

Date: 25 February 2022

**Letter Work Plan for Investigation-Derived Material Disposal Camp Smith
11 Bear Mountain Bridge Road, Cortlandt, New York 10567**

This letter Work Plan details the specific disposal requirements for investigation-derived material (IDM) disposal of soil and purge/decon water containing per- and polyfluoroalkyl substances (PFAS) related to the 2019 Site Investigation (SIs) and 2021 Supplemental Site Investigation (SSI) performed at Camp Smith by AECOM. Based upon records generated during the SI and Supplemental SI, 2 drums of soil, and 14 drums of water remain at the site for disposal. Currently, 1 drum of soil and 13 water drums from SSI are located in a Conex box off North Camp Road and 1 drum of soil and 1 drum of water are located in the Combined Support Maintenance Shop A (CMSA) (see figures below). Currently, the Conex box is locked and to gain access, the contractor (EA) will need to cut the lock. After treating all drums of water, all drums will be consolidated to the Conex box for secure storage. A new lock will be added to the Conex box by the contractor (EA). This letter work plan and attachments are intended to provide the necessary steps for treatment and disposal of IDM remaining on site. A summary of planned disposal activities is listed in Table 1 below. Data tables from the 2022 Site Inspection report are provided in Attachment 3. Activities will be coordinated with the installation upon notification of approval with this plan.

TABLE 1 SUMMARY OF PLANNED DISPOSAL ACTIVITIES

Media	# of Drums	Disposal Instructions (Per local regulatory coordination with NYSDEC)
Soil	2 (1 from SI, 1 from SSI)	• The Office of the Secretary of Defense (OSD) screening levels (SLs) for soil are 130 micrograms per kilogram ($\mu\text{g/kg}$) perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA), and 1,900 $\mu\text{g/kg}$ Perfluorobutanesulfonic acid (PFBS) (Assistant Secretary of Defense, 2021). • The NYSDEC proposed soil guidance values for the protection of groundwater are considered for IDM management purposes; as outlined in “Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS)”, the values are 1.1 $\mu\text{g/kg}$ for PFOA and 3.7 $\mu\text{g/kg}$ for PFOS (NYSDEC, 2021) • Per records, the soil drum from the 2021 SSI activities was generated from drilling fluids recovered from location CS-MW004S. The solids were tested for PFAS; the only detections were PFBA at 0.090 micrograms per kilogram ($\mu\text{g/kg}$) and PFHxA at 0.032 $\mu\text{g/kg}$. Soil from this drum is proposed to be distributed at the point of generation, CS-MW004S. • Per records, soil from the 2019 SI borings was combined into one drum. Distribution is proposed at the location of the highest detected soil concentration during the 2019 SI. The highest detection of PFOS in soil generated during the 2019 SI activities was 1.02 $\mu\text{g/kg}$ at location AOI 3-SB2, in surface soil. Soil from this drum is proposed to be distributed at AOI 3-SB2. • Per 2021 SSI coordination with NYSDEC, soil can be discharged directly to the ground surface at the point of generation. Soil concentrations are below both OSD SLs and NYSDEC guidance values. Soils from Camp Smith will be discharged directly to the ground surface in a manner to prevent mounding, as described above. • Should regulatory approval not be granted for disposing of the soil as described above, USACE and ARNG will be contacted to determine the path forward for offsite disposal.

¹ EA Engineering, P.C. is affiliated with EA Engineering, Science, and Technology, Inc., PBC who does business as EA Science and Technology in State of New York.

Purge and Decon Water	14 (1 from SI, 13 from SSI)	• Purge/decon water from all drums, will be pumped from current containers and treated with pre-hydrated granular activated carbon (GAC) filters in accordance with the attached EA SOP 042A. Pre-hydration eliminates the need for an onsite potable water source. • Treated water will be collected and re-containerized in its original drum. One confirmatory sample will be collected at the end of treatment, or from the treated water from the drum originally containing the highest PFAS concentration if known. The sample will be submitted for analysis of PFAS compounds (existing Table B-15 PFAS list) with a turnaround time of 28-days. Sample results from the PFAS sampling will be provided to NYSDEC for agency approval prior to surface discharge. • If sample results have concentrations below the applicable NYSDEC MCL of 10 ng/L for PFOA and PFOS, and approval to discharge has been obtained, EA will re-mobilize to the site to dispose of the treated water. • Treated water must be discharged directly to the ground surface in a manner that does not cause ponding and allows for adequate percolation into the ground. No treated water may be discharged directly into a surface water body. Alternatively, if no ground discharge is permitted by NYSDEC, treated water may be discharged into the Wastewater Treatment Plant (WWTP) onsite. The facility has no means to move the drums from the connex box to the WWTP thus EA will need to utilize a drum dolly and lift gate pickup truck to move the drums to the disposal location. • If sample results are still above screening levels, USACE and ARNG will be contacted for pathforward.
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Attachments

