Final
Site Inspections Report of Fire Fighting Foam Usage at Niagara Falls Air Reserve Station Niagara County, New York

December 2018
(Revision 1)

Submitted to:

Air Force Civil Engineer Center
3515 General McMullen Suite 155
San Antonio, Texas 78226-2018

Submitted by:

U.S. Army Corps of Engineers
Savannah District
100 W. Oglethorpe Avenue
Savannah, Georgia 31401-3640

Prepared by:

Aerostar SES LLC
1006 Floyd Culler Court
Oak Ridge, Tennessee 37830-8022
under
Contract No. W912HN-15-C-0022

Final
Site Inspections Report
of
Fire Fighting Foam Usage
at
Niagara Falls Air Reserve Station
Niagara County, New York

December 2018
(Revision 1)

Submitted to:
Air Force Civil Engineer Center
3515 General McMullen Suite 155
San Antonio, Texas 78226-2018

Submitted by:
U.S. Army Corps of Engineers
Savannah District
100 West Oglethorpe Avenue
Savannah, Georgia 31401-3640

Prepared by:
Aerostar SES LLC
1006 Floyd Culler Court
Oak Ridge, Tennessee 37830
under
Contract No. W912HN-15-C-0022

Table of Contents

Page

ACRONYMS AND ABBREVIATIONS vii

1.0 INTRODUCTION 1

2.0 AFFF AREA DESCRIPTIONS 4

2.1 NIAGARA FALLS AIR RESERVE STATION 4
2.2 FT007/FPTA NO. 3/SITE 9 – AFFF AREA 1 5
2.3 HANGAR 850 – AFFF AREA 2 5
2.4 BUILDING 706 – AFFF AREA 3 6
2.5 BUILDING 700 – AFFF AREA 4 6
2.6 BLUE ANGELS CRASH SITE – AFFF AREA 5 7
2.7 FOX ROW/TAXIWAY ALPHA – AFFF AREA 6 7
2.8 OUTFALLS 004, 005, 007, AND 009 – AFFF AREA 7 7
2.9 HULBY STREET – AFFF AREA 8 8

3.0 FIELD ACTIVITIES AND FINDINGS 8

3.1 FIELD ACTIVITIES AND SAMPLING PROCEDURES 8
3.2 PFAS CROSS-CONTAMINATION AVOIDANCE PROCEDURES 10
3.2.1 Field Equipment 10
3.2.2 Field Clothing and Personal Protective Equipment 10
3.2.3 Sample Containers 11
3.2.4 Wet Weather 11
3.2.5 Equipment Decontamination 11
3.2.6 Personnel Hygiene 12
3.2.7 Food Considerations 12
3.2.8 Visitors 12
3.3 FT007/FPTA NO. 3/SITE 9 – AFFF AREA 1 12
3.3.1 Sample Locations 12
3.3.2 Lithology 12
3.3.3 Groundwater Flow 12
3.3.4 Analytical Results 13
3.3.5 Conclusions 15
3.4 HANGAR 850 – AFFF AREA 2 16
3.4.1 Sample Locations 16
3.4.2 Lithology 16
3.4.3 Groundwater Flow 16
3.4.4 Analytical Results 16
3.4.5 Conclusions 19
3.5 BUILDING 706 – AFFF AREA 3 20
3.5.1 Sample Locations 20
3.5.2 Lithology 20
3.5.3 Groundwater Flow 20
3.5.4 Analytical Results 20
3.5.5 Conclusions 22
3.6 BUILDING 700 – AFFF AREA 4 22
3.6.1 Sample Locations 22
3.6.2 Lithology 22
3.6.3 Groundwater Flow 23

