The Fifth Unregulated Contaminant Monitoring Rule (UCMR 5) Data Summary: January 2024

Overview

The U.S. Environmental Protection Agency has released the third set of data collected under the fifth Unregulated Contaminant Monitoring Rule (UCMR 5) for the 30 chemical contaminants (29 per- and polyfluoroalkyl substances [PFAS] and lithium) listed in Table 1. With this latest action, the data released to date represent approximately 24% of the total results that the EPA expects to receive until completion of data reporting in 2026. The EPA will update the results quarterly in the UCMR 5 Data Finder and on the UCMR Occurrence Data webpage. Data are added and possibly removed or updated over the course of this reporting cycle following further review by analytical laboratories, public water systems (PWSs), states, and the EPA. Before conducting your own assessment of the data, please review the Data Considerations section. For answers to common questions on accessing and understanding the UCMR 5 data, and on PFAS and lithium in drinking water, please review the UCMR 5 website.

UCMR 5 will provide new data that will improve the EPA's understanding of the frequency that these contaminants are found in the nation's drinking water systems, and at what levels. Notably, the monitoring data for 29 PFAS will enable a better understanding of where and to what extent different PFAS co-occur with each other in drinking water. The UCMR 5 data on PFAS and lithium will help the agency make determinations about future regulations and other actions to protect public health under the Safe Drinking Water Act (SDWA). This monitoring also helps federal, state, and other researchers prioritize studies for health effects information, identify data gaps, and determine the need for future studies to improve our understanding of the possible health risks associated with these contaminants in public drinking water. Through the Bipartisan Infrastructure Law, the EPA is helping states, Tribes, and especially small, disadvantaged, and rural communities to leverage billions of dollars in funding dedicated to investments in infrastructure solutions. Those investments will allow communities to remove emerging contaminants, like PFAS and lithium, from their drinking water. For more information, visit the agency's website.

Based on this limited set of data, the EPA notes the following:

- PFOA and PFOS are two of the most widely studied PFAS, and each has an EPA Health Advisory (HA) level. One or each of these two PFAS was measured at or above the EPA's UCMR minimum reporting level (MRL), and therefore above the agency's HA levels, in the initial subset of sample events for 16.1% of PWSs with results to date.
    - Individually, PFOA and PFOS were measured above the EPA HA levels for 11.5% and 12.8% of PWSs, respectively.
- The other two PFAS with EPA HA levels are HFPO-DA ("GenX chemicals") and PFBS. HFPO-DA was measured above its HA level by 0.03% of PWSs (1 of 3,722). PFBS was not found above its HA level.
- HA levels have not been established for the other 25 PFAS that are part of UCMR 5.
    - Seventeen of these 25 PFAS were measured at or above their respective UCMR MRL by at least one PWS.
    - For the other eight PFAS, no PWSs have reported results at or above the respective UCMR MRLs.
- These data show that PFAS co-occur as mixtures in drinking water systems. For example, there are 831 PWSs that have reported results for two or more PFAS at or above the UCMR MRL. In March 2023, the EPA presented peer-reviewed science that indicates that mixtures of PFAS can pose a health risk greater than each chemical on its own, as conveyed in the proposed National Primary Drinking Water Regulation

(NPDWR) for six PFAS. The EPA will continue to evaluate the co-occurrence of PFAS in drinking water systems and at sampling locations as the agency gathers more UCMR 5 monitoring data.
- The EPA has not published a HA level for lithium but has calculated a Health Reference Level (HRL) for screening purposes. To date, 25.6% of PWSs have reported lithium results above the screening HRL.

Additional details on contaminant health effects information are provided in Table 2. Summary details for contaminant occurrence to date are shown in Table 3.

Background

The EPA uses the UCMR program to collect nationally representative data for contaminants that may be present in drinking water but are not yet subject to regulatory standards set under SDWA. This monitoring is used by the agency to understand the frequency and level of occurrence of unregulated contaminants in the nation's drinking water systems. Every five years, taking into consideration the EPA's Contaminant Candidate List (CCL), the agency develops a new list of UCMR contaminants for monitoring. SDWA, as amended by Section 2021 of America's Water Infrastructure Act of 2018, calls for the EPA to:

- Issue a list of unregulated contaminants to be monitored by certain PWS types[1] every five years
- Require large PWSs (*i.e.*, those that serve more than 10,000 people) to monitor their water for the contaminants
- Require small PWSs serving between 3,300 and 10,000 people to monitor, subject to the availability of EPA appropriations and sufficient laboratory capacity
- Require a nationally representative sample of small PWSs serving less than 3,300 people to monitor
- Make analytical results available in the National Contaminant Occurrence Database (NCOD)

State and local officials may also use the UCMR data to assess the need for actions to protect public health. When evaluating the UCMR data, one should consider the following:

- UCMR monitoring generates a robust dataset that is representative of national occurrence.
- UCMR results are available after PWSs and the laboratories that support their monitoring have reported results to the EPA (up to four months after the samples are collected). Small PWS results may be available sooner relative to large PWS results since the laboratories contracted by the EPA to analyze small PWS samples are contractually obligated to report results within a shorter timeframe.
- There is information about health effects and treatment techniques to address some of these unregulated contaminants.

[1] UCMR 5 requirements apply to community water systems (CWSs) and non-transient non-community water systems (NTNCWSs). They do not apply to transient non-community water systems (TNCWSs). The use of "PWS" throughout this document refers to participating CWSs and NTNCWSs. For more information on PWS types, visit the agency's website.