1 – Figures

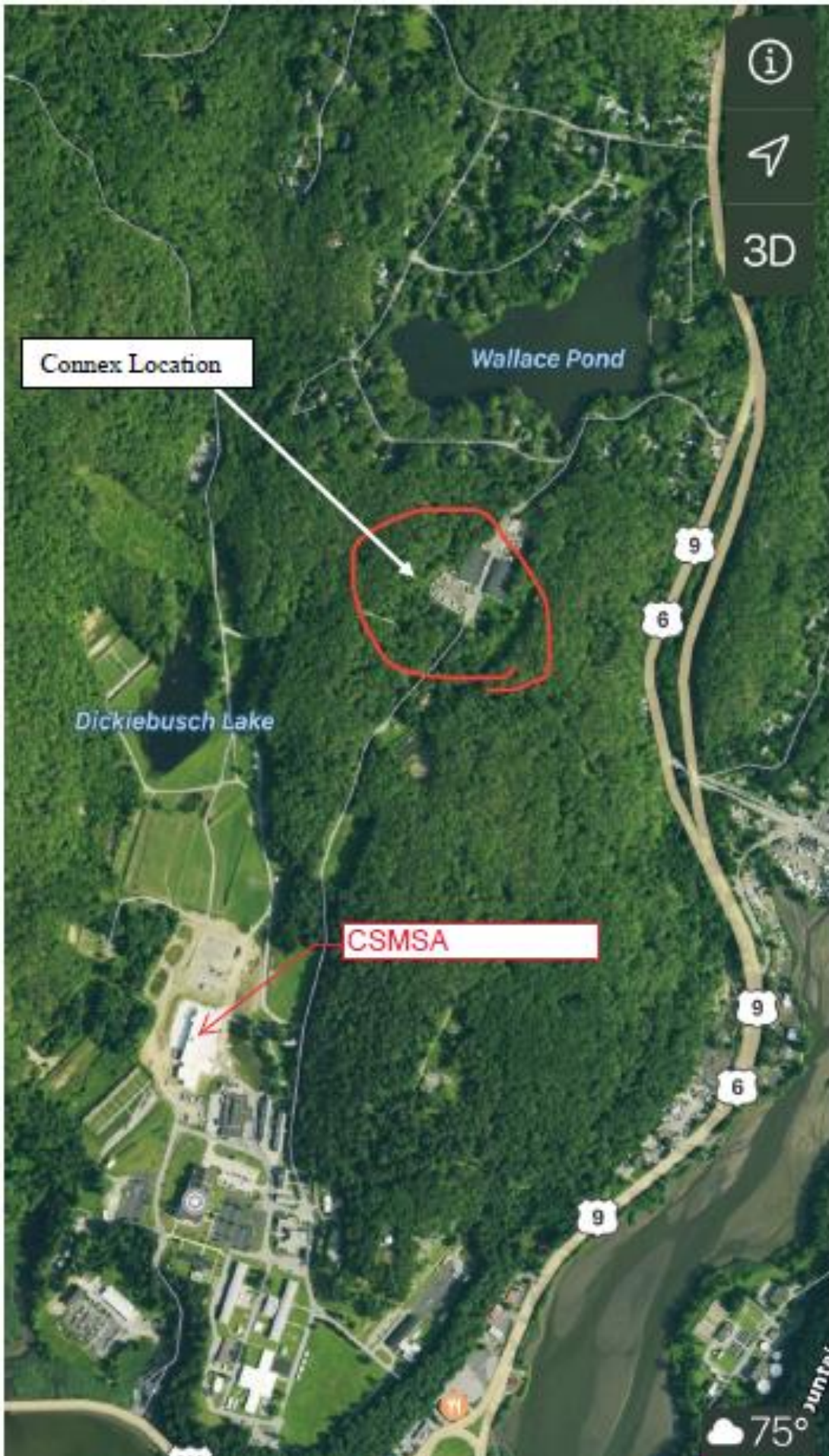
2 – Standard Operating Procedure No. 042A, For Treating Liquid Investigation-Derived Material