3.6.4 Analytical Results *23*
3.6.5 Conclusions *25*
3.7 BLUE ANGELS CRASH SITE – AFFF AREA 5 25
3.7.1 Sample Locations *25*
3.7.2 Lithology *25*
3.7.3 Groundwater Flow *26*
3.7.4 Analytical Results *26*
3.7.5 Conclusions *28*
3.8 FOX ROW/TAXIWAY ALPHA – AFFF AREA 6 28
3.8.1 Sample Locations *28*
3.8.2 Lithology *28*
3.8.3 Groundwater Flow *28*
3.8.4 Analytical Results *28*
3.8.5 Conclusions *32*
3.9 OUTFALLS 004, 005, 007, AND 009 – AFFF AREA 7 32
3.9.1 Sample Locations *32*
3.9.2 Lithology *32*
3.9.3 Groundwater Flow *32*
3.9.4 Analytical Results *32*
3.9.5 Conclusions *34*
3.10 HULBY STREET – AFFF AREA 8 34
3.10.1 Sample Locations *34*
3.10.2 Lithology *34*
3.10.3 Groundwater Flow *34*
3.10.4 Analytical Results *34*
3.10.5 Conclusions *36*
3.11 INVESTIGATION-DERIVED WASTE 36
3.11.1 Waste Soil and Water *36*
3.11.2 Construction Waste *37*

4.0 GROUNDWATER PATHWAY 37
4.1 NIAGARA FALLS AIR RESERVE STATION HYDROGEOLOGY 37
4.2 FT007/FPTA NO. 3/SITE 9 – AFFF AREA 1 39
4.3 HANGAR 850 – AFFF AREA 2 39
4.4 BUILDING 706 – AFFF AREA 3 40
4.5 BUILDING 700 – AFFF AREA 4 40
4.6 BLUE ANGELS CRASH SITE – AFFF AREA 5 40
4.7 FOX ROW/TAXIWAY ALPHA – AFFF AREA 6 40
4.8 OUTFALLS 004, 005, 007, AND 009 – AFFF AREA 7 41
4.9 HULBY STREET – AFFF AREA 8 41

5.0 SURFACE WATER PATHWAY 41
5.1 FT007/FPTA NO. 3/SITE 9 – AFFF AREA 1 42
5.2 HANGAR 850 – AFFF AREA 2 42
5.3 BUILDING 706 – AFFF AREA 3 42
5.4 BUILDING 700 – AFFF AREA 4 42
5.5 BLUE ANGELS CRASH SITE – AFFF AREA 5 42
5.6 FOX ROW/ TAXIWAY ALPHA – AFFF AREA 6 42
5.7 OUTFALLS 004, 005, 007, AND 009 – AFFF AREA 7 43
5.8 HULBY STREET – AFFF AREA 8 43

6.0 SOIL, SEDIMENT, AND AIR EXPOSURE PATHWAYS 43

6.1 FT007/FPTA NO.3/SITE 9 – AFFF AREA 1 43
6.2 HANGAR 850 – AFFF AREA 2 43
6.3 BUILDING 706 – AFFF AREA 3 43
6.4 BUILDING 700 – AFFF AREA 4 44
6.5 BLUE ANGELS CRASH SITE – AFFF AREA 5 44
6.6 FOX ROW/TAXIWAY ALPHA – AFFF AREA 6 44
6.7 OUTFALLS 004, 005, 007, AND 009 – AFFF AREA 7 44
6.8 HULBY STREET – AFFF AREA 8 44

7.0 UPDATES TO CONCEPTUAL SITE MODELS 45
7.1 FT007/FPTA NO. 3/SITE 9 – AFFF AREA 1 45
7.2 HANGAR 850 – AFFF AREA 2 45
7.3 BUILDING 706 – AFFF AREA 3 46
7.4 BUILDING 700 – AFFF AREA 4 46
7.5 BLUE ANGELS CRASH SITE – AFFF AREA 5 46
7.6 FOX ROW/TAXIWAY ALPHA – AFFF AREA 6 47
7.7 OUTFALLS 004, 005, 007, AND 009 – AFFF AREA 7 47
7.8 HULBY STREET – AFFF AREA 8 47