Table 1. Contaminants and Methods

Contaminant	CASRN[1]	EPA Method	Contaminant Classification
lithium	7439-93-2	200.7	Metal/Pharmaceutical
hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX chemicals)	13252-13-6	533	PFAS
perfluorobutanesulfonic acid (PFBS)	375-73-5	533	PFAS
perfluorooctanesulfonic acid (PFOS)	1763-23-1	533	PFAS
perfluorooctanoic acid (PFOA)	335-67-1	533	PFAS
perfluorohexanesulfonic acid (PFHxS)	355-46-4	533	PFAS
perfluorononanoic acid (PFNA)	375-95-1	533	PFAS
perfluorobutanoic acid (PFBA)	375-22-4	533	PFAS
perfluorohexanoic acid (PFHxA)	307-24-4	533	PFAS
perfluorodecanoic acid (PFDA)	335-76-2	533	PFAS
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	533	PFAS
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	533	PFAS
1H, 1H, 2H, 2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	533	PFAS
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	533	PFAS
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	533	PFAS
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	533	PFAS
nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	151772-58-6	533	PFAS
perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	113507-82-7	533	PFAS
perfluoro-3-methoxypropanoic acid (PFMPA)	377-73-1	533	PFAS
perfluoro-4-methoxybutanoic acid (PFMBA)	863090-89-5	533	PFAS
perfluorododecanoic acid (PFDoA)	307-55-1	533	PFAS
perfluoroheptanesulfonic acid (PFHpS)	375-92-8	533	PFAS
perfluoroheptanoic acid (PFHpA)	375-85-9	533	PFAS
perfluoropentanesulfonic acid (PFPeS)	2706-91-4	533	PFAS
perfluoropentanoic acid (PFPeA)	2706-90-3	533	PFAS
perfluoroundecanoic acid (PFUnA)	2058-94-8	533	PFAS
n-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	537.1	PFAS
n-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	537.1	PFAS
perfluorotetradecanoic acid (PFTA)	376-06-7	537.1	PFAS
perfluorotridecanoic acid (PFTrDA)	72629-94-8	537.1	PFAS

[1] CASRN – Chemical Abstracts Service Registry Number

Information About UCMR 5 Results

The purpose of this document is to (1) summarize UCMR 5 results reported to date and (2) provide context around UCMR 5 results in relation to EPA-established UCMR minimum reporting levels (MRLs) and, if available, health-based reference values (*i.e.*, reference concentrations and reference doses [RfDs]). The UCMR 5 MRLs are the lowest concentrations that laboratories may report to the EPA during UCMR 5 monitoring. UCMR MRLs are determined using data from multiple laboratories that participate in the EPA's MRL-setting studies and are not associated with contaminant health effects information. The EPA establishes UCMR MRLs to ensure consistency in the quality of the information reported to the agency.

Depending on the available health and toxicological information for a UCMR 5 contaminant, a reference concentration (*e.g.*, a lifetime Health Advisory [HA] level, Health Reference Level [HRL]) in drinking water may be available. Reference concentrations can be derived from an RfD (*i.e.*, a non-cancer endpoint) or an oral cancer slope factor (CSF) (*i.e.*, a cancer endpoint), if available, and consider additional assumptions about body weight and drinking water intake. The health-based reference values identified in this document do not represent regulatory limits or action levels and should not be interpreted as an indication of future agency actions. UCMR occurrence data are used to inform the agency's Regulatory Determination process (*i.e.*, the process that addresses potential regulatory actions for unregulated contaminants).

Community water systems (CWSs) required to monitor under UCMR must inform their customers of UCMR results (including the average and range of results) in their annual Consumer Confidence Report (CCR). See 40 CFR 141.153(d)(7) for the CCR regulatory requirements and Section IV of the EPA's guidance Preparing Your Drinking Water Consumer Confidence Report for details on the content of the report. Additional resources are available on the EPA's CCR Compliance Help webpage.

Non-transient non-community water systems (NTNCWSs), such as an office park or school that operates its own drinking water system, and CWSs required to monitor under UCMR must inform their customers of the availability of all UCMR results through Tier 3 Public Notification (PN). See 40 CFR 141.207 for the PN regulatory requirements and the EPA's PN Compliance Help webpage for guidance.

The EPA recognizes the high interest in timely access to UCMR results and is committed to publicly posting results on the agency's Occurrence Data webpage approximately quarterly (following large PWS review of their UCMR results and EPA review of small PWS results). The EPA manages the laboratory analyses for small PWSs and will work to communicate their results in a timely manner. Large PWSs wishing to have earlier access to their data should consider making arrangements with their UCMR 5 laboratory for early notification of UCMR results (*i.e.*, before their contracted laboratory posts the results to the UCMR web-based reporting system).

States may establish requirements (regulatory or non-regulatory) for drinking water contaminants not yet regulated by the EPA, and those requirements may be based on state-established levels that differ from the agency's reference concentrations for UCMR 5. PWSs are responsible for being aware of and complying with their state's requirements, if any.

In March 2023, the agency announced a proposed NPDWR for six PFAS included in UCMR 5 monitoring. The proposed PFAS NPDWR does not require any actions until it is finalized. The EPA's PFAS website provides additional information on agency actions to address PFAS contamination, describes current PFAS research, and identifies related tools and resources.

