October 22, 2018

Ms. Sally Dewes
NYSDEC
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, New York 12233

RE: Richardson Hill Road Landfill – Emerging Contaminant Sampling Work Plan

FILE: 3729/68804

Dear Ms. Dewes:

On behalf of Amphenol Corporation and Honeywell International (the Respondents), this document constitutes the work plan for collection of groundwater samples for analysis of emerging contaminants (per- and polyfluoroalkyl substances [PFCs] and 1,4-dioxane) at the Richardson Hill Road Landfill (RHRL) Site located in the Town of Sidney, New York. This is a single sampling and analysis event specifically requested by the New York State Department of Environmental Conservation (NYSDEC) in a letter dated August 31, 2018. These analyses are in addition to the regular analyses performed quarterly. PFCs require special consideration when sampling as discussed in the next section.

Groundwater samples will be collected during the fourth quarter of 2018. Six wells (RH-02, RH-05D, RH-06S, RH-07S, RH-08D, and MW-12DD) will be sampled and analyzed specifically for PFCs and 1,4 -dioxane. In accordance with NYSDEC's letter requesting this sampling, these wells were selected as they have the greatest potential to evaluate if the site is a potential source of these emerging contaminants. **Figure 1** shows the monitoring well locations.

Monitoring Well Sampling - Special Considerations

Given the low detection limits associated with PFC analysis, and the potential for cross-contamination from many common commercial products, field personal will take precautions to limit the potential for false positive detections of the PFCs as described in **Attachment A**, **Field Sampling Protocols to Avoid Cross-contamination of Perfluorinated Compounds (PFCs)**. The sampling protocols described in Attachment A are in conformance with NYSDEC guidelines.

As outlined in Attachment A, teflon tubing and low-flow samplers using low-density polyethylene (LDPE) wetted parts will be replaced with HDPE materials prior to sampling. Although LDPE does not contain PFCs, it is possible for these compounds to adhere to the material and (if present) could cause results to be biased high. PFCs may also adhere to silica particles and high turbidity may also bias samples results high.

Sample and Quality Control Analysis

Groundwater samples will be shipped to the Honeywell-contracted lab, SGS Accutest, for the full PFC Target Analyte List specified by NYSDEC and 1,4-dioxane, and analyzed using EPA Method modified 537 and USEPA Method 8270 selective ion monitoring (SIM), respectively. The analytes and detection limits for this event are provided in **Attachment B**.

Quality control (QC) samples will be collected at a minimum frequency of one per 20 samples. The QC samples for the PFCs analyses will include one field duplicate (FD) sample, one matrix spike/matrix spike duplicate (MS/MSD) sample pair, one equipment blank (EB) and one field reagent blanks (FRB). The field reagent blank is PFC-free water supplied by the laboratory, that is transferred into a laboratory-supplied container in the field at the same location and time as one of the groundwater samples is collected. The QC samples for 1,4-dioxane will include one FD sample, one MS/MSD sample pair, and one EB.

Data Quality Objectives

Sampling for PFCs and 1,4-dioxane is being conducted to evaluate the potential that the RHRL Site is a source of these emerging contaminants. Modified Method 537 achieves reporting limits for perfluorooctanoic acid (PFOA) and perfluorooctanessulfonic acid (PFOS) of 2 ng/L (parts per trillion), well below the USEPA HA and RSL.

New York does not currently have a standard or guidance value for 1,4-dioxane in groundwater, however, the USEPA issued a Regional Screening Level of 0.46 µg/L. For this sampling effort, the NYSDEC has requested detection limits no higher than 0.35 µg/L.

Laboratory Reporting and Data Validation

SGS Accutest will provide a New York State Category B data deliverable report. An EQuIS™ 4-file electronic data deliverable (EDD) will also be provided by SGS Accutest. The analytical data will be validated and a Data Usability Summary Report (DUSR) will be prepared by an independent 3rd party.

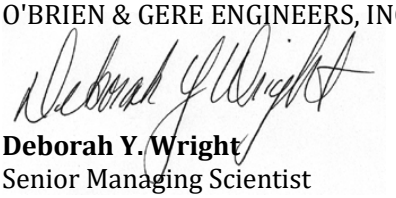
Report

The results of the analyses will be submitted to NYSDEC and USEPA in a letter separate from the quarterly monitoring reports associated with the RHRL Operations and Maintenance program. The letter will include table summarizing the detected constituents. Copies of the laboratory report and the DUSR will be included as attachments. Validated analytical data will also be submitted to NYSDEC in an EDD-format compliant with NYSDEC electronic data submission requirements.

