# Per- and Polyfluoroalkyl Substances (PFAS) Update

## *The USEPA PFAS Roadmap and Other Regulatory Developments*

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# AGENDA

**01** Welcome and Opening Remarks

**02** USEPA Roadmap Overview (Approach, Goals & Objectives and Key Actions)

**03** New and Expected PFAS Regulatory Developments

**04** Final Thoughts and Recommendations

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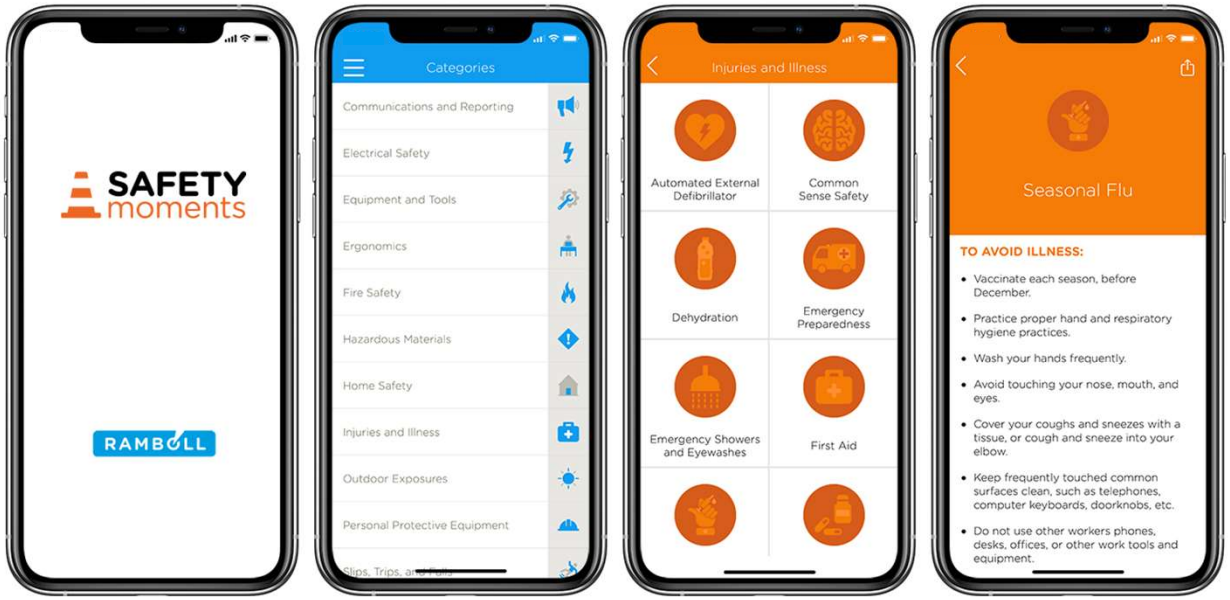
# RAMBOLL SAFETY MOMENTS APP
## FOR IPHONE AND ANDROID

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# USEPA ROADMAP OVERVIEW

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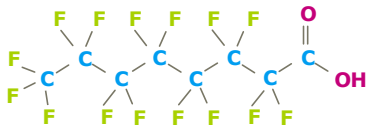
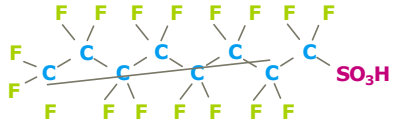
# WHAT ARE PFAS?

1. PFAS is a generic term for a large subclass of human-made fluorinated chemicals
2. Used in a wide range of industrial applications, commercial products and firefighting foams
3. Unique because of their ability to repel oil, grease and water
4. Exceptionally stable, non-reactive chemicals, resistant to degradation naturally and heat resistant
5. Properties/behavior varies dramatically




**PFOA** – perfluorooctanoic acid




**PFOS** – perfluorooctanesulfonic acid

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# WHY THE INTEREST IN PFAS

- Ubiquitous in the environment
- Relatively mobile in the environment, moderately soluble
- Potential human toxicity
- Bio-accumulative
- Lengthy/varied history of use
- USEPA has identified more than 10,000 individual PFAS compounds