Available drinking water treatment information for UCMR 5 contaminants can be found in the EPA's Drinking Water Treatability Database.

Health-Based Reference Values

Table 2 provides health-based reference values (*i.e.*, reference concentrations and RfDs) for each contaminant monitored under UCMR 5, if available. To identify reference values, the EPA applied the following principles:

(1) Reference concentrations and RfDs were compiled from the following publicly available resources:
   a. Drinking Water Health Advisories (HAs),
   b. Integrated Risk Information System (IRIS) Assessments,
   c. Technical Support Document for the Final CCL 5 – Contaminant Information Sheets, and
   d. Agency for Toxic Substances and Disease Registry (ATSDR) Toxicological Profiles

   The above resources are the products (or compilation) of peer-reviewed health assessments. The reference values are subject to change as new health assessments are completed; they are not legally enforceable federal standards.

(2) If health information was available from more than one of the resources listed above, the most recent health information was used.

(3) If both cancer and non-cancer reference concentrations were available from the most recent resource, the lower (more conservative) of the two concentrations was used. Please review the references and footnotes in Table 2 for additional health effects information.

(4) If an RfD (*i.e.*, a non-cancer endpoint) was the basis for the reference concentration, and both chronic and subchronic/short-term exposure values were available from the most recent resource, the lower concentration (associated with the chronic exposure) was used. Please review the references and footnotes in Table 2 for additional health effects information (*e.g.*, additional short-term, subchronic, or chronic values).

(5) For the contaminants that do not have a reference concentration available from a resource listed above, only the RfDs from finalized health assessments are provided in Table 2, if available. If a health assessment is in process, a link to additional information about its status is provided.

The EPA considers this a "living document" and will update Table 2 as new health-based information becomes available. For example, the agency is currently using the 2022 EPA lifetime HA levels for GenX chemicals, PFBS, PFOS, and PFOA as reference concentrations for UCMR 5 and will update the values, as appropriate, when the final PFAS NPDWR is promulgated.

Table 2. UCMR Minimum Reporting Levels (MRLs) and Health-Based Reference Values

Contaminant [Note: to convert to ng/L or parts per trillion (ppt), multiply by 1,000]	UCMR MRL (µg/L)	Health-Based Reference Values		References
		Reference Concentration (µg/L)	RfD (mg/kg-day)	
lithium[1]	9	HRL = 10	Subchronic and Chronic Provisional RfD = 2×10^{-3}	Technical Support Document for the Final CCL 5 Contaminant Information Sheets (2022)
hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX chemicals)[2,3]	0.005	Lifetime HA = 0.01	Chronic RfD = 3×10^{-6}	Drinking Water Health Advisory: Hexafluoropropylene Oxide (HFPO) Dimer Acid and HFPO Dimer Acid Ammonium Salt, Also Known as "GenX Chemicals" (2022)
perfluorobutanesulfonic acid (PFBS)[2,3]	0.003	Lifetime HA = 2	Chronic RfD = 3×10^{-4}	Drinking Water Health Advisory: Perfluorobutane Sulfonic Acid and Related Compound Potassium Perfluorobutane Sulfonate (2022)
perfluorooctanesulfonic acid (PFOS)[3,4]	0.004	Lifetime Interim HA = 0.00002	Chronic RfD = 7.9×10^{-9}	INTERIM Drinking Water Health Advisory: Perfluorooctane Sulfonic Acid (PFOS) (2022)
perfluorooctanoic acid (PFOA)[3,4]	0.004	Lifetime Interim HA = 0.000004	Chronic RfD = 1.5×10^{-9}	INTERIM Drinking Water Health Advisory: Perfluorooctanoic Acid (PFOA) (2022)
perfluorohexanesulfonic acid (PFHxS)[3,5]	0.003	-	ATSDR: Minimal Risk Level = 2×10^{-5} (intermediate duration)	ATSDR Toxicological Profile for Perfluoroalkyls (2021)
perfluorononanoic acid (PFNA)[3,5]	0.004	-	ATSDR: Minimal Risk Level = 3×10^{-6} (intermediate duration)	ATSDR Toxicological Profile for Perfluoroalkyls (2021)
perfluorobutanoic acid (PFBA)	0.005	-	Chronic RfD = 1×10^{-3} Subchronic RfD = 6×10^{-3}	Integrated Risk Information System (IRIS) Assessment (2022)

[1] The reference concentration is the Health Reference Level (HRL) calculated as part of the CCL 5 process and is based on the RfD from the following health assessment: Provisional Peer-Reviewed Toxicity Values (PPRTV), 2008. The EPA has developed a Technical Fact Sheet on Lithium in Drinking Water for Primacy Agencies, available here.

[2] More information is available on the final lifetime HAs for GenX chemicals and PFBS.

[3] On March 14, 2023, the EPA announced a proposed NPDWR for six PFAS (GenX chemicals, PFBS, PFOS, PFOA, PFHxS, and PFNA). After the agency has considered public comments and publishes a final PFAS NPDWR, the reference concentrations for these six PFAS will be updated as appropriate.

[4] More information is available on the interim lifetime HAs for PFOA and PFOS.

[5] In process/draft EPA Integrated Risk Information System (IRIS) assessments for PFHxS and PFNA.

