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June 18, 2018 ***** VIA EMAIL: rachel.gardner@dec.ny.gov *****

Ms. Rachel K. Gardner, E.I.T.
Project Manager
NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
Division of Environmental Remediation, Region 6
317 Washington Street
Watertown, New York 13601-3787

RE: Proposed Work Plan for Sampling of Emerging Contaminants
Former Oneida Knife Plant – Lot 1
City of Sherrill, Oneida County, New York
Brownfield Cleanup Program Site No. C633077
Project No. 2015025

Dear Ms. Gardner:

We offer the following Work Plan for sampling the above-referenced site for emerging contaminants as requested in your April 26, 2018 letter.

We propose the collection of groundwater samples for emerging contaminant analysis from monitoring wells TW-1, TW-2R, TW-9R and MW-4. The work will be completed in accordance with the attached *Field Operating Procedures – PFAS Groundwater Sampling and Analysis.* Refer to the attached *Figure 1 – Site Plan* for monitoring well locations.

Please review this proposed Work Plan and contact us with your comments. We anticipate sampling the wells within approximately three weeks from receipt of your approval.

Very truly yours,

PLUMLEY ENGINEERING, P.C.

Frank K Karboski

Frank A. Karboski, P.G.

FAK/cas
Attachments
cc: Ms. Samantha Nahra (w/attachments) [via email: Samantha.Nahra@theoneidagroup.com]

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PLUMLEY ENGINEERING, P.C.
FIELD OPERATING PROCEDURES

PFAS GROUNDWATER SAMPLING AND ANALYSIS

FORMER ONEIDA KNIFE PLANT – LOT 1
City of Sherrill, Oneida County, New York
Brownfield Cleanup Program Site No. C633077
Project No. 2015025

June 2018

This procedure details groundwater monitoring well sampling procedures and analysis methods for the New York State Department of Environmental Conservation (DEC) emergent contaminant list, including 1,4-Dioxane and Per- and Polyfluorinated Alkyl Substances (PFAS) Target Analyte List (TAL), to be completed at the site. The procedure will assure a representative groundwater sample will be collected from the wells and that operational protocols are identified and followed, minimizing the risk of cross contamination of the sample for the emerging contaminant analysis. PFAS are known to be of widespread occurrence and together with low laboratory reporting and regulatory limits, magnifies the importance of eliminating cross contamination to the extent possible.

PREPARATION

Identify the Wells to be Sampled

Obtain and review available information on the wells to be sampled, including well as-built data, water level depths and contaminant history. Read over the scope of work to become familiar with the specifics of the program. The following wells will be sampled: TW-1, TW-9R (replacement well for TW-9), TW-2R (replacement well for TW-2) and MW-4.

The following is attached (check those applicable):

__X__ Site Plan

__X__ Well As-Built Table

__X__ Water Level Data

__X__ Groundwater Analytical Summary Table(s)

Designate a Project Laboratory and Detail Requirements

Select a laboratory for the project with acceptable accreditation for the emerging contaminants for the required analyses. The laboratory should be selected from the current DEC list of certified laboratories for PFAS analyses (page 14). The laboratory selected for this project is SGS North America, Inc. The method detection limits the laboratory will be required to achieve for the emerging contaminants are as follows:

1,4-Dioxane.....0.049 µg/kg EPA 8270 SIM
0.29 µg/L EPA 8260 SIM

PFAS.....0.002 µg/L

Arrange to obtain sample containers from the project laboratory that are suitable for use for the emerging contaminants, to include high-density polyethylene (HDPE) or polypropylene container materials. Do not use low-density polyethylene (LDPE) or glass bottles, polytetrafluoroethylene (PTFE) or containers using Teflon-lined caps. Bottle orders are to be placed one week in advance to assure specifications for each parameter satisfy current sampling standards. If testing for other parameters is being conducted concurrently, the containers for the PFAS samples are to be kept separate and isolated from other sampling containers and cooler during transit to, at and from the sampling site.