3 – Soil Analytical Summary Result Tables from 2019 SI and 2021 Supplemental SI

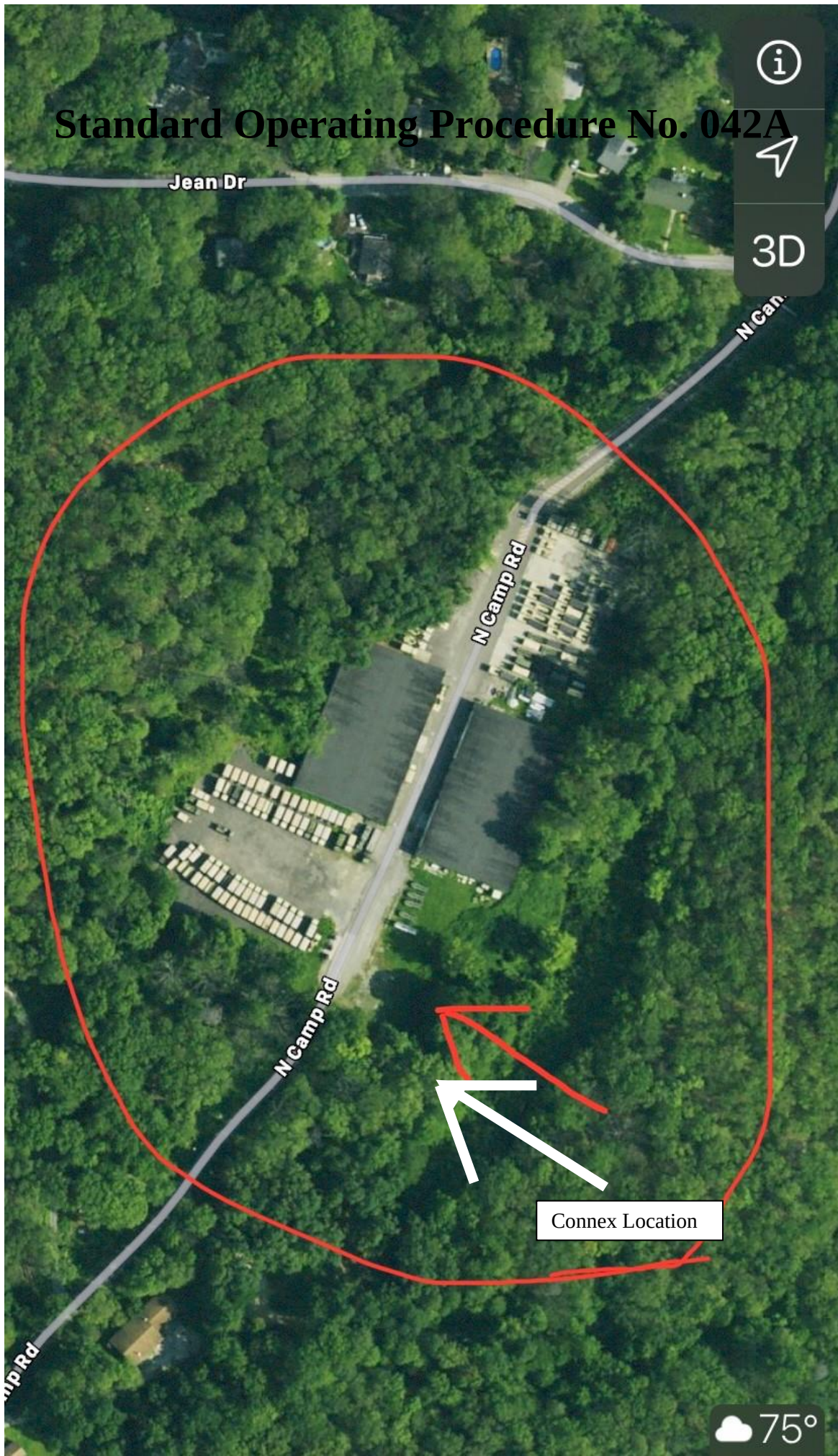
Attachment 1

Figures

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Standard Operating Procedure No. 042A



3D

Jean Dr

N Can.

N Camp Rd

N Camp Rd

hip Rd

Connex Location

75°

Attachment 2

**Standard Operating Procedure No. 042A, For
Treating Liquid Investigation-Derived Material**

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Standard Operating Procedure No. 042A For Treating Liquid Investigation-Derived Material (Purge water, drilling water, and decontamination fluids)

Prepared by

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Revision 2
September 2021

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PROJECT-SPECIFIC VARIANCE FORM

This form is to be completed to indicate if there are any client-, project-, or site-*specific* variances to this Standard Operating Procedure (SOP).

SOP No. 042A	
SOP Section	Variance
General	Please note that all procedures and materials used for the treatment of Investigation-Derived Material (IDM) will be confirmed to be Per- and polyfluoroalkyl substances (PFAS)-free.
General	This SOP covers disposal of liquid IDM associated with the PFAS Site Inspection (SI) sampling at Army National Guard (ARNG) sites. This SOP does not cover disposal of Solid IDM.
9/14/2021	Updated Section 3.1 to clarify screening criteria for disposal may be site specific as agreed to during TPPs.

Michael O'Neill

Project Manager (Name)

Michael O'Neill

Project Manager (Signature)

09/14/2021

Date

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1. SCOPE AND APPLICATION

The purpose of this Standard Operating Procedure is to define the required steps for staging and treating liquid investigation-derived material (IDM) generated during Per- and polyfluoroalkyl substances (PFAS) Site Investigation (SI) field activities. IDM, as used herein, includes purged groundwater and decontamination fluids (liquids) associated with PFAS sampling. This SOP also addresses the management of residuals left in the drum.

2. MATERIALS

The following materials may be required:

Department of Transportation (DOT) approved 55-gallon open top drum (steel) containers	Drum labels and paint pen
55-gallon container containing charcoal granular activated carbon (GAC)	Drum Dolly
PFAS free transfer pump(s) and hoses	Field logbook (bound)
Prefilter for sediment removal	Waste identification labels (Non-Haz, Non-RCRA" labels)
Drum Generation Information (provided by generator)	Previous sampling results from purge/decontamination water
Any additional equipment that may be dictated by project, site location, or site-specific plans	Sampling Equipment and containers (i.e., hoses, gauges, 5-gallon buckets, etc.)
Level D personal protective equipment [long sleeves, gloves, safety vest, safety glasses, and steel toe shoes	

3. PROCEDURE

3.1 GENERAL

No container will be labeled as a "Hazardous Waste" unless the contents are in fact known to be hazardous as defined by 40 Code of Federal Regulation 261. If contents are considered hazardous (as supported by generator knowledge or analytical results), the U.S. Army Corps of Engineers (USACE) and ARNG will be contacted and no handling or treatment will occur.

Generally, the IDM is considered impacted with PFAS if analytical results indicate that perfluorooctanoic acid [PFOA], perfluorooctanesulfonic acid [PFOS] and perfluorobutanesulfonic acid (PFBS) analytes are present at or above the 2019 Office of the Secretary of Defense (OSD) screening levels (SLs) (Deputy Assistant Director of Defense, 2019). IDM impacted with PFAS at or above appropriate OSD SLs will be treated after which it may be discharged onsite if approved by USACE,¹ ARNG, and regulatory personnel and documented in an approved work plan for the site or in a separate written approval notice.

It is noted that in some circumstances, state regulatory agencies may have required that ARNG meet state specific discharge criteria in order to discharge water. Sampling results, disposal criteria and approval will be verified with ARNG prior to initiating disposal.

3.2 PROCEDURES FOR LIQUID INVESTIGATION-DERIVED MATERIAL DISPOSAL

The following general conditions are anticipated prior to moving forward with handling and disposal of liquid IDM.