Contaminant [Note: to convert to ng/L or parts per trillion (ppt), multiply by 1,000]	UCMR MRL (µg/L)	Health-Based Reference Values		References
		Reference Concentration (µg/L)	RfD (mg/kg-day)	
perfluorohexanoic acid (PFHxA)	0.003	-	Subchronic and Chronic RfD = 5×10^{-4}	Integrated Risk Information System (IRIS) Assessment (2023)
perfluorodecanoic acid (PFDA)	0.003	-	-	IN PROCESS/DRAFT Integrated Risk Information System (IRIS) Assessment
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OudS)	0.005	-	-	-
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	0.005	-	-	-
1H, 1H, 2H, 2H-perfluorohexane sulfonic acid (4:2 FTS)	0.003	-	-	-
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	0.005	-	-	-
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	0.003	-	-	-
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	0.002	-	-	-
nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	0.02	-	-	-
perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	0.003	-	-	-
perfluoro-3-methoxypropanoic acid (PFMPA)	0.004	-	-	-
perfluoro-4-methoxybutanoic acid (PFMBA)	0.003	-	-	-
perfluorododecanoic acid (PFDoA)	0.003	-	-	-
perfluoroheptanesulfonic acid (PFHpS)	0.003	-	-	-
perfluoroheptanoic acid (PFHpA)	0.003	-	-	-
perfluoropentanesulfonic acid (PFPeS)	0.004	-	-	-
perfluoropentanoic acid (PFPeA)	0.003	-	-	-
perfluoroundecanoic acid (PFUnA)	0.002	-	-	-
n-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.005	-	-	-
n-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.006	-	-	-
perfluorotetradecanoic acid (PFTA)	0.008	-	-	-
perfluorotridecanoic acid (PFTrDA)	0.007	-	-	-

Terms and Definitions

a) **UCMR MRL** – EPA-established UCMR Minimum Reporting Level. The lowest concentration that laboratories may report to the EPA during UCMR 5 monitoring. MRLs are not associated with health effects information. More specifically, an MRL is the quantitation limit for a contaminant that is considered achievable, with 95% confidence, by at least 75% of laboratories nationwide using a specified analytical method (recognizing that individual laboratories may be able to measure at lower levels). **[Note that the Agency for Toxic Substances and Disease Registry (ATSDR) uses the term "MRL" for a different purpose (*i.e.*, to describe "Minimal Risk Level"). The UCMR term and the ATSDR term have no relationship to each other.]**

b) **Ref Conc** – Reference Concentration. Published EPA Drinking Water Health Advisories (HAs) and the Health Reference Levels (HRLs) from the EPA's Fifth Contaminant Candidate List (CCL 5). These reference concentrations are derived from peer-reviewed health assessments published by the EPA or other governmental agencies. They are not legally enforceable federal standards and are subject to change as new health assessments are completed. Depending on available health effects information, a reference concentration in drinking water can be derived from a reference dose (RfD) (*i.e.*, a non-cancer endpoint) or a cancer slope factor (CSF) (*i.e.*, a cancer endpoint), and considers additional assumptions about body weight and drinking water intake.

c) **HA** – Health Advisory. Provides information on a contaminant that can cause negative human health effects and is known or anticipated to occur in drinking water. SDWA authorizes the EPA to issue HAs for contaminants that are not subject to a National Primary Drinking Water Regulation (NPDWR). The EPA's HAs are non-enforceable and non-regulatory and provide technical information to state agencies and other public health officials on health effects, analytical methods, and treatment technologies associated with drinking water contaminants. The HA documents include the derivation of the HA levels, which are the concentrations of contaminants at or below which adverse health effects are not anticipated to occur over specific exposure durations, such as one day, 10 days, or a lifetime. The lifetime HA for the drinking water contaminant is calculated from its associated Drinking Water Equivalent Level (DWEL), obtained from its RfD, and incorporates a drinking water Relative Source Contribution (RSC) factor of contaminant-specific data or a default of 20% of total exposure from all sources. For more information, refer to the EPA's Drinking Water HAs webpage and questions and answers on the lifetime HAs for PFAS.

d) **HRL** – Health Reference Level. Derived during the CCL 5 process for screening purposes. HRLs are used in the EPA's Regulatory Determination process as risk-derived concentrations against which to evaluate occurrence data to determine if contaminants occur at levels of public health concern. HRLs are not final determinations about the level of a contaminant in drinking water that is necessary to protect any particular population and, in some cases, are derived prior to development of a complete exposure assessment using the best available data. HRLs are not legally enforceable federal standards. To determine the HRL for a chemical, the agency considers adverse health effects that may pose a greater risk to specific lifestages and other sensitive groups which represent a meaningful portion of the population. For more information on HRL derivation, please see the Technical Support Document for the Final CCL 5 – Contaminant Information Sheets.

e) **RfD** – Oral Reference Dose. A non-cancer estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. It is typically derived by dividing a point-of-departure (POD) from a selected dose-response study (*e.g.*, no-observed-adverse-effect level [NOAEL], lowest-observed-adverse-effect level [LOAEL], benchmark dose [BMD]) by the uncertainty factors (UFs) applied to reflect database limitations. Chronic RfDs are typically derived from animal toxicological studies with an exposure duration of months to years, representing a lifetime exposure in humans. Subchronic RfDs are typically derived from animal toxicological studies with an exposure duration of 31 to 90 days, representing a less than lifetime exposure in humans (up to 10% of average lifespan). Visit the EPA's IRIS website for more information about RfD derivation.

