



WPCF PFAS Sampling Study (Weston & Sampson, June 2023) Summary of Findings

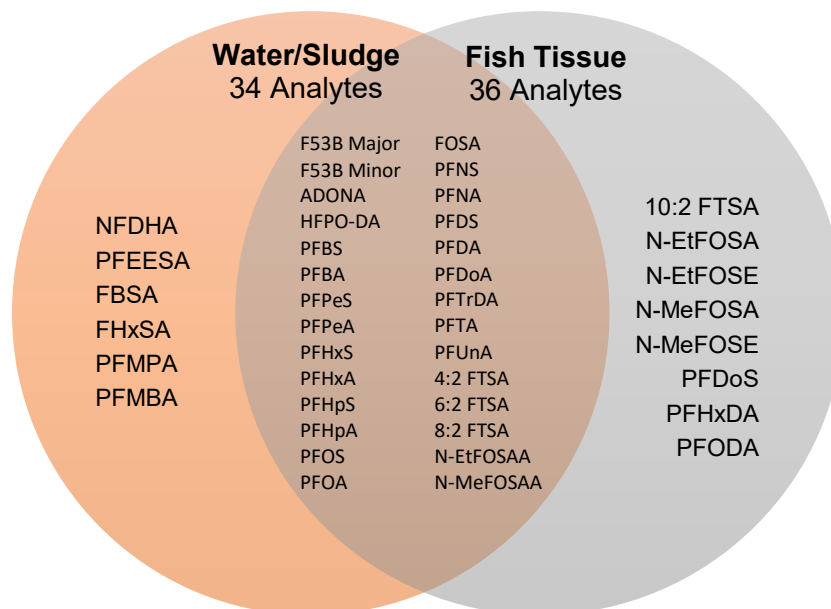
The Connecticut Department of Energy and Environmental Protection (DEEP) contracted with Weston & Sampson Engineers, Inc. to perform a study assessing the potential presence of per- and polyfluoroalkyl substances (PFAS) in various environmental media at select water pollution control facilities (WPCFs) within Connecticut, as well as in their receiving waters and in aquatic species in such waters. Thirty-five (35) WPCFs were selected for participation by DEEP to provide geographic coverage of the state and cover a range of differing community sizes, inputs, and treatment processes.

Environmental media tested for (PFAS) included:

- Influent, effluent, and sewage sludge from 35 water pollution control facilities (WPCFs), sampled in summer 2021 and winter 2022
- Composite sewage sludge and incinerator scrubber water from 4 WPCFs that incinerate sewage sludge, sampled in summer 2021 and winter 2022
- Fish tissue and surface water (upstream and downstream) near 10 WPCF outfalls, sampled in September 2021 only

Summary of Findings

- 1) Sample analyses were conducted by Con-Test/Pace Analytical of East Longmeadow, Massachusetts for all samples except fish tissue, which were analyzed at Pace's Minnesota laboratory. The proprietary analytical method used by Con-Test/Pace to analyze PFAS in water and sludge samples tested for thirty-four (34) PFAS analytes. Twenty-nine (29) different PFAS compounds were detected in at least one water or sludge sample. The proprietary analytical method used by Pace to analyze PFAS in fish tissue samples tested for thirty-six (36) PFAS analytes. Nineteen (19) different PFAS compounds were detected in fish tissue samples.



2) The following eight (8) PFAS compounds were most prevalent and were detected in greater than 50% of all samples analyzed across all media:

Compound Name	Compound Acronym
Perfluorobutanesulfonic acid	PFBS
Perfluorobutanoic acid	PFBA
Perfluoropentanoic acid	PFPeA
Perfluorohexanesulfonic acid	PFHxS
Perfluorohexanoic acid	PFHxA
Perfluoroheptanoic acid	PFHpA
Perfluorooctanesulfonic acid	PFOS*
Perfluorooctanoic acid	PFOA*

* PFOA and PFOS, the two most widely studied PFAS, are no longer manufactured or imported into the US, though there could be some imported goods that contain these substances.

- 3) **Influent (n=68):** PFPeA (5-carbon version of PFOA) was the dominant PFAS compound found in WPCF influent, with an average concentration of 111 parts per trillion (ppt). PFPeA and PFHxA were both detected in >90% of influent samples.
- 4) **Effluent (n=69):** PFPeA and PFHxA (5- and 6-carbon versions of PFOA) had the highest average concentrations in WPCF effluent. Average effluent concentrations were higher than average influent concentrations for 7 out of the 8 most prevalent PFAS compounds listed in the table above (all except PFPeA). Conversely, average concentrations of PFPeA decreased severalfold from influent to effluent. PFPeA, PFHxA, and PFOA were detected in >90% of effluent samples.

- 5) **Sludge:** PFPeA, 6:2 fluorotelomersulfonic acid (6:2 FTSA), and PFHxA were the dominant PFAS compounds found in **liquid** sewage sludge (n=10). PFOS was the dominant PFAS compound found in **solid** sewage sludge/sludge cake (n=62).
- 6) **Incinerator Composite Sludge:** PFPeA was the dominant PFAS compound found **liquid** composite sludge sampled prior to incineration (n=1). PFOS was the dominant PFAS compound found **solid** composite sludge sampled prior to incineration (n=9).
- 7) **Incinerator Scrubber Water (n=10):** PFPeA and PFHxA were the dominant PFAS compounds found in incinerator scrubber water.
- 8) **Fish tissue (n=62):** PFOS was the dominant PFAS compound in fish tissue samples. Six (6) PFAS compounds were detected in >90% of fish tissue samples: PFOS, perfluorodecanoic acid (PFDA), perfluorododecanoic acid (PFDoA), perfluorotridecanoic acid (PFTrDA), perfluorotetradecanoic acid (PFTA), and perfluoroundecanoic acid (PFUnA).

While this initial sampling effort provides some insight into the nature and extent of PFAS at WPCFs in the state, it is important to note that the samples collected represent only small snapshots in time and may not be representative of the range and extent of PFAS loads at the studied WPCFs. Also, based on the science and analytical methods available at the time the study was initiated, samples were analyzed for 34 out of thousands of known PFAS chemicals. More robust data is needed to better understand PFAS loads at WPCFs in the state, both through additional sampling at WPCFs in the state and evaluation of industrial and other potential PFAS sources.

Further Investigation: Similar Data/Studies from Other States

- California – Influent, effluent, and sludge sampling data is available on an [interactive map](#) for select facilities. A NEWEA presentation discussing the data is available [here](#).
- Massachusetts – NPDES permit sampling data for influent, effluent, and sludge as well as land-applied residuals data is available [here](#).
- Michigan – [Evaluation of PFAS in Influent, Effluent, and Residuals of Wastewater Treatment Plants \(WWTPs\) in Michigan, April 2021, AECOM](#)
- Vermont – [PFAS at Wastewater Treatment Facilities and Landfill Leachate, January 2020, Weston & Sampson](#)
- Vermont – [PFAS Inputs to Wastewater Treatment Facilities, March 2022, Weston & Sampson](#)