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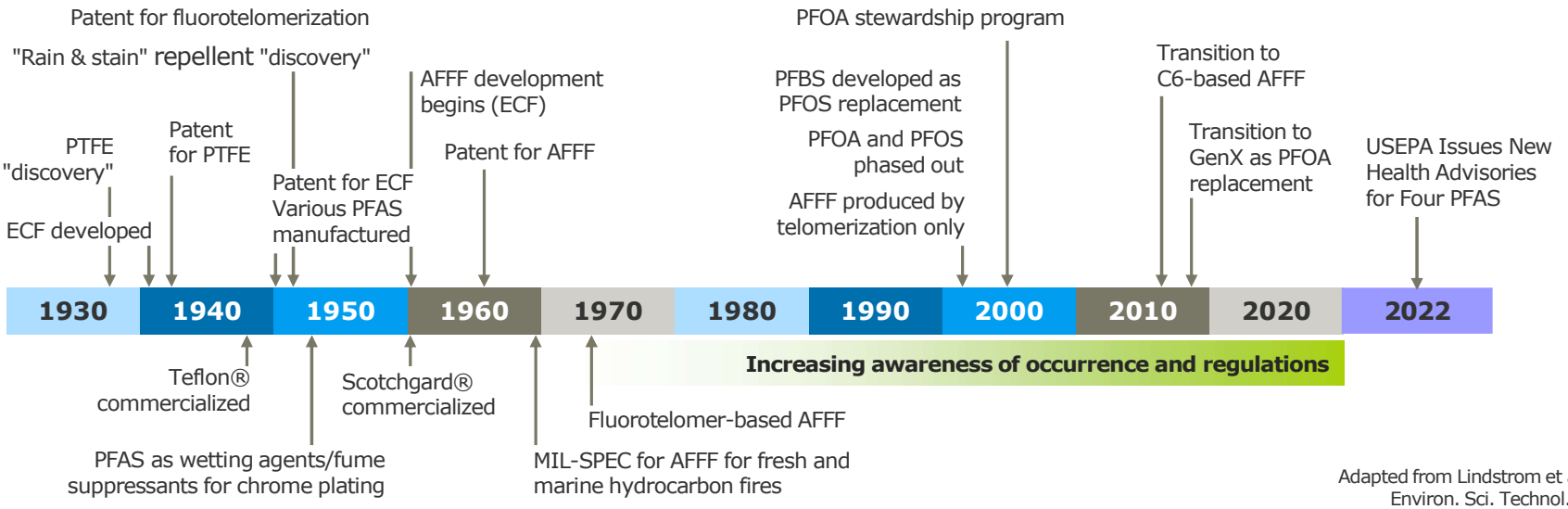
# PFAS: A BRIEF CHRONOLOGY




Adapted from Lindstrom et al. 2011. Environ. Sci. Technol. Vol. 45: 7954–7961

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# WHAT ARE THE SOURCES OF PFAS?

| Household/ cooking |
| --- |
| Cookware |
| Packaging |
| Carpet/fiber protector |
| Floor finishing |

| Apparel/ textiles |
| --- |
| Stain-resistant clothing |
| Outdoor gear |

| Personal care/ healthcare |
| --- |
| Eyewear coating |
| Cosmetics |
| Biomaterials |
| Medical devices |

| Industrial/ specialized |
| --- |
| Firefighting foams |
| Chrome plating |
| Aviation hydraulic fluids |
| Semiconductor |
| Coatings/adhesives |

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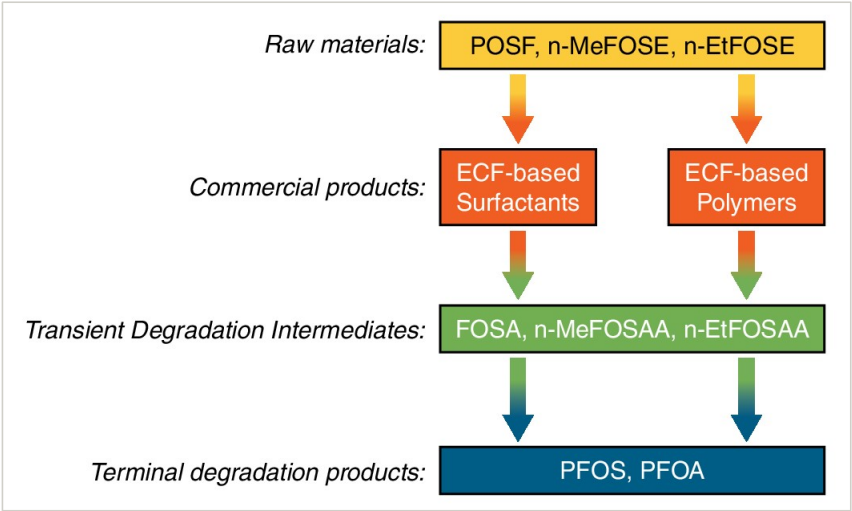
# SOURCES & PHYSICAL PROPERTY VARIABILITY