Schedule

The PFC and 1,4-dioxane sampling will be conducted during November 2018. The summary letter report will be provided within 4 weeks of receipt of the DUSR.

Very truly yours,
O'BRIEN & GERE ENGINEERS, INC.

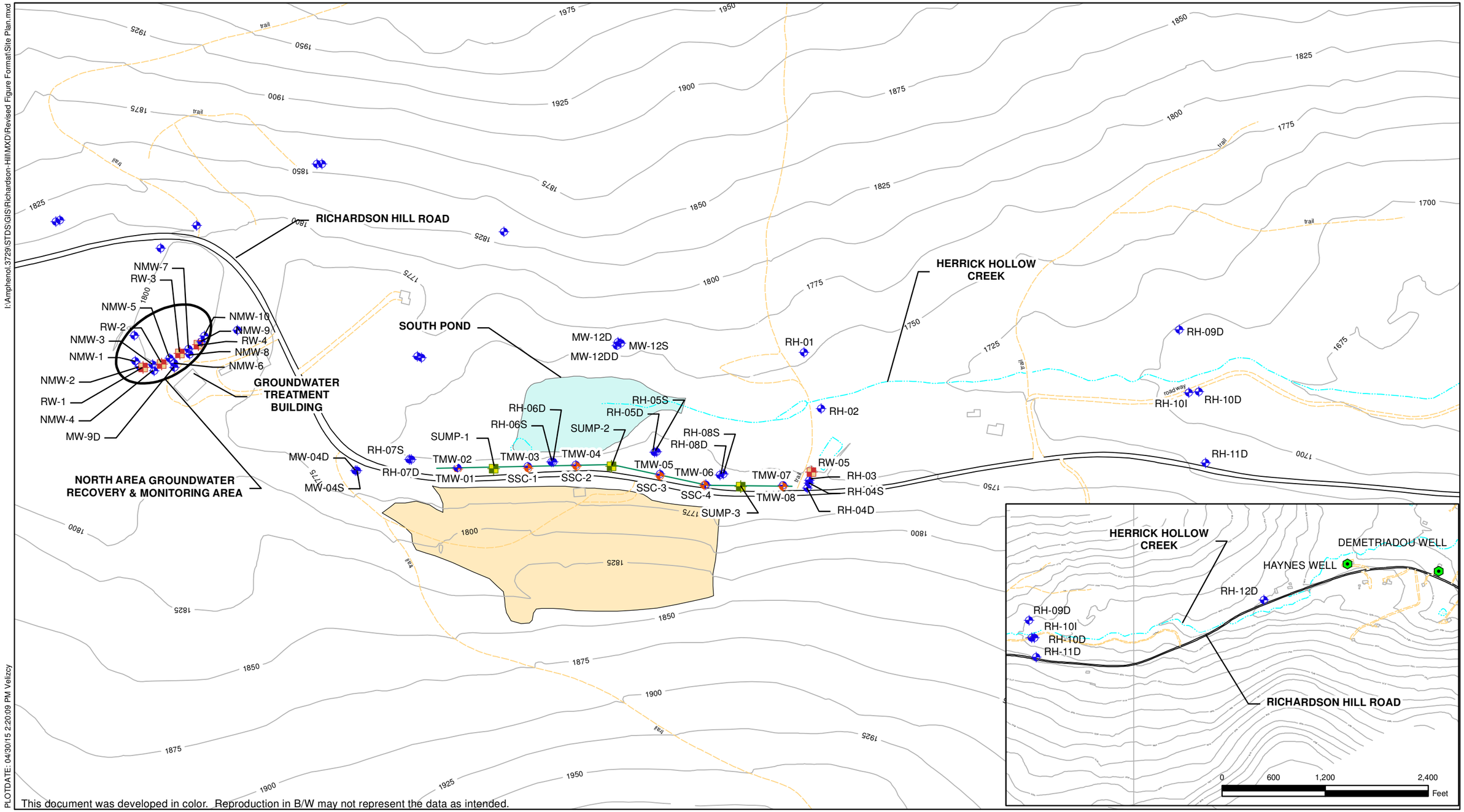


Deborah Y. Wright
Senior Managing Scientist

I:\Amphenol.3729\68804.2018-Landfills\Docs\Reports\RHRL\Emerging_Contaminant_Work_Plan\EC_WorkPlan_Text_20181001.docx

cc: P. Tames – USEPA (via email)
J. Bianchi – Amphenol Corporation (via email)
M. Sweitzer – Honeywell International (via email)
D. Carnevale – OBG (via email)