f) **Minimal Risk Levels** – Developed by ATSDR as screening tools to help identify chemicals that may be of concern. A minimal risk level is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse non-cancer health effects over a specified route and duration of exposure. Minimal risk levels are derived when reliable and sufficient data exist to identify the target organ(s) of effect or the most sensitive health effect(s) for a specific duration for a given route of exposure. These substance specific estimates, which are intended to serve as screening levels, are used by ATSDR health assessors to determine areas and populations potentially at risk for health effects from exposure to a particular substance. Exposure above the minimal risk level does not mean that health problems will occur. Instead, it may act as a signal to health assessors to look more closely at a particular site where exposures may be identified. Minimal risk levels do not define regulatory or action levels for ATSDR.

Table 3. January 2024 Data Summary[1,2]

Contaminant	UCMR MRL[3] (µg/L)	Ref Conc[4] (µg/L)	Total number of results	Number of results ≥MRL	Number of results >Ref Conc[5]	% of total results >Ref Conc[5]	Total number of PWSs with results	Number of PWSs with results ≥MRL	Number of PWSs with results >Ref Conc[5]	% of PWSs with results >Ref Conc[5]
lithium	9	10	17,932	5,177	3,645	20.3%	3,764	1,319	963	25.6%
hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX chemicals)	0.005	0.01	16,777	24	2	0.01%	3,722	17	1	0.03%
perfluorobutanesulfonic acid (PFBS)	0.003	2	16,766	1,443	0	0.0%	3,720	570	0	0.0%
perfluorooctanesulfonic acid (PFOS)[6]	0.004	0.00002	16,768	1,149	1,149	6.9%	3,720	477	477	12.8%
perfluorooctanoic acid (PFOA)[6]	0.004	0.000004	16,772	1,076	1,076	6.4%	3,720	429	429	11.5%
perfluorohexanesulfonic acid (PFHxS)	0.003	-	16,768	933	-	-	3,721	374	-	-
perfluorononanoic acid (PFNA)	0.004	-	16,778	48	-	-	3,722	26	-	-
perfluorobutanoic acid (PFBA)	0.005	-	16,773	1,443	-	-	3,722	683	-	-
perfluorohexanoic acid (PFHxA)	0.003	-	16,770	1,550	-	-	3,720	621	-	-
perfluorodecanoic acid (PFDA)	0.003	-	16,778	9	-	-	3,722	4	-	-
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	0.005	-	16,779	0	-	-	3,722	0	-	-
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	0.005	-	16,776	1	-	-	3,722	1	-	-
1H, 1H, 2H, 2H-perfluorohexane sulfonic acid (4:2 FTS)	0.003	-	16,778	1	-	-	3,722	1	-	-
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	0.005	-	16,775	82	-	-	3,722	60	-	-
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	0.003	-	16,778	0	-	-	3,722	0	-	-
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	0.002	-	16,770	0	-	-	3,722	0	-	-

[1] This data summary represents approximately 24% of total results that the EPA expects to receive over the next three years.
[2] Analytical results from the UCMR program are reported by laboratories and provided by the agency in micrograms/liter (µg/L, or parts per billion). To convert results in µg/L to nanograms/liter (ng/L, or parts per trillion), multiply the value by 1,000. UCMR results do not represent locational running annual averages.
[3] UCMR MRL – EPA-established UCMR Minimum Reporting Level. Based on laboratory capability; not related to contaminant health effects information.
[4] Ref Conc – Reference Concentration. The EPA Health Advisories (HAs) for four PFAS and the EPA's CCL 5 Health Reference Level (HRL) for lithium.
[5] The EPA HAs and HRLs are expressed with one significant digit; comparison of UCMR results to HAs and HRLs is therefore based on one significant digit. Results ≥0.015 µg/L for GenX chemicals and ≥2.5 µg/L for PFBS round to ≥0.02 µg/L and ≥3 µg/L, respectively, and are identified as above reference concentrations. Results for lithium are likewise identified as above the reference concentration if they are ≥15 µg/L.
[6] The HA levels for PFOA and PFOS are below the levels that can be reliably measured; thus, the UCMR MRLs for PFOA and PFOS are greater than the HA levels. Any result at or above the MRL for PFOA or PFOS is understood to be above its HA level. The number and % of PWSs with results above the reference concentration for PFOA and/or PFOS is greater than or equal to the number and % of PWSs with results at or above the UCMR MRL.

