

# *Automated Sample Preparation for PFAS in Soils Prior to LC-MS/MS as a Fast Screening Procedure*

August 2025

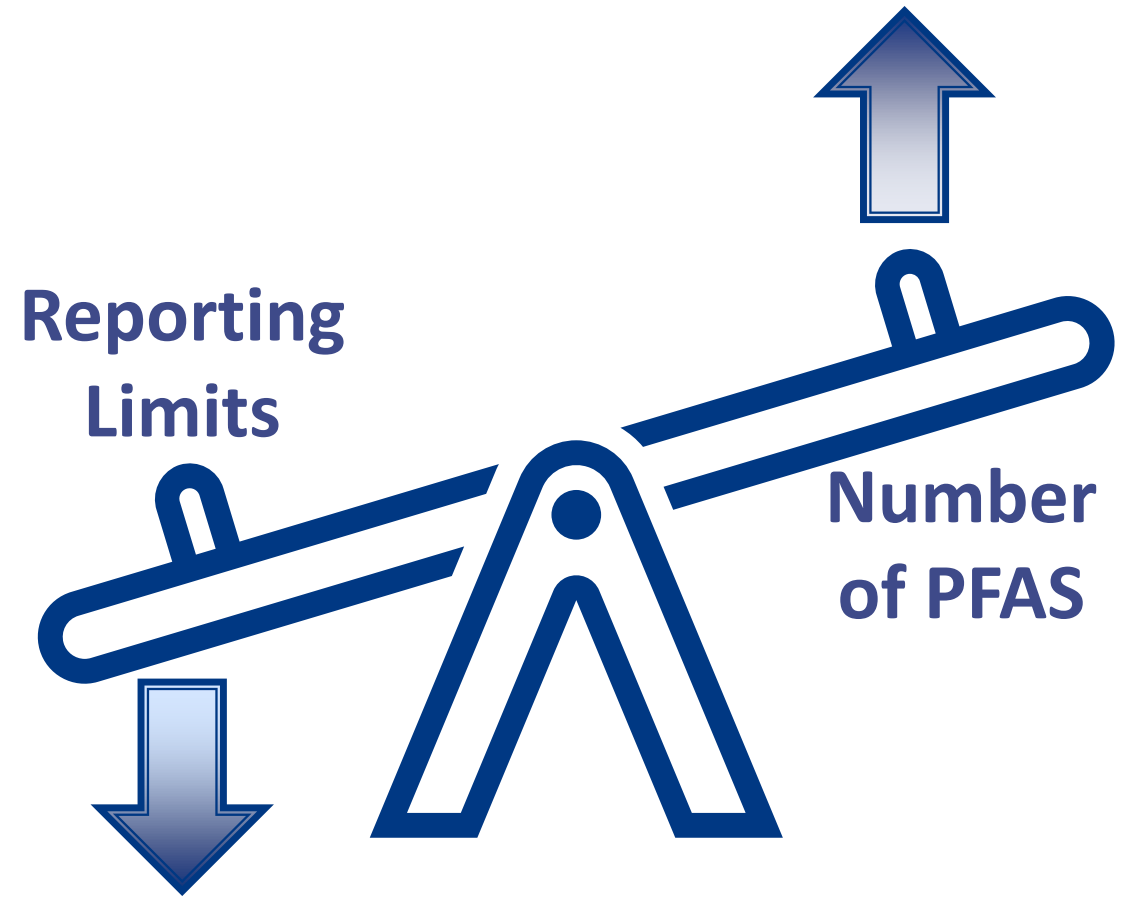
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Environment Testing

# Evolution of PFAS testing

- Need for Speed



# Where to begin?

## WHAT WILL THE DATA BE USED FOR?

Developing a Conceptual Site Model?

Determining the extent of  
contamination?

Investigating sources of contamination?

Assessing human health impacts?

Implementing a remediation plan?



# Why Screen samples?

- Highly contaminated areas
  - Protection of laboratory
  - Detect hot-spots in the field & plan drilling/excavation/remediation

Water- Dilute and Shoot

Soil- extract, dilute and shoot

More sample handling, more contamination,

Image of AFFF in solution > shaken



# Automated- Rapid Screening



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# Screening Non-Potable Water, Soils, Biosolids and Tissues



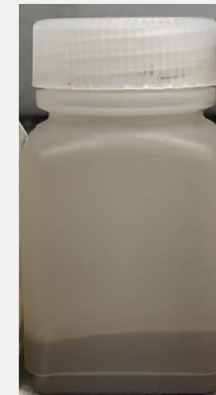
Office of Water

[www.epa.gov](http://www.epa.gov)

December 2024

## Method 1633, Revision A

**Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS**



# Aqueous Samples:

- Aqueous (not solvent)
- Low TSS (<50mg/bottle)
- Cannot filter
- Does not foam
- Not multiphasic
- Homogenous

