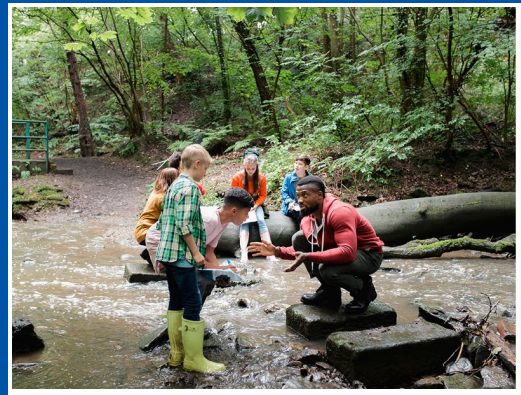



Superfund PFAS Update

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EPA Office of Emergency Management

April 30, 2024

EPA's PFAS Strategic Roadmap: Commitments to Action 2021-2024

- EPA Administrator Michael Regan established the EPA Council on PFAS in April 2021.
- The Council developed the PFAS Strategic Roadmap, released in October 2021 – a strategic, whole-of-EPA approach to protect public health and the environment from PFAS.
- The Roadmap:
  - Includes timelines for concrete actions from 2021-2024;
  - Fills a critical gap in federal leadership;
  - Supports states' ongoing efforts; and
  - Builds on the Biden-Harris Administration's commitment to restore scientific integrity.

EPA's Goals in the Strategic Roadmap

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

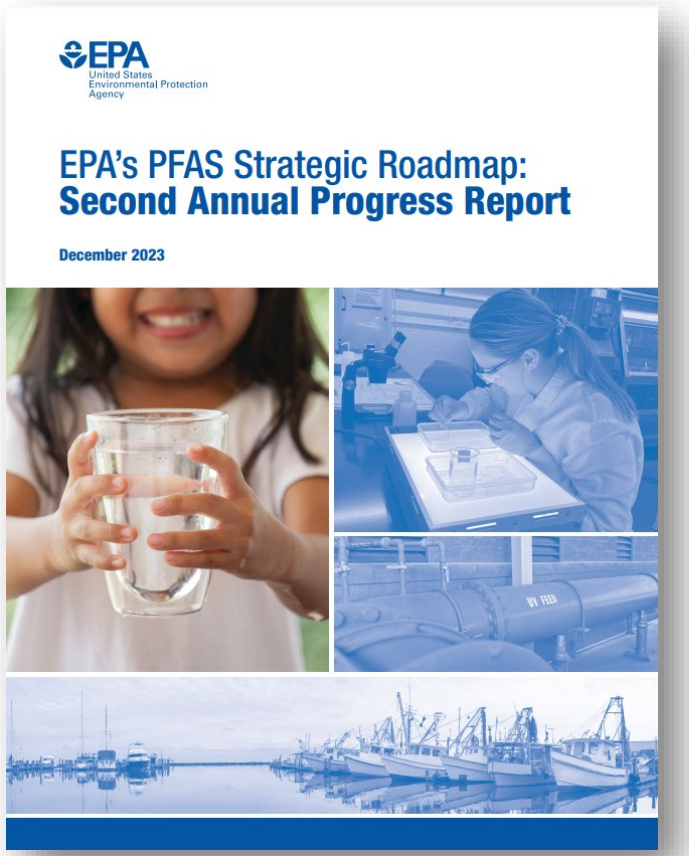
Broaden and accelerate the cleanup of PFAS contamination to protect human health and ecological systems.

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.

Key PFAS Roadmap Accomplishments: 2023



- **Making PFAS use safer** through robust chemical reviews and improving data
- **Holding polluters accountable** through enforcement and compliance and hazardous-substance designations
- **Protecting America's drinking water** through national drinking water standards and nationwide monitoring
- **Deploying Bipartisan Infrastructure Law funding** to address PFAS in water
- **Turning off the tap for industrial polluters** using Clean Water Act authorities
- **Advancing the science** of PFAS toxicity, exposures, and methods
- **Incorporating equity and environmental justice** through analyses, funding, data, and tools
- **Listening to and learning from communities**

PFAS Strategic Roadmap: EPA's Commitments to Action 2021–2024

Why are PFAS Relevant for Waste Sites?

