POTWs that exceed their new NPDES discharge limits may have to treat for PFAS if their Industrial Pretreatment Program efforts don't reduce enough PFAS
- The cost and complexity of PFAS treatment at a POTW is >> than for drinking water
- POTW treatment funding opportunities are not yet known



\*Note: Water quality standards may include water quality values (WQVs), water quality criteria (WQC), water quality based effluent limits (WQBELS), etc.



## MCLs

MCL vs HI

Other State  
MCLs

## Monitoring

RAA

Trigger Rule  
triennial  
monitoring

## Timeline

Act Now






# Funding Options

# Funding Options

## Bipartisan Infrastructure Law (BIL)

- \$4B through Drinking Water State Revolving Funds
  - 25% (\$1B) to disadvantaged communities or PWS < 25,000 people
- \$5B as grants through EC-SDC Grant Program
  - \$2B appropriated in February 2023
  - No cost share or match requirement
  - Small PWS < 10,000 people or disadvantaged
  - 2% (\$20M) for Tribes

<https://www.epa.gov/dwcapacity/emerging-contaminants-ec-small-or-disadvantaged-communities-grant-sdc>

BIL EC FUNDING SOURCES COMPARISON		
Programs		
<b>Clean Water State Revolving Fund Bipartisan Infrastructure Law Emerging Contaminants Funding (CWSRF EC)</b>	<b>Drinking Water State Revolving Fund Bipartisan Infrastructure Law Emerging Contaminants Funding (DWSRF EC)</b>	<b>Emerging Contaminants Small and Disadvantaged Communities (EC-SDC) Grant Program</b>
		
Who is eligible for funding?		
Funding is allocated to states, who then will award the funds to eligible entities.  Eligible entities are dependent on the project type and may include: municipalities, intermunicipal, interstate, or state agencies; non-profit entities; private, for-profit entities; watershed groups; community groups; homeowner's associations; and individuals.	Funding is allocated to states, who then will award the funds to eligible entities. <b>Eligible entities include:</b> <ul style="list-style-type: none"><li>• <b>Public or private community water systems.</b> A community water system is a public water system that serves at least 15 service connections used by year-round residents, or regularly serves at least 25 year-round residents.</li><li>• <b>Non-profit non-community water systems.</b> A non-profit non-community water system is a public water system that is not a community water system and is owned and operated as a non-profit entity (e.g., a school). The non-profit entity could also be government owned.</li></ul>	States apply for funding. Using this funding, states administer grants, which are made available for eligible entities. Eligible entities are <b>privately- and publicly-owned community water systems and non-profit non-community water systems that serve small and/or disadvantaged communities.</b> <ul style="list-style-type: none"><li>• <b>Small<sup>1</sup></b></li><li>• <b>Disadvantaged</b> is determined by affected criteria under the Safe Drinking Water Act (SDWA), SDWA 1452.</li></ul>
How are disadvantaged communities defined?		
CWA section 603(j) requires states to establish affordability criteria based on income, unemployment data, population trends, and other data determined relevant by the state. Affordability criteria varies by state.	Under SDWA 1452(d), states are required to define "disadvantaged community" for their DWSRF program. The definition of disadvantaged community varies by state.	Disadvantaged is determined by affected criteria under SDWA 1452. The definition of disadvantaged community varies by state.
What are the general financial requirements?		
<ul style="list-style-type: none"><li>• States are required to provide funding from this appropriation to eligible entities as forgivable loans, grants, or a combination of both. States may mix these funds with other CWSRF funding to create a funding package (i.e., assistance agreement) that may include repayable financing.</li><li>• No state match required.</li><li>• States may use up to 2% of funding to provide technical assistance to small, rural, and tribal publicly-owned treatment works.</li></ul>	<ul style="list-style-type: none"><li>• States are required to provide funding from this appropriation to eligible entities as forgivable loans, grants, or a combination of both. States may mix these funds with other DWSRF funding to create a funding package (i.e., assistance agreement) that may include repayable financing.</li><li>• No state match required.</li><li>• States have the flexibility to take DWSRF set-asides from this appropriation for non-infrastructure support for the state and water systems. The set-asides must be used to administer the grant or serve the primary purpose of this funding (i.e., addressing emerging contaminants).</li></ul>	<ul style="list-style-type: none"><li>• 100% of funding will be provided to eligible entities as grants.</li><li>• No state match required.</li><li>• Up to 3% of funding may be used for program related salaries, expenses, and administration.</li></ul>
<small><sup>1</sup>"Small" refers to communities that have a population of less than 10,000 individuals and lack the capacity to incur sufficient debt to finance the project.</small>		

# Funding Options

## 3M/DuPont/Tyco/BASF Class Action Settlement

- \$12B+ settlement for public drinking water systems
- Opt-out deadline passed (12/11/23)
- Phase One PWS Claims Form – due 7/12/24
- Phase Two PWS Claims Form – due 7/31/26

<https://www.pfaswatersettlement.com/>

## Environmental Finance Center Network

<https://efcnetwork.org/resources/funding-tables/>

<https://swefc.unm.edu/home/wp-content/uploads/2024/05/PFAS-Settlement-Info-Sheet-May-2024.pdf>







## MCLs

5 PFAS

MCL vs HI

Other State  
MCLs

## Requirements

RAA

Trigger Rule

Primacy

## Act Now!

We are just  
getting  
started.

Don't wait!

Secure  
funding

## EFCN

Leverage your  
local EFCN  
chapter

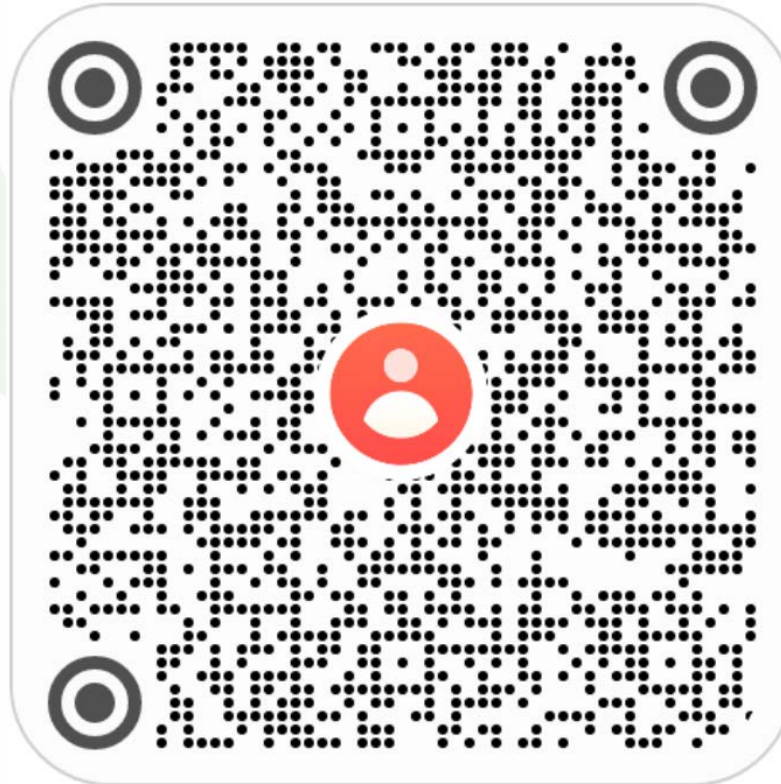
**Questions?**

# Speaker Contact Information

**Will Shaffer, PE**  
Project Engineer



C: (949) 309-7635  
wshaffer@eecenv.com  
www.eecenv.com



Thank you!

**Environmental Finance  
Center Network**



**Southwest EFC**