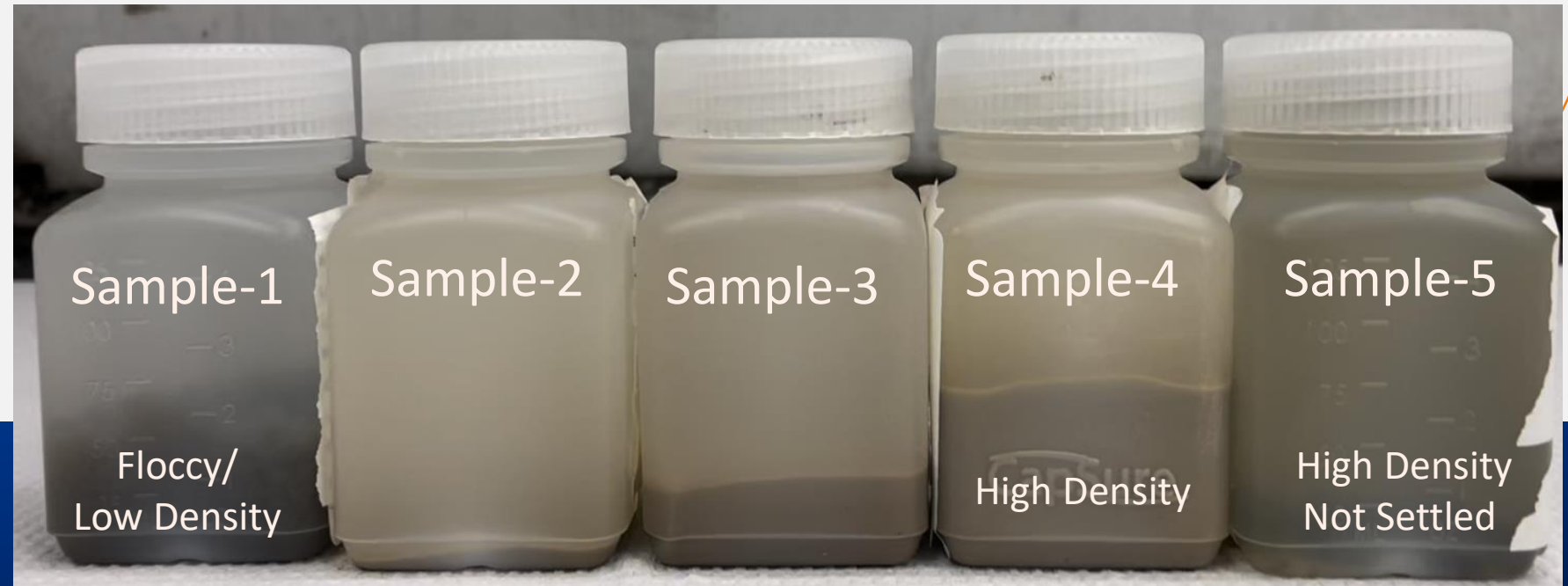
Multiphasic



Wastewater/Biosolid



GW with oil sheen



# Solid Samples:

- Solid (%Moisture < 80%)
- Homogeneous & < 1mm
- No organic material
- No large rocks
- No invertebrates
- No foreign objects

Sand



Wet Sand



Sand with pebbles\*



Soil\*



Soil\*



Rocks\*

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# Solid Samples:

- Solid (%Moisture < 80%)
- Homogeneous & < 1mm
- No organic material
- No large rocks
- No invertebrates
- No foreign objects



Clay



Clay with water\*



Cannot be mixed

Mud with Rocks\*



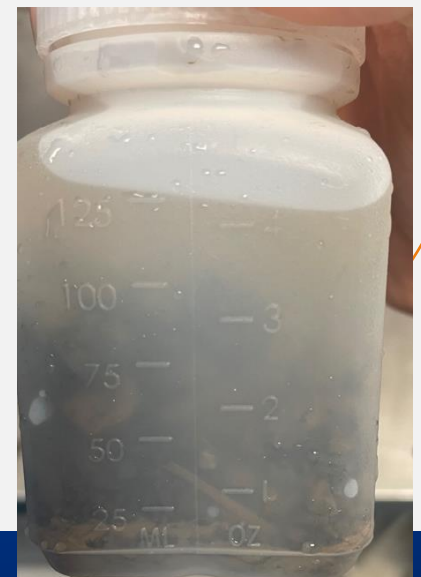
Can be mixed, avoid rocks



Wet soil with Sticks\*



Organic Matter, no Soil\*



Gravel topped with water\*

## Complete Robotic Operation

- One ePrep will feed multiple analytical instruments
- unattended operation
- process repeatability

## Modular Accessories

- sample filtering
- vortex and magnetic mixing
- SPE standard and micro
- direct mass spec interface