**Direct sources**
(manufacturers, secondary users)

**Indirect sources**
- **Precursor degradation**
- Residual impurities

**Physical property variability**
- Solubility
- Volatility
- Organic carbon/water partitioning coefficient ($K_{oc}$)




Source: Interstate Technology Regulatory Council. *Naming Conventions and Physical and Chemical Properties of Per- and Polyfluoroalkyl Substances (PFAS) Fact Sheet.* April 2020

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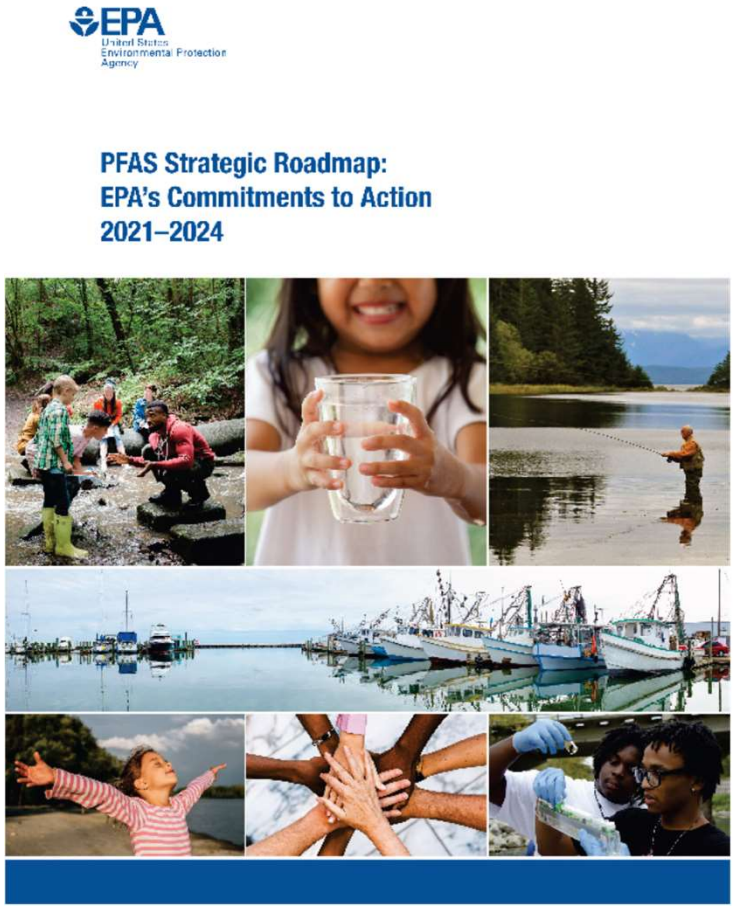
# USEPA PFAS ROADMAP – GOALS AND OBJECTIVES

- Published in October 2021
- Outlines USEPA's approach and tentative schedule to addressing PFAS issues
- The ubiquity of these contaminants requires a holistic, integrated approach to their subsequent regulation
- USEPA is simultaneously tackling the PFAS issue on several different fronts, including:
  - "***Research.*** *Invest in research, development, and innovation to increase understanding of PFAS exposures and toxicities, human health and ecological effects, and effective interventions that incorporate the best available science.*
  - ***Restrict.*** *Pursue a comprehensive approach to proactively prevent PFAS from entering air, land, and water at levels that can adversely impact human health and the environment.*
  - ***Remediate.*** *Broaden and accelerate the cleanup of PFAS contamination to protect human health and ecological systems.*"

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# USEPA PFAS ROADMAP – GENERAL APPROACH

01 **Lifecycle Considerations**

02 **Get Upstream**

03 **Hold Polluters Accountable**

04 **Science-Based Decision-Making**

05 **Prioritize Disadvantaged Communities**

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# USEPA PFAS ROADMAP – LIFECYCLE CONSIDERATIONS

- PFAS are released into the environment as a result of manufacturing, processing, distribution in commerce, use and disposal
- Each action in this cycle represents a potential human or ecological exposure
- Their persistence in the environment means that even when PFAS are removed, they may create a waste that needs to be managed
- Technologies that destroy PFAS are seemingly preferred, but concerns over treatment efficiency and potentially hazardous by-products have stalled several efforts to treat certain wastes.

