Final
Site Inspections Report of Fire Fighting Foam Usage at Vermont Air National Guard Burlington Air National Guard Base Chittenden County, Vermont

January 2018

Submitted to:

Air Force Civil Engineer Center
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San Antonio, Texas 78226-2018

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under
Contract No. W912HN-15-C-0022

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Acronyms and Abbreviations

µg/L	micrograms per liter
µg/kg	microgram per kilogram
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFFF	aqueous film forming foam
amsl	above mean sea level
ANG	Air National Guard
ASL	Aerostar SES LLC
bgs	below ground surface
BRLTN	Burlington Air National Guard Base
btoc	below top of casing
CAS	Chemical Abstracts Service
DOT	Department of Transportation
DPT	direct push technology
dup	duplicate
EPA	Environmental Protection Agency
ft.	foot or feet
FTA	fire training area
GAC	granular-activated carbon
gpm	gallons per minute
GPS	global positioning system
GW	groundwater
HA	health advisory
ID	identification
IDW	investigation-derived waste
IRP	Installation Restoration Program
J	The reported concentration is an estimated value.
LOQ	limit of quantification
mg/kg	milligrams per kilogram
MW	monitoring well
NA	not applicable
ND	not detected
NL	not listed
OWS	oil/ water separator
PA	preliminary assessment
PFAS	per- and polyfluorinated alkyl substances
PFBS	perfluorobutane sulfonate
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
pH	potential of hydrogen
QAPP	quality assurance project plan
RSL	regional screening level
SD	sediment
SI	site inspection
SM	silty sand
SO	subsurface soil
SP	poorly graded sand
SP-SM	poorly graded silty sand
SS	surface soil

SVOC	semivolatile organic compound
SW	surface water
TCLP	toxicity characteristic leaching procedure
TOC	total organic carbon
U	The analyte was not detected above the reporting value.
UJ	The analyte was not detected above the reported value. The reported value is approximate.
VDEC	Vermont Department of Environmental Conservation
VDH	Vermont Department of Health
VOC	volatile organic compound
VTANG	Vermont Air National Guard
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USCS	Unified Soil Classification System
WWTP	wastewater treatment plant

1.0 INTRODUCTION

Aerostar SES LLC (ASL) under contract to the United States Army Corps of Engineers (USACE) Savannah District (Contract No. W912HN-15-C-0022) conducted screening-level site inspections (SIs) at five known or suspected aqueous film forming foam (AFFF) release areas at Burlington Air National Guard (ANG) Base (Figure 1, Appendix A). The purpose of the inspections was to determine the presence or absence of perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) in the environment at these areas. PFOA and PFOS are in a class of synthetic fluorinated chemicals used in industrial and consumer products, including defense-related applications. This class of compounds is also referred to as per- and polyfluorinated alkyl substances (PFAS).

In 1970, the United States Air Force (USAF) began using AFFF firefighting agents containing PFOS and PFOA to extinguish petroleum fires. Releases of AFFF to the environment routinely occur during fire training, equipment maintenance, storage, and use. Although manufacturers have reformulated AFFF to eliminate PFOS, the United States Environmental Protection Agency (EPA) continues to permit the use of PFOS-based AFFF, and the USAF maintains a significant inventory of PFOS-based AFFF. As of this report, the USAF is actively removing PFOS-based AFFF from its inventory and replacing it with formulations based on shorter carbon chains, which may be less persistent and bioaccumulative in the environment.

SIs were conducted at the Burlington ANG Base in April 2017 in accordance with contract requirements (USACE, February 2016), a quality assurance project plan (QAPP) (ASL, January 2016) and a site-specific addendum to the QAPP (ASL, February 2017). The QAPP and QAPP addendum were prepared in accordance with EPA guidance (EPA, March 2012) and Air Force Civil Engineer Center (AFCEC) requirements.

The objectives of the SIs were to

- determine if a confirmed release of PFOS, PFOA, or PFBS has occurred at the areas selected for inspection;
- determine if PFOS and PFOA are present in groundwater or surface water at the inspection areas at concentrations exceeding Vermont Groundwater Enforcement Standards;
- determine if PFBS is present in groundwater or surface water above generic EPA Regional Screening Levels (RSLs);
- determine if PFOA is present in soil or sediment at inspection areas above the Vermont Department of Health (VDH) screening level;
- determine if PFBS is present in soil or sediment at inspection areas above generic EPA RSLs;
- determine if PFOS is present in soil or sediment at the inspection areas at concentrations exceeding the calculated RSL; and
- identify potential receptor pathways with immediate impacts to human health (immediate impact to human health is considered consumption of drinking water with PFOS/PFOA above the Vermont Groundwater Enforcement Standard or PFBS above the RSL).

The Vermont Groundwater Enforcement Standard for combined PFOA and PFOS in groundwater is 0.02 µg/L (Vermont Department of Environmental Conservation [VDEC], December 2016). The EPA health advisory (HA) for drinking water for combined PFOA and PFOS is 0.07 µg/L. The VDH screening level for PFOA in surface soil is 300 µg/kg based on a residential use exposure scenario (Vose, March 2016). Screening levels for PFOA and PFOS in soil and sediment were calculated at 1,260 µg/kg using EPA's RSL calculator (https://epaprgs.ornl.gov/cgi-bin/chemicals/csl_search) (Appendix B). The toxicity value input for the calculator was the Tier 3 value reference dose of 0.00002 milligrams/kilograms per day

derived by EPA in its drinking water health advisories for PFOS (EPA, May 2016a) and PFOA (EPA, May 2016b).

The VDH screening value for PFOA in surface soil was selected as the screening level for surface soil, subsurface soil and sediment because it is more conservative than the calculated RSL. Because the Vermont Groundwater Enforcement Standard for combined PFOA and PFOS is more conservative, 0.02 µg/L was selected as the screening level for groundwater and surface water.

In summary, a PFOS/PFOA release was considered confirmed when exceedances of the following concentrations were identified:

PFOS:

- 0.02 micrograms per liter (µg/L) in groundwater and surface water (combined with PFOA value).
- 1,260 micrograms per kilogram (µg/kg) in soil and sediment.

PFOA:

- 0.02 µg/L in groundwater and surface water (combined with PFOS value).
- 300 µg/kg in soil and sediment.

Although PFOS and PFOA are the focus of the HA and provide specific targets for the USAF to address in this SI, EPA has also derived RSLs for PFBS, for which there is a Tier 2 toxicity value (Provisional Peer Reviewed Toxicity Value). The USAF considered a release to be confirmed if exceedances of the following concentrations were identified:

PFBS:

- 400 µg/L in groundwater and surface water.
- 1,300,000 µg/kg in soil and sediment.

To better facilitate reporting and discussion of the investigation, sampling, and analysis of PFOA/ PFOS/ PFBS in this report, these compounds will hereafter be referred to collectively as PFAS. Table 1 presents the screening values for comparing the analytical results for each of the PFAS compounds.

This report does not include assessment of ecological exposure pathways, receptors, or risk from PFAS impacts to the environment. Confirmed releases may require further investigation to fully delineate the extent of contamination and perform a complete risk assessment that includes ecological receptors.

The five areas discussed in this report were identified in a preliminary assessment (PA) conducted in July 2015 (CH2M HILL, October 2015). The five areas (now identified as AFFF Areas 1 through 5) are listed in Table 2 and shown on Figure 2. A sixth area, a private plane crash on the runway, was also identified in the PA; however, at the direction of AFCEC, the site was not included in this effort because the aircraft was privately owned and the crash occurred off Base.

2.0 AREA DESCRIPTIONS

Burlington ANG Base is in western Chittenden County in South Burlington, Vermont, adjacent to the Burlington International Airport. The Base occupies approximately 240 acres of the 942-acre airport property and is 1.5 miles east of the Burlington city limits, 3.5 miles east of Lake Champlain, and approximately 0.25 miles southwest of the Winooski River. Burlington International Airport is to the south and west of the Base, residential neighborhoods are to the north, and agricultural farmland and the Winooski River are to the north and east. The Base supports the operation and maintenance of the 158th Fighter Wing and houses aircraft, support personnel, vehicles, and equipment. Vermont Air National Guard (VTANG) fire and rescue units support both military and civilian aircraft incidents.

Table 1 Regulatory Screening Values

Parameter	Chemical Abstracts Number	EPA Regional Screening Level Table (November 2017) [a]			Calculated Screening Level for Soils and Sediment[b] (µg/kg)	EPA Health Advisory for Drinking Water (Surface Water or Groundwater)[c] (µg/L)	Vermont Preliminary Soil Screening Values[d] (µg/kg)	Vermont Enforcement Standard for Groundwater (µg/L)[e]
		Residential Soil (µg/kg)	Industrial Soil (µg/kg)	Tap Water (µg/L)				
Perfluorobutane sulfonate (PFBS)	29420-43-3	1,300,000	16,000,000	400	N/A	NL	NL	NL
Perfluorooctanoic acid (PFOA)	335-67-1	NL	NL	NL	1,260	0.07[f]	300	0.02[g]
Perfluorooctane sulfonate (PFOS)	1763-23-1	NL	NL	NL	1,260		NL	

[a] EPA Regional Screening Levels (November 2017) (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017).
[b] Screening levels calculated using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
[c] EPA, May 2016a. "Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS)."
EPA, May 2016b. "Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)."
[d] Vose, Sarah. Memorandum to Chuck Schwer, March 2016. *Perfluorooctanoic acid (PFOA) Soil Screening Value.*
[e] Vermont Department of Environmental Conservation, December 2016. Chapter 12 of the Environmental Protection Rules, "Groundwater Protection Rule and Strategy."
[f] The EPA Health Advisory value for drinking water of 0.07 µg/L applies to the combined detected concentrations of PFOS and PFOA.
[g] The Vermont Enforcement Standard for groundwater of 0.02 µg/L applies to the combined detected concentrations of PFOS and PFOA.
µg/kg = micrograms per kilogram
µg/L = micrograms per liter
EPA = Environmental Protection Agency
N/A = not applicable
NL = not listed

Table 2 Aqueous Film Form Foam Areas and Selection Rationale for Site Inspections at Burlington Air National Guard Base

AFFF Area	Location	Associated Existing IRP ID	Rationale	Media of Concern
1	Former FTA 1	Site 1	• Previous fire training area was not a closed system. • No known engineered containment. • AFFF likely used as extinguishing agent (volume unknown).	Subsurface soil Groundwater Sediment Surface water
2	Building 90 Former Fire Station	N/A	• Known previous storage of small quantities of AFFF. • AFFF refilling and truck washing activities may have resulted in releases. • No engineered containment. • Wash water was periodically pushed out the front bay doors with a squeegee.	Surface soil Subsurface soil Groundwater Sediment Surface water
3	Building 60 Current Fire Station	N/A	• AFFF refilling and truck washing activities may have resulted in releases. • Less than ½ gallon confirmed release of AFFF in one area.	Surface soil Subsurface soil Groundwater Sediment Surface water
4	Fire Department Equipment Testing Area	N/A	• Equipment containing AFFF was tested annually for several years. • An unknown volume of AFFF released. • No known engineered containment.	Surface soil Subsurface soil Groundwater
5	F-16 Emergency Response Site	N/A	• One-time response incident using AFFF from a hand line supplied from a fire truck. • No known containment or cleanup.	Surface soil Subsurface soil Groundwater

Table modified from Table 4.1 of *Final Preliminary Assessment Report for Perfluorinated Compounds at Vermont National Guard, South Burlington, Vermont* (CH2M HILL, October 2015)
AFFF = aqueous film forming foam
ANG = Air National Guard
FTA = fire training area
N/A = not applicable
ID = identification
IRP = Installation Restoration Program

The VTANG has operated continuously at Burlington airport since February 1951, when the 134th Fighter Squadron was assigned there. The air Base was activated as Ethan Allen Air Force Base (AFB) in February 1953 and operated on the north side of the airport. Ethan Allen AFB was closed as an active Base in May 1960 because of budget constraints, and the Base was transferred to the ANG and redesignated Burlington ANG Base. The VTANG 134th Fighter-Interceptor Squadron began operating out of the old airport administration building and the adjacent wooden hangar. The 134th Squadron was reorganized as the 158th Fighter Interceptor Group in mid-1960 and was placed under Air Defense Command. The Maintenance and Operations Squadrons immediately moved into the facilities vacated by the USAF with the closure of Ethan Allen AFB. The rest of the 158th Fighter Interceptor Group remained on the Williston Road side of the airfield, and military vehicles were allowed to cross the east end of the runway to transport personnel and materials after receiving clearance from the tower. The Base is now an industrial facility supporting the VTANG 158th Fighter Wing.

The climate at South Burlington, Vermont, consists of moderately warm summers and cold winters with average high temperatures ranging from 80.9 degrees Fahrenheit in July to 27 degrees Fahrenheit in January between 1980 and 2016. Annual precipitation averaged approximately 39 inches between 1980 and 2016, with precipitation between October and May typically falling as snow. Monthly precipitation

ranged from an average low of 2.2 inches in February to average high of 4.3 inches in July. Mean annual snowfall, as measured from 1958 to 1987, was 78 inches (ASL, August 2017).

2.1 FORMER FIRE TRAINING AREA 1 (INSTALLATION RESTORATION PROGRAM SITE 1) – AFFF AREA 1

Former Fire Training Area (FTA) 1 is a grassed field east of NCO Drive on Burlington ANG Base (Figure 3, Appendix A). The field is bordered to the north by chain link fencing that serves as the northern perimeter of the Base and to the west by NCO Drive. A second FTA, FTA 2, is immediately south of FTA 1 and is included as part of FTA 1. Surface topography at FTA 1 slopes downward to the northeast, ranging from 309 to 311 feet above mean sea level (amsl) to approximately 277 feet amsl near Poor Farm Road. An intermittent stream to the southeast flows northeast toward Poor Farm Road. The area is used for recreational vehicle storage, Base equipment storage, and contractor material staging. Emergency response car extraction training is conducted south of FTA 1, and all other fire training activities are now conducted off-Base at the New Hampshire Fire Explorer Training Academy in Concord.

FTA 1 consisted of an approximately 150-foot-diameter primary burn area (FTA 1) and an approximately 50-foot-diameter secondary burn area (FTA 2) encompassing approximately 1/2 acre. Use of the FTAs began in 1960 and was discontinued in 1980. Training exercises were conducted an average of 26 times per year from 1960 to 1973 and an average of 12 times per year from 1973 to 1980. As much as 2,000 gallons of JP-4 were dispersed on the ground during each exercise between 1960 and 1973. From 1973 to 1980, dispersal was reduced to approximately 300 gallons during each exercise. Additionally, approximately 1,500 gallons of various mixtures of acetone, alcohol, cyclohexanone, methyl ethyl ketone, methanol, propyl alcohol, and waste paint pigments were collected from the surrounding communities and burned from 1979 to 1980 instead of JP-4. During periods of use, both FTAs were excavated to create shallow depressions to retain ignitable liquids. The liquids were ignited and the resultant fire would then be extinguished as part of the fire training exercise.

Installation Restoration Program (IRP) Site 1 was established in response to volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) that were released as part of fire training exercises. The uppermost 3 feet of fuel-contaminated soil was excavated from FTAs 1 and 2 in September 1980 and transported off site for disposal. The exact dimensions of the excavation are not known. Currently, IRP Site 1 includes a groundwater collection trench constructed in late 2003/early 2004 northeast of the site along National Guard Avenue and an active air sparging and soil vapor extraction system installed in 2012. Until recently, shallow groundwater intercepted by the groundwater collection trench was pumped to the Base sewer lift station and ultimately to the Airport Parkway Wastewater Treatment Plant (WWTP) in South Burlington, Vermont (CH2MHill, October 2015).

Unvalidated analytical results for a water sample collected by EPA from the groundwater collection trench sump on May 18, 2016, showed PFOS and PFOA concentrations of 38 µg/L and 9.3 µg/L respectively (H&S/Nobis Environmental JV, LLC, June 2016). As a result, the groundwater treatment system was modified to address PFOA and PFOS in groundwater at FTA 1. Since August 2017, groundwater from the collection trench has been treated for PFAS by routing it through two granular-activated carbon (GAC) vessels. Treated groundwater is pumped to infiltration trenches constructed at the site and is no longer pumped to the WWTP (CH2MHill, June 2017).

2.2 BUILDING 90 FORMER FIRE STATION – AFFF AREA 2

Building 50, the former fire station at Burlington ANG Base, was demolished in approximately 1995 prior to construction of Building 90, which now occupies the site. Building 90 is on the southwest side of NCO Drive and northeast of the F-16 flightline apron (Figure 4, Appendix A). The building is bordered to the northeast, northwest, and southwest by grassed lawn and to the southeast by a paved access/parking area.

Building 90 has never been used as a fire station and is currently used as an administrative building for deployments and for the STARBASE Vermont day camp for children. A review of historical topographic maps indicates that the original building (Building 50) was constructed between 1972 and 1983. According to historical imagery, Building 90 was constructed between May 2004 and October 2006.

The original fire station building did not have floor drains, and spills were pushed out the front of the three-bay doors facing the runway. A historical photograph suggests that the area in front of the three-bay doors was paved; however, the former bays are beneath the location of the current Building 90. Stormwater from the Building 90 area discharges to a drainage ditch approximately 960 feet to the east/ northeast on the south side of Mustang Pass as shown on Figure 4 in Appendix A.

Because the fire station was active after 1970 (the year the USAF began using AFFF), historical use of AFFF at the fire station is considered likely. The VTANG fire department, however, has no knowledge or records of the quantity of AFFF that may have been used/released during AFFF transfer and filling operations at the former fire station (ASL, August 2017).

2.3 BUILDING 60 CURRENT FIRE STATION – AFFF AREA 3

Building 60, the current Base fire station, is north of the airfield between Taxiway F and NCO Drive (Figure 5, Appendix A). The fire station is bordered to the northwest and southeast by grassed lawn and to the northeast and southwest by paved access ramps.

Fire engine bays are in the northwest end of the building, and office space is in the southeast end of the building. Fire trucks are washed within the bays at Building 60. The building has a floor drain system that transports liquids to an oil/ water separator (OWS) system on the north side of the building. OWS fluid goes to the Base wastewater lift station, where it is pumped under the runway to the South Burlington Airport Parkway WWTP. Stormwater from the Building 60 area discharges across NCO Drive to an intermittent stream approximately 300 feet to the northeast.

The only reported release of AFFF at the building occurred on July 22, 2015, when approximately ½ gallon of AFFF was released while transferring 130 gallons of AFFF from a P-19 vehicle to the foam storage trailer. The AFFF was rinsed into the grass area adjacent to the concrete pad on the northwest side of Building 60. No other releases of AFFF have been reported at Building 60 (ASL, August 2017).

2.4 FIRE DEPARTMENT EQUIPMENT TESTING AREA – AFFF AREA 4

Until July 2015, the VTANG fire department tested fire equipment annually using AFFF along an approximately 700-foot section of Taxiway F as shown on Figure 6 (Appendix A). Foam was typically sprayed directly onto grassed areas on either side of the 50-foot wide taxiway, but occasionally it was sprayed on the taxiway and washed to the grassed areas. The discharge range of the equipment is approximately 225 feet. During the June 2015 test, approximately 65 gallons of AFFF solution (water and AFFF) were released to Taxiway F and washed to grassed areas on either side of the taxiway. On July 30,

2015, the Base received notification from AFCEC to discontinue testing equipment with AFFF because of environmental concerns.

2.5 F-16 EMERGENCY RESPONSE SITE – AFFF AREA 5

A 1995/1996 F-16 bird strike required using a cable arresting system at the north end of the runway to stop the F-16 during landing. An equipment malfunction caused a fire at the tail of the jet, and AFFF from a fire truck hand line was used to extinguish the flames. The AFFF/water solution (volume unknown) was likely washed off the runway to the grassed areas on either side of the runway. The approximate location of the incident was the centerline of the runway just north of the arresting system and North Barrier Road and is outside the current Base boundary as shown on Figures 2 and 7 in Appendix A.

3.0 FIELD ACTIVITIES AND FINDINGS

ASL conducted field activities at Burlington ANG Base the week of April 17, 2017. Fieldwork was conducted in accordance with the QAPP (ASL, January 2016) and the Base-specific field sampling plan addendum to the QAPP (ASL, February 2017). A readiness review covering anticipated hazards, types and proper use of equipment needed for field activities, sampling procedures, and procedures to prevent cross-contamination of samples with PFAS-containing compounds was conducted with all ASL field personnel prior to mobilization. Documentation of this review is in Appendix C.

Field activities included collecting groundwater samples (from direct push technology [DPT] borings, temporary wells, and existing monitoring wells), collecting surface soil and subsurface soil samples (from hand auger and DPT soil borings), and collecting surface water and sediment samples. ASL selected sampling locations in areas most likely to have been impacted by known or suspected AFFF releases. Field duplicate samples were collected at a frequency of one for every 10 samples for each sample media. Matrix spike/matrix spike duplicate samples were collected at a frequency of one for every 20 samples for each media. Boring logs and sample collection forms are in Appendix C.

Soil, sediment, groundwater, and surface water samples were submitted via overnight courier to Maxxam Analytics International Corporation of Mississauga, Ontario, Canada, under chain of custody procedures and analyzed for PFAS using modified EPA Method 537. All samples were analyzed for the following parameters.

Analyte	*CAS Number
Perfluorobutane sulfonate (PFBS)	29420-43-3
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorooctane sulfonate (PFOS)	1763-23-1

*CAS = Chemical Abstracts Service

Third-party data validation was conducted on 100% of the analytical data. Overall, the quality of the data was acceptable. The precision and accuracy results were acceptable for the project. Other data quality indicators (representativeness, comparability, and completeness) also met the project objectives. All the results were evaluated as usable for the decisions being made. With the exception of AFFF Area 5 (discussed in Section 3.5.4), determinations of an AFFF release were not based on quality-control-qualified data. The data validation report, laboratory case narratives, and laboratory analytical data sheets are presented in Appendix D.

To provide basic soil parameter information, ASL also collected representative composite surface soil and subsurface soil samples for physiochemical parameters from each area. The composite samples were

submitted to CT Laboratories LLC of Baraboo, Wisconsin, and analyzed for potential of hydrogen (pH), particle size distribution, total organic carbon (TOC), and percent solids; the results of these analyses are in Appendix F.

Soil borings were advanced with a track-mounted DPT drill rig. Surface soil samples were collected to a depth of 6 inches below ground surface (bgs) with stainless steel hand augers. Subsurface soil samples were collected immediately above the water saturated/unsaturated soil interface using a DPT Macro-core® sampler with acetate liner. Soil samples were placed in containers using stainless steel spoons.

Groundwater samples collected from existing and temporary monitoring wells were collected with peristaltic pumps and disposable polyvinyl tubing inserted to the approximate midpoint of the saturated portion of the screened interval. Groundwater samples were collected from DPT soil borings using a reusable GeoProbe® SP16 drive point groundwater sampler consisting of a sheathed 0.78-inch inside diameter by 41-inch-long stainless steel screen. The drive point was advanced to the desired depth and the sheath retracted, exposing the screen. Groundwater samples were then collected with peristaltic pumps and polyvinyl tubing inserted through the drill rods into the screen.

Sediment samples were collected using stainless steel spoons. Surface water samples were collected by attaching the sample container to an extendable rod designed for sampling and dipping the container into the water.

Coordinates and elevations for soil borings and temporary wells at AFFF Areas 1, 2, and 3 were established by Button Professional Land Surveyors, PC of South Burlington, Vermont. Northing and easting coordinates were recorded in the Vermont State Plane Coordinate System based on North American Datum 1983. Elevations were referenced to North American Vertical Datum 1988. Soil borings at AFFF Areas 4 and 5 were recorded with a Trimble GeoX7 handheld global positioning system (GPS) unit. All sediment and surface water sample points were recorded with a Trimble GeoX7 GPS unit.

Sample locations, area-specific lithology, groundwater flow direction, analytical results, and conclusions for each AFFF area are presented in Sections 3.1 through 3.5.

3.1 FORMER FIRE TRAINING AREA 1 (INSTALLATION RESTORATION PROGRAM SITE 1) – AFFF AREA 1

3.1.1 Sample Locations

To assess possible PFAS impacts from previous use of AFFF at FTA 1 (including FTA 2), three subsurface soil samples (two primary and one duplicate), nine groundwater samples (eight primary and one duplicate), two sediment samples (one primary and one duplicate), and two surface water samples (one primary and one duplicate) were collected. Subsurface soil and drive point groundwater samples were collected from soil borings BRLTN01-001 and BRLTN01-002 at FTA 1 and FTA 2.

Groundwater samples were collected from existing monitoring wells V1-BP2 and V1-BP3 at FTA 1 (source area) and from existing downgradient wells MW-102, MW-103, and V1-MW-14L. Downgradient monitoring wells MW-103 and V1-MW-14L were sampled to assess possible PFAS impacts within known organic solvent plumes identified during the remedial investigation of FTA 1, which may represent preferred pathways (Parsons, June 2002). Downgradient well MW-102 was sampled to evaluate possible PFAS impacts along a more easterly flow pathway toward the Winooski River. V1-MW-14L was sampled in lieu of planned well MW-104, which could not be sampled because of a blockage in the

well. A sample was also collected from the groundwater collection trench sump (BRLTN01-TRENCHSUMP) near Poor Farm Road to verify the May 2016 EPA sampling results.

Sediment and surface water samples were collected at BRLTN01-003 from an intermittent stream immediately south of the groundwater collection trench sump and downstream from the FTAs. Sample locations are shown on Figure 3 in Appendix A. Surface soil was not sampled because hydrocarbon/ solvent-impacted soil had been excavated from the area during a previous remediation effort.

3.1.2 Lithology

The two soil borings completed at the former FTA were terminated at 15 feet bgs. Soils encountered at these borings included silty sand (Unified Soil Classification System [USCS] – SM), well-graded sand (USCS – SW), poorly graded sand (USCS – SP), and silt (USCS – ML). Detailed boring logs are included in Appendix C.

3.1.3 Groundwater Flow

On April 21, 2017, groundwater level measurements were collected from eight existing monitoring wells at FTA 1. Total depths of these wells range from 11 feet to 27 feet bgs, and groundwater was detected at depths ranging from 3.07 feet to 18.95 feet below top of casing (btoc). Groundwater at FTA 1 flows to the northeast toward the groundwater collection trench as shown on Figure 3 in Appendix A. Downgradient of the collection trench, groundwater flows to the east/northeast toward the Winooski River. Groundwater level measurements and elevations on April 21, 2017, are summarized in Table G-1 in Appendix G.

3.1.4 Analytical Results

Subsurface Soil
Two primary subsurface soil samples and one duplicate sample were collected from soil borings BRLTN01-001 and BRLTN01-002 at FTA 1. PFBS was not detected in any of the samples, but PFOA and PFOS were detected in all three samples. PFOA was detected at concentrations ranging from an estimated 0.38 µg/kg to 25 µg/kg, and PFOS was detected at concentrations ranging from an estimated 4.7 µg/kg to an estimated 1,200 µg/kg, all below their respective screening levels. Results are summarized in Table 3 and shown on Figure 8 in Appendix A.

Soil Physiochemical Analyses
To provide basic soil parameter information, composite surface soil and subsurface soil samples were collected from FTA 1 soil borings and submitted for pH, TOC, and grainsize analysis. The surface soil sample (BRLTN01-004-SS-001) was composed of equal aliquots of soil collected from borings BRLTN01-001 and BRLTN01-002 at 6 inches bgs. The subsurface soil sample (BRLTN01-004-SO-008) was composed of equal aliquots of soil collected from the same borings at depths of 8 and 7feet respectively. Table F-1 summarizing the physiochemical data and supporting laboratory data sheets are included in Appendix F.

Table 3 Former Fire Training Area 1 (AFFF Area 1) Subsurface Soil Analytical Results

	Sample ID	BRLTN01-001-SO-008	BRLTN01-002-SO-007	BRLTN01-002-SO-907 (dup)
	Date Collected	04/20/17	04/19/17	04/19/17
	Depth (ft. bgs)	7 – 8	6 - 7	6 - 7
Analyte	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	1,300,000[a]	0.66 UJ	5.1 U	6.2 U
Perfluorooctanoic acid (PFOA)	300[b]	**0.38 J**	**18**	**25**
Perfluorooctane sulfonate (PFOS)	1,260[c]	**4.7 J**	**590 J**	**1,200 J**

Bold values indicate analyte detected at concentration indicated.
[a]EPA Regional Screening Levels (RSLs) for Residential Soil (November 2017) (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017)
[b] Vose, Sarah. Memorandum to Chuck Schwer, March 2016. *Perfluorooctanoic acid (PFOA) Soil Screening Value.*
[c]Screening level calculated using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms/kilogram
BRLTN = Burlington Air National Guard Base
ft. = foot or feet
SO = subsurface soil
bgs = below ground surface
dup = field duplicate
J = reported concentration is an estimated value
U = analyte was not detected above the reported value

Groundwater

Eight primary groundwater samples and one duplicate sample were collected at AFFF Area 1. Groundwater samples were collected from two soil borings (BRLTN01-001 and BRLTN01-002), five existing monitoring wells (two source area wells and three downgradient wells), and from the downgradient groundwater collection trench sump.

PFBS was detected in seven of eight groundwater samples (six primary samples and one duplicate sample) and in the trench sump sample at concentrations ranging from 0.52 µg/L to 3.4 µg/L, all below the RSL of 400 µg/L. PFOA and PFOS were also detected in each of the groundwater samples and in the trench sump sample at combined concentrations ranging from 4.75 µg/L to 72 µg/L all above the 0.02 µg/L screening level. Groundwater analytical results for PFBS, PFOA, and PFOS are presented in Table 4 and are shown on Figure 9 in Appendix A.

Sediment

One primary and one duplicate sediment sample were collected from an intermittent stream downstream from FTA 1 at BRLTN01-003. PFBS was detected at concentrations of 1.2 µg/kg and 1.3 µg/kg; PFOA was detected at concentrations of 2.2 µg/kg and 2.0 µg/kg; and PFOS was detected at concentrations of 170 µg/kg and 180 µg/kg. All PFBS, PFOA, and PFOS detections were below their respective screening levels as summarized in Table 5 and shown on Figure 8 in Appendix A.

Table 4 Former Fire Training Area 1 (AFFF Area 1) Groundwater Analytical Results

	Sample ID	BRLTN01-001-GW-013	BRLTN01-002-GW-015	BRLTN01-TRENCHSUMP-001	BRLTN01-MW-V1BP2-009	BRLTN01-MW-BP3-012
	Date Collected	04/20/17	04/19/17	04/19/17	04/20/17	04/20/17
	Depth (ft. bgs)	13	15	9	9	12
Analyte	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane sulfonate (PFBS)	400[a]	**1.1**	**0.52**	**0.87**	0.10 U	**3.4**
Perfluorooctanoic acid (PFOA)	0.02[b]	**0.47**	**2.7**	**4.2**	**1.3**	**41**
Perfluorooctane sulfonate (PFOS)	0.02[b]	**8.8**	**3.0**	**15**	**16**	**31**
PFOS +PFOA	0.02[b]	**9.27**	**5.7**	**19.2**	**17.3**	**72**

	Sample ID	BRLTN01-MW102-011	BRLTN01-MW103-009	BRLTN01-MW103-909 (dup)	BRLTN01-V1MW14L-008
	Date Collected	04/18/17	04/18/17	04/18/17	04/19/17
	Depth (ft. bgs)	11	9	9	8
Analyte	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane sulfonate (PFBS)	400[a]	**1.4**	**1.7**	**1.7**	**1.7 J**
Perfluorooctanoic acid (PFOA)	0.02[b]	**0.55**	**1.4**	**1.4**	**1.8**
Perfluorooctane sulfonate (PFOS)	0.02[b]	**4.2**	**18**	**20**	**7.6**
PFOS +PFOA	0.02[b]	**4.75**	**19.4**	**21.4**	**9.4**

Bold values indicate analyte detected at concentration indicated. Shaded values indicate analyte exceeds screening criteria.

[a]EPA Regional Screening Levels for Residential Soil (November 2017))https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017)

[b]Vermont Department of Environmental Conservation, December 2016. Chapter 12 of the Environmental Protection Rules, "Groundwater Protection Rule and Strategy."

µg/L = micrograms per liter
BRLTN = Burlington Air National Guard Base
ft = foot or feet
GW = groundwater
J = reported concentration is an estimated value
U = analyte was not detected above the reported value
bgs = below ground surface
dup = duplicate
FTA = fire training area
ID = identification
MW = monitoring well

Table 5 Former Fire Training Area 1 (AFFF Area 1) Sediment Analytical Results

	Sample ID	BRLTN01-003-SD-001	BRLTN01-003-SD-901 (dup)
	Date Collected	04/18/17	04/18/17
	Depth (ft. bgs)	0 - 0.5	0 - 0.5
Analyte	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	1,300,000[a]	**1.2**	**1.3**
Perfluorooctanoic acid (PFOA)	300[b]	**2.2**	**2.0**
Perfluorooctane sulfonate (PFOS)	1,260[c]	**170**	**180**

Bold values indicate analyte detected at concentration indicated.
[a]EPA Regional Screening Levels for Residential Soil (November 2017) (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017)
[b] Vose, Sarah. Memorandum to Chuck Schwer, March 2016. *Perfluorooctanoic acid (PFOA) Soil Screening Value.*
[c]Screening level calculated using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilograms
BRLTN = Burlington Air National Guard Base
ft. = foot or feet
ID = identification
bgs = below ground surface
dup = field duplicate
FTA = fire training area
SD = sediment

Surface Water

One primary and one duplicate surface water sample were also collected from the intermittent stream downstream from FTA 1 at BRLTN01-003. PFBS was detected in both samples at concentrations of 2.0 µg/L and 1.9 µg/L, below the 400 µg/L screening level. PFOA and PFOS were detected in both samples at combined concentrations of 35.3 µg/L and 38.4 µg/L, above the 0.02 µg/L screening level as summarized in Table 6 and shown on Figure 9 in Appendix A.

Table 6 Former Fire Training Area 1 (AFFF Area 1) Surface Water Analytical Results

	Sample ID	BRLTN01-003-SW-001	BRLTN01-003-SW-901 (dup)
	Date Collected	04/18/17	04/18/17
Analyte	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane sulfonate (PFBS)	400[a]	**2.0**	**1.9**
Perfluorooctanoic acid (PFOA)	0.02[b]	**1.3**	**1.4**
Perfluorooctane sulfonate (PFOS)	0.02[b]	**34**	**37**
PFOS +PFOA	0.02[b]	**35.3**	**38.4**

Bold values indicate analyte detected at concentration indicated.
Shaded values indicate analyte exceeds screening criteria.
[a]EPA Regional Screening Levels for Residential Soil (November 2017) (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017)
[b]Vermont Department of Environmental Conservation, December 2016. Chapter 12 of the Environmental Protection Rules, "Groundwater Protection Rule and Strategy."
µg/L = micrograms per liter
dup = field duplicate
SW = surface water
BRLTN = Burlington Air National Guard Base
ID = identification

3.1.5 Conclusions

Use of AFFF during training exercises at FTA 1 has resulted in releases of PFAS to the environment. Although PFOA and PFOS concentrations in soil and sediment were below screening levels, combined PFOA and PFOS concentrations exceeded the screening level in groundwater and surface water. Combined PFOA and PFOS concentrations were above screening levels in seven primary and one

duplicate groundwater sample, one primary and one duplicate surface water sample, and a groundwater collection trench sump sample. The maximum combined PFOA and PFOS concentration detected was 72 µg/L in groundwater and 38.4 µg/L in surface water. PFBS was not detected above screening levels in any media sampled at AFFF Area 1.

3.2 BUILDING 90 FORMER FIRE STATION – AFFF AREA 2

3.2.1 Sample Locations

To assess possible PFAS impacts from AFFF that may have been used/released during AFFF transfer and filling operations at the former fire station, four surface soil samples (three primary and one duplicate), three subsurface soil samples, three groundwater samples, one sediment sample, and one surface water sample were collected. Surface soil and subsurface soil samples were collected from soil borings BRLTN02-001, BRLTN02-002, and BRLTN02-003 around the original fire station footprint. Groundwater samples were collected from temporary monitoring wells installed in each of the soil borings. Sediment and surface water samples were collected at BRLTN02-004 at a downstream stormwater discharge at a drainage ditch approximately 960 feet east/northeast of Building 90 on the south side of Mustang Pass. It is noted that after completion of the SI sampling effort (during review of the draft SI report), the Base provided information indicating that 730 tons of soil were removed from the drainage swale in 2012 as part of a remedial action for IRP Site 4 (Drainage Ditch Area). Soil was excavated to a depth of 2 feet and backfilled. The location of sediment and surface water sample BRLTN02-004 is within the limits of the remedial action area (CH2MHill, June 2012). Sample locations are shown on Figure 4 in Appendix A.

3.2.2 Lithology

The three soil borings completed at AFFF Area 2 were terminated at depths ranging from 30 to 35 feet bgs. Soils encountered at these borings included silty sand (USCS – SM) and well-graded sand (USCS – SW), and poorly graded sand (USCS – SP). Detailed boring logs are included in Appendix C.

3.2.3 Groundwater Flow

On April 21, 2017, groundwater level measurements were collected from the three temporary monitoring wells at the former fire station (BRLTN02-001, BRLTN02-002, and BRLTN02-003). Total depth of these wells ranged from 30 feet to 35 feet bgs, and groundwater was detected at depths ranging from 25.05 feet to 29.29 feet btoc. Based on the April 21, 2017, water level measurements and water levels collected from adjacent AFFF Area 3, groundwater flows to the east/northeast as shown on Figure 4 in Appendix A. Water level measurements and groundwater elevations are summarized in Table G-1 in Appendix G.

3.2.4 Analytical Results

Surface Soil

Three primary surface soil samples and one duplicate sample were collected from soil borings BRLTN02-001, BRLTN02-002, and BRLTN02-003 at Building 90, site of the former fire station. PFBS was detected in the duplicate sample collected at BRLTN02-001 at an estimated concentration of 0.28 µg/kg but was not detected in any of the three primary samples. PFOA and PFOS were detected in all four samples. PFOA was detected at estimated concentrations ranging from 0.53 µg/kg to 0.91 µg/kg and PFOS was detected at estimated concentrations ranging from 5.6 µg/kg to 31 µg/kg. PFOA and PFOS

detections were all below their respective screening levels, as summarized in Table 7 and shown on Figure 10 in Appendix A.

Table 7 Building 90 Former Fire Station Location (AFFF Area 2) Surface Soil Analytical Results

	Sample ID	BRLTN02-001-SS-001	BRLTN02-001-SS-901 (dup)	BRLTN02-002-SS-001	BRLTN02-003-SS-001
	Date Collected	04/18/17	04/18/17	04/18/17	04/18/17
	Depth (ft. bgs)	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
Analyte	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	1,300,000[a]	0.50 UJ	**0.28 J**	0.66 U	0.66 UJ
Perfluorooctanoic acid (PFOA)	300[b]	**0.53 J**	**0.69 J**	**0.91 J**	**0.70 J**
Perfluorooctane sulfonate (PFOS)	1,260[c]	**31 J**	**28**	**21**	**5.6 J**

Bold values indicate analyte detected at concentration indicated.
[a]EPA Regional Screening Levels (RSLs) for Residential Soil (November 2017) [https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017]
[b]Vose, Sarah. Memorandum to Chuck Schwer, March 2016. *Perfluorooctanoic acid (PFOA) Soil Screening Value.*
[c]Screening level calculated using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/cls_search)
µg/kg = micrograms per kilogram bgs = below ground surface BRLTN = Burlington Air National Guard
dup = duplicate ID = identification J = reported concentration is an estimated value
SS = surface soil U = analyte was not detected above the reported value

Subsurface Soil

Three subsurface soil samples were also collected from soil borings BRLTN02-001, BRLTN02-002, and BRLTN02-003 at Building 90. PFBS was not detected in any of the samples. PFOA and PFOS, however, were detected in all three samples. PFOA was detected at estimated concentrations ranging from 0.52 µg/kg to 7.8 µg/kg, and PFOS was detected at concentrations ranging from an estimated 20 µg/kg to 160 µg/kg. PFOA and PFOS detections were all below their respective screening levels, as summarized in Table 8 and shown on Figure 10 in Appendix A.

Table 8 Building 90 Former Fire Station Location (AFFF Area 2) Subsurface Soil Analytical Results

	Sample ID	BRLTN02-001-SO-020	BRLTN02-002-SO-020	BRLTN02-003-SO-025
	Date Collected	04/18/17	04/18/17	04/18/17
	Depth (ft. bgs)	19 - 20	19 - 20	24 - 25
Analyte	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	1,300,000[a]	0.58 U	0.66 U	0.52 UJ
Perfluorooctanoic acid (PFOA)	300[b]	**1.7**	**0.52 J**	**7.8 J**
Perfluorooctane sulfonate (PFOS)	1,260[c]	**160**	**160**	**20 J**

Bold values indicate analyte detected at concentration indicated.
[a]EPA Regional Screening Levels (RSLs) for Residential Soil (November 2017) (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017)
[b]Vose, Sarah. Memorandum to Chuck Schwer, Director of Waste Management, Vermont Department of Environmental Conservation, March 2016. *Perfluorooctanoic acid (PFOA) Soil Screening Value.*
[c]Screening level calculated using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram bgs = below ground surface BRLTN = Burlington Air National Guard Base
ft. = foot or feet ID = identification J = reported concentration is an estimated value
SO = subsurface soil U = analyte was not detected above the reported value

Soil Physiochemical Analyses

To provide basic soil parameter information, composite surface soil and subsurface soil samples were collected from Building 90 soil borings and submitted for pH, TOC, and grainsize analysis. The surface soil sample (BRLTN02-005-SS-001) was composed of equal aliquots of soil collected from borings BRLTN02-001, BRLTN02-002, and BRLTN02-003 at 6 inches bgs. The subsurface soil sample (BRLTN02-005-SO-032) was composed of equal aliquots of soil collected from the same borings at 20 feet bgs, 20 feet bgs, and 25 feet bgs, respectively. Table F-1 summarizing the physiochemical data and supporting laboratory data sheets are included in Appendix F.

Groundwater

Three groundwater samples were collected from the three temporary wells at Building 90. PFBS was detected in all three samples at concentrations ranging from 0.14 µg/L to 0.47 µg/L, below the 400 µg/L screening level. PFOA and PFOS were also detected in all three samples at combined concentrations ranging from 9.48 µg/L to 54.5 µg/L, all above the 0.02 µg/L screening level. PFBS, PFOA, and PFOS groundwater analytical results are summarized in Table 9 and shown on Figure 11 in Appendix A.

Table 9 Building 90 Former Fire Station Location (AFFF Area 2) Groundwater Analytical Results

Sample ID		BRLTN02-001-GW-027	BRLTN02-002-GW-029	BRLTN02-003-GW-032
Date Collected		04/20/17	04/21/17	04/21/17
Depth (ft. btoc)		27	29	32
Analyte	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane sulfonate (PFBS)	400[a]	**0.25 J**	**0.47**	**0.14**
Perfluorooctanoic acid (PFOA)	0.02[b]	**0.23**	**0.50**	**0.28**
Perfluorooctane sulfonate (PFOS)	0.02[b]	**14**	**54**	**9.2**
PFOS +PFOA	0.02[b]	**14.23**	**54.5**	**9.48**

Bold values indicate analyte detected at concentration indicated.
Shaded values indicate analyte exceeds screening criteria.
[a]EPA Regional Screening Levels for Residential Soil (November 2017) (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017)
[b]Vermont Department of Environmental Conservation, December 2016. Chapter 12 of the Environmental Protection Rules, "Groundwater Protection Rule and Strategy."
µg/L = micrograms per liter
BRLTN = Burlington Air National Guard Base
btoc = below top of casing
ft. = foot or feet
GW = groundwater
ID = identification
J = reported concentration is an estimated value

Sediment

One sediment sample was collected from a drainage ditch approximately 960 feet east/northeast of Building 90 at BRLTN02-004. PFOS was detected in the sample at a concentration of 2.3 µg/kg, below the 1,260 µg/kg screening level. PFBS and PFOA were not detected. Analytical results are summarized in Table 10 and shown on Figure 10 in Appendix A.

Surface Water

One surface water sample was also collected from the drainage ditch east/northeast of Building 90 at BRLTN02-004. PFBS was detected at a concentration of 0.035 µg/L, below the 400 µg/L screening level. PFOS was detected at a concentration of 0.081 µg/L, above the 0.02 µg/L screening level; PFOA was not detected. Analytical results are summarized in Table 11 and shown on Figure 11 in Appendix A.

Table 10 Building 90 Former Fire Station Location (AFFF Area 2) Sediment Analytical Results

	Sample ID	BRLTN02-004-SD-001
	Date Collected	04/18/17
	Depth (ft. bgs)	0 - 0.5
Analyte	Screening Level (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	1,300,000[a]	0.72 U
Perfluorooctanoic acid (PFOA)	300[b]	0.72 U
Perfluorooctane sulfonate (PFOS)	1,260[c]	**2.3**

Bold values indicate analyte detected at concentration indicated.
[a]EPA Regional Screening Levels (RSLs) for Residential Soil (November 2017) (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017).
[b]Vose, Sarah. Memorandum to Chuck Schwer, March 2016. *Perfluorooctanoic acid (PFOA) Soil Screening Value.*
[c]Screening level calculated using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram
BRLTN = Burlington Air National Guard Base
ID = identification
U = analyte was not detected above the reported value
bgs = feet below ground surface
ft. = foot or feet
SD = sediment

Table 11 Building 90 Former Fire Station Location (AFFF Area 2)
Surface Water Analytical Results

	Sample ID	BRLTN02-004-SW-001
	Date Collected	04/18/17
Analyte	Screening Level (µg/L)	Result (µg/L)
Perfluorobutane sulfonate (PFBS)	400[a]	**0.035**
Perfluorooctanoic acid (PFOA)	0.02[b]	0.010 U
Perfluorooctane sulfonate (PFOS)	0.02[b]	**0.081**
PFOS +PFOA	0.02[b]	**0.081**

Bold values indicate analyte detected at concentration indicated.
Shaded values indicate analyte exceeds screening criteria.
[a]EPA Regional Screening Levels for Residential Soil (November 2017) [https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017]
[b]Vermont Department of Environmental Conservation, December 2016. Chapter 12 of the Environmental Protection Rules, "Groundwater Protection Rule and Strategy."
µg/L = micrograms per liter
ID = identification
U = analyte was not detected above the reported value
BRLTN = Burlington Air National Guard
SW = surface water

3.2.5 Conclusions

Apparent AFFF spills at the former fire station have resulted in releases of PFAS to the environment. Combined PFOA and PFOS concentrations were above screening levels in each of the three groundwater samples and in the one surface water sample collected. The maximum combined PFOA and PFOS concentration was 54.5 µg/L in groundwater and 0.081 µg/L in surface water. PFOA and PFOS concentrations in soil and sediment were below screening levels, and PFBS was not detected above screening levels in any sampled media at AFFF Area 2. The location of sediment and surface water sample BRLTN02-004 is within the limits of the IRP Site 4 (Drainage Ditch Area) remedial action area, and the sediment sample represents backfill and sediment deposition since 2012.

3.3 BUILDING 60 CURRENT FIRE STATION – AFFF AREA 3

3.3.1 Sample Locations

To assess possible PFAS impacts from the release of approximately 1/2 gallon of AFFF at the fire station, two surface soil samples, two subsurface soil samples, two groundwater samples, one sediment sample, and one surface water sample were collected. Surface soil and subsurface soil samples were collected from soil borings BRLTN03-001 and BRLTN03-002 on the north side of Building 60 in the grassed area, where the spilled AFFF was rinsed. Groundwater samples were collected from temporary wells installed at each soil boring. Sediment and surface water samples were collected at BRLTN03-003, where storm water from the fire station discharges to a drainage ditch approximately 300 feet to the northeast across NCO Drive. Sample locations are shown on Figure 5 in Appendix A.

3.3.2 Lithology

The two soil borings completed at AFFF Area 3 were terminated at a depth of 25 feet bgs. Soils encountered included silty sand (USCS – SM) well-graded sand (USCS – SW), poorly graded sand (USCS – SP), and sandy silt (USCS – ML). Detailed boring logs are included in Appendix C.

3.3.3 Groundwater Flow

On April 21, 2017, groundwater level measurements were collected from the two temporary monitoring wells at the current fire station (BRLTN03-001 and BRLTN03-002). Total depth of each well was 25 feet bgs, and groundwater was detected at 18.87 feet and 18.35 feet btoc, respectively. Based on these water level measurements (and water levels collected from adjacent AFFF Area 2), groundwater flows to the east/ northeast as shown on Figure 5 in Appendix A. Water level measurements and groundwater elevations are summarized in Table G-1 in Appendix G.

3.3.4 Analytical Results

Surface Soil
Two surface soil samples were collected from soil borings BRLTN03-001 and BRLTN03-002 at Building 60. PFBS was detected in both samples at estimated concentrations of 0.32 µg/kg and 0.71 µg/kg. PFOA was detected at estimated concentrations of 1.5 µg/kg and 0.92 µg/kg, and PFOS was detected at concentrations of 280 µg/kg and 170 µg/kg. All PFBS, PFOA, and PFOS detections were below their respective screening levels, as summarized in Table 12 and shown on Figure 12 in Appendix A.

Subsurface Soil
Two subsurface soil samples were also collected from soil borings BRLTN03-001 and BRLTN03-002 at Building 60. PFBS was in both samples at estimated concentrations of 0.37 µg/kg and 0.49 µg/kg. PFOA was detected at concentrations of 1.0 µg/kg and an estimated 0.54 µg/kg, and PFOS was detected at concentrations of 140 µg/kg and 110 µg/kg. All PFBS, PFOA, and PFOS detections were below their respective screening levels, as summarized in Table 13 and shown on Figure 12 in Appendix A.

Table 12 Building 60 Current Fire Station (AFFF Area 3) Surface Soil Analytical Results

	Sample ID	BRLTN03-001-SS-001	BRLTN03-002-SS-001
	Date Collected	04/18/17	04/18/17
	Depth (ft. bgs)	0 - 0.5	0 - 0.5
Analyte	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	1,300,000[a]	**0.32 J**	**0.71 J**
Perfluorooctanoic acid (PFOA)	300[b]	**1.5 J**	**0.92 J**
Perfluorooctane sulfonate (PFOS)	1,260[c]	**280**	**170**

Bold values indicate analyte detected at concentration indicated.
[a]EPA Regional Screening Levels (RSLs) for Residential Soil (November 2017) [https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017]
[b]Vose, Sarah, State Toxicologist, Vermont Department of Health. Memorandum to Chuck Schwer, Director of Waste Management, Vermont Department of Environmental Conservation, March 2016. *Perfluorooctanoic acid (PFOA) Soil Screening Value.*
[c]Screening level calculated using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/L = micrograms per liter
BRLTN = Burlington Air National Guard
ID = identification
SS = surface soil
bgs = below ground surface
ft. = foot or feet
J = reported concentration is an estimated value

Table 13 Building 60 Current Fire Station AFFF Area 3 Subsurface Soil Analytical Results

	Sample ID	BRLTN03-001-SO-014	BRLTN03-002-SO-015
	Date Collected	04/18/17	04/18/17
	Depth (ft. bgs)	13 - 14	14 - 15
Analyte	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	1,300,000[a]	**0.37 J**	**0.49 J**
Perfluorooctanoic acid (PFOA)	300[b]	**1.0**	**0.54 J**
Perfluorooctane sulfonate (PFOS)	1,260[c]	**140**	**110**

Bold values indicate analyte detected at concentration indicated.
[a]EPA Regional Screening Levels (RSLs) for Residential Soil (November 2017) (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017)
[b]Vose, Sarah. Memorandum to Chuck Schwer, March 2016. *Perfluorooctanoic acid (PFOA) Soil Screening Value.*
[c]Screening level calculated using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram
BRLTN = Burlington Air National Guard Base
ID = identification
SO = subsurface soil
bgs = below ground surface
ft. = foot or feet
J = reported concentration is an estimated value

Soil Physiochemical Analyses

To provide basic soil parameter information, composite surface soil and subsurface soil samples were collected from Building 60 soil borings and submitted for pH, TOC, and grainsize analysis. The surface soil sample (BRLTN03-004-SS-001) was composed of equal aliquots of soil collected from borings BRLTN03-001 and BRLTN03-002 at 6 inches bgs. The subsurface soil sample (BRLTN03-004-SO-016) was composed of equal aliquots of soil collected from the same borings at 14 feet and 15 feet bgs, respectively. Table F-1 summarizing the physiochemical data and supporting laboratory data sheets are included in Appendix F.

Groundwater

Two groundwater samples were also collected from temporary wells installed at borings BRLTN03-001 and BRLTN03-002 at the current fire station. PFBS was detected in both samples at concentrations of 2.5

µg/L and 1.8 µg/L, below the 400 µg/L screening level. PFOA and PFOS were detected at combined concentrations of 62 µg/L and 66.97 µg/L, above the 0.02 µg/L screening level. Groundwater analytical results are summarized in Table 14 and shown on Figure 13 in Appendix A.

Table 14 Building 60 Current Fire Station (AFFF Area 3) Groundwater Analytical Results

	Sample ID	BRLTN03-001-GW-022	BRLTN03-002-GW-022
	Date Collected	04/20/17	04/20/17
	Depth (ft. btoc)	22	22
Analyte	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane sulfonate (PFBS)	400[a]	**2.5**	**1.8**
Perfluorooctanoic acid (PFOA)	0.02[b]	**2.0**	**0.97**
Perfluorooctane sulfonate (PFOS)	0.02[b]	**60**	**66**
PFOS +PFOA	0.02[b]	**62**	**66.97**

Bold values indicate analyte detected at concentration indicated.
Shaded values indicate analyte exceeds screening criteria.
[a]EPA Regional Screening Levels for Residential Soil (November 2017) [https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017]
[b]Vermont Department of Environmental Conservation, December 2016. Chapter 12 of the Environmental Protection Rules, *"Groundwater Protection Rule and Strategy."*
µg/L = micrograms per liter
BRLTN = Burlington Air National Guard
btoc = feet below top of casing
ft. = foot or feet
GW = groundwater
ID = identification

Sediment

One sediment sample was collected from a drainage ditch approximately 300 feet northeast of Building 60 at BRLTN03-003. PFBS was detected in the sample at an estimated concentration of 0.43 µg/kg, and PFOS was detected at a concentration of 63 µg/kg, both below their respective screening levels. PFOA was not detected in the sample. Analytical results are summarized in Table 15 and shown on Figure 12 in Appendix A.

Table 15 Building 60 Current Fire Station (AFFF Area 3) Sediment Analytical Results

	Sample ID	BRLTN03-003-SD-001
	Date Collected	04/18/17
	Depth (ft. bgs)	0 - 0.5
Analyte	Screening Level (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	1,300,000[a]	**0.43 J**
Perfluorooctanoic acid (PFOA)	300[b]	0.66 U
Perfluorooctane sulfonate (PFOS)	1,260[c]	**63**

Bold values indicate analyte detected at concentration indicated.
[a]EPA Regional Screening Levels (RSLs) for Residential Soil (November 2017) [https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017]
[b]Vose, Sarah, State Toxicologist, Vermont Department of Health. Memorandum to Chuck Schwer, Director of Waste Management, Vermont Department of Environmental Conservation, March 2016. *Perfluorooctanoic acid (PFOA) Soil Screening Value.*
[c]Screening level calculated using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram
bgs = below ground surface
BRLTN = Burlington Air National Guard
ID = identification
J = reported concentration is an estimated value
SD = sediment
U = analyte was not detected above the reported value

Surface Water

A surface water sample was also collected from the drainage ditch northeast of Building 60 at BRLTN03-003. PFBS was detected in the sample at an estimated concentration of 0.19 µg/L, below the 400 µg/L screening level. PFOA and PFOS were detected at an estimated combined concentration of 13.096 µg/L, above the 0.02 µg/L screening level. Analytical results are summarized in Table 16 and shown on Figure 13 in Appendix A.

Table 16 Building 60 Current Fire Station (AFFF Area 3) Surface Water Analytical Results

	Sample ID	BRLTN03-003-SW-001
	Date Collected	04/18/17
Analyte	Screening Level (µg/L)	Result (µg/L)
Perfluorobutane sulfonate (PFBS)	400[a]	**0.19 J**
Perfluorooctanoic acid (PFOA)	0.02[b]	**0.096 J**
Perfluorooctane sulfonate (PFOS)	0.02[b]	**13**
PFOS +PFOA	0.02[b]	**13.096 J**

Bold values indicate analyte detected at concentration indicated.
Shaded values indicate analyte exceeds screening criteria.
[a]EPA Regional Screening Levels for Residential Soil (November 2017) (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017)
[b]Vermont Department of Environmental Conservation, December 2016. Chapter 12 of the Environmental Protection Rules, "Groundwater Protection Rule and Strategy."
µg/L = micrograms per liter
BRLTN = Burlington Air National Guard
ID = identification
J = reported concentration is an estimated value
SW = surface water

3.3.5 Conclusions

At least one documented AFFF spill at the current fire station has resulted in a release of PFAS to the environment. Combined PFOA and PFOS concentrations were above screening levels in both groundwater samples and the surface water sample. The maximum combined PFOA and PFOS concentration was 66.97 µg/L in groundwater and an estimated 13.096 µg/L in surface water. PFOA and PFOS concentrations in soil and sediment were below screening levels, and PFBS was not detected above screening levels in any sampled media at AFFF Area 3.

3.4 Fire Department Equipment Testing Area – AFFF Area 4

3.4.1 Sample Locations

To assess possible PFAS impacts from the release of AFFF during annual firefighting equipment testing, four surface soil samples, four subsurface soil samples, and five groundwater samples (four primary and one duplicate) were collected. Surface soil and subsurface soil samples were collected from soil boring BRLTN04-001 on the upgradient side of the area (southwest of Taxiway F) and from BRLTN04-002, BRLTN04-003, and BRLTN04-004 on the downgradient side (northeast of Taxiway F). Groundwater samples were collected from each boring; however, because of access limitations on the airfield, grab samples were collected from SP16 drive point samplers rather than by installing temporary monitoring wells. Sample locations are shown on Figure 6 in Appendix A.

3.4.2 Lithology

The four soil borings completed at AFFF Area 4 were terminated at depths ranging from 15 to 20 feet bgs. Soils encountered in these borings included silty sand (USCS – SM), well-graded sand (USCS – SW), and poorly graded sand (USCS – SP). Detailed boring logs are included in Appendix C.

3.4.3 Groundwater Flow

Temporary monitoring wells could not be installed at AFFF Area 4 because of airfield access limitations; therefore, groundwater flow direction could not be determined during this sampling event. Area 4 boring logs indicate groundwater was detected between 10 and 14 feet bgs during drilling. Based on groundwater flow determinations at nearby AFFF Areas 2 and 3 on April 21, 2017, it is anticipated that groundwater at the testing area also flows to the northeast as shown on Figure 6 in Appendix A.

3.4.4 Analytical Results

Surface Soil

Four surface soil samples were collected from soil borings BRLTN04-001 through BRLTN04-004 at the fire department equipment test area. PFBS was not detected in the samples. PFOA was detected in three samples at concentrations ranging from an estimated 0.71 µg/kg to 1.8 µg/kg. PFOS was detected in all four samples at estimated concentrations ranging from 4.3 µg/kg to 42 µg/kg. All PFBS, PFOA, and PFOS detections were below their respective screening levels, as summarized in Table 17 and shown on Figure 14 in Appendix A.

Table 17 Fire Department Equipment Test Area (AFFF Area 4) Surface Soil Analytical Results

	Sample ID	BRLTN04-001-SS-001	BRLTN04-002-SS-001	BRLTN04-003-SS-001	BRLTN04-004-SS-001
	Date Collected	04/20/17	04/20/17	04/20/17	04/20/17
	Depth (ft. bgs)	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
Analyte	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	1,300,000[a]	0.53 UJ	0.60 UJ	0.60 U	0.53 UJ
Perfluorooctanoic acid (PFOA)	300[b]	0.53 UJ	**0.71 J**	**1.8**	**0.94 J**
Perfluorooctane sulfonate (PFOS)	1,260[c]	**4.3 J**	**42 J**	**36**	**18 J**

Bold values indicate analyte detected at concentration indicated.
[a]EPA Regional Screening Levels (RSLs) for Residential Soil (November 2017) (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017).
[b]Vose, Sarah. Memorandum to Chuck Schwer, March 2016. *Perfluorooctanoic acid (PFOA) Soil Screening Value.*
[c]Screening level calculated using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram
BRLTN = Burlington Air National Guard
ID = identification
SS = surface soil
bgs = below ground surface
ft. = foot or feet
J = reported concentration is an estimated value
U = analyte was not detected above the reported value

Subsurface Soil

Four subsurface soil samples were collected from soil borings BRLTN04-001 through BRLTN04-004. PFBS was not detected in the samples. PFOA was detected in one sample (at BRLTN04-002) at an

estimated concentration of 0.46 µg/kg. PFOS was detected in three samples at concentrations ranging from an estimated 6.0 µg/kg to 800 µg/kg. All PFOA and PFOS detections were below their respective screening levels, as summarized in Table 18 and shown on Figure 14 in Appendix A.

