

## Per and polyfluoroalkyl Substance (PFAS) Sampling Guidance for Sludges, Biosolids, Short Paper Fiber, and Soils

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### Sampling Plan, Supplies, Equipment and Decontamination

To ensure quality assurance in sampling and analysis, the facility should develop a sampling plan. The plan should be specific to the operations of the facility and be comprehensive, documenting how to prepare for sampling, how to collect representative samples, and how to properly preserve and transport samples to an analytical laboratory. The sampling plan should be reviewed by all relevant staff and can be used as a reference for sampling events. The sampling plan should establish the supplies and equipment needed for sampling, the sampling procedure, as well as the ways to avoid contaminating samples. For more detailed guidance on sampling plan preparation and supplies, see New England Interstate Water Pollution Control Commission's, "The Wastewater Treatment Plant Operators Guide to Biosolids Sampling Plans" (Reference 3).

Due to the ubiquitous nature of PFAS in commercial products and in the environment, and due to the low levels at which they are quantified in laboratory analysis, avoiding cross contamination of PFAS during sampling is of the utmost importance. Great care must be taken to ensure that sources of PFAS unrelated to the media being sampled are not introduced to the sample. This guidance provides measures to reduce the potential of cross-contamination.

- 1) Reference any regulatory permit that requires the sampling and analysis to ensure that the testing parameters, frequency, analysis method are understood.
- 2) Always contact laboratory(ies) performing the analyses prior to the sampling to:
  - a. Ensure laboratory can perform sample analysis method identified in applicable regulatory permit.
  - b. Consult lab to obtain sample bottles, coolers, labels, field/trip blanks, chain of custody, etc.
  - c. Understand required sample volumes, preservation and hold time requirements.
  - d. Discuss sample transport options (mail, courier).
  - e. Obtain estimates of costs for analysis but budgeting.
  - f. Understand estimated sample analysis/reporting turnaround times\*

\*Communicate any needs for accelerated sample turnaround times (i.e. rush samples)

#### 3) Recommended materials for sample collection and handling/transport:

- |   |   |
|---|---|
| a. Sample containers and labels<br>(provided by laboratory) | f. Chain of custody/sample submittal form<br>(provided by laboratory) |
| b. Nitrile gloves   | g. Sample log/field data sheets                                       |
| c. Sample cooler with ice                                   | h. Resealable storage bags  |
| d. Stainless steel bucket                                   | i. Sharpie markers and pens   |
| e. Stainless steel trowel, shovel, probe, or auger          |   |

4) Recommended materials for decontaminating sample equipment (stainless steel bucket, trowels, shovel, probes, augers), as needed:

- a. Disposable towels
- b. PFAS free water
- c. Deionized water
- d. Scrub brush
- e. Approved detergent (Alconox, Liquinox, Luminox)

For a more detailed guidance on approved and prohibited items at sampling locations see Appendix D-1 of North East Biosolids & Residuals Association's, "Sampling and Analysis of PFAS in Biosolids and Associated Media." (Reference 2)

**Decontaminating Sampling Equipment:**

Prior to sampling day, decontaminate all equipment that will come into contact with the sample media using the following process:

- a. Remove loose material with a brush.
- b. Rinse equipment with tap water and scrub.
- c. Wash with Alconox® or Liquinox® phosphate-free detergent made with distilled or deionized water.
- d. Triple rinse with PFAS-free tap water
- e. Allow equipment to completely air dry.
- f. Store equipment in clean, unused Ziploc® bags for transport to the field sampling site

## Sampling for Sludges, Biosolids, and Short Paper Fiber

Prior to a sampling event, confirm media will be available for sampling at the proposed date, time, and sampling location. Collect the sample in the processed form that it is typically in when it is transported from the facility to be recycled or disposed. For example, if the facility is producing biosolids via composting, ensure that compost has met time and temperature and that after sampling, testing results will be received prior to the time for distribution

Listed below are the materials and steps required to prepare, collect, and transport the samples:

1. Prior to sampling, determine the ideal sample location for the facility's operations. For example, a sample location may be a storage bunker, a conveyor post dewatering, or other accessible points that represent the final material to be managed.



