Standard Operating Procedure

Sampling Procedures for Per- & Poly-Fluoroalkyl Substances

Department for Environmental Protection
Prepared By: Division of Water and Division of Waste Management

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Revision History

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PURPOSE

This Standard Operating Procedure (SOP) provides guidance for collecting samples for per- and poly-fluoroalkyl substances (PFAS) analysis for the Kentucky Department for Environmental Protection (Department). PFAS are unregulated emerging contaminants and the regulatory status of PFAS is still being evaluated and researched. These procedures will be updated as more is known about PFAS.

Special care should be taken in handling and sampling for PFAS because they are commonly found in many consumer products and in equipment typically used in collecting environmental samples. Additionally, analytical methods for laboratory analysis of PFAS have detection limits in the parts per trillion (nanograms per liter) range.

This SOP outlines general practices for collecting PFAS samples and provides a summary of field and sampling materials that are likely to contain PFAS and acceptable alternatives. Any modifications to this SOP shall be approved in advance by the Kentucky Department for Environmental Protection (KDEP) Project Manager (DWM and\or DOW), documented in the field logbook, and presented in the final sampling report.

INTRODUCTION AND BACKGROUND

Based on U.S. Environmental Protection Agency (USEPA) guidance[1], "per- and polyfluoroalkyl substances (PFAS)" is the preferred term to refer to this class of chemicals, although the general public and others may also refer to them as "perfluorinated chemicals (PFCs)" or "perfluorinated compounds (PFCs)."

PFAS are a family of man-made compounds that do not naturally occur in the environment. They have a large number of industrial uses and are found in many commercial products because of their properties to resist heat, oil, grease, and water. Once released to the environment, PFAS are persistent and do not readily biodegrade or break down. Several states within the United States are dealing with sites where there have been widespread PFAS impacts to drinking water supplies.

The USEPA issued drinking water lifetime health advisories for two PFAS compounds, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) on May 19, 2016: 70 parts per trillion (ppt) for PFOA, 70 ppt for PFOS, and 70 ppt for PFOA and PFOS combined[1]. Lifetime Health Advisories are not drinking water standards (Primary Drinking Water Standards or Treatment Technology) but are being used for screening of drinking water, groundwater, and source water used by public water systems. The USEPA has not established Health Advisories for the other PFAS at this time. Additionally, the USEPA

[1] https://www.epa.gov/pfas/what-are-pfcs-and-how-do-they-relate-and-polyfluoroalkyl-substances-pfass

developed Method 537 to analyze for PFAS in the Unregulated Contaminant Monitoring Rule 3 program and developed and validated and published two additional methods (537.1 and 533) for analysis of 29 PFAS in drinking water[2].

Commercial and Industrial Uses of PFAS

Various PFAS have been utilized in commerce and industry since the 1940s. Common uses include waterproof clothing, non-stick coatings, stain-resistant fabric coatings and Aqueous Film Forming Foams (AFFF) used in firefighting. PFAS may also be associated with solid waste and waste water treatment facilities. Several of the known commercial and industrial uses of PFAS are summarized below in Table 1, but this table may not be all inclusive.

Table 1. Commercial and Industrial Uses of PFAS

Commercial Products	Industrial Uses
Cookware (nonstick, Analon®, Teflon®)	Photo Imaging
Fast Food Containers and Bags	Metal Plating
Candy Wrappers	Semiconductor Coatings
Microwave Popcorn Bags	Hydraulic Fluids
Personal Care Products (Shampoos, Lotion)	Medical Devices (Including Implants)
Cosmetics (Nail Polish, Eye Makeup)	Class B Firefighting Foams (AFFF)
Paints and Varnishes	Insect Bait
Stain-Resistant Carpet	Printers and Copiers
Stain-Resistant Applications (Scotchgard®)	Oil Additives
Water-Resistant Clothing	Automobile Parts and Lubricants
Cleaning Products	Oil Production Fluids
Electronics and Circuit Boards	Textiles and Carpet Manufacture
Ski Wax	Paper and Packaging
Sunblock	Rubber and Plastics