Table 18 Fire Department Equipment Test Area (AFFF Area 4) Subsurface Soil Analytical Results

	Sample ID	BRLTN04-001-SO-009	BRLTN04-002-SO-010	BRLTN04-003-SO-011	BRLTN04-004-SO-013
	Date Collected	04/20/17	04/20/17	04/20/17	04/20/17
	Depth (ft. bgs)	8 – 9	9 - 10	10 - 11	12 - 13
Analyte	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	1,300,000[a]	0.66 UJ	0.56 U	0.60 UJ	0.60 UJ
Perfluorooctanoic acid (PFOA)	300[b]	0.66 UJ	**0.46 J**	0.60 UJ	0.60 UJ
Perfluorooctane sulfonate (PFOS)	1,260[c]	0.66 UJ	**800**	**40 J**	**6.0 J**

Bold values indicate analyte detected at concentration indicated.
[a]EPA Regional Screening Levels (RSLs) for Residential Soil (November 2017) (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017).
[b]Vose, Sarah. Memorandum to Chuck Schwer, March 2016. *Perfluorooctanoic acid (PFOA) Soil Screening Value.*
[c]Screening level calculated using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram
ft. = foot or feet
J = reported concentration is an estimated value
U = analyte was not detected above the reported value
bgs = below ground surface
ID = identification
SO = subsurface soil

Soil Physiochemical Analyses

To provide basic soil parameter information, composite surface soil and subsurface soil samples were collected from AFFF Area 4 soil borings and submitted for pH, TOC, and grainsize analysis. The surface soil sample (BRLTN04-005-SS-001) was composed of equal aliquots of soil collected from borings BRLTN04-001 through BRLTN04-004 at 6 inches bgs. The subsurface soil sample (BRLTN04-005-SO-012) was composed of equal aliquots of soil collected from the same borings at depths ranging from 9 feet to 13 feet. Table F-1 summarizing the physiochemical data and supporting laboratory data sheets are included in Appendix F.

Groundwater

Four primary groundwater samples and one duplicate sample were also collected from soil borings BRLTN04-001 through BRLTN04-004 using an SP16 drive point sampler. PFBS was detected in all five samples at concentrations ranging from an estimated 0.0052 µg/L to 0.044 µg/L, below the 400 µg/L screening level. PFOA and PFOS were also detected in all five samples at combined concentrations ranging from an estimated 0.0641 µg/L to 0.322 µg/L, above the 0.020 µg/L screening level. PFBS, PFOA, and PFOS analytical results are summarized in Table 19 and shown on Figure 15 in Appendix A.

3.4.5 Conclusions

Annual testing of fire equipment using AFFF has resulted in releases of PFAS to the environment at the test area on Taxiway F. Combined PFOA and PFOS concentrations exceeded the screening level in each of five samples collected (four primary and one duplicate) with a maximum concentration of 0.322 µg/L. PFOA and PFOS concentrations in soil and sediment samples were below screening levels, and PFBS was not detected above screening levels in any sampled media at AFFF Area 4.

Table 19 Fire Department Equipment Test Area (AFFF Area 4) Groundwater Analytical Results

	Sample ID	BRLTN04-001-GW-013	BRLTN04-002-GW-018	BRLTN04-003-GW-018	BRLTN04-004-GW-018	BRLTN04-004-GW-918 (dup)
	Date Collected	04/20/17	04/20/17	04/20/17	04/20/17	04/20/17
	Depth (ft. bgs)	13	18	18	18	18
Analyte	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane sulfonate (PFBS)	400[a]	**0.013 J**	**0.0052 J**	**0.016 J**	**0.039**	**0.044**
Perfluorooctanoic acid (PFOA)	0.02[b]	**0.084**	**0.0081 J**	**0.023**	**0.061**	**0.062**
Perfluorooctane sulfonate (PFOS)	0.02[b]	**0.10**	**0.056**	**0.24**	**0.26**	**0.26**
PFOS +PFOA	0.02[b]	**0.184**	**0.0641 J**	**0.263**	**0.321**	**0.322**

Bold values indicate analyte detected at concentration indicated.
Shaded values indicate analyte exceeds screening criteria.
[a]EPA Regional Screening Levels for Residential Soil (November 2017) (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017).
[b]Vermont Department of Environmental Conservation, December 2016. Chapter 12 of the Environmental Protection Rules, *"Groundwater Protection Rule and Strategy."*
µg/L = micrograms per liter
BRLTN = Burlington Air National Guard Base
ft. = foot or feet
ID = identification
bgs = below ground surface
dup = field duplicate
GW = groundwater
J = reported concentration is an estimated value

3.5 F-16 EMERGENCY RESPONSE SITE – AFFF AREA 5

3.5.1 Sample Locations

To assess possible PFAS impacts from the use of AFFF to extinguish an F-16 fire, four surface soil samples (three primary and one duplicate), four subsurface soil samples (three primary and one duplicate), and three groundwater samples (two primary and one duplicate) were collected. Surface soil and subsurface soil samples were collected from soil boring BRLTN05-001 on the upgradient side of the area (southwest of Runway 15/33) and from BRLTN05-002 and BRLTN05-003 on the downgradient side (northeast side of Runway 15/33). Groundwater samples were collected from borings BRLTN05-001 and BRLTN05-002, however, because of access limitations on the airfield, grab samples were collected using SP16 drive point samplers rather than temporary monitoring wells. A groundwater sample could not be collected from boring BRLTN05-003 because the boring refused at a depth of 28 feet before encountering groundwater. Sample locations are shown on Figure 7 in Appendix A.

3.5.2 Lithology

The three soil borings completed at AFFF Area 5 were terminated at depths ranging from 19 to 36 feet bgs. Soils encountered at these borings included silty sand (USCS – SM), well-graded sand (USCS – SW), poorly graded sand (USCS – SP), silty clay (USCS – CL), and silt (USCS – ML). Detailed boring logs are included in Appendix C.

3.5.3 Groundwater Flow

Temporary monitoring wells could not be installed at AFFF Area 5 because of airfield access limitations; therefore, groundwater flow direction could not be verified. Area 5 boring logs indicate groundwater was detected at 19 feet bgs at BRLTN05-001 and 36 feet in BRLTN05-002 during drilling. Based on groundwater level measurements collected in 2010 in other nearby areas (CH2MHill, March 2010), groundwater likely flows north/northeast as shown on Figure 7 in Appendix A.

3.5.4 Analytical Results

Surface Soil

Three primary surface soil samples and one duplicate sample were collected from soil borings BRLTN05-001 through BRLTN05-003 at AFFF Area 5. PFBS and PFOA were not detected in the samples. PFOS was detected in all four samples at estimated concentrations ranging from 0.78 µg/kg to 2.7 µg/kg, below the 1,260 µg/kg screening level. PFBS, PFOA, and PFOS analytical results are summarized in Table 20 and shown on Figure 16 in Appendix A.

Subsurface Soil

Three primary subsurface soil samples and one duplicate sample were collected from soil borings BRLTN05-001 through BRLTN05-003. PFBS, PFOA, and PFOS were not detected in the samples. Subsurface soil analytical results are summarized in Table 21 and shown on Figure 16 in Appendix A.

Table 20 F-16 Emergency Response (AFFF Area 5) Surface Soil Analytical Results

	Sample ID	BRLTN05-001-SS-001	BRLTN05-001-SS-901 (dup)	BRLTN05-002-SS-001	BRLTN05-003-SS-001
	Date Collected	04/19/17	04/19/17	04/19/17	04/19/17
	Depth (ft. bgs)	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
Analyte	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	1,300,000[a]	0.58 UJ	0.59 UJ	0.52 U	0.49 UJ
Perfluorooctanoic acid (PFOA)	300[b]	0.58 U	0.59 UJ	0.52 U	0.49 UJ
Perfluorooctane sulfonate (PFOS)	1,260[c]	**0.78 J**	**0.97 J**	**1.2**	**2.7 J**

Bold values indicate analyte detected at concentration indicated.
[a]EPA Regional Screening Levels for Residential Soil (November 2017) (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017).
[b]Vose, Sarah. Memorandum to Chuck Schwer, March 2016. *Perfluorooctanoic acid (PFOA) Soil Screening Value.*
[c]Screening level calculated using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram
BRLTN = Burlington Air National Guard Base
ft. = foot or feet
J = reported concentration is an estimated value
U = analyte was not detected above the reported value
bgs = below ground surface
dup = field duplicate
ID = identification
SS = surface soil

Table 21 F-16 Emergency Response (AFFF Area 5) Subsurface Soil Analytical Results

	Sample ID	BRLTN05-001-SO-014	BRLTN05-002-SO-028	BRLTN05-002-SO-928 (dup)	BRLTN05-003-SO-032
	Date Collected	04/19/17	04/19/17	04/19/17	04/19/17
	Depth (ft. bgs)	13 - 14	27 - 28	27 - 28	31 - 32
Analyte	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	1,300,000[a]	0.60 UJ	0.60 UJ	0.60 UJ	0.60 UJ
Perfluorooctanoic acid (PFOA)	300[b]	0.60 UJ	0.60 UJ	0.60 UJ	0.60 UJ
Perfluorooctane sulfonate (PFOS)	1,260[c]	0.60 UJ	0.60 UJ	0.60 UJ	0.60 UJ

Bold values indicate analyte detected at concentration indicated.
[a]EPA Regional Screening Levels (RSLs) for Residential Soil (November 2017) (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017).
[b]Vose, Sarah. Memorandum to Chuck Schwer, Director of Waste Management, Vermont Department of Environmental Conservation, March 2016. *Perfluorooctanoic acid (PFOA) Soil Screening Value.*
[c]Screening level calculated using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram
BRLTN = Burlington Air National Guard Base
ft. = foot or feet
J = reported concentration is an estimated value
U = analyte was not detected above the reported value.
bgs = below ground surface
dup = field duplicate
ID = identification
SO = subsurface soil

Soil Physiochemical Analyses

To provide basic soil parameter information, composite surface soil and subsurface soil samples were collected from AFFF Area 5 soil borings and submitted for pH, TOC, and grainsize analysis. The surface soil sample (BRLTN05-004-SS-001) was composed of equal aliquots of soil collected from borings BRLTN05-001, BRLTN05-002, and BRLTN05-003 at 6 inches bgs. The subsurface soil sample

(BRLTN05-004-SO-024) was composed of equal aliquots of soil collected from the same borings at depths of 14 feet, 28 feet, and 32 feet, respectively. Table F-1 summarizing the physiochemical data and supporting laboratory data sheets are included in Appendix F.

Groundwater

Two primary groundwater samples and one duplicate sample were collected from soil borings BRLTN05-001 and BRLTN05-002 using a drive point sampler. PFBS was detected in all three samples at estimated concentrations ranging from 0.0062 µg/L to 0.016 µg/L, below the 400 µg/L screening level. PFOA and PFOS were also detected in all three samples at estimated combined concentrations ranging from 0.028 µg/L to 0.294 µg/L, all above the 0.02 µg/L screening level.

The analytical results for each of the three groundwater samples at AFFF Area 5 were qualified during the quality control process ("J flagged") by the validator, indicating estimated but usable data. PFOA and PFOS results for sample BRLTN05-001-GW-017 and BRLTN05-002-GW-933 were flagged because of low surrogate recoveries in laboratory control samples. The PFOA and PFOS results for sample BRLTN05-002-GW-033 were flagged because the results were below the limit of quantification (LOQ). Low surrogate recoveries indicate a potentially biased low result; however, the analytes were detected at concentrations above screening levels (either individually or when combined), indicating a release has occurred based on the reported concentrations. Similarly, when results were below the LOQ, the combined value also exceeded the screening level.

PFBS, PFOA, and PFOS groundwater analytical results are summarized in Table 22 and shown on Figure 17 in Appendix A.

Table 22 F-16 Emergency Response (AFFF Area 5) Groundwater Analytical Results

	Sample ID	BRLTN05-001-GW-017	BRLTN05-002-GW-033	BRLTN05-002-GW-933 (dup)
	Date Collected	04/19/17	04/19/17	04/19/17
	Depth (ft. bgs)	17	33	33
Analyte	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane sulfonate (PFBS)	400[a]	**0.0062 J**	**0.016 J**	**0.012 J**
Perfluorooctanoic acid (PFOA)	0.02[b]	**0.054 J**	**0.017 J**	**0.021 J**
Perfluorooctane sulfonate (PFOS)	0.02[b]	**0.24 J**	**0.011 J**	**0.020 J**
PFOS +PFOA	0.02[b]	**0.294 J**	**0.028 J**	**0.041 J**

Bold values indicate analyte detected at concentration indicated.
Shaded values indicate analyte exceeds screening criteria.
[a]EPA Regional Screening Levels for Residential Soil (November 2017) (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017).
[b]Vermont Department of Environmental Conservation, December 2016. Chapter 12 of the Environmental Protection Rules, "Groundwater Protection Rule and Strategy."
µg/L = micrograms per liter
BRLTN = Burlington Air National Guard Base
ft. = foot or feet
ID = identification
bgs = below ground surface
dup = field duplicate
GW = groundwater
J = reported concentration is an estimated value

3.5.5 Conclusions

Use of AFFF during an F-16 emergency response has resulted in a release of PFAS to the environment near the cable arrest system on the runway. PFOA and PFOS concentrations in soil and sediment were below screening levels. Combined PFOA and PFOS concentrations exceeded the screening level in each

of the three groundwater samples collected (two primary and one duplicate) with a maximum estimated concentration of 0.294 µg/L. PFBS was not detected above screening levels in any sampled media at AFFF Area 5.

3.6 INVESTIGATION-DERIVED WASTE

3.6.1 Waste Soil

Waste soil generated during the installation of soil borings was placed in two Department of Transportation (DOT)-approved steel drums and staged at AFFF Area 1 for waste sampling and proper disposal. A representative sample was collected from the waste soil, submitted to the project laboratory, and analyzed for PFAS and Toxicity Characteristic Leaching Procedure (TCLP) for VOCs, SVOCs, pesticides, herbicides, metals, polychlorinated biphenyls, total petroleum hydrocarbons, flashpoint, corrosivity (pH), sulfide, and cyanide. The analytical results will be used to develop a waste profile and shipping manifest. Final disposal of investigation-derived waste (IDW) will be determined at that time. Waste manifests will be included in Appendix E.

3.6.2 Wastewater

Wastewater generated during groundwater sampling and decontamination activities was placed in one DOT-approved steel drum and staged at AFFF Area 1 for waste sampling and proper disposal. A representative sample was collected from the waste fluids and submitted to the project laboratory to be analyzed for PFAS and the full TCLP list. The analytical results will be used to develop a waste profile and shipping manifest. Final disposal of IDW will be determined at that time. Waste manifests will be included in Appendix E.

3.6.3 General Waste

General waste – such as paper, plastic, trash, and personal protective equipment – was placed in plastic garbage bags and placed in an on-site dumpster for disposal at an off-site Resource Conservation and Recovery Act Subtitle D industrial landfill.

4.0 GROUNDWATER PATHWAY

The objective of groundwater sampling during the SI was to determine if groundwater in the individual areas had been impacted by the release of AFFF and whether concentrations of PFBS, PFOA, and PFOS remain in groundwater at concentrations exceeding the calculated human health-based screening levels.

Burlington Air National Guard Base Hydrogeology
The uppermost water-bearing zone at Burlington ANG occurs under unconfined (water table) conditions in deltaic glaciofluvial sands and silts. This surficial water-bearing zone is underlain by a potentially confining to semiconfining lacustrine clay layer present across much of the Base. A second deeper water-bearing zone occurs within glacial till and the underlying limestone and marble bedrock of the Ordovician Bascom Formation bedrock. A generalized stratigraphic column is included as Figure 18 in Appendix A.

The vertical hydraulic gradient at the Base is generally downward and the till/bedrock aquifer appears to be connected hydraulically to the overlying surficial aquifer. Shallow groundwater generally flows to the northeast toward (and may discharge to) the Winooski River (Roy F. Weston, Inc., March 1986; Earth Technology, May 1991; HAZWRAP, August 1997; Parsons, June 2002; CH2MHill, March 2010; ANG,

December 2011). Slug testing conducted at IRP Site 1 (AFFF Area 1) has indicated hydraulic conductivities ranging from 0.056 feet per day (Earth Technology, May 1991) to 7.87 feet per day (Parsons, June 2002). Depths to groundwater in overburden wells vary from less than 5 feet to more than 60 feet bgs (CH2MHill, March 2010).

The bedrock surface in the vicinity of the Base is irregular and ranges from surface outcrops (off-Base north of AFFF Area 1) to more than 80 feet bgs (HAZWRAP, August 1997). Bedrock groundwater primarily occurs within the carbonate solution features, faults, and fractures. Local bedrock wells have water yields ranging from 6 to 40 gallons per minute. The Vermont Department of Water Resources has classified the bedrock groundwater in the area of Burlington ANG Base as Class III water resource suitable for domestic water supply, irrigation, agricultural use, and general industrial and commercial use. The Base and surrounding areas purchase potable water from the Champlain Water District, which obtains its public water supply from Lake Champlain. No groundwater supply wells are on the Base.

Although several drinking water wells, owned by either private or local government entities, were identified within a 4-mile radius of the approximate center point of the Base, none appear to be downgradient from the Base (CH2MHill, October 2015; Vermont Natural Resources, September 2017).

Six documented private bedrock water wells (Well Nos. 6, 58, 59, 93, 205, and 223) are within an approximate 1-mile radius of the center of the Base as shown on Figure 19 and in Table 23. Wells 58 and 59 are within ¼ mile of the northern boundary of the Base (north of and sidegradient to AFFF Area 1). Well No. 58 is listed as a domestic well, and Well No. 59 is listed as an agricultural well in the Vermont Well Completion Searchable Database. Well No. 6 (listed as a domestic well in the database) is in a residential area southwest of the airport and approximately ½ mile southwest of (and upgradient from) the Base boundary. It is unknown if Well #6 is in use or how water from the well is used. The remaining wells (93, 205, and 223) are east of the Winooski River and are also listed as domestic wells in the database (Vermont Department of Conservation, October 2017; Vermont Agency of Natural Resources, September 2017). Groundwater flow in the area of these wells is expected to be to the south toward the Winooski River.

Table 23 Summary of Private Wells within Approximately 1 Mile of Burlington ANG Base

Well Number	Well Type	Well Depth (feet)	Casing Length (feet)	Depth to Bedrock (feet)	Well Yield (gpm)	Screened Interval	Year Completed
6	Domestic	158	111	100	4	Open hole	1968
58	Domestic	374	94	92	25	Open hole	1983
59	Agricultural	128	102	93	40	Open hole	1983
93	Domestic	143	69	64	7	Open hole	1975
205	Domestic	468	33	27	30	Open hole	1980
223	Domestic	243	68	61	6	Open hole	1981

Notes: Well data from available (post-1965) Vermont Department of Conservation water well completion reports. Listed wells are within an approximate 1-mile radius of the center of the Base.
gpm = gallons per minute

Wells #58 and #59 are on a dairy farm north of the Base and south of the Winooski River. Information provided by the Base indicates that VDEC personnel collected a water sample from a tap in a barn adjacent to the location shown by VDEC as Well #58. However, VDEC could not confirm the identification of the well sampled. Well #58 is classified as “domestic” in the database but is primarily used for agricultural purposes. The well identified as Well #59 (classified as “agricultural”) could not be located and, according to the owner of the property, Well #59 does not exist, and there is no well at the location shown in the VDEC well database. Given these uncertainties, it is unclear which well (#58 or

#59) exists and was sampled. Preliminary unvalidated results for the sample collected by VDEC indicate elevated levels of PFOS; however, the final results for this sample are pending at the time of this report.

4.1 FORMER FIRE TRAINING AREA 1 (INSTALLATION RESTORATION PROGRAM SITE 1) – AFFF AREA 1

Shallow groundwater at FTA 1 flows to the northeast toward the Winooski River as shown on Figure 9 in Appendix A. Since installation of a groundwater collection trench in 2004 to address chlorinated VOCs (Parsons, August 2004), groundwater from FTA 1 has been collected in the trench and pumped to the WWTP. A pretreatment system was installed at FTA 1 in July 2017 by others to address PFOA and PFOS in groundwater (CH2MHill, June 2017). The previous permitted discharge to the WWTP was discontinued, and treated groundwater (below the Vermont enforcement standard of 0.02 µg/L) was directed to an existing infiltration gallery at the site. Shallow groundwater downgradient of the trench, beyond the influence of the collection trench, flows to the northeast toward the Winooski River.

Analytical results show that combined PFOA and PFOS concentrations in all eight groundwater samples collected at AFFF Area 1 were above the 0.02 µg/L screening level. PFOA and PFOS were detected in three groundwater samples collected at the source area at combined concentrations ranging from 5.7 µg/L in sample BRLTN01-002-GW-015 to 72 µg/L in sample BRLTN01-MW-BP3-012. PFOA and PFOS were also detected in three wells downgradient from the groundwater collection trench at combined concentrations ranging from 4.75 µg/L in sample BRLTN01-MW102-011 to 21.4 µg/L in duplicate sample BRLTN01-MW103-909. PFOA and PFOS were also detected in a sample collected from the collection trench sump (BRLTN01-TRENCHSUMP-001) at a concentration of 19.2 µg/L.

No public water supply wells and no known domestic drinking water wells are downgradient from FTA 1 between the area and the Winooski River, the presumed groundwater discharge point. However, given that Well #58 (north and sidegradient from AFFF Area 1) has been impacted by PFAS, the groundwater pathway (for impacted groundwater from the Base) may be complete. In addition, PFAS-impacted groundwater may be discharging to the Winooski River. The river is approximately 1,200 feet northeast of the collection trench, and the nearest impacted monitoring well (MW-102 with a combined PFOA and PFOS concentration 4.75 µg/L) is downgradient from the trench and approximately 750 feet southwest of the river.

4.2 BUILDING 90 FORMER FIRE STATION – AFFF AREA 2

Shallow groundwater at the former fire station flows to the east/northeast as shown on Figure 11 in Appendix A. As indicated on Figure 11 in Appendix A, PFOA and PFOS were detected in three groundwater samples above the 0.02 µg/L screening level, at combined concentrations ranging from 9.48 µg/L in sample BRLTN02-003-GW-032 to 54.5 µg/L in sample BRLTN02-002-GW-029.

No public water supply wells and no known domestic drinking water wells are downgradient from the former fire station between the area and the Winooski River, the presumed groundwater discharge point. Therefore, there are no immediate human exposure risks from the presence of PFOA and PFOS in shallow groundwater, and the human ingestion pathway is incomplete. PFAS-impacted groundwater may, however, be discharging to the Winooski River, approximately 2,100 feet to the northeast.

4.3 BUILDING 60 CURRENT FIRE STATION – AFFF AREA 3

Shallow groundwater at the current fire station flows to the east/northeast as shown on Figure 13 in Appendix A. Analytical results showed PFOA and PFOS were detected at combined concentrations above the 0.02 µg/L screening level in two groundwater samples collected at the fire station. Combined PFOA and PFOS concentrations were 62 µg/L in sample BRLTN03-001-GW-022 and 66.97 µg/L in sample BRLTN03-002-GW-022.

No public water supply wells and no known domestic wells are downgradient from the current fire station between the area and the Winooski River, the presumed groundwater discharge point. Therefore, despite the presence of PFOA and PFOS in shallow groundwater, the human ingestion pathway is incomplete. PFAS-impacted groundwater may, however, be discharging to the Winooski River, approximately 2,200 feet to the northeast.

4.4 FIRE DEPARTMENT EQUIPMENT TESTING AREA – AFFF AREA 4

Shallow groundwater at the fire department equipment testing area flows to the northeast as shown on Figure 15 in Appendix A. Analytical results showed PFOA and PFOS were detected above the 0.02 µg/L screening level in five groundwater samples collected at the equipment testing area at combined concentrations ranging from an estimated 0.0641 µg/L in sample BRLTN04-002-GW-018 to 0.322 µg/L in duplicate sample BRLTN04-004-GW-918.

No known domestic wells are downgradient from the fire department equipment testing area between the area and the Winooski River, the presumed groundwater discharge point. Therefore, despite the presence of PFOA and PFOS in shallow groundwater, the human ingestion pathway is incomplete. PFAS-impacted groundwater may, however, be discharging to the Winooski River, approximately 2,600 feet to the northeast.

4.5 F-16 EMERGENCY RESPONSE SITE – AFFF AREA 5

Shallow groundwater at the F-16 emergency response site flows to the north as shown on Figure 17 in Appendix A. Analytical results showed PFOA and PFOS were detected above the 0.02 µg/L screening level in three groundwater samples collected at the area at estimated combined concentrations ranging from 0.028 µg/L in sample BRLTN05-002-GW-033 to 0.294 µg/L in sample BRLTN05-001-GW-017.

No known domestic wells are directly downgradient from the F-16 emergency response site (between the site and the Winooski River to the north, the presumed groundwater discharge point). The nearest domestic well, Well #58, is approximately ½ mile northeast of Area 5 and down/side gradient of the area. Therefore, despite the presence of PFOA and PFOS in shallow groundwater, the human ingestion pathway is incomplete. PFAS-impacted groundwater may, however, be discharging to the Winooski River, approximately 4,100 feet to the north.

5.0 SURFACE WATER PATHWAY

The objective of surface water sampling during the SI was to determine if surface water in the individual areas had been impacted by the release of AFFF and whether concentrations of PFBS, PFOA, and PFOS remain in surface water at concentrations exceeding the calculated human health-based screening levels.

Surface water drainage at Burlington ANG Base occurs through numerous streams along the western and northern boundaries of the Burlington airport with predominant drainage northward to the Winooski

River. Muddy Brook flows along the eastern airport north boundary toward the Winooski River. Intermittent drainages may seasonally flow along the eastern airport boundary with discharge toward the Winooski River (ASL, August 2017). The PA (CH2MHill, October 2015) indicates surface water from each of the five AFFF areas ultimately discharges north toward the Winooski River.

The Winooski River empties into Lake Champlain, approximately 16 river miles downstream of the northwestern end of the Base. Although Lake Champlain is the primary source of drinking water for the Base and surrounding areas, there are no surface water intakes within 15 river miles downstream of the Base (Vermont Agency of Natural Resources, September 2017).

5.1 FORMER FIRE TRAINING AREA 1 (INSTALLATION RESTORATION PROGRAM SITE 1) – AFFF AREA 1

FTA 1 is relatively flat with both grassed and unvegetated bare areas. Surface runoff at FTA 1 occurs as sheet flow, primarily collecting in low areas or draining to the intermittent stream to the south and east. The intermittent stream channel is less than 2 feet wide and less than 0.5 feet deep and empties into a marshy area northeast of National Guard Avenue at Outfall SDO-002.

As shown on Figure 9 in Appendix A, one primary sample (BRLTN01-003-SW-001) and one duplicate surface water sample (BRLTN01-003-SW-901) were collected from the intermittent stream near Outfall SDO-002. PFOA and PFOS were detected above the 0.02 µg/L screening level in both samples at combined concentration of 35.3 µg/L and 38.4 µg/L respectively.

Surface water from FTA 1 does not appear to be directly discharging to the Winooski River. Surface water may, however, be infiltrating shallow groundwater. Further delineation is needed to determine if impacted groundwater may be discharging to the river. However, because no surface water intakes are within 15 river miles downstream of the Base, the human ingestion pathway is incomplete.

5.2 BUILDING 90 FORMER FIRE STATION – AFFF AREA 2

The area surrounding Building 90 is a relatively flat grassed lawn area. Surface runoff from the area flows to stormwater inlets northeast and north of the building and discharges to an open drainage ditch on the south side of Mustang Pass, approximately 960 feet to the east/northeast. Flow from the ditch continues to the east/northeast toward Outfall SDO-001 and the Winooski River.

As indicated on Figure 11 in Appendix A, one surface water sample (BRLTN02-004-SW-001) collected from the drainage ditch on the south side of Mustang Pass and downstream from the site. PFOA and PFOS were detected above the 0.02 µg/L screening level at a combined concentration of 0.081 µg/L.

Surface water from Building 90 discharges to the Winooski River via Outfall SD0-001. In addition, discharge of PFOA- and PFOS-impacted groundwater to the river (though undetermined) is possible. However, because no surface water are intakes within 15 river miles downstream of the Base, the human ingestion pathway is incomplete.

5.3 BUILDING 60 CURRENT FIRE STATION – AFFF AREA 3

The area surrounding Building 60 is a relatively flat lawn. Surface water runoff enters stormwater inlets southeast, northeast, and northwest of the building and discharges into the intermittent stream on the north side of NCO Drive. The intermittent stream flows along the southern limits of FTA 1 (which is northeast of Building 60) and empties into a marshy area northeast of National Guard Avenue at Outfall SDO-002.

As indicated on Figure 13 in Appendix A, one surface water sample (BRLTN03-003-SW-001) was collected from an intermittent stream downstream from the site. PFOA and PFOS were detected above the 0.02 µg/L screening level at a combined concentration of 13.096 µg/L.

Although surface water from the current fire station does not appear to be directly discharging to the Winooski River, surface water may be infiltrating the subsurface and impacting shallow groundwater. In addition, discharge of PFOA- and PFOS-impacted groundwater to the river (though undetermined), is possible. However, because no surface water are intakes within 15 river miles downstream of the Base, the human ingestion pathway is incomplete.

5.4 FIRE DEPARTMENT EQUIPMENT TESTING AREA – AFFF AREA 4

The fire department equipment testing area includes a section of Taxiway F and surrounding level grassed areas. No stormwater inlets, ditches, or standing water are near the test area. Any runoff from the area would largely occur as sheet flow and likely infiltrate into the ground surface. No surface water samples were collected at AFFF Area 4.

Although surface water was not present at the testing area, discharge of impacted groundwater to the river (though undetermined) is possible. However, because no surface water intakes are within 15 river miles downstream of the Base, the human ingestion pathway is incomplete.

5.5 F-16 EMERGENCY RESPONSE SITE – AFFF AREA 5

The F-16 emergency response site includes a section of Runway 15/33 and surrounding level grassed areas. No stormwater inlets, ditches, or standing water are near the emergency response site. Any runoff from the area would largely occur as sheet flow and likely infiltrate into the ground surface. No surface water samples were collected at AFFF Area 5.

Although surface water was not present at the testing area, discharge of impacted groundwater to the river (though undetermined) is possible. However, because no surface water intakes are within 15 river miles downstream of the Base, the human ingestion pathway is incomplete.

6.0 SOIL AND SEDIMENT EXPOSURE AND AIR PATHWAYS

The objective of soil sampling during the SI was to determine if soils in the individual areas had been impacted by the release of AFFF and whether concentrations of PFBS, PFOA, and PFOS remain in the soils exceeding the calculated human health-based screening levels.

6.1 FORMER FIRE TRAINING AREA 1 (INSTALLATION RESTORATION PROGRAM SITE 1) – AFFF AREA 1

Where detected, PFAS concentrations in subsurface soil samples and a sediment sample collected at former FTA 1 were below screening levels, as indicated on Tables 3 and 5. Lacking concentrations of PFAS above screening levels, the soil and air pathways are incomplete at AFFF Area 1. Surface soil was not sampled at FTA 1 because soil had been excavated from the area during a previous remediation effort.

6.2 BUILDING 90 FORMER FIRE STATION – AFFF AREA 2

Where detected, PFAS concentrations in surface soil, subsurface soil, and sediment samples collected at the former fire station site were below screening levels (see Tables 7, 8, and 10). Lacking concentrations of PFAS above screening levels, the soil and air pathways are incomplete at AFFF Area 2.

6.3 BUILDING 60 CURRENT FIRE STATION – AFFF AREA 3

Where detected, PFAS concentrations in surface soil, subsurface soil, and the sediment sample collected at the current fire station site were below screening levels (see Tables 12, 13, and 15). Lacking concentrations of PFAS above screening levels, the soil and air pathways are incomplete at AFFF Area 3.

6.4 FIRE DEPARTMENT EQUIPMENT TESTING AREA – AFFF AREA 4

Where detected, PFAS concentrations in surface soil and subsurface soil samples collected at the fire department equipment testing area were below screening levels (see Tables 17 and 18). Lacking concentrations of PFAS above screening levels, the soil and air pathways are incomplete at AFFF Area 4.

6.5 F-16 EMERGENCY RESPONSE SITE – AFFF AREA 5

Where detected, PFAS concentrations in surface soil and subsurface soil samples collected at the emergency response site were below screening levels (see Tables 20 and 21). Lacking concentrations of PFAS above screening levels, the soil and air pathways are incomplete at AFFF Area 4.

7.0 UPDATES TO CONCEPTUAL SITE MODELS

The following sections contain updates to the conceptual site models for AFFF Areas 1 through 5 and address PFOA and PFOS in soil, groundwater, surface water, and sediment. PFBS was not detected above screening levels in any sampled media and will not be discussed further.

7.1 FORMER FIRE TRAINING AREA 1 (INSTALLATION RESTORATION PROGRAM SITE 1) – AFFF AREA 1

The QAPP addendum (ASL, August 2017) identified subsurface soil, groundwater, sediment, and surface water as media potentially impacted by previous releases of AFFF at FTA 1. As indicated in Sections 3.1.4 and 6.1, PFOA and PFOS concentrations in subsurface soil and sediment (where detected) were below screening levels and do not represent a complete human exposure pathway.

PFOA/PFAS concentrations in groundwater and surface water however, exceeded screening levels, as indicated in Section 3.1.4. Although there are no drinking water wells between AFFF Area 1 and the Winooski River, Well #58 (north and sidegradient from AFFF Area 1) has been impacted by PFAS. As indicated in Section 4.1, the groundwater pathway (for impacted groundwater from the Base) may be complete.

Although PFOA- and PFOS-impacted surface water from FTA 1 does not appear to be directly discharging to the Winooski River, infiltration of surface water to shallow groundwater is possible. Further delineation is needed to determine if impacted groundwater from FTA 1 is discharging to the river. However, because no surface water intakes are within 15 river miles downstream of the Base, the ingestion pathway is also incomplete for surface water, as indicated in Section 5.1.

7.2 BUILDING 90 FORMER FIRE STATION – AFFF AREA 2

The QAPP addendum identified surface soil, subsurface soil, groundwater, sediment, and surface water as media potentially impacted by previous releases of AFFF at the former fire station. As indicated in Sections 3.2.4 and 6.2, PFOA/PFAS concentrations in subsurface soil and sediment (where detected) were below screening levels and do not represent a complete human exposure pathway.

PFOA and PFOS concentrations in groundwater and surface water, however, exceeded screening levels, as indicated in Section 3.2.4. The human ingestion pathway for groundwater is incomplete, as indicated in Section 4.2.

PFOA- and PFOS-impacted surface water from Building 90 eventually discharges to the Winooski River via Outfall SD0-001 and impacted groundwater may also be discharging to the river. However, because no surface water intakes are within 15 river miles downstream of the Base, the ingestion pathway is also incomplete for surface water, as indicated in Section 5.2.

7.3 BUILDING 60 CURRENT FIRE STATION – AFFF AREA 3

The QAPP addendum identified surface soil, subsurface soil, groundwater, sediment, and surface water as media potentially impacted by previous releases of AFFF at the current fire station. As indicated in Sections 3.3.4 and 6.3, PFOA/PFAS concentrations in surface soil, subsurface soil, and sediment (where detected) were below screening levels and do not represent a complete human exposure pathway.

PFOA/PFAS concentrations in groundwater and surface water, however, exceeded screening levels, as indicated in Section 3.3.4. The human ingestion pathway for groundwater is incomplete, as indicated in Section 4.3.

Although surface water from the current fire station does not appear to be directly discharging to the Winooski River, surface water may be infiltrating the subsurface and impacting shallow groundwater. Further delineation is needed to determine if impacted groundwater is discharging to the river. However, because no surface water intakes are within 15 river miles downstream of the Base, the ingestion pathway is also incomplete for surface water, as indicated in Section 5.3.

7.4 FIRE DEPARTMENT EQUIPMENT TESTING AREA – AFFF AREA 4

The QAPP addendum identified surface soil, subsurface soil, and groundwater as media potentially impacted by previous releases of AFFF at the fire department equipment training area. As indicated in Sections 3.4.4 and 6.4, PFOA/PFAS concentrations in surface soil and subsurface soil (where detected) were below screening levels and do not represent a complete human exposure pathway. Surface water was not present at or near AFFF Area 4.

PFOA/PFAS concentrations in groundwater, however, exceeded screening levels as indicated in Section 3.4.4. The human ingestion pathway for groundwater is incomplete, as indicated in Section 4.4.

Impacted groundwater may also be discharging to the river. However, because no surface water intakes are within 15 river miles downstream of the Base, the ingestion pathway is also incomplete for surface water, as indicated in Section 5.4.

7.5 F-16 EMERGENCY RESPONSE SITE – AFFF AREA 5

The QAPP addendum identified surface soil, subsurface soil, and groundwater as media potentially impacted by previous releases of AFFF at the F-16 emergency response site. As indicated in Sections 3.5.4 and 6.5, PFOA/PFAS concentrations in surface soil and subsurface soil (where detected) were below screening levels and do not represent a complete human exposure pathway. Surface water was not present at or near AFFF Area 5. PFOA/PFAS concentrations in groundwater, however, exceeded screening levels, as indicated in Section 3.5.4. The human ingestion pathway for groundwater is incomplete, as indicated in Section 4.5.

Impacted groundwater may also be discharging to the river. However, because no surface water intakes are within 15 river miles downstream of the Base, the ingestion pathway is also incomplete for surface water as indicated in Section 5.5.

8.0 SUMMARY AND CONCLUSIONS

ASL completed SIs at five known or suspected areas of AFFF releases at Burlington ANG Base as documented in the PA (CH2M HILL, October 2015) and as detailed in the subsequent site-specific QAPP addendum (ASL, February 2017). The areas inspected were

- Former FTA 1 (IRP Site 1) (AFFF Area 1),
- Building 90 Former Fire Station (AFFF Area 2),
- Building 60 Current Fire Station (AFFF Area 3),
- Fire Department Equipment Testing Area (AFFF Area 4), and
- F-16 Emergency Response Site (AFFF Area 5).

All fieldwork was conducted in accordance with the site-specific QAPP addendum (ASL, February 2017) with the following exceptions:

- At AFFF Area 1, existing monitoring well V1-MW-14L was sampled in lieu of planned existing well MW-104, which could not be sampled because of a blockage in the well.
- Temporary monitoring wells could not be installed at AFFF Areas 4 and 5 because of airfield access limitations. Groundwater samples were collected using drive point samplers.

Selected sample media varied for the five sites but included surface soil, subsurface soil, groundwater, sediment, and surface water. Sampling was primarily limited to the immediate areas of known or suspected AFFF releases and biased toward locations most likely to have been impacted by the releases. All samples were analyzed for PFBS, PFOA, and PFOS using modified EPA Method 537. Analytical results for PFBS in soil and sediment were compared to published EPA RSLs. Analytical results for PFOS in soil and sediment were compared to the calculated RSL of 1,260 µg/kg. Analytical results for PFOA in soil and sediment were compared to the VDH screening level of 300 µg/kg. Analytical results for PFBS in groundwater and surface water were compared to the published EPA RSL. Analytical results for PFOA and PFOS in groundwater and surface water were compared to the Vermont Groundwater Enforcement Standard of 0.02 µg/L (for the combined concentrations of PFOA and PFOS).

AFFF use at the Base has resulted in PFOA and PFOS concentrations in groundwater and surface water above screening levels; however, no potential receptor pathways with immediate impacts to human health were identified. Although no immediate impacts were identified, further assessment of PFOA and PFOS impacts at each of the AFFF areas (via expanded SI or remedial investigation [RI]) may be warranted. Table 23 summarizes detected concentrations of PFBS, PFOA, and PFOS for each media sampled at each area. Summaries of key findings and conclusions for each area (focusing on PFOA and PFOS exceedances) are included in Sections 8.1 through 8.5.

Table 24 Summary of PFBS, PFOA, and PFOS Detections and Screening Level Exceedances[1]

AFFF Area	Associated Existing IRP ID	Parameter	Maximum Detected Concentration	Screening Level	Number of Samples / Number of Exceedances	Exceeds Screening Level
AFFF Area 1 Former FTA 1	Site 1	**Subsurface Soil**	**(µg/kg)**	**(µg/kg)**		
		PFBS	ND	1,300,000	3/0	No
		PFOA	25	300	3/0	No
		PFOS	1,200 J	1,260	3/0	No
		Groundwater	**(µg/L)**	**(µg/L)**		
		PFBS	3.4	400	9/0	No
		PFOA	**41**	0.02	9/9	**Yes**
		PFOS	**31**	0.02	9/9	**Yes**
		PFOA + PFOS	**72**	0.02	9/9	**Yes**
		Sediment	**(µg/kg)**	**(µg/kg)**		
		PFBS	1.3	1,300,000	2/0	No
		PFOA	2.2	300	2/0	No
		PFOS	180	1,260	2/0	No
		Surface Water	**(µg/L)**	**(µg/L)**		
		PFBS	2.0	400	2/0	No
		PFOA	**1.4**	0.02	2/2	**Yes**
		PFOS	**37**	0.02	2/2	**Yes**
		PFOA + PFOS	**38.4**	0.02	2/2	**Yes**
AFFF Area 2 Building 90 Former Fire Station	None (New Area)	**Surface Soil**	**(µg/kg)**	**(µg/kg)**		
		PFBS	0.28 J	1,300,000	4/0	No
		PFOA	0.91 J	300	4/0	No
		PFOS	31 J	1,260	4/0	No
		Subsurface Soil	**(µg/kg)**	**(µg/kg)**		
		PFBS	ND	1,300,000	3/0	No
		PFOA	7.8 J	300	3/0	No
		PFOS	160	1,260	3/0	No
		Groundwater	**(µg/L)**	**(µg/L)**		
		PFBS	0.47	400	3/0	No
		PFOA	**0.50**	0.02	3/3	**Yes**
		PFOS	**54**	0.02	3/3	**Yes**
		PFOA + PFOS	**54.5**	0.02	3/3	**Yes**
		Sediment	**(µg/kg)**	**(µg/kg)**		
		PFBS	ND	1,300,000	1/0	No
		PFOA	ND	300	1/0	No
		PFOS	2.3	1,260	1/0	No
		Surface Water	**(µg/L)**	**(µg/L)**		
		PFBS	0.035	400	1/0	No
		PFOA	ND	0.02	1/0	No
		PFOS	**0.081**	0.02	1/1	**Yes**
		PFOA + PFOS	**0.081**	0.02	1/1	**Yes**
AFFF Area 3 Building 60 Current Fire Station	None (New Area)	**Surface Soil**	**(µg/kg)**	**(µg/kg)**		
		PFBS	0.71 J	1,300,000	2/0	No
		PFOA	1.5 J	300	2/0	No
		PFOS	280	1,260	2/0	No
		Subsurface Soil	**(µg/kg)**	**(µg/kg)**		
		PFBS	0.49 J	1,300,000	2/0	No
		PFOA	1.0	300	2/0	No
		PFOS	140	1,260	2/0	No

AFFF Area	Associated Existing IRP ID	Parameter	Maximum Detected Concentration	Screening Level	Number of Samples / Number of Exceedances	Exceeds Screening Level
		Groundwater	**(µg/L)**	**(µg/L)**		
		PFBS	2.5	400	2/0	No
		PFOA	**2.0**	0.02	2/2	**Yes**
		PFOS	**66**	0.02	2/2	**Yes**
		PFOA + PFOS	**66.97**[2]	0.02	2/2	**Yes**
		Sediment	**(µg/kg)**	**(µg/kg)**		
		PFBS	0.43 J	1,300,000	1/0	No
		PFOA	ND	300	1/0	No
		PFOS	63	1,260	1/0	No
		Surface Water	**(µg/L)**	**(µg/L)**		
		PFBS	0.19 J	400	1/0	No
		PFOA	**0.096 J**	0.02	1/1	**Yes**
		PFOS	**13**	0.02	1/1	**Yes**
		PFOA + PFOS	**13.096 J**	0.02	1/1	**Yes**
AFFF Area 4 Fire Department Equipment Testing Area	**None (New Area)**	**Surface Soil**	**(µg/kg)**	**(µg/kg)**		
		PFBS	ND	1,300,000	4/0	No
		PFOA	1.8	300	4/0	No
		PFOS	42 J	1,260	4/0	No
		Subsurface Soil	**(µg/kg)**	**(µg/kg)**		
		PFBS	ND	1,300,000	4/0	No
		PFOA	0.46 J	300	4/0	No
		PFOS	800	1,260	4/0	No
		Groundwater	**(µg/L)**	**(µg/L)**		
		PFBS	0.044	400	5/0	No
		PFOA	**0.084**	0.02	5/4	**Yes**
		PFOS	**0.26**	0.02	5/5	**Yes**
		PFOA + PFOS	**0.322**[2]	0.02	5/5	**Yes**
AFFF Area 5 F-16 Emergency Response Site	**None (New Area)**	**Surface Soil**	**(µg/kg)**	**(µg/kg)**		
		PFBS	ND	1,300,000	4/0	No
		PFOA	ND	300	4/0	No
		PFOS	2.7 J	1,260	4/0	No
		Subsurface Soil	**(µg/kg)**	**(µg/kg)**		
		PFBS	ND	1,300,000	4/0	No
		PFOA	ND	300	4/0	No
		PFOS	ND	1,260	4/0	No
		Groundwater	**(µg/L)**	**(µg/L)**		
		PFBS	0.016 J	400	3/0	No
		PFOA	**0.054 J**	0.02	3/2	**Yes**
		PFOS	**0.24 J**	0.02	3/1	**Yes**
		PFOA + PFOS	**0.294 J**	0.02	3/3	**Yes**

[1] Includes duplicate and resample results.
[2] Maximum PFOA + PFOS concentration shown is the highest combined PFOA and PFOS concentration detected in a specific groundwater sample and in this instance is not the sum of the individual maximum PFOA and PFOS concentrations listed as they occurred in two separate samples.
Bold values exceed screening levels.
µg/L = micrograms per liter
µg/kg = micrograms per kilogram
AFFF = aqueous film forming foam
FTA = fire training area
ID = identification
IRP = Installation Restoration Program
J = estimated concentration
ND = not detected
PFBS = perfluorobutane sulfonate
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate

8.1 Former Fire Training Area 1 (Installation Restoration Program Site 1) – AFFF Area 1

Use of AFFF at FTA 1 between 1970 and 1980 has resulted in PFAS impacts to groundwater above screening levels. Although no public water supply wells and no known domestic wells (drinking water or irrigation) are downgradient from the area, Well #58 (north and sidegradient from FTA 1) has been impacted by PFAS and may represent a complete pathway for impacted groundwater from the Base. Further, although discharge of impacted groundwater to the Winooski River north of the Base is possible, the nearest surface water intake is more than 15 miles downstream.

In addition, a modification to the current groundwater collection system at FTA 1 to treat PFOA and PFOS has been installed by others (CH2MHill, June 2017). Groundwater from the collection trench is treated by routing it through two GAC vessels. Treated groundwater is pumped to infiltration trenches constructed at the site.

8.2 Building 90 Former Fire Station – AFFF Area 2

Although releases of AFFF at the former fire station have resulted in PFOA and PFOS in groundwater above screening levels, no complete human receptor pathways have been identified at the former fire station. No public water supply wells and no known domestic wells (drinking water or irrigation) are downgradient from the area. Further, although discharge of impacted groundwater to the Winooski River is possible, the nearest surface water intake is more than 15 miles downstream.

8.3 Building 60 Current Fire Station – AFFF Area 3

Although releases of AFFF at the current fire station have resulted in PFOA and PFOS in groundwater above screening levels, no complete human receptor pathways have been identified at the current fire station. No public water supply wells and no known domestic wells (drinking water or irrigation) are downgradient from the area. Further, although discharge of impacted groundwater to the Winooski River is possible, the nearest surface water intake is more than 15 miles downstream.

8.4 Fire Department Equipment Testing Area – AFFF Area 4

Although releases of AFFF at the fire department equipment testing area have resulted in PFOA and PFOS to groundwater above screening levels, no complete human receptor pathways have been identified at the spray test area. No public water supply wells and no known domestic wells (drinking water or irrigation) are downgradient from the area. Although discharge of impacted groundwater to the Winooski River is possible, the nearest surface water intake is more than 15 miles downstream.

8.5 F-16 Emergency Response Site – AFFF Area 5

Although release of AFFF at the F-16 emergency response site has resulted in PFOA and PFOS in groundwater above screening levels, no complete human receptor pathways have been identified at the emergency response site. No public water supply wells and no known domestic wells (drinking water or irrigation) are downgradient from the area. Further, although discharge of impacted groundwater to the Winooski River is possible, the nearest surface water intake is more than 15 miles downstream.

9.0 REFERENCES

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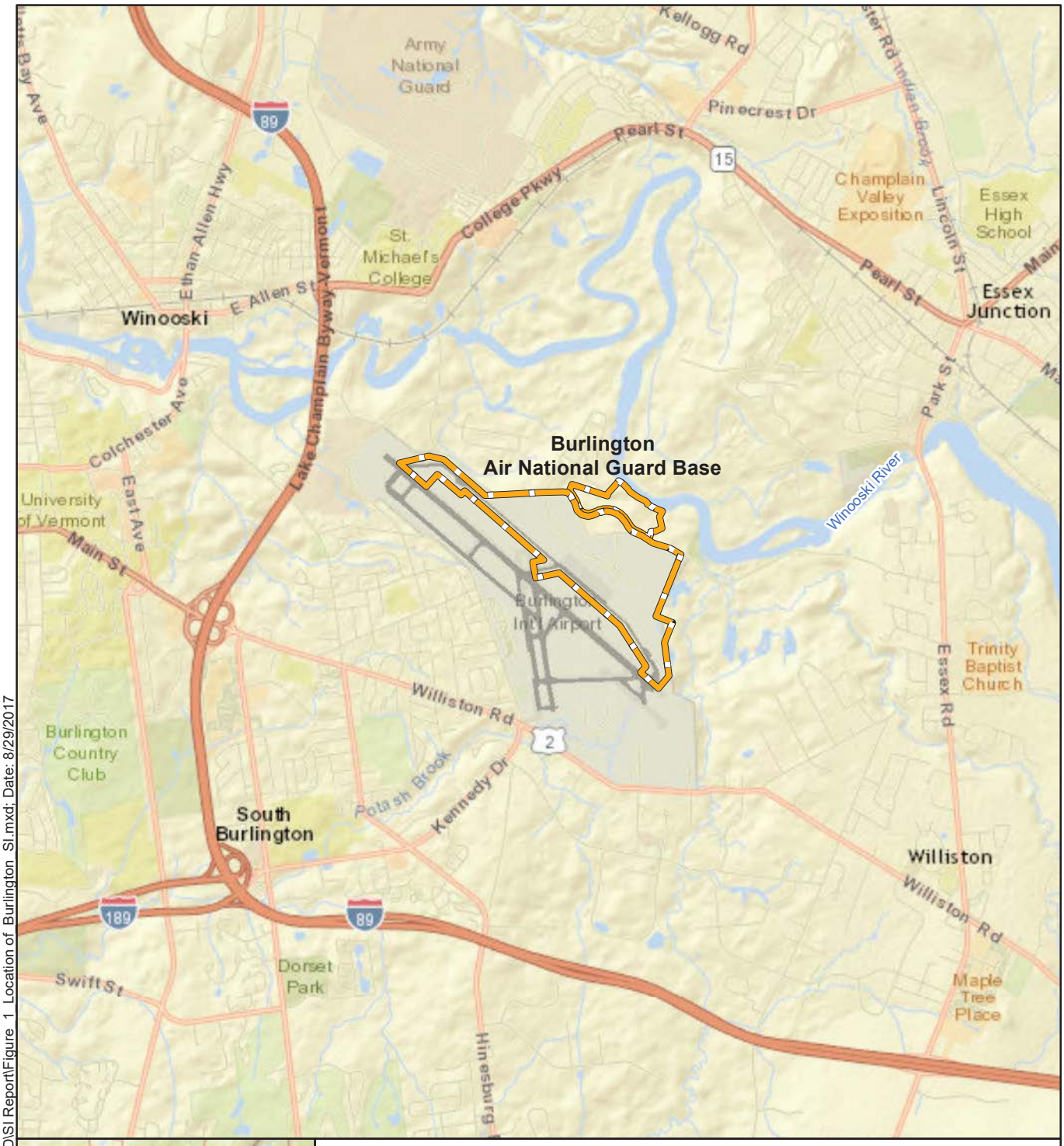
Appendix A
Figures



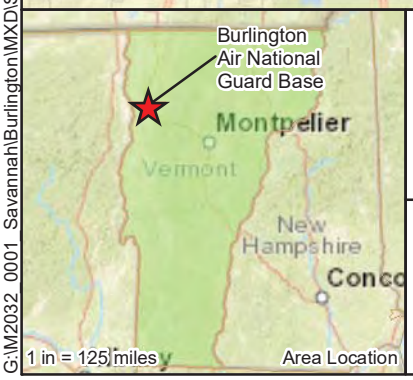


Figure 1 Location of Burlington Air National Guard Base
Chittenden County, Vermont

Legend

Installation Boundary

Service Layer Credits: Esri StreetMap North America

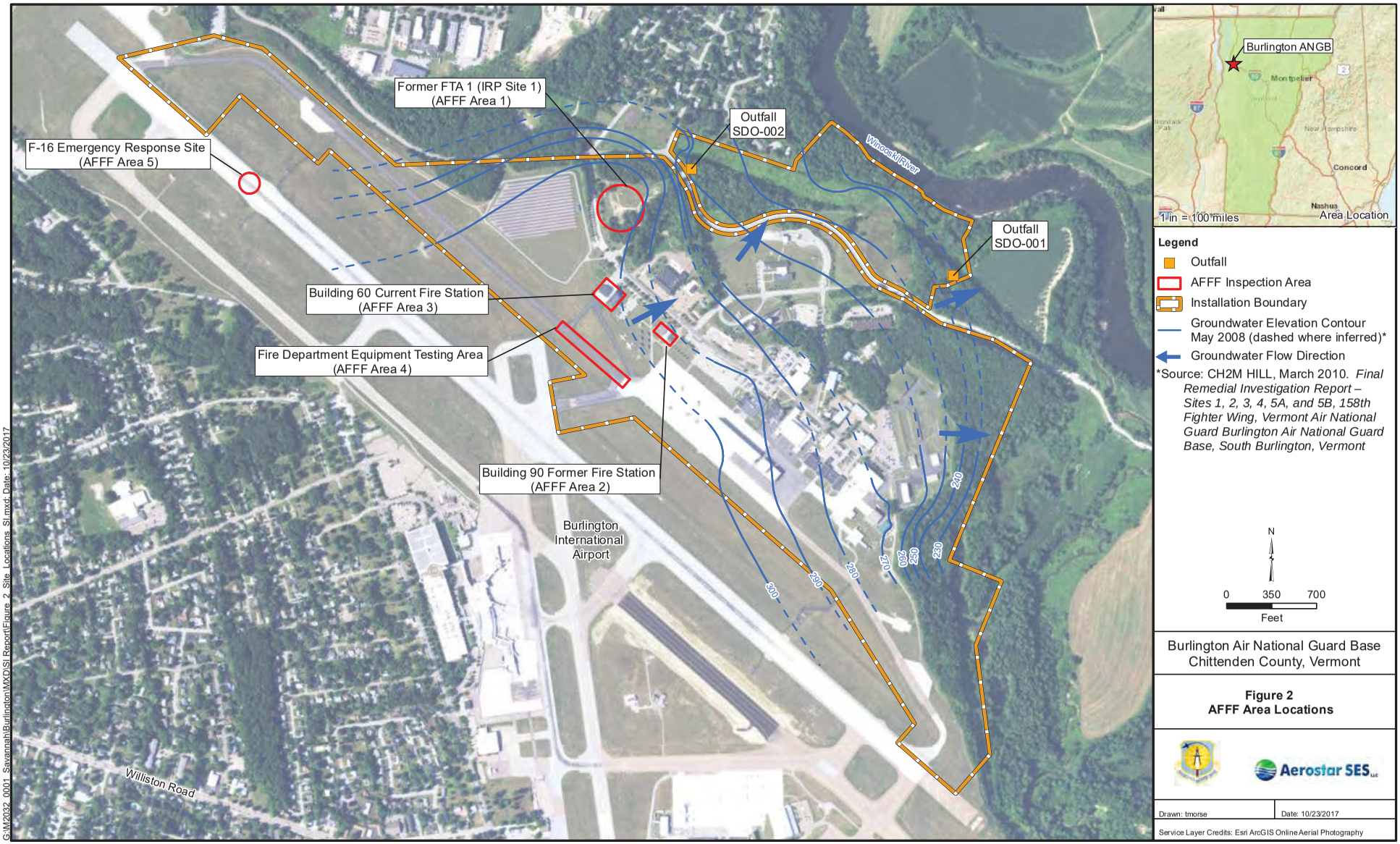
Drawn: tmorse

Date: 8/29/2017

N

0 1 Miles

G:\M2032_0001 Savannah\Burlington\MXD\SI Report\Figure_1_Location of Burlington_SI.mxd; Date: 8/29/2017



Burlington Air National Guard Base
Chittenden County, Vermont

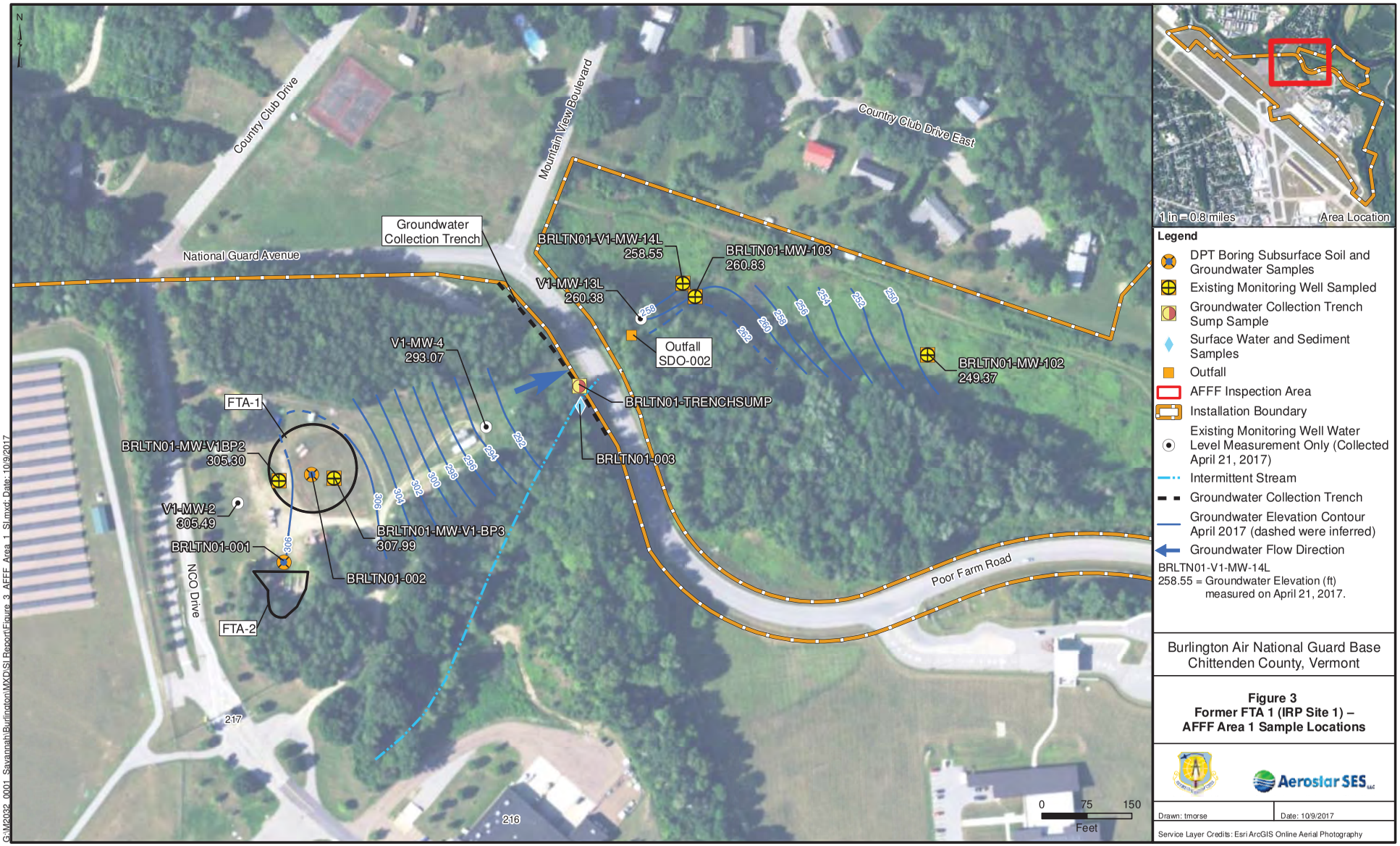
Figure 2
AFFF Area Locations

Aerostar SES LLC

Drawn: tmorse | Date: 10/23/2017

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Burlington\MXD\SI Report\Figure_2_Site_Locations_SI.mxd; Date: 10/23/2017



Burlington Air National Guard Base
Chittenden County, Vermont

Figure 3
Former FTA 1 (IRP Site 1) –
AFFF Area 1 Sample Locations

Aerostar SES LLC

Drawn: tmorse | Date: 10/9/2017

Service Layer Credits: Esri ArcGIS Online Aerial Photography

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Burlington Air National Guard Base
Chittenden County, Vermont

Figure 4
Building 90 Former Fire Station – AFFF Area 2 Sample Locations

Aerostar SES LLC

Drawn: tmorse | Date: 10/18/2017

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Burlington\MXD\SI Report\Figure 4_AFFF_Area_2_SI.mxd; Date: 10/18/2017


N
217
BRLTN03-003
NCO Drive
BRLTN03-002
308.25
BRLTN03-001
308.53
216
Building
60
308
309
307
306
305
304
303
302
301
300
299
3
97
BRLTN02-002
300.00
BRLTN02-001
303.36
Building
90
Taxiway F
1 in = 0.8 miles
Area Location
Legend
DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
Surface Water and Sediment Samples
AFFF Inspection Area
Installation Boundary
Storm Sewer*
Intermittent Stream
Groundwater Elevation Contour April 2017 (dashed were inferred)
Groundwater Flow Direction
BRLTN03-001
308.53 = Groundwater Elevation (ft) measured on April 21, 2017.
Note: *For clarity, only storm sewers from Buildings 60 and 90 are shown.
0
40
80
Feet
Burlington Air National Guard Base
Chittenden County, Vermont
Figure 5
Building 60 Current Fire Station – AFFF Area 3 Sample Locations
Aerostar SES
Drawn: tmorse
Date: 10/23/2017
Service Layer Credits: Esri ArcGIS Online Aerial Photography
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346
308
309
307
306
305
304
303
302
300
NCO Drive
3
97
103
Building 90
Taxiway F
BRLTN04-002
BRLTN04-001
BRLTN04-003
BRLTN04-004
Taxiway A
Runway 01/19
Taxiway E
Runway 15/33
1 in = 0.8 miles
Area Location
Legend
DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
AFFF Inspection Area
Installation Boundary
Groundwater Elevation Contour April 2017 (dashed where inferred)*
Inferred Groundwater Flow Direction
Note: Temporary wells were not installed because of airfield access limitations.
* Groundwater Contours shown are at AFFF Areas 2 and 3.
N
0
50
100
Feet
Burlington Air National Guard Base
Chittenden County, Vermont
Figure 6
Fire Department Equipment Testing Area – AFFF Area 4 Sample Locations
Aerostar SES LLC
Drawn: tmorse
Date: 10/23/2017
Service Layer Credits: Esri ArcGIS Online Aerial Photography
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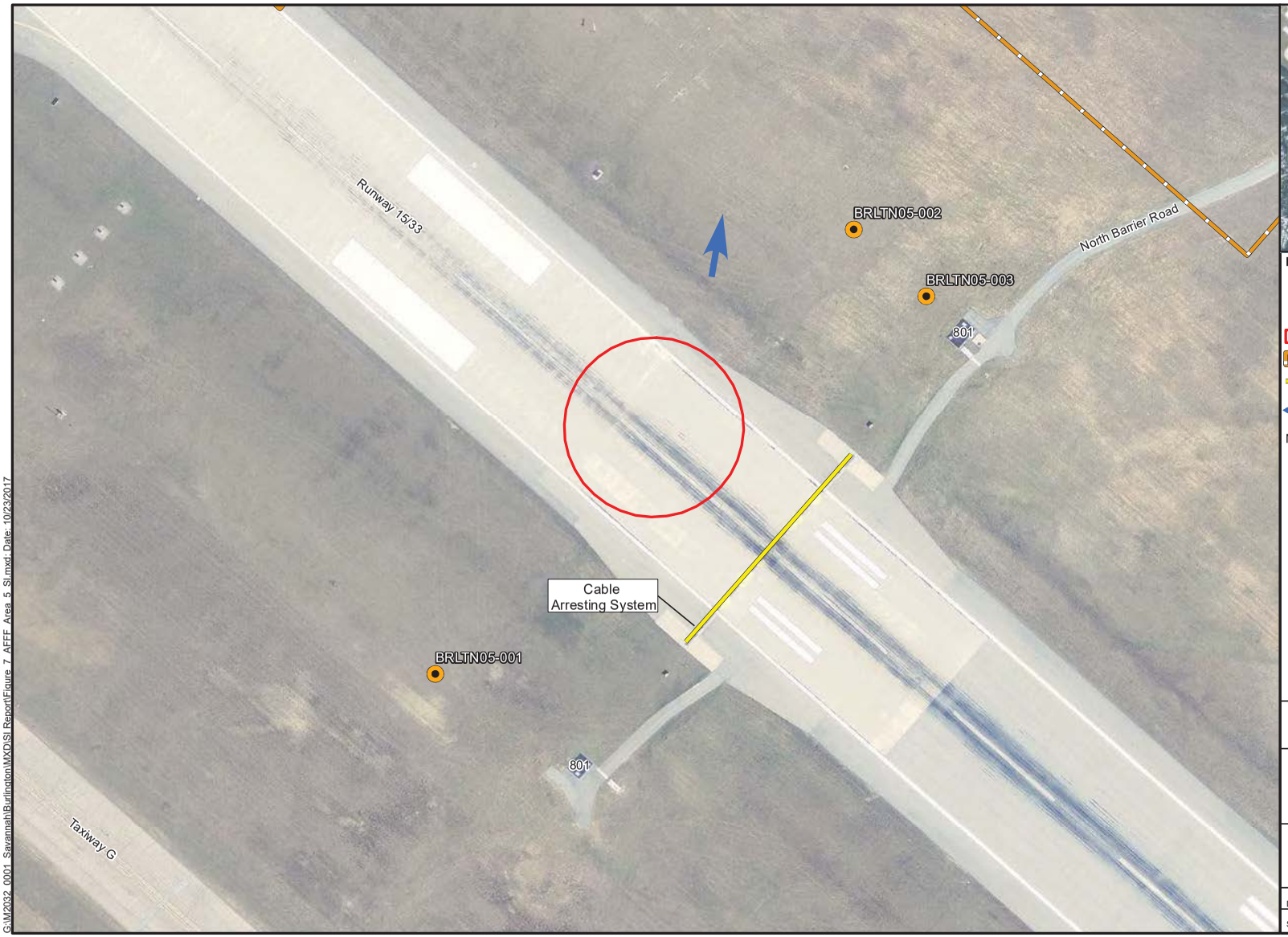

Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- AFFF Inspection Area
- Installation Boundary
- Cable Arresting System
- Estimated Groundwater Flow Direction*

Note: Temporary wells were not installed because of airfield access limitations.

