



**pennsylvania**  
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Bureau of Safe Drinking Water

# Safe Drinking Water PFAS Update WWOAP Conference

October 5, 2021

Tom Wolf, Governor

Patrick McDonnell, Secretary

# SDW Facts

- State population = 13 M
- Number of public water systems (PWS) = 8,347
- Population served by PWSs = 11.4 M (88%)
- Estimated population served by private wells = 12% (1.6 M)



# SDW Facts

## PWS Types:

- CWSs = 1,939
  - 83% are small systems (may lack TMF capacity)
  - Medium and large systems serve 92% of population
- NTNCWSs = 1,113
- TNCWSs = 5,126
- BVRBs = 169

# New/Upcoming Regulations

## Federal Lead & Copper Rule Revisions:

- Final rule published December 2020
- Addresses gaps in current rule – lead service lines, optimization of treatment, sample collection and sampling plans
- EPA extended effective and compliance deadlines to December 2021 and January 2024, respectively, while agency seeks additional stakeholder input

## Microbial/Disinfection Byproducts (DBP) Rules:

- Pathogens vs. DBPs – risk/risk trade-off, simultaneous compliance, unintended impacts to treatment efficacy
- Emerging opportunistic pathogens (e.g. *Legionella*)
- Currently seeking stakeholder input
- Proposed federal rule expected in 2024

# New/Upcoming Regulations

## Emerging/Unregulated Contaminants:

- Unregulated Contaminant Monitoring Rule (UCMR) 4:
  - Direct implementation rule - gather occurrence data on 30 contaminants for use in regulatory determinations
  - Monitoring period: 2018 – 2020, included cyanotoxins, HAAs (brominated), SVOCs, pesticides, alcohols & metals
- UCMR 5:
  - Proposed rule March 2021
  - Monitoring period: 2023 – 2025
  - Includes 29 PFAS and lithium
- PFAS (per- and polyfluoroalkyl substances)

# PFAS Background

- Per- and polyfluoroalkyl substances (PFAS) are a class of synthetic chemicals that have been manufactured and in use since the 1940s.
- PFAS are used to make products resistant to water, heat and stains and are found in industrial and consumer products such as clothing, carpeting, food packaging, non-stick cookware, firefighting foam, personal care products, adhesives, metal plating, wire manufacturing and many other uses.
- PFAS have unique chemical properties because they readily dissolve in water and are mobile, are highly persistent in the environment, and bioaccumulate.



# Federal Actions to Address PFAS

- EPA issued provisional Health Advisory Levels (HAL) in 2009 for PFOS at 200 ng/L or ppt and PFOA at 400 ng/L or ppt.
- Six PFAS were included in EPA's Third Unregulated Contaminant Monitoring Rule (UCMR 3) (2013-2015).
- In 2016, EPA set a combined Lifetime HAL for PFOS & PFOA of 70 ppt.
- In March 2021, EPA published a final regulatory determination to begin the process to propose a drinking water regulation for PFOS and PFOA. EPA will propose a regulation within 24 months (by March 2023).

# State Actions to Address PFAS

Governor Wolf's Executive Order (Sept. 19, 2018) established a PFAS Action Team to develop a comprehensive response to identify and eliminate sources of contamination, ensure drinking water is safe, manage environmental contamination, review gaps in data and oversight authority, and recommend actions to address those gaps.

- The PFAS Action Team released an Initial Report in December 2019
- The Report includes information about PFAS, challenges associated with managing contamination, actions taken to date and recommendations for future actions. Recommendations include additional funding for communities dealing with PFAS contamination and strengthened statutory authorities to adequately address PFAS.