8.0 CONCLUSIONS AND RECOMMENDATIONS 48
8.1 FT007/FPTA NO. 3/SITE 9 – AFFF AREA 1 54
8.2 HANGAR 850 – AFFF AREA 2 54
8.3 BUILDING 706 – AFFF AREA 3 54
8.4 BUILDING 700 – AFFF AREA 4 55
8.5 BLUE ANGELS CRASH SITE – AFFF AREA 5 55
8.6 FOX ROW/TAXIWAY ALPHA – AFFF AREA 6 55
8.7 OUTFALLS 004, 005, 007, AND 009 – AFFF AREA 7 56
8.8 HULBY STREET – AFFF AREA 8 56

9.0 REFERENCES 56

List of Tables

Table 1 Regulatory Screening Values 2
Table 2 AFFF Areas and Selection Rationale for Site Inspections at NFARS 3
Table 3 FT007/FPTA NO. 3/Site 9 AFFF Area 1 Surface Soil Analytical Results 13
Table 4 FT007/FPTA NO. 3/Site 9 AFFF Area 1 Subsurface Soil Analytical Results 13
Table 5 FT007/FPTA NO. 3/Site 9 AFFF Area 1 Groundwater Analytical Results 14
Table 6 FT007/FPTA NO. 3/Site 9 AFFF Area 1 Sediment Analytical Results 15
Table 7 FT007/FPTA NO. 3/Site 9 AFFF Area 1 Surface Water Analytical Results 15
Table 8 Hangar 850 AFFF Area 2 Surface Soil Analytical Results 17
Table 9 Hangar 850 AFFF Area 2 Subsurface Soil Analytical Results 17
Table 10 Hangar 850 AFFF Area 2 Groundwater Analytical Data 18
Table 11 Hangar 850 AFFF Area 2 Sediment Analytical Results 19
Table 12 Hangar 850 AFFF Area 2 Surface Water Analytical Results 19
Table 13 Building 706 AFFF Area 3 Surface Soil Analytical Results 20
Table 14 Building 706 AFFF Area 3 Subsurface Soil Analytical Results 21
Table 15 Building 706 AFFF Area 3 Groundwater Analytical Results 22
Table 16 Building 700 AFFF Area 4 Surface Soil Analytical Results 23
Table 17 Building 700 AFFF Area 4 Subsurface Soil Analytical Results 24
Table 18 Building 700 AFFF Area 4 Groundwater Analytical Results 25
Table 19 Blue Angels Crash Site Area 5 Surface Soil Analytical Results 26
Table 20 Blue Angels Crash Site AFFF Area 5 Subsurface Soil Analytical Results 27

Table 21 Blue Angels Crash Site AFFF Area 5 Groundwater Analytical Results 27
Table 22 Fox Row/Taxiway Alpha Area 6 Surface Soil Analytical Results 29
Table 23 Fox Row/Taxiway Alpha AFFF Area 6 Subsurface Soil Analytical Results 29
Table 24 Fox Row/Taxiway Alpha AFFF Area 6 Groundwater Analytical Results 31
Table 25 Outfalls 004, 005, 007, and 009 Area 7 Sediment Analytical Results 33
Table 26 Outfalls 004, 005, 007, and 009 AFFF Area 7 Surface Water Analytical Results 33
Table 27 Hulby Street AFFF Area 8 Surface Soil Analytical Results 35
Table 28 Hulby Street AFFF Area 8 Subsurface Soil Analytical Results 35
Table 29 Hulby Street AFFF Area 8 Groundwater Analytical Results 36
Table 30 Wells within 4 Miles Downgradient of NFARS 38
Table 31 Summary of PFBS, PFOA, and PFOS Detections and Screening Level Exceedances 50