*Source: CH2M HILL, March 2010. *Final Remedial Investigation Report – Sites 1, 2, 3, 4, 5A, and 5B, 158th Fighter Wing, Vermont Air National Guard Burlington Air National Guard Base, South Burlington, Vermont*

N

0 45 90

Feet

Burlington Air National Guard Base
Chittenden County, Vermont

Figure 7
F-16 Emergency Response Site – AFFF Area 5 Sample Locations

Aerostar SES LLC

Drawn: tmorse | Date: 10/23/2017

Service Layer Credits: Esri ArcGIS Online Aerial Photography

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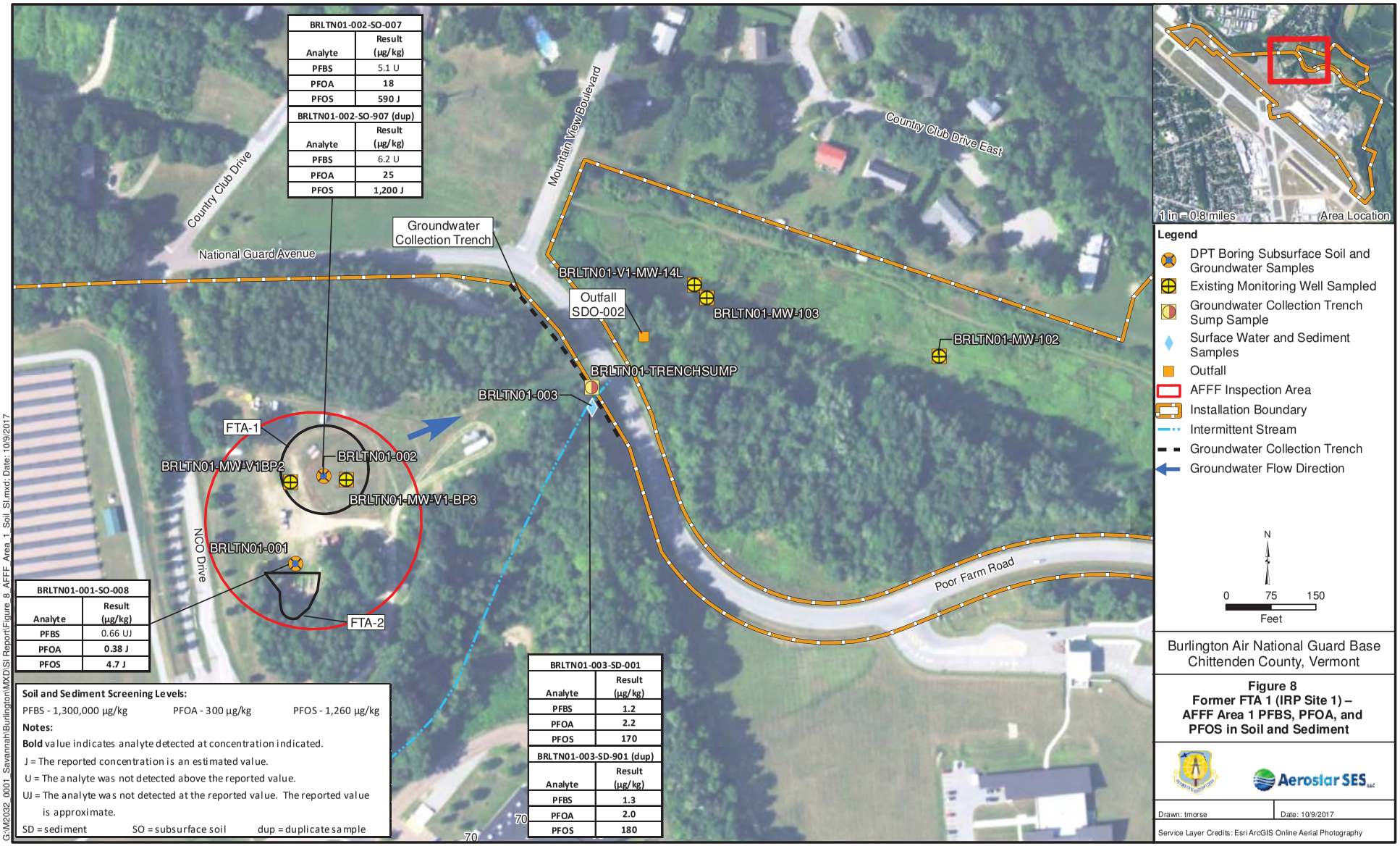

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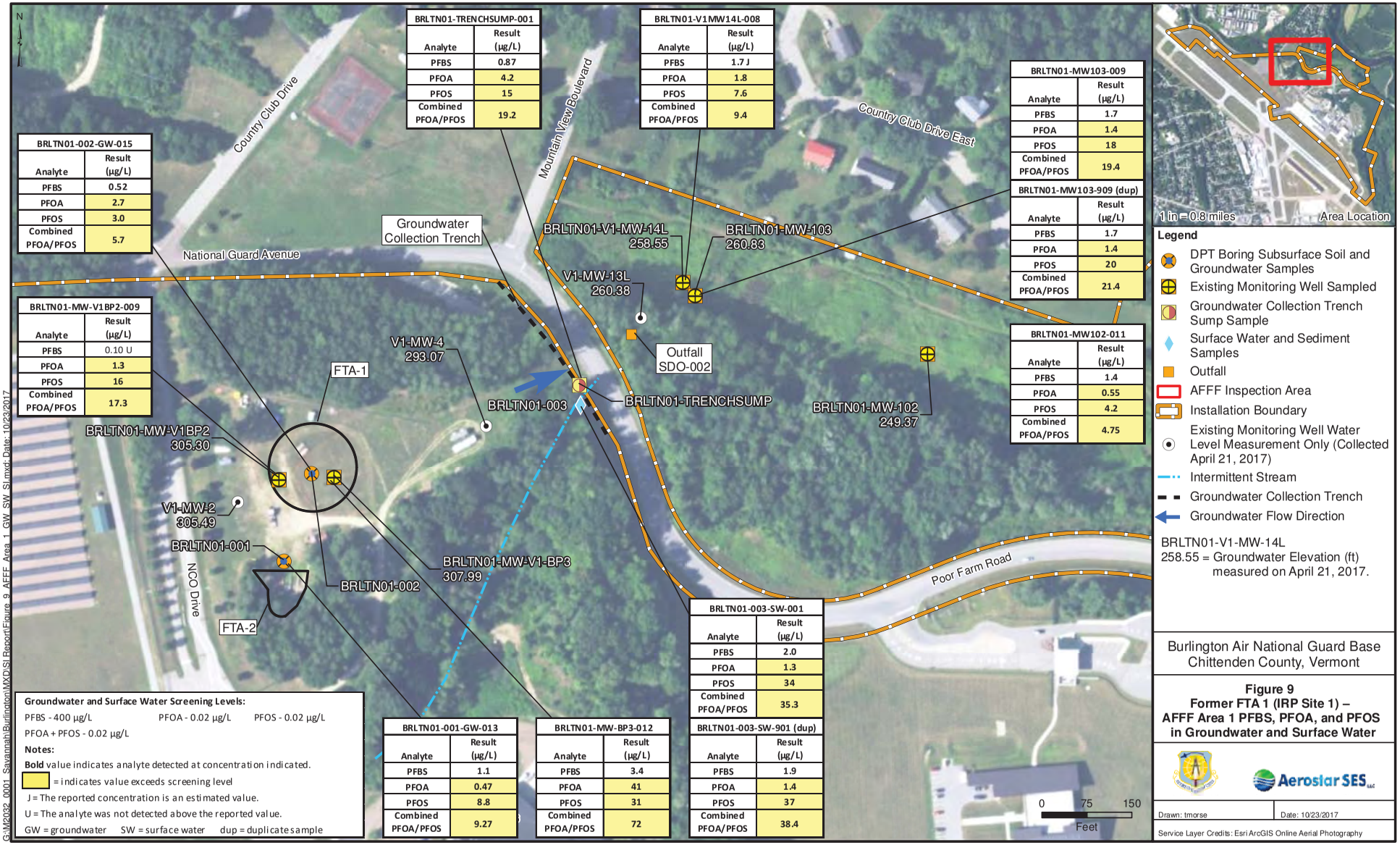

BRLTN01-TRENCHSUMP-001	
Analyte	Result (µg/L)
PFBS	0.87
PFOA	4.2
PFOS	15
Combined PFOA/PFOS	19.2

BRLTN01-V1MW14L-008	
Analyte	Result (µg/L)
PFBS	1.7 J
PFOA	1.8
PFOS	7.6
Combined PFOA/PFOS	9.4

BRLTN01-MW103-009	
Analyte	Result (µg/L)
PFBS	1.7
PFOA	1.4
PFOS	18
Combined PFOA/PFOS	19.4

BRLTN01-MW103-909 (dup)	
Analyte	Result (µg/L)
PFBS	1.7
PFOA	1.4
PFOS	20
Combined PFOA/PFOS	21.4

BRLTN01-002-GW-015	
Analyte	Result (µg/L)
PFBS	0.52
PFOA	2.7
PFOS	3.0
Combined PFOA/PFOS	5.7

BRLTN01-MW-V1BP2-009	
Analyte	Result (µg/L)
PFBS	0.10 U
PFOA	1.3
PFOS	16
Combined PFOA/PFOS	17.3

BRLTN01-MW102-011	
Analyte	Result (µg/L)
PFBS	1.4
PFOA	0.55
PFOS	4.2
Combined PFOA/PFOS	4.75

BRLTN01-003-SW-001	
Analyte	Result (µg/L)
PFBS	2.0
PFOA	1.3
PFOS	34
Combined PFOA/PFOS	35.3

BRLTN01-003-SW-901 (dup)	
Analyte	Result (µg/L)
PFBS	1.9
PFOA	1.4
PFOS	37
Combined PFOA/PFOS	38.4

BRLTN01-001-GW-013	
Analyte	Result (µg/L)
PFBS	1.1
PFOA	0.47
PFOS	8.8
Combined PFOA/PFOS	9.27

BRLTN01-MW-BP3-012	
Analyte	Result (µg/L)
PFBS	3.4
PFOA	41
PFOS	31
Combined PFOA/PFOS	72

Groundwater and Surface Water Screening Levels:

PFBS - 400 µg/L PFOA - 0.02 µg/L PFOS - 0.02 µg/L

PFOA + PFOS - 0.02 µg/L

Notes:

Bold value indicates analyte detected at concentration indicated.

= indicates value exceeds screening level

J = The reported concentration is an estimated value.

U = The analyte was not detected above the reported value.

GW = groundwater SW = surface water dup = duplicate sample

Legend

- DPT Boring Subsurface Soil and Groundwater Samples
- Existing Monitoring Well Sampled
- Groundwater Collection Trench Sump Sample
- Surface Water and Sediment Samples
- Outfall
- AFFF Inspection Area
- Installation Boundary
- Existing Monitoring Well Water Level Measurement Only (Collected April 21, 2017)
- Intermittent Stream
- Groundwater Collection Trench
- Groundwater Flow Direction

BRLTN01-V1-MW-14L
258.55 = Groundwater Elevation (ft) measured on April 21, 2017.

Burlington Air National Guard Base
Chittenden County, Vermont

Figure 9
Former FTA 1 (IRP Site 1) – AFFF Area 1 PFBS, PFOA, and PFOS in Groundwater and Surface Water

Aerostar SES LLC

Drawn: tmorse | Date: 10/23/2017

Service Layer Credits: Esri ArcGIS Online Aerial Photography

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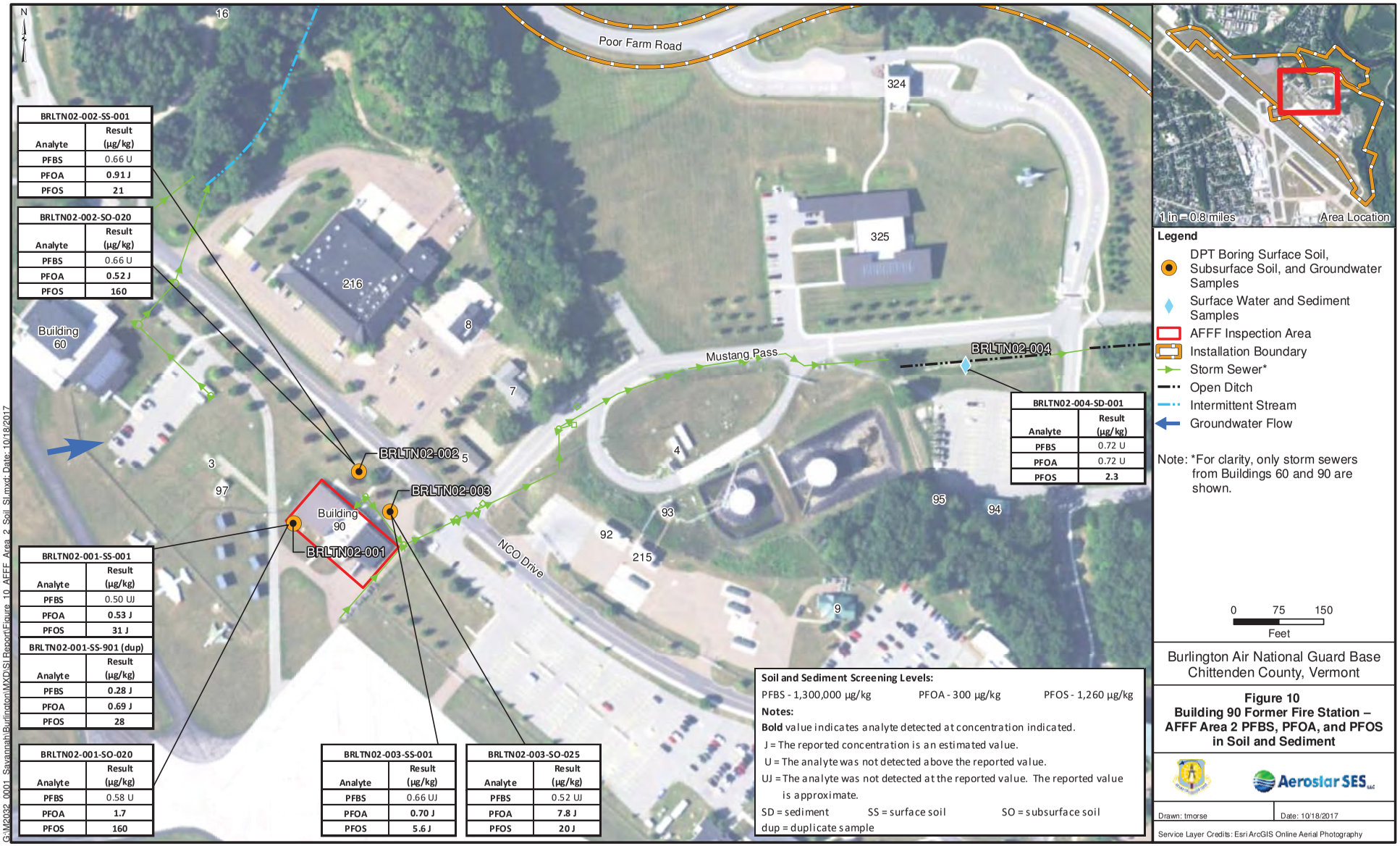

Burlington Air National Guard Base
Chittenden County, Vermont

Figure 10
Building 90 Former Fire Station – AFFF Area 2 PFBS, PFOA, and PFOS in Soil and Sediment

Aerostar SES LLC

Drawn: tmorse | Date: 10/18/2017

Service Layer Credits: Esri ArcGIS Online Aerial Photography

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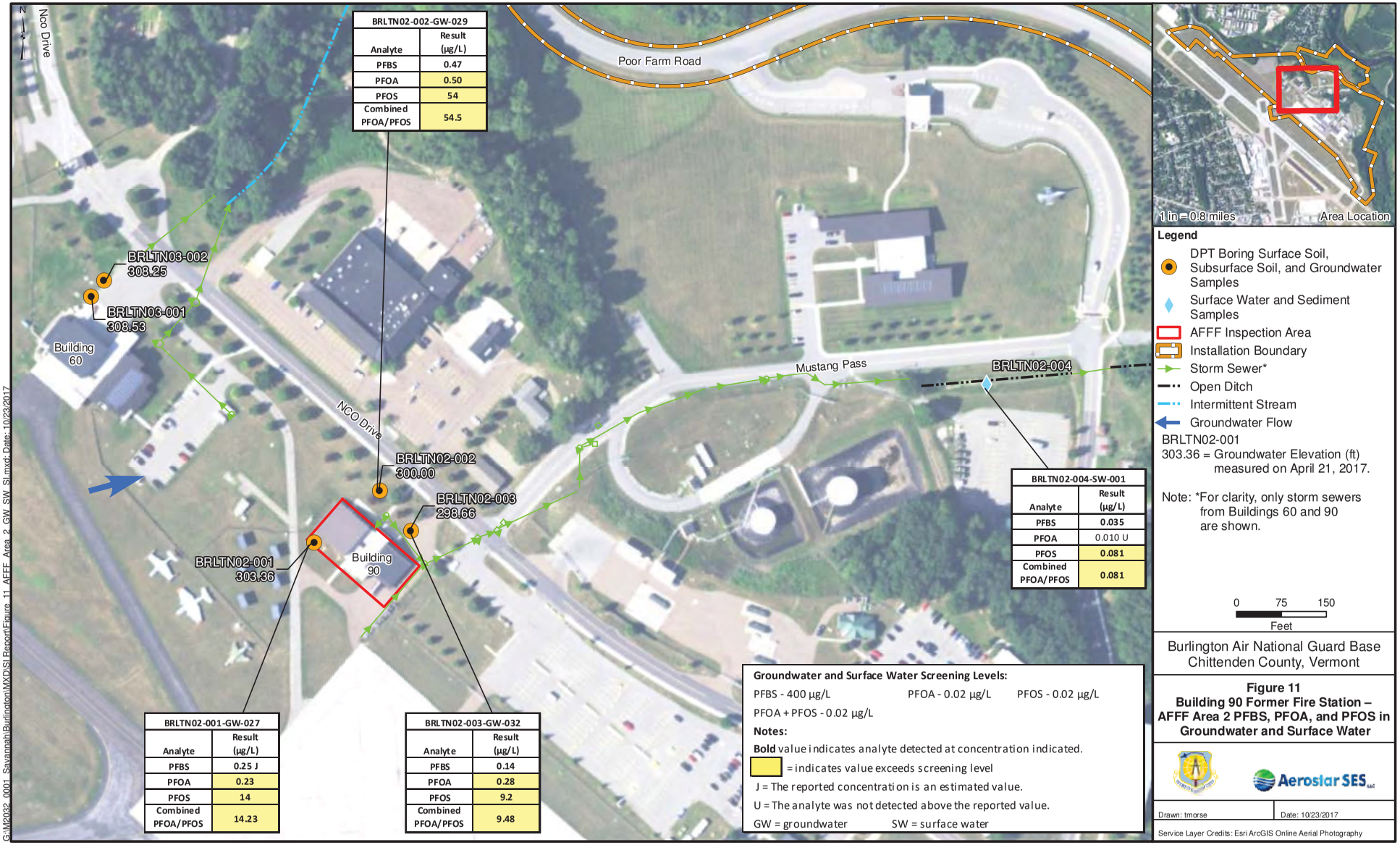
N
Nco Drive
Poor Farm Road
BRLTN02-002-GW-029
Analyte | Result (µg/L)
PFBS | 0.47
PFOA | 0.50
PFOS | 54
Combined PFOA/PFOS | 54.5
BRLTN03-002
308.25
BRLTN03-001
308.53
Building 60
NCO Drive
Mustang Pass
BRLTN02-004
BRLTN02-002
300.00
BRLTN02-003
298.66
BRLTN02-001
303.36
Building 90
BRLTN02-004-SW-001
Analyte | Result (µg/L)
PFBS | 0.035
PFOA | 0.010 U
PFOS | 0.081
Combined PFOA/PFOS | 0.081
BRLTN02-001-GW-027
Analyte | Result (µg/L)
PFBS | 0.25 J
PFOA | 0.23
PFOS | 14
Combined PFOA/PFOS | 14.23
BRLTN02-003-GW-032
Analyte | Result (µg/L)
PFBS | 0.14
PFOA | 0.28
PFOS | 9.2
Combined PFOA/PFOS | 9.48
Groundwater and Surface Water Screening Levels:
PFBS - 400 µg/L
PFOA - 0.02 µg/L
PFOS - 0.02 µg/L
PFOA + PFOS - 0.02 µg/L
Notes:
Bold value indicates analyte detected at concentration indicated.
= indicates value exceeds screening level
J = The reported concentration is an estimated value.
U = The analyte was not detected above the reported value.
GW = groundwater
SW = surface water
1 in = 0.8 miles
Area Location
Legend
DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
Surface Water and Sediment Samples
AFFF Inspection Area
Installation Boundary
Storm Sewer*
Open Ditch
Intermittent Stream
Groundwater Flow
BRLTN02-001
303.36 = Groundwater Elevation (ft) measured on April 21, 2017.
Note: *For clarity, only storm sewers from Buildings 60 and 90 are shown.
0
75
150
Feet
Burlington Air National Guard Base
Chittenden County, Vermont
Figure 11
Building 90 Former Fire Station – AFFF Area 2 PFBS, PFOA, and PFOS in Groundwater and Surface Water
Aerostar SES
Drawn: tmorse
Date: 10/23/2017
Service Layer Credits: Esri ArcGIS Online Aerial Photography
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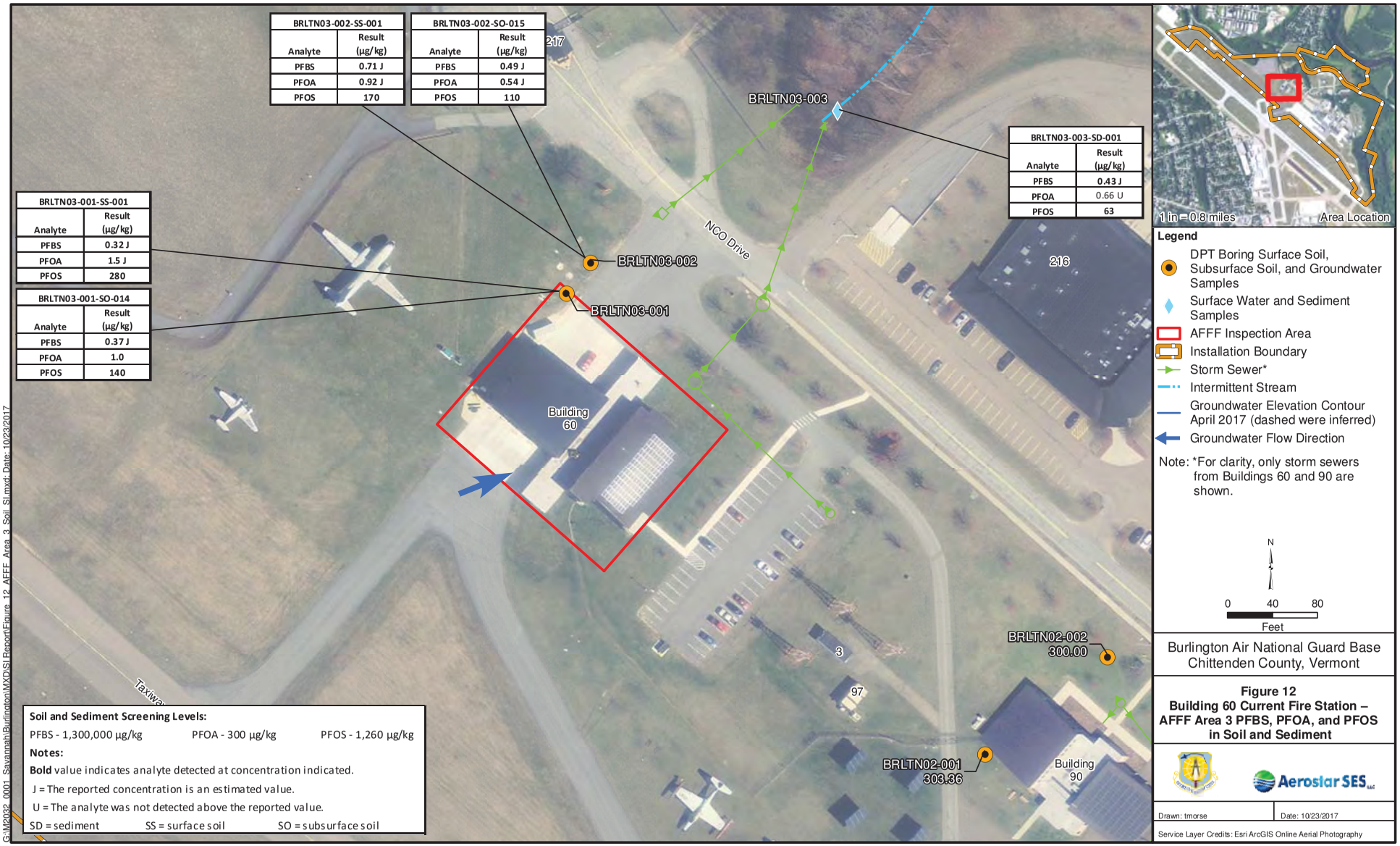


Burlington Air National Guard Base
Chittenden County, Vermont

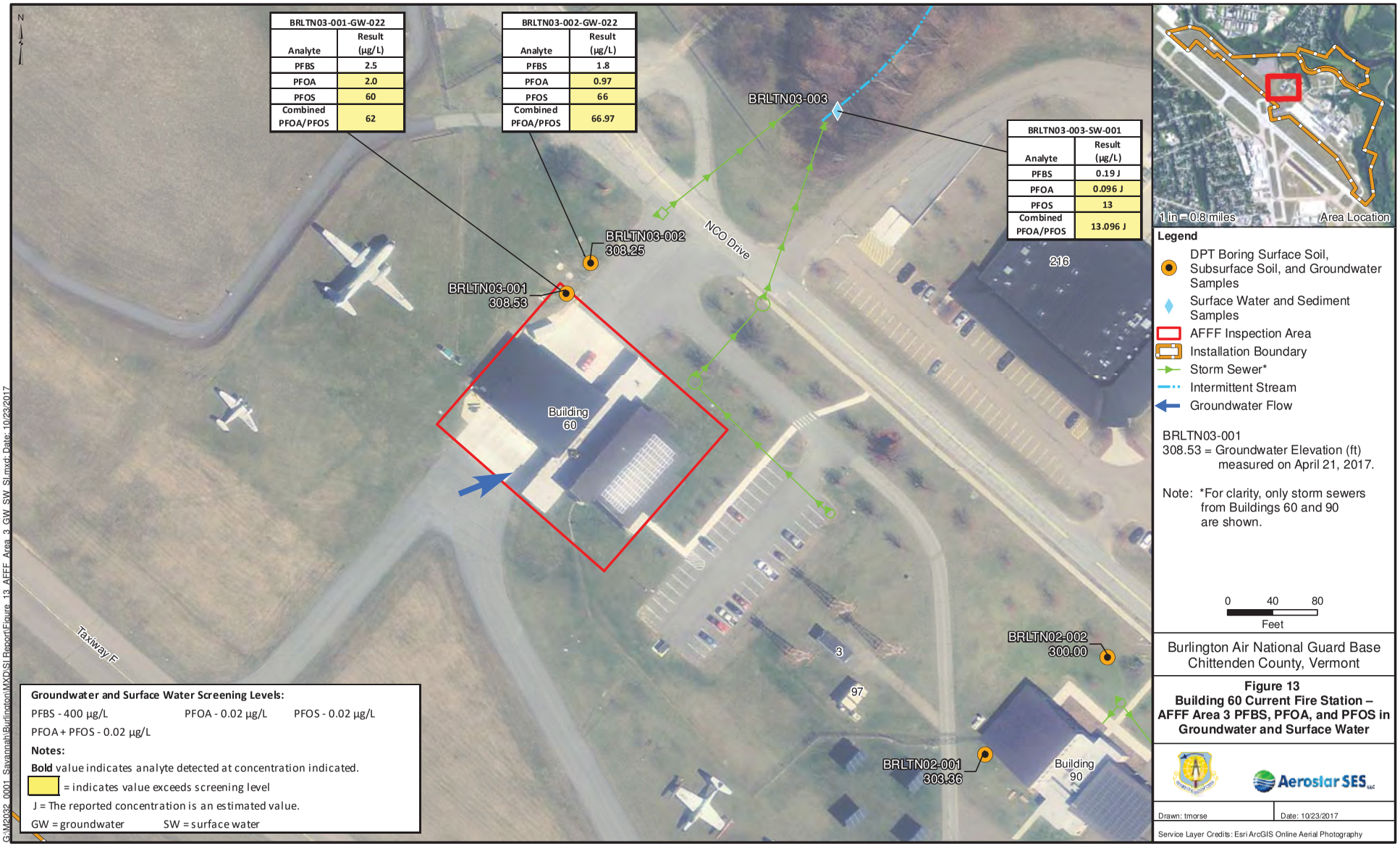
Figure 12
Building 60 Current Fire Station – AFFF Area 3 PFBS, PFOA, and PFOS in Soil and Sediment

Aerostar SES LLC

Drawn: tmorse | Date: 10/23/2017

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Burlington\MXD\SI Report\Figure_12_AFFF_Area_3_Soil_SI.mxd: Date: 10/23/2017


N
BRLTN03-001-GW-022
Analyte | Result (µg/L)
PFBS | 2.5
PFOA | 2.0
PFOS | 60
Combined PFOA/PFOS | 62
BRLTN03-002-GW-022
Analyte | Result (µg/L)
PFBS | 1.8
PFOA | 0.97
PFOS | 66
Combined PFOA/PFOS | 66.97
BRLTN03-003-SW-001
Analyte | Result (µg/L)
PFBS | 0.19 J
PFOA | 0.096 J
PFOS | 13
Combined PFOA/PFOS | 13.096 J
BRLTN03-003
BRLTN03-002
308.25
BRLTN03-001
308.53
NCO Drive
216
Building
60
Taxiway F
3
97
BRLTN02-002
300.00
BRLTN02-001
303.36
Building
90
Groundwater and Surface Water Screening Levels:
PFBS - 400 µg/L
PFOA - 0.02 µg/L
PFOS - 0.02 µg/L
PFOA + PFOS - 0.02 µg/L
Notes:
Bold value indicates analyte detected at concentration indicated.
= indicates value exceeds screening level
J = The reported concentration is an estimated value.
GW = groundwater
SW = surface water
1 in = 0.8 miles
Area Location
Legend
DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
Surface Water and Sediment Samples
AFFF Inspection Area
Installation Boundary
Storm Sewer*
Intermittent Stream
Groundwater Flow
BRLTN03-001
308.53 = Groundwater Elevation (ft) measured on April 21, 2017.
Note: *For clarity, only storm sewers from Buildings 60 and 90 are shown.
0
40
80
Feet
Burlington Air National Guard Base
Chittenden County, Vermont
Figure 13
Building 60 Current Fire Station – AFFF Area 3 PFBS, PFOA, and PFOS in Groundwater and Surface Water
Aerostar SES
Drawn: tmorse
Date: 10/23/2017
Service Layer Credits: Esri ArcGIS Online Aerial Photography
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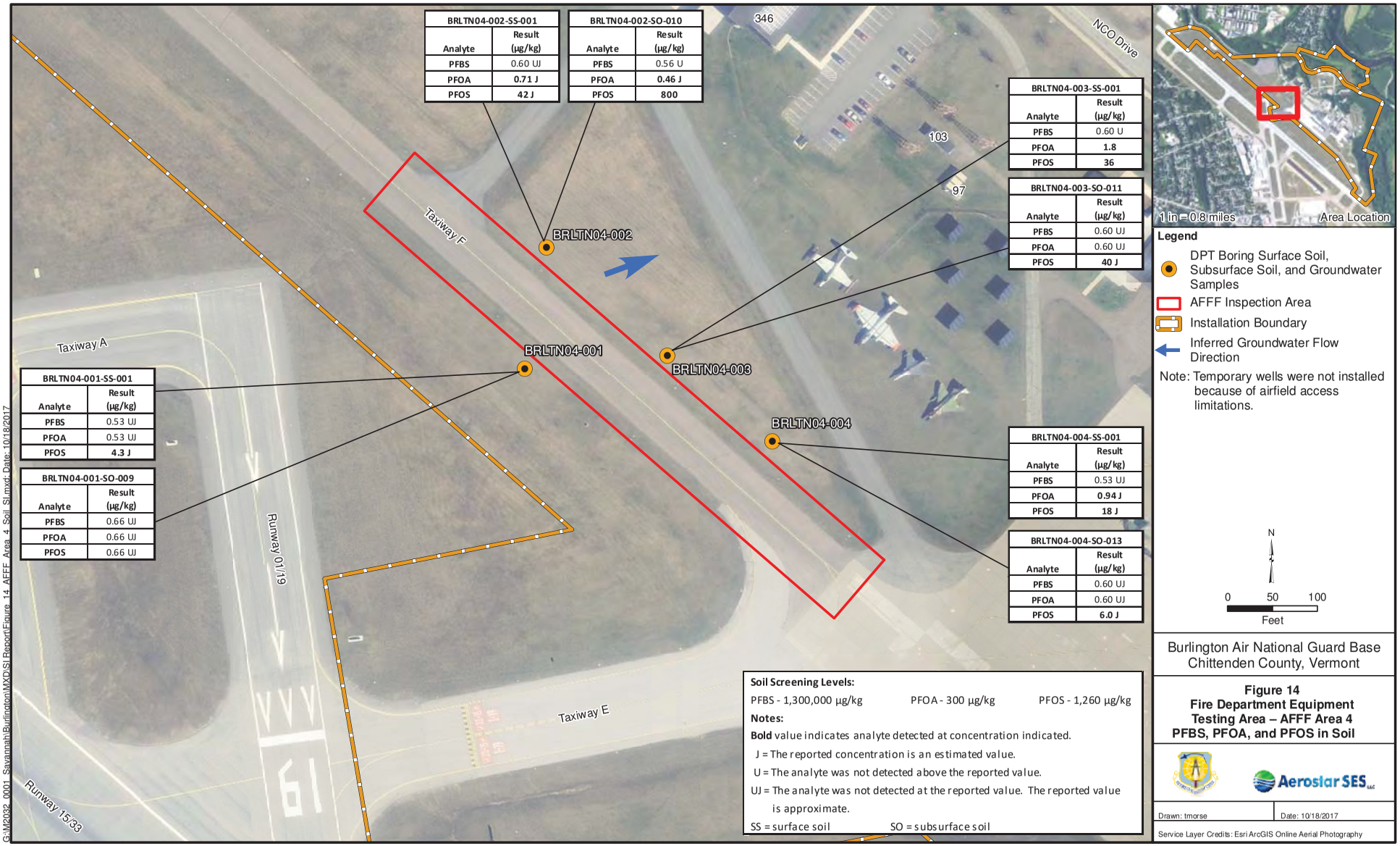

Burlington Air National Guard Base
Chittenden County, Vermont

Figure 14
Fire Department Equipment Testing Area – AFFF Area 4
PFBS, PFOA, and PFOS in Soil

Aerostar SES LLC

Drawn: tmorse | Date: 10/18/2017

Service Layer Credits: Esri ArcGIS Online Aerial Photography

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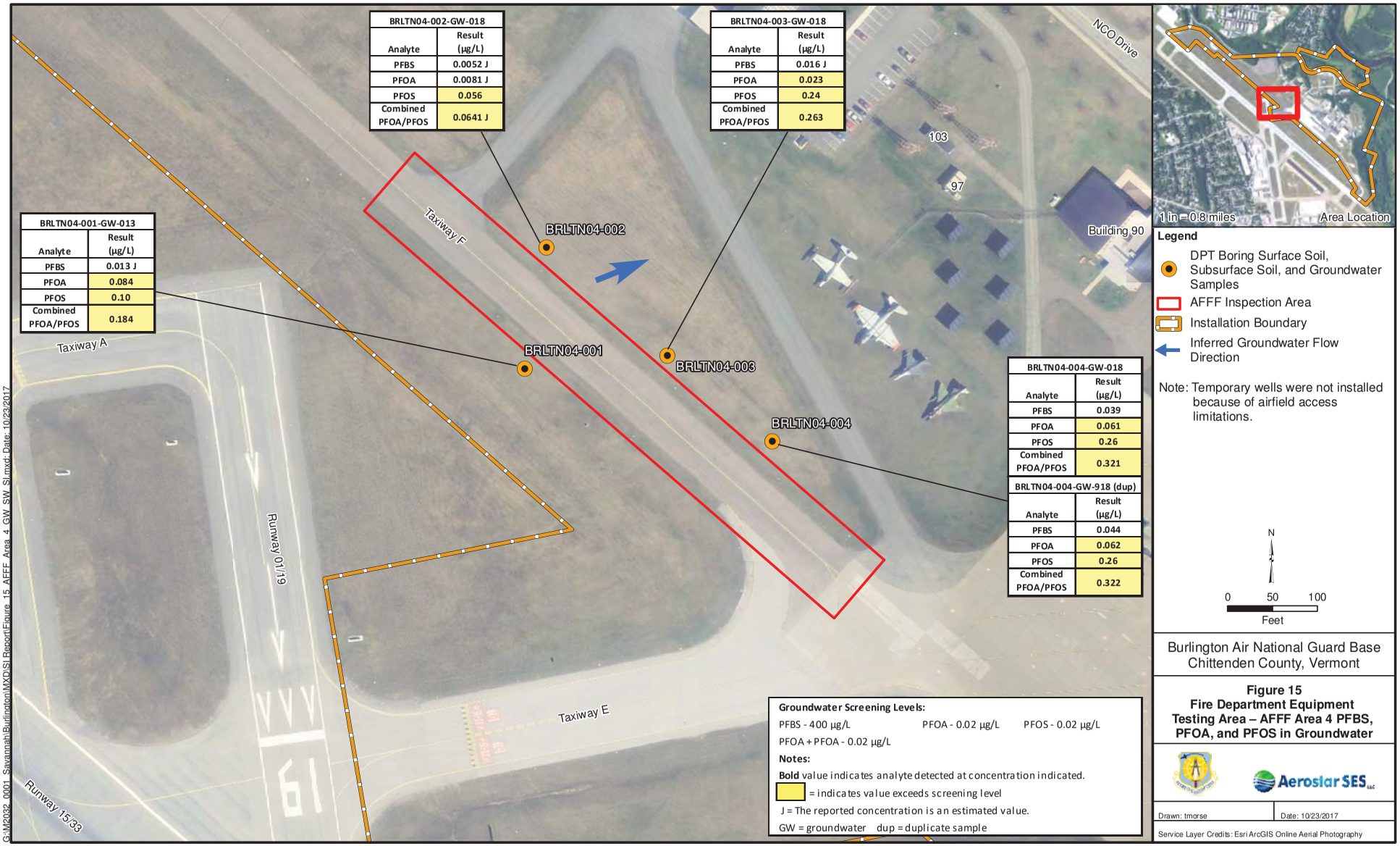
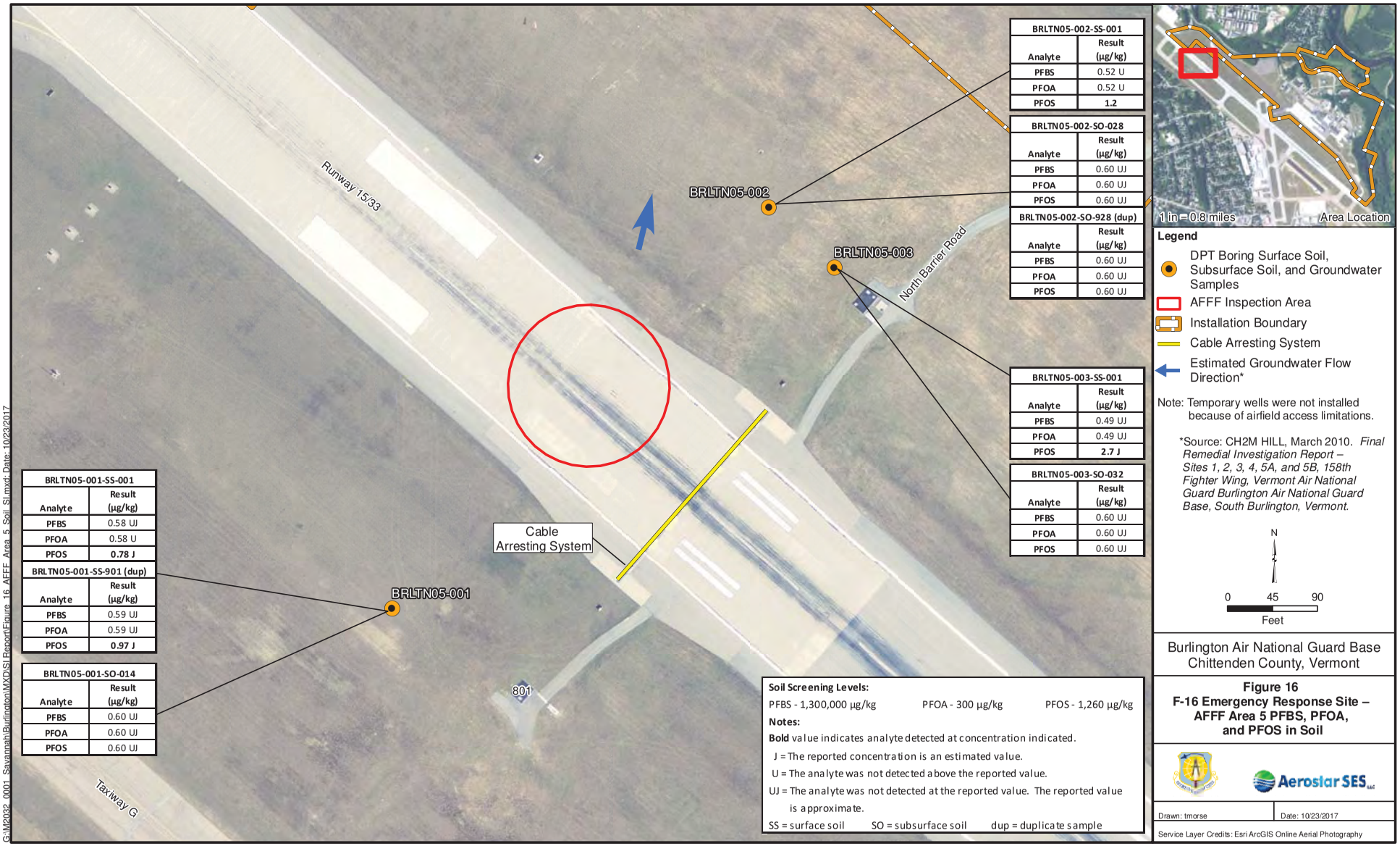
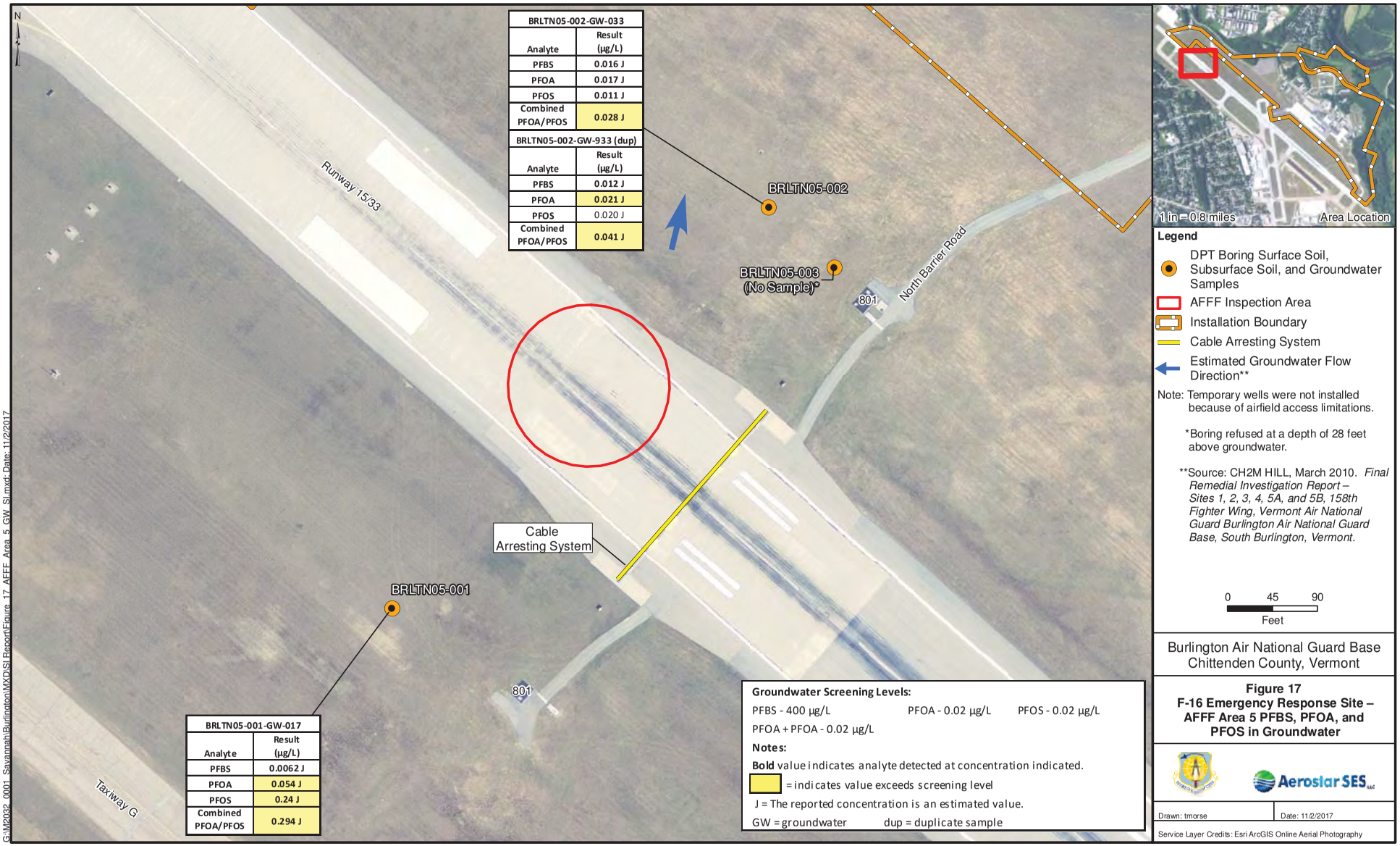
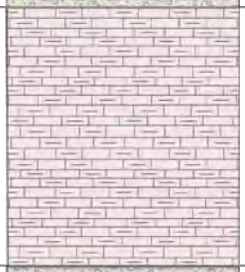
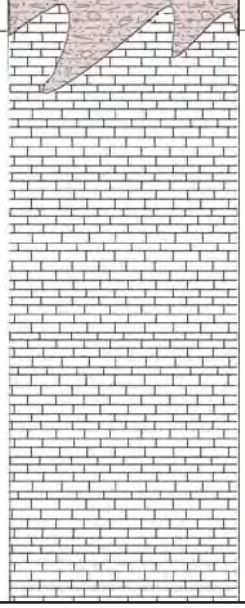

BRLTN04-002-GW-018
Analyte | Result (µg/L)
PFBS | 0.0052 J
PFOA | 0.0081 J
PFOS | 0.056
Combined PFOA/PFOS | 0.0641 J
BRLTN04-003-GW-018
Analyte | Result (µg/L)
PFBS | 0.016 J
PFOA | 0.023
PFOS | 0.24
Combined PFOA/PFOS | 0.263
BRLTN04-001-GW-013
Analyte | Result (µg/L)
PFBS | 0.013 J
PFOA | 0.084
PFOS | 0.10
Combined PFOA/PFOS | 0.184
BRLTN04-004-GW-018
Analyte | Result (µg/L)
PFBS | 0.039
PFOA | 0.061
PFOS | 0.26
Combined PFOA/PFOS | 0.321
BRLTN04-004-GW-918 (dup)
Analyte | Result (µg/L)
PFBS | 0.044
PFOA | 0.062
PFOS | 0.26
Combined PFOA/PFOS | 0.322
BRLTN04-001
BRLTN04-002
BRLTN04-003
BRLTN04-004
Taxiway A
Taxiway E
Taxiway F
Runway 01/19
Runway 15/33
NCO Drive
Building 90
103
97
Groundwater Screening Levels:
PFBS - 400 µg/L
PFOA - 0.02 µg/L
PFOS - 0.02 µg/L
PFOA + PFOA - 0.02 µg/L
Notes:
Bold value indicates analyte detected at concentration indicated.
= indicates value exceeds screening level
J = The reported concentration is an estimated value.
GW = groundwater dup = duplicate sample
1 in = 0.8 miles
Area Location
Legend
DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
AFFF Inspection Area
Installation Boundary
Inferred Groundwater Flow Direction
Note: Temporary wells were not installed because of airfield access limitations.
N
0 50 100
Feet
Burlington Air National Guard Base
Chittenden County, Vermont
Figure 15
Fire Department Equipment Testing Area – AFFF Area 4 PFBS, PFOA, and PFOS in Groundwater
Aerostar SES
Drawn: tmorse
Date: 10/23/2017
Service Layer Credits: Esri ArcGIS Online Aerial Photography
G:\M2032_0001_Savannah\Burlington\MXD\SI Report\Figure_15_AFFF_Area_4_GW_SW_SI.mxd: Date: 10/23/2017



G:\M2032_0001_Savannah\Burlington\MXD\SI Report\Figure_16_AFFF_Area_5_Soil_SI.mxd: Date: 10/23/2017

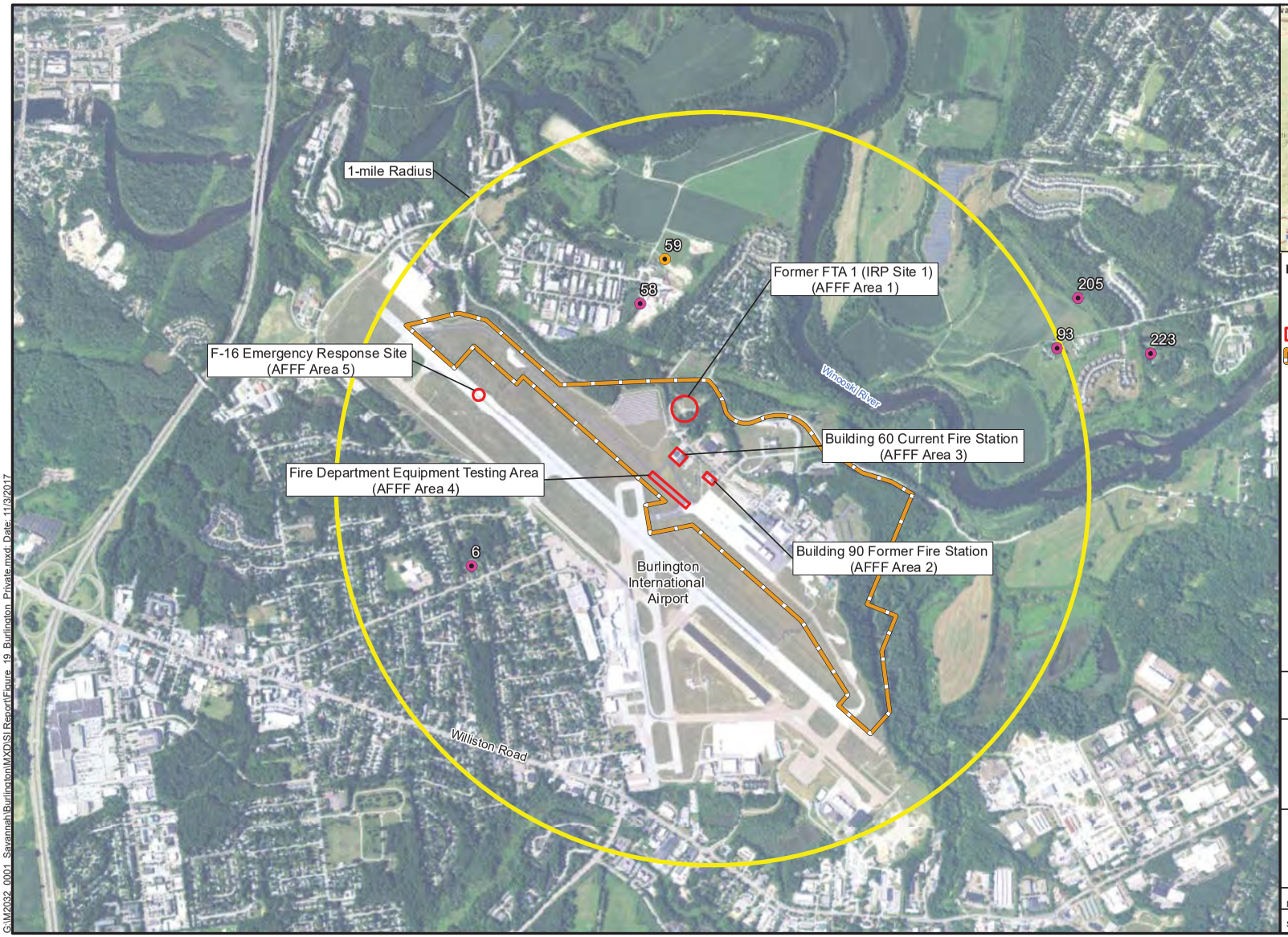

N
BRLTN05-002-GW-033
Analyte | Result (µg/L)
PFBS | 0.016 J
PFOA | 0.017 J
PFOS | 0.011 J
Combined PFOA/PFOS | 0.028 J
BRLTN05-002-GW-933 (dup)
Analyte | Result (µg/L)
PFBS | 0.012 J
PFOA | 0.021 J
PFOS | 0.020 J
Combined PFOA/PFOS | 0.041 J
BRLTN05-002
BRLTN05-003 (No Sample)*
Runway 15/33
North Barrier Road
801
Cable Arresting System
BRLTN05-001
801
Taxiway G
BRLTN05-001-GW-017
Analyte | Result (µg/L)
PFBS | 0.0062 J
PFOA | 0.054 J
PFOS | 0.24 J
Combined PFOA/PFOS | 0.294 J
1 in = 0.8 miles
Area Location
Legend
DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
AFFF Inspection Area
Installation Boundary
Cable Arresting System
Estimated Groundwater Flow Direction**
Note: Temporary wells were not installed because of airfield access limitations.
*Boring refused at a depth of 28 feet above groundwater.
**Source: CH2M HILL, March 2010. Final Remedial Investigation Report – Sites 1, 2, 3, 4, 5A, and 5B, 158th Fighter Wing, Vermont Air National Guard Burlington Air National Guard Base, South Burlington, Vermont.
0 45 90
Feet
Groundwater Screening Levels:
PFBS - 400 µg/L PFOA - 0.02 µg/L PFOS - 0.02 µg/L
PFOA + PFOA - 0.02 µg/L
Notes:
Bold value indicates analyte detected at concentration indicated.
= indicates value exceeds screening level
J = The reported concentration is an estimated value.
GW = groundwater dup = duplicate sample
Burlington Air National Guard Base
Chittenden County, Vermont
Figure 17
F-16 Emergency Response Site – AFFF Area 5 PFBS, PFOA, and PFOS in Groundwater
Aerostar SES
Drawn: tmorse
Date: 11/2/2017
Service Layer Credits: Esri ArcGIS Online Aerial Photography
G:\M2032_0001_Savannah\Burlington\MXD\SI Report\Figure_17_AFFF_Area_5_GW_SI.mxd - Date: 11/2/2017

Era	Period	Epoch	Unit	Columnar Section	Thickness (feet)	Typical Lithologic Characteristics
		Recent	Fill		0 - 7'±	
Cenozoic	Quaternary	Pleistocene	Deltaic Deposits		9 - 50'±	Fine to Coarse Brown to Gray Sand to Sandy Silt
			Lucustrine/ Marine Deposits		0 - 50'±	Gray to Blue Gray Clay, and Silty Clay, Trace Gravel
			Gravelly Glacial Till and Boulders		0 - 22'±	Gray Nonstratified Boulders, Gravel, Sand, Silt and Clay Mixtures Angular to Subangualar Cobbles
			Large Unconformity			
Paleozoic	Ordovician		Beekmantown Group Bascom Formation			White Crystalline Limestone

Source: Roy F. Weston, Inc. (Weston), March 1986. *Installation Restoration Program Phase II - Confirmation/ Quantification Stage 1, Final Report for Burlington Air National Guard Base, Vermont.*

Figure 18 Generalized Stratigraphic Column
Burlington Air National Guard Base, Chittenden County, Vermont

G:\M2032_0001_Savannah\Burlington\MXD\SI Report\Figure_18_Burlington_Stratigraphic.mxd; Date: 10/6/2017