FIGURE 1



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LEGEND

- DUAL-ZONE TRENCH MONITORING WELL
- HOMEOWNER WELL
- MONITORING WELL
- RECOVERY WELL
- SUMP
- GROUNDWATER RECOVERY TRENCH
- CAPPED LANDFILL

RICHARDSON HILL ROAD LANDFILL SITE
SIDNEY CENTER, NEW YORK

0 150 300 600 900 1,200
Feet

N

SITE PLAN

APRIL 2015
3729/60842

O'BRIEN & GERE

Attachment A – Field Sampling Protocols to Avoid Cross-Contamination during Sampling for Perfluorinated Compounds

FIELD SAMPLING PROTOCOLS TO AVOID CROSS-CONTAMINATION DURING SAMPLING FOR PERFLUORINATED COMPOUNDS (PFCs)

PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to describe the necessary procedures that must be followed when collecting soil, sediment, surface water, and groundwater samples at per- and poly-fluorinated compounds. This SOP also describes a tiered approach that should be used to assist with field decisions. SOPs must also be reviewed prior to conducting field sampling activities. The information contained within this SOP is included within sampling specific SOPs as applicable.

SCOPE

This procedure applies to all personnel and subcontractors who collect or otherwise handle samples of soil, sediment, surface water, and groundwater for analysis of PFCs. This SOP must be reviewed by all on-site personnel prior to implementation of field activities.

REFERENCES

NYSDEC, 2016. *Collection of Groundwater Samples for Perfluorooctanoic Acid (PFOA) and Perfluorinated Compounds (PFCs) from Monitoring Wells Sample Protocol*. June.

NYSDEC, 2016. *Collection of Surface Water Samples for Perfluorooctanoic Acid (PFOA) and Perfluorinated Compounds (PFCs) Protocol*. June.

GENERAL

Given the low detection limits associated with PFC analysis and the potential for cross contamination from commercially available products that may contain PFCs, field personnel are required to strictly follow these protocols, follow the nitrile glove use procedures as noted under *Procedures/Considerations, Field Clothing and Personal Protective Equipment* and rinsing field equipment to help mitigate the potential for false detections of PFCs. Specific items related to field sampling are discussed below.

RESPONSIBILITIES

Field Personnel

Field personnel assigned to sampling activities are responsible for completing their tasks according to specifications outlined in the work plan, applicable SOPs, and other appropriate procedures. Field personnel are responsible for reporting deviations from procedures to the Project Manager.

PROCEDURES/CONSIDERATIONS

The following are procedures to be made during field activities while sampling for PFCs. A summary of the prohibited and acceptable items to be used while sampling is included in Table 1. A checklist, provided as Attachment 1, shall be used daily prior to the commencement of fieldwork to ensure the field team is following this protocol.

Field Equipment

- **Do not use Teflon®-containing materials** (e.g., Teflon® tubing, bailers, tape, plumbing paste, or other Teflon® materials) since Teflon® contains fluorinated compounds.
- High-density polyethylene (HDPE), low-density polyethylene (LDPE), and silicon materials are acceptable for sampling. Samples should not be stored in containers made of LDPE materials.
- To avoid plastic coating or glue materials, **do not use waterproof field books**. Field reports will be documented on loose paper on masonite or aluminum clipboards (i.e. plastic clipboards, binders, or spiral hard cover notebooks are not acceptable) using a pen or pencil. Sharpies®/markers may be used.
- **Post-It Notes are not allowed** on project sites.
- **Do not use markers other than Sharpies®markers.** Pens will be used when documenting field activities in the field log and on field forms as well as labeling sample containers and preparing the Chain of Custody.
- **Do not use chemical (blue) ice packs** during the sampling program. This includes the use of ice packs for the storage of food and/or samples.

