Analytical Method for PFAS in Environmental Media: CWA-1633

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Center for Environmental Solutions and Emergency Response
Office of Research and Development

Executive Meeting | Board of Scientific Counselors
September 29-30, 2021

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PFAS Analytical Methods

- Drinking Water Methods
  - EPA 537.1
  - EPA 533
- Non-Drinking Water Methods
  - SW-846 Method 8327 – Direct Injection
  - Draft CWA-1633—Isotope Dilution
- PFAS Analysis in Marine Waters
- PFAS Analysis in Fish Tissue
- Total Organofluorine Analysis using Combustion Ion Chromatography (TOF)
- Total Oxidizable Precursors (TOP)
- Summary of EPA PFAS Methods as of April 2021

Types of Standard Methods

Three broad categories of EPA Standard Methods:

- Safe Drinking Water Act Methods
- Clean Water Act Methods
- SW846 Methods

These are generally targeted methods for solids and water.

Non-Drinking Water Sample Methods: CWA-1633/SW-846 Method—*Isotope Dilution*

Build in flexibility

- Columns
- Elution schemes

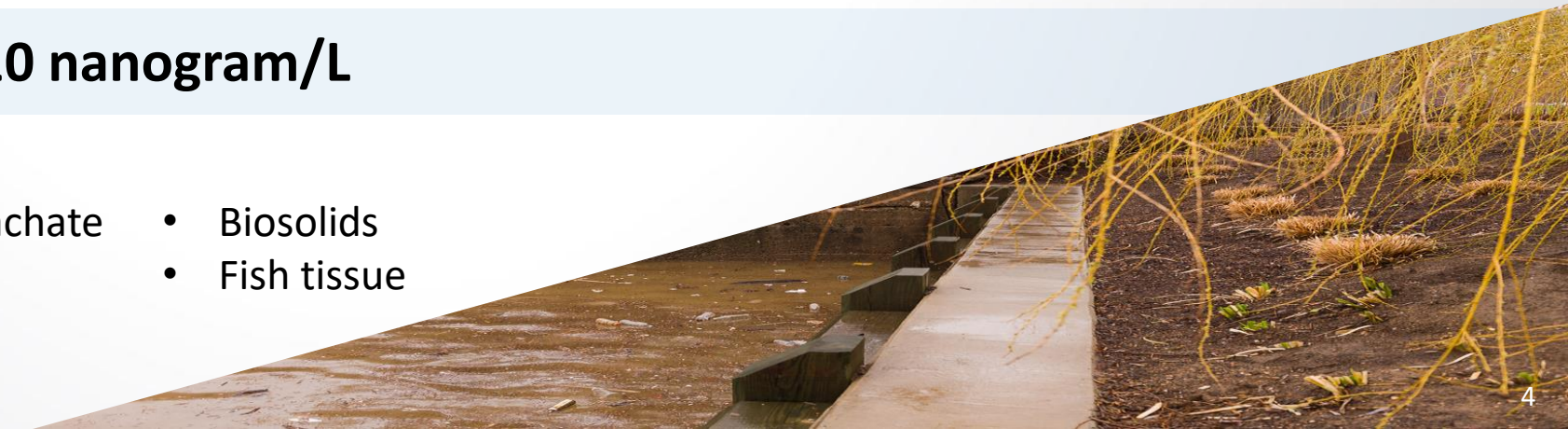
Single laboratory validated and released as draft CW-1633 in Sept 2021

- Collaborative effort among DoD, EPA Office of Water, EPA Office of Land and Emergency Management, and EPA ORD
- Multi-laboratory validation will start in 2021
- Method being developed in accordance SW-846 protocols for method development

Target Quantitation Limits: 1-10 nanogram/L

Matrices include:

- Wastewater (influent and effluent)
- Groundwater
- Surface water
- Landfill leachate
- Soil
- Sediment
- Biosolids
- Fish tissue



Non-Drinking Water Sample Methods: CWA-1633/SW-846 Method—*Isotope Dilution*

More complex method relative to direct injection; however, will:

- be more robust for complex matrices (e.g., wastewater influents, biosolids). Account for matrix effects (e.g., sorption) through isotopically-labelled standard recoveries;
- afford options to meet DoD requirements; and
- allow users to perform lower-level analyses based on screening results (e.g., 8327, TOF).

40 PFAS analytes - includes all analytes listed in 537.1, 533, and SW-846 8327

Non-drinking water samples

- Surface water, groundwater, wastewater
- Landfill leachates
- Solids (soils, sediments, biosolids, tissues)

Summary: EPA PFAS Methods, April 2021

EPA has validated Standard Methods complete or in development for PFAS in water

- Final SDWA Methods 533 and 537.1 for available for drinking water (29 PFAS)
- SW-846 Method 8327 validated for non-potable water (24 PFAS)
- Method in CWA-1633 completed single lab and undergoing multi lab validation for non-potable water/solids (40 PFAS). SW-846 determination to follow.

EPA has or is developing additional methods for partner use

- **Fish Tissue** – Isotope dilution method for 13 PFAS has been used in national surveys
- **Serum** – Isotope dilution method (targeted and non-targeted) used in biomonitoring
- **Ambient air and emissions** – Sampling and analysis methods undergoing development and testing
- **Total Organic Precursors (TOP)** – Identify total PFAS load which may degrade to most persistent PFAS
- **Total Organic Fluorine (TOF)** – Potential rapid screening tool to identify total PFAS presence/absence
- **Nontargeted analysis –** Continued development and application of HRMS methods for discovery of novel PFAS, suspect screening analysis, and identification of transformation and end products.

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Acknowledgement:
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