

November 15, 2016

Mr. Lewis Sumner
Selectboard Chair
Town of Halifax
P.O. Box 127
Halifax, VT 05358

Via Email to lsumner@myfairpoint.net

**Re: Perfluorinated Compound Private Well Sampling - Work Plan
Halifax Landfill, Halifax, Vermont**

Dear Mr. Sumner:

1.0 Introduction

KAS, Inc. (KAS) has prepared this work plan to sample private drinking water wells located adjacent to the Halifax Landfill for perfluorinated compounds (PFCs). This work plan was prepared in accordance with requests made in a letter correspondence from Ms. Kasey Kathan of the Vermont Department of Environmental Conservation (VTDEC) to the Halifax Selectboard dated November 7, 2016. Activities included in this work plan are: 1) collection of water samples from two private drinking water wells for PFC analysis, and 2) submittal of the analytical laboratory report to the Town and VTDEC. The private wells to be sampled were identified in the VTDECs' letter as follows:

1. SPAN# 276-087-10030; Parcel# brn.1636; Branch Road
2. SPAN# 276-087-10260; Parcel # hub.0637; Town Dump Road

KAS will rely on the Town to provide contact information for the owners of the private wells listed above. The VTDEC has also requested monitoring well MW-4 be tested for PFCs in accordance with the previously approved KAS' Work Plan dated October 7, 2016. Because sampling of MW-4 is governed under the previous work plan, a discussion has not been included herein. Results of the drinking water and groundwater sampling efforts will be incorporated in the letter report task described in the previous work plan.

2.0 Scope of Work

The following specific tasks will be performed.

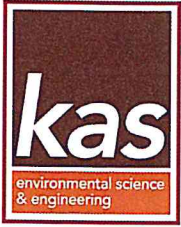
2.1 Private Drinking Water Well Sampling

KAS will coordinate with the owners of the private wells to schedule a sampling date/time. One drinking water sample will be collected from each private well for PFC analysis. The sample identification nomenclature will use the owner's last name (i.e. Smith Well). The specific sampling location will be determined after discussions with the private well owner. KAS will make every effort to obtain a sample from the bottom of the pressure tank. If this is not achievable, the sample will be collected from a location after the pressure tank but before any treatment; however, the specific location will be dependent on the layout of the water system and accessibility. The last resort

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sample location will be an "after" treatment location. Prior to collecting the water sample, all screens/aerators (if present) will be removed from the sample location and the system will be purged for a minimum of 15 minutes. The purge and sample locations may be different depending on the layout of the water system. The water samples will be placed in laboratory provided containers, properly preserved, placed on ice and submitted under proper chain of custody procedures to Northern Lake Service, Inc. in Crandon, Wisconsin for PFC analysis via EPA Method 537 (short list). One duplicate sample will also be submitted for analysis via EPA Method 537 (short list). A field blank sample will be prepared at each location with laboratory provided PFC-free "blank" water and submitted to the laboratory along with all samples. The field blank sample will only be analyzed if the associated sample location has a positive result for PFCs. The PFC analysis will be performed such that detection limits of 6.7 parts per trillion (ppt) are achieved. All drinking water samples will be collected in accordance with KAS' *Perfluorinated Compound Drinking Water Sampling Protocol*, a copy of which is enclosed.

2.2 *Data Deliverable*

Upon receipt of the laboratory report, KAS will submit the analytical report to the Town and VTDEC via email. The analytical report is anticipated to be received by KAS within 10-14 days of laboratory receipt of samples. As discussed above, the sample nomenclature used will allow each location result to be easily identifiable by the Town, VTDEC and private well owner.

3.0 Schedule

Sampling efforts will be performed within 10 business days after VTDEC work plan approval is received.

Please feel free to contact me if you have questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Rebecca Treat". The signature is stylized with a large, sweeping initial "R" and a horizontal line extending to the right.

Rebecca Treat
Project Geologist

cc. KAS # 610110045

1.0 Scope and Application

This protocol specifies the purpose, qualifications, equipment, supplies, and procedures to be employed for the collection of drinking water samples for perfluorinated compound (PFCs) analysis. This procedure pertains to samples collected from an operating water supply system. This procedure does not include steps necessary to collect a sample from an out-of-service water supply. A site-specific procedure would be drawn up in that instance.

The procedures and other aspects of this protocol will be the sole means of accomplishing the tasks described herein during work on all KAS projects, unless an alternate methodology is specified in an approved project work plan.

2.0 Purpose

The purpose of this protocol is to standardize the described procedures and to enhance reproducibility, accuracy and precision among multiple users. This protocol addresses user qualifications, equipment, supplies, and procedures.

3.0 User Qualifications

This protocol will be implemented only by personnel who have 40-hour OSHA training (29 CFR 1910.120), in addition to in-house training regarding use of the required equipment.

4.0 Equipment

- a) Safety glasses.
- b) Slotted pliers for removing filters/aerators.
- c) Paper Towels (for water spills).
- d) Nitrile Powder-free gloves.
- e) PFC free notepad (loose paper, no rite in the rain).
- f) PFC free writing instrument (Sharpie).

