

Table 1-3
Screening Levels for PFAS

PFAS CERCLA Remedial Investigation Site Characterization Summary Report
Former Loring Air Force Base
Limestone, Maine

Parameter			Method 1633 Pooled MDLs			Groundwater			Soil			Sediment	Surface Water	Fish		Soil	Surface Water	Sediment	Foraging Biota for Human Consumption Screening Values*							
						Health Based Screening Levels and Toxicity-based PRGs												Ecological Risk Assessment Benchmarks								
						Aqueous	Solid	Tissue	USEPA Tapwater RSL ^a	MCL ^b	Maine Sum of Six MCL ^c	USEPA Residential Soil RSL ^a	USEPA Industrial Soil RSL ^a	USEPA Industrial Soil RSL ^d	Wading Sediment SL ^e	Swimming SL ^e	Fish Consumption SL ^e	Fish Consumption FCA SL ^{g,f}	Lowest Soil Benchmark	Lowest SW/PW Benchmark	Lowest Sediment Benchmark	Fiddlehead	Labrador Tea	Cattail Shoots	Cattail Roots	Blueberries
						(ng/L)	(mg/kg)	(mg/kg)	(ng/L)	(ng/L)	(ng/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ng/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Perfluorobutane sulfonic acid	PFBS	375-73-5	0.37	0.00005	0.000097	600	- ⁱ		1.9	25	250	8.9	30,000	0.078	0.062	0.817	160000	0.73	0.18	11	8.6	3.6	0.35			
Perfluorobutanoic acid	PFBA	375-22-4	0.79	0.00015	0.000208	1800	-		7.8	120	1200	37	57,000	0.26	0.21	2.98	75700	1.6	0.62	36	29	12	1.2			
Perfluorodecanoic acid	PFDA	335-76-2	0.52	0.00006	0.000149	0.004	-	20	0.000013	0.00016	0.0016	0.000059	0.20	0.00000052	0.00000041	0.0677	71.6	-	0.0000012	0.000073	0.000057	0.000024	0.0000024			
Perfluorohexanesulfonic acid	PFHxS	355-46-4	0.54	0.00008	0.000081	39 ^{h)}	10 ⁱ	20	0.13	1.6	16	0.59	1,800	0.0052	0.0041	0.145	10800	-	0.012	0.73	0.57	0.24	0.024			
Perfluorohexanoic acid	PFHxA	307-24-4	0.46	0.00006	0.000111	990	-		3.2	41	410	15	46,000	0.13	0.10	6.2	33800	1.8	0.31	18	14	6.1	0.59			
Perfluorononanoic acid	PFNA	375-95-1	0.45	0.00014	0.000119	5.9	10 ⁱ	20	0.019	0.25	2.5	0.089	260	0.00078	0.00062	0.0242	88	0.01	0.0018	0.11	0.086	0.036	0.0035			
Perfluorooctanesulfonic acid	PFOS	1763-23-1	0.63	0.00007	0.000145	0.20	4.0	20	0.0063	0.0082	0.082	0.0030	10	0.000026	0.000021	0.004	12.8	0.0014	0.000062	0.0036	0.0029	0.0012	0.00012			
Perfluorooctanoic acid	PFOA ^h	335-67-1	0.54	0.00007	0.000105	0.0027	4.0	20	0.000019	0.000078	0.0078	0.000086	0.25	0.0000003	0.00000037	3.84	36400	0.006	0.00000039	0.000023	0.000018	0.0000076	0.00000074			
Hexafluoropropylene oxide dimer acid	HFPO-DA	13252-13-6	0.51	0.00025	0.000339	1.5	10 ⁱ		0.023	0.35	3.5	0.11	11	0.00078	0.00062	-	-	-	0.0018	0.11	0.086	0.036	0.0035			
Perfluoroheptanoic acid	PFHpA	375-85-9	0.37	0.00005	0.000099	-	-	20	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-			

Notes:

Additional notes included on Table 1-1.

Screening level is below the pooled Method Detection Limit (MDL) for Method 1633.

^a USEPA Regional Screening Levels (RSLs), November 2024. [URL: https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search]. RSLs are set at hazard quotient of 0.1 and a target excess lifetime cancer risk of 1E-6.

Values are current as of January 28, 2025 and consistent with the January 17, 2025 DoD memo: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program.

^b USEPA Maximum Contaminant Levels (MCLs), Final PFAS National Primary Drinking Water Regulation, April 2024. [URL: <https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas>]

^c The Maine Sum of Six MCL sets a drinking water standard of 20 ng/L for six PFAS compounds individually or combined.