# BSDW Actions to Address PFAS

Since 2016, the BSDW has ensured that follow-up and corrective actions are taken at public water systems with PFOS/PFOA levels above EPA's HAL of 70 ppt, including:

- One-hour reporting of sample results to DEP (§ 109.701(a)(3)(iii))
- Collection of confirmation samples (§ 109.302)
- Issuance of Tier 2 Public Notice (§ 109.409)
- Quarterly monitoring at the entry point (§ 109.302)
- If levels continue to exceed the HAL, additional actions may be needed including taking sources off-line, installing treatment, etc. (§ 109.4)

# PFAS Sampling Plan

BSDW completed a statewide PFAS Sampling Plan to identify impacted PWSs and generate statewide occurrence data. The Plan was intended to prioritize sites for PFAS sampling.

Several factors were considered in developing the plan, including:

- Location of potential sources of PFAS contamination (PSOC)
- PWS sources located within ½ mile of PSOCs
- Selection of PWS sources to serve as a control group

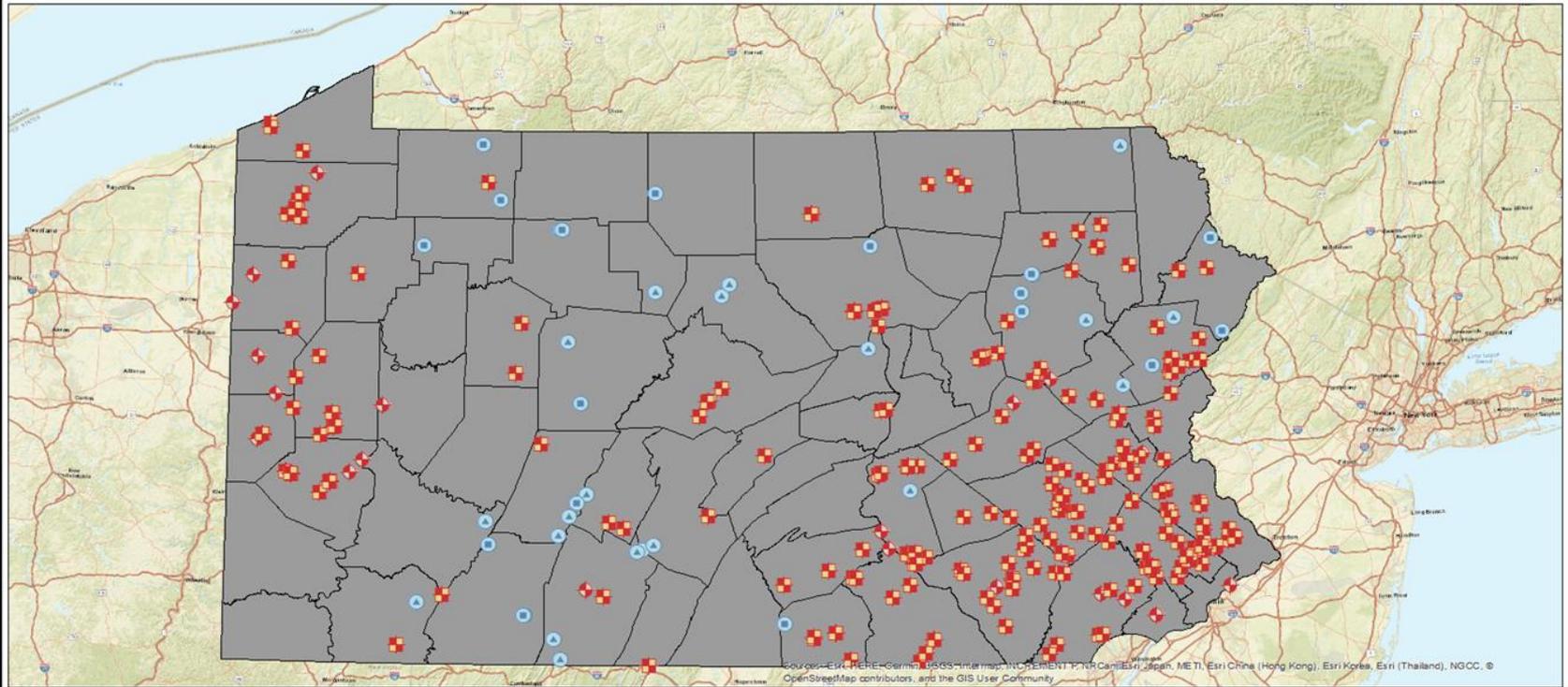
# PSOCs

The GIS data layer of PSOCs included the following industries and land uses:

- Military bases
- Fire training schools/sites
- Airports
- Landfills
- Manufacturing facilities (apparel, chemicals, electronics, fabricated metal, paper products, textiles and leather, upholstered furniture)
- State HSCA, EPA Superfund and other known PFAS-contamination sites

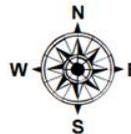
# Sampling Plan

## Drinking Water Sources Selected for Sampling



### LEGEND

- BASELINE WELLS\_032019
- TARGET WELLS\_032019
- ▲ BASELINE INTAKES\_032019
- ◆ TARGET INTAKES\_032019



25 12.5 0 25 50 75 100  
Miles



**pennsylvania**  
DEPARTMENT OF ENVIRONMENTAL  
PROTECTION  
Bureau of Safe Drinking Water, Operations Section

# Sampling Plan

- Posted the Plan to PFAS webpage in April 2019
- Sampling began Summer 2019 using EPA Method 537 (6 PFAS) and contract lab
- In 2020, had opportunity to modify sampling:
  - Switched to EPA Method 537.1 (18 PFAS)
  - Repeated 2019 sampling for consistency
  - Sent samples to contract lab and state lab
- Impacts from pandemic - sampling was halted in March 2020 and resumed in August 2020 under approved Health and Safety Plan
- Sampling was completed in March 2021, with final sample results posted in June 2021

# ▶ Sampling Plan – Summary of Results

	PFOA	PFOS	PFNA	PFHxS	PFHpA	PFBS	Units
<b>Total # Samples</b>	412	412	412	412	412	412	--
<b>Average</b>	2.0	2.5	0.4	1.4	0.7	1.1	ng/l
<b>Median</b>	0 (ND)	0 (ND)	0 (ND)	0 (ND)	0 (ND)	0 (ND)	ng/l
<b>Minimum</b>	0 (ND)	0 (ND)	0 (ND)	0 (ND)	0 (ND)	0 (ND)	ng/l
<b>Maximum</b>	59.6	187.1	18.1	140.0	32.6	64.0	ng/l
<b># and % of Detects</b>	112 (27%)	103 (25%)	23 (6%)	52 (13%)	49 (12%)	66 (16%)	--
<b>Avg Detect Value</b>	7.5	9.9	7.2	10.9	6.1	7.0	ng/l
<b>Med Detect Value</b>	5.3	6.5	5.6	4.5	4.5	4.2	ng/l
<b>Min Detect Value</b>	1.7	1.8	1.8	1.9	1.8	1.7	ng/l
<b>Max Detect Value</b>	59.6	187.1	18.1	140.0	32.6	64.0	ng/l

Full results available at [www.dep.pa.gov/pfas](http://www.dep.pa.gov/pfas)

# Toxicology Report

In December 2019, the BSDW executed a toxicology services contract with Drexel University to review other state and federal agency work on MCLs; independently review the data, science and studies; and develop recommended MCLGs for select PFAS.

- MCLGs are non-enforceable, developed solely based on health effects, and do not take into consideration other factors, such as technical limitations and cost. MCLGs are the starting point for determining MCLs.

Deliverables were completed in January 2021 and include the “Drexel PFAS Workbook” and “MCLG Drinking Water Recommendations for PFAS in the Commonwealth of PA”.

# Toxicology Report

## DPAG Reference Dose and Recommended Chronic Non-Cancer MCLGs

PFAS	Reference Dose (ng/kg/day)	MCLG (ng/L or ppt)
PFOA	3.9	8
PFOS	3.1	14
PFNA	2.2	6
PFHxS	4.0	20
PFHpA	None derived*	8
PFBS	39	55
GenX (HFPO-DA)	75	108

\*Reference dose was not derived due to a lack of evidence on its toxicity. Recommended MCLG is based on its chemical structure.