Legend

- Agricultural Well
- Domestic Well
- AFFF Inspection Area
- Installation Boundary

N

0 900 1,800

Feet

Burlington Air National Guard Base
Chittenden County, Vermont

Figure 19
Private Wells within Approximate 1-Mile Radius of the Center of Burlington ANG Base

Aerostar SES LLC

Drawn: tmorse | Date: 11/3/2017

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Burlington\MXD\SI Report\Figure_19_Burlington_Private.mxd: Date: 11/3/2017

Appendix B
Regional Screening Level Calculations

Default

Resident Equation Inputs for Soil

Variable	Value
THQ (target hazard quotient) unitless	1
TR (target risk) unitless	1.0E-6
LT (lifetime) years	70
ET_{res} (exposure time) hours/day	24
ET_{res-c} (child exposure time) hours/day	24
ET_{res-a} (adult exposure time) hours/day	24
ET_{0-2} (mutagenic exposure time) hours/day	24
ET_{2-6} (mutagenic exposure time) hours/day	24
ET_{6-16} (mutagenic exposure time) hours/day	24
ET_{16-26} (mutagenic exposure time) hours/day	24
ED_{res} (exposure duration) years	26
ED_{res-c} (exposure duration - child) years	6
ED_{res-a} (exposure duration - adult) years	20
ED_{0-2} (mutagenic exposure duration) years	2
ED_{2-6} (mutagenic exposure duration) years	4
ED_{6-16} (mutagenic exposure duration) years	10
ED_{16-26} (mutagenic exposure duration) years	10
BW_{res-c} (body weight - child) kg	15
BW_{res-a} (body weight - adult) kg	80
BW_{0-2} (mutagenic body weight) kg	15
BW_{2-6} (mutagenic body weight) kg	15
BW_{6-16} (mutagenic body weight) kg	80
BW_{16-26} (mutagenic body weight) kg	80
SA_{res-c} (skin surface area - child) cm^2/day	2373
SA_{res-a} (skin surface area - adult) cm^2/day	6032
SA_{0-2} (mutagenic skin surface area) cm^2/day	2373
SA_{2-6} (mutagenic skin surface area) cm^2/day	2373
SA_{6-16} (mutagenic skin surface area) cm^2/day	6032
SA_{16-26} (mutagenic skin surface area) cm^2/day	6032
EF_{res} (exposure frequency) days/year	350
EF_{res-c} (exposure frequency - child) days/year	350
EF_{res-a} (exposure frequency - adult) days/year	350
EF_{0-2} (mutagenic exposure frequency) days/year	350

Output generated 18JUL2017:23:07:27

Default

Resident Equation Inputs for Soil

Variable	Value
EF_{2-6} (mutagenic exposure frequency) days/year	350
EF_{6-16} (mutagenic exposure frequency) days/year	350
EF_{16-26} (mutagenic exposure frequency) days/year	350
$IFS_{res-adj}$ (age-adjusted soil ingestion factor) mg/kg	36750
$IFSM_{res-adj}$ (mutagenic age-adjusted soil ingestion factor) mg/kg	166833.33
IRS_{res-c} (soil intake rate - child) mg/day	200
IRS_{res-a} (soil intake rate - adult) mg/day	100
IRS_{0-2} (mutagenic soil intake rate) mg/day	200
IRS_{2-6} (mutagenic soil intake rate) mg/day	200
IRS_{6-16} (mutagenic soil intake rate) mg/day	100
IRS_{16-26} (mutagenic soil intake rate) mg/day	100
AF_{res-a} (skin adherence factor - adult) mg/cm ^{2}	0.07
AF_{res-c} (skin adherence factor - child) mg/cm ^{2}	0.2
AF_{0-2} (mutagenic skin adherence factor) mg/cm ^{2}	0.2
AF_{2-6} (mutagenic skin adherence factor) mg/cm ^{2}	0.2
AF_{6-16} (mutagenic skin adherence factor) mg/cm ^{2}	0.07
AF_{16-26} (mutagenic skin adherence factor) mg/cm ^{2}	0.07
$DFS_{res-adj}$ (age-adjusted soil dermal factor) mg/kg	103390
$DFSM_{res-adj}$ (mutagenic age-adjusted soil dermal factor) mg/kg	428260
$City_{PEF}$ (Climate Zone) Selection	Default
A_s (acres)	0.5
Q/C_{iwp} (inverse of the ratio of the geometric mean air concentration to the emission flu	93.77
PEF (particulate emission factor) m ^{3}/kg	1359344438
A (PEF Dispersion Constant)	16.2302
B (PEF Dispersion Constant)	18.7762
C (PEF Dispersion Constant)	216.108
V (fraction of vegetative cover) unitless	0.5
U_m (mean annual wind speed) m/s	4.69
U_t (equivalent threshold value)	11.32
F(x) (function dependant on U_m/U_t) unitless	0.194
$City_{VF}$ (Climate Zone) Selection	Default
A_s (acres)	0.5
Q/C_{vol} (inverse of the ratio of the geometric mean air concentration to the emission flu	68.18

Output generated 18JUL2017:23:07:27

Default

Resident Equation Inputs for Soil

Variable	Value
foc (fraction organic carbon in soil) g/g	0.006
p_b (dry soil bulk density) g/cm ^{3}	1.5
p_s (soil particle density) g/cm ^{3}	2.65
n (total soil porosity) L_{pore}/L_{soil}	0.43396
$_a$ (air-filled soil porosity) L_{air}/L_{soil}	0.28396
$_w$ (water-filled soil porosity) L_{water}/L_{soil}	0.15
T (exposure interval) s	819936000
A (VF Dispersion Constant)	11.911
B (VF Dispersion Constant)	18.4385
C (VF Dispersion Constant)	209.7845
$City_{VF\ mass\text{-}loading}$ (Climate Zone) Selection	Default
VF_{ml} (volitization factor - mass-limit) m ^{3}/kg	.
Q/C_{vol} (inverse of the ratio of the geometric mean air concentration to the emission fl	68.18365
A_e (acres)	0.5
T (exposure interval) yr	26
d_e (depth of source) m	.
p_b (dry soil bulk density) g/cm ^{3}	1.5
A (VF Dispersion Constant - Mass Limit)	11.911
B (VF Dispersion Constant - Mass Limit)	18.4385
C (VF Dispersion Constant - Mass Limit)	209.7845

Output generated 18JUL2017:23:07:27

Default

Resident Risk-Based Screening Levels (RSL) for Soil

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #27); H = HEAST; F = See FAQ; J = New Jersey; E = see user guide Section 2.3.5; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Chemical	CAS Number	Mutagen?	VOC?	Ingestion SF (mg/kg-day) $^{-1}$	SFO Ref	Inhalation Unit Risk (ug/m^3)$^{-1}$	IUR Ref	Chronic RfD (mg/kg-day)	Chronic RfD Ref	Chronic RfC (mg/m^3)	Chronic RfC Ref	GIABS	ABS	RBA
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	No	No	-		-		2.00E-05	DW	-		1	0.1	1
Perfluorooctanoic acid (PFOA)	335-67-1	No	No	7.00E-02	D	-		2.00E-05	DW	-		1	0.1	1

Chemical	Volatilization Factor (m^3/kg)	Henry's Law Constant (unitless)	S (mg/L)	K_{oc} (cm3/g)	Soil Saturation Concentration (mg/kg)	Particulate Emission Factor (m^3/kg)	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)
Perfluorooctane sulfonic acid (PFOS)	-	-	6.80E+02	3.72E+02	-	1.36E+09	-	-	-	-
Perfluorooctanoic acid (PFOA)	-	-	9.50E+03	1.15E+02	-	1.36E+09	9.93E+00	3.53E+01	-	7.75E+00

Chemical	Ingestion SL Child THQ=1 (mg/kg)	Dermal SL Child THQ=1 (mg/kg)	Inhalation SL Child THQ=1 (mg/kg)	Noncarcinogenic SL Child THI=1 (mg/kg)	Ingestion SL Adult THQ=1 (mg/kg)	Dermal SL Adult THQ=1 (mg/kg)	Inhalation SL Adult THQ=1 (mg/kg)	Noncarcinogenic SL Adult THI=1 (mg/kg)	Screening Level (mg/kg)
Perfluorooctane sulfonic acid (PFOS)	1.56E+00	6.59E+00	-	1.26E+00	1.67E+01	3.95E+01	-	1.17E+01	1.26E+00 nc
Perfluorooctanoic acid (PFOA)	1.56E+00	6.59E+00	-	1.26E+00	1.67E+01	3.95E+01	-	1.17E+01	1.26E+00 nc

Output generated 18JUL2017:23:07:27

Chemical	CASNUM	Inhalation Unit Risk (µg/m ³)⁻¹	Toxicity Source	EPA Cancer Classification	Inhalation Unit Risk Tumor Type	Inhalation Unit Risk Target Organ	Inhalation Unit Risk Species	Inhalation Unit Risk Method	Inhalation Unit Risk Route	Inhalation Unit Risk Treatment Duration	Inhalation Unit Risk Study Reference
Perfluorooctane sulfonic acid (PFOS)	1763-23-1										
Perfluorooctanoic acid (PFOA)	335-67-1										

Output generated 18JUL2017:23:07:27

Oral Slope Factor Toxicity Metadata

Chemical	CASNUM	Oral Slope Factor (mg/kg-day) $^{-1}$	Toxicity Source	EPA Cancer Classification	Oral Slope Factor Tumor Type	Oral Slope Factor Target Organ	Oral Slope Factor Species	Oral Slope Factor Method	Oral Slope Factor Route	Oral Slope Factor Treatment Duration	Oral Slope Factor Study Reference
Perfluorooctane sulfonic acid (PFOS)	1763-23-1										
Perfluorooctanoic acid (PFOA)	335-67-1	7.00E-02	DWSHA	NA	NA	NA	NA	NA	NA	NA	NA

Output generated 18JUL2017:23:07:27

Oral Chronic Toxicity Metadata

Chemical	CASNUM	Chronic Oral Reference Dose (mg/kg-day)	Toxicity Source	Oral Chronic Reference Dose Basis	Oral Chronic Reference Dose Confidence Level	Oral Chronic Reference Dose Critical Effect
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	2.00E-05	DWSHA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	335-67-1	2.00E-05	DWSHA	NA	NA	NA

Oral Chronic Reference Dose Target Organ	Oral Chronic Reference Dose Modifying Factor	Oral Chronic Reference Dose Uncertainty Factor	Oral Chronic Reference Dose Species	Oral Chronic Reference Dose Route	Oral Chronic Reference Dose Study Duration	Oral Chronic Reference Dose Study Reference
NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA

Output generated 18JUL2017:23:07:27

Inhalation Chronic Toxicity Metadata

Chemical	CASNUM	Chronic Inhalation Reference Concentration (mg/m^3)	Toxicity Source	Inhalation Chronic Reference Concentration Basis	Inhalation Chronic Reference Concentration Confidence Level	Inhalation Chronic Reference Concentration Critical Effect
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	-				
Perfluorooctanoic acid (PFOA)	335-67-1	-				

Inhalation Chronic Reference Concentration Target Organ	Inhalation Chronic Reference Concentration Modifying Factor	Inhalation Chronic Reference Concentration Uncertainty Factor	Inhalation Chronic Reference Concentration Species	Inhalation Chronic Reference Concentration Route	Inhalation Chronic Reference Concentration Study Duration	Inhalation Chronic Reference Concentration Study Reference

Output generated 18JUL2017:23:07:27

Appendix C

Readiness Review Forms, Field Forms, and Boring Logs

SES FIELD READINESS REVIEW FORM

Employee Name: Franklin Johnson

Employee Number: 130253

Job Number: M2032.0001

Job Location: ANG Burlington

Job Tasks:

Surface Sampling, Groundwater Sampling, Soil Sampling – Surface Soil and subsurface soil, Soil boring logging, Surface water and sediment sampling, Mobilization/demobilization tasks

Equipment Needed:

Soil boring: Munsell Charts, Tape measure, pens, soil boring forms, USCS Table,

GW Sampling: YSI, peristaltic pump, multi-RAE, sample containers etc.

Sediment Sampling: Sample containers, spoons

SW Sampling: Sample containers, SW collection device

Proper PPE for all above tasks is a minimum Level D, plus nitriles.

Documents Needed:

Field forms: Boring log, GW sampling log, sample log, log book, calibration sheets

Significant training conducted prior to departure:

- Mid Project QC Rev 4 outline reviewed with personnel.

Equipment Packed for travel on: 04/06/17

Travel Dates: 04-16-17 through 04-25-17

Site Supervisor Signature

SES FIELD READINESS REVIEW FORM

Employee Name: Kaleb Brumbaugh

Employee Number: 130333

Job Number: M2032.0001

Job Location: ANG Burlington

Job Tasks:

Surface Sampling, Groundwater Sampling, Soil Sampling – Surface Soil and subsurface soil, Soil boring logging, Surface water and sediment sampling, Mobilization/demobilization tasks

Equipment Needed:

Soil boring: Munsell Charts, Tape measure, pens, soil boring forms, USCS Table,

GW Sampling: YSI, peristaltic pump, multi-RAE, sample containers etc.

Sediment Sampling: Sample containers, spoons

SW Sampling: Sample containers, SW collection device

Proper PPE for all above tasks is a minimum Level D, plus nitriles.

Documents Needed:

Field forms: Boring log, GW sampling log, sample log, log book, calibration sheets

Significant training conducted prior to departure:

- Mid Project QC Rev 4 outline reviewed with personnel.

Equipment Packed for travel on: 04/06/17

Travel Dates: 04-16-17 through 04-25-17

Site Supervisor Signature

SES FIELD READINESS REVIEW FORM

Employee Name: Ryan Reynolds

Employee Number:

Job Number: M2032.0001

Job Location: ANG Burlington

Job Tasks:

Surface Sampling, Groundwater Sampling, Soil Sampling – Surface Soil and subsurface soil, Soil boring logging, Surface water and sediment sampling, mobilization/demobilization tasks

Equipment Needed:

Soil boring: Munsell Charts, Tape measure, pens, soil boring forms, USCS Table,

GW Sampling: YSI, peristaltic pump, multi-RAE, sample containers etc.

Sediment Sampling: Sample containers, spoons

SW Sampling: Sample containers, SW collection device

Proper PPE for all above tasks is a minimum Level D, plus nitriles.

Documents Needed:

Field forms: Boring log, GW sampling log, sample log, log book, calibration sheets

Significant training conducted prior to departure:

- Mid Project QC Rev 4 outline reviewed with personnel.

Equipment Packed for travel on: 04/06/17

Travel Dates: 04-16-17 through 04-25-17

Site Supervisor Signature

AerostarSES LLC

WELL DEVELOPMENT LOG

Project Name: SI of AFFF Savannah
ASL Project No: M2032.0001
Installation: Burlington ANGB
Site: 02
Date: 4/19/17
Sample Technician: Ragen Reynolds
Well ID No.: BRLTN02-001

Initial Measurements

Well Total Depth: 30.45 ft BTOC		Water Level: 22.13 ft BTOC	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = (30.45 Ft - 22.13 Ft) x 0.02 gal/ft = 0.1664 Gal			
Calculated Well Volume: 0.1664 Gallons		Well Diameter: 0.75 inches	
Calculations:	1" diameter = 0.041 gal/ft	2" diameter = 0.163 gal/ft	4" diameter = 0.653 gal/ft

Well Purging Activites

Purging Method (pump type): Peristaltic Flow rate (incl. units): 400 ml/min

Time	Flow Rate (ml/min)	Turbidity (NTUs)	Temp (°C)	Cond. (mS/Cm)	pH	Depth to water (BTOC)	DO (mg/l)	ORP	Total Gal Pumped	Comments
16:31	400	OOR	8.71	.183	8.65	22.13	8.45	-191.2	0.105	
16:41	400	7.89	8.76	.169	8.39	—	4.90	-182.0	1.155	
16:51	400	4.73	8.80	.170	8.11	—	5.06	-62.1	2.205	
17:01	400	2.13	8.74	.168	7.85	—	5.30	-41.8	3.255	
17:11	400	1.74	8.76	.167	7.70	—	5.38	-129.6	4.305	
17:21	400	1.70	8.72	.166	7.53	—	5.47	-133.7	5.355	
Results At End Of Purging:		1.70	8.72	0.166	7.53	*	5.47	-133.7 (ft)	5.355	

COMMENTS:
Pump start @ 16:30
Pump stop @ 17:21
~~Final DTW = (ft)~~

* cannot fit water level probe down well with tubing inside

AerostarSES LLC

WELL DEVELOPMENT LOG

Project Name: SI of AFFF Bayou
ASL Project No: M2032.001
Installation: Burlington ANGB
Site: 02
Date: 4/20/17
Sample Technician: Rajan Reynolds
Well ID No.: BRLTN02-002

Initial Measurements

Well Total Depth: 31.55 ft BTOC		Water Level: 27.44 ft BTOC	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY			
(only fill out if applicable) = (31.55 Ft - 27.44 Ft) x 0.02 gal/ft = 0.0822 Gal			
Calculated Well Volume: 0.0822 Gallons		Well Diameter: 0.75 inches	
Calculations:	1" diameter = 0.041 gal/ft	2" diameter = 0.163 gal/ft	4" diameter = 0.653 gal/ft

Well Purging Activites

Purging Method (pump type): Peristaltic Flow rate (incl. units): 330 ml

Time	Flow Rate (ml/min)	Turbidity (NTUs)	Temp (°C)	Cond. (mS/Cm)	pH	Depth to water (BTOC)	DO (mg/l)	ORP	Total Gal Pumped	Comments
10:20	330	-OOR-	9.26	0.138	8.36	—	5.85	-152.4	0.08	
10:30	330	10.9	9.35	0.138	8.31	—	5.33	-151.8	0.88	
10:40	330	1.45	9.41	0.136	7.95	—	5.85	-128.2	1.68	
10:50	330	1.27	9.49	0.134	7.89	—	5.86	-119.6	2.48	
11:00	330	0.80	9.53	0.133	7.80	—	5.79	-115.9	3.28	
Results At End Of Purging:										

COMMENTS:

Pump started @ 10:19
Pump finish @ 11:00

* Cannot fit water level probe in well while tubing is in.

AerostarSES LLC

WELL DEVELOPMENT LOG

Project Name: SI of AFFF Savannah
ASL Project No: M2032.0001
Installation: Burlington ANGB
Site: 03
Date: 4/20/17
Sample Technician: Regan Reynolds
Well ID No.: BRLTN02-003

Initial Measurements

Well Total Depth: 37.46 ft BTOC		Water Level: 29.27 ft BTOC	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = (37.46 Ft - 29.27 Ft) x 0.02 gal/ft = 0.1638 Gal			
Calculated Well Volume: 0.1638 Gallons		Well Diameter: 0.75 inches	
Calculations:	1" diameter = 0.041 gal/ft	2" diameter = 0.163 gal/ft	4" diameter = 0.653 gal/ft

Well Purging Activites

Purging Method (pump type): Peristaltic Flow rate (incl. units): 135 ml/min

Time	Flow Rate (ml/min)	Turbidity (NTUs)	Temp (°C)	Cond. (mS/Cm)	pH	Depth to water (BTOC)	DO (mg/l)	ORP	Total Gal Pumped	Comments
8:47	135	-OOR-	7.71	0.167	8.53	–	4.76	-104.4	0.035	
8:57	135	-OOR-	7.83	0.170	8.41	–	4.72	-100.8	0.385	
9:07	135	30.8	8.18	0.170	8.27	–	4.75	-109.2	0.735	
9:17	135	6.06	8.21	0.168	8.22	–	4.82	-117.8	1.085	
9:27	135	6.00	8.30	0.167	8.19	–	4.88	-120.1	1.435	
9:37	135	4.84	8.39	0.168	8.13	–	4.90	-119.8	1.785	
Results At End Of Purging:		4.84	8.39	0.168	8.13	*	4.90	-119.8	1.785	

COMMENTS:

Purging started @ 8:46
Purging ended @ 9:37

* Cannot fit water level probe down well while tubing is inside

* slow development due to low recharge rate

AerostarSES LLC

WELL DEVELOPMENT LOG

Project Name: SI AFF Savannah
ASL Project No: M2032.0001
Installation: Burlington ARB
Site: 03
Date: 4/19/17
Sample Technician: Kaleb Brumbaugh
Well ID No.: BRLIN03-001

Initial Measurements

Well Total Depth: 25.7 ft BTOC		Water Level: 17 ft BTOC	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY			
(only fill out if applicable) = (25.7 Ft - 17.0 Ft) x 0.02 gal/ft = 0.174 Gal			
Calculated Well Volume: 0.174 Gallons		Well Diameter: 0.75 inches	
Calculations:	1" diameter = 0.041 gal/ft	2" diameter = 0.163 gal/ft	4" diameter = 0.653 gal/ft

Well Purging Activites

Purging Method (pump type): Peri Pump Flow rate (incl. units): 500mL/min

Time	Flow Rate (ml/min)	Turbidity (NTUs)	Temp (°C)	Cond. (mS/Cm)	pH	Depth to water (BTOC)	DO (mg/l)	ORP	Total mL Pumped	Comments
1510	500	OR	8.66	0.213	9.40	N/A	3.34	-281	500	
1520	" "	54.6	8.67	0.207	9.32		3.92	-286	5000	
1530	" "	26.2	8.66	0.208	9.21		3.86	-276	10500	
1540	" "	10.4	8.61	0.210	9.02		4.31	-261.6	15500	
Results At End Of Purging:		10.4	8.61	0.210	9.02		4.31	-261.6	15500mL	

COMMENTS:

0.75" well diameter equals 0.02"
OR = Out of Range,
(*Note*: NO GWL reading due to diameter of well & diameter of poly tube 0.25")

AerostarSES LLC

WELL DEVELOPMENT LOG

Project Name: ~~Burlington ANGB~~ RP: 51 of AFFF Savannah
ASL Project No: M2032.0001
Installation: Burlington ANGB
Site: 03
Date: 4/19/17
Sample Technician: Ryan Reynolds
Well ID No.: BRLNG03-002

Initial Measurements

Well Total Depth: 25.45 ft BTOC		Water Level: 16.53 ft BTOC	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY			
(only fill out if applicable) = (25.45 Ft - 16.53 Ft) x 0.02 gal/ft = 0.1784 Gal			
Calculated Well Volume: 0.1784 Gallons		Well Diameter: 0.75 inches	
Calculations:	1" diameter = 0.041 gal/ft	2" diameter = 0.163 gal/ft	4" diameter = 0.653 gal/ft

Well Purging Activites

Purging Method (pump type): Peristaltic Flow rate (incl. units): 520 ml/min

Time	Flow Rate (ml/min)	Turbidity (NTUs)	Temp (°C)	Cond. (mS/Cm)	pH	Depth to water (BTOC)	DO (mg/l)	ORP	Total Gal Pumped	Comments
14:11	520	-OOR-	8.67	0.173	8.16	–	7.39	-97.2	1.87	
14:21	520	33.2	8.66	0.174	8.21	–	6.98	-107.1	2.8	
14:31	520	20.7	8.65	0.174	8.23	–	6.46	-117.6	4.1	
14:36	520	16	8.64	0.175	8.19	–	6.45	-114.9	4.75	
14:41	520	14	8.65	0.175	8.10	–	6.47	-118.2	5.4	
14:46	520	6.25	8.63	0.175	8.08	–	6.40	-118.3	6.05	
Results At End Of Purging:		6.25	8.63	0.175	8.08	16.50	6.40	-118.3	6.05	

COMMENTS: Pump start @ 14:02
Pump stop @ 14:46
Final DTW = 16.50

* Cannot fit water level down well with tubing inside

AerostarSES, LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah) M2032.0001	Installation: Burlington AFB	
WELL NO: BRLTN01-MW-V1BP2	SAMPLE ID: BRLTN01-MW-V1BP2-009	DATE: 04/20/2017

PURGING DATA

WELL DIAMETER (inches):	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: Ft - Ft	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE OR BAILER:
2.0	1/4		8.73	PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (9.08 Ft − 8.73 Ft) x 0.16 gal/ft = 0.06 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) D.N.A. = gal + (x Ft) + gal = gal

Location (Circle one): (Monitoring Well) Temporary Well Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED ~~(gallons)~~ L:
9.0	9.0	1632	1703	4.50

TIME	VOLUME PURGED ~~(gallons)~~ L	CUMUL. VOLUME PURGED ~~(gallons)~~ L	PURGE RATE ~~(gpm)~~ mL/min	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (mS/cm) or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1632		Pump Started		8.73								
1642	1.5	1.5	150	8.99	5.98	5.86	0.052	5.61	69.3	10.2	clear	none
1647	0.75	2.25	150	8.99	5.72	5.79	0.054	5.50	93.5	6.73	clear	none
1653	0.75	3.00	150	8.95	5.68	5.81	0.054	5.45	100.4	14.2	clear	none
1658	0.75	3.75	150	8.97	5.36	5.71	0.055	5.36	108.7	16.7	clear	none
1703	0.75	4.50	150	8.94	5.44	5.60	0.055	5.44	117.2	13.6	clear	none

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
Franklin Johnson / ASL		1705	1707

PUMP OR TUBING DEPTH IN WELL (feet):	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	Filter Size: n/a mm
9.0			

FIELD DECONTAMINATION: PUMP Y (N) TUBING Y N(replaced) DUPLICATE: Y (N)

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION # CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
BRLTN01-MW-V1BP2-009	1	PE	250	EPA 537M	APP	✓	150

REMARKS:

Well Abandoned? Y (N) Date Well Abandoned:

Well Measurement Method: (Probe) Tape Other _____

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah) M2032.0001	Installation: Burlington AFB BRLTN01-MW-BP3-012		
WELL NO: MW-BP3	SAMPLE ID: BRLTN01-BP3-012		DATE: 4/20/17

PURGING DATA

WELL DIAMETER (inches): 3 in	TUBING DIAMETER (inches): 1/4"	WELL SCREEN INTERVAL DEPTH: Ft - Ft	STATIC DEPTH TO WATER (feet): 11.5		PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (13.68 Ft − 11.5 Ft) x 0.37 gal/ft = 0.8066 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.0026 x 16 Ft) + 0.1 gal 0.1416 gal

Location (Circle one): Monitoring Well (circled) Temporary Well Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 12	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 1536	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons) mL	CUMUL. VOLUME PURGED (gallons) mL	PURGE RATE (gpm) mL	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. mS/cm or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1536					Pump start							
1538		Pump stop					well dry					
1550	400mL	400mL	200	12.1	6.92	7.7	0.288	0.96	1.0	49.3	Slmurky	None
1555	1000	1400mL	" "		Pump stop		well	dry				
1603		Pump	Start									
1604	150mL	1550mL	150mL	12.9	6.83	7.14	0.300	1.29	-8.1	44.3	Sl.murky	none
1605			Pump	stop			well	dry				
1625	Pump Start		100mL	12.1	6.55	8.05	0.316	0.331	14.7	41.1	more clear	none
1628	Pump Stop		" "	13.68								
		1850mL										

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Kaleb Brumbaugh	SAMPLER(S) SIGNATURE(S): [signature]	SAMPLING INITIATED AT: 1626	SAMPLING ENDED AT: 1628
PUMP OR TUBING DEPTH IN WELL (feet): 0	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	Filter Size mm
FIELD DECONTAMINATION: PUMP Y N	TUBING Y N (replaced)	DUPLICATE: Y (N)	

SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
~~BRLTN01-BP3-012~~ BRLTN01-MW-BP3-012	1	HDPE	250	537M	PP	✓	

REMARKS: PUMPED DRY b/t 1536-1538, 1550-1555, 1603-1605, 1625-1628

Well Abandoned? Y (N) Date Well Abandoned:

Well Measurement Method: (Probe) Tape Other____

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah) M2032.0001	Installation: Burlington AFB	
WELL NO: BRLTN01-MW-102	SAMPLE ID: BRLTN01-MW-102-041	DATE: 4/18/17

PURGING DATA

WELL DIAMETER (inches): 2"	TUBING DIAMETER (inches): 1/4"	WELL SCREEN INTERVAL DEPTH: 6.61 Ft - 16.61 Ft	STATIC DEPTH TO WATER (feet): 8.46	PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (16.61 Ft − 8.46 Ft) x 0.16 gal/ft = 1.304 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.026 x 15 Ft) + 0 gal = 0.139 gal

Location (Circle one): (Monitoring Well) Temporary Well Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 11	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 11	PURGING INITIATED AT: 16:12	PURGING ENDED AT: 16:40	TOTAL VOLUME PURGED (gallons): 6.57

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. mS/cm or (µS/cm)	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
16:18	0.36	0.36	0.09	8.81	6.25	5.14	568	70.2	169.9	2.72	clear	none
16:31	5.4	5.76	0.09	9.37	6.55	4.82	539	59.2	148.1	2.72	clear	none
16:34	0.27	6.03	0.09	9.40	6.62	4.70	537	57.2	138.3	2.73	clear	none
16:37	0.27	6.30	0.09	9.62	6.70	4.67	532	56.1	132.7	2.97	clear	none
16:40	0.27	6.57	0.09	9.68	6.80	4.59	528	55.3	134.2	4.38	clear	none
~~16:41~~ (RW)												

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Ryan Reynolds / Aerostar	SAMPLER(S) SIGNATURE(S): Ryan Reynolds	SAMPLING INITIATED AT: 16:45	SAMPLING ENDED AT: ENDED AT: 16:46
PUMP OR TUBING DEPTH IN WELL (feet): 11	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) Filter Size: mm	
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y N (replaced)	DUPLICATE: Y (N)	

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION # CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low-Flow Sampling	SAMPLE PUMP FLOW RATE (mL per minute)
BRLTN01-MW-102-041	1	HDPE	250ml	537M	APP	✓	0.09

REMARKS: (RW)

Well Abandoned? Y (N) Date Well Abandoned:

Well Measurement Method: (Probe) Tape Other _____

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah) M2032.0001	Installation: Burlington AFB	
WELL NO: BRLTN01-MW-103	SAMPLE ID: BRLTN01-MW-103-009	DATE: 4/18/17

PURGING DATA

WELL DIAMETER (inches): 2"	TUBING DIAMETER (inches): 1/4"	WELL SCREEN INTERVAL DEPTH: 3.75 Ft - 13.75 Ft	STATIC DEPTH TO WATER (feet): 3.35	PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (13.75 Ft − 3.35 Ft) x 0.16 gal/ft = 1.664 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.0026 x 14 Ft) + 0.1 gal = 0.1364 gal

Location (Circle one): (Monitoring Well) Temporary Well Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):
9	9	17:18	17:52	2.25

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. mS/cm or (µS/cm)	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
17:22	0.36	0.36	0.09	3.59	7.26	3.68	554	0.84	104.8	57.1	clear	none
17:41	0.27	1.71	0.09	3.80	7.10	3.17	563	0.88	107.3	4.99	clear	none
17:44	0.27	1.98	0.09	3.80	7.09	3.14	564	0.67	106.3	5.00	clear	none
17:47	0.27	2.25	0.09	3.81	7.08	3.13	564	0.67	105.0	5.08	clear	none

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Ryan Reynolds / AEROSTAR	SAMPLER(S) SIGNATURE(S): Ryan Reynolds	SAMPLING INITIATED AT: 17:52	SAMPLING ENDED AT: ENDED AT:
PUMP/OR TUBING DEPTH IN WELL (feet): 9	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	Filter Size mm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y N (replaced)	DUPLICATE: (Y) N	

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION # CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
BRLTN01-MW-103-009	2	HDPE	250ml	537 M	APP	✓	0.09
BRLTN01-MW-103-909	1	HDPE	250ml	537 M	APP	✓	0.09

REMARKS: Parent + MS/MSD + field dup

Well Abandoned? Y (N) Date Well Abandoned:

Well Measurement Method: (Probe) Tape Other _____

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES, LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah) M2032.0001 | Installation: Burlington AFB

WELL NO: BRLNT01-V1-MW14L (PP) | SAMPLE ID: BRLNT01-V1MW14L-008 | DATE: 4/19/17

PURGING DATA

WELL DIAMETER (inches):	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH:	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE OR BAILER:
2	1/4	2.75 Ft - 12.75 Ft	~~4.05~~ 4.08 (RP)	PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (12.75 Ft - 4.05 Ft) x 0.16 gal/ft = 1.392 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) ~~0~~ (RP) 0 gal + (0.0026 x 14 Ft) + 0.1 gal = 0.1364 gal

Location (Circle one): Monitoring Well / Temporary Well / Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):
8	8	12:42	13:20	3.04

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. mS/cm or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
12:43												
(RP) ~~12:43~~	0.08	0.08	0.08	4.16	8.04	5.48	552	0.35	-30.8	11.0	clear	none
13:00	1.44	1.44	0.08	4.11	8.14	5.34	550	0.26	-51.9	5.12	clear	none
1310	0.80	2.24	0.08	4.11	8.16	5.31	549	0.31	-54.8	4.05	clear	none
1315	0.40	2.64	0.08	4.11	8.10	5.17	546	0.30	-55.3	3.44	clear	none
1320	0.40	3.04	0.08	4.11	8.12	5.17	546	0.24	-57.0	2.73	clear	none

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Ryan Reynolds / Aerostar SES | SAMPLER(S) SIGNATURE(S): Ryan Reynolds | SAMPLING INITIATED AT: 13:21 | SAMPLING ENDED AT: 13:22

PUMP OR TUBING DEPTH IN WELL (feet): 8 | TUBING MATERIAL CODE: PE | FIELD-FILTERED: Y (N) Filtration Equipment Type: | Filter Size: mm

FIELD DECONTAMINATION: PUMP Y (N) TUBING Y N (replaced) | DUPLICATE: Y (N)

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION # CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
BRLNT01-V1MW14L-008	1	HDPE	250ml	537M	APP	✓	0.08

REMARKS:

Well Abandoned? (Y) N Date Well Abandoned:

Well Measurement Method: (Probe) Tape Other ____

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES, LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah) M2032.0001	Installation: Burlington AFB	
WELL NO: ~~BRLTN02~~ BRLTN02cd	SAMPLE ID: BRLTN02-001-GW-027	DATE: 4/20/17

PURGING DATA

WELL DIAMETER (inches): 0.75	TUBING DIAMETER (inches): 1/4"	WELL SCREEN INTERVAL DEPTH: 2.45 Ft - 22.45 Ft	STATIC DEPTH TO WATER (feet): 25.9	PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (52.45 Ft − 25.9 Ft) x 0.02 gal/ft = 0.53 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.022 x 37 Ft) + 0.1 gal = 0.982 gal

Location (Circle one): Monitoring Well (Temporary Well) Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):
27	27	14:05	14:35	~~1~~ 1.00

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. mS/cm or (µS/cm)	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
14:15	0.7	0.7	0.07	–	7.78	9.42	237	5.81	-47.0	908	brown	none
14:20	0.35	1.05	0.07	–	7.80	9.39	240	5.74	-48.1	5.98	clear	none
14:25	0.35	1.40	0.07	–	7.71	9.30	245	5.63	-54.9	4.22	clear	none
14:30	0.35	1.75	0.07	–	7.69	9.29	246	5.66	-54.7	2.52	clear	none
14:35	0.35	2.00	0.07	–	7.61	9.29	245	5.70	-57.9	1.50	clear	none

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Ryan Reynolds / ASL	SAMPLER(S) SIGNATURE(S): Ryan Reynolds	SAMPLING INITIATED AT: 14:35	SAMPLING ENDED AT: ENDED AT: 14:36
PUMP OR TUBING DEPTH IN WELL (feet): 27	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) Filter Size mm; Filtration Equipment Type:	
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y N (replaced)	DUPLICATE: Y (N)	

(B) (N) SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION: # CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
BRLTN02-001-GW-027	1	HDPE	250mL	537M	APD	✓	

REMARKS: Final DTW = 25.8 ft

Well Abandoned? (Y) N Date Well Abandoned: 04/21/2017

Well Measurement Method: (Probe) Tape Other ____

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah) M2032.0001	Installation: Burlington AFB	
WELL NO: BRLTNO2-MW002	SAMPLE ID: BRLTNO2-002-GW-029	DATE: 4/21/17

PURGING DATA

WELL DIAMETER (inches):	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH:	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE OR BAILER:
0.75	1/4	21.55 Ft - 31.55 Ft	27.43	PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (31.55 Ft - 27.43 Ft) x 0.02 gal/ft = 0.08 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.0026 x 37 Ft) + 0.1 gal = 0.1962 gal

Location (Circle one): Monitoring Well (Temporary Well) Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):
29	29	8:16	8:35	1.52

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. mS/cm or (µS/cm)	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
8:26	0.80	0.80	0.08	–	7.63	9.35	298	11.36	-39.5	21.1	cloudy	none
8:29	0.24	1.04	0.08	–	7.69	9.35	298	11.38	-40.3	16.4	clear	none
8:32	0.24	1.28	0.08	–	7.61	9.34	297	11.40	-41.9	8.17	clear	none
8:35	0.24	1.52	0.08	–	7.59	9.33	297	11.42	-45.9	0.57	clear	none
						FT						

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
Megan Reynolds / ASL	Megan Reynolds	8:36	ENDED AT: 8:38

PUMP OR TUBING DEPTH IN WELL (feet):	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) Filter Size mm	Filtration Equipment Type:
29			

FIELD DECONTAMINATION: PUMP Y (N) TUBING Y N (replaced) DUPLICATE: Y N

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION # CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
BRLTNO2-002-GW-029	1	HDPE	250ml	537M	APP	✓	300
			FT				

REMARKS:

Well Abandoned? Y (N) Date Well Abandoned: 04/21/2017

Well Measurement Method: (Probe) Tape Other _____

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah) M2032.0001	Installation: Burlington AFB	04/21/2017
WELL NO: BRLTN02-003	SAMPLE ID: BRLTN02-003-GW-032	DATE: ~~BRLTN02-003 FJ~~

PURGING DATA

WELL DIAMETER (inches): 0.75	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: 27.46 Ft - 37.46 Ft	STATIC DEPTH TO WATER (feet): 29.25	PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (37.46 Ft - 29.25 Ft) x 0.02 ~~0.16 FJ~~ gal/ft = 0.16 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) D.N.A = gal + (x Ft) + gal = gal

Location (Circle one): Monitoring Well (Temporary Well) Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED ~~(gallons)~~ L:
32.0	32.0	0822	0857	3.5

TIME	VOLUME PURGED ~~(gallons)~~ L	CUMUL. VOLUME PURGED ~~(gallons)~~ L	PURGE RATE ~~(gpm)~~ mL/min	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (mS/cm or µS/cm)	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
0822				29.25	Pump Started							
0832	1.0	1.0	100	—	6.42	9.58	0.247	6.75	-17.6	80.6	cloudy brown	none
0842	1.0	2.0	100	—	6.49	9.78	0.253	6.33	-36.2	18.9	clear	none
0852	1.0	3.0	100	—	6.49	9.79	0.252	6.12	-41.0	7.33	clear	none
0857	0.5	3.5	100	—	6.47	9.86	0.253	6.17	-43.9	4.55	clear	none

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Franklin Johnson / ASL	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 0900	SAMPLING ENDED AT: ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet): 32.0	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	Filter Size n/a mm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y N (replaced)	DUPLICATE: Y (N)	

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION # CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
BRLTN02-003-GW-032	1	PE	250	EPA 537M	APP	✓	100

REMARKS:
No Depth To Water readings due to 0.75" well ~~and~~ FJ, tubing diameter, and diameter of WLM probe

Well Abandoned? (Y) N Date Well Abandoned: 04/21/2017

Well Measurement Method: (Probe) Tape Other ____

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah) M2032.0001	Installation: Burlington AFB	
WELL NO: BRLTN03-PMWC01	SAMPLE ID: BRLTN03-001-GW-022	DATE: 4/20/17

PURGING DATA

WELL DIAMETER (inches):	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH:	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE OR BAILER:
0.75	1/4	17.7 Ft - 27.7 Ft	18.90	PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (27.7 Ft - 18.90 Ft) x 0.02 gal/ft = 0.176 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= 0 gal + (0.0026 x 25 Ft) + 0.1 gal = 0.165 gal

Location (Circle one): Monitoring Well / Temporary Well / Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):
22	22	12:48	13:03	1.196

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. mS/cm or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
12:49	0.092	0.092	0.092	–	9.72	8.63	3.19	4.14	-264.0	599	light brown	none
12:52	0.276	0.368	0.092	–	9.73	8.66	318	3.94	-264.7	18.8	clear	none
12:55	0.276	0.644	0.092	–	9.72	8.64	319	3.97	-263.9	15.1	clear	none
12:58	0.276	0.920	0.092	–	9.69	8.64	318	4.08	-263.4	13.4	clear	none
13:01	0.276	1.196	0.092	–	9.60	8.70	319	4.10	-258.6	7.7	clear	none

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
Ryan Reynolds / ASL	Ryan Reynolds	13:03	13:04

PUMP OR TUBING DEPTH IN WELL (feet):	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) Filter Size mm	Filtration Equipment Type:
22			

FIELD DECONTAMINATION: PUMP Y (N) TUBING Y N (replaced) DUPLICATE: Y (N)

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION # CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
BRLTN03-001-GW-022	1	HDPE	250ml	537 M	APP	✓	350

REMARKS: Final DTW = 18.80

Well Abandoned? (Y) N Date Well Abandoned: 04/21/2017

Well Measurement Method: (Probe) Tape Other _____

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah) M2032.0001 | Installation: Burlington AFB

WELL NO: N/A | SAMPLE ID: BRLTN03-002-GW-022 | DATE: 4/20/17

PURGING DATA

WELL DIAMETER (inches): 0.75 | TUBING DIAMETER (inches): 1/4" | WELL SCREEN INTERVAL DEPTH: 27.45 Ft - 17.45 Ft | STATIC DEPTH TO WATER (feet): 18.4 | PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) 27.45 ~~48.5~~ - 18.4 Ft) x 0.02 gal/ft = 0.181 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = gal + 0.0026 x 25 Ft) + 0.1 gal = 0.165 gal

Location (Circle one): Monitoring Well (Temporary Well) Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 22 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 22 | PURGING INITIATED AT: 12:00 | PURGING ENDED AT: 12:12 | TOTAL VOLUME PURGED (gallons): 0.96

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. mS/cm or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
12:03	0.24	0.24	0.08	–	7.85	8.53	266	6.82	-34.4	36.7	light Brown	none
12:06	0.24	0.48	0.08	–	7.88	8.51	265	6.67	-42.4	14.9	clear	none
12:09	0.24	0.72	0.08	–	7.84	8.55	265	6.70	-43.1	10.0	clear	none
12:12	0.24	0.96	0.08	–	7.83	8.56	265	6.79	-42.8	5.4	clear	none

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Ryan Reynolds / ASL | SAMPLER(S) SIGNATURE(S): [signature] | SAMPLING INITIATED AT: 12:13 | SAMPLING ENDED AT: 12:14

PUMP OR TUBING DEPTH IN WELL (feet): 22 | TUBING MATERIAL CODE: PE | FIELD-FILTERED: Y (N) | Filter Size: mm | Filtration Equipment Type:

FIELD DECONTAMINATION: PUMP Y (N) | TUBING Y (N (replaced)) | DUPLICATE: Y (N)

SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL-(gal) per minute)
BRLTN03-002-GW-022	1	HDPE	250ml	537M	APP	✓	0.08

REMARKS: Depth to water N/A due to diameter of well, diameter of poly flow & diameter of water level probe. End of Sampling DTW = 18.4

Well Abandoned? Y/N Date Well Abandoned: 04/21/2017

Well Measurement Method: (Probe) Tape Other

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Burlington ARB

Date: 04/20/2017

Sample Technician(s): Franklin Johnson

Station ID: BRLTN01-001

Location Description: 150 ft due south from Monitoring well BRLTN01-MW-V1BP2

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch Holding Pond/Lagoon Lake/Pond River/Stream Trench Other

SEDIMENT SAMPLE

Sample ID: _____ Sample Collection Time: _____

Sample Depth: _____ Sediment Description: _____

Collection Method: _____ Analysis/Method: _____

Sample Container: _____ Preservative: _____

SURFACE WATER SAMPLE

Sample ID: _____ Sample Collection Time: _____

Sample Depth: _____ Collection Method: _____

Analysis/Method: _____ Sample Container: _____

Preservative: _____ Water Quality (circle one): Clear Cloudy Turbid Other

Groundwater Sample Collected from (circle one): (Hydropunch) Monitoring Well Temporary Well Other _____

GROUNDWATER GRAB SAMPLE

Sample ID: BRLTN01-001-GW-013 Sample Collection Time: 1425

Sample Depth: 13 ft BGS Collection Method: PP

Analysis/Method: EPA 537M Sample Container: 250 mL PE

Preservative: N/A Water Quality (circle one): Clear Cloudy (Turbid) Other

REMARKS:

AerostarSES LLC

SAMPLE COLLECTION LOG
SEDIMENT AND SURFACE WATER

Project Name: ~~AFFF SI~~ ~~OMAHA~~ ~~DISTRICT~~ Savannah

ASL Project No: ~~M2027.0003~~ M2032.0001

Installation: ~~WRIGHT PATTERSON AFB~~ Burlington ANG

Date: 4/19/17

Sample Technician(s): Kaleb Brumbaugh

Station ID: BRLNG1-002

Location Description: 135° SE to Guard Shack on NCO Drive

Type(s) of Sample (circle all that apply):	Sediment	Surface Water	Ground Water
Sample Collected from (circle one):	Channel/Ditch	Holding Pond/Lagoon	Lake/Pond
	River/Stream	Trench	Other Rods

SEDIMENT SAMPLE

Sample ID: _____ Sample Collection Time: _____

Sample Depth: _____ Sediment Description: _____

Collection Method: _____ Analysis/Method: _____

Sample Container: _____ Preservative: _____

SURFACE WATER SAMPLE

Sample ID: _____ Sample Collection Time: _____

Sample Depth: _____ Collection Method: _____

Analysis/Method: _____ Sample Container: _____

Preservative: _____ Water Quality (circle one): Clear Cloudy Turbid Other

GROUND WATER SAMPLE

Sample ID: BRLNG1-002-GW-0415 Sample Collection Time: 0850

Sample Depth: 15 Collection Method: grab w/ PP

Analysis/Method: 537 M Sample Container: (2) 250 mL

Preservative: N/A Water Quality (circle one): Clear Cloudy (Turbid) Other

COMMENTS: 2 samples taken due to turbid

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Burlington ARB

Date: 4/18/17

Sample Technician(s): Kaleb Brumbaugh

Station ID: BRLTN01

Location Description: 90°E to Poor Farm RD 15 meters

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch, River/Stream, Holding Pond/Lagoon, Trench, Lake/Pond, (Other) Creek

SEDIMENT SAMPLE

Sample ID: BRLTN01-003-SD-001/MS/MSD/901 Sample Collection Time: 1310

Sample Depth: 0-0.5' Sediment Description: Silty Sand

Collection Method: grab Analysis/Method: 537M

Sample Container: HDPE Preservative: N/A

SURFACE WATER SAMPLE

Sample ID: BRLTN01-003-SW-001/MS/MSD/901 Sample Collection Time: 1310

Sample Depth: 0-0.5' Collection Method: grab

Analysis/Method: 537M Sample Container: HD PE

Preservative: N/A Water Quality (circle one): (Clear) Cloudy Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch Monitoring Well Temporary Well

Other

GROUNDWATER GRAB SAMPLE

Sample ID: Sample Collection Time:

Sample Depth: Collection Method:

Analysis/Method: Sample Container:

Preservative: Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS:

BRLTN-RS-001 assoc w/ BRLTN01-003-SD-001/MS/MSD/901

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Burlington

Date: 4/18/19

Sample Technician(s): Kaleb Brumbaugh

Station ID: BRLTN02

Location Description: 52°NE to Mustang Pass, 10 meters

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch | Holding Pond/Lagoon | Lake/Pond | River/Stream | Trench | Other

SEDIMENT SAMPLE

Sample ID: BRLTN02-004-SD-001 Sample Collection Time: 1454

Sample Depth: 0-0.5' Sediment Description: Silty Sand

Collection Method: grab Analysis/Method: 537

Sample Container: HDPE Preservative: N/A

SURFACE WATER SAMPLE

Sample ID: BRLTN02-004-SW-001 Sample Collection Time: 1500

Sample Depth: 0-0.5' Collection Method: grab

Analysis/Method: 537M Sample Container: HDPE

Preservative: N/A Water Quality (circle one): Clear Cloudy Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch | Monitoring Well | Temporary Well | Other

GROUNDWATER GRAB SAMPLE

Sample ID: KB Sample Collection Time:

Sample Depth: Collection Method:

Analysis/Method: Sample Container:

Preservative: Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS:

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Burlington

Date: 4/18/17

Sample Technician(s): Kaleb Brumbaugh

Station ID: ~~BRLTN03-003-SS~~ BRLTN03

Location Description: 211°SW to NCO Drive 80meters

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch Holding Pond/Lagoon Lake/Pond River/Stream Trench (Other) Creek

SEDIMENT SAMPLE

Sample ID: BRLTN03-003-SD-001 Sample Collection Time:

Sample Depth: 0-0.5' Sediment Description: Sand trace Silt

Collection Method: grab Analysis/Method: 537M

Sample Container: HDPE Preservative: N/A

SURFACE WATER SAMPLE

Sample ID: BRLTN03-003-SW-001 Sample Collection Time: 1356

Sample Depth: 0-0.5' Collection Method: grab

Analysis/Method: 537M Sample Container: HDPE

Preservative: N/A Water Quality (circle one): Clear (Cloudy) Turbid Other

Groundwater Sample Collected from (circle one): (KB) Hydropunch Monitoring Well Temporary Well

Other

GROUNDWATER GRAB SAMPLE

Sample ID: Sample Collection Time:

Sample Depth: Collection Method:

Analysis/Method: Sample Container:

Preservative: Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS:

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Omaha)

ASL Project No: M2027.0003

Installation: Burlington ANG

Date: 04/20/2017

Sample Technician(s): Franklin Johnson

Station ID: ~~BRLTN04-001-SS-001~~ FJ BRLTN04-001

Location Description: Aprox 40 ft SW from edge of Foxtrot Runway

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch Holding Pond/Lagoon Lake/Pond River/Stream Trench Other

SEDIMENT SAMPLE

Sample ID: _____ Sample Collection Time: _____

Sample Depth: _____ Sediment Description: _____

Collection Method: FJ Analysis/Method: _____

Sample Container: _____ Preservative: _____

SURFACE WATER SAMPLE

Sample ID: ~~BRLTN04-001-GW-013~~ Sample Collection Time: _____

Sample Depth: ~~13 ft BGS~~ FJ Collection Method: _____

Analysis/Method: ~~ET~~ Sample Container: _____

Preservative: _____ Water Quality (circle one): Clear Cloudy Turbid Other

Groundwater Sample Collected from (circle one): (Hydropunch) Monitoring Well Temporary Well Other _____

GROUNDWATER GRAB SAMPLE

Sample ID: BRLTN04-001-GW-013 Sample Collection Time: 1235

Sample Depth: 13 ft BGS Collection Method: PP

Analysis/Method: EPA 537M Sample Container: 250mL PE

Preservative: N/A Water Quality (circle one): Clear Cloudy (Turbid) Other

REMARKS:

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Omaha)

ASL Project No: M2027.0003

Installation: Burlington ARB

Date: 04/20/2017

Sample Technician(s): Franklin Johnson

Station ID: BLRTN04-002

Location Description: Apprx 50 ft NE from edge of Foxtrot Runway

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch Holding Pond/Lagoon Lake/Pond River/Stream Trench Other

SEDIMENT SAMPLE

Sample ID: _____ Sample Collection Time: _____

Sample Depth: _____ Sediment Description: _____

Collection Method: _____ Analysis/Method: _____

Sample Container: _____ Preservative: _____

SURFACE WATER SAMPLE

Sample ID: _____ Sample Collection Time: _____

Sample Depth: _____ Collection Method: _____

Analysis/Method: _____ Sample Container: _____

Preservative: _____ Water Quality (circle one): Clear Cloudy Turbid Other

Groundwater Sample Collected from (circle one): (Hydropunch) Monitoring Well Temporary Well Other _____

GROUNDWATER GRAB SAMPLE

Sample ID: BRLTN04-002-GW-018 Sample Collection Time: 0910

Sample Depth: 18 ft BGS Collection Method: PP

Analysis/Method: EPA 537M Sample Container: 250 mL PE

Preservative: n/a Water Quality (circle one): Clear (Cloudy) Turbid Other

REMARKS:

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Burlington ANG

Date: 04/20/2017

Sample Technician(s): Franklin Johnson

Station ID: BRLTN04-003

Location Description: Apox 50 ft NE from edge of Foxtrot Runway.

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch Holding Pond/Lagoon Lake/Pond River/Stream Trench Other

SEDIMENT SAMPLE

Sample ID: _____ Sample Collection Time: _____

Sample Depth: _____ Sediment Description: _____

Collection Method: _____ Analysis/Method: _____

Sample Container: _____ Preservative: _____

SURFACE WATER SAMPLE

Sample ID: _____ Sample Collection Time: _____

Sample Depth: _____ Collection Method: _____

Analysis/Method: _____ Sample Container: _____

Preservative: _____ Water Quality (circle one): Clear Cloudy Turbid Other

Groundwater Sample Collected from (circle one): (Hydropunch) Monitoring Well Temporary Well Other _____

GROUNDWATER GRAB SAMPLE

Sample ID: BRLTN04-003-GW-018 Sample Collection Time: 1020

Sample Depth: 18 ft BGS Collection Method: PP

Analysis/Method: EPA 537 M Sample Container: 250 mL PE

Preservative: n/a Water Quality (circle one): Clear Cloudy (Turbid) Other

REMARKS:

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Burlington ANG

Date: 04/20/2017

Sample Technician(s): Franklin Johnson

Station ID: BRLTN04-004

Location Description: Aprox 50 ft NE from edge of Foxtrot Runway.