^d Screening Levels are set at hazard quotient (HQ) of 1 and a target excess lifetime cancer risk of 1E-4 and were calculated using the RSL calculator and toxicity values consistent with the January 17, 2025 DoD memo.

^e USEPA Region 1 Loring-specific PFAS Screening Levels (SLs) calculated using the USEPA Regional Screening Level (RSL) calculator. Screening Levels are set at hazard quotient of 0.1 and a target excess lifetime cancer risk of 1E-6.

The recalculated SLs use the exposure assumptions provided via email communication from Mike Daly (USEPA) on 4 November 2021.

Values are current as of January 28, 2025 and consistent with the January 17, 2025 DoD memo: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program.

The most recent PFAS toxicity values adopted by DoD and published in the RSLs have been used (November 2024).

^f Fish consumption rates calculated based on Maine's Fish Consumption Advisory (FCA) limits for mercury for brook trout fish (i.e. two meals per month for adults and one meal per month for pregnant adults & children).

The pregnant adult fish consumption scenario is less conservative than fish consumption at the mercury consumption advisory and therefore not shown.

^g The RSL for PFHxS is above the established MCL of 10 ng/L. In some circumstances the MCL may be the appropriate value to use.

^h The calculated screening levels for PFOA are based on the cancer endpoint at a target excess lifetime cancer risk of 1E-6. Screening levels for fish are based on lifetime exposure calculated in proprietary spreadsheets using USEPA equations.

ⁱ These PFAS are included in the MCL Hazard Index (HI) calculation. Health screening level of 2,000 ng/L for PFBS is not an independent MCL: https://www.epa.gov/system/files/documents/2024-04/plas-ndpw_fact-sheet_hazard-index_4.8.24.pdf

^j The screening value equations are consistent with USEPA RAGS Part A and the RSL calculator for food ingestion. Exposure parameters are consistent with the USEPA RSL calculator. The minimum value of the child and adult non cancer and cancer screening values are shown.

^k Adult ingestion rates have been sourced from First Nations Food, Nutrition and Environment Study (FNFNES) (Chan et al., 2021).

The 95th percentile value for the Atlantic Maritime ecozone was selected for the ingestion rate for allforaging food types listed except for cattail shoots. The 95th percentile value for the Boreal Shield ecozone was selected as the ingestion rate for cattail shoots since a value for this food type was not available for the Atlantic Maritime ecozone. Cattail root values were also not available. Sweetflag roots have been used as a substitute. Cattails are not anticipated to be a large portion of a subsistence diet: [URL: https://www.fntnes.ca/docs/FNFNES_Supplemental_Data_Report_2022-02-25.pdf].

The child ingestion rate was calculated using a ratio developed from the Exposure Factor Handbook (EFH) consumer-only total vegetables ingestion rate for adults 20 years and older and children aged 6 months to <6 years

Benchmarks for soil COPEC selection were obtained from Grippo et al. (2024) Table ES-3; and from Divine et al. (2020) Table ES-3 (plants) and Table ES-4 (soil invertebrates).

Benchmarks for surface water/sediment pore COPEC selection for PFOS and PFOA were obtained from USEPA NRIWQC documents (USEPA, 2024a,b). Remaining benchmarks were obtained from Grippo et al. (2024) Appendix E as the lowest bird or mammal Wildlife Value (WV).

Benchmarks for sediment COPEC selection were obtained from Divine et al. (2020) Table ES-5, NOAA-based Risk Based Screening Levels (RBSLs) for sediment.

Lowest soil benchmark among terrestrial plants, soil invertebrate, birds, and mammals.

Lowest SW/PW benchmark among aquatic life, water-dependent birds, and water-dependent mammals.

Lowest sediment benchmark between water-dependent birds and water-dependent mammals.

- Benchmark not available

Sources:

Divine, C., J. Zdrorow, M. Frenchmeyer, K. Dally, E. Osborn, and P. Anderson. 2020. Approach for Assessing PFAS Risk to Threatened and Endangered Species. Strategic Environmental Research and Development Program (SERDP). Project ERL18-1653.

Grippo, M., J. Hayse, I. Hlohowskyj, and K. Picef. 2024. Derivation of PFAS Ecological Screening Values. Update. Argonne National Laboratory, October.

USEPA. 2024a. Final Freshwater Aquatic Life Ambient Water Quality Criteria and Acute Saltwater Benchmark for Perfluorooctane Sulfonate (PFOS). EPA-842-R-24-003. September.

USEPA. 2024b. Final Freshwater Aquatic Life Ambient Water Quality Criteria and Acute Saltwater Aquatic Life Benchmark for Perfluorooctanoic Acid (PFOA). EPA-842-R-24-002. September.