# MCL Rulemaking Process

An MCL rulemaking should be based on available data, studies, and science, and must consider all factors as required by the Federal Safe Drinking Water Act (SDWA) and Pennsylvania's Regulatory Review Act (RRA), including:

- Health effects
- Occurrence data
- Technical limitations such as available analytical methods and detection and reporting limits
- Treatability of the contaminant and available treatment technologies
- Costs and benefits

# Pre-Draft PFAS MCL Rulemaking

- Pre-draft PFAS MCL rulemaking was presented to Public Water Systems Technical Assistance Center (TAC) Board on July 29, 2021.
- Rulemaking materials are available on TAC advisory committee's webpage.
- DEP is proposing MCLGs and MCLs for PFOA and PFOS.

# Proposed PFOA MCLG & MCL

## Proposed PFOA MCL of 14 ppt:

- # of sites (of 435) > 14 ppt = 25 (or 5.7%)
- Estimated # of EPs (of 3785) > 14 ppt = **218**
- Estimated costs:
  - Total annual cumulative monitoring costs (@ \$716/EP/Q) = **\$3,365,387**
  - Total annual treatment costs (to treat 1 MGD) over 20 years per EP (includes capital and annual O&M costs):
    - GAC = \$416,470 per MGD
    - IX = \$333,750 per MGD
    - Average of GAC & IX = **\$375,110 per MGD**
  - Total annual cumulative treatment costs over 20 years = **\$81,773,904**
  - Total annual cumulative costs over 20 years (includes average of (GAC & IX treatment per MGD) + monitoring costs = **\$85,139,291**
- Estimated benefits:
  - **90%** improvement in health protection as compared to current EPA HAL of 70 ppt

	PFOA (ng/L or ppt)
Proposed MCLG	8
Proposed MCL	14

# Proposed PFOS MCLG & MCL

## Proposed PFOS MCL of 18 ppt:

- # of sites (of 435) > 18 ppt = 22 (or 5.1%)
- Estimated # of EPs (of 3785) > 18 ppt = **191**
- Estimated costs:
  - Total annual cumulative monitoring costs (@ \$716/EP/Q) = **\$3,141,028**
  - Total annual treatment costs (to treat 1 MGD) over 20 years per EP includes capital and annual O&M costs):
    - GAC = \$416,470 per MGD
    - IX = \$333,750 per MGD
    - Average GAC & IX = **\$375,110 per MGD**
  - Total annual cumulative treatment costs over 20 years = **\$71,645,943**
  - Total annual cumulative costs over 20 years (includes average of (GAC & IX treatment per MGD) + monitoring costs = **\$74,786,971**
- Estimated benefits:
  - **93% improvement** in health protection as compared to current EPA HAL of 70 ppt

	PFOS (ng/L or ppt)
Proposed MCLG	14
Proposed MCL	18

# Pre-Draft Proposed MCLs

## The Proposed PFOA and PFOS MCLs:

- Are technically feasible
- Increase public health protection by 90% for PFOA and 93% for PFOS
- Strike a balance between public health protection and costs
- Are within the range of other federal standards where the MCL  $\neq$  MCLG
  - Federal range of MCLs is 125% - 400% of MCLG
  - PFOA MCL is 175% of MCLG, PFOS MCL is 129% of MCLG
- Are within the range and same magnitude as other state standards

	NY	MI	NJ	NH	PA	MA	VT
PFOA	10	8	14	12	14	20*	20*
PFOS	10	16	13	15	18	20*	20*

\*The MCL for MA & VT is for a PFAS group (not individual contaminants).



**pennsylvania**  
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Bureau of Safe Drinking Water

Lisa Daniels, Director  
Bureau of Safe Drinking Water  
[ldaniels@pa.gov](mailto:ldaniels@pa.gov)



**pennsylvania**  
DEPARTMENT OF ENVIRONMENTAL PROTECTION