Allowable and Prohibited Items for Sampling Events

Due to the wide and varied uses of PFAS, and the sensitivity of analytical methods, there are several common items and materials that pose a risk of cross contaminating environmental samples. Therefore, many items and materials that are typically associated with field work cannot be used, or in the proximity, when collecting samples for PFAS analysis. Table 2 is a summary of items and materials that are either prohibited or allowable for use when collecting PFAS samples. While the list in Table 2 is lengthy, it is likely not all inclusive of materials that contain PFAS. When in doubt about an item or

material that does not appear on this list, further research will be required to determine if it represents potential cross contamination.

These guidelines are based on a review of the New Hampshire Department of Environmental Services (NHDES) *Sample Collection Guidance*[2] and Michigan Department of Environmental Quality (MDEQ) *General PFAS Sampling Guidance*[3] and provides a summary of items that are likely to contain PFAS along with acceptable alternatives. This list will be amended as new information becomes available.

Prohibited identifies items and materials that should not be used when sampling. It is well documented that they contain PFAS or that PFAS are used in their manufacture. **Allowable** identifies items and materials that have been proven to not be sources of PFAS cross-contamination and are considered allowable for sampling. **Needs Screening** identifies items and materials that have the potential for PFAS cross-contamination due to a lack of scientific data or statements from manufacturers to prove otherwise.

Table 2. Allowable and Prohibited Materials Used in Sampling.

Category	
Field Equipment Including: • Pumps • Tubing • Bailers	**Prohibited Items:** Teflon® and other fluoropolymer-containing materials (e.g., Teflon tubing, bailers, tape; Teflon-containing plumbing paste, or other Teflon materials) **Note**: The Grundfos Redi-Flow Submersible Pump has a Teflon impeller and is not recommended for collecting PFAS samples. Polyvinylidene fluoride (PVDF) that includes the trademark Kynar® Polychlorotrifluoroethylene (PCTFE) that includes the trademark Neoflon® Ethylene-tetrafluoroethylene (ETFE) that includes the trademark Tefzel®
	Allowable Items: High-density polyethylene (HDPE) -*preferred,* low density polyethylene (LDPE)*,or silicone tubing HDPE/LDPE* or stainless steel bailers

[2] https://www.des.nh.gov/organization/commissioner/documents/pfas-sample-guidance-201611.pdf

[3] https://www.michigan.gov/documents/pfasresponse/General_PFAS_Sampling_Guidance_634597_7.pdf

	Peristaltic pumps Stainless steel submersible pumps (e.g., ProActive stainless steel pumps with PVC [polyvinyl chloride]) leads and Geotech Stainless Steel Geosub pumps)
	Needs Screening: *LDPE may be used if an equipment blank has confirmed it to be PFAS-free. LDPE does not contain PFAS in the raw material but may contain PFAS cross-contamination from the manufacturing process. Bladder pumps with polyethylene bladders and tubing need to be evaluated on a case-by-case basis because the gaskets and O-rings may contain PFAS. Equipment with Viton components needs to be evaluated on a case-by-case basis. Viton contains PTFE, but may be acceptable if used in gaskets or O-rings that are sealed away and will not come into contact with sample or sampling equipment.)
Decontamination	**Prohibited Items:** Decon 90
	Allowable Items: Alconox® or Liquinox® [4], 10% HCl solution in DI water followed by laboratory "PFAS-free" DI water rinse.
Sample Storage and Preservation	**Prohibited Items:** LDPE or glass bottles, PTFE-or Teflon-lined caps, blue or chemical ice packs
	Allowable Items: Laboratory-provided sample container; HDPE or polypropylene bottles or vials with an unlined plastic screw cap, as specified by the laboratory doing the analysis Trizma® preservative Regular loose ice (preferably from a known PFAS-free source).
	Needs Screening: If it is necessary to use blue or chemical ice packs, they should be tested to ensure that they are PFAS-free.
Field Documentation	**Prohibited Items:** Waterproof/treated paper or field books, plastic clipboards, non-Sharpie® markers, Post-It® and other adhesive paper products.