Appendix A – Site-Specific Figures

Figure 1 Location of Niagara Falls Air Reserve Station, Niagara County New York A-1
Figure 2 Niagara Falls Air Reserve Station AFFF Area Site Inspection Locations A-2
Figure 3 Stratigraphic Column of the area near Niagara Falls Air Reserve Station A-3
Figure 4 Installation Potentiometric Map A-4
Figure 5 Off-Base Wells within a 4-Mile Radius A-5
Figure 6 FT007/FPTA No. 3/Site 9 (AFFF Area 1) Sample Locations and Potentiometric Contours A-6
Figure 7 FT007/FPTA No. 3/Site 9 (AFFF Area 1) PFBS, PFOA, and PFOS in Soil and Sediment A-7
Figure 8 FT007/FPTA No. 3/Site 9 (AFFF Area 1) PFBS, PFOA, and PFOS in Groundwater and Surface Water A-8
Figure 9 Hangar 850 (AFFF Area 2) Sample Locations and Potentiometric Contours A-9
Figure 10 Hangar 850 (AFFF Area 2) (AFFF Area 3) PFBS, PFOA, and PFOS in Soil and Sediment A-10
Figure 11 Hangar 850 (AFFF Area 2) PFBS, PFOA, and PFOS in Groundwater and Surface Water ... A-11
Figure 12 Building 706 (AFFF Area 3) Sample Locations and Potentiometric Contours A-12
Figure 13 Building 706 (AFFF Area 3) PFBS, PFOA, and PFOS in Soil A-13
Figure 14 Building 706 (AFFF Area 3) PFBS, PFOA, and PFOS in Groundwater A-14
Figure 15 Building 700 (AFFF Area 4) Sample Locations and Potentiometric Contours A-15
Figure 16 Building 700 (AFFF Area 4) PFBS, PFOA, and PFOS in Soil A-16
Figure 17 Building 700 (AFFF Area 4) PFBS, PFOA, and PFOS in Groundwater A-17
Figure 18 Blue Angels Crash Site (AFFF Area 5) Sample Locations A-18
Figure 19 Blue Angels Crash Site (AFFF Area 5) PFBS, PFOA, and PFOS in Soil A-19
Figure 20 Blue Angels Crash Site (AFFF Area 5) PFBS, PFOA, and PFOS in Groundwater A-20
Figure 21 Fox Row/Taxiway Alpha (AFFF Area 6) Sample Locations and Potentiometric Contours .. A-21
Figure 22 Fox Row/Taxiway Alpha (AFFF Area 6) PFBS, PFOA, and PFOS in Soil A-22
Figure 23 Fox Row/Taxiway Alpha (AFFF Area 6) PFBS, PFOA, and PFOS in Groundwater A-23
Figure 24 Outfalls 004, 005, 007, and 009 (AFFF Area 7) Sample Locations A-24
Figure 25 Outfalls 004, 005, 007, and 009 (AFFF Area 7) PFBS, PFOA, and PFOS in Sediment A-25
Figure 26 Outfalls 004, 005, 007, and 009 (AFFF Area 7) PFBS, PFOA, and PFOS in Surface Water A-26
Figure 27 Hulby Street (AFFF Area 8) Sample Locations and Potentiometric Contours A-27
Figure 28 Hulby Street (AFFF Area 8) PFBS, PFOA, and PFOS in Soil A-28
Figure 29 Hulby Street (AFFF Area 8) PFBS, PFOA, and PFOS in Groundwater A-29

Appendix B RSL Calculations for PFOS and PFOA
Appendix C Field Forms and Boring Logs
Appendix D Validation Report and Laboratory Data
Appendix E Physiochemical Sample Results
Appendix F Groundwater Level Data
Appendix G NYSDEC-Provided Well Data

