Group A Public Water Supplies • Chapter 246-290 WAC

DOH Approach to Developing PFAS State Action Levels

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Starting in 2002, per- and polyfluoroalkyl substances, or PFAS, have been detected in U.S. drinking water, primarily near manufacturing facilities, local fire departments, military bases, and airports. Between 2013 and 2015, the United States Environmental Protection Action (EPA) required a representative number of Group A water systems to measure for six PFAS as part of the third Unregulated Contaminant Monitoring Rule (UCMR 3). Results from UCMR 3 and additional testing at and around military bases identified several areas in Washington with PFAS in groundwater.

The State Board of Health (board) revised the Group A rule (chapter 246-290 WAC) to address concerns about PFAS, contaminants that do not have a maximum contaminant level (MCL). The board and the department are concerned because almost a dozen Group A public water systems and over 200 private wells in five areas of the state are known to have PFAS contamination in their groundwater supplies above EPA, and other state's, health advisory levels.

Determining health protective values

The PFAS toxicology assessment provides detailed supporting information regarding our approach to developing the PFAS SALs[1]. This assessment involved evaluation of the primary PFAS scientific literature and review of recent assessments by federal agencies and several states to support the establishment of the SALs. The department selected health protective values from high-quality recent science assessments conducted by U.S. federal and state governments. Sufficient information is availableto recommend SALs for perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorononanoic acid (PFNA), perfluorohexane sulfonic acid (PFHxS), and perfluorobutane sulfonic acid(PFBS). Because the first four of these PFAS are highly bioaccumulative in humans and may harm a child's development, the SALs account for unique PFAS exposure pathways of early life stages including placental and lactational transfer using a peer-reviewed model developed by the Minnesota Department of Health[2].

The health protective values for these five PFAS were derived from studies in laboratory animals with support from epidemiological data when available. Health concerns about PFAS stem from the wide range of adverse effects observed in animal testing. Health effects of the best studied PFAS include liver,kidney, thyroid and immune toxicity; developmental and reproductive toxicity; hormone disruption; and tumors in certain organs. The specific profile of effects and the weight of evidence varies by the PFAS examined. PFOA is considered "possibly carcinogenic to humans" by the International Agency for Research on Cancer. Carcinogenicity of the other four PFAS with SALs is less studied.

Health researchers are still learning about how environmental exposure to PFAS might affect people's health. The strongest evidence from epidemiology shows that some PFAS may increase serum cholesterol levels, alter liver enzyme levels, slightly lower birth weights, and reduce immune response to

[1] Recommended State Action Levels for Per- and Polyfluoroalkyl Substances (PFAS) In Drinking Water: Approach, Methods and Supporting Information.

[2] The MDH Model is the Minnesota Department of Health toxicokinetic model for infant intake of bioaccumulative PFAS in drinking water. It includes age-specific drinking water ingestion rates as well as placental and lactational transfer pathways from mother to child.

childhood vaccines. Outcomes with more limited evidence of an association with PFAS exposure include thyroid disease, hypertension disorders during pregnancy, reproductive problems, altered hormone levels, and metabolic issues. There is some evidence from occupational and non-occupational studies that PFOA may increase rates of kidney and testicular cancer. Little human data are available for other PFAS.

The SALs in Table 1 define a level in daily drinking water expected to be without appreciable health effects even in sensitive populations. They are comparable to a health advisory level or maximum contaminant level goal (MCLG) in the federal Safe Drinking Water Act. Acting at these levels is consistentwith the mission of providing safe and reliable drinking water.

Contaminant or Group ofContaminants	SAL
PFOA	10 ng/L
PFOS	15 ng/L
PFHxS	65 ng/L
PFNA	9 ng/L
PFBS	345 ng/L

PFAS frequently appear as mixtures in drinking water. Use of these five SALs, together with the broad mitigation technologies available, provides a reasonable initial approach to protect the public from PFAS mixtures in drinking water. Less is known about the other PFAS although many can be removed by the same mitigation technologies employed to remove the five PFAS with SALs.

When water systems take public health actions based on a PFAS SAL exceedance, we encourage them tochoose mitigation options that are effective at removing many PFAS such as activated granular carbon and anion exchange resin filtration. Ultimately, a more comprehensive grouped approach to regulation ispreferred to a chemical-by-chemical approach given the large size of the PFAS class of chemicals.

As the science advances, PFAS could be grouped according to subclasses based on key characteristics such as chemical structure, bioavailability, bioaccumulation potential, toxicity, or mechanism of action. We will consider a grouped approach to regulating PFAS mixtures if a method becomes available that is supported by science.

As mentioned above, the department prepared a much more detailed technical support document: "Recommended state action levels for per- and polyfluoroalkyl substances (PFAS) in drinking water: approach, methods and supporting information" that is available at our PFAS rulemaking webpage along with other supporting rulemaking materials.

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For more Information

PFAS Webpage: www.doh.wa.gov/CommunityandEnvironment/Contaminants/PFAS
Office of Drinking Water's rulemaking webpage:
www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/RegulationandCompliance/Rule Making