- Water/fluids from the initial development of new SI wells, decontamination, and purge water generated during soil and groundwater sampling, has been containerized in DOT approved 55-gallon drums and staged in accessible areas.
- Water/fluid which is containerized will remain on-site until analytical results are received, and an agreeable path forward is determined.
- The disposal method after treatment (i.e., containerize and sample again, disposal to the ground surface, or other) will be approved by the USACE, ARNG, and regulatory personnel and documented in an approved work plan for the site or in a separate written approval notice prior to EA Engineering, Science, and Technology, Inc., PBC (EA) engaging in the handling and disposal of liquid IDM .

The following general sequence is anticipated for handling and disposal of liquid IDM.

1. Prior to arrival onsite:
 - a. Review sampling results and confirm PFAS levels and quantity of material to be treated. If there are any other hazardous substances (as designated by EPA) or contaminants of concern in IDM other than PFAS that require management other than on site GAC treatment, immediately contact USACE, ARNG, and generator to resolve any discrepancy and confirm path forward.
 - b. Based on the volume of IDM liquid and maximum PFAS concentrations, the GAC treatment cannister(s) will be sized to achieve the site-specific treatment levels with an appropriate safety factor for the type of GAC used

¹ Site-specific maximum PFAS levels detected at the site and total volume of IDM fluids will be used to size GAC treatment canisters with safety factor necessary to achieve treatment levels established for the site. USACE will be contacted if PFAS levels detected onsite or the volume of water to be treated cannot be treated with a single GAC unit.

- to prevent PFAS breakthrough.
 - c. Review/determine site logistics including access requirements, drum locations and general conditions (hardstand or other), and discharge requirements (i.e., containerize after treatment, dispose on ground surface in vicinity, or disposal in alternate location). Immediately contact USACE, ARNG, and generator to resolve any discrepancy and confirm path forward.
 - d. Determine if work requires any changes to SOP (i.e., use of additional equipment [i.e., Photoionization detector for VOC monitoring] or personal protective equipment beyond what is specified in SOP).
2. Upon arrival onsite:
- a. Confirm containers as to type of media, generation date of the container, point-of- generation, and points-of-contact and condition (still sealed, any damage, leaking etc.).
 - b. Confirm the sampling and container identification with the description provided by the generator. If containers do not match or if there is evidence of damage, leaking, non-matching drum count is observed, immediately contact USACE, ARNG, and generator to resolve any discrepancy and confirm a path forward.
 - c. Confirm site logistics and confirm treatment and discharge approach with ARNG to ensure it matches previous documentation/understanding (i.e., team not receiving new instructions).
3. Treatment of IDM will proceed in the following general sequence:
- a. Open existing 55-gallon IDM containers and confirm contents. If conditions do not match or there is evidence of damage/leaks, or if non-matching drum count is observed, immediately contact USACE, ARNG, and generator to resolve any discrepancy and confirm path forward.
 - b. Set up equipment, pump, prefilter, influent and effluent hoses, and empty drum (if containerizing after treatment).
 - c. Lower pump intake hose into drum being careful to keep it above any sediment/soils.
 - d. Pump the liquid media through the prefilter and then through the GAC. Dispose via the approved disposal method after treatment and described in the work plan. Flow rates should be monitored with a maximum flow rate of 5 gallons per minute unless authorized by the engineer for empty bed contact time of 15 mins or greater. Treatment flow rate is likely to be lower due to filter pressure.
 - e. Monitor discharge and pressure gauges to confirm back pressure.
 - f. Monitor filter and stop pumping to change filter when pressures increase, or filter media is observed to be built up with sediment.
 - g. Empty remaining sediment/liquids into existing soils/sediment drums onsite. Consolidate residual material per sampling location. Document the quantity, type of material, and source of material emptied into existing soil/sediment drums on-site.
 - h. Rinse the drum with PFAS free water, treat the rinsate, and collect the effluent.

- Label drums as clean/empty. Final drum disposition is discussed below.
- i. If water is pumped into drums instead of being discharged to the ground surface after GAC treatment, one water sample will be collected from one drum of water (likely the final drum of treated water). Samples will be shipped next day for analysis of PFAS compounds (existing Table B-15 PFAS list).
 - j. Document process/remaining conditions. Collect photographs of treatment activities, empty drums, and site conditions if appropriate.
 - k. Provide a written summary of treatment activities to the client.
 - l. Post treatment GAC will be moved to a secure location as identified by the installation and left for future use.
 - m. Adhere a drum label to remaining drums and as a backup also label drums with a paint pen. Label drums as “GAC filtered liquid”.
4. When discharge is approved by USACE and ARNG the following process will be followed:
- a. Discharge should be in an area deemed appropriate by the ARNG and regulatory personnel as documented.
 - b. Discharge should conform to any received written instructions. Generally, if a discrepancy arises immediately contact USACE, ARNG, and generator to resolve any discrepancy and confirm path forward.
 - c. Discharge water may be gradually infiltrated into the ground. Disposal locations must allow percolation of the water and prohibit “ponding.” No discharge into a stream or municipal system.
 - d. Upon completion of water discharge to ground, enter type of media, amount of media, date of disposal, and discharge point(s) in a bound Field Logbook. Collect photographs of discharge activities and discharge locations.
 - e. Provide a written summary of discharge activities to the client.
 - f. Confirm location and move empty drums. Adhere a drum label 2) As a backup also label with a paint pen. Installation to dispose of or recycle empty drums.

3.3 PROCEDURES FOR DECONTAMINATION SOLUTION AND PERSONAL PROTECTIVE EQUIPMENT DISPOSAL

Decontamination solutions include catch water from drill rigs, as well as smaller quantities of soapy water and rinse solutions used in decontaminating field sampling equipment. The decontamination solution will be treated as liquid IDM and combined with other liquid wastes and addressed as noted above (Section 3.2).