Acronyms and Abbreviations

%	percent
µg/L	micrograms per liter
µg/kg	microgram per kilogram
AFCEC	Air Force Civil Engineer Center
AFFF	aqueous film forming foam
amsl	above mean sea level
ANG	Air National Guard
ASL	Aerostar SES LLC
ARW	Air Refueling Wing
AW	Airlift Wing
bgs	below ground surface
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethylbenzene, and xylenes
cm/sec	centimeters per second
CSM	conceptual site model
DPT	direct push technology
dup	field duplicate
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
FPTA	fire protection training area
FTA	fire training area
GM	gravel with sand or silt
GW	groundwater
HA	health advisory
HQ	hazard quotient
ID	identification
IRP	Installation Restoration Program
J	Reported concentration is an estimated value.
ML	inorganic silts, non-plastic, or slightly plastic
MW	monitor well
N/A	not applicable
ND	not detected at the Method Detection Limit
NFARS	Niagara Falls Air Reserve Station
NFP	Niagara Frontier Publications
NIGRA	Niagara Falls Air Reserve Station
NL	not listed
No.	number
NYSDEC	New York State Department of Environmental Conservation
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
PVC	polyvinyl chloride
QAPP	quality assurance project plan

R	The analyte was not detected at the concentration indicated; the result was rejected during validation because the sample was received outside the 4 +/- 2 degree temperature criterion.
RCRA	Resource Conservation and Recovery Act
RSL	regional screening level
SD	sediment
SI	site inspection
SM	silty sands sand silt mixtures
SO	subsurface soil
SS	surface soil
SW	surface water
TOC	total organic carbon
TPH	total petroleum hydrocarbons
TW	temporary well
U	The analyte was not detected above the reported sample quantification limit.
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USCS	Unified Soil Classification System

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 eight known or suspected aqueous film forming foam (AFFF) release areas at Niagara Falls Air Reserve Station (NFARS) (Figure 1, Appendix A). The purpose of the inspections was to determine the presence or absence of perfluorooctanoic acid (PFOA), perfluorooctane sulfonate (PFOS), and perfluorobutane sulfonate (PFBS) in the environment at these areas. PFOA, PFOS, and PFBS are included 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 PFAS (per- and polyfluorinated alkyl substances).

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 USAF maintains a significant inventory of PFOS-based AFFF. As of this report, the USAF is actively removing PFOS-based AFFF from their 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 NFARS in August 2017 and were conducted 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, August 2017). The QAPP and QAPP addendum were prepared in accordance with Environmental Protection Agency (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 the EPA lifetime health advisory (HA) for drinking water;
- determine if PFBS is present in soil, sediment, groundwater, or surface water at the inspection areas at concentrations exceeding generic regional screening levels (RSLs);
- determine if PFOA and PFOS are present in soil or sediment at the inspection areas at concentrations exceeding screening levels; and
- identify potential receptor pathways with potential impacts to human health.

This report identifies any releases of AFFF that resulted in PFOS, PFOA, or PFBS contamination in the environment above the project screening levels and to drinking water above the HA levels. The 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.

Screening levels for this SI were determined for PFOS, PFOA, and PFBS. The screening level for PFOS and PFOA in soil and sediment was calculated using EPA's RSL calculator (https://epaprgs.ornl.gov/cgi-bin/chemicals/csl_search) (Appendix B). The calculations were conducted using the residential scenario with a hazard quotient (HQ) of 0.1. The toxicity value input for the calculator is the Tier 3 value reference dose of 0.02 µg/kg per day derived by EPA in its drinking water health advisories for both PFOS (EPA, May 2016a) and PFOA (EPA, May 2016b). The final site-specific QAPP addendum for NFARS (ASL, August 2017) used an HQ of 1.0. The USAF has decided to use the HQ of 0.1 in accordance with recently

released EPA requirements. A PFAS release was considered confirmed when exceedances of the following concentrations were identified:

PFOS:

- 0.07 micrograms per liter (µg/L) in groundwater/surface water (combined with PFOA value).
- 126 micrograms per kilogram (µg/kg) in soil/sediment.