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch Holding Pond/Lagoon Lake/Pond River/Stream Trench Other

SEDIMENT SAMPLE

Sample ID: _____ Sample Collection Time: _____

Sample Depth: _____ Sediment Description: _____

Collection Method: _____ Analysis/Method: _____

Sample Container: _____ Preservative: _____

SURFACE WATER SAMPLE

Sample ID: _____ Sample Collection Time: _____

Sample Depth: _____ Collection Method: _____

Analysis/Method: _____ Sample Container: _____

Preservative: _____ Water Quality (circle one): Clear Cloudy Turbid Other

Groundwater Sample Collected from (circle one): (Hydropunch) Monitoring Well Temporary Well Other _____

GROUNDWATER GRAB SAMPLE

Sample ID: BRLTN04-004-GW-018 Sample Collection Time: 1200

Sample Depth: BRLTN04-004-GW-918 18 Ft BGS Collection Method: PP

Analysis/Method: EPA 537M Sample Container: 250 mL PE

Preservative: n/a Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS:

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Burlington ARB

Date: 04/19/2017

Sample Technician(s): B. Odom, F. Johnson

Station ID: BRLTN05-001

Location Description: Apprx 200 ft heading SW of otP main Runway

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch Holding Pond/Lagoon Lake/Pond River/Stream Trench Other

SEDIMENT SAMPLE

Sample ID: _____ Sample Collection Time: _____

Sample Depth: _____ Sediment Description: _____

Collection Method: _____ Analysis/Method: _____

Sample Container: _____ Preservative: _____

SURFACE WATER SAMPLE

Sample ID: _____ Sample Collection Time: _____

Sample Depth: _____ Collection Method: _____

Analysis/Method: _____ Sample Container: _____

Preservative: _____ Water Quality (circle one): Clear Cloudy Turbid Other

Groundwater Sample Collected from (circle one): (Hydropunch) Monitoring Well Temporary Well Other _____

GROUNDWATER GRAB SAMPLE

Sample ID: BRLTN05-001-GW-017 Sample Collection Time: 1115

Sample Depth: 17 ft BGS Collection Method: PP

Analysis/Method: EPA 537M Sample Container: 250 mL PE

Preservative: N/A Water Quality (circle one): Clear Cloudy (Turbid) Other

REMARKS:

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Burlington ANG

Date: 04/19/2017

Sample Technician(s): B. Odom, Franklin Johnson

Station ID: ~~BRLTN05-003~~ FD BRLTN05-002

Location Description: Aprox 200 meters heading NE from edge of main Runway

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch Holding Pond/Lagoon Lake/Pond River/Stream Trench Other

SEDIMENT SAMPLE

Sample ID: _____ Sample Collection Time: _____

Sample Depth: _____ Sediment Description: _____

Collection Method: _____ Analysis/Method: _____

Sample Container: _____ Preservative: _____

SURFACE WATER SAMPLE

Sample ID: _____ Sample Collection Time: _____

Sample Depth: _____ Collection Method: _____

Analysis/Method: _____ Sample Container: _____

Preservative: _____ Water Quality (circle one): Clear Cloudy Turbid Other

Groundwater Sample Collected from (circle one): (Hydropunch) Monitoring Well Temporary Well Other _____

BRLTN05-002-GW-~~03~~ **GROUNDWATER GRAB SAMPLE**

Sample ID: BRLTN05-002-GW-~~03~~ Sample Collection Time: 1655

Sample Depth: 13 ft BGS Collection Method: PP

Analysis/Method: EPA 537M Sample Container: 250 mL PE

Preservative: n/a Water Quality (circle one): Clear Cloudy (Turbid) Other

REMARKS:

3 bottles collected 1 normal + 1 MS/MSD and 1 duplicate sample

Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Burlington Air National Guard Base

BORING LOG - BRLTN01-001

Start Date	: 04/20/17
End Date	: 04/20/17
Northing	: 721506.03
Easting	: 1470502.76
Surface Elev. (ft)*	: 311.90
Total Depth (ft)**	: 15.0

Site Name	: AFFF Area 01
Drilling Company	: Cascade Drilling
Drilling Method	: Geoprobe 7822DT
Driller	: Chris Aldrich
Borehole Diameter	: 2.25 in.
Boring Completion	: Abandoned Bentonite Chips
Abandonment Date	: 04/20/17
DTW During Drilling (ft)	: 8.5
Logged By	: Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAVD88) feet (ft)

**Below Ground Surface (BGS) feet (ft)

DEPTH IN FEET (BGS)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID	REMARKS
0										
1	1	100	(0.0 - 3.0) SILTY SAND, 10YR 4/3, brown, sub-angular fine gravel, moist, no odor	0	SM					No temporary well installed.
2										
3			(3.0 - 5.0) SAND, well graded, 10YR 6/1, gray, fine to coarse grained, no odor		SW					
4										
5	2	70	(5.0 - 9.0) SILTY SAND, 10YR 4/3, brown, fine grained sand, ~ 5% silt, wet below 8.5 ft bgs	0	SM			SO	BRLTN01-001-SO-008 Note: Interval 7.0 - 8.0 ft	
6										
7										
8							▼			
9			(9.0 - 15.0) SILT, 10YR 5/1, brown, uniform color and texture, wet, no odor							
10	3	100		0	ML					
11										
12										
13								GW	BRLTN01-001-GW-013 Note: Interval 11.0 - 15.0 ft	Geoprobe SP16 Screen Interval (11.0 - 15.0 ft)
14										
15										

Total Depth of Boring 15.0 feet

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Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Burlington Air National Guard Base

BORING LOG - BRLTN01-002

Start Date	: 04/19/17
End Date	: 04/19/17
Northing	: 721651.86
Easting	: 1470549.34
Surface Elev. (ft)*	: 311.21
Total Depth (ft)*	: 15.0

Site Name	: AFFF Area 01
Drilling Company	: Cascade Drilling
Drilling Method	: Geoprobe 7822 DT
Driller	: Chris Aldrich
Borehole Diameter	: 2.25 in.
Boring Completion	: Abandoned Bentonite Chips
Abandonment Date	: 04/19/17
DTW During Drilling (ft)	: 8.0
Logged By	: Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAVD88) feet (ft)

**Below Ground Surface (BGS) feet (ft)

DEPTH IN FEET (BGS)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID	REMARKS
0										
1	1	100	(0.0 - 3.0) SILTY SAND, 10YR 4/3, brown, sub-angular fine gravel, strong fuel odor	68	SM					No temporary well installed.
2										
3			(3.0 - 5.0) SAND, well graded, 10YR 6/1, gray, fine to coarse grained, moist, strong fuel odor		SW					
4										
5	2	76	(5.0 - 15.0) SAND, poorly graded, 10YR 2/1, black, fine grained, strong fuel odor, wet below 8 ft bgs	112	SP		▼	SO	BRLTN01-002-SO-007 BRLTN01-002-SO-907 Note: Interval 6.0 - 7.0 ft	
6										
7										
8										
9										
10	3	100		95				GW	BRLTN01-002-GW-015 Note: Interval 11.0 - 15.0 ft	Geoprobe SP16 Screen Interval (11.0 - 15.0 ft)
11										
12										
13										
14										
15			Total Depth of Boring 15.0 feet							

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Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Burlington Air National Guard Base

BORING LOG - BRLTN02-001

Start Date	: 04/18/2017
End Date	: 04/18/2017
Northing	: 720614.44
Easting	: 1470801.08
Surface Elev. (ft)*	: 326.01
Total Depth (ft)**	: 30.0

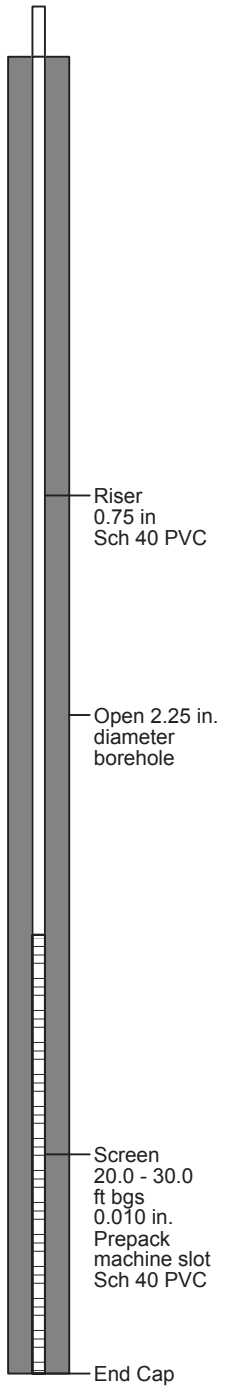
Site Name	: AFFF Area 02
Drilling Company	: Cascade Drilling
Drilling Method	: Geoprobe 7822 DT
Driller	: Chris Aldrich
Borehole Diameter	: 2.25 in.
Boring Completion	: Abandoned Bentonite Chips
Abandonment Date	: 04/21/17
DTW During Drilling (ft)	: 21.0
Logged By	: Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAVD88) feet (ft)
**Below Ground Surface (BGS) feet (ft)

DEPTH IN FEET (BGS)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMLE ID
0–13	1	100	(0.0 - 13.0) SILTY SAND, fine to medium grained, 10YR 4/3, brown, ~ 20% well rounded cobbles to fine gravel, moist, no odor	0	SM	10YR 4/3		SS	BRLTN02-001-SS-001 BRLTN02-001-SS-901 Note: Interval 0.0 - 0.5 ft
5–10	2	64	grading to ~10% well rounded fine gravel	0	SM	10YR 4/3			
10–13	3	64		0	SM	10YR 4/3			
13–19	4	68	(13.0 - 19.0) SAND, poorly graded, 10YR 5/2, grayish brown	0	SP	10YR 5/2			
19–20	5	70	(19.0 - 25.0) SILTY SAND, 10YR 3/3, dark brown, fine grained sand, no odor, wet below 21 ft bgs.	0	SM	10YR 3/3	▼	SO	BRLTN02-001-SO-020 Note: Interval 19.0 - 20.0 ft
20–25	5	70			SM	10YR 3/3			
25–30	6	70	(25.0 - 30.0) SILTY SAND, 10YR 4/2, dark grayish brown, fine grained, no odor, wet		SM	10YR 4/2			

Total Depth of Boring 30.0 feet



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Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Burlington Air National Guard Base

BORING LOG - BRLTN02-002

Start Date	: 04/18/2017
End Date	: 04/18/2017
Northing	: 720700.71
Easting	: 1470910.10
Surface Elev. (ft)*	: 324.92
Total Depth (ft)**	: 30.0

Site Name	: AFFF Area 02
Drilling Company	: Cascade Drilling
Drilling Method	: Geoprobe 7822 DT
Driller	: Chris Aldrich
Borehole Diameter	: 2.25 in.
Boring Completion	: Abandoned Bentonite Chips
Abandonment Date	: 04/21/17
DTW During Drilling (ft)	: 21.0
Logged By	: Franklin Johnson

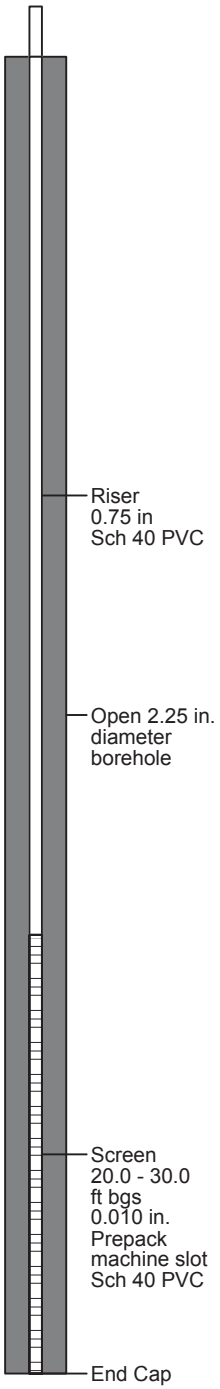
Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAVD88) feet (ft)
**Below Ground Surface (BGS) feet (ft)

DEPTH IN FEET (BGS)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0–5	1	100	(0.0 - 5.0) SILTY SAND, 10YR 4/3, brown, fine sub-angular gravels, moist, no odor	0	SM			SS	BRLTN02-002-SS-001 Note: Interval 0.0 - 0.5 ft
5–10	2	64	(5.0 - 13.0) SAND, well graded, 10YR 4/3, brown, fine to medium grained, ~ 5% sub-angular gravel, moist, no odor	0	SW				
10–13	3	64		0					
13–15			(13.0 - 15.0) SAND, well graded, 10YR 5/4, grayish brown, fine to medium grained, ~ 5% sub-angular gravel, moist, no odor		SW				
15–20	4	68	(15.0 - 21.0) SAND, poorly graded, 10YR 5/2, grayish brown, fine grained, moist no odor	0	SP			SO	BRLTN02-002-SO-020 Note: Interval 19.0 - 20.0 ft
20–25	5	70	(21.0 - 30.0) SILTY SAND, 10YR 3/2, very dark grayish brown, uniform texture and color, wet below 21.0 ft bgs	0	SM		▼		
25–30	6	100							

Total Depth of Boring 30.0 feet

Temporary Well: BRLTN02-002
Elev (TOC): 327.43



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Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Burlington Air National Guard Base

BORING LOG - BRLTN02-003

Start Date	: 04/18/2017
End Date	: 04/18/2017
Northing	: 720633.94
Easting	: 1470962.30
Surface Elev. (ft)*	: 325.28
Total Depth (ft)**	: 35.0

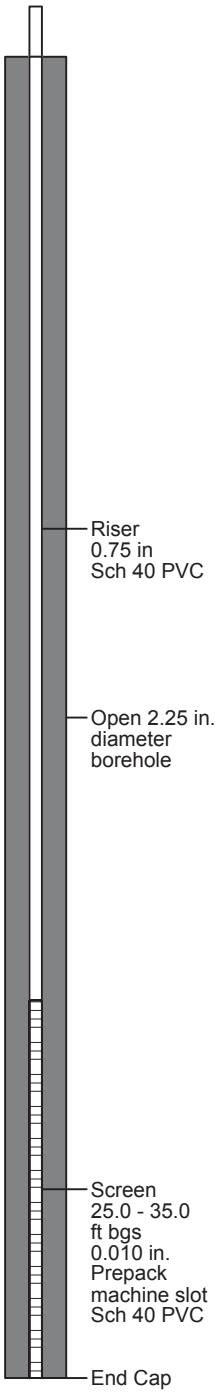
Site Name	: AFFF Area 02
Drilling Company	: Cascade Drilling
Drilling Method	: Geoprobe 7822 DT
Driller	: Chris Aldrich
Borehole Diameter	: 2.25 in.
Boring Completion	: Abandoned Bentonite Chips
Abandonment Date	: 04/21/17
DTW During Drilling (ft)	: 26.0
Logged By	: Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAVD88) feet (ft)
**Below Ground Surface (BGS) feet (ft)

DEPTH IN FEET (BGS)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 13.0) SILTY SAND, 10YR 3/2, brown, ~ 5% sub-angular fine gravel	0	SM		▼	SS	BRLTN02-003-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	64		0					
10	3	78		0					
13			(13.0 - 25.0) SAND, poorly graded, 10YR 6/2, light grayish brown, fine grained uniform texture and color, moist, no odor						
15	4	84		0	SP				
20			20.0 ft bgs, color grading to brown 10YR 4/2						
20	5	88		0					
25								SO	BRLTN02-003-SO-025 Note: Interval 24.0 - 25.0 ft
25	6	88	(25.0 - 30.0) SILTY SAND, 10YR 4/2, dark grayish brown, uniform color and texture, no odor, wet	0	SM				
30	7	100		0					
35			Total Depth of Boring 35.0 feet						

Temporary Well: BRLTN02-003
Elev. TOC: 327.95



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Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Burlington Air National Guard Base

BORING LOG - BRLTN03-001

Start Date	: 04/18/2017
End Date	: 04/18/2017
Northing	: 721023.55
Easting	: 1470428.44
Surface Elev. (ft)*	: 324.45
Total Depth (ft)**	: 25.0

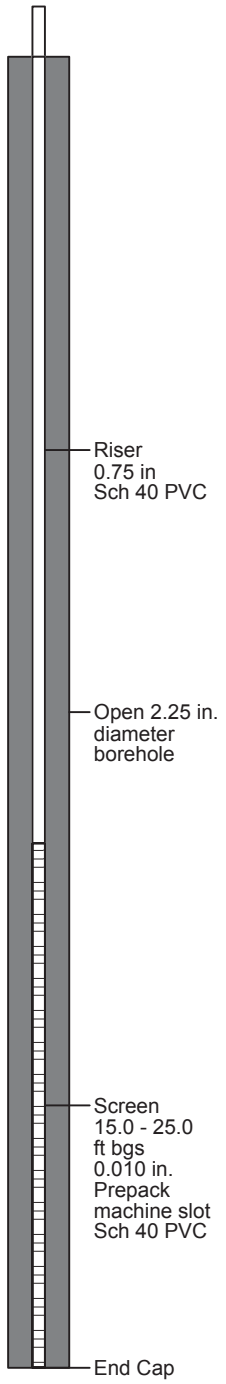
Site Name	: AFFF Area 03
Drilling Company	: Cascade Drilling
Drilling Method	: Geoprobe 7822 DT
Driller	: Chris Aldrich
Borehole Diameter	: 2.25 in.
Boring Completion	: Abandoned Bentonite Chips
Abandonment Date	: 04/21/17
DTW During Drilling (ft)	: 15.0
Logged By	: F. Johnson/R. Reynolds

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAVD88) feet (ft)

**Below Ground Surface (BGS) feet (ft)

DEPTH IN FEET (BGS)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 7.0) SAND, well graded, 7.5YR 4/3, brown, ~ 5%, fine well rounded gravel, damp, no odor	0	SW			SS	BRLTN03-001-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	100	(7.0 - 13.0) SAND, well graded, 10YR 4/3, brown, medium to fine grained, damp, no odor	0	SW				
10	3	100	(13.0 - 22.0) SILTY SAND, 10YR 4/3, brown, fine grained, damp, no odor	0	SM		▼	SO	BRLTN03-001-SO-014 Note: Interval 13.0 - 14.0 ft
15	4	100		0					
20	5	100	(22.0 - 25.0) SILTY SAND, 10YR 3/1, brown, fine grained, wet, no odor	0	SM				
25			Total Depth of Boring 25.0 feet						



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AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Burlington Air National Guard Base

BORING LOG - BRLTN03-002

Start Date	: 04/18/2017
End Date	: 04/18/2017
Northing	: 721050.72
Easting	: 1470450.06
Surface Elev. (ft)*	: 323.78
Total Depth (ft)**	: 25.0

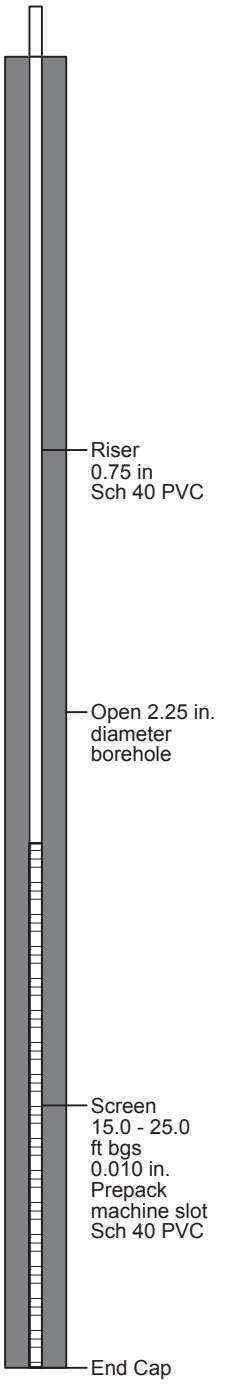
Site Name	: AFFF Area 03
Drilling Company	: Cascade Drilling
Drilling Method	: Geoprobe 7822 DT
Driller	: Chris Aldrich
Borehole Diameter	: 2.25 in.
Boring Completion	: Abandoned Bentonite Chips
Abandonment Date	: 04/21/17
DTW During Drilling (ft)	: 16.0
Logged By	: Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAVD88) feet (ft)
**Below Ground Surface (BGS) feet (ft)

DEPTH IN FEET (BGS)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0									
1	1	100	(0.0 - 2.0) SANDY SILT, 7.5YR 4/3, ~ 5% fine well rounded gravel, damp, no odor	0	ML			SS	BRLTN03-002-SS-001 Note: Interval 0.0 - 0.5 ft
2			(2.0 - 8.0) SILTY SAND, 7.5YR 3/2, dark brown, fine grained, ~ 5% fine well rounded gravel, damp, no odor	0	SM				
3	2	60							
4			(8.0 - 10.0) SILTY SAND, 7.5YR 3/2, dark brown, fine to medium grained, damp, no odor		SM				
5									
6									
7									
8									
9									
10	3	64	(10.0 - 18.0) SAND, poorly graded, 10YR 3/2, dark brown, fine grained, moist, no odor	0	SP				
11									
12									
13									
14								SO	BRLTN03-002-SO-015 Note: Interval 14.0 - 15.0 ft
15	4	64	wet, 16.0 ft bgs	0					
16							▼		
17									
18			(18.0 - 25.0) SAND, poorly graded, 7.5YR 3/2, dark brown, fine grained, wet, no odor						
19									
20	5	100	20.0 ft bgs, color grades to 10YR 4/2, dark grayish brown	0	SP				
21									
22									
23									
24									
25			Total Depth of Boring 25.0 feet	0					

Temporary Well: BRLTN03-002
Elev. TOC: 326.60



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AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Burlington Air National Guard Base

BORING LOG - BRLTN04-001

Start Date	: 04/20/2017
End Date	: 04/20/2017
Northing	: 720457.07
Easting	: 1470205.47
Surface Elev. (ft)*	: 314.9
Total Depth (ft)**	: 15.0

Site Name	: AFFF Area 04
Drilling Company	: Cascade Drilling
Drilling Method	: Geoprobe SP16
Driller	: Chris Aldrich
Borehole Diameter	: 2.25 in.
Boring Completion	: Abandoned Bentonite Chips
Abandonment Date	: 04/20/17
DTW During Drilling (ft)	: 10.0
Logged By	: Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAVD88) feet (ft)

**Below Ground Surface (BGS) feet (ft)

DEPTH IN FEET (BGS)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID	REMARKS
0										
1			(0.0 - 2.0) SILTY SAND, 10YR 3/2, very dark grayish brown, moist, no odor	0	SM			SS	BRLTN04-001-SS-001 Note: Interval 0.0 - 0.5 ft	No temporary well installed.
2	1	100	(2.0 - 8.5) SAND, well graded, 10YR 4/3, brown, fine to medium grained, moist, no odor							
3										
4										
5				0	SW					
6										
7	2	88								
8								SO	BRLTN04-001-SO-009 Note: Interval 8.0 - 9.0 ft	
9			(8.5 - 15.0) SILTY SAND, 10YR 3/2, very dark gray, moist above 10 ft then wet below 10 ft, no odor							
10				0			▼			
11										
12	3	100			SM					
13								GW	BRLTN04-001-GW-013 Note: Interval 11.0 - 15.0 ft	Geoprobe SP16 Screen Interval (11.0 - 15.0 ft)
14										
15				0						

Total Depth of Boring 15.0 feet

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AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Burlington Air National Guard Base

BORING LOG - BRLTN04-002

Start Date	: 04/20/2017
End Date	: 04/20/2017
Northing	: 720591.69
Easting	: 1470229.55
Surface Elev. (ft)*	: 315.9
Total Depth (ft)**	: 20.0

Site Name	: AFFF Area 04
Drilling Company	: Cascade Drilling
Drilling Method	: Geoprobe SP16
Driller	: Chris Aldrich
Borehole Diameter	: 2.25 in.
Boring Completion	: Abandoned Bentonite Chips
Abandonment Date	: 04/20/17
DTW During Drilling (ft)	: 11.0
Logged By	: Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAVD88) feet (ft)

**Below Ground Surface (BGS) feet (ft)

DEPTH IN FEET (BGS)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID	REMARKS
0										
1	1	100	(0.0 - 2.0) SILTY SAND, 10YR 3/2, very dark grayish brown, moist, no odor	0	SM			SS	BRLTN04-002-SS-001 Note: Interval 0.0 - 0.5 ft	No temporary well installed.
2			(2.0 - 10.0) SAND, poorly graded, 10YR 4/3, brown, moist, no odor							
3										
4										
5	2	84		0	SP					
6										
7										
8										
9										
10				0				SO	BRLTN04-002-SO-010 Note: Interval 9.0 - 10.0 ft	
11	3	82	10.0 - 20.0) SILTY SAND, very dark grayish brown Wet, 11.0 ft bgs				▼			
12										
13										
14										
15				0	SM					
16										
17										
18	4	100						GW	BRLTN04-002-GW-018 Note: Interval 16.0 - 20.0 ft	Geoprobe SP16 Screen Interval (16.0 - 20.0 ft)
19										
20			Total Depth of Boring 20.0 feet							

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Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Burlington Air National Guard Base

BORING LOG - BRLTN04-003

Start Date	: 04/20/2017
End Date	: 04/20/2017
Northing	: 720471.62
Easting	: 1470363.64
Surface Elev. (ft)*	: 318.1
Total Depth (ft)**	: 20.0

Site Name	: AFFF Area 04
Drilling Company	: Cascade Drilling
Drilling Method	: Geoprobe SP16
Driller	: Chris Aldrich
Borehole Diameter	: 2.25 in.
Boring Completion	: Abandoned Bentonite Chips
Abandonment Date	: 04/20/17
DTW During Drilling (ft)	: 12.0
Logged By	: Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAVD88) feet (ft)

**Below Ground Surface (BGS) feet (ft)

DEPTH IN FEET (BGS)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID	REMARKS
0										
1			(0.0 - 2.0) SILTY SAND, 10YR 3/2, very dark grayish brown, moist, no odor	0	SM			SS	BRLTN04-003-SS-001 Note: Interval 0.0 - 0.5 ft	No temporary well installed.
2	1	100	(2.0 - 10.0) SAND, well graded, 10YR 5/2, grayish brown, ~ 5% sub angular fine gravel, moist no odor	0	SW					
3										
4										
5	2	70		0						
6										
7										
8										
9										
10			10.0 - 20.0) SILTY SAND, 10YR 3/2, very dark grayish brown, ~ 10% silt	0				SO	BRLTN04-003-SO-011 Note: Interval 10.0 - 11.0 ft	
11										
12	3	72	Wet, 12.0 ft bgs				▼			
13										
14										
15				0	SM					
16										
17										
18	4	100						GW	BRLTN04-003-GW-018 Note: Interval 16.0 - 20.0 ft	Geoprobe SP16 Screen Interval (16.0 - 20.0 ft)
19										
20			Total Depth of Boring 20.0 feet							

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Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Burlington Air National Guard Base

BORING LOG - BRLTN04-004

Start Date	: 04/20/2017
End Date	: 04/20/2017
Northing	: 720376.62
Easting	: 1470480.79
Surface Elev. (ft)	: 317.3
Total Depth (ft)	: 20.0

Site Name	: AFFF Area 04
Drilling Company	: Cascade Drilling
Drilling Method	: Geoprobe SP16
Driller	: Chris Aldrich
Borehole Diameter	: 2.25 in.
Boring Completion	: Abandoned Bentonite Chips
Abandonment Date	: 04/20/17
DTW During Drilling (ft)	: 14.0
Logged By	: Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAVD88) feet (ft)

**Below Ground Surface (BGS) feet (ft)

DEPTH IN FEET (BGS)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID	REMARKS
0										
1			(0.0 - 2.0) SILTY SAND, 10YR 3/2, very dark grayish brown, moist, no odor	0	SM			SS	BRLTN04-004-SS-001 Note: Interval 0.0 - 0.5 ft	No temporary well installed.
2	1	100	(2.0 - 10.5) SAND, well graded, 10YR 3/3, dark brown, medium to coarse grained, moist, no odor		SW					
3										
4										
5										
6	2	70								
7										
8										
9										
10				0						
11			(10.5 - 20.0) SILTY SAND, 10YR 4/2, dark grayish brown, fine grained sand with silt							
12	3	72						SO	BRLTN04-004-SO-013 Note: Interval 12.0 - 13.0 ft	
13										
14			Wet, 14.0 ft bgs				▼			
15				0	SM					
16										
17										
18	4	100						GW	BRLTN04-004-GW-018 BRLTN04-004-GW-918 Note: Interval 16.0 - 20.0 ft	Geoprobe SP16 Screen Interval (16.0 - 20.0 ft)
19										
20			Total Depth of Boring 20.0 feet							

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Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Burlington Air National Guard Base

BORING LOG - BRLTN05-001

Start Date	: 04/19/2017
End Date	: 04/19/2017
Northing	: 721549.53
Easting	: 1467447.41
Surface Elev. (ft)	: 306.3
Total Depth (ft)	: 19.0

Site Name	: AFFF Area 05
Drilling Company	: Cascade Drilling
Drilling Method	: Geoprobe SP16
Driller	: Chris Aldrich
Borehole Diameter	: 2.25 in.
Boring Completion	: Abandoned Bentonite Chips
Abandonment Date	: 04/19/17
DTW During Drilling (ft)	: 15.0
Logged By	: Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAVD88) feet (ft)
**Below Ground Surface (BGS) feet (ft)

DEPTH IN FEET (BGS)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID	REMARKS
0										
1	1	100	(0.0 - 6.5) SAND, poorly graded, 10YR 5/3, brown, fine grained, moist	0	SP			SS	BRLTN05-001-SS-001 BRLTN05-001-SS-901 Note: Interval 0.0 - 0.5 ft	No temporary well installed.
2										
3										
4										
5				0						
6	2	82	(6.5 - 6.7) SILTY CLAY, 10YR 4/1, dark gray, low plasticity, soft, moist, no odor		CL					
7			(6.7 - 10.0) SAND, well graded, 10YR 5/3, brown, fine to medium grained, moist		SW					
8										
9										
10	3	84	(10.0 - 19.0) SAND, poorly graded, 10YR 5/3, brown, uniform color, no odor,	0	SP			SO	BRLTN05-001-SO-014 Note: Intervall 13.0 - 14.0 ft	
11										
12										
13										
14										
15			Wet, 15 ft bgs	0			▼			
16	4	100						GW	BRLTN05-001-GW-017 Note: Interval 15.0 - 19.0 ft	Geoprobe SP16 Screen Interval (15.0 - 19.0 ft)
17										
18										
19			Total Depth of Boring 19 feet							

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Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Burlington Air National Guard Base

BORING LOG - BRLTN05-002

Start Date	: 04/19/2017
End Date	: 04/19/2017
Northing	: 721950.17
Easting	: 1467824.96
Surface Elev. (ft)*	: 302.9
Total Depth (ft)**	: 36.0

Site Name	: AFFF Area 05
Drilling Company	: Cascade Drilling
Drilling Method	: Geoprobe SP16
Driller	: Chris Aldrich
Borehole Diameter	: 2.25 in.
Boring Completion	: Abandoned Bentonite Chips
Abandonment Date	: 04/21/17
DTW During Drilling (ft)	: 29.0
Logged By	: Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAVD88) feet (ft)
**Below Ground Surface (BGS) feet (ft)

DEPTH IN FEET (BGS)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID	REMARKS
0–5	1	100	(0.0 - 5.0) SILTY SAND, 7.5YR 3/2, dark brown, silt fine grained sand, moist, no odor	0	SM			SS	BRLTN05-002-SS-001 Note: Interval 0.0 - 0.5 ft	No temporary well installed.
5–10	2	86	(5.0 - 10.0) SAND, poorly graded, 10YR 4/2, dark grayish brown, fine grained	0	SP					
10–15	3	80	(10.0 - 34.0) SILT, 10YR 5/2, grayish brown, moist	0	ML					
15–20	4	80		0						
20–25	5	100		0						
25–30	6	100		0				SO	BRLTN05-002-SO-028 BRLTN05-002-SO-928 Note: Interval 27.0 - 28.0 ft	
28–31	7	100	Wet 29 ft bgs	0			▼			
31–34	8	100		0				GW	BRLTN05-002-GW-033 BRLTN05-002-GW-933 Note: Interval 32.0 - 33.0 ft	Geoprobe SP16 Screen Interval (30.0 - 34.0 ft)
34–36			(34.0 - 36.0) SAND, poorly graded, 10YR 5/3, brown, fine grained, wet, no odor	0	SP					

Total Depth of Boring 36.0 feet

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Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Burlington Air National Guard Base

BORING LOG - BRLTN05-003

(Page 1 of 1)

Start Date	: 04/19/2017
End Date	: 04/19/2017
Northing	: 721889.89
Easting	: 1467890.35
Surface Elev. (ft)*	: 305.9
Total Depth (ft)**	: 32.5

Site Name	: AFFF Area 05
Drilling Company	: Cascade Drilling
Drilling Method	: Geoprobe SP16
Driller	: Chris Aldrich
Borehole Diameter	: 2.25 in.
Boring Completion	: Abandoned Bentonite Chips
Abandonment Date	: 04/21/17
DTW During Drilling (ft)	: Not Encountered
Logged By	: Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAVD88) feet (ft)
**Below Ground Surface (BGS) feet (ft)

DEPTH IN FEET (BGS)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID	REMARKS
0-5	1	100	(0.0 - 5.0) SILTY SAND, 7.5YR 3/2, dark brown, silt and fine grained sand, moist, no odor	0	SM			SS	BRLTN05-003-SS-001 Note: Interval 0.0 - 0.5 ft	No temporary well installed.
5-10	2	100	(5.0 - 10.0) SAND, poorly graded, 10YR 4/2, fine grained, moist, no odor	0	SP					
10-32.5	3	125	(10.0 - 32.5) SILT, 10YR5/2, grayish brown, moist, no odor	0	ML					No groundwater encountered during drilling.
	4	125		0						
	5	100		0						
	6	100		0						
	7	100								
	8	100		0				SO	BRLTN05-003-SO-032 Note: Interval 31.0 - 32.0 ft	
32-33			Total Depth of Boring 32.5 feet							

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Appendix D
Laboratory Case Narratives
Data Validation Report
and
Analytical Data Sheets

Prepared for: Aerostar SES LLC

Project: M2032.0001 (SAVANNAH) BURLINGTON

Analytical Data Package
(Level IV)

Analysis: PFOS and PFOA in water and soil (Method 537 mod.)

Maxxam Job #: B780315

Maxxam Analytics International
6740 Campobello Rd.
Mississauga, Ontario, Canada
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1-800-668-0639
www.maxxamanalytics.com

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Table of Contents

I hereby certify that to the best of my knowledge all analytical data presented in this report:

- Has been checked for completeness.
- Is accurate, legible and error free.
- Has been conducted in accordance with approved SOP's and that all deviations are clearly listed in the Case Narrative.
- This report has been generated in .pdf format.

Review Performed By:

Maxxam Analytics International
6740 Campobello Rd.
Mississauga, Ontario, Canada
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Glossary of Terms

- ***Detection Limit (DL)*** this can also be called ***Method Detection Limit (MDL***): The lowest concentration or amount of the target analyte that can be identified, measured, and reported with confidence that the analyte concentration is not a false positive value. (Clarification): The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence. At the DL, the false positive rate (Type I error) is 1%.

- ***Limit of Detection (LOD*)**: An estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. (Clarification): The smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.

- ***Limits of Quantitation (LOQ)*** this can also be called ***Reporting Detection Limit (RDL)***: The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. (Clarification): The lowest concentration that produces a quantitative result within specified limits of precision and bias. For DoD projects, the LOQ shall be set at or above the concentration of the lowest initial calibration standard.

- ***Acceptance Criteria*** are values used by the laboratory to determine that a process is in control.

- ***Accuracy*** is the degree of agreement of a measured value with the true or expected value.

- ***Calibration Standards*** are a set of solutions containing the analytes of interest at a specified concentration.

- ***Calibration Verification Standard*** consists of a calibration standard solution of intermediate concentration (mid-point initial calibration level) used to access whether the initial calibration is still valid

- ***Certified Reference Material*** is a stable homogenous material that is certified by repetitive analysis from a supplier who is certified to generate said materials.

- ***Internal Standard*** a deuterated or ^{13}C-labelled analyte that is added to a sample extract prior to instrumental analysis to compensate for injection variability.

- ***Isomer*** is a member of a group of compounds that differ from each other only in the locations of a specific number of common substituent atoms or groups of atoms on the parent compound.

- ***Method Blank*** is a laboratory control sample using reagents that are known to be free of contamination.

- ***Precision*** is the degree of agreement between the data generated from repetitive measurements under specific conditions.

- ***Quality Assurance*** is a system of activities whose purpose is to provide the producer or user of a product with the assurance that the product meets a defined standard of quality.

- ***Quality Control*** is the overall system of activities whose purpose is to control the quality of a product so that it meets the needs of the end user.

- ***RSD*** is the relative standard deviation.

- ***Blank Spike*** is a laboratory control sample that has been fortified with native analytes of interest.

- ***Window Defining Mixture*** is a solution containing only the earliest and latest eluting congeners within each homologous group of target analytes on a specified GC column.

- ***RPD*** or Relative Percent Difference. A measure used to compare duplicate sample analysis.

- ***EMPC/NDR –*** Peak detected does not meet ratio criteria and has resulted in a higher detection limit.

1.0 Project Narrative

Maxxam Analytics International
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Maxxam Job: B780315 – Soil Analysis

Sample Analysis

Soil samples were initially pre-screened and estimated concentrations were obtained so that samples could be appropriately diluted for quantitative analysis on QC batches 4966650 (2017/05/09), 4966664 (2017/05/09) and 4966672 (2017/05/09). Due to high concentrations, 10x dilutions were required for Perfluorooctanesulfonate (PFOS) in the following samples:

EGG575 *BRLTN01-003-SD-001*
EGG576 *BRLTN01-003-SD-901*
EGG579 *BRLTN03-003-SD-001*
EGG589 *BRLTN03-002-SS-001*
EGG590 *BRLTN03-002-SO-015*
EGG592 *BRLTN03-001-SS-001*
EGG593 *BRLTN03-001-SO-014*
EGG596 *BRLTN02-001-SO-020*
EGG599 *BRLTN02-002-SO-020*

Detection limits were adjusted accordingly for this analyte.

High concentrations of target analytes were detected in several samples during pre-screening. These samples were diluted prior to analysis, with additional dilutions for the following selected analytes:

EGG602 *BRLTN01-002-SO-007* *Perfluorooctanesulfonate (PFOS), Perfluorooctane sulfonamide (PFOSA)*

EGG603 *BRLTN01-002-SO-907* *Perfluorooctanesulfonate (PFOS), Perfluorooctane sulfonamide (PFOSA)*

Detection limits were adjusted accordingly for these samples.

The following sample was analyzed on QC batch 4966664 (2017/05/09) immediately after the Matrix Spike/Matrix Spike Duplicate (MS/MSD) which contained high concentrations of Perfluorooctanesulfonate (PFOS):

EGG594 *BRLTN02-001-SS-001*

Because an Instrument Blank (IB) was not injected prior to this sample to eliminate the possibility of potential carryover from the MS/MSD, the sample was re-extracted and re-analyzed on QC batch 4994232 (2017/05/27) for Perfluorooctanesulfonate (PFOS), past the method defined hold time. Because of their chemical structures, per- and polyfluorinated alkyl substances (PFAS) are chemically and biologically stable in the environment and resist typical environmental degradation processes. This would suggest the hold time exceedance would not have a significant impact on the data quality.

Data was evaluated in accordance with acceptance criteria specified in DoD QSM 5.1.

QC Samples

Matrix Spike and Matrix Spike Duplicate (MS/MSD) was performed on sample EGG602 *(BRLTN01-002-SO-007)* on QC batch 4966672 (2017/05/09). Due to high concentrations of target analytes in the native sample, the undiluted native sample was not analyzed, and MS/MSD recoveries could not be calculated.

Extracted Internal Standard Analytes

Isotopically labeled $^{13}C_2$-Perfluoroundecanoic acid (MPFUnA) and $^{13}C_8$-Perfluorooctane sulfonamide (MPFOSA) are used as internal standards to quantify native Perfluoroundecanoic acid (PFUnA) and Perfluorooctane sulfonamide (PFOSA) respectively. The recoveries observed for selected extracted internal standard analytes were below the defined lower control limit (LCL) for the following samples:

EGG610 *BRLTN05-002-SS-001* *(MPFUnA)*

EGG611 *BRLTN05-002-SO-028 (MPFOSA)*
EGG612 *BRLTN05-002-SO-928 (MPFOSA)*

When quantifying analytes using isotope dilution techniques, the extracted internal standard analytes differ from the native compounds only in the presence of the stable isotopes. The physical and chemical behavior of each extracted internal standard analyte is virtually identical to its unlabeled or "native" analog. Any loss (or apparent gain) of the native compound that may occur during any of the sample preparation, extraction, cleanup or determinative steps will be mirrored by a similar loss (or apparent gain) of the extracted internal standard analyte, and as such can be accounted for and corrected. Therefore, the quantification of these target compounds is not affected by the low (or high) recoveries, provided the instrument response for the native and labeled compounds is distinguishable from the instrument or background noise.

Quantitation of PFAS

Many PFAS (e.g. PFOS) have several isomeric forms that may show up as separate or partially-merged peaks in the analytical chromatograms. These peaks will be integrated and the areas summed such that the result represents the concentration of the sum of the linear and branched isomers, per USEPA (2009). Instrumentation is calibrated using certified quantitative standards containing only the linear isomer for all target analytes, except Perfluorooctane sulfonate (PFOS) and Perfluorohexane sulfonate (PFHxS), which are calibrated using certified branched and linear isomer mixtures. As additional certified reference materials containing branched and linear isomers become commercially available, they will be incorporated into the analytical method.

Sin Chii Chia, B.Sc.
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Office 905 817 5700

Maxxam Job: B780315 – Water Analysis

Sample Analysis

Water samples were initially pre-screened and estimated concentrations were obtained so that samples could be appropriately diluted for quantitative analysis on QC batches 4963000 (2017/05/05) and 4963931 (2017/05/03). The following sample required 20x dilutions for selected analytes:

EGG583	*BRLTN01-MW102-011*	*Perfluorobutanesulfonate (PFBS), Perfluorohexanoic acid (PFHxA), Perfluorohexanesulfonate (PFHxS), Perfluorooctanesulfonate (PFOS)*

Detection limits were adjusted accordingly for these analytes.

High concentrations of target analytes were detected in several samples during pre-screening. These samples were diluted prior to analysis, with the following selected analytes requiring further dilutions:

EGG577	*BRLTN01-003-SW-001*	*Perfluorohexanesulfonate (PFHxS), Perfluorooctanesulfonate (PFOS)*
EGG578	*BRLTN01-003-SW-901*	*Perfluorohexanesulfonate (PFHxS), Perfluorooctanesulfonate (PFOS)*
EGG580	*BRLTN03-003-SW-001*	*Perfluorooctanesulfonate (PFOS)*
EGG583	*BRLTN01-MW102-011*	*Perfluorobutanesulfonate (PFBS), Perfluorohexanoic acid (PFHxA), Perfluorohexanesulfonate (PFHxS), Perfluorooctanesulfonate (PFOS)*
EGG584	*BRLTN01-MW103-009*	*Perfluorohexanesulfonate (PFHxS), Perfluorooctanesulfonate (PFOS)*
EGG585	*BRLTN01-MW103-909*	*Perfluorohexanesulfonate (PFHxS), Perfluorooctanesulfonate (PFOS)*
EGG586	*BRLTN01-002-GW-015*	*Perfluorohexanesulfonate (PFHxS)*
EGG587	*BRLTN01-TRENCHSUMP-001*	*Perfluorohexanesulfonate (PFHxS), Perfluorooctanesulfonate (PFOS)*
EGG588	*BRLTN01-VIMW14L-008*	*Perfluorohexanesulfonate (PFHxS)*
EGG615	*BRLTN03-002-GW-022*	*Perfluorooctanesulfonate (PFOS)*
EGG616	*BRLTN03-001-GW-022*	*Perfluorohexanesulfonate (PFHxS), Perfluorooctanesulfonate (PFOS)*
EGG617	*BRLTN02-001-GW-027*	*Perfluorohexanesulfonate (PFHxS), Perfluorooctanesulfonate (PFOS), 6:2 Fluorotelomersulfonate (6:2FTS)*
EGG618	*BRLTN01-001-GW-013*	*Perfluorohexanesulfonate (PFHxS), Perfluorooctanesulfonate (PFOS), 6:2 Fluorotelomersulfonate (6:2FTS)*

Detection limits were adjusted accordingly for these samples.

The following sample was initially analyzed on QC batch 4963000 (2017/05/05):

EGG577 *BRLTN01-003-SW-001*

Due to failure of QC acceptance criteria on this batch, this sample was re-extracted and re-analyzed on QC batch 4974570 (2017/05/09) past the method defined hold time.

All other water samples were initially analyzed on QC batch 4963931 (2017/05/03). The concentration of 6:2 Fluorotelomersulfonate (6:2FTS) in the Blank (Method Blank) was above the defined upper control limit in this batch. As a result, samples were re-extracted and re-analyzed for this analyte on QC batch 4978406 (2017/05/11) past the method defined hold time, with the exception of the following sample:

EGG607 *BRLTN05-001-GW-017*

This sample could not be re-extracted due to limited sample volume, and the result for 6:2 Fluorotelomersulfonate (6:2FTS) was reported from QC batch 4963931 (2017/05/03) and should be used with discretion.

Because of their chemical structures, per- and polyfluorinated alkyl substances (PFAS) are chemically and biologically stable in the environment and resist typical environmental degradation processes. This would suggest the hold time exceedance would not have a significant impact on the data quality.

Data was evaluated in accordance with acceptance criteria specified in DoD QSM 5.1.

QC Samples

Matrix Spike and Matrix Spike Duplicate (MS/MSD) was required on the following samples:

EGG577 *BRLTN01-003-SW-001*
EGG584 *BRLTN01-MW103-009*

Due to high concentrations of target analytes in the native samples, Matrix Duplicates (MDs) were prepared instead for these samples, in addition to Spike Duplicates (LCS Duplicates).

Extracted Internal Standard Analytes

Isotopically labeled $^{13}C_2$-Perfluorododecanoic acid (MPFDoA) is used as an internal standard to quantify native Perfluorododecanoic acid (PFDoA). The recovery observed for this extracted internal standard analyte was below the defined lower control limit (LCL) for the following sample:

EGG607 *BRLTN05-001-GW-017*

When quantifying analytes using isotope dilution techniques, the extracted internal standard analytes differ from the native compounds only in the presence of the stable isotopes. The physical and chemical behavior of each extracted internal standard analyte is virtually identical to its unlabeled or "native" analog. Any loss (or apparent gain) of the native compound that may occur during any of the sample preparation, extraction, cleanup or determinative steps will be mirrored by a similar loss (or apparent gain) of the extracted internal standard analyte, and as such can be accounted for and corrected. Therefore, the quantification of these target compounds is not affected by the low (or high) recoveries, provided the instrument response for the native and labeled compounds is distinguishable from the instrument or background noise.

Quantitation of PFAS

Many PFAS (e.g. PFOS) have several isomeric forms that may show up as separate or partially-merged peaks in the analytical chromatograms. These peaks will be integrated and the areas summed such that the result represents the concentration of the sum of the linear and branched isomers, per USEPA (2009). Instrumentation is calibrated using certified quantitative standards containing only the linear isomer for all target analytes, except Perfluorooctane sulfonate (PFOS) and Perfluorohexane sulfonate (PFHxS), which are calibrated using certified branched and linear isomer mixtures. As additional certified reference materials containing branched and linear isomers become commercially available, they will be incorporated into the analytical method.

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PROJECT NARRATIVE

Maxxam Analytics
Client Project #: M2032.0001 (SAVANNAH)

Client: Aerostar SES LLC
Client Project: M2032.0001 (SAVANNAH)

I. SAMPLE RECEIPT/ANALYSIS

a) Sample Listing

Maxxam ID	Client Sample ID	Date Sampled	Date Received	Date Prepped	Date Run	Initial Calibration
PFOS and PFOA in soil by SPE/LCMS						
EGG575	BRLTN01-003-SD-001	2017/04/18	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG576	BRLTN01-003-SD-901	2017/04/18	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG579	BRLTN03-003-SD-001	2017/04/18	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG581	BRLTN02-004-SD-001	2017/04/18	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG589	BRLTN03-002-SS-001	2017/04/18	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG590	BRLTN03-002-SO-015	2017/04/18	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG592	BRLTN03-001-SS-001	2017/04/18	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG593	BRLTN03-001-SO-014	2017/04/18	2017/04/21	2017/05/03	2017/05/09	2017/05/09 & 2017/05/27
EGG594	BRLTN02-001-SS-001	2017/04/18	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG595	BRLTN02-001-SS-901	2017/04/18	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG596	BRLTN02-001-SO-020	2017/04/18	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG597	BRLTN02-002-SS-001	2017/04/18	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG598	BRLTN02-003-SS-001	2017/04/18	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG599	BRLTN02-002-SO-020	2017/04/18	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG600	BRLTN02-003-SO-025	2017/04/18	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG602	BRLTN01-002-SO-007	2017/04/19	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG603	BRLTN01-002-SO-907	2017/04/19	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG604	BRLTN05-001-SS-001	2017/04/19	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG605	BRLTN05-001-SS-901	2017/04/19	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG606	BRLTN05-001-SO-014	2017/04/19	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG608	BRLTN05-003-SS-001	2017/04/19	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG609	BRLTN05-003-SO-032	2017/04/19	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG610	BRLTN05-002-SS-001	2017/04/19	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG611	BRLTN05-002-SO-028	2017/04/19	2017/04/21	2017/05/03	2017/05/09	2017/05/09
EGG612	BRLTN05-002-SO-928	2017/04/19	2017/04/21	2017/05/03	2017/05/09	2017/05/09
PFOS and PFOA in water by SPE/LCMS						
EGG574	BRLTN-RS-001	2017/04/18	2017/04/21	2017/05/11	2017/05/11	2017/05/03 & 2017/05/11
EGG577	BRLTN01-003-SW-001	2017/04/18	2017/04/21	2017/05/09	2017/05/12	2017/05/09
EGG577 Dup	BRLTN01-003-SW-001	2017/04/18	2017/04/21	2017/05/09	2017/05/12	2017/05/09
EGG578	BRLTN01-003-SW-901	2017/04/18	2017/04/21	2017/05/11	2017/05/11	2017/05/03 & 2017/05/11
EGG580	BRLTN03-003-SW-001	2017/04/18	2017/04/21	2017/05/11	2017/05/11	2017/05/03 & 2017/05/11
EGG582	BRLTN02-004-SW-001	2017/04/18	2017/04/21	2017/05/11	2017/05/11	2017/05/03 & 2017/05/11
EGG583	BRLTN01-MW102-011	2017/04/18	2017/04/21	2017/05/11	2017/05/11	2017/05/03 & 2017/05/11
EGG584	BRLTN01-MW103-009	2017/04/18	2017/04/21	2017/05/11	2017/05/11	2017/05/03 & 2017/05/11
EGG584 Dup	BRLTN01-MW103-009	2017/04/18	2017/04/21	2017/05/02	2017/05/03	2017/05/03
EGG585	BRLTN01-MW103-909	2017/04/18	2017/04/21	2017/05/11	2017/05/11	2017/05/03 & 2017/05/11
EGG586	BRLTN01-002-GW-015	2017/04/19	2017/04/21	2017/05/11	2017/05/11	2017/05/03 & 2017/05/11
EGG587	BRLTN01-TRENCHSUMP-001	2017/04/19	2017/04/21	2017/05/11	2017/05/11	2017/05/03 & 2017/05/11
EGG588	BRLTN01-V1MW14L-008	2017/04/19	2017/04/21	2017/05/11	2017/05/11	2017/05/03 & 2017/05/11
EGG591	BRLTN-SB-001	2017/04/18	2017/04/21	2017/05/11	2017/05/11	2017/05/03 & 2017/05/11
EGG601	BRLTN-RS-002	2017/04/19	2017/04/21	2017/05/11	2017/05/11	2017/05/03 & 2017/05/11
EGG607	BRLTN05-001-GW-017	2017/04/19	2017/04/21	2017/05/02	2017/05/03	2017/05/03
EGG613	BRLTN05-002-GW-033	2017/04/19	2017/04/21	2017/05/11	2017/05/11	2017/05/03 & 2017/05/11
EGG614	BRLTN05-002-GW-933	2017/04/19	2017/04/21	2017/05/11	2017/05/11	2017/05/03 & 2017/05/11
EGG615	BRLTN03-002-GW-022	2017/04/20	2017/04/21	2017/05/11	2017/05/11	2017/05/03 & 2017/05/11
EGG616	BRLTN03-001-GW-022	2017/04/20	2017/04/21	2017/05/11	2017/05/11	2017/05/03 & 2017/05/11
EGG617	BRLTN02-001-GW-027	2017/04/20	2017/04/21	2017/05/11	2017/05/11	2017/05/03 & 2017/05/11
EGG618	BRLTN01-001-GW-013	2017/04/20	2017/04/21	2017/05/11	2017/05/11	2017/05/03 & 2017/05/11

Run Date is defined as the date of injection of the last calibration standard (12 hours or less) prior to the samples analyzed within that run sequence. Therefore the time of calibration injection that defines the run date is always within 12 hours of the time of sample injection.

b) Shipping Problems: none encountered

c) Documentation Problems: Samples "BRLTN05-002-GW-033" and "BRLTN05-002-GW-933" were listed as soils on the CoC. Proceeded with water analysis as the samples are liquid and the sample ID indicated GW.

II. SAMPLE PREP:

No problems encountered

III. SAMPLE ANALYSIS:

See also comments within the appropriate Certificate of Analysis

a) Hold Times: Due to rework requirements, the following samples were extracted for past the recommended hold time of 14 days: Samples EGG574, EGG578, EGG580, EGG582, EGG583, EGG584, EGG585, EGG586, EGG587, EGG588, EGG591, EGG601, EGG613, EGG614, EGG615, EGG616, EGG617, and EGG618 for 6:2 FTS, sample EGG594 for PFOS, and sample EGG577 for all analytes.

b) Instrument Calibration: all within control limits

c) Quality Control: All applicable QC meets control criteria, except where otherwise noted.

d) All analytes requiring manual intergration(s) are noted on the sample chromatograms

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for other than the conditions detailed above.

In addition, I certify, that to the best of my knowledge and belief, the data as reported are true and accurate. Release of the data contained in this data package has been authorized by the cognizant laboratory official or his/her designee, as verified by this signature.

Steph Faller

Project Manager- Site Assessment and Remediation/ Ultra Trace

2017/06/23

Date

2.1 Sample Custody

Maxxam Analytics International
6740 Campobello Rd
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

Aerostar SES LLC

1006 Floyd Culler Court
Oak Ridge, TN 37830
865-481-7837

Chain of Custody Record/ Analysis Req

21-Apr-17 14:11

Melissa DiGrazia

B780315

PS4 ENV-767

408

1 of 3

Project Name: Site Inspections of Fire Fighting Foam Usage at Various Air Force Bases in the Eastern United States

Job No.: M2032.0001 (Savannah)

Installation: Burlington

Aerostar Project Manager: Brian Odom, BOdom@specproenv.com (478) 397-4906
Send Data to: Jenny Vance, jvance@aerostar.net (865) 483-7904

Sampler(s): Kaleb Brownbaugh, Ryan Reynolds

Laboratory Name/Address:
Maxxam Analytics, Inc
6740 Campobello Rd.
Mississauga, Ontario
L5N2L8

Laboratory Shipping Address:
Maxxam Analytics
c/o FedEx Depot
299 Cayuga Rd.
Cheektowaga, NY 14225

Please indicate "HOLD FOR PICKUP"

Contact: Melissa DiGrazia

Phone: (905) 817-5700, ext. 5784
email: MDiGrazia@maxxam.ca

ple Types:
= Normal
= Field Duplicate
= Ambient Blank or Field Reagent Blank
EB = Equipment Rinsate

Matrix:
WG = Groundwater
SO = Soil
WP = Potable Water
SE = Sediment
WS = Surface Water
WQ = Field QC (AB, EB)

MAXXAM use only	Sample ID	Date Collected	Time Collected	Sample Type	Matrix	PFAS (see list of 16 analytes below)						NOTES
	BRLTN-RS-001	4/18/17	1250	EB	WQ	1						(Spoon) assoc. w/ Sample below
	BRLTN01-003-SD-001	4/18/17	1310	N	SE	2						Parent + MS/MSD
	BRLTN01-003-SD-001	4/18/17	1310	FD	SE	1						
	BRLTN01-003-SW-001	4/18/17	1310	N	WS	2						MS/MSD + parent
	BRLTN01-003-SW-901	4/18/17	1310	FD	WS	1						
	BRLTN03-003-SD-001	4/18/17	1356	N	SE	1						
	BRLTN03-003-SW-001	4/18/17	1356	N	WS	1						
	BRLTN02-004-SD-001	4/18/17	~~1354~~ 1356	N	SE	1						
	BRLTN02-004-SW-001	4/18/17	~~1356~~ 1358	N	WS	1						
	BRLTN01-MW102-011	4/18/17	1645	N	WG	1						
	BRLTN01-MW103-009	4/18/17	1752	N	WG	2						Parent + (MS/MSD)
	BRLTN01-MW103-900	4/18/17	1752	FD	WG	1						
	BRLTN01-002-GW-015	4/19/17	0950	N	WG	2						2 bottles + grab sample
	BRLTN01-TRENCHSUMP-001	4/19/17	1130	N	WG	2						2 bottles + grab sample
	BRLTN01-YIMW14L-016	4/19/17	1321	N	WG	1						

Total # of Containers: 20

RELINQUISHED BY:
Signature: Date/Time: 4/20/17 @1800
Printed Name: Kaleb Brownbaugh Firm: ASL

RECEIVED BY:
Signature: Paralytek Date/Time: 2017/04/21 14:11
Printed Name: PARAMJEET SINGH Firm: 1.5 1.7 1.9 2.1 20.1 .9

Analyte List:

ANALYTE	EXPRES PAR CODE	CAS	ANALYTE	EXPRES PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorooctanesulfonamide	PFOSA	754-91-6
Perfluorooctanoic acid	PFOA	335-67-1	Perfluoroundecanoic acid	PFUnA	2058-94-8
Perfluorononanoic acid	PFNA	375-95-1	Perfluorododecanoic acid	PFDoA	307-55-1
Perfluorooctanesulfonamidoacetic acid	PFOSAA	2355-31-9	6:2 Fluorotelomersulfonic acid	6:2FTS	27619-97-2
Perfluoroheptanoic acid	PFHpA	375-85-9	8:2 Fluorotelomersulfonic acid	8:2FTS	39108-34-4
Perfluorohexanesulfonic acid	PFHxS	355-46-4	Perfluorobutanesulfonic acid	PFBS	375-73-5
Perfluorodecanoic acid	PFDA	335-76-2	Perfluorohexanesulfonamide	FHxSA	41997-13-1
Perfluorohexanoic acid	PFHxA	307-24-4	Perfluorotridecanoic Acid	PFTrA	72629-94-8

AerostarSES

1006 Floyd Culler Court
Oak Ridge, TN 37830
865-481-7837

Chain of Custody Record/ Analysis Request Number: 409

Project Name: Site Inspections of Fire Fighting Foam Usage at Various Air Force Bases in the Eastern United States

Job No.: M2032.0001 (Savannah)

Installation: Burlington

Aerostar Project Manager: Brian Odom, BOdom@specproenv.com (478) 397-4906
Send Data to: Jenny Vance, jvance@aerostar.net (865) 483-7904

Sampler(s): Frank Johnson

Laboratory Name/Address: Maxxam Analytics, Inc 6740 Campobello Rd. Mississauga, Ontario L5N2L8

Laboratory Shipping Address: Maxxam Analytics c/o FedEx Depot 299 Cayuga Rd. Cheektowaga, NY 14225

Please indicate "HOLD FOR PICKUP"

Contact: Melissa DiGrazia
Phone: (905) 817-5700, ext. 5784
email: MDiGrazia@maxxam.ca

ANALYSIS

Sample Types:
N = Normal
FD = Field Duplicate
AB = Ambient Blank or Field Reagent Blank
EB = Equipment Rinsate

Matrix:
WG = Groundwater
SO = Soil
WP = Potable Water
SE = Sediment
WS = Surface Water
WQ = Field QC (AB, EB)

MAXXAM use only	Sample ID	Date Collected	Time Collected	Sample Type	Matrix	PFAS (see list of 18 analytes below)						NOTES
	BRLTN03-002-SS-001	04/18/2017	0852	N	SO	1						
	BRLTN03-002-SO-015	04/18/2017	0945	N	SO	1						
	BRLTN-SB-001	04/18/2017	0919	AB	WQ	1						
	BRLTN03-001-SS-001	04/18/2017	1037	N	SO	1						
	BRLTN03-001-SO-004	04/18/2017	1120	N	SO	1						
	BRLTN02-001-SS-001	04/18/2017	1255	N	SO	2						Normal + MS/MSD
	BRLTN02-001-SS-901	04/18/2017	1255	FD	SO	1						
	BRLTN02-001-SO-020	04/18/2017	1405	N	SO	1						
	BRLTN02-002-SS-001	04/18/2017	1445	N	SO	1						
	BRLTN02-003-SS-001	04/18/2017	1600	N	SO	1						
	BRLTN02-002-SO-020	04/18/2017	1530	N	SO	1						
	BRLTN02-003-SO-025	04/18/2017	1705	N	SO	1						
	BRLTN-RS-002	04/19/2017	0730	EB	WQ	1						Spoon rinsate, asc. with ↓ sample
	BRLTN01-002-SO-007	04/19/2017	0840	N	SO	2						Normal + MS/MSD; High VOC
	BRLTN01-002-SO-907	04/19/2017	0840	FD	SO	1						High VOC
					Total # of Containers	17						

RELINQUISHED BY:
Signature: [illegible] Date/Time: 4/20/17 @1800
Printed Name: Kaleb Brumbaugh Firm: ASL
Signature: Date/Time:
Printed Name: Firm:

RECEIVED BY:
Signature: Paramjeet Date/Time: 2017/04/21 14:11
Printed Name: PARAMJEET SINGH Firm:
1.5/1.7/1.9 2.1/2.0/1.9
Signature: Date/Time:
Printed Name: Firm:

Analyte List:

ANALYTE	ERPTOOL PAR CODE	CAS	Contaminant	ERPTOOL PAR CODE	CAS
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

AIR

AerostarSES LLC

1006 Floyd Culler Court
Oak Ridge, TN 37830
865-481-7837

Chain of Custody Record/ Analysis Request Number: 410

Page 3 of 3

Project Name: Site Inspections of Fire Fighting Foam Usage at Various Air Force Bases in the Eastern United States

Job No.: M2032.0001 (Savannah)

Installation: Burlington

Aerostar Project Manager: Brian Odom, BOdom@specproenv.com (478) 397-4906
Send Data to: Jenny Vance, jvance@aerostar.net (865) 483-7904

Sampler(s): Frank Johnson, Kaleb Brumbaugh

Laboratory Name/Address:
Maxxam Analytics, Inc
6740 Campobello Rd.
Mississauga, Ontario
L5N2L8

Laboratory Shipping Address:
Maxxam Analytics
c/o FedEx Depot
299 Cayuga Rd.
Cheektowaga, NY 14225

Please indicate "HOLD FOR PICKUP"

Contact: Melissa DiGrazia

Phone: (905) 817-5700, ext. 5784
email: MDiGrazia@maxxam.ca

ANALYSIS

Sample Types:
N = Normal
FD = Field Duplicate
AB = Ambient Blank or Field Reagent Blank
EB = Equipment Rinsate

Matrix:
WG = Groundwater
SO = Soil
WP = Potable Water
SE = Sediment
WS = Surface Water
WQ = Field QC (AB, EB)

MAXXAM use only	Sample ID	Date Collected	Time Collected	Sample Type	Matrix	PFAS (see list of 18 analytes below)						NOTES
	BRLTN05-001-SS-001	4/19/2017	1025	N	SO	1						
	BRLTN05-001-SS-901	4/19/2017	1025	FD	SO	1						
	BRLTN05-001-SO-014	4/19/2017	1100	N	SO	1						
	BRLTN05-001-GW-017	4/19/2017	1115	N	WG	1						
	BRLTN05-003-SS-001	4/19/2017	1145	N	SO	1						
	BRLTN05-003-SO-032	4/19/2017	1417	N	SO	1						
	BRLTN05-002-SS-001	04/19/2017	1500	N	SO	1						
	BRLTN05-002-SO-028	04/19/2017	1625	N	SO	1						
	BRLTN05-002-SO-928	04/19/2017	1625	FD	SO	1						
	BRLTN05-002-GW-033	04/19/2017	1655	N	SO	2						Normal + MS/MSD
	BRLTN05-002-GW-933	04/19/2017	1655	FD	SO	1						
	BRLTN03-002-GW-022	04/20/2017	1213	N	WG	1						
	BRLTN03-001-GW-022	04/20/2017	1303	N	WG	1						
	BRLTN02-001-GW-027	04/20/2017	1435	N	WG	1						
	BRLTN01-001-GW-013	04/20/2017	1425	N	WG	1						
				Total # of Containers		16						

RELINQUISHED BY:
Signature: Date/Time: 4/21/17 @ 1500
Printed Name: Kaleb Brumbaugh Firm: ASL

Signature: Date/Time:
Printed Name: Firm:

RECEIVED BY:
Signature: Date/Time: 2017/04/21 14:11
Printed Name: PARAMJEET SINGH Firm: 1-5|1.7|1.9 2-1|2.0|1.9

Signature: Date/Time:
Printed Name: Firm:

Analyte List:

ANALYTE	EXPOSURE CODE	CAS	Contaminant	EXPOSURE CODE	CAS
Perfluorotetradecanoic acid	PFTA		Perfluorooctanesulfonic acid	PFOS	
Perfluorotridecanoic acid	PFTrDA		Perfluorohexanesulfonic acid	PFHxS	
Perfluorododecanoic acid	PFDoA		Perfluorooctanesulfonamide	FOSA	
Perfluoroundecanoic acid	PFUnA		N-Methylperfluorooctanesulfonamidoacetic acid	NMeFOSAA	
Perfluorodecanoic acid	PFDA		N-Ethylperfluorooctanesulfonamidoacetic acid	NEtFOSAA	
Perfluorononanoic acid	PFNA		6:2 Fluorotelomer sulfonate	6:2FTS	
Perfluorooctanoic acid	PFOA		8:2 Fluorotelomer sulfonate	8:2FTS	
Perfluoroheptanoic acid	PFHpA		Perfluorobutanesulfonic acid	PFBS	
Perfluorohexanoic acid	PFHxA		Perfluoropentanoic acid	PFPeA	
Perfluorobutanoic acid	PFBA		Perfluorobutanoic acid	PFBA	

Prepared for: Aerostar SES LLC

Project: M2032.0001 (SAVANNAH)
BURLINGTON

Analytical Data Package
(Level IV)

Analysis: PFOS and PFOA in water and soil (Method 537 mod.)

Maxxam Job #: B780516

Maxxam Analytics International
6740 Campobello Rd.
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

Table of Contents

Maxxam Analytics International
6740 Campobello Rd.
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

Table of Contents

I hereby certify that to the best of my knowledge all analytical data presented in this report:

- Has been checked for completeness.
- Is accurate, legible and error free.
- Has been conducted in accordance with approved SOP's and that all deviations are clearly listed in the Case Narrative.
- This report has been generated in .pdf format.

Review Performed By:

Maxxam Analytics International
6740 Campobello Rd.
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

Glossary of Terms

- ***Detection Limit (DL)*** this can also be called ***Method Detection Limit (MDL***): The lowest concentration or amount of the target analyte that can be identified, measured, and reported with confidence that the analyte concentration is not a false positive value. (Clarification): The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence. At the DL, the false positive rate (Type I error) is 1%.

- ***Limit of Detection (LOD*)**: An estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. (Clarification): The smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.

- ***Limits of Quantitation (LOQ)*** this can also be called ***Reporting Detection Limit (RDL)***: The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. (Clarification): The lowest concentration that produces a quantitative result within specified limits of precision and bias. For DoD projects, the LOQ shall be set at or above the concentration of the lowest initial calibration standard.

- ***Acceptance Criteria*** are values used by the laboratory to determine that a process is in control.

- ***Accuracy*** is the degree of agreement of a measured value with the true or expected value.

- ***Calibration Standards*** are a set of solutions containing the analytes of interest at a specified concentration.

- ***Calibration Verification Standard*** consists of a calibration standard solution of intermediate concentration (mid-point initial calibration level) used to access whether the initial calibration is still valid

- ***Certified Reference Material*** is a stable homogenous material that is certified by repetitive analysis from a supplier who is certified to generate said materials.

- ***Internal Standard*** a deuterated or ^{13}C-labelled analyte that is added to a sample extract prior to instrumental analysis to compensate for injection variability.

- ***Isomer*** is a member of a group of compounds that differ from each other only in the locations of a specific number of common substituent atoms or groups of atoms on the parent compound.

- ***Method Blank*** is a laboratory control sample using reagents that are known to be free of contamination.

- ***Precision*** is the degree of agreement between the data generated from repetitive measurements under specific conditions.

- ***Quality Assurance*** is a system of activities whose purpose is to provide the producer or user of a product with the assurance that the product meets a defined standard of quality.

- ***Quality Control*** is the overall system of activities whose purpose is to control the quality of a product so that it meets the needs of the end user.

- ***RSD*** is the relative standard deviation.

- ***Blank Spike*** is a laboratory control sample that has been fortified with native analytes of interest.

- ***Window Defining Mixture*** is a solution containing only the earliest and latest eluting congeners within each homologous group of target analytes on a specified GC column.

- ***RPD*** or Relative Percent Difference. A measure used to compare duplicate sample analysis.