Personal protective equipment and disposable sampling equipment will be containerized onsite, appropriately labeled, and disposed in a designated trash receptacle.

4. MAINTENANCE

The waste disposal records collected during operations will be incorporated into the project file as soon as possible in either hard copy or electronic format. Refer to EA’s Records

Retention Policy for archiving information. Records will be distributed to USACE and ARNG as noted in previous sections.

5. REFERENCES

Deputy Assistant Secretary of Defense. 2019. Investigation Per- and Polyfluoroalkyl Substances within The Department of Defense Cleanup Program. United States Department of Defense. 19 October.

Environment Article Section 7-201(t).

U.S. Environmental Protection Agency. 1991. Management of Investigation-Derived Wastes during Site Inspections PB91-921331, OERR Directive 9345.3-02. Office of Emergency and Remedial Response U.S. Environmental Protection Agency, Washington, D.C. May.

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Attachment 3

Soil Analytical Summary Result Tables from 2019 SI and 2021 Supplemental SI ²

² AECOM, 2022. *Draft Final Site Inspection Report Camp Smith Training Site, Cortlandt, New York. Perfluorooctanesulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) Impacted Sites ARNG Installations, Nationwide.* January.

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Table 6-2
PFAS Detections in Surface Soil
Site Inspection Report, Camp Smith

Area of Interest Sample ID Sample Date Depth		AOI1										AOI2							
		AOI 1-SB1-0.5-1		AOI 1-SB2-0.5-1		AOI 1-SB3-0.5-1		AOI 1-SB3-1-2		CS-MW001S-SB-00-02		CS-MW001S-SB-00-02-D		AOI 2-SB1-0.5-1		AOI2-SB2-00-02		AOI2-SB3-00-02	
		12/11/2019		12/11/2019		12/11/2019		12/11/2019		07/20/2021		07/20/2021		12/10/2019		07/24/2021		07/24/2021	
		0.5 - 1 ft		0.5 - 1 ft		0.5 - 1 ft		1 - 2 ft		0 - 2 ft		0 - 2 ft		0.5 - 1 ft		0 - 2 ft		0 - 2 ft	
Analyte	OSD Screening Level ^a	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Soil, PFAS by LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)†																			
6:2 FTS	-	ND		ND		ND		ND		ND		ND		ND		ND		0.460	J
8:2 FTS	-	ND		ND		ND		ND		ND		ND		ND		0.077	J	7.65	
PFBA	-	ND		ND		0.146	J	0.325	J	0.224	J	0.207	J	0.143	J	ND		ND	
PFBS	1900	ND		ND		ND		ND		0.034	J	0.034	J	ND		ND		ND	
PFDA	-	ND		ND		ND		ND		0.093	J	0.085	J	ND		ND		0.111	J
PFDoA	-	ND		ND		ND		ND		0.032	J	0.030	J	ND		0.025	J	ND	
PFHpA	-	ND		ND		ND		ND		0.134	J	0.126	J	ND		ND		0.061	J
PFHxA	-	ND		ND		ND		ND		0.123	J	0.113	J	ND		ND		0.033	J
PFHxS	-	ND		ND		ND		ND		ND		ND		ND		0.053	J	0.150	J
PFNA	-	ND		ND		ND		ND		0.217	J	0.197	J	ND		ND		0.071	J
PFOA	130	ND		ND		ND		0.919	J	0.669	J	0.627	J	ND		ND		0.126	J
PFOS	130	0.260	J	0.345	J	ND		0.339	J	0.396	J	0.334	J	0.432	J	4.56		34.2	
PFPeA	-	ND		ND		ND		ND		0.129	J	0.110	J	ND		ND		0.021	J
PFUnDA	-	ND		ND		ND		ND		0.073	J	0.072	J	ND		0.027	J	0.021	J

Grey Fill

Detected concentration exceeded OSD Screening Levels

†Samples collected during Mobilization 1 were analyzed by QSM 5.1 (which was the most current version at the time of the event)

References

a. Assistant Secretary of Defense, 2021. Risk Based Screening Levels Calculated for PFOS and PFOA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. 15 September 2021. Soil screening levels based on residential scenario for direct ingestion of contaminated soil.

Interpreted Qualifiers

J = Estimated concentration

Chemical Abbreviations	
6:2 FTS	6:2 fluorotelomer sulfonate
8:2 FTS	8:2 fluorotelomer sulfonate
PFBA	perfluorobutanoic acid
PFBS	perfluorobutanesulfonic acid
PFDA	perfluorodecanoic acid
PFDoA	perfluorododecanoic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFPeA	perfluoropentanoic acid
PFUnDA	perfluoro-n-undecanoic acid

Acronyms and Abbreviations	
AOI	Area of Interest
D/FD	duplicate
ft	feet
HQ	hazard quotient
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	interpreted qualifier
SB	soil boring
USEPA	United States Environmental Protection Agency
µg/kg	micrograms per kilogram
-	not applicable