## Analytical Syringe Operation

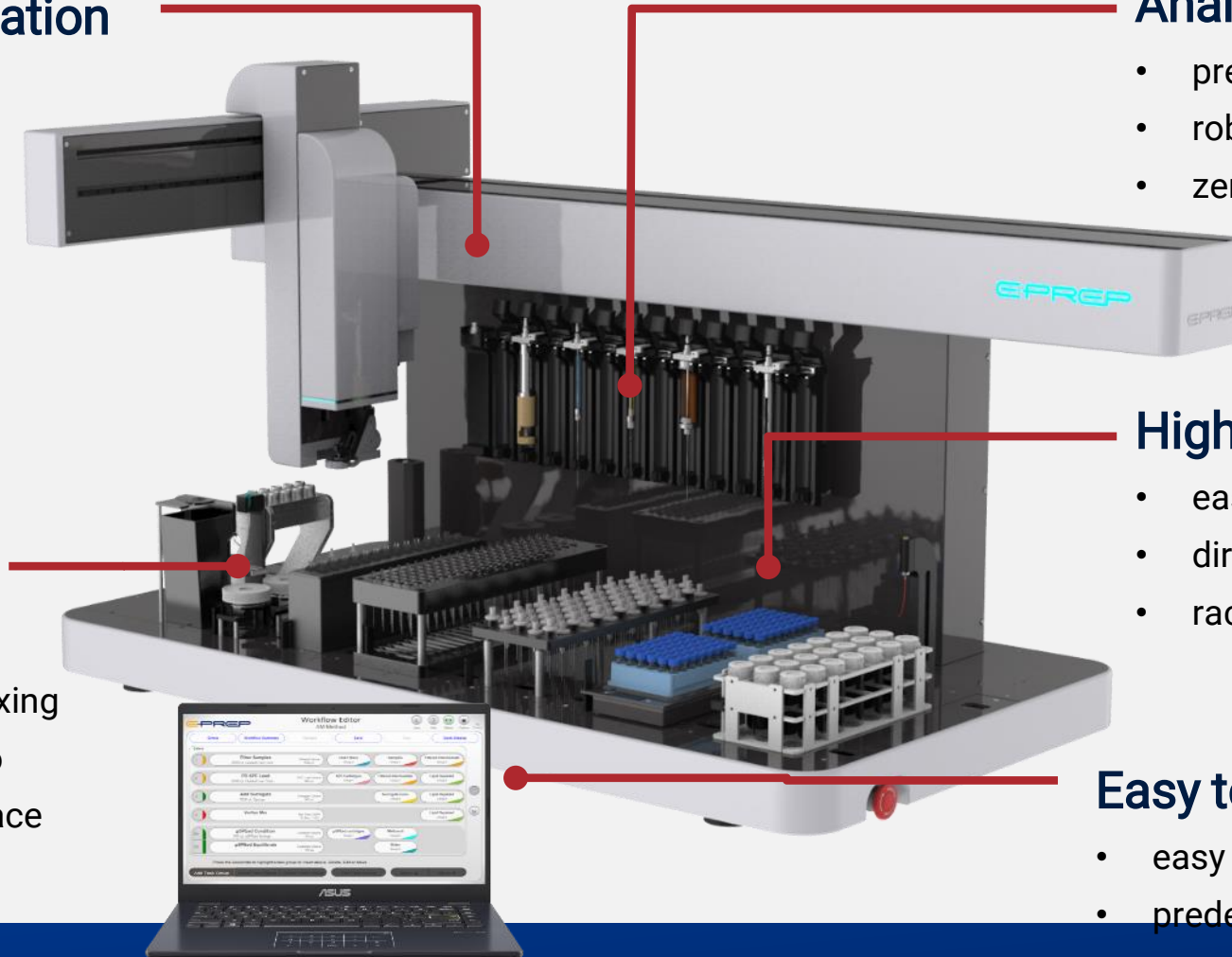
- precision, accuracy even at low volumes
- robotic tool change
- zero carryover

## Highly Flexible

- easily used for 5-100 samples
- direct to your autosampler rack
- rack configuration is not fixed

## Easy to Use Software Control

- easy graphical interface
- predefined templates and tasks



## Features / Benefits Overview

Benefit	ePrep Operation	Advantage
Stand Alone	Modular Rack	Prepare directly into the autosampler vial – Complete flexibility, prepare for multiple instruments.
Improve Productivity	Unattended Operation	Feed multiple instruments from a single ePrep with unattended day and night operation
Reduced Staff Training	Predefined Tasks, Syringes, Tools, Racks and Vials are simple to program and operate	Workflows can be operated with ease by Laboratory Assistants with minimal training
Optimise Resources (more with less)	Entire robotic Operation with minimal human input	Use your team for tasks requiring human judgement and decision making, and let ePrep do the boring stuff.
More Samples without additional cost.	24/7 operation allowing sample prep when everyone has gone home.	More samples in but not necessarily more people
Improve Results Reliability	It's a robot and will do the same task reproducibly all day and all night	Results are independent of the operator eliminating errors, saving time, and avoiding repeats.
Drive Profitability	More samples in without addition of human resources.	Improved financials - higher efficiencies and better economics.
Validation and Compliance	ePrep records all operations associated with the User, a Workflow and Input/output vial.	Chain-of-Custody report and compliance
Next Generation Laboratory	Cutting edge technologies allow new techniques such as $\mu$ SPE, filtering and positive pressure SPE	Capabilities for future-proofing the chromatography laboratory
Works like Robot	ePrep does repetitive work like a robot	Have your scientists do science and avoid RSI

# Screening Better (sunscreen)

## Goals

- Fast & Hands-Free
- Comparable at high concentration
- Matrix Robustness & Instrument protection

# THANK YOU

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