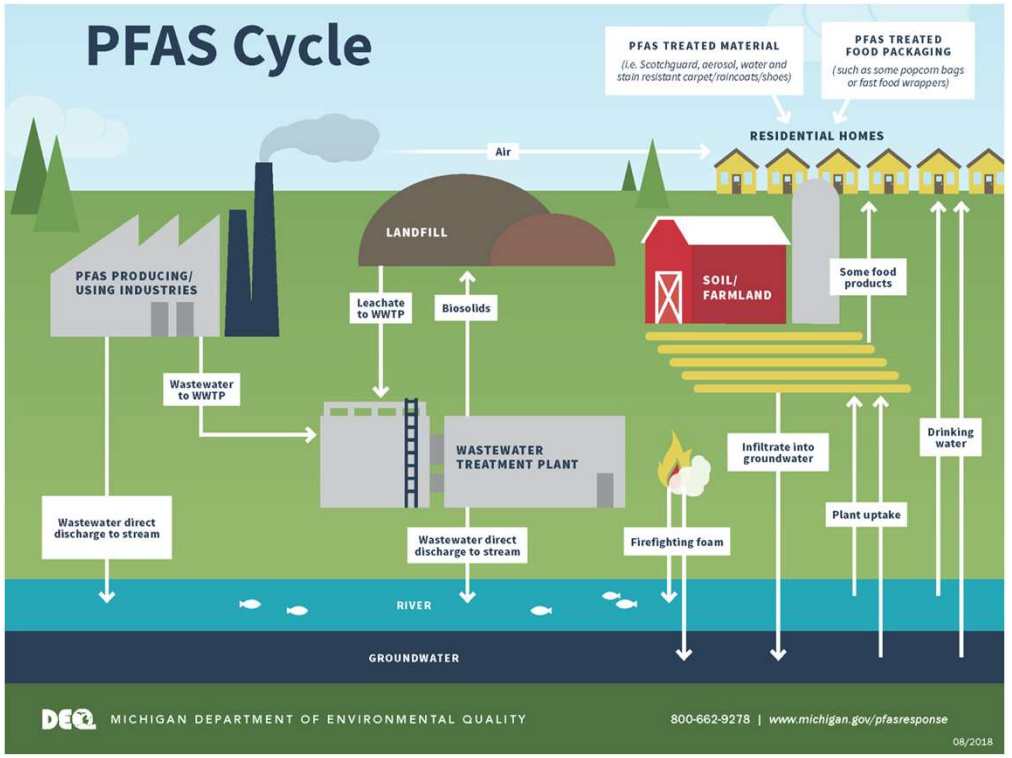


*Image courtesy of Michigan Department of Environmental Quality*

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# USEPA PFAS ROADMAP – GET UPSTREAM

- A centerpiece of USEPA's strategy to confront the PFAS problem is **to prevent PFAS from entering the environment in the first place.**
- USEPA states that "a modest number of industrial facilities directly discharge PFAS into water or soil or air in large quantities", providing a clear opportunity to restrict releases into the environment.
- Other regulatory and permitting actions will likely be used to further limit releases