Table 6-2
PFAS Detections in Surface Soil
Site Inspection Report, Camp Smith

Area of Interest Sample ID Sample Date Depth		AOI 2				AOI3									
		AOI2-SB4-00-02		AOI2-SB5-00-02		AOI 3-SB1-0.5-1		AOI 3-SB1-1-2		AOI 3-SB1-1-2-FD		AOI 3-SB2-0.5-1		CS-MW004S-SB-00-02	
		07/24/2021		07/24/2021		12/10/2019		12/10/2019		12/10/2019		12/10/2019		07/19/2021	
		0 - 2 ft		0 - 2 ft		0.5 - 1 ft		1 - 2 ft		1 - 2 ft		0.5 - 1 ft		0 - 2 ft	
Analyte	OSD Screening Level ^a	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Soil, PFAS by LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)†															
6:2 FTS	-	ND		ND		ND		ND		ND		ND		ND	
8:2 FTS	-	0.065	J	ND		ND		ND		ND		ND		ND	
PFBA	-	ND		ND		0.270	J	0.304	J	0.207	J	0.301	J	0.059	J
PFBS	1900	ND		ND		ND		ND		ND		ND		ND	
PFDA	-	ND		ND		ND		ND		ND		ND		ND	
PFDoA	-	ND		ND		ND		ND		ND		ND		ND	
PFHpA	-	ND		0.030	J	ND		ND		ND		ND		0.033	J
PFHxA	-	ND		0.095	J	ND		ND		ND		ND		0.042	J
PFHxS	-	0.067	J	ND		ND		ND		ND		ND		0.048	J
PFNA	-	ND		0.032	J	ND		ND		ND		0.130	J	ND	
PFOA	130	ND		ND		0.172	J	ND		ND		0.173	J	0.110	J
PFOS	130	1.25		0.099	J	0.194	J	ND		ND		1.02	J	0.283	J
PFPeA	-	ND		0.095	J	ND		ND		ND		ND		0.040	J
PFUnDA	-	ND		ND		ND		ND		ND		ND		ND	

Grey Fill

Detected concentration exceeded OSD Screening Levels

†Samples collected during Mobilization 1 were analyzed by QSM 5.1 (which was the most current version at the time of the event)

References
a. Assistant Secretary of Defense, 2021. Risk Based Screening Levels Calculated for PFOS and PFOA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. 15 September 2021. Soil screening levels based on residential scenario for direct ingestion of contaminated soil.

Interpreted Qualifiers
J = Estimated concentration

Chemical Abbreviations	
6:2 FTS	6:2 fluorotelomer sulfonate
8:2 FTS	8:2 fluorotelomer sulfonate
PFBA	perfluorobutanoic acid
PFBS	perfluorobutanesulfonic acid
PFDA	perfluorodecanoic acid
PFDoA	perfluorododecanoic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFPeA	perfluoropentanoic acid
PFUnDA	perfluoro-n-undecanoic acid

Acronyms and Abbreviations	
AOI	Area of Interest
D/FD	duplicate
ft	feet
HQ	hazard quotient
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	interpreted qualifier
SB	soil boring
USEPA	United States Environmental Protection Agency
µg/kg	micrograms per kilogram
-	not applicable

Table 6-3 PFAS Detections in Shallow Subsurface Soil Site Inspection Report, Camp Smith																					
Area of Interest Sample ID Sample Date Depth		AOI1						AOI2								AOI3					
		AOI 1-SB1-6-8		AOI 1-SB1-12-14		CS-MW001D-SB-08-10		AOI 2-SB1-11-13		AOI2-SB2-02-04		AOI2-SB3-02-04		AOI2-SB4-02-04		AOI2-SB5-02-04		AOI 3-SB2-7-9		CS-MW004S-SB-07-09	
		12/11/2019		12/11/2019		07/20/2021		12/10/2019		07/24/2021		07/24/2021		07/24/2021		07/24/2021		12/10/2019		07/19/2021	
		6 - 8 ft		12 - 14 ft		8 - 10 ft		11 - 13 ft		2 - 4 ft		2 - 4 ft		2 - 4 ft		2 - 4 ft		7 - 9 ft		7 - 9 ft	
Analyte	OSD Screening Level ^a	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Soil, PFAS by LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)†																					
6:2 FTS	-	ND		ND		ND		ND		ND		3.10		ND		ND		ND		ND	
8:2 FTS	-	ND		ND		ND		ND		0.670	J	30.2		2.08		0.426	J	ND		ND	
PFBA	-	0.313	J	0.257	J	ND		0.299	J	ND		0.050	J	ND		ND		0.274	J	ND	
PFBS	25000	ND		ND		0.025	J	ND		ND		ND		ND		ND		ND		ND	
PFDA	-	ND		ND		ND		ND		0.066	J	0.199	J	ND		ND		ND		ND	
PFDoA	-	ND		ND		ND		ND		ND		0.025	J	ND		ND		ND		ND	
PFHpA	-	ND		ND		ND		ND		0.031	J	0.195	J	0.022	J	ND		ND		ND	
PFHxA	-	ND		ND		0.034	J	ND		0.033	J	0.198	J	ND		0.033	J	ND		ND	
PFHxS	-	ND		ND		ND		ND		0.168	J	0.860	J	0.079	J	0.213	J	ND		ND	
PFNA	-	ND		ND		ND		ND		0.046	J	0.285	J	ND		ND		ND		ND	
PFOA	1600	ND		ND		0.129	J	ND		ND		0.588	J	ND		ND		ND		ND	
PFOS	1600	ND		ND		0.117	J	ND		24.4		191		17.6		1.42	J-	ND		ND	
PFPeA	-	ND		ND		ND		ND		ND		0.121	J	0.025	J	ND		ND		ND	
PFUnDA	-	ND		ND		ND		ND		0.037	J	0.028	J	0.022	J	ND		ND		ND	
Grey Fill		Detected concentration exceeded OSD Screening Levels										Chemical Abbreviations 6:2 FTS 8:2 FTS PFBA PFBS PFDA PFDoA PFHpA PFHxA PFHxS PFNA PFOA PFOS PFPeA PFUnDA 6:2 fluorotelomer sulfonate 8:2 fluorotelomer sulfonate perfluorobutanoic acid perfluorobutanesulfonic acid perfluorodecanoic acid perfluorododecanoic acid perfluoroheptanoic acid perfluorohexanoic acid perfluorohexanesulfonic acid perfluorononanoic acid perfluorooctanoic acid perfluorooctanesulfonic acid perfluoropentanoic acid perfluoro-n-undecanoic acid									
References		a. Assistant Secretary of Defense, 2021. Risk Based Screening Levels Calculated for PFOS and PFOA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. 15 September 2021. Soil screening levels based on industrial/commercial composite worker scenario for incidental ingestion of contaminated soil.																			
Interpreted Qualifiers		J = Estimated concentration J- = Estimated concentration, biased low																			