Field Clothing and Personal Protective Equipment

- **Do not wear water resistant, waterproof, or stain-treated clothing** during the field program. Field clothing made of synthetic and natural fibers (preferably cotton) are acceptable. Field clothing should be laundered avoiding the use of fabric softener. Preferably, field gear should be cotton construction and well laundered (a minimum of 6 times from time of purchase). New clothing may contain PFC related treatments. **Do not use new clothing** while sampling or sample handling.
- **Do not wear clothing or boots containing Gore-Tex™** during the sampling program as it consists of a PFC membrane.
- All safety footwear will consist of steel-toed boots made with polyurethane and polyvinyl chloride (PVC).
- **Do not wear Tyvek® clothing** on-site since it contains fluorinated compounds.
- Disposable nitrile gloves must be worn at all times. Further, a new pair of nitrile gloves shall be donned prior to the following activities at each sample location:
  - Decontamination of re-usable sampling equipment;
  - Prior to contact with sample bottles or water containers;
  - Insertion of anything into the well (e.g. HDPE tubing, HydraSleeve bailer, etc.);
  - Completion of monitor well purging, prior to sample collection;
  - Handling of any quality assurance/quality control samples including field blanks and equipment blanks; and,
  - After the handling of any non-dedicated sampling equipment, contact with non-decontaminated surfaces, or when judged necessary by field personnel.

Sample Containers

- Sample collection containers for PFC sampling are required to be shipped to the site in a separate cooler from other sample collection containers. The PFC sample collection containers are *not* to be combined with any other cooler contents before, during or after sampling. Collection shall follow all protocols in this document before being returned to the original shipping cooler.

- Different laboratories may supply sample collection containers of varying sizes dependent on the type of media to be sampled (e.g. soil, groundwater, etc.). All samples should be collected in polypropylene or HDPE bottles. The screw cap will be made of polypropylene or HDPE and may be lined or unlined. However, if lined, the liner may not be made of Teflon® or contain PFCs.
- Container labels will be completed using pen after the caps have been placed back on each bottle.
- Glass containers should also be avoided due to potential loss of analyte through adsorption.

Wet Weather

- Field sampling occurring during wet weather (e.g., rainfall and snowfall) should be conducted while wearing appropriate clothing that will not pose a risk for cross-contamination. Teams will avoid synthetic gear that has been treated with water-repellant finishes containing PFCs. Use rain gear made from polyurethane and wax-coated materials.
- Teams should consider the use of a gazebo tent, which can be erected overtop of the sample location and provide shelter from the rain. It should be noted that the canopy material is likely a treated surface and should be treated as such; therefore, gloves should be worn when moving the tent, changed immediately afterwards and further contact with the tent should be avoided until all sampling activities have been finished and the team is ready to move on to the next sample location.

Equipment Decontamination

Field sampling equipment, including oil/water interface meters and water level indicators, that are utilized at each sample location will require cleaning between uses. Alconox® and Liquinox® soap is acceptable for use since the Material Safety Data Sheets do not list fluoro-surfactants as an ingredient. However, **Decon 90 will not be used** during decontamination activities. Water used for the final rinse during decontamination of sampling equipment will be laboratory certified "PFC-free" water.

Groundwater Sampling

- At sites with dedicated sampling equipment installed in the wells that contains Teflon (e.g.,tubing, pumps), this equipment should be removed from the wells and replaced with HDPE tubing and non-Teflon containing equipment, if possible. These wells will be purged by removing three well volumes of water, if possible, and letting the wells recover for at least 48 hours prior to sampling.
- At sites with dedicated sampling equipment installed in the wells that contain LDPE tubing, this tubing could be removed from the wells and replaced with HDPE tubing. These wells can be sampling immediately following replacement tubing; however, attempts should be made to remove one well volume prior to sampling. For larger wells, with higher volumes of water, it may be preferable to purge the wells and remove one well volume with a higher volume pump. In such cases the wells should be allowed to recover for at least 48 hours prior to sampling.

Personnel Hygiene

- Field personnel will not use cosmetics, moisturizers, hand cream, or other related products as part of their personal cleaning/showering routine on the morning of a sampling event, as these products may contain surfactants and represent a potential source of PFCs.