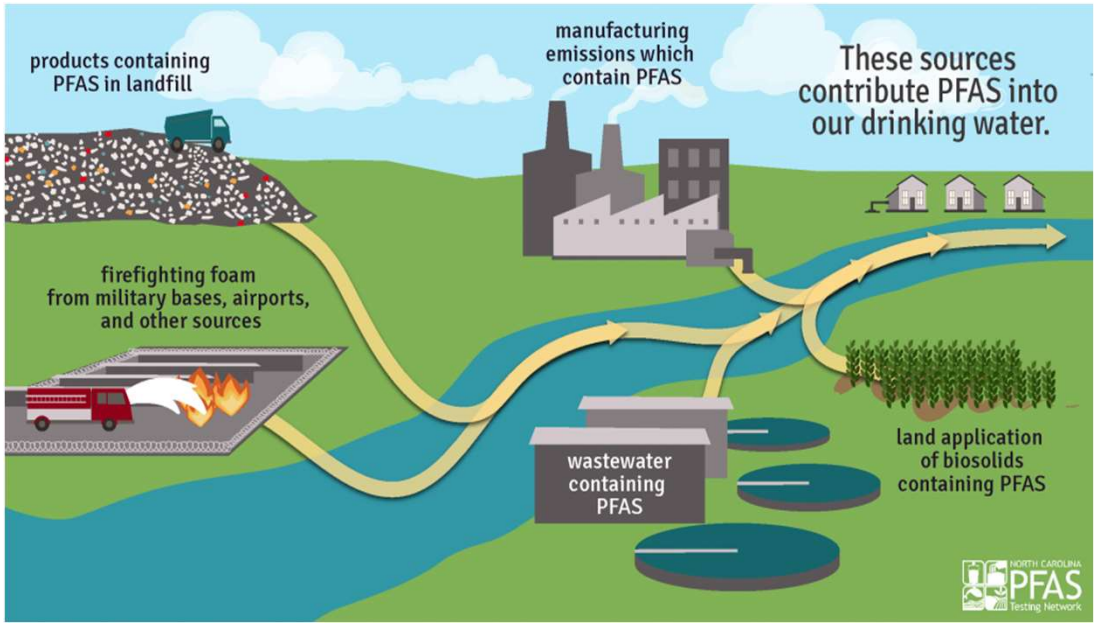


*Image courtesy of North Carolina Department of Environmental Quality*

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# USEPA PFAS ROADMAP – HOLD POLLUTERS ACCOUNTABLE

- Industrial sites, airports and land where biosolids have been applied have been investigated for potential PFAS releases - many of these sites are the subject of current litigation
- More sites will inevitably be discovered and require evaluation, especially as thresholds are lowered
- Reflect on prior learnings with PCBs, Dioxins

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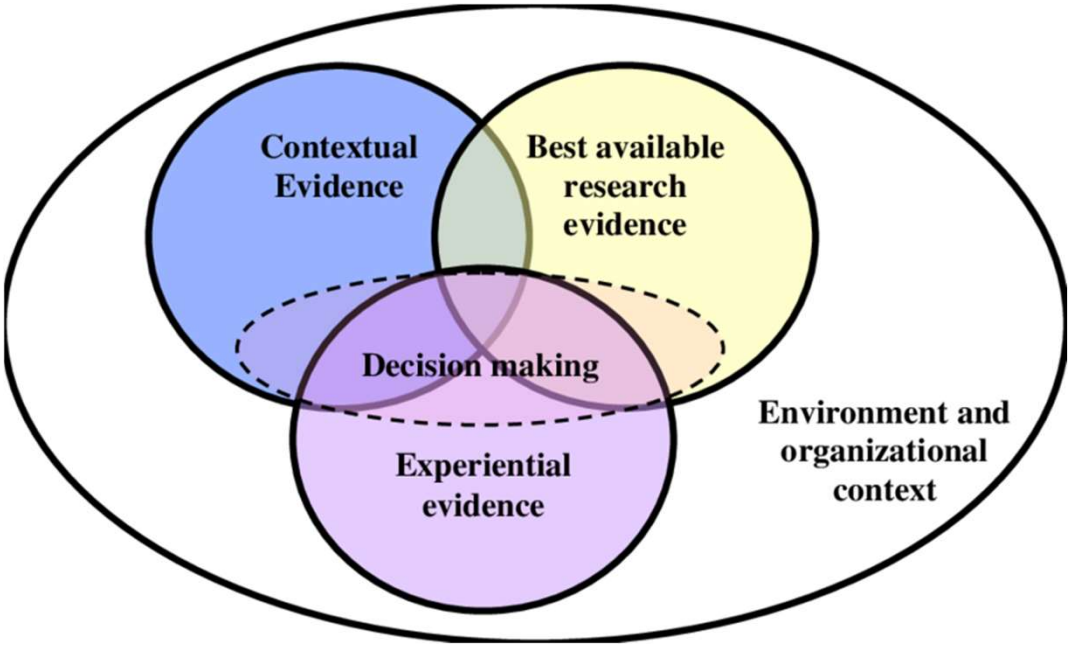
# USEPA PFAS ROADMAP – HOLD POLLUTERS ACCOUNTABLE