Contaminant	UCMR MRL[3] (µg/L)	Ref Conc[4] (µg/L)	Total number of results	Number of results ≥MRL	Number of results >Ref Conc[5]	% of total results >Ref Conc[5]	Total number of PWSs with results	Number of PWSs with results ≥MRL	Number of PWSs with results >Ref Conc[5]	% of PWSs with results >Ref Conc[5]
nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	0.02	-	16,772	4	-	-	3,721	3	-	-
perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	0.003	-	16,778	0	-	-	3,722	0	-	-
perfluoro-3-methoxypropanoic acid (PFMPA)	0.004	-	16,778	2	-	-	3,722	1	-	-
perfluoro-4-methoxybutanoic acid (PFMBA)	0.003	-	16,778	2	-	-	3,722	1	-	-
perfluorododecanoic acid (PFDoA)	0.003	-	16,774	2	-	-	3,722	2	-	-
perfluoroheptanesulfonic acid (PFHpS)	0.003	-	16,777	1	-	-	3,722	1	-	-
perfluoroheptanoic acid (PFHpA)	0.003	-	16,774	426	-	-	3,720	197	-	-
perfluoropentanesulfonic acid (PFPeS)	0.004	-	16,777	28	-	-	3,722	20	-	-
perfluoropentanoic acid (PFPeA)	0.003	-	16,765	1,757	-	-	3,721	692	-	-
perfluoroundecanoic acid (PFUnA)	0.002	-	16,774	1	-	-	3,721	1	-	-
n-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.005	-	17,224	0	-	-	3,751	0	-	-
n-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.006	-	17,224	0	-	-	3,751	0	-	-
perfluorotetradecanoic acid (PFTA)	0.008	-	17,224	0	-	-	3,751	0	-	-
perfluorotridecanoic acid (PFTrDA)	0.007	-	17,224	0	-	-	3,751	0	-	-

Data Considerations

The UCMR 5 analytical results are publicly available through the UCMR 5 Data Finder and as text files on the UCMR Occurrence Data webpage.

The UCMR 5 Data Finder allows people to easily search for, summarize, and download the available UCMR 5 analytical results. Results can be filtered using multiple data fields, including public water system (PWS), state, EPA Region, contaminant, source water type, results at or above UCMR minimum reporting levels (MRLs), and results above health-based reference concentrations (data definitions provided in Table 4). The UCMR 5 Data Finder can be used by federal, state, and local agencies as well as the public to easily locate and retrieve specific results and assist with answering questions regarding UCMR 5 monitoring. Selected results can be viewed online or downloaded as a Microsoft Excel file (.xlsx). A video demonstration of the UCMR 5 Data Finder is available here.

For those interested in large-scale data processing using statistical or data analysis software, the EPA recommends using the occurrence data text files containing the UCMR 5 analytical results as well as additional data element and ZIP Code information reported by participating PWSs. Data are provided in tab delimited text files (.txt) within zip files (.zip) (see below for descriptions), with field names included in the first row of each file and no text qualifier. The EPA recommends importing all ID fields into your choice of software as text since some of the IDs can otherwise be misinterpreted as long integer field types when they contain alpha characters.

- To download the occurrence data text files (data definitions provided in Table 5), select one of the following zip files from UCMR 5 (2023-2025) Occurrence Data:
    - **UCMR 5 Occurrence Data** to view all the analytical results to date (*i.e.*, results for all analytes reported by all PWSs). Note: the **UCMR5_all.txt** file will likely become too large to be imported into Excel once the majority of the UCMR 5 results are reported, in which case you can try other applications (*e.g.*, Microsoft Access) or import a subset of the data as described below.
    - **UCMR 5 Occurrence Data by State** to view all the analytical results to date, organized by Tribes and states. Within that zip file, one text file (**UCMR5_All_Tribes_AK_LA.txt**) will have all results for Tribal systems and for the states starting alphabetically with A through L; another file (**UCMR5_All_MA_WY.txt**) will have all results for the states starting alphabetically with M through W. The results are organized this way to address file size limitations and streamline data management.
    - **UCMR 5 Occurrence Data by Method Classification** to view all the analytical results to date, organized by analytical method. Within that zip file, you will find individual text files with results organized by method (*e.g.*, a Method 200.7 text file with results for lithium).
- The following text files for the **additional data elements** (*i.e.*, information reported by PWSs beyond the analytical results for the 30 UCMR 5 contaminants) are also contained in each of the above zip files:
    - **UCMR5_ZIPCodes.txt** – U.S. Postal Service ZIP Code(s) for all areas served by a PWS (data definitions provided in Table 6)
    - **UCMR5_AddtlDataElem.txt** – DisinfectantType, TreatmentInformation, LithiumOccurrence, LithiumTreatment, PFASOccurrence, PFASTreatment, PotentialPFASSources, PotentialPFASSourcesDetail (data definitions provided in Table 7)
        - The EPA is not asking PWSs for a formal, in-depth, source water evaluation for potential PFAS sources and recognizes that some PWSs will have more complete information than others. The agency's PFAS Analytic Tools can serve as a starting point to answer this question and are accessible here. UCMR 5 data will be updated in the PFAS Analytic Tools soon after each quarterly data release.

For step-by-step details on using the UCMR 5 Data Finder and occurrence data text files, please refer to the document "Instructions for Accessing Results from UCMR 5" on the UCMR Occurrence Data webpage. Additional reference material, including common questions and answers on accessing and understanding the UCMR 5 data, is available on the UCMR 5 website.