Samples for this site will not be analyzed for other parameters in addition to the emerging contaminants at this time. The following table specifies the proposed analytical methods that will be completed and the associated container requirements:

Parameter	Method	Container Requirements*	Preservative	Deliverables Required (A/B)
Emerging Contaminants:				
PFAS TAL**	EPA 537M by ID	(2) 250 mL HDPE bottles	None	B
1,4 Dioxane	EPA 8270 SIM	(2) 1,000 mL Amber	None	B

*To be obtained from the project laboratory

**Full PFAS Target Analyte List provided on page 15

Purging and Sampling Methods

Specify the methods and equipment that will be used to purge the wells and collect the samples for this site.

The construction materials of all pumping and sampling equipment are to be determined and confirmed to be acceptable for emerging contaminants prior to the use in the wells (refer to Equipment Preparations).

Purging: A peristaltic pump will be used with dedicated down-the-well and drive/sample tubing for each well being sampled. A minimum three well volume purge will be completed.

Sample Collection: Peristaltic pump using dedicated tubing used for purging.

Equipment Preparations

The equipment and components used for PFAS sampling that will come in contact with groundwater shall not be constructed of perfluorinated compounds (PFC) or fluoropolymer materials, low density polyethylene (LDPE) or polytetrafluoroethylene (PTFE, Teflon). Acceptable materials currently include stainless steel, polyvinyl chloride (PVC), HDPE, silicone, acetate and polypropylene.

Consult the Equipment Checklist (attached) and reserve/procure equipment, as necessary.

NOTE: Dedicated sampling materials and equipment will be used to the extent practical to minimize field decontamination procedures. Check, test and decontaminate all equipment before leaving for the site. Only new disposable materials or properly decontaminated materials and equipment shall be used. For PFAS sampling, confirm that all bailers and tubing are constructed of polypropylene, acetate, PVC, silicon, HDPE or stainless steel.

Always bring more than enough personal protective equipment and expendables (i.e. nitrile gloves, bailer twine, etc.) to the site to complete the program.

Additional Preparations

Determine the order the wells are to be sampled based on site information, working from known cleaner wells to more contaminated wells. For this site, the order will be: TW-1, TW-9R, MW-4 and TW-9R.

For PFAS sampling, clothing worn by sampling personnel is to be made of cotton and all clothing must have been laundered multiple times without the use of fabric softeners. Treated clothing or foot gear that contains PTFE material (including GORE-TEX®) or that have been waterproofed with

PFC materials must be avoided. Do not use sunscreen, insect repellant or moisturizers unless the products are determined to be free of PFC materials.

QA/QC Samples

The following QA/QC samples will be selected (check as applicable and indicate number of and procedures that will be used):

_____ ***Trip Blank:*** Prepared using reagent water and is to accompany the field samples throughout all sampling and transport operations; not to be opened during sampling activities.

__X__ ***Equipment Blank (Rinsate):*** To be collected from sample collection devices that will be used during sampling, prepared immediately prior to or during sampling activities at a site sampling location using PFAS-free DI water provided by the laboratory.

_____ ***Field Blank:*** Prepared on-site during the sampling activities using reagent water. Use PFAS-free DI water provided by the laboratory, collect and preserve in the same manner as the environmental samples.

__X__ ***Field Duplicate:*** Collected as an independent sample as close as possible to the primary field sample.

__X__ ***Temperature Blank:*** Prepared with a water-filled vial or a suitable thermometer included with the cooler of samples designated for transport.

FIELD SAMPLING PROCEDURES

Overview

Sequence of sampling operations:

1. Confirm the identification of each well and complete standard entrance procedures.

2. Measure depth to water level.

3. Deploy purging equipment.

4. Remove minimum three well volumes using low flow peristaltic pumping.

5. Collect and preserve samples.

6. Remove equipment.

7. Secure well.

8. Complete any decontamination of equipment required.

9. Proceed to next well.

PFAS Sampling Procedures

- Establish a staging area away from the sampling work.

