



PFAS: 'FOREVER & EVERYWHERE CHEMICALS' AND WATERSHED HEALTH

What are PFAS?

Per- and polyfluoroalkyl substances (PFAS) are a family of more than 4,000 synthetic chemicals widely used since the 1940s in products that resist heat, oils, stains, and water. Perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) are two of the most widely used chemicals in the PFAS group. Even though U.S. manufacturers voluntarily phased out the manufacture of PFOS in 2002 and PFOA in 2015, they are still manufactured overseas and can be imported in consumer goods. Also, many other PFAS compounds are being manufactured today and remain prevalent in many household products. PFAS are considered “forever chemicals” because they are extremely resistant to breaking down in the environment.

The chemicals exist at low levels in the environment, in wastewater and biosolids, and in most animals — including humans. Studies have suggested that these chemicals are linked to negative health effects.

PFAS sources



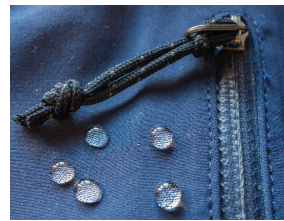
Firefighting foam



Nonstick cookware and utensils



Stain repellent carpets, upholstery, and other fabrics



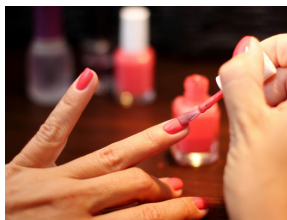
Stain and water-repellant apparel (including Gore-Tex)



Grease/oil-resistant food packaging and containers



Polishes, paints, cleaning products



Personal care products and cosmetics (nail polish, eye makeup, dental floss)



Furniture

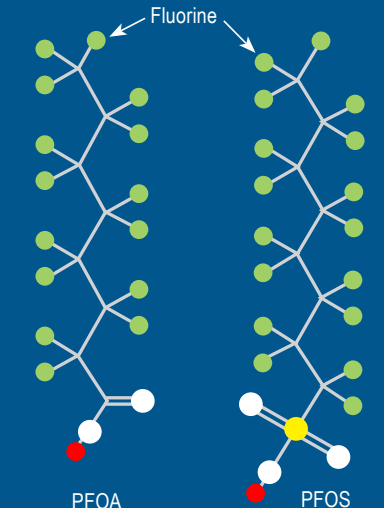


Chrome plating solutions



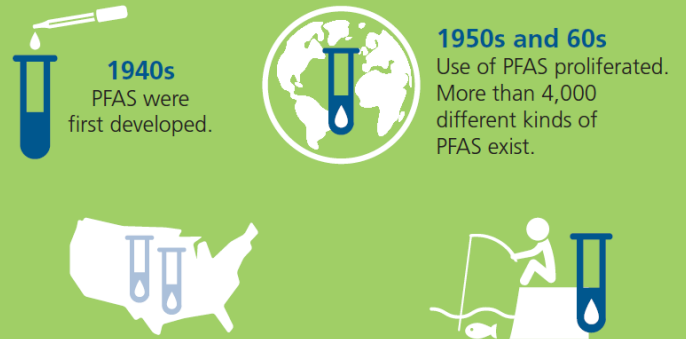
Sealants and waxes

PFAS are a class of synthetic chemicals



- Chains of carbon (C) atoms surrounded by fluorine (F) atoms, with different endings
- Complicated chemistry - thousands of different variations exist in commerce
- Widely used in industrial processes and in consumer products

'Forever & Everywhere Chemicals' timeline



1940s
PFAS were first developed.

1950s and 60s
Use of PFAS proliferated. More than 4,000 different kinds of PFAS exist.

2000s
National use of two of the most studied PFAS – PFOA and PFOS – voluntarily phased out (though they are still used in products manufactured in other countries).

LONG into the future
PFAS will still be around. The chemicals are extremely stable in the environment and in the human body, meaning that they don't break down and can accumulate over time.

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Where have PFAS been found?

The chemicals have primarily entered the water cycle at sites used for firefighting training, like airports and military bases, or for manufacturing. Because of their resistance to breaking down, the chemicals can accumulate, leading to elevated levels in the groundwater and surface waters near those sites. They can also enter the water cycle from landfills, treated wastewater discharge, stormwater discharges from contaminated areas, and biosolids land application. Wastewater, stormwater, and biosolids are generally small contributors, except where industrial discharges high in PFAS are present.

PFAS have been detected in public drinking water in some states, but detection has been rare in Oregon. For test results from 155 public water sources in Oregon, visit yourwater.oregon.gov/pfascounty.php. Most PFAS contamination in Oregon has been found where firefighting foam has been used. Oregon doesn't have a long industrial history as found in the eastern and midwestern United States, where higher concentrations of PFAS have been detected near large industrial manufacturing sites.



PFAS and biosolids

Clean Water Services (CWS) produces 32 dry tons of biosolids per day as it cleans an average of 65 million gallons daily of used water. The nutrient-rich biosolids are land applied as a soil amendment to farms and rangeland in the Willamette Valley and Eastern Oregon. For Clean Water Services, partnering with farmers allows biosolids to be beneficially used as a valuable resource. If biosolids weren't land applied, they would be disposed in a landfill or incinerated.

Since PFAS are present in products we use daily and are found in our food and clothing, trace amounts of PFAS will naturally end up in biosolids. Biosolids from municipal treatment facilities like CWS' contain low concentrations of PFAS compounds and have been applied for beneficial use to agricultural land for decades. Nationally, higher levels of PFAS have been found in solids from industrial facilities that use or manufacture PFAS compounds. Higher levels of PFAS are sometimes also found in some biosolids at municipal facilities that receive significant contributions from industries that manufacture or use PFAS compounds.



What is being done about PFAS?

The Environmental Protection Agency and Oregon Health Authority have issued health advisory levels for PFOS and PFOA in drinking water, and the EPA has developed a PFAS Action Plan that outlines concrete steps the agency is taking to address PFAS and to protect public health. The PFAS concentrations CWS typically detects in wastewater are even lower than drinking water advisory levels. While wastewater treatment facilities are not the source of PFAS, CWS is working with national industry experts Water Research Foundation and the National Association of Clean Water Agencies, monitoring research developments, and conducting our own research. We're also collaborating with state industry expert Oregon Association of Clean Water Agencies to understand the prevalence of PFAS in Oregon.

The CWS biosolids program is in full compliance with Environmental Protection Agency and Oregon Department of Environmental Quality standards and regulations. By proactively monitoring our facilities, biosolids, and industrial customers, CWS is taking steps to ensure our biosolids remain free from elevated PFAS levels and can continue to be used as a valuable resource on agricultural land.

Where can I get more information on PFAS?

A Dose of PFAS Reality: biocycle.net/a-dose-of-pfas-reality/

DEQ and OHA: bit.ly/34UH2kl

National Association of Clean Water Agencies: PFAS fact sheet (bit.ly/300PXzv) and PFAS page (nacwa.org/advocacy-analysis/campaigns/pfas)

EPA: epa.gov/pfas

Everything we do at Clean Water Services aims to protect public health while enhancing the natural environment of the Tualatin River Watershed.

Clean Water Services

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