Table 4. Data Definitions for the UCMR 5 Data Finder

Field Name	Definition
PWS ID	Public Water System (PWS) Identification Code. The code used to identify each PWS. The code begins with the standard 2-character postal state abbreviation or Region code; the remaining 7 numbers are unique to each PWS in the state
PWS Name	Name of the PWS
Contaminant	The UCMR 5 contaminant analyzed
Result (µg/L)	Numeric value of the analytical result in µg/L for the contaminants. Results less than the UCMR MRL are indicated by "<MRL"
Minimum Reporting Level (MRL, µg/L)	Minimum Reporting Level (MRL) defined by UCMR 5 in µg/L for the contaminants. Based on laboratory capability; not related to contaminant health effects information (see Terms and Definitions)
Health-Based Ref Conc (µg/L)	Health-Based Reference Concentration in µg/L for the contaminants, if available (see Terms and Definitions)
Collection Date	Date of sample collection (month, day, year)
Facility ID	Identification code for each applicable facility associated with water treatment or delivery at the PWS
Facility Name	Name of the facility at the PWS
Sample Point ID	Identification code for each sample point location at the PWS
Sample Point Name	Name of the sample point at the PWS
Sample Event Code	Identification code for each sample event: **SE1**, **SE2**, **SE3**, **SE4**
Sample ID	Identification code for each sample
Method ID	Identification code of the analytical method
PWS Size	Size category of the PWS for UCMR 5, based on retail population as indicated by the Safe Drinking Water Information System (Federal) (SDWIS/FED) as of February 1, 2021: **S** (≤ 10,000), **L** (> 10,000)
Facility Water Type	Source of water at the facility: **SW** (surface water), **GW** (groundwater), **GU** (groundwater under the direct influence of surface water), **MX** (Any combination of: SW, GW, and GU)
Sample Point Type	Sampling Point Type Code: **EP** (entry point to the distribution system)
EPA Region	EPA Region (states): **Region 1** (CT, ME, MA, NH, RI, VT), **Region 2** (NJ, NY, PR [Puerto Rico], VI [Virgin Islands]), **Region 3** (DE, DC, MD, PA, VA, WV), **Region 4** (AL, FL, GA, KY, MS, NC, SC, TN), **Region 5** (IL, IN, MI, MN, OH, WI), **Region 6** (AR, LA, NM, OK, TX), **Region 7** (IA, KS, MO, NE), **Region 8** (CO, MT, ND, SD, UT, WY), **Region 9** (AZ, CA, HI, NV, AS [American Samoa], GU [Guam], MP [Northern Marianas Islands], NN [Navajo Nation]), **Region 10** (AK, ID, OR, WA)
State	State abbreviation. Tribal PWSs without primacy are attributed to an EPA Region (01, 02, 03, 04, 05, 06, 07, 08, 09, 10)

Table 5. Data Definitions for Text Files: UCMR5_All, UCMR5_All_Tribes_AK_LA, UCMR5_All_MA_WY, and UCMR5_*MethodNumber*

Field Name	Definition
PWSID	Public Water System (PWS) Identification Code. The code used to identify each PWS. The code begins with the standard 2-character postal state abbreviation or Region code; the remaining 7 numbers are unique to each PWS in the state
PWSName	Name of the PWS
Size	Size category of the PWS for UCMR 5, based on retail population as indicated by the Safe Drinking Water Information System (Federal) (SDWIS/FED) as of February 1, 2021: **S** (≤ 10,000), **L** (> 10,000)
FacilityID	Identification code for each applicable facility associated with water treatment or delivery at the PWS
FacilityName	Name of the facility at the PWS

Field Name	Definition
FacilityWaterType	Source of water at the facility: **SW** (surface water), **GW** (groundwater), **GU** (groundwater under the direct influence of surface water), **MX** (Any combination of: SW, GW, and GU)
SamplePointID	Identification code for each sample point location at the PWS
SamplePointName	Name of the sample point at the PWS
SamplePointType	Sampling Point Type Code: **EP** (entry point to the distribution system)
AssociatedFacilityID	Null for UCMR 5
AssociatedSamplePointID	Null for UCMR 5
CollectionDate	Date of sample collection (month, day, year)
SampleID	Identification code for each sample
Contaminant	The UCMR 5 contaminant analyzed
MRL	Minimum Reporting Level (MRL) defined by UCMR 5 in µg/L for the contaminants. Based on laboratory capability; not related to contaminant health effects information (see Terms and Definitions)
Units	Units of the UCMR MRL and analytical results: **µg/L**
MethodID	Identification code of the analytical method
AnalyticalResultsSign	Sign indicating whether the analytical result is less than (**<**) the UCMR MRL or equal to (**=**) a numeric value at or above the UCMR MRL
AnalyticalResultValue	Numeric value of the analytical result in µg/L for the contaminants. Null (or blank) values represent results less than the UCMR MRL
SampleEventCode	Identification code for each sample event**:** **SE1**, **SE2**, **SE3**, **SE4**
MonitoringRequirement	AM (Assessment Monitoring)
Region	EPA Region (states): **1** (CT, ME, MA, NH, RI, VT), **2** (NJ, NY, PR [Puerto Rico], VI [Virgin Islands]), **3** (DE, DC, MD, PA, VA, WV), **4** (AL, FL, GA, KY, MS, NC, SC, TN), **5** (IL, IN, MI, MN, OH, WI), **6** (AR, LA, NM, OK, TX), **7** (IA, KS, MO, NE), **8** (CO, MT, ND, SD, UT, WY), **9** (AZ, CA, HI, NV, AS [American Samoa], GU [Guam], MP [Northern Marianas Islands], NN [Navajo Nation]), **10** (AK, ID, OR, WA)
State	State abbreviation. Tribal PWSs without primacy are attributed to an EPA Region (01, 02, 03, 04, 05, 06, 07, 08, 09, 10)
UCMR1SampleType	Null for UCMR 5

Table 6. Data Definitions for Text File: UCMR5_ZIPCodes

Field Name	Definition
ZIPCode	U.S. Postal Service ZIP Code(s) for all areas served by a PWS. This is entered by the PWS.