- Potential for contamination exists at numerous locations due to pervasive manufacturing and use/release of PFAS.

- PFAS are persistent, toxic, mobile, and bioaccumulative and can have a deleterious effect on human health and the environment.

Summary of Sites

(as of Jan 2024)

- 405 NPL sites
  - 124 FF sites
  - 281 private sites
- < 5 Removal Sites

- Types of sites (NPL and non-NPL)
  - AFFF usage
  - Landfills
  - Metal plating
  - Textile coating
  - Biosolids or waste sludge (i.e., papermaking) application to fields

Other Sites of Potential Concern

- Mining
- Explosives
- Concrete manufacturing
- Medical parts manufacturing
- Paints, coatings, inks, varnishes
- Cleaning products
- Electronics manufacturing
- Papermaking

- Gaines (2023) “Historical and current usage of per- and polyfluoroalkyl substances (PFAS): A literature review” DOI: 10.1002/ajim.23362

Fate and Transport

- PFAS have different properties depending on chain length, functional group, etc.
- PFAS tend to accumulate at interfaces: air/water, soil/water, etc.
- Shorter chain PFAS
  - More mobile
  - More likely to be volatile
  - Break through GAC faster
  - More likely to be found in plants
- Longer chain PFAS
  - More likely to bioaccumulate in animals

PFAS Toxicity

- Final federal toxicity values available for PFAS: PFOA, PFOS, PFNA, PFHxS, PFBS, HFPO-DA, PFBA, PFHxA, PFPrA, TFSI (HQ-115)
- No inhalation toxicity values but several states have proposed route to route extrapolation
- 3 PFAS on IRIS agenda
  - PFDA public draft April 2023, PFHxS public draft July 2023
  - PFNA not yet available

PFAS	Year	Source	Status	RfD (mg/kg/day)	Tap Water RSL HQ=1 (ng/l, ppt)*
PFODA	2020	WI	Final	4.00E-02	800,000
PFTetDA	2020	WI	Final	1.00E-03	20,000
PFDoDA	2020	WI	Final	5.00E-05	1,000
PFUDA	2020	WI	Final	3.00E-04	6,000
PFNA	2021	ATSDR	Final	3E-6	59
PFOA	2021	ATSDR	Final	3E-6	60
PFHxA	2023	IRIS	Final	5E-4	9,900
PFBA	2023	IRIS	Final	1E-3	18,000
PFPrA	2023	HERA	Final	1E-4	9,800
PFOS	2021	ATSDR	Final	2E-6	40
PFHxS	2021	ATSDR	Final	2E-5	390
PFBS	2021	PPRTV	Final	3E-4	6,000
HFPO-DA	2021	OW	Final	3E-6	15
TFSI	2023	HERA	Final	3E-4	5,900

PFAS	Year	Source	Status	RfD (mg/kg/day)	Tap Water RSL HQ=1 (ng/l, ppt)
PFBS	2014	PPRTV	Archived	2E-2	400,000
PFBS	2021	PPRTV	Final	3E-4	6000
PFOA	2016	OW	Final	2E-5	400
PFOA	2021	ATSDR	Final	3E-6	60
PFOA	2023	OW	Draft	3E-8	0.6
PFOS	2016	OW	Final	2E-5	400
PFOS	2021	ATSDR	Final	2E-6	40
PFOS	2023	OW	Draft	1E-7	2

State Toxicity/Risk Levels

- 30 states have derived water levels (risk, screening, cleanup, MCL, etc.) for a total of 25 different PFAS
- Many states only using EPA levels
- 14 different PFAS have originally derived state toxicity values
- 9 PFAS have a state derived toxicity equivalent factor or similar
- Summary: States in your region may have their own PFAS risk levels
- ITRC has good summary of information
  - https://pfas-1.itrcweb.org/