5.0 Supplies

- a) **No potential PFC containing materials (Tyvek, waterproofing, gore-tex etc) can be used. See enclosed list of prohibited and acceptable materials. This list also includes restrictions on food/drink, field clothing/PPE, sample containers and much more so care should be taken to thoroughly review the list prior to any field preparation.**

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- b) Sufficient number of laboratory supplied sampling containers and preservatives. Typical sample kit will include 4 containers: 3 Trizma preserved sample bottles and one full bottle containing PFC free water (blank water).
 - c) Sample labels provided by laboratory.
 - d) Chain of custody form provided by laboratory.
 - e) New nitrile or other suitable non-allergenic, non-PFC containing gloves.

6.0 Calibration

There are no calibration procedures associated with this protocol.

7.0 Operation

- a) Prior to the scheduled sampling event, perform all necessary coordination including arranging access to the supply well sampling point.
- b) The project field checklist will contain information relative to collection of quality assurance samples (blanks and/or duplicates) that may be required.
- c) Upon arrival, document the sample/purge location(s) and prepare a sketch if one does not exist. If possible, the sample should be collected from a port located at the bottom of the pressure tank. If this is not achievable, the next best option would be to collect a sample from a port located between the pressure tank and any treatment (particulate filter, water softener etc). A sample location downgradient/after treatment should only be selected if no other option exists. If a sink tap is used, remove the aerator, screen and any faucet-mounted filtration device prior to purging and sampling.
- d) Note any new or unusual conditions such as leakage or a new or relocated water treatment system. Note any new or unusual water quality complaints or other conditions reported by the system user. If a water meter is present, collect a water meter reading before purging the system. Note any potential PFC containing items in the area nearby the sampling point.
- e) New gloves will be donned by the sampler prior to purging and prior to sample collection.
- f) Purging of the water supply system is required but does not have to occur at the sample location. Initiate cold water flow and allow the water to run a minimum of 10 minutes at full flow before proceeding to sample collection.
- g) If field checklist requires a field blank at sample location, prepare field blank immediately prior to collecting sample. Locate the bottle labeled "blank water" and the empty sample container labeled "field blank" bottle. Dispense contents of "blank water" into "field blank" container and label as appropriate.

- h) If the sample location is different from the purge location, make sure to flush 8-12 ounces of water prior to collecting sample.
- i) Collect the sample(s) by reducing the flow to less than 0.5 gallon per minute and then filling the sample container(s). Take special care to not overflow sample bottles.
- j) Place all sample/field blank/duplicate bottles in the laboratory provided bags and then in shipping container/cooler. Use regular ice (no ice packs etc) to maintain sample temperature below 4 degrees Celsius.
- k) Upon completion, verify that all sampling taps are closed and that all aerators, filters and other devices have been reinstalled. Test any devices that were disassembled by turning the water on and off several times and make sure that no new leaks have been produced. Clean up any spills that may have been created during sampling. Remove all spent gloves, paper towels, etc. and return them to the office. Do not dispose of trash at the sample location.

8.0 Maintenance

There are no maintenance procedures associated with this protocol.

9.0 References

PFC Sampling – Prohibited and Acceptable Items

Prohibited	Acceptable
Field Equipment	
Teflon [®] containing materials	High-density polyethylene (HDPE) materials
Low density polyethylene (LDPE) materials	Acetate Liners
	Silicon Tubing
Waterproof field books	Loose paper (non-waterproof)
Plastic clipboards, binders, or spiral hard cover notebooks	Aluminum field clipboards or with Masonite
	Sharpies [®] , pens
Post-It Notes [®]	
Chemical (blue) ice packs	Regular ice
Field Clothing and PPE	
New cotton clothing or synthetic water resistant, waterproof, or stain-treated clothing, clothing containing Gore-Tex [™]	Well-laundered clothing made of natural fibers (preferable cotton)
Clothing laundered using fabric softener	No fabric softener
Boots containing Gore-Tex [™]	Boots made with polyurethane and PVC
Tyvek [®]	Cotton clothing
No cosmetics, moisturizers, hand cream, or other related products as part of personal cleaning/showering routine on the morning of sampling	<p>Sunscreens - Alba Organics Natural Sunscreen, Yes To Cucumbers, Aubrey Organics, Jason Natural Sun Block, Kiss my face, Baby sunscreens that are "free" or "natural"</p> <p>Insect Repellents - Jason Natural Quit Bugging Me, Repel Lemon Eucalyptus Insect repellent, Herbal Armor, California Baby Natural Bug Spray, BabyGanics</p> <p>Sunscreen and insect repellent - Avon Skin So Soft Bug Guard Plus – SPF 30 Lotion</p>
Sample Containers	
LDPE or glass containers	HDPE or polypropylene
Teflon-lined caps	Unlined polypropylene caps
Rain Events	
Waterproof or resistant rain gear	Gazebo tent that is only touched or moved prior to and following sampling activities
Equipment Decontamination	
Decon 90 [®]	Alconox [®] and/or Liquinox [®]
Water from an on-site well	Potable water from municipal drinking water supply
Food Considerations	
All food and drink, with exceptions noted on right	Bottled water and hydration fluids (i.e, Gatorade [®] and Powerade [®]) to be brought and consumed only in the staging areas