Examples of potential biosolids sample locations

2. While wearing nitrile gloves and any other required/desired personal safety equipment, collect a grab sample of the material using a stainless-steel trowel and deposit into a stainless-steel bucket or bowl large enough to hold many grab samples. For solid materials (compost, de-watered cake, soil, etc.) the lab containers for the sample to be analyzed for PFAS will typically be between 250 and 500 ml (1 to 2 cups) of sample. Collect at least 10 individual grab samples to make up the composite sample.
3. All grab samples should be of similar volume and should be collected, either over time or from multiple locations in storage pile/batch, and added to the steel bucket. Thoroughly mix grab samples in stainless steel bucket to create a composite sample. Fill the sample container with the required amount of material as determined by the consulting laboratory. Collect any required field duplicates, blanks, equipment blanks or other field quality control measures. It is also recommended to keep a portion of the composite sample in a separate lab-provided container to store in a cooler on site as an archive sample until the sample results have been reviewed.





## Sampling for Soils at Land Application Sites

Prior to a sampling event, contact landowner to coordinate sample location, sampling date and time, and access to the site/field. Double check that all necessary personal protective and sampling equipment is packed, including sufficient ice.

Listed below are the materials and steps required to prepare, collect, and transport the samples:

1. Soil samples must be a composite, comprised of multiple grab samples collected to represent the entire land application area. One composite sample should be obtained per ten (10) to fifteen (15) acres of land application field utilized and the composite should be represented by at least fifteen (15) to twenty (20) grab samples. To represent the entire field, there are multiple, possible strategies:
  - a) Grid out the field prior to sampling and establish way points at locations to collect each grab sample.
  - b) Walking a zig-zag pattern over the area while collecting grab samples.
  - c) Pick two or three transects, walk each transect collecting multiple grab samples across the entire distance of the transects.

Options a) and b), being simpler methods, may not ensure full coverage of area but are suitable methods. For further field sampling representation see The University of Vermont Extension Agricultural & Environmental Testing Lab's "How to Take a Soil Sample" (Reference 1)



Example custom grid plot for optimal sampling coverage.  
Photo: University of Florida, Farming More Efficiently with Grid Soil Testing and Precision Nutrient Application. November 12, 2021.

2. While wearing nitrile gloves and any other required/desired personal safety equipment, collect each grab sample from the determined sample location using a stainless-steel trowel or soil auger. Remove top layers of vegetation/organic matter and set aside, collect soil from the top 6" of depth and deposit into stainless steel bucket or bowl. Return vegetation/organic matter to sample location. If a GPS unit is available, log in locations of grab samples.

3. Continue to collect grab samples to formulate a composite representing the field intended for land application. Thoroughly mix sample in stainless steel bucket. Fill the sample container provided by the lab with the recommended amount of soil required by the laboratory. Collect any required field duplicates, blanks, equipment blanks, split sample, or other field quality control measures.



After blending grab soil samples in stainless steel bowl, field staff fills container with recommended amount of soil.

4. Fill out the sample label(s) and attach them to the containers. The sampler should also take notes in a log or data sheet that document date and time of collection, sample location (GPS if available), person collecting sample, preservative method and required test(s), and weather conditions.
5. Place sealed and labeled container(s) in resealable storage bags to keep the container clean and dry. Preserve all samples on ice for transportation to the laboratory. Complete a chain-of-custody (COC) sheet to document proper sample handling and place in resealable storage bag.
6. Follow “Decontaminating Sampling Equipment” procedure on Page 2.

## References

1. How to Take a Soil Sample. The University of Vermont Extension Agricultural & Environmental Testing Lab, Burlington, VT. March 2022.  
<https://www.uvm.edu/sites/default/files/UVM-Extension-Cultivating-Healthy-Communities/how-to-take-a-soil-sample-2.pdf>
2. Sampling and Analysis of PFAS in Biosolids and Associated Media. North East Biosolids & Residuals Association, Hope, RI. 2020.  
<https://www.nebiosolids.org/pfas-sampling-analysis-guidance>
3. Sampling Soils for Nutrient Management. United States Department of Agriculture, Natural Resources Conservation Service, Bozeman, MT. April 2007.
4. The Wastewater Treatment Plant Operators Guide to Biosolids Sampling Plans. New England Interstate Water Pollution Control Commission, Lowell, MA. September 2006.  
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