PFAS RSL and RML

- ONLY Those PFAS with final, federal toxicity values are in the RSL/RML
- PFBS in RSL/RML since 2014, updated in 2021
- PFOA, PFOS, PFNA, PFHxS, and HFPO-DA added May 2022
- PFBA and PFHxA added May 2023
- PFPrA and TFSI added in November 2023 as well as 4 WI state values for PFUDA, PFDoDA, PFTetA and PFODA
- RSL and RML will continue to change and be added to as new toxicity values are generated
- RSL and RML may also change due to physicochemical properties, which cause some to have a dermal component

PFAS RSL and RML

- 2019 Memo on PFOA and PFOS in GW has been rescinded; EPA suggests using existing processes or, for CERCLA, relevant and appropriate requirements (ARARs), such as state drinking water Maximum Contaminant Levels (MCLs), if available. If not available or protective, EPA recommends using the Risk Assessment Guidance for Superfund (RAGS) to screen for PFOA and PFOS, develop risk-based preliminary remediation goals and establish final cleanup levels.

PFAS RSL, RML, and HA

PFAS	RSL HQ=0.1 (ng/l, ppt)	RSL HQ=1 (ng/l, ppt)	RML HQ=1 (ng/l, ppt)	RML HQ=3 (ng/l, ppt)	HA (ng/l,ppt)
HFPO-DA	2	15	15	45	10
PFBS	600	6000	6000	18000	2000
PFHxS	39	390	390	1200	
PFNA	6	59	59	180	
PFBA	1800	18000	18000	54000	
PFHxA	990	9900	9900	29700	
PFOA	6	60	60	180	0.004
PFOS	4	40	40	120	0.020

*All concentrations in ng/l or ppt; PFOA and PFOS HAs are interim and based on EPA OW's 2021 updated toxicity assessment. RSLs and RMLs are based on ATSDR's 2021 toxicity profile.

Disposal and Destruction

- 2024 PFAS D&D Interim Guidance focuses on options to destroy or dispose of PFAS containing materials, including soil or contaminated media from treating GW (ex., GAC)
- Three destruction and disposal technologies that may be effective and are commercially available:
  - thermal treatment (destruction),
  - landfilling (disposal),
  - underground injection (disposal).
- Presents review of available information as well as of uncertainties and knowledge gaps; describes ongoing research

Updated PFAS D&D Interim Guidance

- Issued with new signed rule
- Includes new science, industry testing, EPA PFAS Innovative Treatment Team (PITT) and other research results
- Incorporating new EPA test methods and regulations, along with screening methods to assess vulnerable populations near D&D sites

Will contain revisions based on public comments received

- Following publication, EPA will again accept public comments
- Will include more recent information on potential releases during PFAS D&D
- Key data gaps and uncertainties remain and will need to be resolved before EPA can offer more definitive recommendations

EPA Activities - OLEM

- Rulemaking to designate PFOA and PFOS as hazardous substances (CERCLA)
  - Requires notification to the National Response Center for releases of either substance (Reportable Quantity of 1 pound)
  - Allows for cost recovery and compel cleanup
  - Published in the Federal Register Sept. 6, 2022
  - 62,500 public comments received
  - Signed on April 19th, 2024, effective 60 days from publish date in FR
- Advance notice of proposed rulemaking (ANPRM) seeking public input in several areas regarding PFAS
  - Published in Federal Register in April 2023
  - Public comment period extended to August 11, 2023
  - Developing ANPRM does not obligate EPA to take additional actions

EPA's CERCLA PFAS Enforcement Discretion

- Since the PFOA/PFOS designation rulemaking has been finalized, the Agency issued a CERCLA PFAS enforcement discretion policy regarding PFAS contamination.
- Policy sets forth that EPA does not intend to pursue entities where equitable factors do not support assigning CERCLA responsibility:
  - Community water systems and publicly owned treatment works (POTWs);
  - Municipal separate storm sewer systems (MS4s);
  - Publicly owned/operated municipal solid waste landfills;
  - Publicly owned airports and local fire departments; and
  - Farms where biosolids are applied to the land.