- Many data gaps about PFAS sources, behavior, treatment and toxicology remain
- Juxtaposition between public demands vs. current understanding
- The possibility of regulating categories of PFAS, rather than individual chemicals

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# USEPA PFAS ROADMAP – PRIORITIZE DISADVANTAGED COMMUNITIES

- Efforts to engage lower income communities and influence USEPA's decision-making
- Need to consider cultural, infrastructure, socio-economic and on-the-ground conditions to ensure policy solutions are equitable
- Monitoring being performed in these communities to better under potential exposures

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# KEY ACTIONS TO BE TAKEN BY USEPA

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# KEY ACTIONS TO BE TAKEN BY USEPA

- PFAS Road Map summarizes EPA actions to be taken from 2021-2024 and other ongoing efforts
  - ❖Strategic building blocks to protect public health and ecosystem
  - ❖Inclusive engagement with stakeholders

# KEY ACTIONS TO BE TAKEN BY USEPA

- TSCA – issued rules for PFAS
  - ❖2002 – voluntary phase-out of PFAS by 3M
  - ❖2007 – regulate 183 PFAS no longer manufactured
  - ❖2013 – reporting of all new uses related to carpets
  - ❖2016 – TSCA amendments
  - ❖2020 – new uses of PFOA/PFAS apply to “articles”

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# KEY ACTIONS TO BE TAKEN BY USEPA

- PFAS manufacturers subject to TSCA §8 reporting requirements – "substantial risk"
  - ❖USEPA expected to deny pending and future LVE
  - ❖Review previous decisions on PFAS
  - ❖Enhance PFAS reporting under the TRI

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# KEY ACTIONS TO BE TAKEN BY USEPA

- Safe Drinking Water Act
  - ❖USEPA requires water systems to conduct sampling for unregulated contaminants (5 years)
  - ❖Unregulated Contaminant Monitoring Rule (UCMR5)
    - UCMR4 – PFOA/PFAS
    - GenX and 5 PFAS
  - ❖Published Health Advisories

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# KEY ACTIONS TO BE TAKEN BY USEPA

- USEPA proposes maximum contaminants level goals (March 2023)
  - ❖ Proposed drinking water limits by Fall 2022 and finalize by Fall 2023
  - ❖ Proposed legislation

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# KEY ACTIONS TO BE TAKEN BY USEPA

## Clean Water Act

### Restrict PFAS discharges from industrial point sources

- ❖Effluent Limitation Guidelines (ELG's)
- ❖Undertake rulemaking PFAS discharges for certain industrial dischargers
- ❖Issue new guidance to State NPDES Programs

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# KEY ACTIONS TO BE TAKEN BY USEPA

- Monitoring Fish Tissue for PFAS
- List of PFAS for use in fish advisory programs
- Risk assessment for PFOA/PFAS in biosolids

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# KEY ACTIONS TO BE TAKEN BY USEPA

## Clean Water Act

- PFAS unregulated in CAA (except chrome plating operations)
- USEPA released draft method for measuring 50 PFAS in source air emissions (January 2021)

# KEY ACTIONS TO BE TAKEN BY USEPA

USEPA is conducting ongoing work to identify and characterize sources of PFAS air emissions, develop testing methods and monitoring approaches, research mitigation technology, and understand the Environmental Justice/impact to human health of PFAS air emission.

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# KEY ACTIONS TO BE TAKEN BY USEPA

CERCLA

- USEPA is developing Notice of Proposed Rulemaking to designate PFOA/PFAS as CERCLA "hazardous substances".
  - ❖Reportable Quantity

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# KEY ACTIONS TO BE TAKEN BY USEPA

EPCRA

- Section 313 regulates the toxic release inventory (TRI)
- USEPA requires adding certain PFAS to TRI

# KEY ACTIONS TO BE TAKEN BY USEPA

## Other Cross-Over Actions

- RCRA – Destruction and disposal of PFAS waste
- Food, Drug, and Cosmetics Act – FDA activities
- Department of Defense and Federal Aviation Administration – PFAS-based firefighting foam