- ***EMPC/NDR –*** Peak detected does not meet ratio criteria and has resulted in a higher detection limit.

1.0 Project Narrative

Maxxam Analytics International
6740 Campobello Rd.
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www.maxxamanalytics.com

Maxxam Job: B780516 – Soil Analysis

Sample Analysis

Soil samples were initially pre-screened and estimated concentrations were obtained so that samples could be appropriately diluted for quantitative analysis on QC batch 4972291 (2017/05/13). Due to high concentrations, dilutions were required for selected analytes in the following samples:

EGH831	*BRLTN04-002-SO-010*	*Perfluorooctanesulfonate (PFOS)*
EGH850	*BRLTN-WS-001*	*Perfluorooctanesulfonate (PFOS), Perfluorooctane sulfonamide (PFOSA)*

Detection limits were adjusted accordingly.

A typographical error was made when this QC batch was submitted for instrumental analysis. Sample EGH831 (*BRLTN04-002-SO-010, 100x dilution*) was incorrected entered as EGH833 (100x dilution). The error was noted and a comment was added to the quantitation results table as well as the batch printout (worklist report). The result from this sample was correctly reported for sample EGH831.

Data was evaluated in accordance with acceptance criteria specified in DoD QSM 5.1.

Extracted Internal Standard Analytes

Isotopically labeled $^{13}C_2$-Perfluorotetradecanoic acid (MPFTeDA) is used as an internal standard to quantify native Perfluorotridecanoic acid (PFTrDA) & Perfluorotetradecanoic acid (PFTeDA). The recoveries observed for this extracted internal standard analyte were below the defined lower control limit (LCL) for the following samples:

EGH834 *BRLTN04-003-SO-011*
EGH836 *BRLTN04-004-SS-001*

When quantifying analytes using isotope dilution techniques, the extracted internal standard analytes differ from the native compounds only in the presence of the stable isotopes. The physical and chemical behavior of each extracted internal standard analyte is virtually identical to its unlabeled or "native" analog. Any loss (or apparent gain) of the native compound that may occur during any of the sample preparation, extraction, cleanup or determinative steps will be mirrored by a similar loss (or apparent gain) of the extracted internal standard analyte, and as such can be accounted for and corrected. Therefore, the quantification of these target compounds is not affected by the low (or high) recoveries, provided the instrument response for the native and labeled compounds is distinguishable from the instrument or background noise.

Quantitation of PFAS

Many PFAS (e.g. PFOS) have several isomeric forms that may show up as separate or partially-merged peaks in the analytical chromatograms. These peaks will be integrated and the areas summed such that the result represents the concentration of the sum of the linear and branched isomers, per USEPA (2009). Instrumentation is calibrated using certified quantitative standards containing only the linear isomer for all target analytes, except Perfluorooctane sulfonate (PFOS) and Perfluorohexane sulfonate (PFHxS), which are calibrated using certified branched and linear isomer mixtures. As additional certified reference materials containing branched and linear isomers become commercially available, they will be incorporated into the analytical method.

Sin Chii Chia, B.Sc.
schia@maxxam.ca
Office 905 817 5700

Maxxam Job: B780516 – Water Analysis

Sample Analysis

Water samples were initially pre-screened and estimated concentrations were obtained so that samples could be appropriately diluted for quantitative analysis on QC batch 4968581 (2017/05/09). The following sample required 5x dilution for Perfluorohexanesulfonate (PFHxS):

EGH843 *BRLTN04-001-GW-013*

Detection limit was adjusted accordingly for this analyte.

High concentrations of target analytes were detected in several samples during pre-screening. These samples were diluted prior to analysis, with selected analytes requiring further dilutions:

EGH845	*BRLTN01-MW-V1BP2-009*	*Perfluorooctanesulfonate (PFOS)*
EGH846	*BRLTN01-MW-BP3-012*	*Perfluorohexanesulfonate (PFHxS)*
EGH847	*BRLTN02-003-GW-032*	*Perfluorohexanesulfonate (PFHxS), Perfluorooctanesulfonate (PFOS)*
EGH848	*BRLTN02-002-GW-029*	*Perfluorooctanesulfonate (PFOS)*
EGH849	*BRLTN-WW-001*	*Perfluorooctanesulfonate (PFOS)*

Detection limits were adjusted accordingly for these samples.

Data was evaluated in accordance with acceptance criteria specified in DoD QSM 5.1.

Extracted Internal Standard Analytes

Isotopically labeled $^{13}C_2$-6:2 Fluorotelomersulfonate (M2-6:2FTS) and $^{13}C_2$-8:2 Fluorotelomersulfonate (M2-8:2FTS) are used as internal standards to quantify native 6:2 Fluorotelomersulfonate (6:2FTS) and 8:2 Fluorotelomersulfonate (8:2FTS) respectively. The recoveries observed for selected extracted internal standard analytes were above the defined upper control limit (UCL) for the following samples:

EGH843	*BRLTN04-001-GW-013*	*(M2-6:2FTS)*
EGH849	*BRLTN-WW-001*	*(M2-6:2FTS, M2-8:2FTS)*

When quantifying analytes using isotope dilution techniques, the extracted internal standard analytes differ from the native compounds only in the presence of the stable isotopes. The physical and chemical behavior of each extracted internal standard analyte is virtually identical to its unlabeled or "native" analog. Any loss (or apparent gain) of the native compound that may occur during any of the sample preparation, extraction, cleanup or determinative steps will be mirrored by a similar loss (or apparent gain) of the extracted internal standard analyte, and as such can be accounted for and corrected. Therefore, the quantification of these target compounds is not affected by the low (or high) recoveries, provided the instrument response for the native and labeled compounds is distinguishable from the instrument or background noise.

Quantitation of PFAS

Many PFAS (e.g. PFOS) have several isomeric forms that may show up as separate or partially-merged peaks in the analytical chromatograms. These peaks will be integrated and the areas summed such that the result represents the concentration of the sum of the linear and branched isomers, per USEPA (2009). Instrumentation is calibrated using certified quantitative standards containing only the linear isomer for all target analytes, except Perfluorooctane sulfonate (PFOS) and Perfluorohexane sulfonate (PFHxS), which are calibrated using certified branched and linear isomer mixtures. As additional certified reference materials containing branched and linear isomers become commercially available, they will be incorporated into the analytical method.

Sin Chii Chia, B.Sc.
schia@maxxam.ca
Office 905 817 5700

PROJECT NARRATIVE

Maxxam Analytics
Client Project #: M2032.0001 (SAVANNAH)

Client: Aerostar SES LLC
Client Project: M2032.0001 (SAVANNAH)

I. SAMPLE RECEIPT/ANALYSIS

a) Sample Listing

Maxxam ID	Client Sample ID	Date Sampled	Date Received	Date Prepped	Date Run	Initial Calibration
PFOS and PFOA in soil						
EGH830	BRLTN04-002-SS-001	2017/04/20	2017/04/22	2017/05/05	2017/05/13	2017/05/13
EGH831	BRLTN04-002-SO-010	2017/04/20	2017/04/22	2017/05/05	2017/05/13	2017/05/13
EGH833	BRLTN04-003-SS-001	2017/04/20	2017/04/22	2017/05/05	2017/05/13	2017/05/13
EGH834	BRLTN04-003-SO-011	2017/04/20	2017/04/22	2017/05/05	2017/05/13	2017/05/13
EGH836	BRLTN04-004-SS-001	2017/04/20	2017/04/22	2017/05/05	2017/05/13	2017/05/13
EGH838	BRLTN04-004-SO-013	2017/04/20	2017/04/22	2017/05/05	2017/05/13	2017/05/13
EGH841	BRLTN04-001-SS-001	2017/04/20	2017/04/22	2017/05/05	2017/05/13	2017/05/13
EGH842	BRLTN04-001-SO-009	2017/04/20	2017/04/22	2017/05/05	2017/05/13	2017/05/13
EGH844	BRLTN01-001-SO-008	2017/04/20	2017/04/22	2017/05/05	2017/05/13	2017/05/13
EGH850	BRLTN-WS-001	2017/04/21	2017/04/22	2017/05/05	2017/05/13	2017/05/13
PFOS and PFOA in water						
EGH832	BRLTN04-002-GW-018	2017/04/20	2017/04/22	2017/05/04	2017/05/09	2017/05/09
EGH835	BRLTN04-003-GW-018	2017/04/20	2017/04/22	2017/05/04	2017/05/09	2017/05/09
EGH837	BRLTN-RS-003	2017/04/20	2017/04/22	2017/05/04	2017/05/09	2017/05/09
EGH839	BRLTN04-004-GW-018	2017/04/20	2017/04/22	2017/05/04	2017/05/09	2017/05/09
EGH840	BRLTN04-004-GW-918	2017/04/20	2017/04/22	2017/05/04	2017/05/09	2017/05/09
EGH843	BRLTN04-001-GW-013	2017/04/20	2017/04/22	2017/05/04	2017/05/09	2017/05/09
EGH845	BRLTN01-MW-V1BP2-009	2017/04/20	2017/04/22	2017/05/04	2017/05/09	2017/05/09
EGH846	BRLTN01-MW-BP3-012	2017/04/20	2017/04/22	2017/05/04	2017/05/09	2017/05/09
EGH847	BRLTN02-003-GW-032	2017/04/21	2017/04/22	2017/05/04	2017/05/09	2017/05/09
EGH848	BRLTN02-002-GW-029	2017/04/21	2017/04/22	2017/05/04	2017/05/09	2017/05/09
EGH849	BRLTN-WW-001	2017/04/21	2017/04/22	2017/05/04	2017/05/09	2017/05/09

Run Date is defined as the date of injection of the last calibration standard (12 hours or less) prior to the samples analyzed within that run sequence. Therefore the time of calibration injection that defines the run date is always within 12 hours of the time of sample injection.

b) Shipping Problems: none encountered

c) Documentation Problems: none encountered

II. SAMPLE PREP:

No problems encountered

III. SAMPLE ANALYSIS:

See also comments within the appropriate Certificate of Analysis

a) Hold Times: all within recommended hold times

b) Instrument Calibration: all within control limits

c) Quality Control: All applicable QC meets control criteria, except where otherwise noted.

d) All analytes requiring manual intergration(s) are noted on the sample chromatograms

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for other than the conditions detailed above.

In addition, I certify, that to the best of my knowledge and belief, the data as reported are true and accurate. Release of the data contained in this data package has been authorized by the cognizant laboratory official or his/her designee, as verified by this signature.

Steph Fallon

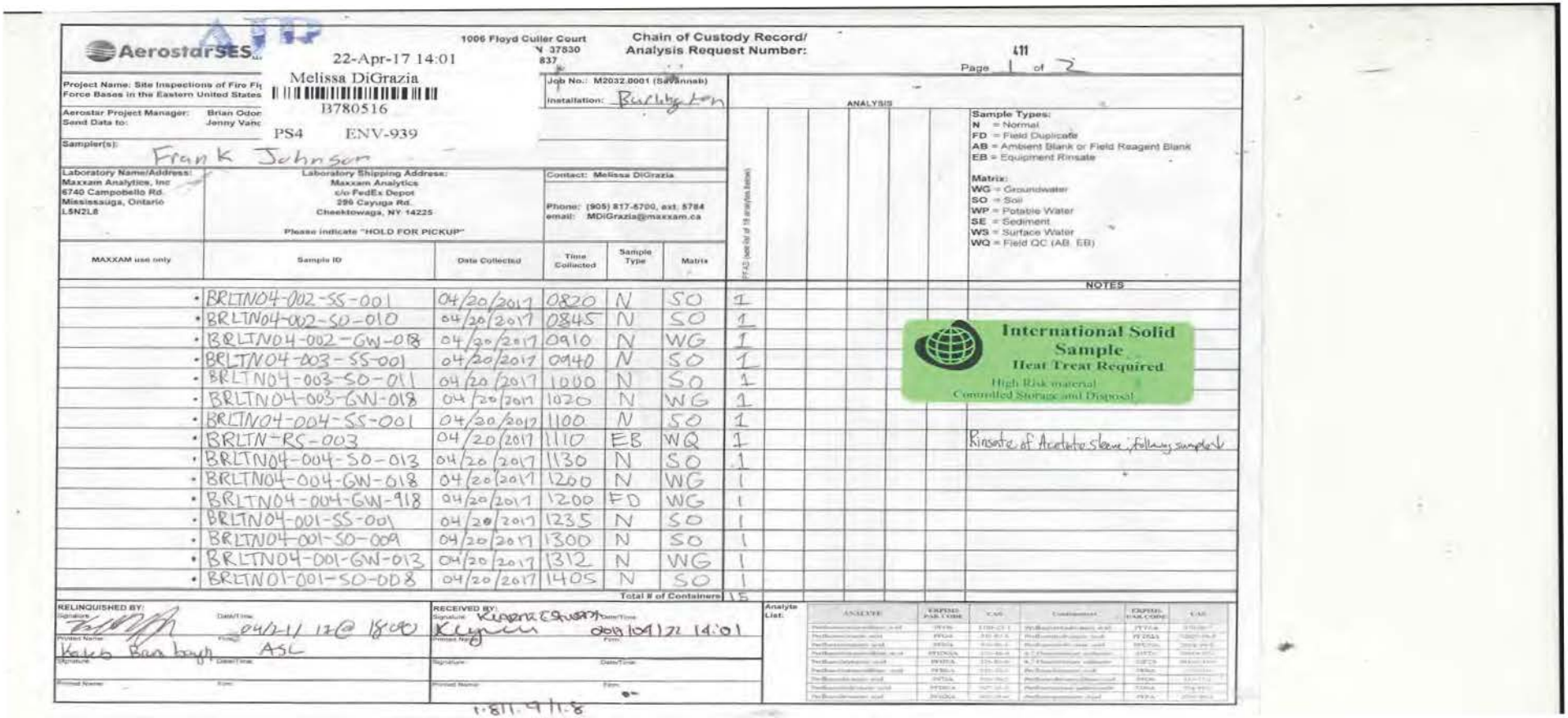
Project Manager- Site Assessment and Remediation/ Ultra Trace

2017/06/15

Date

2.1 Sample Custody

Maxxam Analytics International
6740 Campobello Rd
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com



AerostarSES

1006 Floyd Culler Court
N 37830
837

Chain of Custody Record/
Analysis Request Number:

411

Page 1 of 2

22-Apr-17 14:01

Melissa DiGrazia

B780516

PS4 ENV-939

Project Name: Site Inspections of Fire Fi
Force Bases in the Eastern United States

Aerostar Project Manager: Brian Odor
Send Data to: Jenny Vanc

Job No.: M2032.0001 (Savannah)
Installation: Burlington

Sampler(s): Frank Johnson

Laboratory Name/Address:
Maxxam Analytics, Inc
6740 Campobello Rd.
Mississauga, Ontario
L5N2L8

Laboratory Shipping Address:
Maxxam Analytics
c/o FedEx Depot
396 Cayuga Rd.
Cheektowaga, NY 14225
Please indicate "HOLD FOR PICKUP"

Contact: Melissa DiGrazia
Phone: (905) 817-5700, ext. 5784
email: MDiGrazia@maxxam.ca

ANALYSIS

Sample Types:
N = Normal
FD = Field Duplicate
AB = Ambient Blank or Field Reagent Blank
EB = Equipment Rinsate

Matrix:
WG = Groundwater
SO = Soil
WP = Potable Water
SE = Sediment
WS = Surface Water
WQ = Field QC (AB, EB)

MAXXAM use only	Sample ID	Date Collected	Time Collected	Sample Type	Matrix	PFAS (see list of 18 analytes below)	NOTES
	BRLTN04-002-SS-001	04/20/2017	0820	N	SO	1	
	BRLTN04-002-SO-010	04/20/2017	0845	N	SO	1	
	BRLTN04-002-GW-018	04/20/2017	0910	N	WG	1	
	BRLTN04-003-SS-001	04/20/2017	0940	N	SO	1	
	BRLTN04-003-SO-011	04/20/2017	1000	N	SO	1	
	BRLTN04-003-GW-018	04/20/2017	1020	N	WG	1	
	BRLTN04-004-SS-001	04/20/2017	1100	N	SO	1	
	BRLTN-RS-003	04/20/2017	1110	EB	WQ	1	Rinsate of Acetate sleeve following sample
	BRLTN04-004-SO-013	04/20/2017	1130	N	SO	1	
	BRLTN04-004-GW-018	04/20/2017	1200	N	WG	1	
	BRLTN04-004-GW-918	04/20/2017	1200	FD	WG	1	
	BRLTN04-001-SS-001	04/20/2017	1235	N	SO	1	
	BRLTN04-001-SO-009	04/20/2017	1300	N	SO	1	
	BRLTN04-001-GW-013	04/20/2017	1312	N	WG	1	
	BRLTN01-001-SO-008	04/20/2017	1405	N	SO	1	

Total # of Containers: 15

International Solid Sample
Heat Treat Required
High Risk material
Controlled Storage and Disposal

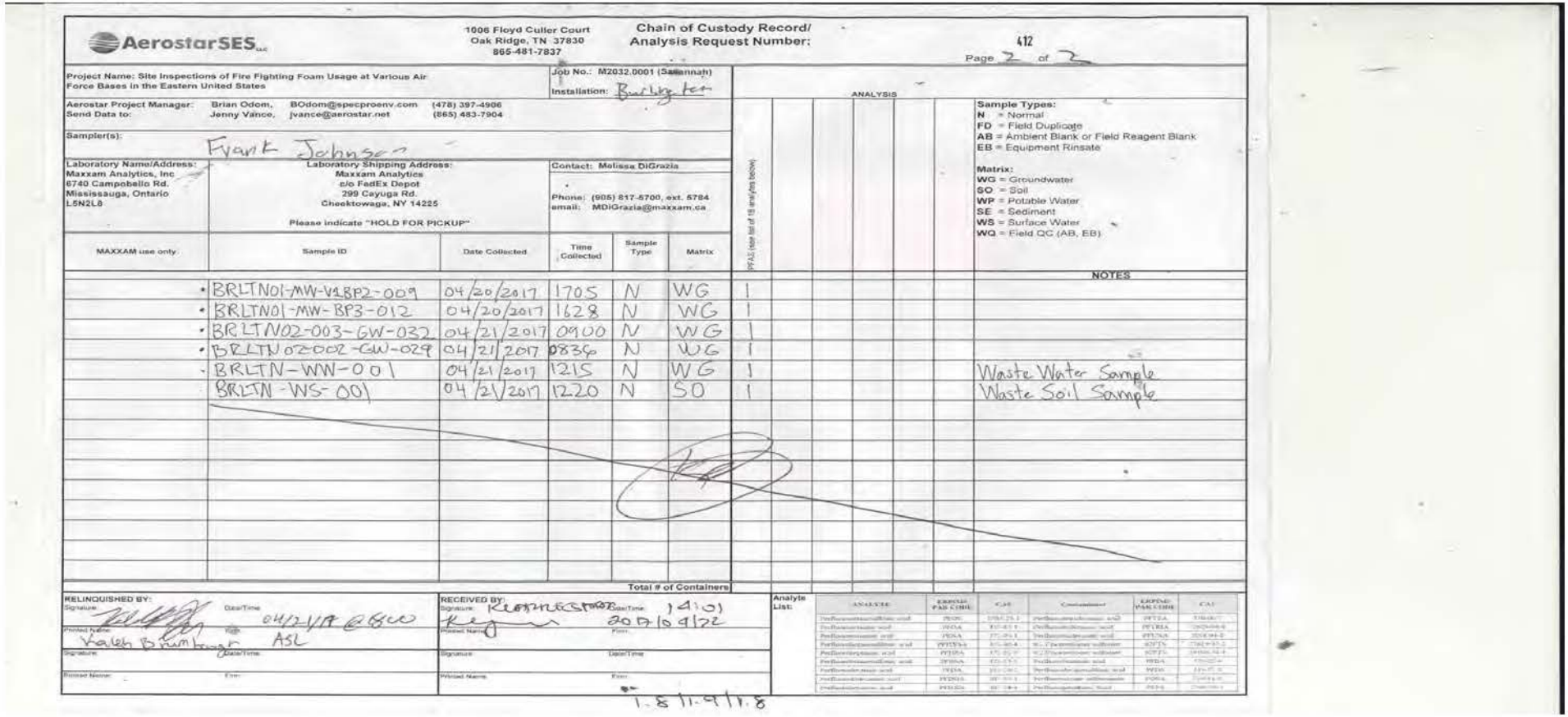
RELINQUISHED BY:
Signature: Date/Time: 04/21/17 @ 1800
Printed Name: Kate Boatwright Firm: ASL
Signature: Date/Time:
Printed Name: Firm:

RECEIVED BY:
Signature: Date/Time: 04/21/17 14:01
Printed Name: Firm:
Signature: Date/Time:
Printed Name: Firm:

1-811-911-8

Analyte List:

ANALYTE	EXPRESS PAR CODE	CAS	Confirmation	EXPRESS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorooctanesulfonic acid	PFOA	335-67-1
Perfluorooctanoic acid	PFOA	335-67-1	Perfluorooctanoic acid	PFDA	335-76-2
Perfluorononanoic acid	PFNA	375-95-1	Perfluorononanoic acid	PFDA	335-76-2
Perfluorodecanoic acid	PFDA	335-76-2			
Perfluoroundecanoic acid	PFUNDA	2058-94-8	6:2 Fluorotelomer sulfonate	6:2FTS	27619-97-2
Perfluorododecanoic acid	PFDODA	307-55-1	8:2 Fluorotelomer sulfonate	8:2FTS	39108-34-4
Perfluorotridecanoic acid	PFTRDA	72629-94-8			
Perfluorotetradecanoic acid	PFTEA	376-06-7	Perfluorooctanesulfonamide	FOSA	754-91-6
Perfluorobutanesulfonic acid	PFBS	375-73-5	Perfluorohexanesulfonic acid	PFHxS	355-46-4
Perfluorohexanoic acid	PFHxA	307-24-4	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
Perfluoroheptanoic acid	PFHpA	375-85-9			



AerostarSES LLC

1006 Floyd Culler Court
Oak Ridge, TN 37830
865-481-7837

Chain of Custody Record/ Analysis Request Number: 412

Page 2 of 2

Project Name: Site Inspections of Fire Fighting Foam Usage at Various Air Force Bases in the Eastern United States

Job No.: M2032.0001 (Savannah)

Installation: Burlington

Aerostar Project Manager: Brian Odom, BOdom@specproenv.com (478) 397-4906
Send Data to: Jenny Vance, jvance@aerostar.net (865) 483-7904

Sampler(s): Frank Johnson

Laboratory Name/Address:
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Please indicate "HOLD FOR PICKUP"

Contact: Melissa DiGrazia
Phone: (905) 817-5700, ext. 5784
email: MDiGrazia@maxxam.ca

ANALYSIS

PFAS (see list of 18 analytes below)

Sample Types:
N = Normal
FD = Field Duplicate
AB = Ambient Blank or Field Reagent Blank
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Matrix:
WG = Groundwater
SO = Soil
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SE = Sediment
WS = Surface Water
WQ = Field QC (AB, EB)

MAXXAM use only	Sample ID	Date Collected	Time Collected	Sample Type	Matrix	PFAS	NOTES
*	BRLTN01-MW-V2BP2-009	04/20/2017	1705	N	WG	1	
*	BRLTN01-MW-BP3-012	04/20/2017	1628	N	WG	1	
*	BRLTN02-003-GW-032	04/21/2017	0900	N	WG	1	
*	BRLTN02002-GW-029	04/21/2017	0836	N	WG	1	
*	BRLTN-WW-001	04/21/2017	1215	N	WG	1	Waste Water Sample
	BRLTN-WS-001	04/21/2017	1220	N	SO	1	Waste Soil Sample

Total # of Containers

RELINQUISHED BY:
Signature: Date/Time: 04/21/17 @ 1800
Printed Name: Valeh Brumbaugh Title: ASL

RECEIVED BY:
Signature: Date/Time: 1401
Printed Name: From:

Signature: Date/Time:
Printed Name: From:

1.8 11.9 11.8

Analyte List:

ANALYTE	EXPOSURE PAR CHEM	CAS	Contaminant	EXPOSURE PAR CHEM	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorooctanesulfonic acid	PFOSA	1763-23-1
Perfluorooctanoic acid	PFOA	335-67-1	Perfluorooctanoic acid	PFOSA	335-67-1
Perfluorooctanoate	PFOA	45285-51-6	Perfluorooctanoate	PFOSA	45285-51-6
Perfluorooctanesulfonic acid	PFOSA	754-91-6	N-Ethylperfluorooctanesulfonamidoacetic acid	EtFOSAA	2991-50-6
Perfluorohexanoic acid	PFHXA	307-24-4	N-Methylperfluorooctanesulfonamidoacetic acid	MeFOSAA	2355-31-9
Perfluorononanoic acid	PFNA	375-95-1	Perfluorononanoic acid	PFNA	375-95-1
Perfluorohexanesulfonic acid	PFHXSA	355-46-4	Perfluorohexanesulfonic acid	PFHXSA	355-46-4
Perfluorobutanesulfonic acid	PFBSA	375-73-5	Perfluorobutanesulfonic acid	PFBSA	375-73-5
Perfluorodecanoic acid	PFDA	335-76-2	Perfluorodecanoic acid	PFDA	335-76-2
Perfluoroundecanoic acid	PFUNDA	2058-94-8	Perfluoroundecanoic acid	PFUNDA	2058-94-8
Perfluorododecanoic acid	PFDODA	307-55-1	Perfluorododecanoic acid	PFDODA	307-55-1
Perfluorotridecanoic acid	PFTRDA	72629-94-8	Perfluorotridecanoic acid	PFTRDA	72629-94-8
Perfluorotetradecanoic acid	PFTEDA	376-06-7	Perfluorotetradecanoic acid	PFTEDA	376-06-7

DATA VALIDATION REPORT

M2032.0001 (Savannah) Burlington

SAMPLE DELIVERY GROUP: B780315, B780516

Prepared for

Aerostar SES LLC

July 6, 2017

MEC^X, Inc.
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TABLES

ACRONYMS AND ABBREVIATIONS

°C	Celsius
%	Percent
%D	percent difference
B	blank contamination
CB	calibration blank
CCAL	continuing calibration
CCB	continuing calibration blank
CCV	continuing calibration verification
COC	chain of custody
CLP	Contract Laboratory Program
EPA	US Environmental Protection Agency
ER	equipment rinsate
FB	field blank
FD	field duplicate
ICAL	initial calibration
ICB	initial calibration blank
ICL	instrument calibration limit
ICV	initial calibration verification
IS	internal standard
J	estimated value
LCS	laboratory control sample
LOD	limit of detection
LOQ	limit of quantification
MB	method blank
MDL	method detection limit
MS	matrix spike
MSD	matrix spike duplicate
ND	nondetect
PARCC	precision, accuracy, representativeness, comparability, completeness
PFC	perfluorinated compound
QAPP	Quality Assurance Program Plan
QC	quality control
QSM	Quality Systems Manual
R	Rejected
RL	reporting limit
RPD	relative percent difference
RRF	relative response factor
RSD	relative standard deviation
SDG	sample delivery group
TB	trip blank
U	not detected
UJ	not detected; associated value is an estimate

I. INTRODUCTION

Task Order Title: M2032.0001 (Savannah) Burlington

Contract: W9128F-15-D-0051

MEC^X Project No.: 1529.001H.01

Sample Delivery Groups: B780315, B780516

Project Manager: Jenny Vance

Matrix: Soil/Water

QC Level: Stage 2B, Stage 4

No. of Samples: 66

Laboratory: Maxxam

TABLE 1 - SAMPLE IDENTIFICATION

Sample Name	Lab Sample Name	Matrix	Collection	Method	Validation Level
BRLTN01-001-SO-008	EGH844	SO	2017-04-20 14:05	E537M	Stage 2B
BRLTN01-MW-BP3-012	EGH846	WG	2017-04-20 16:28	E537M	Stage 4
BRLTN01-MW-V1BP2-009	EGH845	WG	2017-04-20 17:05	E537M	Stage 2B
BRLTN02-002-GW-029	EGH848	WG	2017-04-21 08:36	E537M	Stage 2B
BRLTN02-003-GW-032	EGH847	WG	2017-04-21 09:00	E537M	Stage 2B
BRLTN04-001-GW-013	EGH843	WG	2017-04-20 13:12	E537M	Stage 2B
BRLTN04-001-SO-009	EGH842	SO	2017-04-20 13:00	E537M	Stage 2B
BRLTN04-001-SS-001	EGH841	SO	2017-04-20 12:35	E537M	Stage 2B
BRLTN04-002-GW-018	EGH832	WG	2017-04-20 09:10	E537M	Stage 2B
BRLTN04-002-SO-010	EGH831	SO	2017-04-20 08:45	E537M	Stage 2B
BRLTN04-002-SS-001	EGH830	SO	2017-04-20 08:20	E537M	Stage 2B
BRLTN04-003-GW-018	EGH835	WG	2017-04-20 10:20	E537M	Stage 2B
BRLTN04-003-SO-011	EGH834	SO	2017-04-20 10:00	E537M	Stage 2B
BRLTN04-003-SS-001	EGH833	SO	2017-04-20 09:40	E537M	Stage 2B
BRLTN04-004-GW-018	EGH839	WG	2017-04-20 12:00	E537M	Stage 2B
BRLTN04-004-GW-918	EGH840	WG	2017-04-20 12:00	E537M	Stage 2B
BRLTN04-004-SO-013	EGH838	SO	2017-04-20 11:30	E537M	Stage 2B
BRLTN04-004-SS-001	EGH836	SO	2017-04-20 11:00	E537M	Stage 4

Sample Name	Lab Sample Name	Matrix	Collection	Method	Validation Level
BRLTN-RS-003	EGH837	WQ	2017-04-20 11:10	E537M	Stage 2B
BRLTN-WS-001	EGH850	SO	2017-04-21 12:20	E537M	Stage 2B
BRLTN-WW-001	EGH849	WG	2017-04-21 12:15	E537M	Stage 2B
BRLTN01-001-GW-013	EGG618	WG	2017-04-20 14:25	E537M	Stage 2B
BRLTN01-002-GW-015	EGG586	WG	2017-04-19 08:50	E537M	Stage 4
BRLTN01-002-SO-007	EGG602	SO	2017-04-19 08:40	E537M	Stage 2B
BRLTN01-002-SO-907	EGG603	SO	2017-04-19 08:40	E537M	Stage 4
BRLTN01-003-SD-001	EGG575	SE	2017-04-18 13:10	E537M	Stage 4
BRLTN01-003-SD-901	EGG576	SE	2017-04-18 13:10	E537M	Stage 2B
BRLTN01-003-SW-001	EGG577	WS	2017-04-18 13:10	E537M	Stage 2B
BRLTN01-003-SW-901	EGG578	WS	2017-04-18 13:10	E537M	Stage 2B
BRLTN01-MW102-011	EGG583	WG	2017-04-18 16:45	E537M	Stage 2B
BRLTN01-MW103-009	EGG584	WG	2017-04-18 17:52	E537M	Stage 2B
BRLTN01-MW103-909	EGG585	WG	2017-04-18 17:52	E537M	Stage 2B
BRLTN01-TRENCHSUMP-001	EGG587	WG	2017-04-19 11:30	E537M	Stage 4
BRLTN01-V1MW14L-008	EGG588	WG	2017-04-19 13:21	E537M	Stage 2B
BRLTN02-001-GW-027	EGG617	WG	2017-04-20 14:35	E537M	Stage 2B
BRLTN02-001-SO-020	EGG596	SO	2017-04-18 14:05	E537M	Stage 2B
BRLTN02-001-SS-001	EGG594	SO	2017-04-18 12:55	E537M	Stage 2B
BRLTN02-001-SS-901	EGG595	SO	2017-04-18 12:55	E537M	Stage 4
BRLTN02-002-SO-020	EGG599	SO	2017-04-18 15:30	E537M	Stage 2B
BRLTN02-002-SS-001	EGG597	SO	2017-04-18 14:45	E537M	Stage 2B
BRLTN02-003-SO-025	EGG600	SO	2017-04-18 17:05	E537M	Stage 2B
BRLTN02-003-SS-001	EGG598	SO	2017-04-18 16:00	E537M	Stage 2B
BRLTN02-004-SD-001	EGG581	SE	2017-04-18 15:00	E537M	Stage 2B
BRLTN02-004-SW-001	EGG582	WS	2017-04-18 14:54	E537M	Stage 2B
BRLTN03-001-GW-022	EGG616	WG	2017-04-20 13:03	E537M	Stage 2B
BRLTN03-001-SO-014	EGG593	SO	2017-04-18 11:20	E537M	Stage 2B
BRLTN03-001-SS-001	EGG592	SO	2017-04-18 10:37	E537M	Stage 2B

Sample Name	Lab Sample Name	Matrix	Collection	Method	Validation Level
BRLTN03-002-GW-022	EGG615	WG	2017-04-20 12:13	E537M	Stage 2B
BRLTN03-002-SO-015	EGG590	SO	2017-04-18 09:45	E537M	Stage 2B
BRLTN03-002-SS-001	EGG589	SO	2017-04-18 08:52	E537M	Stage 2B
BRLTN03-003-SD-001	EGG579	SE	2017-04-18 13:56	E537M	Stage 2B
BRLTN03-003-SW-001	EGG580	WS	2017-04-18 13:56	E537M	Stage 2B
BRLTN05-001-GW-017	EGG607	WG	2017-04-19 11:15	E537M	Stage 2B
BRLTN05-001-SO-014	EGG606	SO	2017-04-19 11:00	E537M	Stage 2B
BRLTN05-001-SS-001	EGG604	SO	2017-04-19 10:25	E537M	Stage 2B
BRLTN05-001-SS-901	EGG605	SO	2017-04-19 10:25	E537M	Stage 2B
BRLTN05-002-GW-033	EGG613	WG	2017-04-19 16:55	E537M	Stage 2B
BRLTN05-002-GW-933	EGG614	WG	2017-04-19 16:55	E537M	Stage 2B
BRLTN05-002-SO-028	EGG611	SO	2017-04-19 16:25	E537M	Stage 2B
BRLTN05-002-SO-928	EGG612	SO	2017-04-19 16:25	E537M	Stage 2B
BRLTN05-002-SS-001	EGG610	SO	2017-04-19 15:00	E537M	Stage 2B
BRLTN05-003-SO-032	EGG609	SO	2017-04-19 14:17	E537M	Stage 2B
BRLTN05-003-SS-001	EGG608	SO	2017-04-19 11:45	E537M	Stage 2B
BRLTN-RS-001	EGG574	WQ	2017-04-18 12:50	E537M	Stage 2B
BRLTN-RS-002	EGG601	WQ	2017-04-19 07:30	E537M	Stage 2B
BRLTN-SB-001	EGG591	WQ	2017-04-18 09:19	E537M	Stage 2B

II. SAMPLE MANAGEMENT

According to the case narrative and the chains-of-custody (COCs) provided by the laboratory for sample delivery groups (SDGs) B780315, B780516:

- Cooler temperatures listed on the COCs were within the temperature limits of <6°C and >0°C.
- Field and laboratory personnel signed and dated the COCs.

TABLE 2 - DATA QUALIFIER REFERENCE

Qualifier	Definition
R	The sample results are rejected because of serious deficiencies in the ability to analyze the sample and to meet quality control (QC) criteria. The presence or absence of the analyte cannot be verified.
U	The analyte was analyzed for but was nondetect (ND) above the reported sample quantification limit.
B	The reported concentration is less than 5 times the concentration reported in an associated field or lab blank.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. J- denotes a low bias for the sample results and J+ for a high bias.
UJ	The material was analyzed for but was ND. The associated value is an estimate and may be inaccurate or imprecise.

TABLE 3 - REASON CODE REFERENCE

Reason Code	Definition
01	Sample received outside of 4+/-2 degrees Celsius (°C)
01A	Improper sample preservation
02	Holding time exceeded
02A	Extraction
02B	Analysis
03	Instrument performance – outside criteria
03A*	Bromofluorobenzene (BFB)
03B*	Decafluorotriphenylphosphine (DFTPP)
03C*	dichlorodiphenyltrichloroethane (DDT) and/or endrin % breakdown exceeds criteria
03D	Retention time windows
03E	Resolution
04	ICAL results outside specified criteria
04A	Compound mean RRF QC criteria not met
04B	Individual % RSD criteria not met
04C	$r < 0.995$ or $r^2 < 0.99$
04D	ICAL % Recovery
05	Continuing calibration results outside specified criteria

Reason Code	Definition
05A	Compound mean RRF QC criteria not met
05B	Compound % Difference QC criteria not met
06	Result qualified as a result of the 5x/10x blank correction
06A	Method or preparation blank
06B	ICB or CCB
06C	ER
06D	TB
06E	FB
07	Surrogate recoveries outside control limits
07A	Sample
07B	Associated MB or LCS
08	MS/MSD/Duplicate results outside criteria
08A	MS and/or MSD recovery not within control limits (accuracy)
08B	% RPD outside acceptance criteria (precision)
09*	Post digestion spike outside criteria graphite furnace atomic absorption (GFAA)
10	Internal standards outside specified control limits
10A	Recovery
10B	Retention time
11	LCS recoveries outside specified limits
11A	Recovery
11B	% RPD (if run in duplicate)
12*	Interference check standard
13*	Serial dilution
14*	Tentatively identified compounds
15	Quantification
16	Multiple results available; alternate analysis preferred
17	Field duplicate RPD criteria is exceeded
18*	Percent difference between original and second column exceeds QC criteria
19	Professional judgment was used to qualify the data
20*	Pesticide clean-up checks
21	Target compound identification

Reason Code	Definition
22*	Radiological calibration
23*	Radiological quantification
24	Reported result and/or lab qualifier revised to reflect validation findings

III. METHOD ANALYSIS – PERFLUORINATED COMPOUNDS BY MODIFIED EPA METHOD 537

L. Calvin of MEC[X] reviewed these SDGs July 6 to July 10, 2017

III.1. HOLDING TIMES

SDGs B780315, B780516

The holding times specified in the QAPP were met. Samples were extracted within 28 days of collection and analyzed within 45 days of extraction.

III.2. CALIBRATION

Calibration criteria were met, with exceptions noted in the tables below.

III.2.1. *INITIAL CALIBRATION*

SDGs B780315, B780516

Initial calibration criteria were met. Recoveries were within 70-130% for the lowest level of each initial calibration and 75-125% for the remaining levels, and all correlation coefficient r^2 values were within the control limit of ≥0.990. The calculated peak asymmetry factors were within the control range of 0.8-1.5. MEC[X] noted the laboratory utilized as the calibration method a weighted (1/X) linear initial calibration standard curve not forced through zero.

III.2.2. *CONTINUING CALIBRATION*

SDGs B780315, B780516

The initial calibration verification (ICV) and continuing calibration verification (CCV) recoveries were within the control limits of 75-125%. Low-level check standard (ICS) recoveries were within the control limits of 70-130%.

III.3. QUALITY CONTROL SAMPLES

III.3.1. *METHOD BLANKS*

The method blanks associated with the analyses of the soil and water samples had no target analyte detects above the respective soil and water detection limits (DLs), with exceptions noted in the table below. The method blank detects were not sufficient to qualify most results above the LOQ. Remaining detects were qualified as nondetects (U) at the LOD if detected below the LOD, or at the level of contamination if detected above.

Table 4-Method Blank Detects

SDG B780315

Method Blank Batch	Detect	Concentration	Affected Samples
4963931	6:2-FTS	0.014 µg/L	BRLTN05-001-GW-017
4966650	6:2-FTS	0.27 µg/Kg	BRLTN01-003-SD-001 BRLTN01-003-SD-901 BRLTN03-003-SD-001 BRLTN02-004-SD-001 BRLTN03-002-SS-001

Method Blank Batch	Detect	Concentration	Affected Samples
			BRLTN03-002-SO-015 BRLTN03-001-SS-001 BRLTN03-001-SO-014 BRLTN02-002-SS-001 BRLTN02-003-SS-001 BRLTN02-002-SO-020 BRLTN05-001-SS-001 BRLTN05-001-SS-901 BRLTN05-001-SO-014 BRLTN05-003-SS-001 BRLTN05-003-SO-032
4966650	PFDA	0.27 µg/Kg	ND in associated samples
4966672	PFTeDA	0.19 µg/Kg	BRLTN01-002-SO-007 BRLTN05-002-SS-001 BRLTN05-002-SO-028 BRLTN05-002-SO-928

III.3.2. *LABORATORY CONTROL SAMPLES*

SDGs B780315, B780516

Recoveries affecting sample data were within the control limits of 70-130%, and RPDs for LCS/LCSD pairs were within the control limit of ≤30%.

III.3.3. *SURROGATE RECOVERY*

Surrogate recoveries were not evaluated in samples analyzed at dilutions of 10× or greater, as the surrogates were considered diluted out. Individual analytes reported from those dilutions were not qualified. Surrogate standard recoveries were within the QAPP control limits of 80-140% for soils and 70-130% for waters, with exceptions listed in the tables below. Results associated with the recovery outliers were qualified as estimated (J or UJ) in the affected site samples.

Table 5-Surrogate Recoveries

SDG B780315

Surrogate	Sample	Recovery	Affected Target Analytes
13C4-perfluorooctanesulfonate	BRLTN01-V1MW14L-008	69	All sulfonate analytes
	BRLTN02-001-SS-001	79	
	BRLTN02-003-SS-001	70	
	BRLTN02-003-SO-025	70	
	BRLTN05-001-SS-001	71	
	BRLTN05-001-SS-901	63	
	BRLTN05-001-SO-014	73	
	BRLTN05-001-GW-017	64	

Surrogate	Sample	Recovery	Affected Target Analytes
	BRLTN05-003-SS-001	60	
	BRLTN05-003-SO-032	64	
	BRLTN05-002-SO-028	57	
	BRLTN05-002-SO-928	59	
	BRLTN05-002-GW-933	66	
	BRLTN02-001-GW-027	68	
13C4-perfluorooctanoic acid	BRLTN03-002-SO-015	75	All acid analytes
	BRLTN03-001-SS-001	76	
	BRLTN02-003-SS-001	71	
	BRLTN02-002-SO-020	71	
	BRLTN02-003-SO-025	73	
	BRLTN05-001-SS-901	66	
	BRLTN05-001-SO-014	76	
	BRLTN05-001-GW-017	65	
	BRLTN05-003-SS-001	71	
	BRLTN05-003-SO-032	63	
	BRLTN05-002-SO-028	60	
	BRLTN05-002-SO-928	66	
	BRLTN05-002-GW-933	66	
13C8-perfluorooctanesulfonamide	BRLTN01-V1MW14L-008	66	PFOSA
	BRLTN03-002-SS-001	71	
	BRLTN03-002-SO-015	60	
	BRLTN03-001-SS-001	62	
	BRLTN03-001-SO-014	69	
	BRLTN02-001-SS-001	70	
	BRLTN02-001-SO-020	72	
	BRLTN02-002-SS-001	62	
	BRLTN02-003-SS-001	52	
	BRLTN02-002-SO-020	60	
	BRLTN02-003-SO-025	58	
	BRLTN05-001-SS-001	67	
	BRLTN05-001-SS-901	58	
	BRLTN05-001-SO-014	53	
	BRLTN05-001-GW-017	54	
	BRLTN05-003-SS-001	57	
	BRLTN05-003-SO-032	51	
	BRLTN05-002-SS-001	69	
	BRLTN05-002-SO-028	47	
	BRLTN05-002-SO-928	47	

Surrogate	Sample	Recovery	Affected Target Analytes
	BRLTN05-002-GW-933	67	
	BRLTN03-002-GW-022	58	

SDG B780516

Surrogate	Sample	Recovery	Affected Target Analytes
13C4-perfluorooctanesulfonate	BRLTN04-002-SS-001	62%	All sulfonate analytes
	BRLTN04-003-SO-011	54%	
	BRLTN04-004-SS-001	72%	
	BRLTN04-004-SO-013	62%	
	BRLTN04-001-SS-001	60%	
	BRLTN04-001-SO-009	57%	
	BRLTN01-001-SO-008	73%	
13C4-perfluorooctanoic acid	BRLTN04-002-SS-001	71%	All acid analytes
	BRLTN04-002-SO-010	74%	
	BRLTN04-003-SO-011	63%	
	BRLTN04-004-SS-001	75%	
	BRLTN04-004-SO-013	68%	
	BRLTN04-001-SS-001	76%	
	BRLTN04-001-SO-009	65%	
	BRLTN01-001-SO-008	77%	
	BRLTN-WS-001	65%	
13C8-perfluorooctanesulfonamide	BRLTN04-002-SS-001	74%	PFOSA
	BRLTN04-003-SS-001	67%	
	BRLTN04-003-SO-011	60%	
	BRLTN04-004-SS-001	73%	
	BRLTN04-004-SO-013	66	
	BRLTN04-001-SS-001	73	
	BRLTN04-001-SO-009	61	
	BRLTN01-001-SO-008	72	

III.3.4. *MATRIX SPIKE/MATRIX SPIKE DUPLICATE*

MS/MSD analyses were performed on the samples listed below. Recoveries were not evaluated for target analytes present in the parent sample at concentrations >4× the spike amount, or in parent samples requiring dilutions of 10× or greater. Qualifications were not assigned for a single recovery outlier not occurring in both the MS and MSD of a pair, or for parent sample nondetects associated with high recoveries. Nondetects in the parent sample were not qualified for RPD outliers. With exceptions noted below, recoveries and RPDs affecting sample data were within the control limits of 70-130% and ≤30%, respectively.

SDG B780315

MS/MSD analyses were performed on samples BRLTN05-002-GW-033, BRLTN01-003-SD-001, BRLTN02-001-SS-001, and BRLTN01-002-SO-007 for all analytes, and on sample BRLTN02-001-SS-001 for PFOS only. The RPD exceeded the control limit for PFOS in the MS/MSD of sample BRLTN02-001-SS-001 at 42%. The parent sample detect for PFOS was qualified as estimated (J). Evaluated recoveries and remaining RPDs were within the control limits.

Samples BRLTN01-003-SW-001 and BRLTN01-MW103-009 were designated on the COC for MS/MSD analyses; however, due to high concentrations of several target analytes in the native samples, the laboratory performed laboratory duplicate analyses instead. The laboratory duplicate analyses were not evaluated by the reviewer, as most RPDs were not calculated by the laboratory, and footnotes attributed RPD outliers to varying dilutions required.

SDG B780516

MS/MSD analyses were not performed on a sample in this SDG. MEC^X evaluated method accuracy and precision based on the LCS/LCSD results.

III.4. FIELD QC SAMPLES

MEC^X evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC^X used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below.

III.4.1. *FIELD BLANKS AND EQUIPMENT BLANKS*

The field and equipment blanks and detects, if any, are listed in the tables below. The detected concentrations were not considered sufficient to qualify site sample results.

Table 6-FB/EB Detects

SDG B780315

Field or Equipment Blank	Detects	Concentration
BRLTN-SB-001	none	N/A
BRLTN-RS-001	none	N/A
BRLTN-RS-002	none	N/A

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Field or Equipment Blank	Detects	Concentration
BRLTN-RS-003	none	N/A

III.4.2. *FIELD DUPLICATES*

Field duplicate pairs are listed below. RPDs for common detects above the LOQ were within the control limit of ≤30%, and detects below the LOQ in one or both samples of a pair were within the reasonable control limit of ±LOQ, with exceptions noted in the tables below. Target analyte results for the outlier RPDs were qualified as estimated (J) in both samples of a pair.

Table 7-FD RPDs

SDG B780315

Seven field duplicate pairs were identified in this SDG, as noted in the table below.

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
BRLTN01-003-SD-001	BRLTN01-003-SD-901	N/A	none
BRLTN01-003-SW-001	BRLTN01-003-SW-901	N/A	none
BRLTN01-MW103-009	BRLTN01-MW103-909	N/A	none
BRLTN02-001-SS-001	BRLTN02-001-SS-901	PFHxS	51%
BRLTN01-002-SO-007	BRLTN01-002-SO-907	PFHxS PFOS	51% 68%
BRLTN05-001-SS-001	BRLTN05-001-SS-901	N/A	none
BRLTN05-002-SO-028	BRLTN05-002-SO-928	N/A	none

SDG B780516

One field duplicate pair was identified in this SDG, as noted in the table below.

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
BRLTN04-004-GW-018	BRLTN04-004-GW-918	N/A	none

III.5. INTERNAL STANDARDS PERFORMANCE

The applicable labeled internal standard recoveries were within the control limits of ±50% of the average peak areas of the initial calibration, except as noted in the tables below. Results for the associated target compounds were qualified as estimated (UJ or J) in the affected samples.

Table 8-Internal Standards Percent Recovery

SDG B780315

Internal Standard	% Recovery	Affected Samples	Associated Target Analyte(s)
MPFDoA	49%	BRLTN05-001-GW-017	PFDoA
MPFTeDA	48% 21%	BRLTN05-001-SS-901 BRLTN05-001-GW-017	PFTeDA and PFTrDA
MPFUnA	41%	BRLTN05-002-SS-001	PFUnA
MPFOSA	47% 47% 47%	BRLTN05-003-SO-032 BRLTN05-002-SO-028 BRLTN05-002-SO-928	PFOSA

SDG B780516

Internal Standard	% Recovery	Affected Samples	Associated Target Analyte(s)
MPFTeDA	45% 46%	BRLTN04-003-SO-011 BRLTN04-004-SS-001	PFTeDA and PFTrDA
M2-6:2-FTS	152% 209%	BRLTN04-001-GW-013 BRLTN-WW-001	6:2-FTS
M2-8:2-FTS	138% 174%	BRLTN04-001-GW-013 BRLTN-WW-001	8:2-FTS

III.6. COMPOUND IDENTIFICATION

SDGs B780315, B780516

Compound identification was verified for the following samples: soil samples BRLTN01-003-SD-001, BRLTN02-001-SS-901, BRLTN01-002-SO-907 (SDG B780315), and BRLTN04-004-SS-001 (SDG 780516), and water samples BRLTN01-002-GW-015, BRLTN01-TRENCHSUMP-001 (SDG B780315), and BRLTN01-MW-BP3-012 (SDG 780516). The laboratory analyzed for 18 perfluorinated compounds by modified EPA Method 537. Review of retention times and the ion chromatograms indicated no issues with compound identification.

III.7. COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Calculations were verified and sample results reported on the sample result summaries were verified against the raw data for the samples listed above (see Compound Identification section). Quantitation verification was limited based upon the significant figures presented in the raw data and were therefore estimations of the actual sample amounts. The reviewer considered the concentration verified within that limitation. The laboratory calculated and reported compound-specific detection limits. Detects below the LOQ were qualified as estimated (J). Nondetects are valid to the LOD.

Most samples were initially analyzed undiluted. Eleven of 25 soil samples and 13 of 16 water site samples in SDG 780315, and two of 10 soil samples and five of 10 water site samples in SDG 780516 were reanalyzed at one or more dilutions to report various target analytes within the linear range of the calibration. Analytes were reported from the least dilute analysis possible of multiple dilutions to report all target analytes within the linear calibration range.

The laboratory integrated isomeric forms for the PFCs with linear and branched isomers as is required by Revision 1.1 of EPA Method 537.

III.8. SYSTEM PERFORMANCE

SDGs B780315, B780516

No issues were noted with system performance.

IV. SUMMARY AND CONCLUSIONS

MEC^X evaluated a total of 1116 data records from field samples during the validation and qualified 415 records (37.2% of the data) as nondetect (U) or estimated values (J/UJ). The qualification was required for method blank contamination, surrogate recovery outliers, internal standard recovery outliers, MS/MSD precision outliers and field duplicate precision outliers. Nondetect compounds were flagged (U) to indicate that the compound was analyzed for but not detected above the laboratory detection limit (MDL). Specific qualification were discussed in the text above.

Overall, the quality of the data was acceptable. The precision (99.4%) was acceptable and while the accuracy results (61.4%) were lower, the accuracy was acceptable for the project. Other data quality indicators (DQI) (representativeness, comparability and completeness) met the project objectives. Each of these DQIs is discussed below.

IV.1. PRECISION

Precision is a measure of the agreement between duplicate sample measurements of the same quantity and is reflected in the relative percent difference (RPD) between spikes and the RPD for the field duplicate pair analysis. Precision was measured at 99.4%. Precision was considered acceptable for the project.

IV.2. ACCURACY

Accuracy is measured by the results from the recovery of known amounts of compounds or elements from laboratory control samples (LCS), matrix spikes (MS), internal standards and surrogate recoveries. Method blank contamination is also considered relevant to project accuracy. The accuracy was 61.4%. The lower accuracy value was largely due to the number of surrogate outliers in the soil samples.

Surrogates are added to the sample prior to extraction and are an indication of extraction and injection efficiency. The surrogates failed to meet the laboratory's QC acceptance criteria. The same surrogate compounds are also used as isotope dilution internal standards for specific target analytes. Sample concentrations were quantified by isotope dilution; therefore, the bias in the samples would be considered minimal. However, not all internal standard recoveries met the laboratory's QC acceptance criteria and separate qualifications were applied. The surrogate qualifications are considered a conservative measure.

IV.3. REPRESENTATIVENESS

The measures of representativeness – sample handling, analytical blank analysis, were met. Designated analytical protocols were followed. The laboratory did utilize a weighted 1/X calibration curve which was not forced through zero. Although this is a deviation from Method 537, it is acceptable on DoD projects and was considered acceptable by the reviewer. Holding times were met for all analyses. No analytical problems were noted which would impact data representativeness.

IV.4. COMPARABILITY

The samples were analyzed using appropriate approved methods of analysis. All data were reported correctly using standard units.

IV.5. COMPLETENESS

Completeness is the amount of validated data compared to the planned amount of data and is expressed as a percentage of the usable data divided by the total number of data points. Although one data point was rejected by the reviewer, it was not a target compound and was not counted against the overall percent completeness. Of the 1116 target data points, no data points were rejected, resulting in a completeness of 100%.

V. REFERENCES

Aerostar, 2016. *Final Quality Assurance Project Plan for Site Inspections of Fire Fighting Foam Usage at Various Air Force Bases in the Eastern United States*, January 2016.

Aerostar, 2016a. *Draft Final Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) for Site Inspections Fire Fighting Foam Usage at Various Air Force Bases in the Eastern United States, Addendum 14, Field Sampling Plan for Vermont Air National Guard Base, Chittenden County, Vermont*, February 2017.

Department of Defense (DOD), 2017. *DoD Quality Systems Manual for Environmental Laboratories,* Version 5.1. January 2017.

EPA, 2009. *Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS),* Version 1.1, September 2009. EPA Document #: EPA/600/R-08/092.

EPA, 2014. *EPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review*, EPA/540-R-014-002.

EPA (U.S. Environmental Protection Agency), January 2009. OSWER 9200-1-85. *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use.* EPA-540/R-08-005.