[4] While Alconox and Liquinox soap is acceptable for use for PFAS decontamination, they may contain 1,4-dioxane. If Alconox and Liquinox soap is used at sites where 1,4-dioxane is a contaminant of concern/interest, then equipment blanks analyzed for 1,4-dioxane will be required.

	Allowable Items: Plain Paper, metal clipboard, Sharpies[5], ballpoint pens
Clothing/laundering	**Prohibited Items:** Clothing or boots made of or with Gore-Tex™ or other synthetic water proof/ resistant and/or stain resistant materials, coated Tyvek® material that may contain PFAS; Clothes laundered with fabric softener or dryer sheets
	Allowable Items: Synthetic or cotton material, previously laundered clothing (preferably previously washed greater than six times) without the use of fabric softeners. Polyurethane and wax coated materials. Neoprene Boots made with polyurethane and PVC, well worn or untreated leather boots
	Needs Screening: Tyvek material that is PFAS free (e.g., uncoated)
Personal Care Products (for day of sample collection) **Note:** Guidance from New Hampshire and Michigan both contain lists of sunscreens and insect repellants and each contain different allowable products. Michigan lists some products as requiring screening prior to use that New Hampshire lists as allowable. In the interest of caution, always verify that a product has been confirmed before use.	**Prohibited Items:** Cosmetics, moisturizers, hand cream and other related products
	Allowable Items: **Sunscreens:** Alba Organics Natural, Yes to Cucumbers, Aubrey Organics, Jason Natural Sun Block, Kiss My Face, Baby-safe sunscreens ('free' or 'natural') **Insect Repellents**: Jason Natural Quit Bugging Me, Repel Lemon Eucalyptus, Herbal Armor, California Baby Natural Bug Spray, BabyGanics **Combination Sunscreen - Insect Repellents:** Avon Skin So Soft Bug Guard-SPF 30
	Needs Screening: Personal care products not yet tested for PFAS

[5] Fine point Sharpies may be used if necessary; however, KDEP does not recommend using Sharpies as they can bleed through pages and smudge, making the documentation hard to read.

Food and Beverage	**Prohibited Items:** Pre-packaged food, fast food wrappers or containers, pizza boxes
	Allowable Items: Bottled water or hydration drinks (i.e., Gatorade® and Powerade®) Eating should take place away from the sampling zone with PPE removed and replaced prior to resuming sampling

Further Information

Frequently Asked Questions, fact sheets, and additional information concerning PFAS can be found on the EPA website[6]. The Interstate Technology & Regulatory Council (ITRC)[7] has also prepared educational materials, which are available online. ITRC also conducted a series of training events on PFAS during 2019 and continues to offer training across the country.

GENERAL GUIDANCE

Prior to implementing a PFAS sampling plan the Division of Environmental Program Support (DEPS) laboratory must be consulted. The DEPS lab analyzes all PFAS water samples for the Department and provides all sampling containers, preservatives, coolers and PFAS-free water (as needed). Preparing to analyze PFAS samples requires significant preparation by lab personnel. The general guidance below assumes that the reader will develop a Project Sampling Plan and the necessary project-specific quality assurance document(s) related to the monitoring to be conducted.

The experience from recent PFAS monitoring projects has shown that a team of three samplers is optimum for sample collection. This allows for the primary sampler to fill containers, the secondary sampler to hand off containers to the primary, and the tertiary sampler to act as on-site quality assurance and complete the chain-of-custody (COC) forms. The tertiary sampler should also be prepared to assist with sample collection if the need arises.