Table 6-4
PFAS Detections in Deep Subsurface Soil
Site Inspection Report, Camp Smith

Area of Interest Sample ID Sample Date Depth	AOI2		AOI 2/3						AOI3	
	AOI 2-SB1-21-23		CS-MW002D-SB-39-41		CS-MW003S-SB-40-42		CS-MW003S-SB-40-42-D		AOI 3-SB2-15-17	
	12/10/2019		07/23/2021		07/25/2021		07/25/2021		12/10/2019	
	21 - 23 ft		39 - 41 ft		40 - 42 ft		40 - 42 ft		15 - 17 ft	
Analyte	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Soil, PFAS by LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)†										
PFBA	0.347	J	ND		ND		ND		0.234	J
PFHxA	ND		ND		0.026	J	ND	UJ	ND	
PFOS	ND		0.151	J	0.131	J	0.101	J	ND	

†Samples collected during Mobilization 1 were analyzed by QSM 5.1 (which was the most current version at the time of the event)

Interpreted Qualifiers

J = Estimated concentration
UJ = The analyte was not detected at a level greater than or equal to the adjusted detection limit (DL). However, the reported adjusted DL is approximate and may be inaccurate or imprecise.

Chemical Abbreviations

PFBA perfluorobutanoic acid
PFHxA perfluorohexanoic acid
PFOS perfluorooctanesulfonic acid

Acronyms and Abbreviations

AOI Area of Interest
D duplicate
ft feet
LCMSMS liquid chromatography with tandem mass spectrometry
LOD limit of detection
ND analyte not detected above the LOD
QSM Quality Systems Manual
Qual interpreted qualifier
SB soil boring
µg/kg micrograms per Kilogram

Table 6-5
PFAS Detections in Groundwater
Site Inspection Report, Camp Smith

Area of Interest Sample ID Sample Date			AOI1												AOI 2/3				AOI 3	
			AOI 1-GW1		AOI 1-GW2		AOI 1-GW3		CS-MW001D-GW		CS-MW001S-GW		CS-MW001S-GW-D		CS-MW002D-GW		CS-MW003S-GW		CS-MW004S-GW	
			12/11/2019		12/11/2019		12/11/2019		07/24/2021		07/24/2021		07/24/2021		07/28/2021		07/27/2021		07/22/2021	
Analyte	OSD Screening Level ^a	USEPA HA ^b	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Water, PFAS by LCMSMS compliant with QSM 5.3 Table B-15 (ng/l)†																				
6:2 FTS	-	-	2.10	J	ND		ND		ND		9.15		8.61		10.1		12.6		224	J-
PFBA	-	-	7.28	J	4.73	J	35.4		ND		ND		ND		ND		14.3		ND	
PFBS	600	-	2.87	J	ND		3.39	J	ND		ND		ND		ND		ND		ND	
PFDA	-	-	1.68	J	ND		ND		ND		ND		ND		ND		ND		ND	
PFHpA	-	-	4.77	J	3.50	J	9.51	J	3.00	J	1.74	J	1.85	J	2.75	J	27.0		ND	
PFHxA	-	-	9.81	J	3.42	J	11.4		ND		ND		ND		ND		43.2		ND	
PFHxS	-	-	14.6		3.45	J	10.2		7.05		3.81	J	3.80	J	17.9		64.1		ND	
PFNA	-	-	4.18	J	4.23	J	5.17	J	ND		ND		ND		ND		1.70	J	ND	
PFOA	40	70	29.0		24.0	J-	58.4		16.1		14.3		14.5		ND		21.2		ND	
PFOS	40	70	37.8		13.2	J+	12.5		10.8		ND		ND		37.7		147		ND	
PFPeA	-	-	ND		ND		ND		ND		ND		ND		ND		48.5		ND	
Total PFOA+PFOS	-	70	66.8		37.2		70.9		26.9		14.3		14.5		37.7		168		ND	

Grey FillDetected concentration exceeded OSD Screening Levels

Bold FontDetected concentration exceeded USEPA HA Screening Levels

†Samples collected during Mobilization 1 were analyzed by QSM 5.1 (which was the most current version at the time of the event)

References

a. Assistant Secretary of Defense, 2021. Risk Based Screening Levels Calculated for PFOS and PFOA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. 15 September 2021. Groundwater screening levels based on residential scenario for direct ingestion of groundwater.

b. USEPA, 2016. Drinking Water Health Advisory for PFOA. Office of Water (4304T). Health and Ecological Criteria Division, Washington, DC 20460. EPA Document Number: 822-R-16-005. May 2016. / EPA. 2016. Drinking Water Health Advisory for PFOS. Office of Water (4304T). Health and Ecological Criteria Division, Washington, DC 20460. EPA Document Number: 822-R-16-004. May 2016.