PFOA:

- 0.07 µg/L in groundwater/surface water (combined with PFOS value).
- 126 µg/kg in soil/sediment.

While 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 RSLs for PFBS also used a residential scenario and an HQ = 0.1. The USAF also considered a release to be confirmed if exceedances of the following concentrations were identified:

PFBS:

- 40 µg/L in groundwater/surface water.
- 130,000 µg/kg in soil/sediment.

To streamline reporting and discussion of PFOS, PFOA, and PFBS sampling and analysis, these compounds will hereafter be referred to, collectively, as "PFAS." Table 1 presents the screening values for comparing the analytical results for these three PFAS compounds.

Table 1 Regulatory Screening Values

Parameter	Chemical Abstract Number	EPA Regional Screening Level Table (May 2018) [a]		Calculated Screening Level for Soil and Sediment[b] (µg/kg)	EPA Health Advisory for Drinking Water (Surface Water or Groundwater)[c] (µg/L)
		Residential Soil (µg/kg)	Tap Water (µg/L)		
Perfluorobutane sulfonate (PFBS)[c]	29420-43-3	130,000	40	N/A	NL
Perfluorooctanoic acid (PFOA)	335-67-1	NL	NL	126	0.07[d]
Perfluorooctane sulfonate (PFOS)	1763-23-1	NL	NL	126	

[a] EPA Regional Screening Levels (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[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 Perfluorooctanoic Acid (PFOA) and EPA, May 2016b. Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).
[d] The EPA Health Advisory value for drinking water of 0.07 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 RSL = regional screening level

Preliminary Assessment Findings

The preliminary assessment (PA) conducted during the week of January 11, 2016, identified eight sites that warrant an SI to determine the presence or absence of PFAS (ASL, August 2016). The eight sites (now identified as AFFF Areas 1 through 8) are listed in Table 2, and the area locations are shown on Figure 2 (Appendix A). These areas are discussed in Sections 2.2 through 2.9.

Table 2 AFFF Areas and Selection Rationale for Site Inspections at NFARS

AFFF Area	Location	Associated Existing ERP ID	Rationale	Media of Concern
1	FT007/FPTA No. 3/Site 9	FT007/FPTA No. 3/Site 9	• AFFF has been used at FT007/FPTA No. 3/Site 9 during fire training activities.	• Surface Soil • Subsurface Soil • Groundwater • Surface Water • Sediment
2	Hangar 850	None (New Area)	• This building is currently equipped with an AFFF system and has had several recorded AFFF releases. • The largest spill occurred in 2010 when a lightning strike overpowered the fire suppression system control panels. The release was approximately 48,000 gallons of AFFF concentrate and water mixed. • In 1995, approximately 10 gallons were released from the mechanical room door. • In 1996, approximately 2,100 gallons of AFFF concentrate were released into the hangar due to system overpressure. NYSDEC was notified, and the spill was contained and removed with a vacuum truck. • In 2013, during a water test of the firefighting system at Hangar 850, approximately 5,000 gallons of 0.5% AFFF were released.	• Surface Soil • Subsurface Soil • Groundwater • Surface Water • Sediment
3	Building 706	None (New Area)	• In 1995, there was a release of 216 gallons of AFFF solution onto the ramp west of Building 706. No removal actions were taken at the time.	• Surface Soil • Subsurface Soil • Groundwater
4	Building 700 (Former Fire Station)	None (New Area)	• In 2007, a spill of 3–5 gallons was documented at the south side ramp area. • There is an undocumented spray test area in the grassy area to the south/southeast of the fire station. Records located by ASL were unclear as to the precise location; however, it was situated between the former fire station and FPTA 01.	• Surface Soil • Subsurface Soil • Groundwater
5	Blue Angels Crash Site	None (New Area)	• Unknown volume of AFFF used to extinguish an aircraft crash-related fire.	• Surface Soil • Subsurface Soil • Groundwater