Preparations and Precautions

A considerable amount of preparation is required prior to collecting samples for PFAS analysis. The following activities are necessary preparations and precautions:

1) Coordinate with DEPS laboratory, securing proper type and number of sample containers.

[6] https://www.epa.gov/pfas

[7] http://www.itrcweb.org

2) Ensure that entire sampling team has thoroughly reviewed this SOP and has been trained to collect samples for PFAS analysis.
3) Wash field clothes according to directions in Table 2.
4) Verify that no prohibited items/materials will be used to collect samples.
5) Verify that no prohibited personal items/materials will be in field vehicles.
6) Confirm that sampling materials and equipment can be stored in field vehicle without coming into contact with stain-resistant upholstery.
7) Secure new, unopened boxes of nitrile gloves and zip lock storage bags that will be dedicated to the PFAS monitoring project.

Sampling Materials

All containers, preservatives and dedicated coolers for PFAS sample collection will come from DEPS lab, prepared for field use. Sample containers include 250 mL HDPE and 15 mL HDPE, depending upon the analysis method to be used, which are discussed later in this document. When necessary, sample containers come pre-preserved with powdered TRIZMA™. All other materials to be utilized during sample collection should be evaluated based on Allowable and Prohibited items found in Table 2.

Personal Protective Equipment

In general, the Personal Protective Equipment (PPE) required for PFAS monitoring will be dictated by the water source(s) being sampled and the setting in which samples are collected. At a minimum, nitrile gloves are required to collect PFAS samples. However, due to the prohibitions on personal care products it may be necessary to wear long-sleeved shirts in lieu of using sunscreen and bug spray. Refer to the Department's Worksite Hazard Assessment to determine what PPE will be necessary at each sampling location and compare against the items/materials in Table 2.

Quality Assurance and Quality Control

Some quality assurance and quality control (QA/QC) measures are required by the DEPS lab for all PFAS monitoring. For instance, all samples collected for the Drinking Water PFAS Analysis Method require one Field Blank and a Duplicate sample at every site. In addition, this analysis method requires that one site be sampled in Triplicate on each day of sampling, and that each cooler used includes a combination Temperature/Trip Blank. Samples collected for the Non-potable Water PFAS Analysis Method require each site to be sampled in Duplicate. These QA/QC requirements are due to the extremely low detection limits of these analysis methods, and are described in detail later in this document.

An example COC for PFAS monitoring is included in the appendix of this document. This COC can be adapted for any PFAS monitoring project, and can be modified as necessary. However, modifications to this COC should be approved by the DEPS lab prior to use.

Project-specific QA/QC practices and documentation may need to be developed on a case-by-case basis and should be discussed amongst the sampling project coordinator, their management team, and the appropriate division quality assurance officer.

Decontamination

To the extent practicable, disposable materials should be used for PFAS sample collection to avoid the need for decontamination and eliminate cross-contamination potential. However, the need may arise to utilize portable pumps or other non-disposable equipment to collect PFAS samples. When these situations occur proper decontamination of equipment is crucial.

The first decontamination step is to remove solids that have adhered to the equipment being cleaned, this can be accomplished with potable water and mechanic removal. This should be followed by a double rinse with one of the Allowable decontamination fluids listed in Table 2. The final step is a double rinse with PFAS-free water, which can be obtained from the DEPS lab.

Once decontamination is completed a PFAS equipment rinsate blank shall be collected as evidence that the process was effective. The equipment rinsate blank is collected by pouring PFAS-free water over and/or through the equipment in areas that sample water would contact. That rinsate is collected in one of the sample containers provided by the DEPS lab and labeled as an equipment rinsate blank, the type of equipment, date, time and sampler's initials. A COC shall also be prepared for this blank.

