



TECHNICAL FACT SHEET

Draft National Recommended Human Health Ambient Water Quality Criteria for PFOA, PFOS, and PFBS December 2024

As part of the Environmental Protection Agency's efforts to safeguard human health from exposure to per- and polyfluoroalkyl substances (PFAS), the agency has published draft national recommended human health criteria for three PFAS – perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), and perfluorobutane sulfonic acid (PFBS) – for a 60-day public comment period. These draft Clean Water Act (CWA) recommended criteria reflect the latest scientific knowledge regarding the human health effects, exposure information, and bioaccumulation potential. Once final, the human health criteria will provide national recommendations to states and Tribes authorized to establish their own water quality standards under the Clean Water Act. National recommended human health ambient water quality criteria are not regulations, nor do they impose legally binding requirements.

Background

To help states and Tribes protect people from harmful health effects from exposure to pollutants in surface waters, the EPA periodically publishes national human health criteria recommendations under CWA Section 304(a). The national recommended human health criteria provide information for states and authorized Tribes to consider when developing their own water quality standards.

On October 18, 2021, EPA Administrator Regan announced the agency's [PFAS Strategic Roadmap](#), laying out a whole-of-agency approach to addressing PFAS. This included the EPA's efforts to develop PFAS recommended human health criteria (HHC), starting with PFOA and PFOS. The EPA has released draft recommended human health criteria for PFOA, PFOS, and PFBS and will accept public comments on these criteria documents for 60 days upon announcement in the Federal Register. Following the comment period, the EPA will review the public comments and revise the criteria accordingly. The EPA will then release final criteria recommendations and responses to public comments.

What are national recommended human health water quality criteria?

People can be exposed to pollutants, such as PFAS, when drinking water and eating fish and shellfish from polluted water bodies. Under CWA Section 304(a), the EPA develops, and from time to time, updates, recommended water quality criteria for the protection of human health. States and authorized Tribes can consider the EPA's recommended criteria when setting [water quality standards](#) for their lakes, rivers, and other inland and nearshore water bodies to protect public health.

The EPA's CWA Section 304(a) HHC documents provide scientific information on the human health effects of the pollutants as well as the national recommended levels of pollutants in water (criteria), which, if not exceeded, are expected to protect against adverse effects to human health. For each contaminant, the agency has derived two HHC values: (1) the "water + organism" HHC and (2) the "organism only" HHC. The EPA develops national recommended human health criteria using a mathematical equation that includes a final toxicity factor, exposure factors (for body weight, fish consumption, and drinking water intake), bioaccumulation factors, and a relative source contribution which accounts for exposure from other potential sources (i.e., air, soils, marine fish

consumption). The equations for deriving water + organism, or organism only criteria, as well as equations for cancer and non-cancer-based HHC, can be found in the [EPA's 2000 Methodology](#) (EPA, 2000) document and in each HHC document.

What are the draft National Recommended Ambient Water Quality Criteria for the Protection of Human Health for PFOA, PFOS, and PFBS?

The draft criteria (Table 1) summarize the ambient concentrations for PFOA, PFOS, or PFBS in surface water, which, if not exceeded will protect the general population from adverse health effects due to ingesting water, fish, and shellfish from inland and nearshore water bodies. The EPA provides recommendations for “water + organism” and “organism only” criteria for states and authorized Tribes to consider when adopting human health criteria into their water quality standards. Under the CWA, states and authorized Tribes designate the uses of their water bodies and adopt criteria into their water quality standards to support those uses.

For PFOA and PFOS, the EPA developed draft recommended HHC based on the final non-cancer toxicity values (RfD) and cancer slope factors (CSF), as both chemicals are *Likely to be Carcinogenic to Humans*, based on the final human health toxicity assessments ([EPA, 2024a, b](#)). For PFOA, the EPA is recommending HHC based on the values derived using cancer inputs because they are lower than the noncancer-based HHC and thus, protect against both adverse noncancer and cancer health effects. For PFOS, the EPA is recommending the noncancer HHC because they are lower and thus, protective of both adverse noncancer and cancer health effects. For PFBS, the draft recommended human health criteria are based only on non-cancer health effects because the PFBS toxicity assessment determined that there is *Inadequate Information to Assess Carcinogenic Potential* for PFBS and no CSF was developed.

Under the EPA's recently finalized [Method 1633](#) used for analysis of these three PFAS in aqueous samples, the limit of quantification (LOQ) representing the observed LOQs in the multi-laboratory validation study, range from 1 to 4 ng/L. The pooled Method Detection Limits (MDLs) are 0.54 ng/L (PFOA), 0.63 ng/L (PFOS), and 0.37 ng/L (PFBS). The pooled MDL values are derived from the multi-laboratory validation study using MDL data from eight laboratories and represent the sensitivity that should be achievable in a well-prepared laboratory but may not represent the actual MDL used for data reporting or data quality assessments ([EPA, 2024c](#)). The MDLs and ranges presented here are provided for comparison of analytical concentrations and draft recommended HHC.

Table 1. Draft Human Health Criteria (HHC) for Three PFAS.

PFAS	Water + Organism HHC (ng/L; ppt) ¹	Organism Only HHC (ng/L; ppt) ¹
PFOA	0.0009	0.0036
PFOS	0.06	0.07
PFBS	400	500

¹ Values are provided in ng/L units to aid in comparison to method detection limit (MDL).

Consideration of PFAS mixtures for HHC

The available scientific information shows that mixtures of PFAS can result in dose additive health effects, meaning that the combined effect of the component chemicals in a mixture is equal to the sum of the individual doses or concentrations, scaled for potency. Therefore, specific approaches based on dose-additivity are available and could be used to develop a PFAS mixture HHC. In these draft recommended criteria, the EPA provides an illustrative example for states or Tribes interested in developing a water quality standard for a mixture of two or more PFAS for which human health criteria have been developed using the hazard index (HI)

approach. The HI approach is further described in the final [*Framework for Estimating Noncancer Health Risks Associated with Mixtures of Per- and Polyfluoroalkyl Substances \(PFAS\)*](#).

Where can I find more information?

View the draft human health criteria documents for PFOA, PFOS, and PFBS, and other related information on the EPA's website at: <https://www.epa.gov/wqc/human-health-water-quality-criteria-pfas>

For more information on water quality criteria, visit: <https://www.epa.gov/wqc>

For more information on PFAS, visit: <https://www.epa.gov/pfas>

References

EPA. 2000. *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health* (2000).

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EPA. 2024a. *Final Human Health Toxicity Assessment for Perfluorooctanoic Acid (PFOA) and Related Salts*. EPA 815R24006. Office of Water, Washington, DC. Available on the internet at:

<https://www.epa.gov/system/files/documents/2024-05/final-human-health-toxicity-assessment-pfoa.pdf>.

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EPA. 2024c. Method 1633. Analysis of Per-and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS. EPA 821-R-24-001. Office of Water, Washington, DC.

<https://www.epa.gov/system/files/documents/2024-12/method-1633a-december-5-2024-508-compliant.pdf>.