Validated Sample Result Forms: B780315

Analysis Method: EPA 537 m

Sample Name BRLTN01-001-GW-013 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG618 **Sample Date/Time:** 2017-04-20 14:25 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	1.3	0.032	0.10	0.20	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.011	0.0072	0.020	0.040	ug/L	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	1.1	0.0096	0.020	0.040	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.36	0.013	0.028	0.040	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.020	0.0092	0.020	0.040	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.020	0.0080	0.020	0.040	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.020	0.0056	0.020	0.040	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.30	0.0066	0.020	0.040	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	6.1	0.068	0.20	0.40	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	1.8	0.0058	0.020	0.040	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.020	0.0092	0.020	0.040	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.0080	0.0072	0.020	0.040	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	8.8	0.052	0.20	0.40	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.47	0.0092	0.020	0.040	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.91	0.0054	0.020	0.040	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.020	0.0076	0.020	0.040	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.020	0.0066	0.020	0.040	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.012	0.0086	0.020	0.040	ug/L	J	J	

Analysis Method: EPA 537 m

Sample Name BRLTN01-002-GW-015 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG586 **Sample Date/Time:** 2017-04-19 08:50 **Validation Level:** Stage 4

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	1.4	0.032	0.10	0.20	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.10	0.036	0.10	0.20	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.52	0.048	0.10	0.20	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.31	0.066	0.14	0.20	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.10	0.046	0.10	0.20	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.10	0.040	0.10	0.20	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.10	0.028	0.10	0.20	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.25	0.033	0.10	0.20	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	13	0.34	1.0	2.0	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	1.6	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.10	0.046	0.10	0.20	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	1.7	0.036	0.10	0.20	ug/L			
PERFLUOROOCTANE SULFONATE	1763-23-1	3.0	0.026	0.10	0.20	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	2.7	0.046	0.10	0.20	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.54	0.027	0.10	0.20	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.10	0.038	0.10	0.20	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.10	0.033	0.10	0.20	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.10	0.043	0.10	0.20	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN01-002-SO-007 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG602 **Sample Date/Time:** 2017-04-19 08:40 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<5.1	2.0	5.1	8.5	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<5.1	2.7	5.1	8.5	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<5.1	1.4	5.1	8.5	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	4.5	2.0	5.1	8.5	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	<5.1	2.0	5.1	8.5	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<3.4	1.1	3.4	8.5	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<5.1	1.9	5.1	8.5	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<5.1	1.4	5.1	8.5	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	28	2.0	5.1	8.5	ug/kg		J	17
PERFLUOROHEXANOIC ACID	307-24-4	17	1.6	5.1	8.5	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	<5.1	1.4	5.1	8.5	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	940	22	51	85	ug/kg			
PERFLUOROOCTANE SULFONATE	1763-23-1	590	18	51	85	ug/kg		J	17
PERFLUOROOCTANOIC ACID	335-67-1	18	2.2	5.1	8.5	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	3.0	1.5	5.1	8.5	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	1.0	0.94	3.4	8.5	ug/kg	J	B	06A
PERFLUOROTRIDECANOIC ACID	72629-94-8	<3.4	1.0	3.4	8.5	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<5.1	1.5	5.1	8.5	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN01-002-SO-907 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG603 **Sample Date/Time:** 2017-04-19 08:40 **Validation Level:** Stage 4

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<6.2	2.4	6.2	10	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<6.2	3.3	6.2	10	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<6.2	1.8	6.2	10	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	4.6	2.4	6.2	10	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	<6.2	2.4	6.2	10	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	2.8	1.3	4.1	10	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	<6.2	2.3	6.2	10	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	2.1	1.8	6.2	10	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	47	2.4	6.2	10	ug/kg		J	17
PERFLUOROHEXANOIC ACID	307-24-4	16	2.0	6.2	10	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	3.2	1.8	6.2	10	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	1100	27	62	100	ug/kg			
PERFLUOROOCTANE SULFONATE	1763-23-1	1200	22	62	100	ug/kg		J	17
PERFLUOROOCTANOIC ACID	335-67-1	25	2.7	6.2	10	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	3.8	1.9	6.2	10	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<4.1	1.1	4.1	10	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<4.1	1.2	4.1	10	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<6.2	1.9	6.2	10	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN01-003-SD-001 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EGG575 **Sample Date/Time:** 2017-04-18 13:10 **Validation Level:** Stage 4

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	1.2	0.23	0.60	1.0	ug/kg		B	06A
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.65	0.32	0.60	1.0	ug/kg	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	1.2	0.17	0.60	1.0	ug/kg			
PERFLUOROBUTANOIC ACID	375-22-4	0.53	0.23	0.60	1.0	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	<0.60	0.23	0.60	1.0	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	0.28	0.13	0.40	1.0	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	0.23	0.22	0.60	1.0	ug/kg	J	J	
PERFLUOROHEPTANOIC ACID	375-85-9	0.51	0.17	0.60	1.0	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	16	0.23	0.60	1.0	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	1.9	0.19	0.60	1.0	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	0.57	0.17	0.60	1.0	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	1.0	0.26	0.60	1.0	ug/kg			
PERFLUOROOCTANE SULFONATE	1763-23-1	170	2.1	6.0	10	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	2.2	0.26	0.60	1.0	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	1.0	0.18	0.60	1.0	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	0.16	0.11	0.40	1.0	ug/kg	J	J	
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.17	0.12	0.40	1.0	ug/kg	J	J	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.19	0.18	0.60	1.0	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name BRLTN01-003-SD-901 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EGG576 **Sample Date/Time:** 2017-04-18 13:10 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	1.3	0.30	0.78	1.3	ug/kg	J	B	06A
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.49	0.42	0.78	1.3	ug/kg	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	1.3	0.22	0.78	1.3	ug/kg			
PERFLUOROBUTANOIC ACID	375-22-4	0.67	0.30	0.78	1.3	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	<0.78	0.30	0.78	1.3	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	0.35	0.17	0.52	1.3	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	<0.78	0.29	0.78	1.3	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.67	0.22	0.78	1.3	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	19	0.30	0.78	1.3	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	1.9	0.25	0.78	1.3	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	0.65	0.22	0.78	1.3	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.91	0.34	0.78	1.3	ug/kg	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	180	2.7	7.8	13	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	2.0	0.34	0.78	1.3	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	0.98	0.23	0.78	1.3	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	0.24	0.14	0.52	1.3	ug/kg	J	J	
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.17	0.16	0.52	1.3	ug/kg	J	J	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.78	0.23	0.78	1.3	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN01-003-SW-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG577 **Sample Date/Time:** 2017-04-18 13:10 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	1.3	0.032	0.10	0.20	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.10	0.036	0.10	0.20	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	2.0	0.048	0.10	0.20	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.43	0.066	0.4	0.20	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.10	0.046	0.10	0.20	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.10	0.040	0.10	0.20	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.10	0.028	0.10	0.20	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.50	0.033	0.10	0.20	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	14	0.34	1.0	2.0	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	2.7	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.097	0.046	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.069	0.036	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	34	0.26	1.0	2.0	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	1.3	0.046	0.10	0.20	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.85	0.027	0.10	0.20	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.10	0.038	0.10	0.20	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.10	0.033	0.10	0.20	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.10	0.043	0.10	0.20	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN01-003-SW-901 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG578 **Sample Date/Time:** 2017-04-18 13:10 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	1.4	0.032	0.10	0.20	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.14	0.036	0.10	0.20	ug/L	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	1.9	0.048	0.10	0.20	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.47	0.066	0.14	0.20	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.10	0.046	0.10	0.20	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.10	0.040	0.10	0.20	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.10	0.028	0.10	0.20	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.52	0.033	0.10	0.20	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	16	0.34	1.0	2.0	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	3.6	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.083	0.046	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.086	0.036	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	37	0.26	1.0	2.0	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	1.4	0.046	0.10	0.20	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.95	0.027	0.10	0.20	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.10	0.038	0.10	0.20	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.10	0.033	0.10	0.20	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.10	0.043	0.10	0.20	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN01-MW102-011 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG583 **Sample Date/Time:** 2017-04-18 16:45 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.19	0.0032	0.010	0.020	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	1.4	0.096	0.20	0.40	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.29	0.0066	0.014	0.020	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.28	0.0033	0.010	0.020	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	6.6	0.068	0.20	0.40	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	1.9	0.058	0.20	0.40	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.016	0.0046	0.010	0.020	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	4.2	0.052	0.20	0.40	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.55	0.0046	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.76	0.0027	0.010	0.020	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN01-MW103-009 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG584 **Sample Date/Time:** 2017-04-18 17:52 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.80	0.032	0.10	0.20	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.10	0.036	0.10	0.20	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	1.7	0.048	0.10	0.20	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.38	0.066	0.14	0.20	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.10	0.046	0.10	0.20	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.10	0.040	0.10	0.20	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.10	0.028	0.10	0.20	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.45	0.033	0.10	0.20	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	12	0.34	1.0	2.0	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	2.5	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.046	0.046	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.10	0.036	0.10	0.20	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	18	0.26	1.0	2.0	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	1.4	0.046	0.10	0.20	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.85	0.027	0.10	0.20	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.10	0.038	0.10	0.20	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.10	0.033	0.10	0.20	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.10	0.043	0.10	0.20	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN01-MW103-909 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG585 **Sample Date/Time:** 2017-04-18 17:52 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.69	0.032	0.10	0.20	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.10	0.036	0.10	0.20	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	1.7	0.048	0.10	0.20	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.33	0.066	0.14	0.20	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.10	0.046	0.10	0.20	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.10	0.040	0.10	0.20	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.10	0.028	0.10	0.20	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.44	0.033	0.10	0.20	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	12	0.34	1.0	2.0	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	2.3	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.056	0.046	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.10	0.036	0.10	0.20	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	20	0.26	1.0	2.0	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	1.4	0.046	0.10	0.20	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	1.0	0.027	0.10	0.20	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.10	0.038	0.10	0.20	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.10	0.033	0.10	0.20	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.10	0.043	0.10	0.20	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN01-TRENCHSUMP-00 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG587 **Sample Date/Time:** 2017-04-19 11:30 **Validation Level:** Stage 4

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.10	0.032	0.10	0.20	ug/L	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.10	0.036	0.10	0.20	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.87	0.048	0.10	0.20	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.43	0.066	0.14	0.20	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.10	0.046	0.10	0.20	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.10	0.040	0.10	0.20	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.10	0.028	0.10	0.20	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.60	0.033	0.10	0.20	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	13	0.17	0.50	2.0	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	5.9	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.10	0.046	0.10	0.20	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.10	0.036	0.10	0.20	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	15	0.13	0.50	2.0	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	4.2	0.046	0.10	0.20	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	1.2	0.027	0.10	0.20	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.10	0.038	0.10	0.20	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.10	0.033	0.10	0.20	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.10	0.043	0.10	0.20	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN01-V1MW14L-008 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG588 **Sample Date/Time:** 2017-04-19 13:21 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.92	0.032	0.10	0.20	ug/L		J	07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.10	0.036	0.10	0.20	ug/L	U	UJ	07
PERFLUOROBUTANE SULFONATE	29420-43-3	1.7	0.048	0.10	0.20	ug/L		J	07
PERFLUOROBUTANOIC ACID	375-22-4	0.36	0.066	0.14	0.20	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.10	0.046	0.10	0.20	ug/L	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	<0.10	0.040	0.10	0.20	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.10	0.028	0.10	0.20	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.50	0.033	0.10	0.20	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	13	0.17	0.50	1.0	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	2.4	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.10	0.046	0.10	0.20	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.10	0.036	0.10	0.20	ug/L	U	UJ	07
PERFLUOROOCTANE SULFONATE	1763-23-1	7.6	0.026	0.10	0.20	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	1.8	0.046	0.10	0.20	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	1.0	0.027	0.10	0.20	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.10	0.038	0.10	0.20	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.10	0.033	0.10	0.20	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.064	0.043	0.10	0.20	ug/L	J	J	

Analysis Method: EPA 537 m

Sample Name BRLTN02-001-GW-027 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG617 **Sample Date/Time:** 2017-04-20 14:35 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	1.4	0.032	0.10	0.20	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.18	0.0072	0.020	0.040	ug/L		J	07
PERFLUOROBUTANE SULFONATE	29420-43-3	0.25	0.0096	0.020	0.040	ug/L		J	07
PERFLUOROBUTANOIC ACID	375-22-4	0.15	0.013	0.028	0.040	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.020	0.0092	0.020	0.040	ug/L	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	<0.020	0.0080	0.020	0.040	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.020	0.0056	0.020	0.040	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.20	0.0066	0.020	0.040	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	3.6	0.068	0.20	0.40	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.62	0.0058	0.020	0.040	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.028	0.0092	0.020	0.040	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.022	0.0072	0.020	0.040	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	14	0.052	0.20	0.40	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.23	0.0092	0.020	0.040	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.41	0.0054	0.020	0.040	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.020	0.0076	0.020	0.040	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.020	0.0066	0.020	0.040	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.020	0.0086	0.020	0.040	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN02-001-SO-020 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG596 **Sample Date/Time:** 2017-04-18 14:05 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	9.2	0.22	0.58	0.97	ug/kg			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.86	0.31	0.58	0.97	ug/kg	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.58	0.16	0.58	0.97	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	0.60	0.22	0.58	0.97	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	<0.58	0.22	0.58	0.97	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	0.29	0.13	0.39	0.97	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	<0.58	0.21	0.58	0.97	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.65	0.16	0.58	0.97	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	2.7	0.22	0.58	0.97	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	0.94	0.18	0.58	0.97	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	1.6	0.16	0.58	0.97	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	15	0.25	0.58	0.97	ug/kg		J	07
PERFLUOROOCTANE SULFONATE	1763-23-1	160	2.0	5.8	9.7	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	1.7	0.25	0.58	0.97	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	1.1	0.17	0.58	0.97	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	0.17	0.11	0.39	0.97	ug/kg	J	J	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.39	0.12	0.39	0.97	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.58	0.17	0.58	0.97	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN02-001-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG594 **Sample Date/Time:** 2017-04-18 12:55 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.42	0.19	0.50	0.83	ug/kg	J	J	07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.50	0.27	0.50	0.83	ug/kg	U	UJ	07
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.50	0.14	0.50	0.83	ug/kg	U	UJ	07
PERFLUOROBUTANOIC ACID	375-22-4	0.34	0.19	0.50	0.83	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	<0.50	0.19	0.50	0.83	ug/kg	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	0.38	0.11	0.33	0.83	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	0.21	0.18	0.50	0.83	ug/kg	J	J	
PERFLUOROHEPTANOIC ACID	375-85-9	0.14	0.14	0.50	0.83	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	1.9	0.19	0.50	0.83	ug/kg		J	07;17
PERFLUOROHEXANOIC ACID	307-24-4	0.23	0.16	0.50	0.83	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	0.46	0.14	0.50	0.83	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	5.7	0.22	0.50	0.83	ug/kg		J	07
PERFLUOROOCTANE SULFONATE	1763-23-1	31	0.20	0.56	0.94	ug/kg		J	07;08B
PERFLUOROOCTANOIC ACID	335-67-1	0.53	0.22	0.50	0.83	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.50	0.15	0.50	0.83	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	0.13	0.091	0.33	0.83	ug/kg	J	J	
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.16	0.10	0.33	0.83	ug/kg	J	J	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.17	0.15	0.50	0.83	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name BRLTN02-001-SS-901 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG595 **Sample Date/Time:** 2017-04-18 12:55 **Validation Level:** Stage 4

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.53	0.20	0.53	0.88	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.71	0.28	0.53	0.88	ug/kg	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.28	0.15	0.53	0.88	ug/kg	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	0.43	0.20	0.53	0.88	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	0.53	0.20	0.53	0.88	ug/kg	J	J	
PERFLUORODECANOIC ACID	335-76-2	0.45	0.11	0.35	0.88	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	<0.53	0.19	0.53	0.88	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.16	0.15	0.53	0.88	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	3.2	0.20	0.53	0.88	ug/kg		J	17
PERFLUOROHEXANOIC ACID	307-24-4	0.25	0.17	0.53	0.88	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	0.47	0.15	0.53	0.88	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	5.1	0.23	0.53	0.88	ug/kg			
PERFLUOROOCTANE SULFONATE	1763-23-1	28	0.18	0.53	0.88	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	0.69	0.23	0.53	0.88	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.34	0.16	0.53	0.88	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	0.12	0.097	0.35	0.88	ug/kg	J	J	
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.12	0.11	0.35	0.88	ug/kg	J	J	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.27	0.16	0.53	0.88	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name BRLTN02-002-SO-020 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG599 **Sample Date/Time:** 2017-04-18 15:30 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	1.2	0.25	0.66	1.1	ug/kg		B	06A
8:2 FLUOROTELOMER SULFONATE	39108-34-4	5.0	0.35	0.66	1.1	ug/kg			
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.66	0.25	0.66	1.1	ug/kg	U	UJ	07
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	0.41	0.14	0.44	1.1	ug/kg	J	J	07
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	0.27	0.19	0.66	1.1	ug/kg	J	J	07
PERFLUOROHEXANE SULFONATE	108427-53-8	2.4	0.25	0.66	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	0.65	0.21	0.66	1.1	ug/kg	J	J	07
PERFLUORONONANOIC ACID	375-95-1	0.51	0.19	0.66	1.1	ug/kg	J	J	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	36	0.29	0.66	1.1	ug/kg		J	07
PERFLUOROOCTANE SULFONATE	1763-23-1	160	2.3	6.6	11	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	0.52	0.29	0.66	1.1	ug/kg	J	J	07
PERFLUOROPENTANOIC ACID	2706-90-3	0.51	0.20	0.66	1.1	ug/kg	J	J	07
PERFLUOROTETRADECANOIC ACID	376-06-7	0.18	0.12	0.44	1.1	ug/kg	J	J	07
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.16	0.13	0.44	1.1	ug/kg	J	J	07
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.66	0.20	0.66	1.1	ug/kg	U	UJ	07

Analysis Method: EPA 537 m

Sample Name BRLTN02-002-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG597 **Sample Date/Time:** 2017-04-18 14:45 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.39	0.25	0.66	1.1	ug/kg	J	B	06A
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.47	0.35	0.66	1.1	ug/kg	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	0.98	0.25	0.66	1.1	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	0.77	0.25	0.66	1.1	ug/kg	J	J	
PERFLUORODECANOIC ACID	335-76-2	0.60	0.14	0.44	1.1	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	0.29	0.24	0.66	1.1	ug/kg	J	J	
PERFLUOROHEPTANOIC ACID	375-85-9	0.31	0.19	0.66	1.1	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	2.5	0.25	0.66	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	0.41	0.21	0.66	1.1	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	0.92	0.19	0.66	1.1	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	1.3	0.29	0.66	1.1	ug/kg		J	07
PERFLUOROOCTANE SULFONATE	1763-23-1	21	0.23	0.66	1.1	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	0.91	0.29	0.66	1.1	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.45	0.20	0.66	1.1	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	0.20	0.12	0.44	1.1	ug/kg	J	J	
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.19	0.13	0.44	1.1	ug/kg	J	J	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.60	0.20	0.66	1.1	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name BRLTN02-003-SO-025 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG600 **Sample Date/Time:** 2017-04-18 17:05 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	18	0.20	0.52	0.87	ug/kg		J	07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.32	0.28	0.52	0.87	ug/kg	J	J	07
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.52	0.15	0.52	0.87	ug/kg	U	UJ	07
PERFLUOROBUTANOIC ACID	375-22-4	0.34	0.20	0.52	0.87	ug/kg	J	J	07
PERFLUORODECANE SULFONATE	335-77-3	<0.52	0.20	0.52	0.87	ug/kg	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	0.21	0.11	0.35	0.87	ug/kg	J	J	07
PERFLUORODODECANOIC ACID	307-55-1	<0.52	0.19	0.52	0.87	ug/kg	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	1.1	0.15	0.52	0.87	ug/kg		J	07
PERFLUOROHEXANE SULFONATE	108427-53-8	9.1	0.20	0.52	0.87	ug/kg		J	07
PERFLUOROHEXANOIC ACID	307-24-4	0.40	0.17	0.52	0.87	ug/kg	J	J	07
PERFLUORONONANOIC ACID	375-95-1	0.48	0.15	0.52	0.87	ug/kg	J	J	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.48	0.23	0.52	0.87	ug/kg	J	J	07
PERFLUOROOCTANE SULFONATE	1763-23-1	20	0.18	0.52	0.87	ug/kg		J	07
PERFLUOROOCTANOIC ACID	335-67-1	7.8	0.23	0.52	0.87	ug/kg		J	07
PERFLUOROPENTANOIC ACID	2706-90-3	0.56	0.16	0.52	0.87	ug/kg	J	J	07
PERFLUOROTETRADECANOIC ACID	376-06-7	0.12	0.096	0.35	0.87	ug/kg	J	J	07
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.15	0.10	0.35	0.87	ug/kg	J	J	07
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.52	0.16	0.52	0.87	ug/kg	U	UJ	07

Analysis Method: EPA 537 m

Sample Name BRLTN02-003-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG598 **Sample Date/Time:** 2017-04-18 16:00 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.43	0.25	0.66	1.1	ug/kg	J	JB	06A;07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	UJ	07
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.66	0.19	0.66	1.1	ug/kg	U	UJ	07
PERFLUOROBUTANOIC ACID	375-22-4	1.3	0.25	0.66	1.1	ug/kg		J	07
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	0.67	0.14	0.44	1.1	ug/kg	J	J	07
PERFLUORODODECANOIC ACID	307-55-1	0.40	0.24	0.66	1.1	ug/kg	J	J	07
PERFLUOROHEPTANOIC ACID	375-85-9	0.41	0.19	0.66	1.1	ug/kg	J	J	07
PERFLUOROHEXANE SULFONATE	108427-53-8	1.3	0.25	0.66	1.1	ug/kg		J	07
PERFLUOROHEXANOIC ACID	307-24-4	0.38	0.21	0.66	1.1	ug/kg	J	J	07
PERFLUORONONANOIC ACID	375-95-1	0.58	0.19	0.66	1.1	ug/kg	J	J	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.89	0.29	0.66	1.1	ug/kg	J	J	07
PERFLUOROOCTANE SULFONATE	1763-23-1	5.6	0.23	0.66	1.1	ug/kg		J	07
PERFLUOROOCTANOIC ACID	335-67-1	0.70	0.29	0.66	1.1	ug/kg	J	J	07
PERFLUOROPENTANOIC ACID	2706-90-3	0.48	0.20	0.66	1.1	ug/kg	J	J	07
PERFLUOROTETRADECANOIC ACID	376-06-7	0.30	0.12	0.44	1.1	ug/kg	J	J	07
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.26	0.13	0.44	1.1	ug/kg	J	J	07
PERFLUOROUNDECANOIC ACID	2058-94-8	0.48	0.20	0.66	1.1	ug/kg	J	J	07

Analysis Method: EPA 537 m

Sample Name BRLTN02-004-SD-001 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EGG581 **Sample Date/Time:** 2017-04-18 15:00 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.48	0.28	0.72	1.2	ug/kg	J	B	06A
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.40	0.38	0.72	1.2	ug/kg	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.72	0.20	0.72	1.2	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.72	0.28	0.72	1.2	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.72	0.28	0.72	1.2	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	0.43	0.16	0.48	1.2	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	0.40	0.26	0.72	1.2	ug/kg	J	J	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.72	0.20	0.72	1.2	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.72	0.28	0.72	1.2	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.72	0.23	0.72	1.2	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.72	0.20	0.72	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.34	0.31	0.72	1.2	ug/kg	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	2.3	0.25	0.72	1.2	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	<0.72	0.31	0.72	1.2	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.72	0.22	0.72	1.2	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	0.40	0.13	0.48	1.2	ug/kg	J	J	
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.24	0.14	0.48	1.2	ug/kg	J	J	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.27	0.22	0.72	1.2	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name BRLTN02-004-SW-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG582 **Sample Date/Time:** 2017-04-18 14:54 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.012	0.0032	0.010	0.020	ug/L	J	J	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.0045	0.0036	0.010	0.020	ug/L	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.035	0.0048	0.010	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.046	0.0066	0.014	0.020	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.027	0.0034	0.010	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.032	0.0029	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.081	0.0026	0.010	0.020	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	0.012	0.0027	0.010	0.020	ug/L	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN03-001-GW-022 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG616 **Sample Date/Time:** 2017-04-20 13:03 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	2.7	0.032	0.10	0.20	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.065	0.036	0.10	0.20	ug/L	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	2.5	0.048	0.10	0.20	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.57	0.066	0.14	0.20	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.10	0.046	0.10	0.20	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.10	0.040	0.10	0.20	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.10	0.028	0.10	0.20	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.58	0.033	0.10	0.20	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	43	0.17	0.50	1.0	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	3.4	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.11	0.046	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.10	0.036	0.10	0.20	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	60	0.26	1.0	2.0	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	2.0	0.046	0.10	0.20	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	1.0	0.027	0.10	0.20	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.10	0.038	0.10	0.20	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.10	0.033	0.10	0.20	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.10	0.043	0.10	0.20	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN03-001-SO-014 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG593 **Sample Date/Time:** 2017-04-18 11:20 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.84	0.20	0.53	0.88	ug/kg	J	B	06A
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.96	0.28	0.53	0.88	ug/kg			
PERFLUOROBUTANE SULFONATE	29420-43-3	0.37	0.15	0.53	0.88	ug/kg	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	<0.53	0.20	0.53	0.88	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.53	0.20	0.53	0.88	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	0.23	0.11	0.35	0.88	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	<0.53	0.19	0.53	0.88	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.46	0.15	0.53	0.88	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	25	0.20	0.53	0.88	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	0.26	0.17	0.53	0.88	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	0.51	0.15	0.53	0.88	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.53	0.23	0.53	0.88	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONATE	1763-23-1	140	1.8	5.3	8.8	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	1.0	0.23	0.53	0.88	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	<0.53	0.16	0.53	0.88	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	0.10	0.097	0.35	0.88	ug/kg	J	J	
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.12	0.11	0.35	0.88	ug/kg	J	J	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.53	0.16	0.53	0.88	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN03-001-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG592 **Sample Date/Time:** 2017-04-18 10:37 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.37	0.21	0.55	0.92	ug/kg	J	B	06A
8:2 FLUOROTELOMER SULFONATE	39108-34-4	1.1	0.29	0.55	0.92	ug/kg			
PERFLUOROBUTANE SULFONATE	29420-43-3	0.32	0.16	0.55	0.92	ug/kg	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	0.38	0.21	0.55	0.92	ug/kg	J	J	07
PERFLUORODECANE SULFONATE	335-77-3	7.6	0.21	0.55	0.92	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	0.39	0.12	0.37	0.92	ug/kg	J	J	07
PERFLUORODODECANOIC ACID	307-55-1	0.33	0.20	0.55	0.92	ug/kg	J	J	07
PERFLUOROHEPTANOIC ACID	375-85-9	<0.55	0.16	0.55	0.92	ug/kg	U	UJ	07
PERFLUOROHEXANE SULFONATE	108427-53-8	15	0.21	0.55	0.92	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	0.46	0.17	0.55	0.92	ug/kg	J	J	07
PERFLUORONONANOIC ACID	375-95-1	0.98	0.16	0.55	0.92	ug/kg		J	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	14	0.24	0.55	0.92	ug/kg		J	07
PERFLUOROOCTANE SULFONATE	1763-23-1	280	1.9	5.5	9.2	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	1.5	0.24	0.55	0.92	ug/kg		J	07
PERFLUOROPENTANOIC ACID	2706-90-3	0.51	0.17	0.55	0.92	ug/kg	J	J	07
PERFLUOROTETRADECANOIC ACID	376-06-7	0.21	0.10	0.37	0.92	ug/kg	J	J	07
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.23	0.11	0.37	0.92	ug/kg	J	J	07
PERFLUOROUNDECANOIC ACID	2058-94-8	0.67	0.17	0.55	0.92	ug/kg	J	J	07

Analysis Method: EPA 537 m

Sample Name BRLTN03-002-GW-022 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG615 **Sample Date/Time:** 2017-04-20 12:13 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	1.6	0.064	0.20	0.40	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.29	0.072	0.20	0.40	ug/L	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	1.8	0.096	0.20	0.40	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.52	0.13	0.28	0.40	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.20	0.092	0.20	0.40	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.20	0.080	0.20	0.40	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.20	0.056	0.20	0.40	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.36	0.066	0.20	0.40	ug/L	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	11	0.068	0.20	0.40	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	2.5	0.058	0.20	0.40	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.20	0.092	0.20	0.40	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.20	0.072	0.20	0.40	ug/L	U	UJ	07
PERFLUOROOCTANE SULFONATE	1763-23-1	66	0.26	1.0	2.0	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.97	0.092	0.20	0.40	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	1.0	0.054	0.20	0.40	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.20	0.076	0.20	0.40	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.20	0.066	0.20	0.40	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.20	0.086	0.20	0.40	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN03-002-SO-015 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG590 **Sample Date/Time:** 2017-04-18 09:45 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	1.6	0.23	0.60	1.0	ug/kg		B	06A
8:2 FLUOROTELOMER SULFONATE	39108-34-4	4.9	0.32	0.60	1.0	ug/kg			
PERFLUOROBUTANE SULFONATE	29420-43-3	0.49	0.17	0.60	1.0	ug/kg	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	0.39	0.23	0.60	1.0	ug/kg	J	J	07
PERFLUORODECANE SULFONATE	335-77-3	<0.60	0.23	0.60	1.0	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	0.32	0.13	0.40	1.0	ug/kg	J	J	07
PERFLUORODODECANOIC ACID	307-55-1	<0.60	0.22	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	0.20	0.17	0.60	1.0	ug/kg	J	J	07
PERFLUOROHEXANE SULFONATE	108427-53-8	5.2	0.23	0.60	1.0	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	0.50	0.19	0.60	1.0	ug/kg	J	J	07
PERFLUORONONANOIC ACID	375-95-1	0.50	0.17	0.60	1.0	ug/kg	J	J	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.60	0.26	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONATE	1763-23-1	110	2.1	6.0	10	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	0.54	0.26	0.60	1.0	ug/kg	J	J	07
PERFLUOROPENTANOIC ACID	2706-90-3	0.46	0.18	0.60	1.0	ug/kg	J	J	07
PERFLUOROTETRADECANOIC ACID	376-06-7	0.15	0.11	0.40	1.0	ug/kg	J	J	07
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.16	0.12	0.40	1.0	ug/kg	J	J	07
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.60	0.18	0.60	1.0	ug/kg	U	UJ	07

Analysis Method: EPA 537 m

Sample Name BRLTN03-002-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG589 **Sample Date/Time:** 2017-04-18 08:52 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.51	0.23	0.60	1.0	ug/kg	J	B	06A
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.75	0.32	0.60	1.0	ug/kg	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.71	0.17	0.60	1.0	ug/kg	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	0.68	0.23	0.60	1.0	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	<0.60	0.23	0.60	1.0	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	0.82	0.13	0.40	1.0	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	0.56	0.22	0.60	1.0	ug/kg	J	J	
PERFLUOROHEPTANOIC ACID	375-85-9	0.31	0.17	0.60	1.0	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	7.5	0.23	0.60	1.0	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	0.30	0.19	0.60	1.0	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	0.90	0.17	0.60	1.0	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	3.2	0.26	0.60	1.0	ug/kg		J	07
PERFLUOROOCTANE SULFONATE	1763-23-1	170	2.1	6.0	10	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	0.92	0.26	0.60	1.0	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.57	0.18	0.60	1.0	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	0.25	0.11	0.40	1.0	ug/kg	J	J	
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.30	0.12	0.40	1.0	ug/kg	J	J	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.93	0.18	0.60	1.0	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name BRLTN03-003-SD-001 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EGG579 **Sample Date/Time:** 2017-04-18 13:56 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.69	0.25	0.66	1.1	ug/kg	J	B	06A
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.66	0.35	0.66	1.1	ug/kg	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.43	0.19	0.66	1.1	ug/kg	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	1.6	0.25	0.66	1.1	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	0.31	0.14	0.44	1.1	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	0.24	0.24	0.66	1.1	ug/kg	J	J	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	2.1	0.25	0.66	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	0.23	0.21	0.66	1.1	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	5.2	0.29	0.66	1.1	ug/kg			
PERFLUOROOCTANE SULFONATE	1763-23-1	63	2.3	6.6	11	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	<0.66	0.29	0.66	1.1	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.66	0.20	0.66	1.1	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	0.17	0.12	0.44	1.1	ug/kg	J	J	
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.16	0.13	0.44	1.1	ug/kg	J	J	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.66	0.20	0.66	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN03-003-SW-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG580 **Sample Date/Time:** 2017-04-18 13:56 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.10	0.032	0.10	0.20	ug/L	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.10	0.036	0.10	0.20	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.19	0.048	0.10	0.20	ug/L	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	0.083	0.066	0.14	0.20	ug/L	J	J	
PERFLUORODECANE SULFONATE	335-77-3	0.057	0.046	0.10	0.20	ug/L	J	J	
PERFLUORODECANOIC ACID	335-76-2	<0.10	0.040	0.10	0.20	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.10	0.028	0.10	0.20	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.10	0.033	0.10	0.20	ug/L	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.99	0.034	0.10	0.20	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.22	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.10	0.046	0.10	0.20	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.15	0.036	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	13	0.26	1.0	2.0	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.096	0.046	0.10	0.20	ug/L	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.11	0.027	0.10	0.20	ug/L	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.10	0.038	0.10	0.20	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.10	0.033	0.10	0.20	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.10	0.043	0.10	0.20	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN05-001-GW-017 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG607 **Sample Date/Time:** 2017-04-19 11:15 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.017	0.0032	0.10	0.020	ug/L	J	JB	06A;07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	07
PERFLUOROBUTANE SULFONATE	29420-43-3	0.0062	0.0048	0.10	0.020	ug/L	J	J	07
PERFLUOROBUTANOIC ACID	375-22-4	0.015	0.0066	0.14	0.020	ug/L	J	J	07
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	UJ	07
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	UJ	07;10A
PERFLUOROHEPTANOIC ACID	375-85-9	0.0037	0.0033	0.10	0.020	ug/L	J	J	07
PERFLUOROHEXANE SULFONATE	108427-53-8	0.11	0.0034	0.10	0.020	ug/L		J	07
PERFLUOROHEXANOIC ACID	307-24-4	0.060	0.0029	0.10	0.020	ug/L		J	07
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.92	0.0036	0.10	0.020	ug/L		J	07
PERFLUOROOCTANE SULFONATE	1763-23-1	0.24	0.0026	0.10	0.020	ug/L		J	07
PERFLUOROOCTANOIC ACID	335-67-1	0.054	0.0046	0.10	0.020	ug/L		J	07
PERFLUOROPENTANOIC ACID	2706-90-3	0.0076	0.0027	0.10	0.020	ug/L	J	J	07
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	07;10A
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	07;10A
PERFLUOROUNDECANOIC ACID	2058-94-8	0.0065	0.0043	0.10	0.020	ug/L	J	J	07

Analysis Method: EPA 537 m

Sample Name BRLTN05-001-SO-014 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG606 **Sample Date/Time:** 2017-04-19 11:00 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.30	0.23	0.60	1.0	ug/kg	J	JB	06A;07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.60	0.32	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROBUTANOIC ACID	375-22-4	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
PERFLUORODECANE SULFONATE	335-77-3	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	0.27	0.13	0.40	1.0	ug/kg	J	J	07
PERFLUORODODECANOIC ACID	307-55-1	<0.60	0.22	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEXANOIC ACID	307-24-4	<0.60	0.19	0.60	1.0	ug/kg	U	UJ	07
PERFLUORONONANOIC ACID	375-95-1	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.27	0.26	0.60	1.0	ug/kg	J	J	07
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.60	0.21	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROOCTANOIC ACID	335-67-1	<0.60	0.26	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROPENTANOIC ACID	2706-90-3	<0.60	0.18	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROTETRADECANOIC ACID	376-06-7	0.32	0.11	0.40	1.0	ug/kg	J	J	07
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.40	0.12	0.40	1.0	ug/kg	U	UJ	07
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.60	0.18	0.60	1.0	ug/kg	U	UJ	07

Analysis Method: EPA 537 m

Sample Name BRLTN05-001-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG604 **Sample Date/Time:** 2017-04-19 10:25 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.42	0.22	0.58	0.97	ug/kg	J	JB	06A;07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.58	0.31	0.58	0.97	ug/kg	U	UJ	07
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.58	0.16	0.58	0.97	ug/kg	U	UJ	07
PERFLUOROBUTANOIC ACID	375-22-4	<0.58	0.22	0.58	0.97	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.58	0.22	0.58	0.97	ug/kg	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	0.23	0.13	0.39	0.97	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	<0.58	0.21	0.58	0.97	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.58	0.16	0.58	0.97	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.58	0.22	0.58	0.97	ug/kg	U	UJ	07
PERFLUOROHEXANOIC ACID	307-24-4	<0.58	0.18	0.58	0.97	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.58	0.16	0.58	0.97	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.58	0.25	0.58	0.97	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONATE	1763-23-1	0.78	0.20	0.58	0.97	ug/kg	J	J	07
PERFLUOROOCTANOIC ACID	335-67-1	<0.58	0.25	0.58	0.97	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.58	0.17	0.58	0.97	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	0.15	0.11	0.39	0.97	ug/kg	J	J	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.39	0.12	0.39	0.97	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.58	0.17	0.58	0.97	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN05-001-SS-901 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG605 **Sample Date/Time:** 2017-04-19 10:25 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.24	0.23	0.59	0.99	ug/kg	J	JB	06A;07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.59	0.32	0.59	0.99	ug/kg	U	UJ	07
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.59	0.17	0.59	0.99	ug/kg	U	UJ	07
PERFLUOROBUTANOIC ACID	375-22-4	<0.59	0.23	0.59	0.99	ug/kg	U	UJ	07
PERFLUORODECANE SULFONATE	335-77-3	<0.59	0.23	0.59	0.99	ug/kg	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	0.35	0.13	0.40	0.99	ug/kg	J	J	07
PERFLUORODODECANOIC ACID	307-55-1	<0.59	0.22	0.59	0.99	ug/kg	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	<0.59	0.17	0.59	0.99	ug/kg	U	UJ	07
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.59	0.23	0.59	0.99	ug/kg	U	UJ	07
PERFLUOROHEXANOIC ACID	307-24-4	<0.59	0.19	0.59	0.99	ug/kg	U	UJ	07
PERFLUORONONANOIC ACID	375-95-1	<0.59	0.17	0.59	0.99	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.58	0.26	0.59	0.99	ug/kg	J	J	07
PERFLUOROOCTANE SULFONATE	1763-23-1	0.97	0.21	0.59	0.99	ug/kg	J	J	07
PERFLUOROOCTANOIC ACID	335-67-1	<0.59	0.26	0.59	0.99	ug/kg	U	UJ	07
PERFLUOROPENTANOIC ACID	2706-90-3	<0.59	0.18	0.59	0.99	ug/kg	U	UJ	07
PERFLUOROTETRADECANOIC ACID	376-06-7	0.19	0.11	0.40	0.99	ug/kg	J	J	07;10A
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.15	0.12	0.40	0.99	ug/kg	J	J	07;10A
PERFLUOROUNDECANOIC ACID	2058-94-8	0.20	0.18	0.59	0.99	ug/kg	J	J	07

Analysis Method: EPA 537 m

Sample Name BRLTN05-002-GW-033 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG613 **Sample Date/Time:** 2017-04-19 16:55 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.010	0.0032	0.010	0.020	ug/L	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.016	0.0048	0.10	0.020	ug/L	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	0.026	0.0066	0.14	0.020	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.062	0.0034	0.10	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.036	0.0029	0.10	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.0062	0.0036	0.10	0.020	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.011	0.0026	0.10	0.020	ug/L	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	0.017	0.0046	0.10	0.020	ug/L	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.027	0.0027	0.10	0.020	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN05-002-GW-933 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG614 **Sample Date/Time:** 2017-04-19 16:55 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.010	0.0032	0.010	0.020	ug/L	U	UJ	07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	07
PERFLUOROBUTANE SULFONATE	29420-43-3	0.012	0.0048	0.10	0.020	ug/L	J	J	07
PERFLUOROBUTANOIC ACID	375-22-4	0.026	0.0066	0.14	0.020	ug/L		J	07
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	UJ	07
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	07
PERFLUOROHEXANE SULFONATE	108427-53-8	0.055	0.0034	0.10	0.020	ug/L		J	07
PERFLUOROHEXANOIC ACID	307-24-4	0.033	0.0029	0.10	0.020	ug/L		J	07
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.015	0.0036	0.10	0.020	ug/L	J	J	07
PERFLUOROOCTANE SULFONATE	1763-23-1	0.020	0.0026	0.10	0.020	ug/L		J	07
PERFLUOROOCTANOIC ACID	335-67-1	0.021	0.0046	0.10	0.020	ug/L		J	07
PERFLUOROPENTANOIC ACID	2706-90-3	0.022	0.0027	0.10	0.020	ug/L		J	07
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	07
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	07
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	07

Analysis Method: EPA 537 m

Sample Name BRLTN05-002-SO-028 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG611 **Sample Date/Time:** 2017-04-19 16:25 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.57	0.23	0.60	1.0	ug/kg	J	J	07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.60	0.32	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROBUTANOIC ACID	375-22-4	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
PERFLUORODECANE SULFONATE	335-77-3	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	<0.40	0.13	0.40	1.0	ug/kg	U	UJ	07
PERFLUORODODECANOIC ACID	307-55-1	<0.60	0.22	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEXANOIC ACID	307-24-4	<0.60	0.19	0.60	1.0	ug/kg	U	UJ	07
PERFLUORONONANOIC ACID	375-95-1	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.60	0.26	0.60	1.0	ug/kg	U	UJ	07;10A
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.60	0.21	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROOCTANOIC ACID	335-67-1	<0.60	0.26	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROPENTANOIC ACID	2706-90-3	<0.60	0.18	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROTETRADECANOIC ACID	376-06-7	0.11	0.11	0.40	1.0	ug/kg	J	JB	06A;07
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.40	0.12	0.40	1.0	ug/kg	U	UJ	07
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.60	0.18	0.60	1.0	ug/kg	U	UJ	07

Analysis Method: EPA 537 m

Sample Name BRLTN05-002-SO-928 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG612 **Sample Date/Time:** 2017-04-19 16:25 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.58	0.23	0.60	1.0	ug/kg	J	J	07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.60	0.32	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROBUTANOIC ACID	375-22-4	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
PERFLUORODECANE SULFONATE	335-77-3	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	<0.40	0.13	0.40	1.0	ug/kg	U	UJ	07
PERFLUORODODECANOIC ACID	307-55-1	<0.60	0.22	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEXANOIC ACID	307-24-4	<0.60	0.19	0.60	1.0	ug/kg	U	UJ	07
PERFLUORONONANOIC ACID	375-95-1	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.60	0.26	0.60	1.0	ug/kg	U	UJ	07;10A
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.60	0.21	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROOCTANOIC ACID	335-67-1	<0.60	0.26	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROPENTANOIC ACID	2706-90-3	<0.60	0.18	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROTETRADECANOIC ACID	376-06-7	0.22	0.11	0.40	1.0	ug/kg	J	JB	06A;07
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.40	0.12	0.40	1.0	ug/kg	U	UJ	07
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.60	0.18	0.60	1.0	ug/kg	U	UJ	07

Analysis Method: EPA 537 m

Sample Name BRLTN05-002-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG610 **Sample Date/Time:** 2017-04-19 15:00 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.52	0.20	0.52	0.86	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.52	0.28	0.52	0.86	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.52	0.15	0.52	0.86	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.52	0.20	0.52	0.86	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.52	0.20	0.52	0.86	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.34	0.11	0.34	0.86	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.52	0.19	0.52	0.86	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.52	0.15	0.52	0.86	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.52	0.20	0.52	0.86	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.52	0.16	0.52	0.86	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.52	0.15	0.52	0.86	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.52	0.22	0.52	0.86	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONATE	1763-23-1	1.2	0.18	0.52	0.86	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	<0.52	0.22	0.52	0.86	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.52	0.15	0.52	0.86	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	0.17	0.095	0.34	0.86	ug/kg	J	B	06A
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.34	0.10	0.34	0.86	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.52	0.15	0.52	0.86	ug/kg	U	U	10A

Analysis Method: EPA 537 m

Sample Name BRLTN05-003-SO-032 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG609 **Sample Date/Time:** 2017-04-19 14:17 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.51	0.23	0.60	1.0	ug/kg	J	JB	06A;07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.60	0.32	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROBUTANOIC ACID	375-22-4	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
PERFLUORODECANE SULFONATE	335-77-3	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	0.30	0.13	0.40	1.0	ug/kg	J	J	07
PERFLUORODODECANOIC ACID	307-55-1	<0.60	0.22	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEXANOIC ACID	307-24-4	<0.60	0.19	0.60	1.0	ug/kg	U	UJ	07
PERFLUORONONANOIC ACID	375-95-1	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.60	0.26	0.60	1.0	ug/kg	U	UJ	07;10A
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.60	0.21	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROOCTANOIC ACID	335-67-1	<0.60	0.26	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROPENTANOIC ACID	2706-90-3	<0.60	0.18	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROTETRADECANOIC ACID	376-06-7	0.19	0.11	0.40	1.0	ug/kg	J	J	07
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.19	0.12	0.40	1.0	ug/kg	J	J	07
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.60	0.18	0.60	1.0	ug/kg	U	UJ	07

Analysis Method: EPA 537 m

Sample Name BRLTN05-003-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGG608 **Sample Date/Time:** 2017-04-19 11:45 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.56	0.19	0.49	0.82	ug/kg	J	JB	06A;07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.49	0.26	0.49	0.82	ug/kg	U	UJ	07
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.49	0.14	0.49	0.82	ug/kg	U	UJ	07
PERFLUOROBUTANOIC ACID	375-22-4	<0.49	0.19	0.49	0.82	ug/kg	U	UJ	07
PERFLUORODECANE SULFONATE	335-77-3	<0.49	0.19	0.49	0.82	ug/kg	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	0.28	0.11	0.33	0.82	ug/kg	J	J	07
PERFLUORODODECANOIC ACID	307-55-1	<0.49	0.18	0.49	0.82	ug/kg	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	<0.49	0.14	0.49	0.82	ug/kg	U	UJ	07
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.49	0.19	0.49	0.82	ug/kg	U	UJ	07
PERFLUOROHEXANOIC ACID	307-24-4	<0.49	0.16	0.49	0.82	ug/kg	U	UJ	07
PERFLUORONONANOIC ACID	375-95-1	<0.49	0.14	0.49	0.82	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.49	0.21	0.49	0.82	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONATE	1763-23-1	2.7	0.17	0.49	0.82	ug/kg		J	07
PERFLUOROOCTANOIC ACID	335-67-1	<0.49	0.21	0.49	0.82	ug/kg	U	UJ	07
PERFLUOROPENTANOIC ACID	2706-90-3	<0.49	0.15	0.49	0.82	ug/kg	U	UJ	07
PERFLUOROTETRADECANOIC ACID	376-06-7	0.15	0.090	0.33	0.82	ug/kg	J	J	07
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.10	0.098	0.33	0.82	ug/kg	J	J	07
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.49	0.15	0.49	0.82	ug/kg	U	UJ	07

Analysis Method: EPA 537 m

Sample Name BRLTN-RS-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG574 **Sample Date/Time:** 2017-04-18 12:50 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.010	0.0032	0.010	0.020	ug/L	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.010	0.0048	0.010	0.020	ug/L	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.014	0.0066	0.014	0.020	ug/L	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.010	0.0034	0.010	0.020	ug/L	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.010	0.0029	0.010	0.020	ug/L	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.010	0.0026	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.010	0.0027	0.010	0.020	ug/L	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN-RS-002 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG601 **Sample Date/Time:** 2017-04-19 07:30 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.010	0.0032	0.010	0.020	ug/L	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.010	0.0048	0.010	0.020	ug/L	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.014	0.0066	0.014	0.020	ug/L	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.010	0.0034	0.010	0.020	ug/L	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.010	0.0029	0.010	0.020	ug/L	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.010	0.0026	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.010	0.0027	0.010	0.020	ug/L	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN-SB-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGG591 **Sample Date/Time:** 2017-04-18 09:19 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.010	0.0032	0.010	0.020	ug/L	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.010	0.0048	0.010	0.020	ug/L	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.014	0.0066	0.014	0.020	ug/L	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.010	0.0034	0.010	0.020	ug/L	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.010	0.0029	0.010	0.020	ug/L	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.010	0.0026	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.010	0.0027	0.010	0.020	ug/L	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	U	

Validated Sample Result Forms: B780516

Analysis Method: EPA 537 m

Sample Name BRLTN01-001-SO-008 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGH844 **Sample Date/Time:** 2017-04-20 14:05 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.66	0.25	0.66	1.1	ug/kg	U	UJ	07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	UJ	07
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.66	0.19	0.66	1.1	ug/kg	U	UJ	07
PERFLUOROBUTANOIC ACID	375-22-4	<0.66	0.25	0.66	1.1	ug/kg	U	UJ	07
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	UJ	07
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	<0.66	0.19	0.66	1.1	ug/kg	U	UJ	07
PERFLUOROHEXANE SULFONATE	108427-53-8	0.72	0.25	0.66	1.1	ug/kg	J	J	07
PERFLUOROHEXANOIC ACID	307-24-4	<0.66	0.21	0.66	1.1	ug/kg	U	UJ	07
PERFLUORONONANOIC ACID	375-95-1	<0.66	0.19	0.66	1.1	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	6.6	0.29	0.66	1.1	ug/kg		J	07
PERFLUOROOCTANE SULFONATE	1763-23-1	4.7	0.23	0.66	1.1	ug/kg		J	07
PERFLUOROOCTANOIC ACID	335-67-1	0.38	0.29	0.66	1.1	ug/kg	J	J	07
PERFLUOROPENTANOIC ACID	2706-90-3	<0.66	0.20	0.66	1.1	ug/kg	U	UJ	07
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	UJ	07
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	UJ	07
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.66	0.20	0.66	1.1	ug/kg	U	UJ	07

Analysis Method: EPA 537 m

Sample Name BRLTN01-MW-BP3-012 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGH846 **Sample Date/Time:** 2017-04-20 16:28 **Validation Level:** Stage 4

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.47	0.16	0.50	1.0	ug/L	J	J	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.50	0.18	0.50	1.0	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	3.4	0.24	0.50	1.0	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	2.7	0.33	0.70	1.0	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.50	0.23	0.50	1.0	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.50	0.20	0.50	1.0	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.50	0.14	0.50	1.0	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	11	0.17	0.50	1.0	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	96	3.4	10	20	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	41	0.15	0.50	1.0	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.50	0.23	0.50	1.0	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	3.1	0.18	0.50	1.0	ug/L			
PERFLUOROOCTANE SULFONATE	1763-23-1	31	0.13	0.50	1.0	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	41	0.23	0.50	1.0	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	5.8	0.14	0.50	1.0	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.50	0.19	0.50	1.0	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.50	0.17	0.50	1.0	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.50	0.22	0.50	1.0	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN01-MW-V1BP2-009 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGH845 **Sample Date/Time:** 2017-04-20 17:05 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.10	0.032	0.10	0.20	ug/L	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.34	0.036	0.10	0.20	ug/L			
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.10	0.048	0.10	0.20	ug/L	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.14	0.066	0.14	0.20	ug/L	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.10	0.046	0.10	0.20	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.10	0.040	0.10	0.20	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.10	0.028	0.10	0.20	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.11	0.033	0.10	0.20	ug/L	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	2.6	0.034	0.10	0.20	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.37	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.059	0.046	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.081	0.036	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	16	0.13	0.50	1.0	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	1.3	0.046	0.10	0.20	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.12	0.027	0.10	0.20	ug/L	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.10	0.038	0.10	0.20	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.10	0.033	0.10	0.20	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.10	0.043	0.10	0.20	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN02-002-GW-029 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGH848 **Sample Date/Time:** 2017-04-21 08:36 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	8.3	0.032	0.10	0.20	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.15	0.036	0.10	0.20	ug/L	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.47	0.048	0.10	0.20	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.46	0.066	0.14	0.20	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.10	0.046	0.10	0.20	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.10	0.040	0.10	0.20	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.10	0.028	0.10	0.20	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.29	0.033	0.10	0.20	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	5.5	0.034	0.10	0.20	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	2.0	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.10	0.046	0.10	0.20	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.16	0.036	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	54	0.26	1.0	2.0	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.50	0.046	0.10	0.20	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	2.0	0.027	0.10	0.20	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.10	0.038	0.10	0.20	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.10	0.033	0.10	0.20	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.10	0.043	0.10	0.20	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN02-003-GW-032 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGH847 **Sample Date/Time:** 2017-04-21 09:00 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.95	0.0064	0.020	0.040	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.15	0.0072	0.020	0.040	ug/L			
PERFLUOROBUTANE SULFONATE	29420-43-3	0.14	0.0096	0.020	0.040	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.17	0.013	0.028	0.040	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.020	0.0092	0.020	0.040	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.020	0.0080	0.020	0.040	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.020	0.0056	0.020	0.040	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.14	0.0066	0.020	0.040	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	2.5	0.068	0.20	0.40	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.57	0.0058	0.020	0.040	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.030	0.0092	0.020	0.040	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.13	0.0072	0.020	0.040	ug/L			
PERFLUOROOCTANE SULFONATE	1763-23-1	9.2	0.052	0.20	0.40	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.28	0.0092	0.020	0.040	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.48	0.0054	0.020	0.040	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.020	0.0076	0.020	0.040	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.020	0.0066	0.020	0.040	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.020	0.0086	0.020	0.040	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN04-001-GW-013 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGH843 **Sample Date/Time:** 2017-04-20 13:12 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.020	0.0032	0.010	0.020	ug/L		J	10A
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	10A
PERFLUOROBUTANE SULFONATE	29420-43-3	0.013	0.0048	0.010	0.020	ug/L	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	0.054	0.0066	0.014	0.020	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.14	0.0033	0.010	0.020	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	1.7	0.017	0.050	0.10	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.058	0.0029	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.0051	0.0046	0.010	0.020	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.0053	0.0036	v	0.020	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.10	0.0026	0.010	0.020	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.084	0.0046	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.060	0.0027	0.010	0.020	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN04-001-SO-009 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGH842 **Sample Date/Time:** 2017-04-20 13:00 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.66	0.25	0.66	1.1	ug/kg	U	UJ	07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	UJ	07
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.66	0.19	0.66	1.1	ug/kg	U	UJ	07
PERFLUOROBUTANOIC ACID	375-22-4	0.26	0.25	0.66	1.1	ug/kg	J	J	07
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	UJ	07
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	0.37	0.19	0.66	1.1	ug/kg	J	J	07
PERFLUOROHEXANE SULFONATE	108427-53-8	1.2	0.25	0.66	1.1	ug/kg		J	07
PERFLUOROHEXANOIC ACID	307-24-4	0.36	0.21	0.66	1.1	ug/kg	J	J	07
PERFLUORONONANOIC ACID	375-95-1	<0.66	0.19	0.66	1.1	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.66	0.29	0.66	1.1	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.66	0.23	0.66	1.1	ug/kg	U	UJ	07
PERFLUOROOCTANOIC ACID	335-67-1	<0.66	0.29	0.66	1.1	ug/kg	U	UJ	07
PERFLUOROPENTANOIC ACID	2706-90-3	<0.66	0.20	0.66	1.1	ug/kg	U	UJ	07
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	UJ	07
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	UJ	07
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.66	0.20	0.66	1.1	ug/kg	U	UJ	07

Analysis Method: EPA 537 m

Sample Name BRLTN04-001-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGH841 **Sample Date/Time:** 2017-04-20 12:35 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.53	0.20	0.53	0.89	ug/kg	U	UJ	07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.53	0.28	0.53	0.89	ug/kg	U	UJ	07
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.53	0.15	0.53	0.89	ug/kg	U	UJ	07
PERFLUOROBUTANOIC ACID	375-22-4	<0.53	0.20	0.53	0.89	ug/kg	U	UJ	07
PERFLUORODECANE SULFONATE	335-77-3	<0.53	0.20	0.53	0.89	ug/kg	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	<0.36	0.12	0.36	0.89	ug/kg	U	UJ	07
PERFLUORODODECANOIC ACID	307-55-1	<0.53	0.20	0.53	0.89	ug/kg	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	<0.53	0.15	0.53	0.89	ug/kg	U	UJ	07
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.53	0.20	0.53	0.89	ug/kg	U	UJ	07
PERFLUOROHEXANOIC ACID	307-24-4	<0.53	0.17	0.53	0.89	ug/kg	U	UJ	07
PERFLUORONONANOIC ACID	375-95-1	<0.53	0.15	0.53	0.89	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.53	0.23	0.53	0.89	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONATE	1763-23-1	4.3	0.19	0.53	0.89	ug/kg		J	07
PERFLUOROOCTANOIC ACID	335-67-1	<0.53	0.23	0.53	0.89	ug/kg	U	UJ	07
PERFLUOROPENTANOIC ACID	2706-90-3	<0.53	0.16	0.53	0.89	ug/kg	U	UJ	07
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.36	0.098	0.36	0.89	ug/kg	U	UJ	07
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.36	0.11	0.36	0.89	ug/kg	U	UJ	07
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.53	0.16	0.53	0.89	ug/kg	U	UJ	07

Analysis Method: EPA 537 m

Sample Name BRLTN04-002-GW-018 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGH832 **Sample Date/Time:** 2017-04-20 09:10 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.0086	0.0032	0.010	0.020	ug/L	J	J	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.0052	0.0048	0.010	0.020	ug/L	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	0.016	0.0066	0.014	0.020	ug/L	J	J	
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.0034	0.0033	0.010	0.020	ug/L	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.027	0.0034	0.010	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.016	0.0029	0.010	0.020	ug/L	J	J	
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.0042	0.0036	0.010	0.020	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.056	0.0026	0.010	0.020	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.0081	0.0046	0.010	0.020	ug/L	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.018	0.0027	0.010	0.020	ug/L	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN04-002-SO-010 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGH831 **Sample Date/Time:** 2017-04-20 08:45 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	1.3	0.21	0.56	0.93	ug/kg			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	6.3	0.30	0.56	0.93	ug/kg			
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.56	0.16	0.56	0.93	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.56	0.21	0.56	0.93	ug/kg	U	UJ	07
PERFLUORODECANE SULFONATE	335-77-3	0.98	0.21	0.56	0.93	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	0.21	0.12	0.37	0.93	ug/kg	J	J	07
PERFLUORODODECANOIC ACID	307-55-1	<0.56	0.20	0.56	0.93	ug/kg	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	<0.56	0.16	0.56	0.93	ug/kg	U	UJ	07
PERFLUOROHEXANE SULFONATE	108427-53-8	4.1	0.21	0.56	0.93	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	0.52	0.18	0.56	0.93	ug/kg	J	J	07
PERFLUORONONANOIC ACID	375-95-1	0.39	0.16	0.56	0.93	ug/kg	J	J	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	2.7	0.24	0.56	0.93	ug/kg			
PERFLUOROOCTANE SULFONATE	1763-23-1	800	20	56	93	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	0.46	0.24	0.56	0.93	ug/kg	J	J	07
PERFLUOROPENTANOIC ACID	2706-90-3	<0.56	0.17	0.56	0.93	ug/kg	U	UJ	07
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.37	0.10	0.37	0.93	ug/kg	U	UJ	07
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.37	0.11	0.37	0.93	ug/kg	U	UJ	07
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.56	0.17	0.56	0.93	ug/kg	U	UJ	07

Analysis Method: EPA 537 m

Sample Name BRLTN04-002-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGH830 **Sample Date/Time:** 2017-04-20 08:20 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.60	0.32	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROBUTANOIC ACID	375-22-4	1.1	0.23	0.60	1.0	ug/kg		J	07
PERFLUORODECANE SULFONATE	335-77-3	10	0.23	0.60	1.0	ug/kg		J	07
PERFLUORODECANOIC ACID	335-76-2	0.31	0.13	0.40	1.0	ug/kg	J	J	07
PERFLUORODODECANOIC ACID	307-55-1	<0.60	0.22	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	0.29	0.17	0.60	1.0	ug/kg	J	J	07
PERFLUOROHEXANE SULFONATE	108427-53-8	3.1	0.23	0.60	1.0	ug/kg		J	07
PERFLUOROHEXANOIC ACID	307-24-4	0.54	0.19	0.60	1.0	ug/kg	J	J	07
PERFLUORONONANOIC ACID	375-95-1	1.0	0.17	0.60	1.0	ug/kg		J	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	3.5	0.26	0.60	1.0	ug/kg		J	07
PERFLUOROOCTANE SULFONATE	1763-23-1	42	0.21	0.60	1.0	ug/kg		J	07
PERFLUOROOCTANOIC ACID	335-67-1	0.71	0.26	0.60	1.0	ug/kg	J	J	07
PERFLUOROPENTANOIC ACID	2706-90-3	1.1	0.18	0.60	1.0	ug/kg		J	07
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.40	0.11	0.40	1.0	ug/kg	U	UJ	07
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.40	0.12	0.40	1.0	ug/kg	U	UJ	07
PERFLUOROUNDECANOIC ACID	2058-94-8	0.63	0.18	0.60	1.0	ug/kg	J	J	07

Analysis Method: EPA 537 m

Sample Name BRLTN04-003-GW-018 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGH835 **Sample Date/Time:** 2017-04-20 10:20 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.042	0.0032	0.010	0.020	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.016	0.0048	0.010	0.020	ug/L	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	0.030	0.0066	0.014	0.020	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.021	0.0033	0.010	0.020	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	0.17	0.0034	0.010	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.073	0.0029	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.0051	0.0036	0.010	0.020	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.24	0.0026	0.010	0.020	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.023	0.0046	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.082	0.0027	0.010	0.020	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN04-003-SO-011 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGH834 **Sample Date/Time:** 2017-04-20 10:00 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	2.7	0.32	0.60	1.0	ug/kg		J	07
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROBUTANOIC ACID	375-22-4	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
PERFLUORODECANE SULFONATE	335-77-3	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	<0.40	0.13	0.40	1.0	ug/kg	U	UJ	07
PERFLUORODODECANOIC ACID	307-55-1	<0.60	0.22	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEXANE SULFONATE	108427-53-8	0.46	0.23	0.60	1.0	ug/kg	J	J	07
PERFLUOROHEXANOIC ACID	307-24-4	0.37	0.19	0.60	1.0	ug/kg	J	J	07
PERFLUORONONANOIC ACID	375-95-1	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.45	0.26	0.60	1.0	ug/kg	J	J	07
PERFLUOROOCTANE SULFONATE	1763-23-1	40	0.21	0.60	1.0	ug/kg		J	07
PERFLUOROOCTANOIC ACID	335-67-1	<0.60	0.26	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROPENTANOIC ACID	2706-90-3	<0.60	0.18	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.40	0.11	0.40	1.0	ug/kg	U	UJ	07;10A
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.40	0.12	0.40	1.0	ug/kg	U	UJ	07;10A
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.60	0.18	0.60	1.0	ug/kg	U	UJ	07

Analysis Method: EPA 537 m

Sample Name BRLTN04-003-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGH833 **Sample Date/Time:** 2017-04-20 09:40 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.60	0.23	0.60	1.0	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.54	0.32	0.60	1.0	ug/kg	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.17	0.60	1.0	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	1.2	0.23	0.60	1.0	ug/kg			
PERFLUORODECANE SULFONATE	335-77-3	13	0.23	0.60	1.0	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	0.42	0.13	0.40	1.0	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	0.48	0.22	0.60	1.0	ug/kg	J	J	
PERFLUOROHEPTANOIC ACID	375-85-9	0.52	0.17	0.60	1.0	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	4.4	0.23	0.60	1.0	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	0.57	0.19	0.60	1.0	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	2.2	0.17	0.60	1.0	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	2.5	0.26	0.60	1.0	ug/kg		J	07
PERFLUOROOCTANE SULFONATE	1763-23-1	36	0.21	0.60	1.0	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	1.8	0.26	0.60	1.0	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	0.70	0.18	0.60	1.0	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.40	0.11	0.40	1.0	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.40	0.12	0.40	1.0	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.83	0.18	0.60	1.0	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name BRLTN04-004-GW-018 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGH839 **Sample Date/Time:** 2017-04-20 12:00 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.030	0.0032	0.010	0.020	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.039	0.0048	0.010	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.11	0.0066	0.014	0.020	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.033	0.0033	0.010	0.020	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	0.78	0.0034	0.010	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.23	0.0029	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.014	0.0046	0.010	0.020	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.0050	0.0036	0.010	0.020	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.26	0.0026	0.010	0.020	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.061	0.0046	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.22	0.0027	0.010	0.020	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN04-004-GW-918 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGH840 **Sample Date/Time:** 2017-04-20 12:00 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.025	0.0032	0.010	0.020	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.044	0.0048	0.010	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.11	0.0066	0.015	0.020	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.034	0.0033	0.010	0.020	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	0.93	0.0034	0.010	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.20	0.0029	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.016	0.0046	0.010	0.020	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.0043	0.0036	0.010	0.020	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.26	0.0026	0.010	0.020	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.062	0.0046	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.23	0.0027	0.010	0.020	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN04-004-SO-013 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGH838 **Sample Date/Time:** 2017-04-20 11:30 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.45	0.32	0.60	1.0	ug/kg	J	J	07
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROBUTANOIC ACID	375-22-4	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
PERFLUORODECANE SULFONATE	335-77-3	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
PERFLUORODECANOIC ACID	335-76-2	<0.40	0.13	0.40	1.0	ug/kg	U	UJ	07
PERFLUORODODECANOIC ACID	307-55-1	<0.60	0.22	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.60	0.23	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROHEXANOIC ACID	307-24-4	<0.60	0.19	0.60	1.0	ug/kg	U	UJ	07
PERFLUORONONANOIC ACID	375-95-1	<0.60	0.17	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.60	0.26	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONATE	1763-23-1	6.0	0.21	0.60	1.0	ug/kg		J	07
PERFLUOROOCTANOIC ACID	335-67-1	<0.60	0.26	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROPENTANOIC ACID	2706-90-3	<0.60	0.18	0.60	1.0	ug/kg	U	UJ	07
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.40	0.11	0.40	1.0	ug/kg	U	UJ	07
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.40	0.12	0.40	1.0	ug/kg	U	UJ	07
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.60	0.18	0.60	1.0	ug/kg	U	UJ	07

Analysis Method: EPA 537 m

Sample Name BRLTN04-004-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGH836 **Sample Date/Time:** 2017-04-20 11:00 **Validation Level:** Stage 4

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.53	0.20	0.53	0.88	ug/kg	U	UJ	07
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.53	0.28	0.53	0.88	ug/kg	U	UJ	07
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.53	0.15	0.53	0.88	ug/kg	U	UJ	07
PERFLUOROBUTANOIC ACID	375-22-4	0.64	0.20	0.53	0.88	ug/kg	J	J	07
PERFLUORODECANE SULFONATE	335-77-3	0.57	0.20	0.53	0.88	ug/kg	J	J	07
PERFLUORODECANOIC ACID	335-76-2	0.34	0.11	0.53	0.88	ug/kg	J	J	07
PERFLUORODODECANOIC ACID	307-55-1	<0.53	0.19	0.53	0.88	ug/kg	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	0.36	0.15	0.53	0.88	ug/kg	J	J	07
PERFLUOROHEXANE SULFONATE	108427-53-8	0.63	0.20	0.53	0.88	ug/kg	J	J	07
PERFLUOROHEXANOIC ACID	307-24-4	0.30	0.17	0.53	0.88	ug/kg	J	J	07
PERFLUORONONANOIC ACID	375-95-1	1.6	0.15	0.53	0.88	ug/kg		J	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.53	0.23	0.53	0.88	ug/kg	U	UJ	07
PERFLUOROOCTANE SULFONATE	1763-23-1	18	0.18	0.53	0.88	ug/kg		J	07
PERFLUOROOCTANOIC ACID	335-67-1	0.94	0.23	0.53	0.88	ug/kg		J	07
PERFLUOROPENTANOIC ACID	2706-90-3	0.35	0.16	0.53	0.88	ug/kg	J	J	07
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.35	0.097	0.35	0.88	ug/kg	U	UJ	07;10A
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.35	0.11	0.35	0.88	ug/kg	U	UJ	07;10A
PERFLUOROUNDECANOIC ACID	2058-94-8	0.44	0.16	0.53	0.88	ug/kg	J	J	07

Analysis Method: EPA 537 m

Sample Name BRLTN-RS-003 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGH837 **Sample Date/Time:** 2017-04-20 11:10 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.010	0.0032	0.010	0.020	ug/L	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.010	0.0048	0.010	0.020	ug/L	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.014	0.0066	0.014	0.020	ug/L	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.010	0.0034	0.010	0.020	ug/L	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.010	0.0029	0.010	0.020	ug/L	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.010	0.0026	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.010	0.0027	0.010	0.020	ug/L	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name BRLTN-WS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EGH850 **Sample Date/Time:** 2017-04-21 12:20 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.27	0.21	0.55	0.92	ug/kg	J	J	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	1.7	0.29	0.55	0.92	ug/kg			
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.55	0.16	0.55	0.92	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	0.51	0.21	0.55	0.92	ug/kg	J	J	07
PERFLUORODECANE SULFONATE	335-77-3	1.1	0.21	0.55	0.92	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	0.32	0.12	0.37	0.92	ug/kg	J	J	07
PERFLUORODODECANOIC ACID	307-55-1	<0.55	0.20	0.55	0.92	ug/kg	U	UJ	07
PERFLUOROHEPTANOIC ACID	375-85-9	0.51	0.16	0.55	0.92	ug/kg	J	J	07
PERFLUOROHEXANE SULFONATE	108427-53-8	19	0.21	0.55	0.92	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	3.7	0.17	0.55	0.92	ug/kg		J	07
PERFLUORONONANOIC ACID	375-95-1	0.60	0.16	0.55	0.92	ug/kg	J	J	07
PERFLUOROOCTANE SULFONAMIDE	754-91-6	77	2.4	5.5	9.2	ug/kg			
PERFLUOROOCTANE SULFONATE	1763-23-1	220	1.9	5.5	9.2	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	6.3	0.24	0.55	0.92	ug/kg		J	07
PERFLUOROPENTANOIC ACID	2706-90-3	0.52	0.17	0.55	0.92	ug/kg	J	J	07
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.37	0.10	0.37	0.92	ug/kg	U	UJ	07
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.37	0.11	0.37	0.92	ug/kg	U	UJ	07
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.55	0.17	0.55	0.92	ug/kg	U	UJ	07

Analysis Method: EPA 537 m

Sample Name BRLTN-WW-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EGH849 **Sample Date/Time:** 2017-04-21 12:15 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	1.3	0.032	0.10	0.20	ug/L		J	10A
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.072	0.036	0.10	0.20	ug/L	J	J	10A
PERFLUOROBUTANE SULFONATE	29420-43-3	0.83	0.048	0.10	0.20	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.24	0.066	0.14	0.20	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.10	0.046	0.10	0.20	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.10	0.040	0.10	0.20	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.10	0.028	0.10	0.20	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.38	0.033	0.10	0.20	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	9.3	0.034	0.10	0.20	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	1.8	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.047	0.046	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.60	0.036	0.10	0.20	ug/L			
PERFLUOROOCTANE SULFONATE	1763-23-1	21	0.13	0.50	1.0	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	1.4	0.046	0.10	0.20	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.69	0.027	0.10	0.20	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.10	0.038	0.10	0.20	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.10	0.033	0.10	0.20	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.10	0.043	0.10	0.20	ug/L	U	U	

Appendix E

Investigation-Derived Waste Manifests

(Manifests will be provided after waste disposal.)