SAMPLE COLLECTION METHODS AND SEQUENCE

The DEPS lab utilizes two different analysis methods for PFAS in water samples, the Drinking Water PFAS Analysis Method (EPA Method 537.1) and the Non-potable Water PFAS Analysis Method (EPA Method 8327). The choice of which method to use is based on the source of the water being sampled and its turbidity. The Drinking Water Method requires very low turbidity and may not be appropriate for all surface water samples, but has much lower detection limits. The Non-potable Water Method was developed for sampling waste water and is very effective for turbid samples, but has higher detection limits. The sample containers, preservatives and collection methods are slightly different for each of these analyses, and those protocols are discussed below.

Consult the DEPS lab regarding which method would be most appropriate for the water source(s) you intend to sample. In some cases, it may be advantageous to collect samples to be analyzed using both methods.

The methods for collecting samples for each of these analysis methods are described below in general terms. The next section of this document contains location-specific considerations and instructions for collecting samples from various water source types (e.g. finished drinking water, water wells, streams, etc.). *If sample collection at a monitoring location includes other parameters, always collect PFAS samples first*.

Collecting Samples for the Drinking Water PFAS Analysis Method (EPA Method 537.1)

1) Obtain sample containers, field blank aliquot and dedicated PFAS sampling cooler from DEPS lab.
    a) 250 mL HDPE containers, pre-preserved with TRIZMA©. Minimum of two containers per site (field sample and duplicate), and two more containers for triplicate sample site.

b) 250 mL HDPE container with PFAS-free water Field Blank aliquot.
c) 250 mL HDPE container without preservative, which will be used to collect Field Blank.

2) Don nitrile gloves and directly label all sample containers (do not use adhesive labels), using black Sharpie© pen, with sampling location information, date, time and sampler initials. Include "Field Blank" on the appropriate container.
3) Complete header information of COC with sample location information, date and time.
4) Place labeled containers into zip lock bag to approach sampling location and do not place sample containers on any surface (e.g. counter top or ground).
5) Don clean nitrile gloves after labeling and prior to sample collection.
6) Collect PFAS samples first, before collecting samples for any other parameters.
7) Ensure that water source to be sampled is flowing; flush for a minimum of 5 minutes if collecting from a spigot.
8) Prior to collecting first field sample, pour Field Blank aliquot into Field Blank sample container. Cap and place back into zip lock bag.
9) If collecting field samples from a spigot or faucet, throttle it back so that the water stream is approximately the diameter of a pencil.
10) Collect field sample and duplicate samples; and collect triplicate samples where applicable. Then place filled containers back into zip lock bag.
11) Seal zip lock bag and place into cooler on wet ice.
12) Complete COC with number of sample containers being submitted for each type of analysis and provide any necessary notes in the Comment section.

Collecting Samples for the Non-potable Water PFAS Analysis Method (EPA Method 8327)

1) Obtain sample containers and dedicated PFAS sampling cooler from DEPS lab.
a) 15 mL HDPE vial, minimum of two containers per site (field sample and duplicate); two more containers for triplicate samples as necessary.
2) Don nitrile gloves and directly label all sample containers (do not use adhesive labels), using black Sharpie© pen, with sampling location information, date, time and sampler initials.
3) Complete header information of COC with sample location information, date and time.
4) Place labeled containers into zip lock bag to approach sampling location and do not place containers on any surface (e.g. counter top or ground).
5) Don clean nitrile gloves after labeling and prior to sample collection.
6) Collect PFAS samples first, before collecting samples for any other parameters.
7) Ensure that water source to be sampled is flowing; flush for a minimum of 5 minutes if collecting from a spigot.
8) If collecting field samples from a spigot or faucet, throttle it back so that the water stream is approximately the diameter of a pencil.
9) If collecting field samples from a stream, approach from downstream to avoid stirred up sediment from the stream bottom. Face the capped end of the container upstream and submerge the container a few inches to avoid collecting surface scum and then gently uncap the container to collect samples.