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# NEW AND EXPECTED REGULATORY DEVELOPMENTS

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# UCMR 5

- Published on December 27, 2021
- Requires sample collection from the nation's drinking water systems between January 2023 and December 2025, including 29 PFAS compounds
- Will include surface water and groundwater systems

*Image courtesy of United States Geological Survey (USGS)*

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# PFAS TOXICITY ASSESSMENTS

- In October 2021, USEPA issued its final toxicity assessment for GenX chemicals[(1)]
  - The chronic reference dose (RfD) for GenX chemicals is now $3 \times 10^{-6}$ mg/kg-day
  - By way of comparison, the chronic RfDs for PFOA and PFOS are $2 \times 10^{-5}$ mg/kg-day
- USEPA has already signaled its intent to review the toxicity assessments for PFOA and PFOS

(1) https://www.epa.gov/chemical-research/human-health-toxicity-assessments-genx-chemicals

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# NEW PFAS HEALTH ADVISORY LIMITS

- On June 15, 2022, USEPA issued updated or new drinking water Health Advisories (HAs) for four PFAS compounds: PFOA, PFOS, PFBS and GenX.
- HAs are non-enforceable, informational guidelines issued for certain chemicals that are not subject to National Primary Drinking Water Regulations
- The updated HAs are substantially more stringent than those issued in 2016. The interim updated HA for PFOA has been lowered from 70 ppt to 0.004 ppt – a 17,500-fold reduction. The HA for PFOS was lowered from 70 ppt to to 0.02 ppt – a 3,500-fold reduction.
- HAs were also established for GenX (10 ppt) and PFBS (2,000 ppt)

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# NEW PFAS HEALTH ADVISORIES – WHAT'S THE CONCERN?

- HAs are sometimes cited as benchmarks, such as litigation involving potential human health risks and the evaluation of chemicals in consumer articles
- The updated HAs are substantially more stringent than those issued in 2016. The interim updated HA for PFOA has been lowered from 70 ppt to 0.004 ppt – a 17,500-fold reduction. The HA for PFOS was lowered from 70 ppt to to 0.02 ppt – a 3,500-fold reduction.
- The interim updated HAs for PFOA and PFOS are below current analytical quantitation limits, also below background levels (*i.e.,* the concentration that have been reported in literature for global rainwater, surface water and residential wastewater samples collected from locales without a clear regional PFAS source).
- Current USEPA-approved analytical methods are not able to reliably detect or measure PFOA or PFOS at or below these concentrations.

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## CHANGES COMING TO TRI…

- USEPA developing a proposal to include PFAS on the List of Chemicals of Special Concern
- Inclusion on this list would eliminate the *de minimis* exemption, eliminate the option to submit Form As, and limit the use of range reporting
- NPRM expected in September 2022; final rule expected by November 2023.

# FINAL THOUGHTS AND RECOMMENDATIONS

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# THANK YOU

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# Biographical Information

**Matthew Traister, PE, Vice President, Ramboll US Corp.**
**8805 Governor's Hill Dr. Ste. 164, Cincinnati, OH 45249-3312**
**513-697-2021 Matt.Traister@ramboll.com**

Matt Traister has more than three decades of environmental consulting experience and provides technical expertise and expert services in a variety of air quality matters. For the past three years, Matt has been involved in a number of projects, both domestically and abroad, involving the quantification and control of PFAS emissions and the study of their fate and transport. These projects have been performed for surface coating operations, chemical manufacturers, semiconductor facilities, textile finishing operations and remediation systems. As a professional chemical engineer, Matt assists clients in identifying replacement chemistries and/or modifying their industrial processes so as to minimize the discharge of air contaminants to the environment. Matt also frequently presents on PFAS matters at national and regional conferences, including MEC, the Midwestern States Environmental Consultants Association, and those sponsored by the Air & Waste Management association.