Appendix F

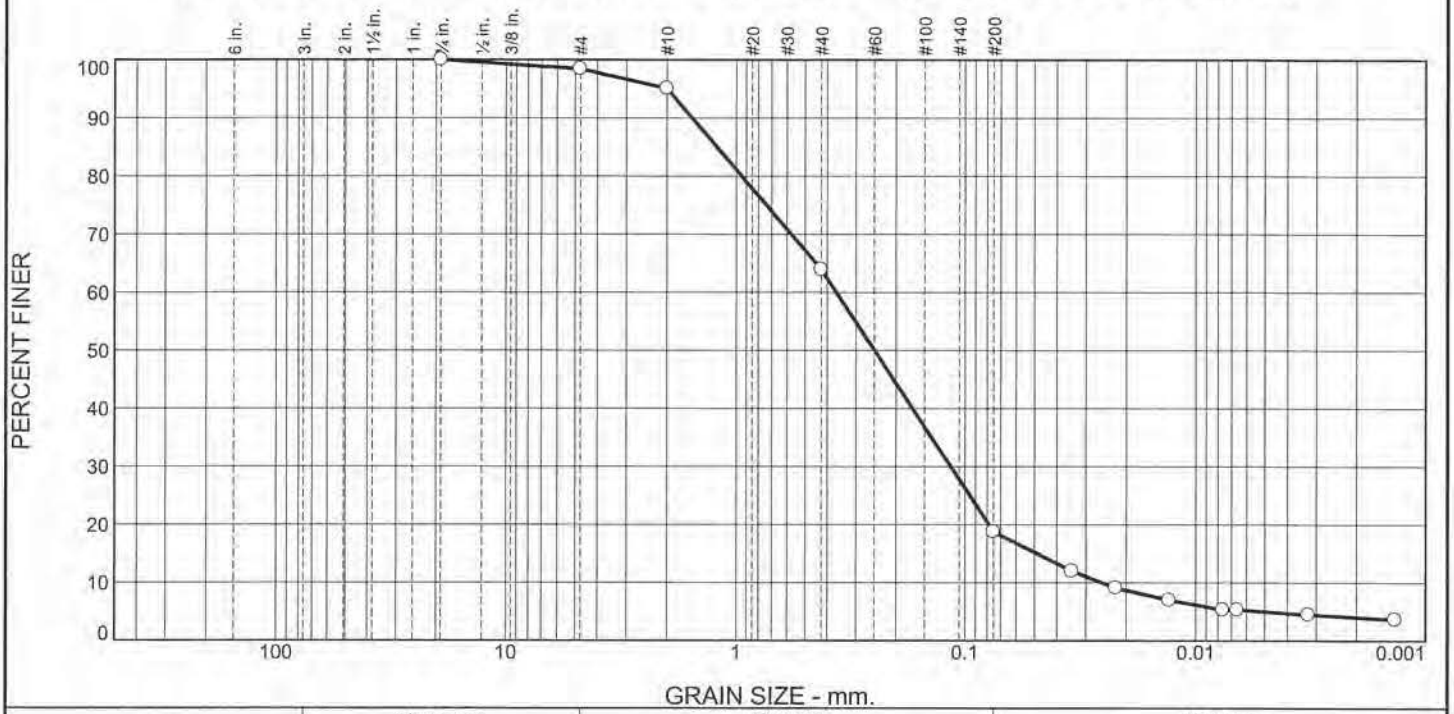
Soil Physiochemical Analytical Results

Table F-1 Soil Physiochemical Analyses Summary

AFFF Area	Sample Number	Percent Passing No. 4 Screen	Percent Passing No. 200 Screen	USCS Classification	TOC (mg/kg)	pH	Percent Solids
AFFF Area 1 Former FTA 1 (IRP Site 1)	BRLTN01-004-SS-001	98.4	18.8	SM	15,000	7.03	81.3
	BRLTN01-004-SO-008	95.5	7.9	SP-SM	1,030	6.98	86.7
AFFF Area 2 Building 90 Former Fire Station	BRLTN02-005-SS-001	92.6	20.7	SM	25,600	7.17	65.5
	BRLTN02-005-SO-032	100.0	25.0	SM	331	7.49	88.1
AFFF Area 3 Building 60 Current Fire Station	BRLTN03-004-SS-001	95.4	18.3	SM	2,940	7.26	91.9
	BRLTN03-004-SO-016	100.0	4.3	SP	316	7.48	86.2
AFFF Area 4 Fire Department Equipment Testing Area	BRLTN04-005-SS-001	100.0	21.5	SM	5,160	7.44	81.4
	BRLTN04-005-SO-012	100.0	23.1	SM	484	7.67	89.0
AFFF Area 5 F-16 Emergency Response Site	BRLTN05-004-SS-001	100.0	19.1	SM	983	7.29	75.5
	BRLTN05-004-SO-024	97.1	28.9	SM	434	7.48	85.4

AFFF = aqueous film forming foam
BRLTN = Burlington Air National Guard Base
FTA = fire training area
IRP = Installation Restoration Program
mg/kg = milligrams per kilogram
pH = potential of hydrogen
SM = silty sand
SP = poorly graded sand
SP-SM = poorly graded silty sand
TOC = total organic carbon
USCS = Unified Soil Classification System

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.6	3.3	31.2	45.1	13.8	5.0

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
.75	100.0		
#4	98.4		
#10	95.1		
#40	63.9		
#200	18.8		
0.0344 mm.	12.0		
0.0222 mm.	9.1		
0.0130 mm.	7.0		
0.0076 mm.	5.3		
0.0066 mm.	5.3		
0.0032 mm.	4.5		
0.0014 mm.	3.7		

* (no specification provided)

Client Sample Description

BRLTN01-004-SS-001

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI= NP

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-2-4(0)

Coefficients

D_{90}= 1.5538 D_{85}= 1.2116 D_{60}= 0.3653
D_{50}= 0.2488 D_{30}= 0.1154 D_{15}= 0.0486
D_{10}= 0.0255 C_u= 14.33 C_c= 1.43

Remarks

Date Received: 4/25/17 **Date Tested:** 4/27/17

Tested By: DWB

Checked By: SMF

Title: ENVIRO. DIRECTOR

Sample Number: 858388 **Date Sampled:** 4/20/17

Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories

Project: SIA FFF SAVANNAH - BURLINGTON ARB, VT (PO 126836 MITECH)

Project No: 10671 **Figure** 1

CT LABORATORIES
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Sample Description

BRLTN01-004-SS-001

INORGANIC ANALYSIS DATA SHEET

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	81.3	Lab Sample ID:	858388
Analytical Method:	L-Kahn/9060A	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137280	Analysis Date/Time	04/28/2017 12:20
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:	INSTRUMENT =	Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
TOC	Total Organic Carbon	15000		44	92	180	180

CT LABORATORIES
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1

INORGANIC ANALYSIS DATA SHEET

Sample Description: **BRLTN01-004-SS-001**

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	81.3	Lab Sample ID:	858388
Analytical Method:	EPA 9045D	Date Received:	04/22/2017
Dilution Factor:	1	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137341	Analysis Date/Time	04/28/2017 13:15
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	S.U.

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
PH	pH	7.03		0.1	0.1	0.1	0.1

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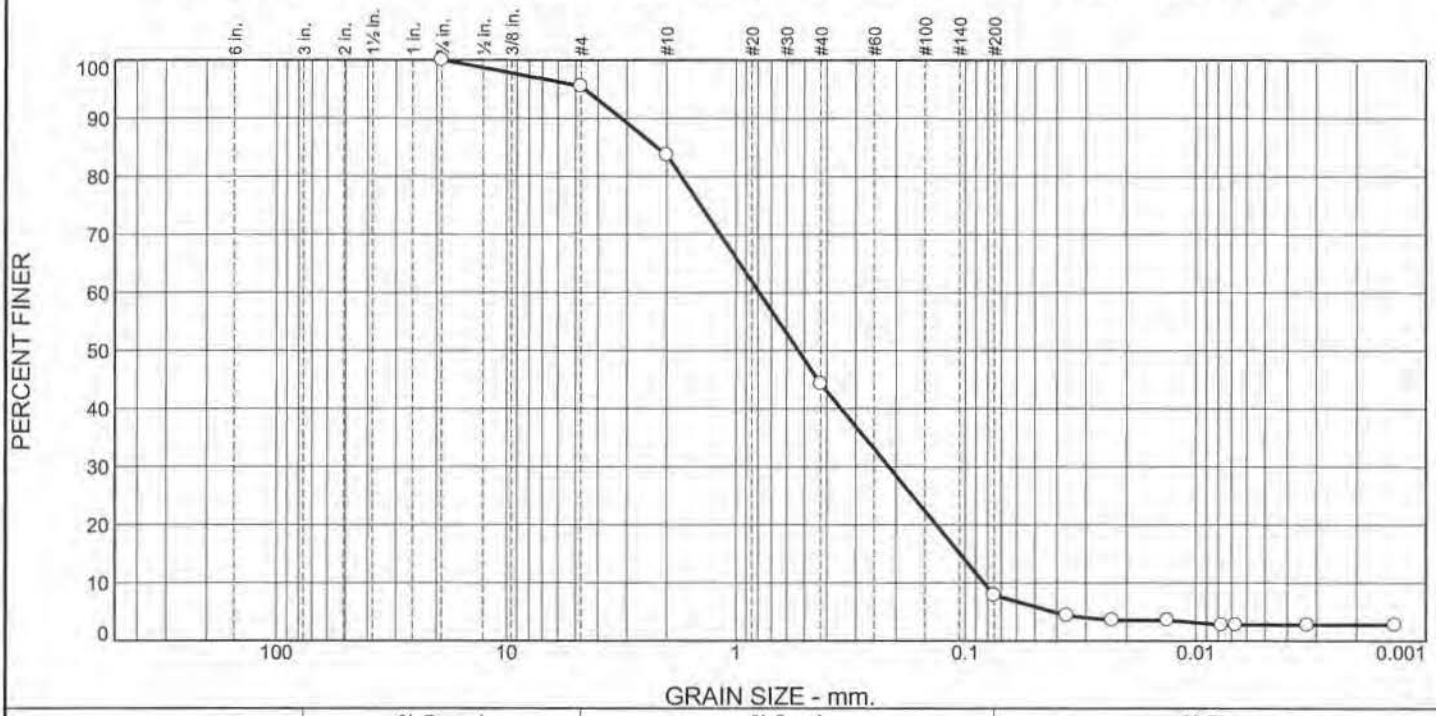
INORGANIC ANALYSIS DATA SHEET

Sample Description: **BRLTN01-004-SS-001**

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	81.3	Lab Sample ID:	858388
Analytical Method:	EPA 8000C	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137160	Analysis Date/Time	04/25/2017 08:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	81.3		0.1	0.1	0.1	0.1

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.5	11.8	39.4	36.4	5.2	2.7

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
.75	100.0		
#4	95.5		
#10	83.7		
#40	44.3		
#200	7.9		
0.0363 mm.	4.4		
0.0231 mm.	3.6		
0.0133 mm.	3.6		
0.0077 mm.	2.7		
0.0067 mm.	2.7		
0.0033 mm.	2.7		
0.0014 mm.	2.7		

* (no specification provided)

Client Sample Description

BRLTN01-004-SO-008

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI=

Classification

USCS (D 2487)= SP-SM AASHTO (M 145)= A-1-b

Coefficients

D_{90}= 3.1730 D_{85}= 2.2034 D_{60}= 0.7887
D_{50}= 0.5323 D_{30}= 0.2153 D_{15}= 0.1053
D_{10}= 0.0830 C_u= 9.50 C_c= 0.71

Remarks

Date Received: 4/25/17 **Date Tested:** 4/27/17

Tested By: DWB

Checked By: SMF

Title: ENVIRO. DIRECTOR

Sample Number: 858389 **Date Sampled:** 4/20/17

Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories
Project: SIA FFF SAVANNAH - BURLINGTON ARB, VT (PO 126836 MITECH)
Project No: 10671 **Figure** 2

CT LABORATORIES
delivering more than data from your environmental analyses

1

Sample Description

BRLTN01-004-SO-008

INORGANIC ANALYSIS DATA SHEET

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	86.7	Lab Sample ID:	858389
Analytical Method:	L-Kahn/9060A	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137280	Analysis Date/Time	04/28/2017 13:34
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:	INSTRUMENT =	Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
TOC	Total Organic Carbon	1030		42	87	170	170

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

BRLTN01-004-SO-008

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	86.7	Lab Sample ID:	858389
Analytical Method:	EPA 9045D	Date Received:	04/22/2017
Dilution Factor:	1	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137341	Analysis Date/Time	04/28/2017 13:15
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	S.U.

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
PH	pH	6.98		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

Sample Description

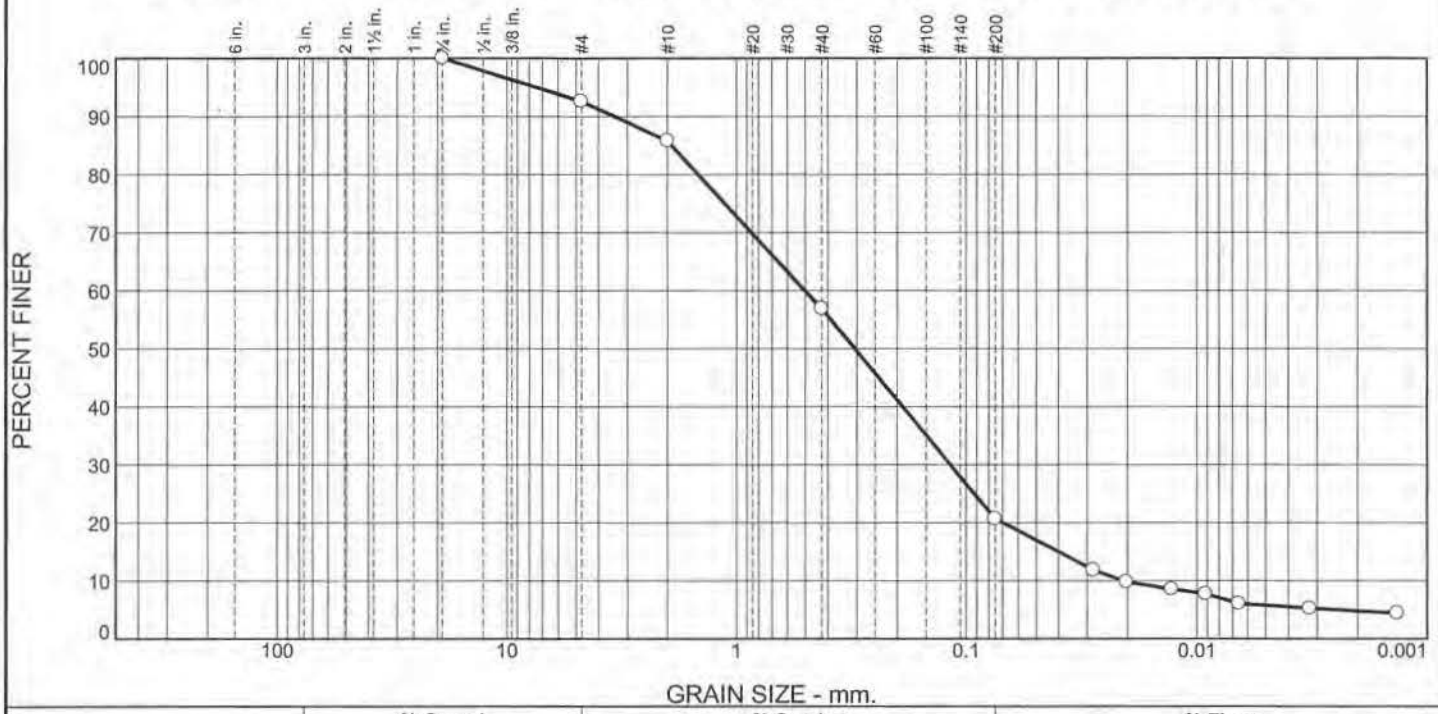
BRLTN01-004-SO-008

INORGANIC ANALYSIS DATA SHEET

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	86.7	Lab Sample ID:	858389
Analytical Method:	EPA 8000C	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137160	Analysis Date/Time	04/25/2017 08:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	86.7		0.1	0.1	0.1	0.1

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	7.4	6.8	28.9	36.2	14.9	5.8

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
.75	100.0		
#4	92.6		
#10	85.8		
#40	56.9		
#200	20.7		
0.0281 mm.	11.8		
0.0202 mm.	9.8		
0.0129 mm.	8.5		
0.0092 mm.	7.7		
0.0066 mm.	6.1		
0.0032 mm.	5.3		
0.0014 mm.	4.4		

* (no specification provided)

Client Sample Description

BRLTN02-005-SS-001

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-2-4(0)

Coefficients

D_{90}= 3.4208 D_{85}= 1.9200 D_{60}= 0.5026
D_{50}= 0.3058 D_{30}= 0.1173 D_{15}= 0.0400
D_{10}= 0.0209 C_u= 24.04 C_c= 1.31

Remarks

Date Received: 4/25/17 **Date Tested:** 4/27/17

Tested By: DWB

Checked By: SMF

Title: ENVIRO. DIRECTOR

Sample Number: 858390 **Date Sampled:** 4/18/17

Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories
Project: SIA FFF SAVANNAH - BURLINGTON ARB, VT (PO 126836 MITECH)
Project No: 10671 **Figure** 3

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description: **BRLTN02-005-SS-001**

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	65.5	Lab Sample ID:	858390
Analytical Method:	L-Kahn/9060A	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137280	Analysis Date/Time	04/28/2017 13:40
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:	INSTRUMENT =	Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
TOC	Total Organic Carbon	25600		55	110	230	230

CT LABORATORIES
delivering more than data from your environmental analyses

1

Sample Description

BRLTN02-005-SS-001

INORGANIC ANALYSIS DATA SHEET

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	65.5	Lab Sample ID:	858390
Analytical Method:	EPA 9045D	Date Received:	04/22/2017
Dilution Factor:	1	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137341	Analysis Date/Time	04/28/2017 13:15
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	S.U.

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
PH	pH	7.17		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

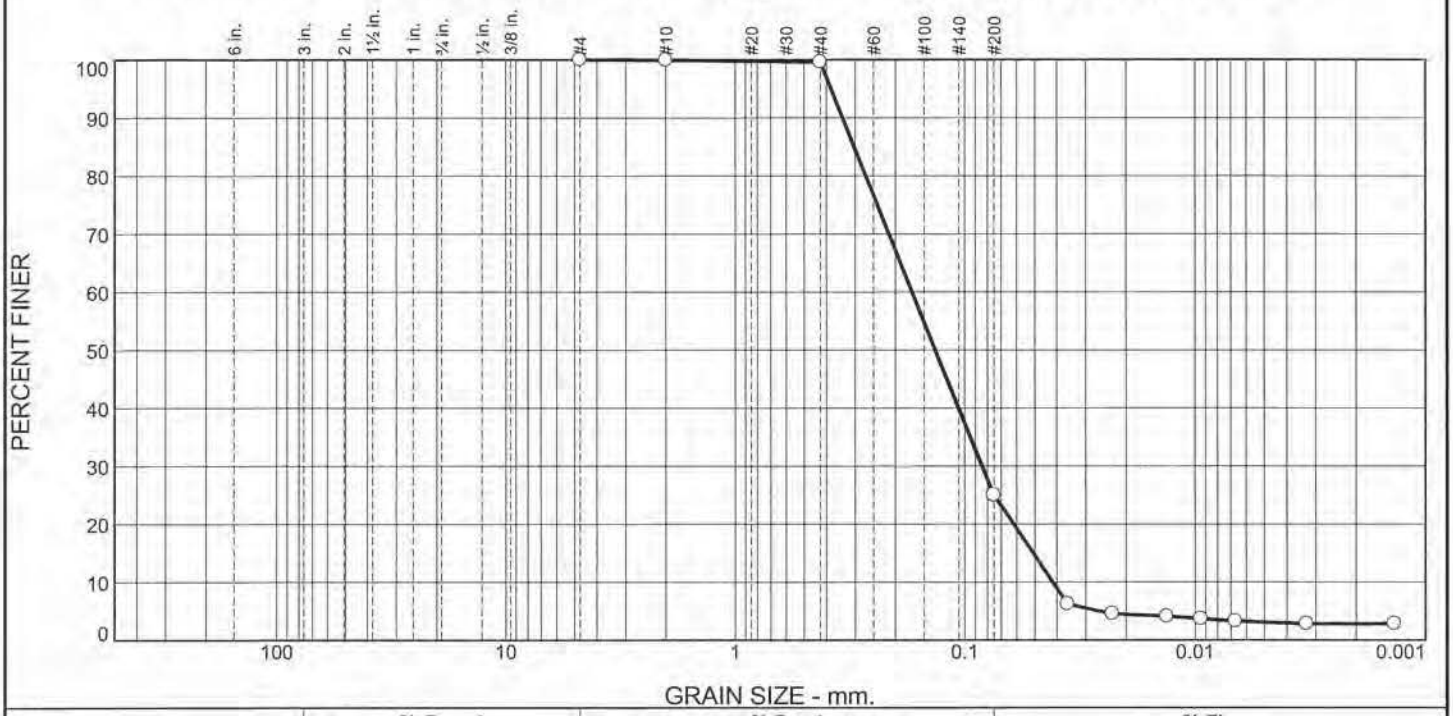
Sample Description

BRLTN02-005-SS-001

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	65.5	Lab Sample ID:	858390
Analytical Method:	EPA 8000C	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137160	Analysis Date/Time	04/25/2017 08:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	65.5		0.1	0.1	0.1	0.1

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.3	74.6	21.9	3.1

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.9		
#40	99.6		
#200	25.0		
0.0359 mm.	6.2		
0.0229 mm.	4.5		
0.0133 mm.	4.1		
0.0094 mm.	3.7		
0.0067 mm.	3.3		
0.0033 mm.	2.8		
0.0014 mm.	2.8		

* (no specification provided)

Client Sample Description

BRLTN02-005-SO-032

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-2-4(0)

Coefficients

D_{90}= 0.3401 D_{85}= 0.3028 D_{60}= 0.1693
D_{50}= 0.1342 D_{30}= 0.0843 D_{15}= 0.0507
D_{10}= 0.0416 C_u= 4.07 C_c= 1.01

Remarks

Date Received: 4/25/17 **Date Tested:** 4/27/17

Tested By: DWB

Checked By: SMF

Title: ENVIRO. DIRECTOR

Sample Number: 858391 **Date Sampled:** 4/18/17

Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories

Project: SIA FFF SAVANNAH - BURLINGTON ARB, VT (PO 126836 MITECH)

Project No: 10671 **Figure** 4

CT LABORATORIES
delivering more than data from your environmental analyses

1

Sample Description

BRLTN02-005-SO-032

INORGANIC ANALYSIS DATA SHEET

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	88.1	Lab Sample ID:	858391
Analytical Method:	L-Kahn/9060A	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137280	Analysis Date/Time	04/28/2017 13:46
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:	INSTRUMENT =	Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
TOC	Total Organic Carbon	331		41	85	170	170

CT LABORATORIES
delivering more than data from your environmental analyses

1

Sample Description

BRLTN02-005-SO-032

INORGANIC ANALYSIS DATA SHEET

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	88.1	Lab Sample ID:	858391
Analytical Method:	EPA 9045D	Date Received:	04/22/2017
Dilution Factor:	1	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137341	Analysis Date/Time	04/28/2017 13:15
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	S.U.

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
PH	pH	7.49		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

Sample Description

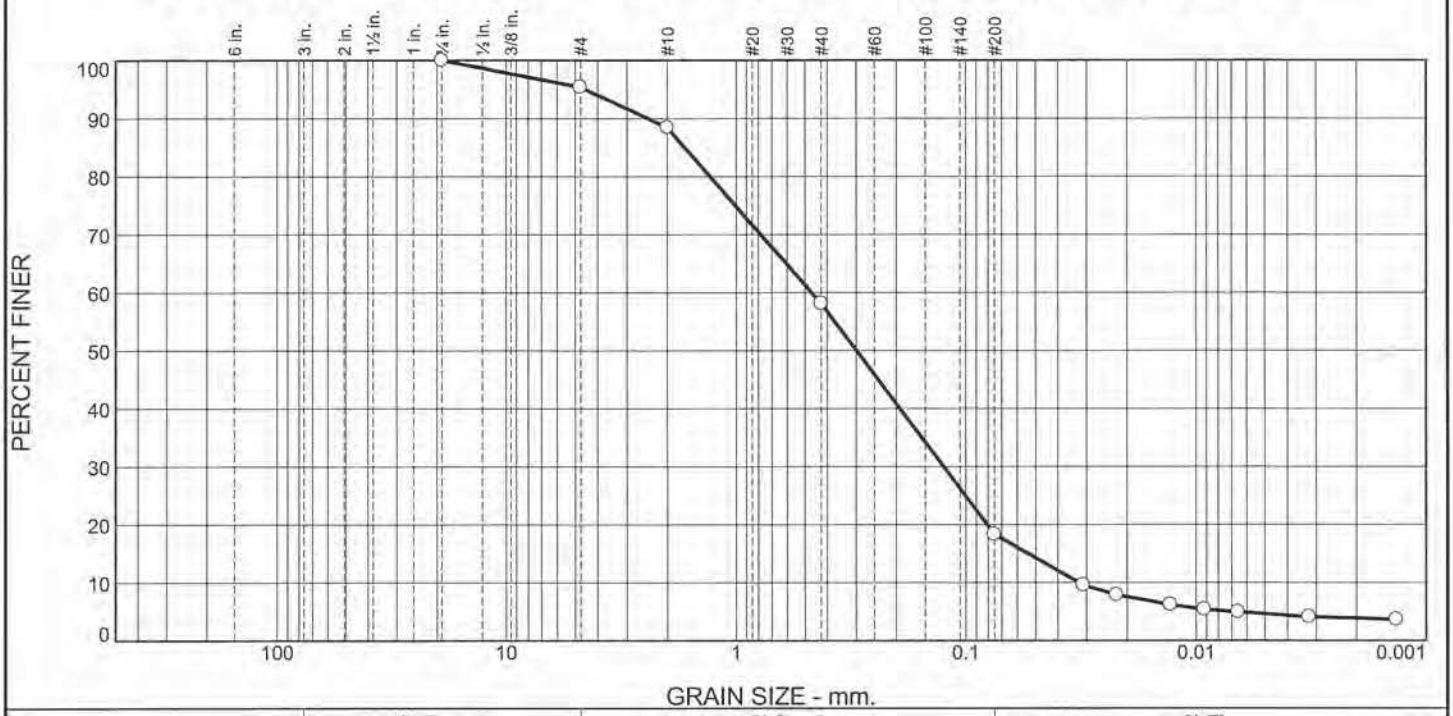
BRLTN02-005-SO-032

INORGANIC ANALYSIS DATA SHEET

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	88.1	Lab Sample ID:	858391
Analytical Method:	EPA 8000C	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137160	Analysis Date/Time	04/25/2017 08:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	88.1		0.1	0.1	0.1	0.1

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.6	7.0	30.3	39.8	13.7	4.6

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
.75	100.0		
#4	95.4		
#10	88.4		
#40	58.1		
#200	18.3		
0.0310 mm.	9.6		
0.0222 mm.	7.9		
0.0130 mm.	6.2		
0.0092 mm.	5.4		
0.0065 mm.	4.9		
0.0032 mm.	4.1		
0.0013 mm.	3.7		

* (no specification provided)

Client Sample Description

BRLTN03-004-SS-001

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI= NP

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-2-4(0)

Coefficients

D_{90}= 2.4354 D_{85}= 1.6799 D_{60}= 0.4683
D_{50}= 0.2986 D_{30}= 0.1249 D_{15}= 0.0537
D_{10}= 0.0324 C_u= 14.45 C_c= 1.03

Remarks

Date Received: 4/25/17 **Date Tested:** 4/27/17

Tested By: DWB

Checked By: SMF

Title: ENVIRO. DIRECTOR

Sample Number: 858392 **Date Sampled:** 4/18/17

Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories

Project: SIA FFF SAVANNAH - BURLINGTON ARB, VT (PO 126836 MITECH)

Project No: 10671 **Figure** 5

CT LABORATORIES
delivering more than data from your environmental analyses

1

Sample Description

BRLTN03-004-SS-001

INORGANIC ANALYSIS DATA SHEET

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	91.9	Lab Sample ID:	858392
Analytical Method:	L-Kahn/9060A	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137280	Analysis Date/Time	04/28/2017 13:54
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:	INSTRUMENT =	Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
TOC	Total Organic Carbon	2940		39	82	160	160

CT LABORATORIES
delivering more than data from your environmental analyses

1

Sample Description

BRLTN03-004-SS-001

INORGANIC ANALYSIS DATA SHEET

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	91.9	Lab Sample ID:	858392
Analytical Method:	EPA 9045D	Date Received:	04/22/2017
Dilution Factor:	1	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137341	Analysis Date/Time	04/28/2017 13:15
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	S.U.

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
PH	pH	7.26		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

Sample Description

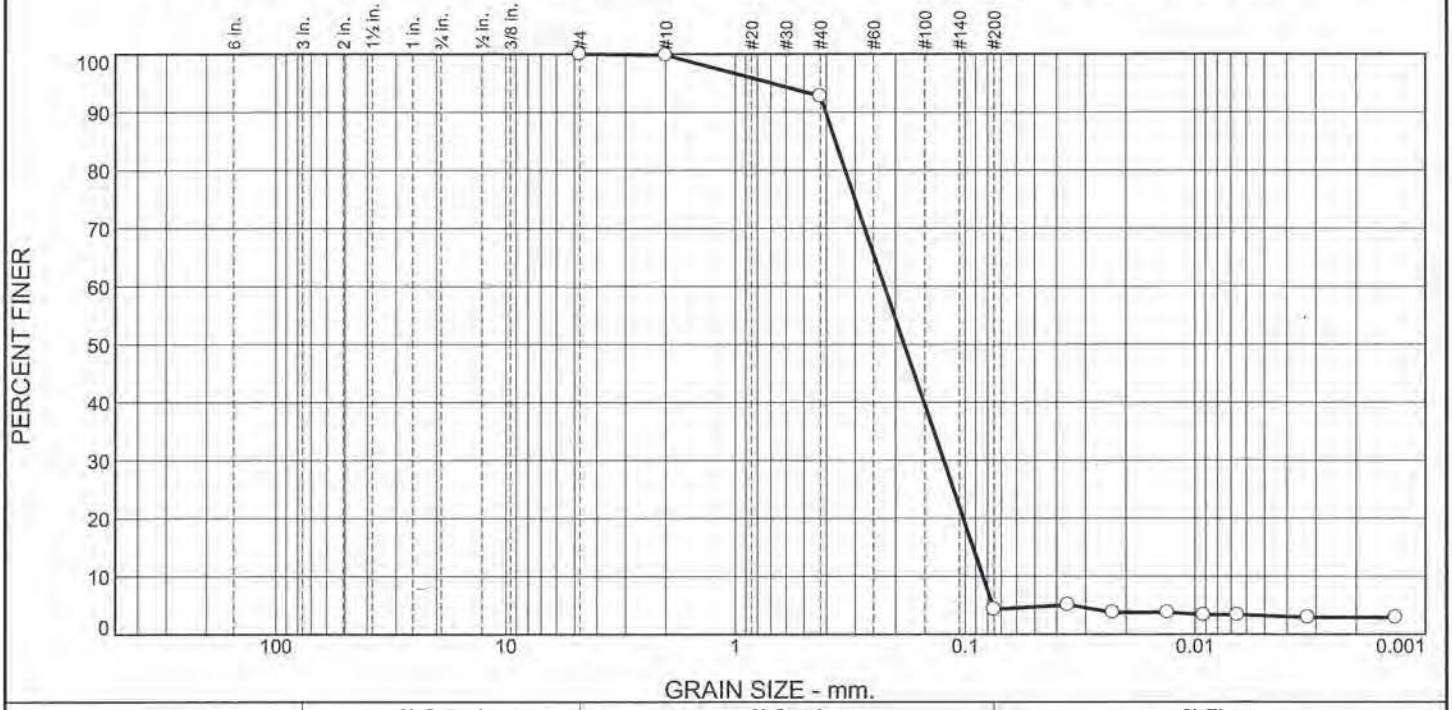
BRLTN03-004-SS-001

INORGANIC ANALYSIS DATA SHEET

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	91.9	Lab Sample ID:	858392
Analytical Method:	EPA 8000C	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137160	Analysis Date/Time	04/25/2017 08:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	91.9		0.1	0.1	0.1	0.1

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	7.1	88.4	1.1	3.2

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.8		
#40	92.7		
#200	4.3		
0.0358 mm.	5.1		
0.0228 mm.	3.8		
0.0132 mm.	3.8		
0.0092 mm.	3.4		
0.0066 mm.	3.4		
0.0032 mm.	2.9		
0.0014 mm.	2.9		

* (no specification provided)

Client Sample Description

BRLTN03-004-SO-016

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI=

Classification

USCS (D 2487)= SP AASHTO (M 145)= A-3

Coefficients

D_{90}= 0.4028 D_{85}= 0.3651 D_{60}= 0.2236
D_{50}= 0.1838 D_{30}= 0.1241 D_{15}= 0.0925
D_{10}= 0.0838 C_u= 2.67 C_c= 0.82

Remarks

Date Received: 4/25/17 **Date Tested:** 4/27/17

Tested By: DWB

Checked By: SMF

Title: ENV. DIRECTOR

Sample Number: 858393 **Date Sampled:** 4/18/17

Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories

Project: SIA FFF SAVANNAH - BURLINGTON ARB, VT (PO 126836 MITECH)

Project No: 10671 **Figure** 6

CT LABORATORIES
delivering more than data from your environmental analyses

1

Sample Description

BRLTN03-004-SO-016

INORGANIC ANALYSIS DATA SHEET

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	86.2	Lab Sample ID:	858393
Analytical Method:	L-Kahn/9060A	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137280	Analysis Date/Time	04/28/2017 15:19
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:	INSTRUMENT =	Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
TOC	Total Organic Carbon	316		42	87	170	170

CT LABORATORIES
delivering more than data from your environmental analyses

1

Sample Description

BRLTN03-004-SO-016

INORGANIC ANALYSIS DATA SHEET

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	86.2	Lab Sample ID:	858393
Analytical Method:	EPA 9045D	Date Received:	04/22/2017
Dilution Factor:	1	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137341	Analysis Date/Time	04/28/2017 13:15
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	S.U.

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
PH	pH	7.48		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

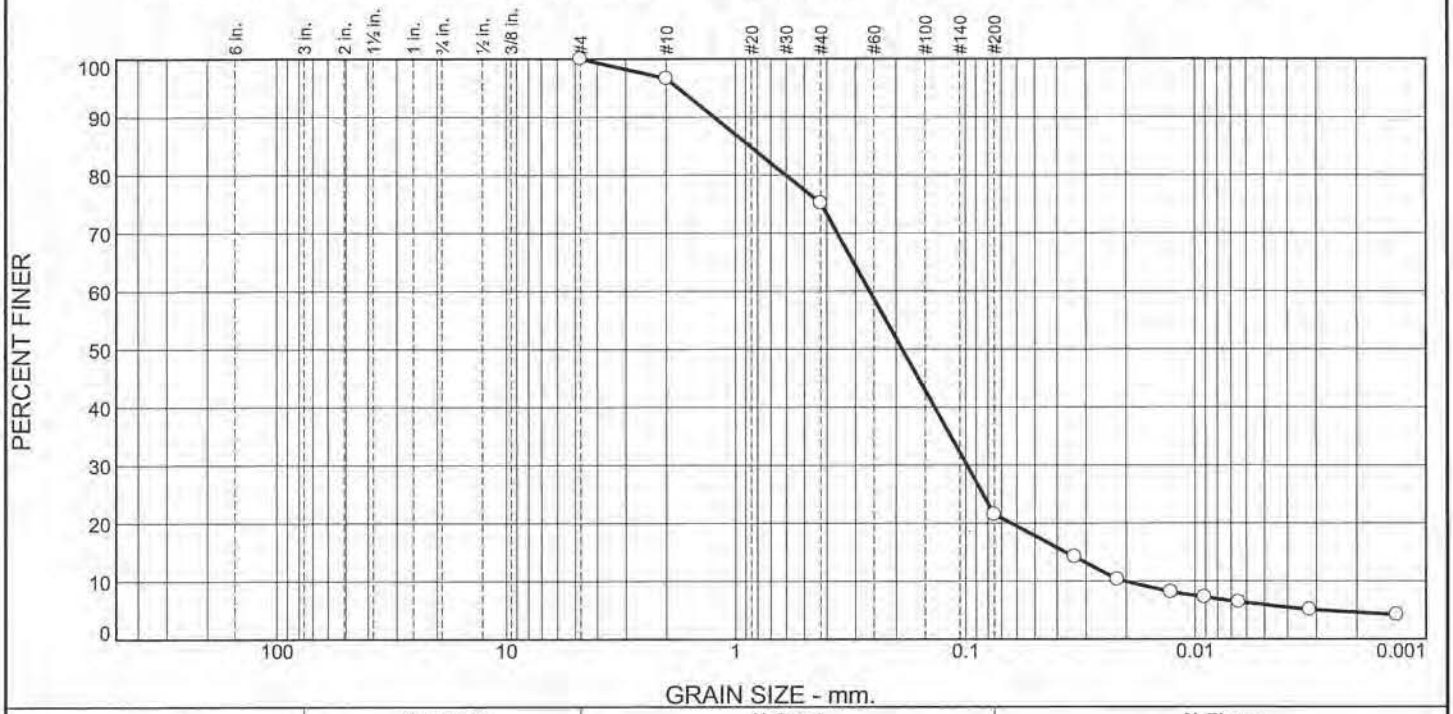
INORGANIC ANALYSIS DATA SHEET

Sample Description: **BRLTN03-004-SO-016**

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	86.2	Lab Sample ID:	858393
Analytical Method:	EPA 8000C	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137160	Analysis Date/Time	04/25/2017 08:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	86.2		0.1	0.1	0.1	0.1

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	3.4	21.5	53.6	15.6	5.9

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	96.6		
#40	75.1		
#200	21.5		
0.0336 mm.	14.2		
0.0218 mm.	10.3		
0.0128 mm.	8.1		
0.0091 mm.	7.3		
0.0065 mm.	6.4		
0.0032 mm.	5.1		
0.0013 mm.	4.2		

* (no specification provided)

Client Sample Description

BRLTN04-005-SS-001

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-2-4(0)

Coefficients

D_{90}= 1.2411 D_{85}= 0.8656 D_{60}= 0.2606
D_{50}= 0.1886 D_{30}= 0.0988 D_{15}= 0.0367
D_{10}= 0.0203 C_u= 12.84 C_c= 1.84

Remarks

Date Received: 4/25/17 **Date Tested:** 4/27/17

Tested By: DWB

Checked By: SMF

Title: ENVIRO. DIRECTOR

Sample Number: 858396 **Date Sampled:** 4/20/17

Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories

Project: SIA FFF SAVANNAH - BURLINGTON ARB, VT (PO 126836 MITECH)

Project No: 10671 **Figure** 9

CT LABORATORIES
delivering more than data from your environmental analyses

1

Sample Description

BRLTN04-005-SS-001

INORGANIC ANALYSIS DATA SHEET

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	81.4	Lab Sample ID:	858396
Analytical Method:	L-Kahn/9060A	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137280	Analysis Date/Time	04/28/2017 14:22
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:	INSTRUMENT =	Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
TOC	Total Organic Carbon	5160		44	92	180	180

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description: **BRLTN04-005-SS-001**

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	81.4	Lab Sample ID:	858396
Analytical Method:	EPA 9045D	Date Received:	04/22/2017
Dilution Factor:	1	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137341	Analysis Date/Time	04/28/2017 13:15
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	S.U.

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
PH	pH	7.44		0.1	0.1	0.1	0.1

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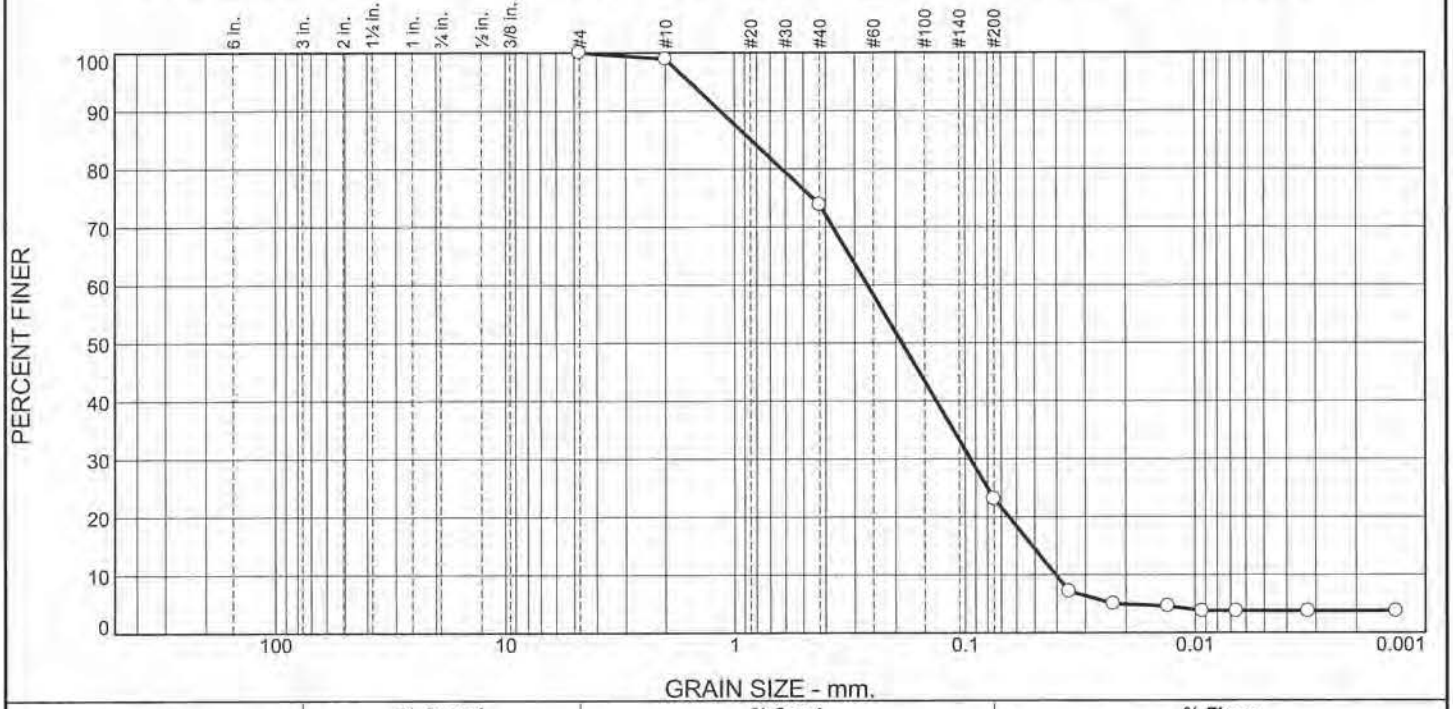
INORGANIC ANALYSIS DATA SHEET

Sample Description: **BRLTN04-005-SS-001**

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	81.4	Lab Sample ID:	858396
Analytical Method:	EPA 8000C	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137160	Analysis Date/Time	04/25/2017 08:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	81.4		0.1	0.1	0.1	0.1

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.1	25.1	50.7	19.4	3.7

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	98.9		
#40	73.8		
#200	23.1		
0.0353 mm.	7.1		
0.0226 mm.	5.0		
0.0131 mm.	4.6		
0.0093 mm.	3.7		
0.0066 mm.	3.7		
0.0032 mm.	3.7		
0.0013 mm.	3.7		

* (no specification provided)

Client Sample Description

BRLTN04-005-SO-012

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-2-4(0)

Coefficients

D_{90}= 1.1545 D_{85}= 0.8477 D_{60}= 0.2649
D_{50}= 0.1882 D_{30}= 0.0949 D_{15}= 0.0511
D_{10}= 0.0404 C_u= 6.56 C_c= 0.84

Remarks

Date Received: 4/25/17 **Date Tested:** 4/27/17

Tested By: DWB

Checked By: SMF

Title: ENVIRO. DIRECTOR

Sample Number: 858397 **Date Sampled:** 4/20/17

Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories
Project: SIA FFF SAVANNAH - BURLINGTON ARB, VT (PO 126836 MITECH)
Project No: 10671 **Figure** 10

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INORGANIC ANALYSIS DATA SHEET

Sample Description: **BRLTN04-005-SO-012**

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	89.0	Lab Sample ID:	858397
Analytical Method:	L-Kahn/9060A	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137280	Analysis Date/Time	04/28/2017 15:08
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:	INSTRUMENT =	Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
TOC	Total Organic Carbon	484		40	84	170	170

CT LABORATORIES
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Sample Description

BRLTN04-005-SO-012

INORGANIC ANALYSIS DATA SHEET

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	89.0	Lab Sample ID:	858397
Analytical Method:	EPA 9045D	Date Received:	04/22/2017
Dilution Factor:	1	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137341	Analysis Date/Time	04/28/2017 13:15
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	S.U.

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
PH	pH	7.67		0.1	0.1	0.1	0.1

CT LABORATORIES
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Sample Description

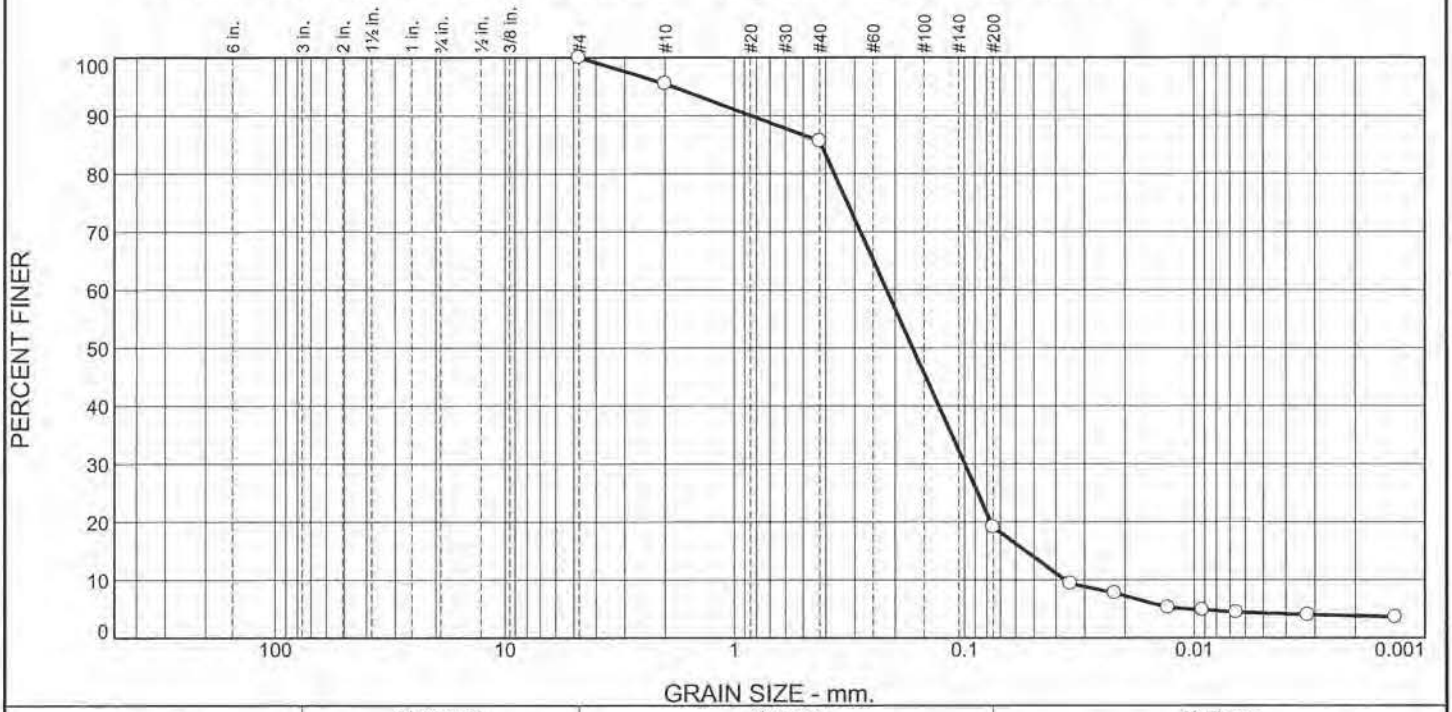
BRLTN04-005-SO-012

INORGANIC ANALYSIS DATA SHEET

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	89.0	Lab Sample ID:	858397
Analytical Method:	EPA 8000C	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137160	Analysis Date/Time	04/25/2017 08:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	89.0		0.1	0.1	0.1	0.1

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	4.5	9.9	66.5	14.8	4.3

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	95.5		
#40	85.6		
#200	19.1		
0.0346 mm.	9.4		
0.0222 mm.	7.7		
0.0130 mm.	5.3		
0.0092 mm.	4.8		
0.0066 mm.	4.4		
0.0032 mm.	4.0		
0.0013 mm.	3.6		

* (no specification provided)

Client Sample Description

BRLTN05-004-SS-001

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-2-4(0)

Coefficients

D_{90}= 0.8467 D_{85}= 0.4183 D_{60}= 0.2180
D_{50}= 0.1680 D_{30}= 0.0997 D_{15}= 0.0542
D_{10}= 0.0364 C_u= 5.98 C_c= 1.25

Remarks

Date Received: 4/25/17 **Date Tested:** 4/27/17

Tested By: DWB

Checked By: SMF

Title: ENVIRO. DIRECTOR

Sample Number: 858394 **Date Sampled:** 4/19/17

Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories
Project: SIA FFF SAVANNAH - BURLINGTON ARB, VT (PO 126836 MITECH)
Project No: 10671 **Figure** 7

CT LABORATORIES
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INORGANIC ANALYSIS DATA SHEET

Sample Description: **BRLTN05-004-SS-001**

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	75.5	Lab Sample ID:	858394
Analytical Method:	L-Kahn/9060A	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137280	Analysis Date/Time	04/28/2017 14:07
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:	INSTRUMENT =	Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
TOC	Total Organic Carbon	983		48	99	200	200

CT LABORATORIES
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INORGANIC ANALYSIS DATA SHEET

Sample Description

BRLTN05-004-SS-001

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	75.5	Lab Sample ID:	858394
Analytical Method:	EPA 9045D	Date Received:	04/22/2017
Dilution Factor:	1	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137341	Analysis Date/Time	04/28/2017 13:15
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	S.U.

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
PH	pH	7.29		0.1	0.1	0.1	0.1

CT LABORATORIES
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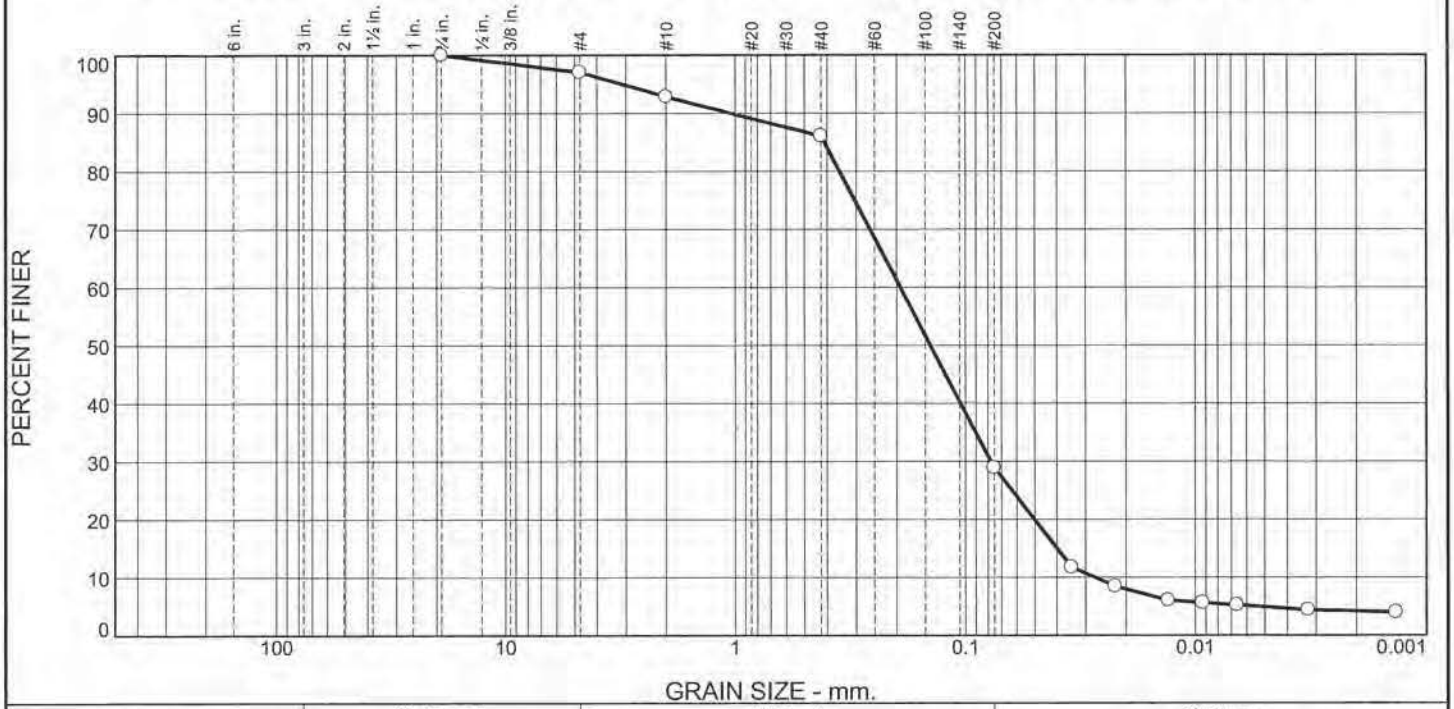
INORGANIC ANALYSIS DATA SHEET

Sample Description: **BRLTN05-004-SS-001**

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	75.5	Lab Sample ID:	858394
Analytical Method:	EPA 8000C	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137160	Analysis Date/Time	04/25/2017 08:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	75.5		0.1	0.1	0.1	0.1

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.9	4.3	6.7	57.2	24.0	4.9

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
.75	100.0		
#4	97.1		
#10	92.8		
#40	86.1		
#200	28.9		
0.0344 mm.	11.7		
0.0223 mm.	8.5		
0.0131 mm.	6.0		
0.0093 mm.	5.6		
0.0066 mm.	5.2		
0.0032 mm.	4.4		
0.0014 mm.	4.0		

* (no specification provided)

Client Sample Description

BRLTN05-004-SO-024

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-2-4(0)

Coefficients

D_{90}= 1.0486 D_{85}= 0.4116 D_{60}= 0.1928
D_{50}= 0.1424 D_{30}= 0.0776 D_{15}= 0.0399
D_{10}= 0.0273 C_u= 7.05 C_c= 1.14

Remarks

Date Received: 4/25/17 **Date Tested:** 4/27/17

Tested By: DWB

Checked By: SMF

Title: ENVIRO. DIRECTOR

Sample Number: 858395 **Date Sampled:** 4/19/17

Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories

Project: SIA FFF SAVANNAH - BURLINGTON ARB, VT (PO 126836 MITECH)

Project No: 10671 **Figure** 8

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Sample Description

BRLTN05-004-SO-024

INORGANIC ANALYSIS DATA SHEET

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	85.4	Lab Sample ID:	858395
Analytical Method:	L-Kahn/9060A	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137280	Analysis Date/Time	04/28/2017 14:15
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:	INSTRUMENT =	Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
TOC	Total Organic Carbon	434		42	88	180	180

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INORGANIC ANALYSIS DATA SHEET

Sample Description: **BRLTN05-004-SO-024**

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	85.4	Lab Sample ID:	858395
Analytical Method:	EPA 9045D	Date Received:	04/22/2017
Dilution Factor:	1	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137341	Analysis Date/Time	04/28/2017 13:15
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	S.U.

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
PH	pH	7.48		0.1	0.1	0.1	0.1

CT LABORATORIES
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INORGANIC ANALYSIS DATA SHEET

Sample Description: **BRLTN05-004-SO-024**

Lab Name:	CT Laboratories	Contract:	MAXXAM ANALYTICS-SIA FFF SAVANNAH
Matrix (soil/water):	SOIL	SDG No.:	126836
% Solids:	85.4	Lab Sample ID:	858395
Analytical Method:	EPA 8000C	Date Received:	04/22/2017
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	137160	Analysis Date/Time	04/25/2017 08:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	85.4		0.1	0.1	0.1	0.1

Appendix G

Groundwater Level Measurements and Elevations

Table G-1 Groundwater Level Measurements and Elevations – April 21, 2017

AFFF Area	Well ID	Well Type	Northing[1,2]	Easting	Total Depth	Ground Surface Elevation[3] (ft)	Top of Casing Elevation[2,3] (ft)	Depth to Water 4/21/17 (ft)	Groundwater Elevation[3] 4/21/17 (ft)
AFFF Area 1 FTA 1	V1-BP-2	Permanent	721641.74	1470494.14	14.2	Not Available	313.97	8.67	305.30
	V1-BP-3	Permanent	721645.72	1470587.06	13.94	Not Available	319.09	11.10	307.99
	V1-MW-102	Permanent	721851.15	1471577.07	11	Not Available	256.19	6.82	249.37
	V1-MW-103	Permanent	721948.28	1471188.86	13.89	Not Available	263.90	3.07	260.83
	V1-MW-13L	Permanent	721911.49	1471098.15	22.81	Not Available	268.38	8.00	260.38
	V1-MW-14L	Permanent	721970.10	1471168.59	10.3	Not Available	262.31	3.76	258.55
	V1-MW-2	Permanent	721604.43	1470425.86	19.75	Not Available	314.26	8.77	305.49
	V1-MW-4	Permanent	721731.14	1470840.35	26.96	Not Available	312.02	18.95	293.07
AFFF Area 2 Building 90 Former Fire Station	BRLTN02-001	Temporary	720614.44	1470801.08	30.0	326.01	328.41	25.05	303.36
	BRLTN02-002	Temporary	720700.71	1470910.10	30.0	324.92	327.43	27.43	300.00
	BRLTN02-003	Temporary	720633.94	1470962.30	35.0	325.28	327.95	29.29	298.66
AFFF Area 3 Building 60 Current Fire Station	BRLTN03-001	Temporary	721023.55	1470428.44	25.0	324.45	327.40	18.87	308.53
	BRLTN03-002	Temporary	721050.72	1470450.06	25.0	323.78	326.60	18.35	308.25

[1]Vermont State Plane North America Datum 1983
[2]Coordinates and top of casing elevations for Area 1 wells taken from Table 4-1 Synoptic WL Measurements and Elevations, Final RI Report - Sites 1, 2, 3, 4, 5A, and 5B, 158th Fighter Wing, VANG, Burlington Air National Guard Base, South Burlington, Vermont, CH2MHill March 2010.
[3]North American Vertical Datum 1988
AFFF = aqueous film forming foam
FTA = fire training area
MW = monitoring well
BRLTN = Burlington
ID = identification