10) Fill container with **as close to** 5 mL of sample as possible; collect replicate samples in same manner. It is okay if more than 5 mL of sample is collected, but that is the optimum amount for lab analysis.
11) Place collected samples into zip lock bag, seal and place into cooler on wet ice.
12) Complete COC with number of sample containers being submitted for each type of analysis and provide any necessary notes in the Comment section.

LOCATION-SPECIFIC COLLECTION INSTRUCTIONS AND CONSIDERATIONS

Instructions and special considerations for collecting PFAS samples from various sources are discussed below for specific settings that have been encountered. Other location types not described here may be encountered during the course of sampling. It is incumbent on the project coordinator and field staff to assess sampling locations to determine if extra precaution is necessary to collect quality samples.

Public Water Systems – Finished Water

Prior to scheduling sample collection at a Public Water System (PWS), contact the superintendent or operator to schedule sampling. Staff from the Division of Water's Drinking Water Branch should also be consulted and can provide assistance with contact and scheduling. Collection of any samples of finished water from a PWS should be from the same location used for their regular compliance samples. This is typically in a laboratory area that will have a finished water tap. In general, the finished water tap is left on and running during normal operation. Often, this finished water tap is next to a raw water tap and both will be monitored for basic water chemistry indicators (e.g. pH, conductivity). Make sure that the raw water tap is shut off before collecting samples so that the finished water sample is not cross-contaminated by splashing or aerosol from the raw water. The sample collection and analysis method for PWSs will always be the Drinking Water PFAS Analysis Method.

Active Production Wells – Raw Water

Active production wells can include those used for drinking water (public and private), commercial, industrial and irrigation supplies. Make sure that the well has a raw water tap that can be accessed to collect samples. Be aware of any health and safety concerns that are specific to the location or facility where the well is located. The Drinking Water PFAS Analysis Method will generally be used for sampling these locations, but groundwater quality should be considered and may require the use of the Non-potable Water PFAS Analysis Method.

During Production Well Pumping Tests – Raw Water

Pumping tests are performed on water wells to determine various aquifer characteristics, groundwater production capacities and to diagnose issues related to well yield. This involves pumping the well for a predetermined duration, sometimes at various rates, while simultaneously collecting data on various physical and chemical parameters. Following the pumping portion of the test, physical groundwater parameters will continue to be monitored for a prescribed amount of time. Collecting any type of water quality sample during a well pumping test requires coordination amongst all parties involved. When planning the PFAS sampling event, ensure that the pump and downhole monitoring equipment are all constructed with PFAS-free materials.

PFAS samples collected during a well pumping test should occur near the end of the pumping portion of the test. The Drinking Water PFAS Analysis Method will generally be used for sampling these locations, but groundwater quality should be considered and may require the use of the Non-potable Water PFAS Analysis Method.

Monitoring Wells

Monitoring Wells may or may not have dedicated pumps that can be used to collect samples and planning efforts must include making that determination. If a monitoring well has a dedicated pump then ensure that is constructed with PFAS-free materials. If a portable pump is employed to collect PFAS samples ensure that it, and its associated discharge tubing, are on the list of Allowable equipment in Table 2. An equipment rinsate blank collected prior to pump deployment may be appropriate to determine the risk of PFAS cross-contamination.

If field measurements are to be collected using a field meter in conjunction with a flow-through cell, ensure that PFAS samples are collected directly from the pump tubing before sample water enters the flow-through cell to avoid potential cross-contamination.

The Drinking Water PFAS Analysis Method will generally be used for sampling these locations, but groundwater quality should be considered and may require the use of the Non-potable Water PFAS Analysis Method.

Inactive Water Wells

Inactive water wells will not have dedicated pumps and will require a means to withdraw water for sample collection. To the extent practicable, PFAS samples should not be drawn from a well using a bailer. This is because PFAS in the sample can adhere to the bailer, presenting the risk of diminished recovery or even false negatives. Use of a portable pump to collect PFAS samples will be required as well as ensuring that it, and its associated discharge tubing, are on the list of Allowable equipment in Table 2. An equipment rinsate blank collected prior to pump deployment may be appropriate to determine the risk of PFAS cross-contamination.