Matt's recent emerging contaminant experience includes:

- Fate and Transport Investigation, Massachusetts: Provided technical direction of air quality activities (including testing, modeling and control) performed in support of a PFAS source investigation at an industrial facility that was suspected of having impacted nearby public and private drinking water supplies.
- Material Balance Study, Asia: Conceived and implemented a material balance study to understand the fate of PFAS chemistry within a semiconductor manufacturing process. This information was used by the client to improve its environmental control of PFAS.
- Emissions Testing, North Carolina: Provided technical review for an emissions testing project performed at a chemical manufacturing plant to evaluate the control efficiency of a thermal oxidizer and a carbon treatment system.
- Emissions Testing, New Jersey: Provided technical oversight for a project team tasked with conducting source emissions testing for select PFAS compounds from two emission sources at a chemical manufacturing facility. PFAS emissions were characterized over the entire 30-hour product batch cycle by collecting samples at five discrete intervals, with the duration of each portion of the test run ranging from 20 to 150 minutes.
- Emissions Testing, West Virginia: Project officer for a massive source testing project to quantify PFAS emissions from a chemical manufacturing operation. Inlet and outlet testing for PFAS from three process scrubbers was conducted as a condition of a regulatory consent order.

## Education

Matt received his B.S. in Chemical Engineering from Clarkson University in 1987.

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# Robert J. Karl

*partner*

Bob focuses his practice in energy and environmental law with an emphasis in matters involving the Federal Water Pollution Control Act, Ohio VAP, CERCLA, FIFRA, TSCA, DOT and RCRA matters, wetlands regulation, pretreatment requirements, state and local environmental statutes and regulations, and lender and fiduciary liability issues. With 30 years of environmental law experience, his clients range from large corporate entities to developers to entrepreneurs to municipalities. He is the chair of Porter Wright's nationally recognized environmental practice.

## Bob's work crosses nearly all major environmental programs, and includes permitting, compliance, criminal and civil defense, drafting of real estate and other transactional documents.

He has successfully briefed and argued numerous appellate and Supreme Court of Ohio cases.

Bob advises clients in the chemical and manufacturing industries across the Northeast, Midwest and Southeast, including Texas. His work includes counseling on a variety of environmental issues including due diligence and audits. He also assists clients in navigating the implementation of state and federal statues related to permitting and regulatory compliance.

As part of the firm's real estate development team, Bob works with industry stakeholders on Brownfield remediation projects and advises on applicable incentives and grants. He also is a part of the firm's economic development group where he regularly collaborates with property developers, state and local officials.

He also has significant experience with energy and mineral issues, including oil and gas disputes and transactional matters; oil and gas litigation, including appellate practice; property and mineral title issues,


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EDUCATION
Vermont Law School, J.D., 1989

Wright State University, B.A., 1982

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including mineral rights disputes, Ohio Dormant Minerals Act (ODMA), forfeiture and royalty disputes; and regulatory and enforcement actions before the Ohio Department of Natural Resources (ODNR) and Ohio courts, representing clients in all actions including mandatory pooling and unitization proceedings.

Before entering private practice, Bob was a former assistant Ohio attorney general where he managed more than 250 water and multimedia civil and criminal enforcement actions in various courts. His legal representation included the ODNR and the Ohio Environmental Protection Agency (EPA) before state and federal courts. Bob has been named to the *Ohio Super Lawyers*® list and is recognized by *Best Lawyers*® in Environmental Law and Litigation - Environmental. He has appeared on the list of "Who's Who in Energy" by *Columbus Business First*.

## BAR ADMISSIONS

- Ohio
- U.S. Court of Appeals for the Sixth Circuit
- U.S. District Court for the Northern District of Ohio
- U.S. District Court for the Southern District of Ohio

## PRESENTATIONS

- "Overview of Ohio's Voluntary Action Program (VAP) & Remediation State Funding Opportunities," Terracon and JobsOhio, November 2019
- "Understanding Federal and State Rules on Stormwater Management," Current Issues in Landscape Architecture, January 2015

## PUBLICATIONS

- "Selling real estate before the 2013 tax law changes," *Commercial Developers Resource*, February 2012

## PROFESSIONAL ASSOCIATIONS

- Columbus Bar Association, Environmental Section, former Co-Chair
- Ohio State Bar Association
- National Brownfield Association
- American Bar Association

## HONORS | AWARDS

- *Best Lawyers*®, Environmental Law and Litigation – Environmental
- *Ohio Super Lawyers*®
- *Columbus Business First*, Who's Who in Energy
- Ohio Attorney General, Professionalism Award, 2001

## COMMUNITY

- National Association of Attorneys General, Environmental Issues, CAFO working group, Ohio Representative, 1998-2002
- Conference of Government Mining Attorneys, Chairperson, 1992-1993

## SERVICES (CONTINUED)

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