



TO: Hyun Kim, Interim City Manager
FROM: Ramiro A. Chavez, P.E. PgMP, Director, Environmental Services
COPY: Infrastructure, Planning, and Sustainability Committee; John Burk, P.E., Division Manager, Science & Engineering
PRESENTER: Tiffany Ryan, Assistant Division Manager, Environmental Services
SUBJECT: PFAS Pilot Test and Regulations
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PRESENTATION TYPE:
 Informational Briefing

SUMMARY:

Per and Polyfluoroalkyl Substances (PFAS) are highly persistent compounds widely used in consumer and industrial products, now linked to significant health risks including cancer, reproductive issues, and immune system impacts. Recent legislation, including WA Senate Bill 5033 and proposed WA House Bill 2279, require PFAS monitoring in biosolids and agricultural products in Washington. Tacoma’s Environmental Services Department (ES) has proactively addressed PFAS concerns by investing in in-house testing capabilities and partnering on a pilot project to remove and destroy PFAS using foam fractionation and hydrothermal alkaline treatment, achieving up to 99 percent degradation. These efforts position the City to meet regulatory requirements and advance PFAS science nationally.

BACKGROUND:

PFAS are a class of over 12,000 compounds that feature a Carbon chain with Fluorine replacing Hydrogen bonds. The C-F bond is extremely difficult to break, making these compounds very durable, which is why they have become known as “Forever Chemicals”. Their unique chemistry makes PFAS useful for water and grease resistance, and stability in extreme temperatures. They have been widely used in firefighting foam (AFFF), food packaging, personal care products, non-stick cookware, semi-conductors, stain resistant carpet/clothing, and water-resistant fabrics.

In the mid-1990s and early-2000s, research began to emerge showing that PFAS bioaccumulated in blood and were linked to cancer in PFAS manufacturing workers. In 2006 an Environmental Protection Agency (EPA) board classified Perfluorooctanoic Acid (PFOA) as a “likely human carcinogen”. Further studies have linked PFAS to reproductive effects such as decreased fertility or increased high blood pressure in pregnant women, developmental effects in children including low birth weight, accelerated puberty, bone variations, or behavioral changes, increased risk of some cancers (prostate, kidney, testicular, etc.), decreased immune system function, and increased cholesterol levels and/or risk of obesity.

In April 2024, the EPA finalized the first enforceable National Primary Drinking Water Regulation for six PFAS, however in May 2025, the EPA rescinded parts of that rule for Perfluorohexanesulfonic acid (PFHxS), Perfluorononanoic acid (PFNA), hexafluoropropylene oxide dimer acid (HFPO-DA), and Perfluorobutanesulfonic acid (PFBS). The PFOA and Perfluorooctanesulfonic acid (PFOS) limits were maintained.

ISSUE:

Senate Bill 5033 became law in January 2026 and requires sampling, analysis and reporting for PFAS in biosolids with a 2029 deadline for Ecology to deliver PFAS biosolids analysis and recommendations. Additionally, in the current 2026 legislative session, House Bill 2279 has been introduced that directs the



Washington Department of Agriculture to evaluate the use of PFAS chemicals in pesticides and fertilizers to develop criteria for product registration and evaluation of PFAS impacts in agricultural applications.

The City is well poised to respond to this new legislation, as well as anticipated future legislation.

Prior to regulatory action, ES identified opportunities to proactively address the concerns about PFAS in our biosolids and TAGRO products, as well as opportunities to advance the science and understanding of PFAS. TAGRO was first analyzed for PFAS in 2019. At that time, the detected levels of PFAS were well below the Northeast Biosolids & Residuals Association (NEBRA) North American average (the most comprehensive data at the time). In January 2023, the ES Laboratory invested in the purchase of an LC-QQQ instrument to analyze PFAS in-house and gained full Washington State Department of Ecology (Ecology) accreditation in 2025. The ES Laboratory has been regularly analyzing the digester sludge for PFAS since 2024, which meets the requirements of Senate Bill 5033.

To advance the science of PFAS removal and destruction, in 2024 ES partnered with UW Tacoma, Aquagga (Tacoma, WA) and ECT2 (Portland, ME), on an EPA and Ecology grant funded project to study the efficacy of PFAS destruction on-site at the Central Treatment Plant: “Cutting the Chain: Innovation to Destroy PFAS in Sludge Dewatering Filtrate at the City of Tacoma Central Wastewater Treatment Plant.” Several locations were tested for PFAS concentrations at the Central Treatment Plant (CTP), with the biosolids dewatering pressate return stream selected for its higher PFAS concentrations as well as its feasibility for equipment staging. Bench scale testing was conducted in 2024, and in January 2025, foam fractionation and HALT equipment were delivered to the CTP site for a 1 month pilot project.

Effluent from the dewatering pressate was processed through ECT2’s foam fractionation equipment to remove PFAS from the effluent stream and concentrate it in the foam. The concentrated foam was then fed through Aquagga’s HALT (hydrothermal alkaline treatment) system, which breaks down PFAS compounds into benign end-products, primarily inorganic fluoride ions (such as sodium fluoride). The length of the pilot allowed researchers to test various foam and HALT conditions to optimize both PFAS removal, as well as operating conditions directly tied to cost. Results from the study indicate that for the foam fractionation portion, long chain PFAS such as PFOS and PFOA were completely removed, and under the best performing conditions, total PFAS were removed by 78 percent. HALT achieved greater than 99 percent total PFAS degradation under the best performing conditions. Complete removal of all PFAS with individual maximum contaminant levels (MCLs) (PFOS, PFOA, PFHxS, PFNA, and HFPO-DA) to non-detect values occurred under all conditions tested.

This study advances the science of PFAS removal and destruction in municipal wastewater, with the possibility of future optimized technologies at municipal treatment plants or the point of discharge into wastewater collection system (e.g. pretreatment programs). There were several challenges noted during the pilot scale project, including the need to mitigate the high solids content of the pressate, which was not observed in the bench scale testing. Additionally, opportunities for future studies and optimization include considerations for site size constraints, power needs, waste stream neutralization, and other site-specific needs (e.g. treatment capacity upgrades for growth). Despite the high solids challenge, long chain PFAS such as PFOS and PFOA were completely removed via foam fractionation during this study.

This is the first study demonstrating foam fractionation on sludge dewatering filtrate and the first study to demonstrate HALT on a municipal wastewater matrix.



ALTERNATIVES:

This is an information briefing only. There are no alternatives presented.

FISCAL IMPACT:

This is an information briefing only. There is no fiscal impact.

RECOMMENDATION:

This is an information briefing only. There is no recommendation.