If field measurements are to be collected using a field meter in conjunction with a flow-through cell, ensure that PFAS samples are collected directly from the pump tubing before sample water enters the flow-through cell to avoid potential cross-contamination.

The Drinking Water PFAS Analysis Method will generally be used for sampling these locations, but groundwater quality should be considered and may require the use of the Non-potable Water PFAS Analysis Method.

Non-potable Water Sources

Non-potable water sources may include surface streams, permitted discharges from various facility types, treated waste water effluent, landfill leachate systems, spring runs or water wells. Sample locations could manifest as typical stream sections, ditches, larger rivers, discharge pipes, or culverts. If wading is required to reach the point of sample collection, be aware that materials that have been treated with waterproofing cannot be worn. When collecting samples from any surface water feature the sample location must be approached from downstream to avoid disturbing sediments. The capped end of the sample container should be faced upstream to collect the sample, which is drawn below the surface.

Collecting samples from a stream bank or a bridge is acceptable, which includes the use of a swing sampler or bridge sampler. The sample containers can be fixed to each of these devices using plastic zip ties. However, it is imperative that when samples are being collected for the Non-potable Water PFAS Analysis Method, using 15 mL HDPE vials, as close as possible to 5 mL of sample is collected. The use of an intermediate sample collection container should be avoided as PFAS in the sample can adhere to the inside of the container, which may diminish recovery or cause false negatives.

The Non-potable Water PFAS Analysis Method will generally be used for sampling these locations. However, water quality may be satisfactory to employ the Drinking Water PFAS Analysis Method.

Decontamination

Decontamination of reusable and shared equipment is of paramount importance for all environmental sampling programs and projects. Following the decontamination protocols outlined earlier in this document, along with equipment-specific manufacturer recommendations is very important. Due to the sensitivity of PFAS analytical methods and ubiquitous nature of these chemicals, extra care is required. Therefore, it may be appropriate to decontaminate shared, reusable equipment prior to its use for PFAS sample collection if it is not dedicated to that purpose. This would be done to ensure that no PFAS residuals remain since the previous decontamination efforts may not have taken PFAS sampling into account.

SAMPLE CUSTODY AND DELIVERY

A sample is in custody if it is in the actual possession of a sampler or in a secured area that is restricted to authorized personnel. The guidelines for storage, transport and delivery of PFAS samples in the custody of DOW staff are below.

Sample Delivery Directly to DEPS Lab

1) Ensure that all sample containers are secure in their zip lock bags, labeled correctly and have a matching COC that has been completed.
2) When delivering samples directly to the DEPS lab, make sure that they are expecting the samples and that the sample custodian will be present for delivery. With ample notification time, the DEPS lab can accommodate after-hours sample delivery.
3) Submit samples to the DEPS lab sample custodian and sign all COCs as Relinquished with the date and time of submittal.

Sample Delivery to DEPS Lab Via Freight Carrier

1) Make sure to inform the DEPS lab prior to sample collection that delivery will be through a third party freight carrier.
2) Upon completion of all sampling, ensure that all sample containers are secure in their zip lock bags, labeled correctly and have a matching COC that has been completed.
3) Sign all COCs as Relinquished with the date and time of shipping, then make a copy of the COC for your records. Seal all of the original COCs for samples in a given cooler into a zip lock bag and tape it to the inside of the cooler lid.
4) Ensure that the cooler is filled with ice prior to sealing it for shipping.

5) Use clear packing tape around the entire cooler, starting and ending on the top or bottom of the cooler so that it cannot be opened without breaking that tape.
6) Use custody seals, or sign and date the packing tape across the junction of the lid and main body of the cooler.
7) Drain excess water out of coolers immediately before shipping and then ensure that drain plugs are sealed.
8) It is recommended to ship all sample coolers certified, overnight to ensure samples are received within required holding times (14 days).