Table 7. Data Definitions for Text File: UCMR5_AddtlDataElem

Additional Data Element	Definition and Response Options
DisinfectantType	All of the disinfectants/oxidants that have been added prior to and at the entry point to the distribution system. Please select ALL that apply. **PEMB** = Permanganate, **HPXB** = Hydrogen peroxide, **CLGA** = Gaseous chlorine, **CLOF** = Offsite generated hypochlorite (stored as a liquid form), **CLON** = Onsite generated hypochlorite, **CAGC** = Chloramine (formed with gaseous chlorine), **CAOF** = Chloramine (formed with offsite hypochlorite), **CAON** = Chloramine (formed with onsite hypochlorite), **CLDB** = Chlorine dioxide, **OZON** = Ozone, **ULVL** = Ultraviolet light, **OTHD** = Other types of disinfectant/oxidant, **NODU** = No disinfectant/oxidant used
TreatmentInformation	Treatment information associated with the sample point. Please select ALL that apply. **CON** = Conventional (non-softening, consisting of at least coagulation/sedimentation basins and filtration), **SFN** = Softening, **RBF** = River bank filtration, **PSD** = Pre-sedimentation, **INF** = In-line filtration, **DFL** = Direct filtration, **SSF** = Slow sand filtration, **BIO** = Biological filtration (operated with

Additional Data Element	Definition and Response Options
	an intention of maintaining biological activity within filter), **UTR** = Unfiltered treatment for surface water source, **GWD** = Groundwater system with disinfection only, **PAC** = Application of powder activated carbon, **GAC** = Granular activated carbon adsorption (not part of filters in CON, SFN, INF, DFL, or SSF), **AIR** = Air stripping (packed towers, diffused gas contactors), **POB** = Pre-oxidation with chlorine (applied before coagulation for CON or SFN plants or before filtration for other filtration plants), **MFL** = Membrane filtration, **IEX** = Ionic exchange, **DAF** = Dissolved air floatation, **CWL** = Clear well/finished water storage without aeration, **CWA** = Clear well/finished water storage with aeration, **ADS** = Aeration in distribution system (localized treatment), **OTH** = Other types of treatment, **NTU** = No treatment used, **DKN** = Do not know
LithiumOccurrence	A yes or no answer provided by the PWS for each entry point to the distribution system. Question: Have you tested for the contaminant in your drinking water in the past? **YES** = If yes, did you modify your treatment and if so, what types of treatment did you implement? (see **LithiumTreatment**); **NO** = Have never tested for the contaminant; **DK** = Do not know.
LithiumTreatment	If yes, select ALL that apply: **PAC** = Application of powder activated carbon, **GAC** = Granular activated carbon adsorption (not part of filters in CON, SFN, INF, DFL, or SSF), **IEX** = Ionic exchange, **NRO** = Nanofiltration and reverse osmosis, **OZN** = Ozone, **BAC** = Biologically active carbon, **MFL** = Membrane filtration, **UVL** = Ultraviolet light, **OTH** = Other, **NMT** = Not modified after testing
PFASOccurrence	A yes or no answer provided by the PWS for each entry point to the distribution system. Question: Have you tested for the contaminant in your drinking water in the past? **YES** = If yes, did you modify your treatment and if so, what types of treatment did you implement? (see **PFASTreatment**); **NO** = Have never tested for the contaminant; **DK** = Do not know.
PFASTreatment	If yes, select ALL that apply: **PAC** = Application of powder activated carbon, **GAC** = Granular activated carbon adsorption (not part of filters in CON, SFN, INF, DFL, or SSF), **IEX** = Ionic exchange, **NRO** = Nanofiltration and reverse osmosis, **OZN** = Ozone, **BAC** = Biologically active carbon, **MFL** = Membrane filtration, **UVL** = Ultraviolet light, **OTH** = Other, **NMT** = Not modified after testing
PotentialPFASSources	A yes or no answer provided by the PWS for each entry point to the distribution system. Question: Are you aware of any potential current and/or historical sources of PFAS that may have impacted the drinking water sources at your water system? **YES** = If yes, select ALL that apply (see **PotentialPFASSourcesDetail**); **NO** = Not aware of any potential current and/or historical sources; **DK** = Do not know
PotentialPFASSourcesDetail	If yes, select ALL that apply: **MB** = Military base, **FT** = Firefighting training school, **AO** = Airport operations, **CW** = Car wash or industrial launderers, **PS** = Public safety activities (*e.g.,* fire and rescue services), **WM** = Waste management, **HW** = Hazardous waste collection, treatment, and disposal, **UW** = Underground injection well, **SC** = Solid waste collection, combustors, incinerators, **MF** = Manufacturing, **FP** = Food packaging, **TA** = Textile and apparel (*e.g.,* stain- and water-resistant, fiber/thread, carpet, house furnishings, leather), **PP** = Paper, **CC** = Chemical, **PR** = Plastics and rubber products, **MM** = Machinery, **CE** = Computer and electronic products, **FM** = Fabricated metal products (*e.g.*, nonstick cookware), **PC** = Petroleum and coal products, **FF** = Furniture, **OG** = Oil and gas production, **UT** = Utilities (*e.g.,* sewage treatment facilities), **CT** = Construction (*e.g.,* wood floor finishing, electrostatic painting), **OT** = Other