EPA Activities - OLEM

- Statutory Hazardous Waste Definition Applicable to RCRA Corrective Action - proposed rulemaking
  - Would provide clear regulatory authority to require cleanup of releases of substances meeting the statutory definition of hazardous waste at RCRA permitted hazardous waste treatment, storage, and disposal facilities.
  - In doing so, would more clearly implement EPA's longstanding interpretation of its statutory corrective action authority.
  - The proposed rule has completed OMB review and is expected to be published in the coming weeks.

EPA Activities - OLEM

- Rulemaking to List Specific PFAS as RCRA Hazardous Constituents
  - EPA, based on review of key toxicity and health effects data for PFAS, has developed a proposed rule to list specific PFAS as RCRA hazardous constituents
  - Constituents can be listed on 40 CFR Part 261 Appendix VIII (the list of RCRA hazardous constituents) if data in scientific studies show they have toxic, carcinogenic, mutagenic or teratogenic effects on humans or other life forms
  - Appendix VIII hazardous constituents are subject to corrective action requirements at hazardous waste treatment, storage, and disposal facilities (TSDFs).
  - Rule would not make PFAS a RCRA listed or characteristic hazardous waste subject to treatment standards, land disposal restriction and other cradle to grave management requirements
  - The proposed rule cleared OMB review on 12/21/2023 and is scheduled to be published in the next few weeks.

EPA PFAS test methods

- *Reliable analytical methods are needed to identify and measure PFAS in air, water and land*

3 main categories:

- Targeted methods
  - Quantitative analysis of a defined set of known analytes
  - Cannot detect PFAS not on the analyte list
- Class-based methods
  - Provide information beyond targeted methods
  - Cannot identify specific chemical structures
- Aqueous Leaching methods
  - Improve fate and transport modeling
  - Evaluate immobilization strategies prior to field deployment

Targeted Analytical Methods

Method	Matrix	Status
Method 533 (OW)	Aqueous (Drinking water)	Final (2019); OW is currently evaluating options to expand target analyte list
Method 537.1 (OW)	Aqueous (Drinking water)	Final (2020)
SW-846 Methods 3512 and 8327 (OLEM)	Aqueous (Surface water, groundwater, wastewater)	Final (2021)
Draft Method 1633 (OW, in partnership with DoD)	Aqueous (Surface water, groundwater, wastewater, leachate), Solid (soil, sediment, biosolids, fish tissue)	Multi-laboratory validation study complete Goal: Finalize in early 2024 OLEM to use data for SW-846 updates
ASTM D8421-22 (“Direct Inject”, EPA/ASTM collaboration)	Aqueous (Surface water, groundwater, wastewater, leachate)	Goal: Finalize interlaboratory validation study report in early 2024
OTM-45 (OAR)	Air (Stationary sources)	Final (2021); Updates in progress
OTM-50 (Volatile PFAS, OAR)	Air (Stationary sources)	New; Anticipated release in early 2024
Voluntary consensus standard for FTOH and related PFAS precursors (ORD)	Aqueous (Surface water, groundwater, wastewater)	Under development

PFAS Drinking Water Rule

New PFAS Drinking Water Rule setting MCLs signed on April 10th 2024, Published in FR on April 26th 2024, Effective date June 24th 2024.

Chemical	Maximum Contaminant Level Goal (MCLG)	Maximum Contaminant Level (MCL)
PFOA	0	4.0 ppt
PFOS	0	4.0 ppt
PFNA	10 ppt	10 ppt
PFHxS	10 ppt	10 ppt
HFPO-DA (GenX chemicals)	10 ppt	10 ppt
Mixture of two or more: PFNA, PFHxS, HFPO-DA, and PFBS	Hazard Index of 1	Hazard Index of 1
Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.		

Questions

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