- Do not bring food or drink to the site with the exception of bottled water and hydration drinks (Gatorade, Powerade) available for consumption at the staging area since many food and drink packaging materials contain PFCs.

- Keep visitors away from the sampling work.

- Document procedures followed and equipment used in the field notes and on SOP forms.

- Use plain paper and a metal clipboard for note-taking (no waterproof field books).

- Do not use aluminum foil, tapes or other adhesives.

- Do not use Blue Ice (chemical) packs.

- Collect the PFAS sample before other parameters (if being tested for) to avoid contact with any other type of sample containers and caps.

- As with all other samples, do not place the sample cap on any surface when collecting the sample and avoid all contact with the inside of the sample bottle or cap.

- Keep PFAS sample containers in the laboratory-provided cooler and in a secure location at the work site staging area until deployed. Bring only what is needed to the work site and sampling locations to the extent practical.

Work Sequence and Procedures

1. Examine the monitoring well.

- Confirm the well identification.
- Note any damage in the groundwater field log.

2. Avoid placing down-the-well sampling equipment on the ground. Use a portable table with a HDPE surface at the monitoring well for staging equipment, as needed.

3. Wipe the monitoring well's outer casing cover clean of any foreign material which might enter the well when it is opened and unlock the monitoring well.

4. Remove the outer well casing cover in preparation for sampling work.

5. Put on a new pair of disposable nitrile gloves before doing any field measurements. Change gloves between wells and frequently, as needed, to prevent cross-contamination. For PFAS sampling, wash hands before sampling and use non-coated nitrile gloves.

6. Avoid disturbing the water column to the extent practical prior to sample and when installing sampling equipment.

7. Measure the depth to water in the monitoring well with an electronic water level indicator. Do not measure the depth to the bottom of the well. Use published log data for this unless confirmation is required. Check the condition of the probe and note whether or not there are any indications of free phase oil. Calculate the volume of water within the well (see below) for evaluating well purge volumes using standard conversion factors, as detailed on the well field logs.

8. When using a pump for purging, install the tubing to a position mid-way between the bottom of the well and the top of the water column and secure in position at the top of the well.

Discharge tubing (dedicated new tubing is to be provided for each well) is to extend beyond the well and remain suspended off the ground. A clean 5-gallon bucket is to be provided to receive the purge water. Note the condition of the purge water in the field notes (turbidity, any presence of sheen).

For purging at least three well volumes of water:

Calculate the volume of water within the well and determine how much must be evacuated.

Monitoring Well Volume Calculation:

SWL	= Depth to Water	C	= Conversion Factor
TD	= Total Depth of Well	N	= Number of Volumes to Evacuate
L	= Length of Water Column	TV	= Total Volume to Evacuate

TD - SWL = L

L x C = 1 well volume

1 well volume x N = TV

For low flow purging, energize the pump and begin evacuating well water at its lowest flow rate. Monitor the water level and adjust the flow rate to maintain a drawdown of 0.3 feet or less. If the well has a very low yield and a larger drawdown is necessary, minimize the pumping rate and drawdown to the extent practical and record water level being maintained. After purging the required minimum volume, shut pump off to allow recovery to at least 95% prior to sampling.

9. Before collecting any samples:

- Measure the depth to water. The water level recovery must be at least 95% of static reading before sampling.

- Verify the sample containers are properly labeled as to client name, sample location, analysis to be performed and container preservation.

- Confirm the sample containers are stored in a contaminant-free environment at the work area.

10. Sample collection:

- Change gloves.

- Using the sampling pump, fill sample containers while pumping under low flow condition at the minimized drawdown level and keep all tubing full of water.

- Fill containers with as little headspace as possible.

- Collect adequate sample volumes for required procedures and Quality Assurance/ Quality Control (QA/QC) requirements, as specified.