- Many manufactured sunblock and insect repellants contain PFCs and should not be brought or used on-site. Sunblock and insect repellants that are used on-site should consist of 100% natural ingredients. A list of acceptable sunscreens and insect repellents are listed in Table 1.
- For washroom breaks, field personnel will leave the exclusion zone and then remove gloves and overalls. Field personnel should wash as normal with extra time for rinsing with water after soap use. When finished washing, the use of a mechanical dryer is preferred and the use of paper towel for drying is to be avoided (if possible).

Food Considerations

- No food or drink shall be brought on-site, except for bottled water and hydration drinks (i.e., Gatorade® and Powerade®), which will only be allowed to be brought and consumed within the staging area.

Visitors

- Visitors to the site are asked to remain outside of the exclusion zone during sampling activities.

Tiered Approach to Assist with Field Decisions

In evaluating whether products contain PFCs and are suitable for use in the field, the tiered approach presented in Table 2 will be used to assist with field decisions. Any member of the field team should contact the Project Manager with questions.

Table 1. Summary of Prohibited and Acceptable Items for PFC Sampling

Prohibited Items	Acceptable Items
Field Equipment	
Teflon® containing materials	High-density polyethylene (HDPE) and Low density polyethylene (LDPE) materials
Storage of samples in containers made of 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 clothing or water resistant, waterproof, or stain-treated clothing, clothing containing Gore-Tex™	Well-laundered clothing, defined as clothing that has been washed 6 or more times after purchase, made of synthetic or 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	**Sunscreens** - Alba Organics Natural Sunscreen, Yes To Cucumbers, Aubrey Organics, Jason Natural Sun Block, Kiss my face, Baby sunscreens that are "free" or "natural" **Insect Repellents** - Jason Natural Quit Bugging Me, Repel Lemon Eucalyptus Insect repellant, Herbal Armor, California Baby Natural Bug Spray, BabyGanics **Sunscreen and insect repellant -** Avon Skin So Soft Bug Guard Plus – SPF 30 Lotion
Sample Containers	
LDPE or glass containers	HDPE or polypropylene
Teflon®-lined caps	Lined or unlined HDPE or polypropylene caps
Rain Events	
Waterproof or resistant rain gear	Gazebo tent that is only touched or moved prior to and following sampling activities
Prohibited Items	**Acceptable Items**
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 the right	Bottled water and hydration drinks (i.e. Gatorade® and Powerade®) to be brought and consumed only in the staging area

Table 2. Tiered Approach to Assist with Field Decisions

Tier and Description	Action
Tier 1: Products that *will come into direct contact* with field samples include, but are not limited to, sampling equipment, sample containers, and well construction materials	These products will undergo the greatest scrutiny and requires chemist's input to help evaluate the materials as a possible source of contamination[A] and as possible sampling or storage materials or both.
Tier 2: Products that *will not come into direct contact* with samples, but could be *reasonably expected to contain PFCs*, such as waterproof or nonstick products	Project team/affected person can review the Safety Data Sheet (SDS)[B] and if it shows PFCs, product should not be used. If product SDS does not indicate PFCs, confirm with chemist before use
Tier 3: Products that *will not come into direct contact* with samples and are *not expected to contain PFCs*, such as ballpoint pens, zipper bags, and body braces	Project team/affected person can review SDS and if no PFCs, then appropriate to use

[A] Tier 1 products will undergo the closest scrutiny. It may be necessary to have Tier 1 products analyzed for PFCs to confirm that a specific batch or lot number does not contain PFCs. Alternate products will need to be evaluated/used if PFCs are identified in the product.

[B] SDS Check: To evaluate product SDS and/or manufacturing specs, check if the product contains anything with "fluoro" in the name or the acronyms TPE, FEP, ETFE, and/or PFA. If fluorinated compounds are not listed in the manufacturing specs and/or on the SDSs, product can be used.