SITE SPECIFIC PFAS INVESTIGATIONS

While this SOP covers the information required for collecting PFAS samples, site specific investigations may require additional measures and documentation for quality assurance. Readers are encouraged to evaluate the SOP relative to their project goals and determine if supplemental documentation is necessary to achieve project goals.

The scope of the investigation of a site-specific sampling and analysis plan shall evaluate whether the site history includes, or has the potential to include, industrial processes that manufactured, processed, or used PFAS or PTFE, solid waste management (e.g., landfilling), fire training and/or response with storage or use of Class B Foam (AFFF), wastewater management (e.g., on-site septic or disposal, treatment facilities, sludge and/or biosolids management). It is appropriate to consider the wide-ranging use of PFAS in commercial and industrial applications, as summarized, but not limited to, the uses shown in Table 1.

The site-specific Sampling and Analysis Plan and Work Plan should describe sample locations, media (e.g., soil, groundwater, drinking water, surface water), and number of samples that are selected based on previous and current uses of the site, site hydrogeology, proximity to sensitive receptors, and other known releases. Samples collected from Public Water Systems, water supply wells, and private wells must be collected from a point in the system that is prior to treatment.

Additional phases of sampling and characterization may be required following review of the PFAS sampling and analysis results. Data results should be evaluated for usability based on the concentrations, types and distribution of PFAS, the site remedial status, and the proximity to sensitive receptors.

REFERENCES

The Northeast Waste Management Officials' Association (NEWMOA), five-part webinar training series, 2016; http://www.newmoa.org/cleanup/workshops.cfm

New Hampshire Department of Environmental Services (NHDES) Website:

NH PFAS Investigation at https://www4.des.state.nh.us/nh-pfas-investigation/

Guidance for Waste Sites (https://www4.des.state.nh.us/nh-pfas-investigation/?page_id=130)

Michigan Department of Environmental Quality (MDEQ) guidance
https://www.michigan.gov/documents/pfasresponse/General_PFAS_Sampling_Guidance_634597_7.pdf

EPA PFAS Webpages

https://www.epa.gov/pfas/what-are-pfcs-and-how-do-they-relate-and-polyfluoroalkyl-substances-pfass
https://www.epa.gov/pfas

Interstate Technology and Regulatory Council PFAS page:
https://www.itrcweb.org/Team/Public?teamID=78

APPENDIX – Example Chain of Custody

CHAIN OF CUSTODY RECORD
ENERGY and ENVIRONMENT CABINET
DIVISION OF WATER
KENTUCKY PFAS PROJECTS – A70

Site Identification	Collection Date/Time	Field Parameters
Location: Site ID #: County:	Date: Time:	pH: Cond (µS): Temp (°C): DO: Flow Est:

Sampler ID:_____

Division of Environmental Program Support				
Number of Containers	**Container Size, Type**	**Preservation Method**	**Parameters**	**DEPS Sample #**
	250 ml HDPE	1.25 g Trizma Cool to 4°C	**PFAS – Drinking Water Method**	
	250 ml HDPE	1.25 g Trizma Cool to 4°C	**Field Blank Analysis**	
	15 mL HDPE Vial	Cool to 4°C	**PFAS – Non-potable Water Method**	

Signatures:

Relinquished by: _____ Date: _____ Time: _____

Received by: _____

Relinquished by: _____ Date: _____ Time: _____

Received by: _____

COMMENTS:

***Note here if site sampled in Triplicate:**

Revised 6/12/2020

PFAS Sampling SOP Rev 0-2 (002)

Final Audit Report 2020-08-06

Created:	2020-07-13
By:	Caroline Chan (Caroline.Chan@ky.gov)
Status:	Signed
Transaction ID:	CBJCHBCAABAA22opYs3vkVZ2taQJNM20WzhKKwV_Oiry

"PFAS Sampling SOP Rev 0-2 (002)" History

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