11. Immediately after sampling:

- Store all collected samples in a cooler maintained at 4° Centigrade. Take precautions to ensure sample containers do not get submerged in meltwater during transport. PFAS containers are to be placed in a plastic (Ziploc) bags prior to storing in the designated cooler.

- Place the custody seals on the containers or coolers if the scope of work calls for them.

- Fill out the chain of custody form.

- Verify the groundwater field log is complete.

  NOTE: Field notes are critical to inform the client and laboratory personnel about the conditions of the well and other observations (i.e. weather, strange odors, bent casing, flooded wells, procedures and equipment used). These notes may help in running the samples, as well as interpreting the analytical results.

12. Collect the used expendables (i.e. gloves, rope, etc.) in a plastic bag and properly dispose of.

13. Lock the monitoring well.

14. Use the following procedure for handling evacuated well water per site HASP/protocols:

__X__ Discharge away from the wells in an area of the site designated by the project manager if protocol allows (see Note).

_____ Place in drums for proper disposal arrangements.

_____ Filter through granular activated carbon (GAC) filter bucket before discharging to appropriate location

_____ Other, as described: _____

NOTE: If the evacuated water is grossly contaminated (i.e. free product, strong odor or sheen), the purge water shall be stored onsite in a secured 55-gallon drum. Notify the project manager/client of the drum status after each sampling event and arrange for appropriate disposal.

15. Decontaminate the water level probe (and any other equipment that is to be reused, if any) before proceeding to the next well location (refer to Decontamination Procedures).

16. Deliver the samples to the laboratory within appropriate holding times for the parameters to be analyzed.

17. Clean all of the used sampling equipment per Decontamination Procedures.

Decontamination Procedures

For PFAS sampling, decontaminate using standard two-step decontamination with Alconox and clean water rinse. Decontaminate any equipment that comes in contact with PFC materials prior to use. The clean rinse water shall be from a public water supply source (document in field notes).

EQUIPMENT LIST (check off equipment to bring)

NOTE: Refer to Equipment Preparation for material requirements.

_____ Multi-Parameter Meter (calibrated, with flow through cell)

__X__ Water Level Indicator

_____ Field Turbidity Meter

_____ Bailers:

- _____ Stainless Steel
- _____ Dedicated PVC ____ 1-inch ____ 2-inch
- _____ Dedicated HDPE for PFAS ____ 1-inch ____ 2-inch
- _____ Other: _____

_X_ Field Decontamination Materials: Potable Water, Paper Towels, Alconox, Brush

_X_ Sampling Pumps and Supplies:

- _____ 12v Sampling Pumps may be used if all parts can be confirmed free of PFC containing materials)
- _X_ Peristaltic Pump with Dedicated Drive and Sampling Tubing
- _X_ New HDPE Sampling Tubing for PFAS sampling (enough for dedicated tubes in all wells)