Interpreted Qualifiers

J = Estimated concentration

J- = Estimated concentration, biased low

J+ = Estimated concentration, biased high

Chemical Abbreviations

6:2 FTS	6:2 fluorotelomer sulfonate
PFBA	perfluorobutanoic acid
PFBS	perfluorobutanesulfonic acid
PFDA	perfluorodecanoic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFPeA	perfluoropentanoic acid

Acronyms and Abbreviations

AOI	Area of Interest
D/FD	duplicate
GW	groundwater
HA	Health Advisory
HQ	hazard quotient
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	interpreted qualifier
USEPA	United States Environmental Protection Agency
ng/l	nanogram per liter
-	not applicable

Table 6-5
PFAS Detections in Groundwater
Site Inspection Report, Camp Smith

Area of Interest Sample ID Sample Date			AOI3					
			AOI 3-GW1		AOI 3-GW1-FD		AOI 3-GW2	
			12/10/2019		12/10/2019		12/10/2019	
Analyte	OSD Screening Level ^a	USEPA HA ^b	Result	Qual	Result	Qual	Result	Qual
Water, PFAS by LCMSMS compliant with QSM 5.3 Table B-15 (ng/l)†								
6:2 FTS	-	-	ND		ND		2.60	J
PFBA	-	-	12.9		12.5		4.50	J
PFBS	600	-	3.77	J	3.69	J	2.66	J
PFDA	-	-	ND		ND		ND	
PFHpA	-	-	8.83	J	8.09	J	ND	
PFHxA	-	-	22.0		21.3		4.49	J
PFHxS	-	-	6.19	J	5.93	J	ND	
PFNA	-	-	3.57	J	4.25	J	ND	
PFOA	40	70	35.5		39.9		10.3	
PFOS	40	70	15.3		14.8		19.7	
PFPeA	-	-	21.9		22.2		ND	
Total PFOA+PFOS	-	70	50.8		54.7		30.0	

Grey Fill	Detected concentration exceeded OSD Screening Levels
Bold Font	Detected concentration exceeded USEPA HA Screening Levels

†Samples collected during Mobilization 1 were analyzed by QSM 5.1 (which was the most current version at the time of the event)

References

a. Assistant Secretary of Defense, 2021. Risk Based Screening Levels Calculated for PFOS and PFOA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. 15 September 2021. Groundwater screening levels based on residential scenario for direct ingestion of groundwater.

b. USEPA, 2016. Drinking Water Health Advisory for PFOA. Office of Water (4304T). Health and Ecological Criteria Division, Washington, DC 20460. EPA Document Number: 822-R-16-005. May 2016. / EPA. 2016. Drinking Water Health Advisory for PFOS. Office of Water (4304T). Health and Ecological Criteria Division, Washington, DC 20460. EPA Document Number: 822-R-16-004. May 2016.

Interpreted Qualifiers

J = Estimated concentration

J- = Estimated concentration, biased low

J+ = Estimated concentration, biased high

Chemical Abbreviations	
6:2 FTS	6:2 fluorotelomer sulfonate
PFBA	perfluorobutanoic acid
PFBS	perfluorobutanesulfonic acid
PFDA	perfluorodecanoic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFPeA	perfluoropentanoic acid

Acronyms and Abbreviations	
AOI	Area of Interest
D/FD	duplicate
GW	groundwater
HA	Health Advisory
HQ	hazard quotient
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	interpreted qualifier
USEPA	United States Environmental Protection Agency
ng/l	nanogram per liter
-	not applicable

**Appendix F Laboratory Data
Investigation Derived Waste
Site Inspection Report, Camp Smith**

Sample ID	CS-ST-04S-072621			
Sample Date	07/26/2021			
Analyte	Result	LOD	LOQ	Qual
Soil, PFAS byLCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)				
6:2 FTS	<	0.316	1.58	U
8:2 FTS	<	0.158	1.58	U
NEtFOSAA	<	0.158	1.58	U
NMeFOSAA	<	0.079	1.58	U
PFBA	0.090	0.158	1.58	J
PFBS	<	0.079	1.58	U
PFDA	<	0.158	1.58	U
PFDoA	<	0.079	1.58	U
PFHpA	<	0.079	1.58	U
PFHxA	0.032	0.079	1.58	J
PFHxS	<	0.158	1.58	U
PFNA	<	0.079	1.58	U
PFOA	<	0.316	1.58	U
PFOS	<	0.316	1.58	U
PFPeA	<	0.079	1.58	U
PFTeDA	<	0.079	1.58	U
PFTTrDA	<	0.158	1.58	U
PFUnDA	<	0.079	1.58	U

Interpreted Qualifiers

J = Estimated concentration

U = The analyte was not detected at a level greater than or equal to the adjusted detection limit

Chemical Abbreviations

6:2 FTS	6:2 fluorotelomer sulfonate
8:2 FTS	8:2 fluorotelomer sulfonate
NEtFOSAA	N-ethyl perfluorooctane- sulfonamidoacetic acid
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid
PFBA	perfluorobutanoic acid
PFBS	perfluorobutanesulfonic acid
PFDA	perfluorodecanoic acid
PFDoA	perfluorododecanoic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFPeA	perfluoropentanoic acid
PFTeDA	perfluorotetradecanoic acid
PFTTrDA	perfluorotridecanoic acid
PFUnDA	perfluoro-n-undecanoic acid

Acronyms and Abbreviations

CS	Camp Smith
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
LOQ	limit of quantitation
QSM	Quality Systems Manual
Qual	interpreted qualifier
µg/kg	micrograms per kilogram
<	analyte not detected above the LOD