Attachment B – Required Laboratory Detection Limits for Per- and Polyfluoroalkyl Substances (PFCs), and 1,4-Dioxane

Compound List Report
Product: LCID537NY21 PFAS Full List NY 21 Analytes
Matrix: AQ Aqueous 9/19/2018 15:18

Method List: LCID537 AQ Method Ref: EPA 537M BY ID LF26158
Report List: LCID537NY21 ALL PFAS List LF25894
RL/MDL Factor: .004 Water 250ml sample to 1ml Vf

Compound	CAS No.	LOQ	LOD	MDL	Units	Control Limits (%) Rev: 04/27/18A MS/MSD	RPD	BS	DUP
Perfluorobutanoic acid	375-22-4	0.008	0.004	0.002	ug/l	70-130	30	70-130	30
Perfluoropentanoic acid	2706-90-3	0.004	0.002	0.0015	ug/l	70-130	30	70-130	30
Perfluorohexanoic acid	307-24-4	0.004	0.002	0.001	ug/l	70-130	30	70-130	30
Perfluoroheptanoic acid	375-85-9	0.004	0.002	0.001	ug/l	71-130	30	71-130	30
Perfluorooctanoic acid	335-67-1	0.004	0.002	0.001	ug/l	74-130	30	74-130	30
Perfluorononanoic acid	375-95-1	0.004	0.002	0.001	ug/l	76-130	30	76-130	30
Perfluorodecanoic acid	335-76-2	0.004	0.002	0.001	ug/l	70-130	30	70-130	30
Perfluoroundecanoic acid	2058-94-8	0.004	0.002	0.001	ug/l	70-130	30	70-130	30
Perfluorododecanoic acid	307-55-1	0.004	0.002	0.0015	ug/l	70-130	30	70-130	30
Perfluorotridecanoic acid	72629-94-8	0.004	0.002	0.001	ug/l	70-139	30	70-139	30
Perfluorotetradecanoic acid	376-06-7	0.004	0.002	0.001	ug/l	70-130	30	70-130	30
Perfluorobutanesulfonic acid	375-73-5	0.004	0.002	0.001	ug/l	73-130	30	73-130	30
Perfluorohexanesulfonic acid	355-46-4	0.004	0.002	0.001	ug/l	74-130	30	74-130	30
Perfluoroheptanesulfonic acid	375-92-8	0.004	0.002	0.001	ug/l	74-130	30	74-130	30
Perfluorooctanesulfonic acid	1763-23-1	0.004	0.002	0.0015	ug/l	70-130	30	70-130	30
Perfluorodecanesulfonic acid	335-77-3	0.004	0.002	0.001	ug/l	70-130	30	70-130	30
PFOSA	754-91-6	0.004	0.002	0.001	ug/l	70-131	30	70-131	30
MeFOSAA	2355-31-9	0.02	0.008	0.004	ug/l	70-130	30	70-130	30
EtFOSAA	2991-50-6	0.02	0.008	0.004	ug/l	70-130	30	70-130	30
6:2 Fluorotelomer sulfonate	27619-97-2	0.008	0.004	0.002	ug/l	70-133	30	70-133	30
8:2 Fluorotelomer sulfonate	39108-34-4	0.008	0.004	0.002	ug/l	70-130	30	70-130	30

13C4-PFBA	Surrogate Limits:	30-140
13C5-PFPeA	Surrogate Limits:	40-140
13C5-PFHxA	Surrogate Limits:	50-150
13C4-PFHpA	Surrogate Limits:	50-150
13C8-PFOA	Surrogate Limits:	50-150
13C9-PFNA	Surrogate Limits:	50-150
13C6-PFDA	Surrogate Limits:	50-150
13C7-PFUnDA	Surrogate Limits:	50-150
13C2-PFDoDA	Surrogate Limits:	50-150
13C2-PFTeDA	Surrogate Limits:	40-150
13C3-PFBS	Surrogate Limits:	50-150
13C3-PFHxS	Surrogate Limits:	50-150
13C8-PFOS	Surrogate Limits:	50-150
13C8-FOSA	Surrogate Limits:	30-140
d3-MeFOSAA	Surrogate Limits:	50-150
13C2-6:2FTS	Surrogate Limits:	50-150
13C2-8:2FTS	Surrogate Limits:	50-150

21 compounds and 17 surrogates reported in list LCID537NY21

Compound List Report

Product: B8270SIM14DIOX 1,4-Dioxane, SIM
Matrix: AQ Aqueous

Sep 20, 2018 08:17 am

Method List:	AB8270SIM AQ	**Method Ref:**	SW846 8270D BY SIM	LJ52052
Report List:	BSURR ALL			LJ28804
RL/MDL Factor:	1			

Compound	CAS No.	RL	MDL	Units
1,4-Dioxane	123-91-1	0.10	0.049	ug/l

1 compounds reported in list BSURR