_____ Decontamination Wash Containers

_X_ Paper towels

_____ Twine and Duct Tape

_X_ 5-Gallon Buckets for Purge Water Storage

_X_ Field Toolbox

_____ Well Keys

_X_ Laboratory Sample Containers, Cooler and Ice

_X_ Disposable Nitrile Gloves

_X_ Safety Glasses

_X_ Well Sampling Field Logs

_X_ Chain of Custody

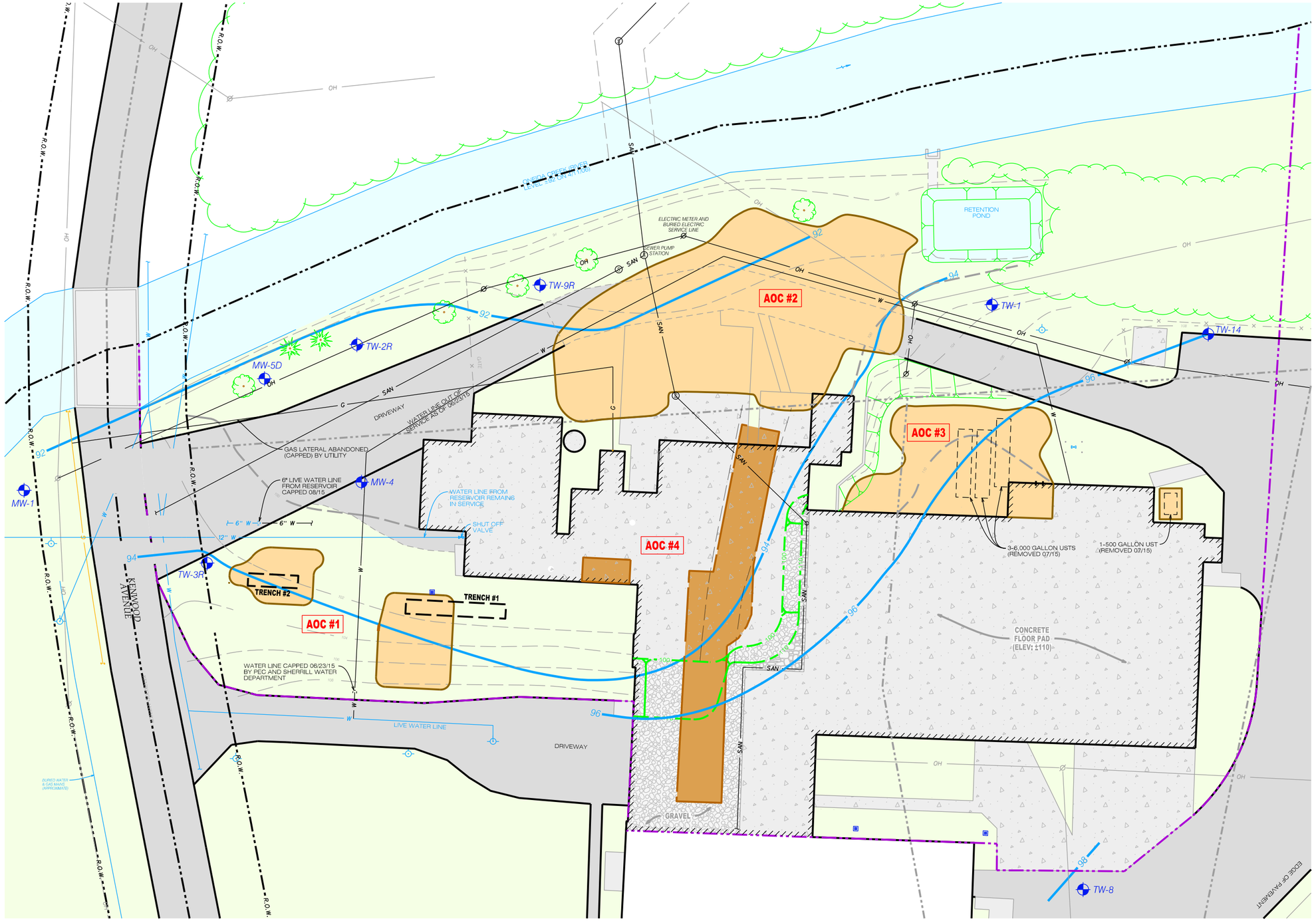
_____ Project Work Plan and HASP

Labs Certified for PFOA and PFOS in Drinking Water				
LAB ID	NAME	CITY	STATE	METHOD
10311	SUFFOLK	HAUPPAUGE	NY	EPA 537
10391	TESTAMERICA	SOUTH BURLINGTON	VT	ISO 25101
10670	EUROFINS	LANCASTER	PA	EPA 537
10730	AMERICAN	BELLEVILLE	IL	EPA 537
10756	MAXXAM	MISSISSAUGA	ON	EPA 537
10763	NYSDOH ORG	ALBANY	NY	EPA 537
10763	NYSDOH ORG	ALBANY	NY	ISO 25101
10899	CON-TEST	EAST LONGMEADOW	MA	EPA 537
10899	CON-TEST	EAST LONGMEADOW	MA	ISO 25101
11320	EUROFINS	MONROVIA	CA	EPA 537
11398	EUROFINS	SOUTH BEND	IN	EPA 537
11411	VISTA	EL DORADO HILLS	CA	EPA 537
11411	VISTA	EL DORADO HILLS	CA	ISO 25101
11501	GEL	CHARLESTON	SC	EPA 537
11608	PACE	ORMOND BEACH	FL	EPA 537
11627	ALPHA	WESTBOROUGH	MA	EPA 537
11666	TESTAMERICA	WEST SACRAMENTO	CA	EPA 537
11666	TESTAMERICA	WEST SACRAMENTO	CA	ISO 25101
11685	SGS NORTH	WILMINGTON	NC	EPA 537
11867	REGIONAL	NEW HAVEN	CT	EPA 537
12022	SGS NORTH	ORLANDO	FL	EPA 537
12060	ALS	KELSO	WA	EPA 537
12073	BSK ASSOCIATES	FRESNO	CA	EPA 537

Full PFAS Target Analyte List

Group	Chemical Name	Abbreviation	CAS Number
Perfluoroalkyl Sulfonates	**Perfluorobutanesulfonic acid**	**PFBS**	**375-73-5**
	Perfluorohexanesulfonic acid	**PFHxS**	**355-46-4**
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanessulfonic acid	**PFOS**	**1763-23-1**
	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluoroalkyl Carboxylates	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	**PFHpA**	**375-85-9**
	Perfluorooctanoic acid	**PFOA**	**335-67-1**
	Perfluorononanoic acid	**PFNA**	**375-95-1**
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUA/PFUdA	2058-94-8
	Perfluorododecanoic acid	PFDoA	307-55-1
	Perfluorotridecanoic acid	PFTriA/PFTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTA/PFTeDA	376-06-7
Fluorinated Telomer Sulfonates	6:2 Fluorotelomer sulfonate	6:2 FTS	27619-97-2
	8:2 Fluorotelomer sulfonate	8:2 FTS	39108-34-4
Perfluorooctane-sulfonamides	Perfluroroctanesulfonamide	FOSA	754-91-6
Perfluorooctane-sulfonamidoacetic acids	N-methyl perfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethyl perfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6

Bold entries depict the six original UCMR3 chemicals



Key

- Property Line
- R.O.W. — Right of Way
- Former Building Wall
- OH — Overhead Utility
- Power Pole
- Catch Basin
- SAN — Sanitary Sewer
- Sanitary Manhole
- W — Water Main w/ Size
- Hydrant
- 3K — Building Name
- 110 — Topographic Contour
- AOC #1, #2 & #3 Remedial Excavations, Completed in Summer of 2015
- AOC #4 & B-29 Area Remedial Excavations, Completed in Summer of 2016
- TW-1 — Monitoring Well
- Groundwater Contour Bsed on 6/11/10 Data

EXISTING UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR TO CONFIRM LOCATIONS BEFORE COMMENCING WORK.

Plan View

SCALE 20 0 20 40 FEET

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REVISIONS: DATE: BY:

PROJECT: *FORMER ONEIDA KNIFE PLANT - LOT 1*
BROWNFIELD CLEANUP PROGRAM

CLIENT: ONEIDA, LTD.

LOCATION: CITY OF SHERRILL, ONEIDA COUNTY, NEW YORK

DWG. TITLE: SITE PLAN

PROJECT No.:	2015025
FILE NAME:	FIGURE 1
SCALE:	AS NOTED
DATE:	MAY 2018
ENG'D BY:	FAK
DRAWN BY:	JJL
CHECKED BY:	DRV

SHEET NO.: FIGURE 1