AFFF Area	Location	Associated Existing ERP ID	Rationale	Media of Concern
6	Fox Row/Taxiway Alpha	None (New Area)	• A fire truck departed from Fox Row in May of 2010 responding to an exercise while unintentionally leaking AFFF from an open valve. Spill records show that approximately 25 gallons of concentrate were released. • Other releases have occurred in the area originating from buildings such as Hangar 850 or Building 706.	• Surface Soil • Subsurface Soil • Groundwater
7	Outfalls 004, 005, 007, and 009	None (New Area)	• These four outfalls are discharge points for all other suspected release locations at NFARS.	• Surface Water • Sediment
8	Hulby Street	None (New Area)	• In 1987, a 4-gallon spill of AFFF occurred on the southern side of Hulby Street, reportedly across from Building 316, the emergency management training building.	• Surface Soil • Subsurface Soil • Groundwater

Note: Table Modified from ASL, August 2016
% = percent
ASL = Aerostar SES LLC
FPTA = fire protection training area
NFARS = Niagara Falls Air Reserve Station
NYSDEC = New York State Department of Environmental Conservation
AFFF = aqueous film forming foam
ERP = Environmental Restoration Program
ID = identification
No. = number

2.0 AFFF AREA DESCRIPTIONS

2.1 NIAGARA FALLS AIR RESERVE STATION

NFARS is near the United States/Canada border on approximately 985 acres in western Niagara County, New York. The station is approximately 6 miles east of the City of Niagara Falls and 15 miles north of the City of Buffalo (ASL, August 2016).

In 1928, the City of Niagara Falls invested $70,000 to establish the Niagara Falls International Airport. Its 150 acres was used for private, single-engine planes. During World War II, the United States Army Air Forces assumed control of the airport and upgraded its facilities to be used as an Army Air Force base. After the war, the Air Force, Air National Guard (ANG), and Navy used the runways. The 107th Fighter Interceptor Group of the New York ANG were assigned to the Niagara Falls location in 1946, the same year the installation was designated as a United States Naval Air Station. Following the conclusion of World War II, Niagara became the home site for the original Camp Bell military installation. Along with this designation, Niagara also served as the home station for Bell Aerospace, who manufactured the Bell X-1A experimental aircraft. In 1947, General Chuck Yeager tested the Bell aircraft at Niagara before breaking the sound barrier at Edwards Air Force Base, California. Additionally, Niagara was home to the original Bell helicopter and the Bell Rocket Belt prototype. In 1952, the Air Force branch of the station was established with the activation of the 76th Air Base Squadron. The station is now home to the 914th Air Refueling Wing (ARW), the 107th Attack Wing (ATKW) of the New York Air National Guard, the 277th Quartermaster Company, Buffalo Military Entrance Processing Station, the 2nd Squadron 101st Cavalry, the 865th Combat Surgical Hospital, and the 1982nd Forward Surgical Team (ASL, August 2016).

The airport has been used for freight, charter flights, and periodic commercial flights and is the alternate landing facility for flights at the Buffalo-Niagara International Airport. The Niagara Frontier Transportation Authority has owned the airport since 1970.

Currently, the 914th ARW is the host unit for the Air Reserve Station, and the 107th ATKW is their tenant. The runways, taxiways, and aircraft parking at the NFARS are used by the 914th ARW. The 107th ATKW does not currently have aircraft and does not use the runways, taxiways, or aircraft parking areas. In general, the western one-third of the Air Reserve Station is devoted to the facilities of the 107th ATKW. The Base Realignment and Closure (BRAC) Commission suggested closing the Air Reserve Station in 1995 and again in 2005. This prompted the creation of the Niagara Military Affairs Council, whose mission is to support the Air Reserve Station and prevent its closing. Due to overwhelming public support and the Air Reserve Station's continued involvement with providing tactical air delivery, intra-theater airlift, and aeromedical evacuation, BRAC removed NFARS from its list of closures in October 2005. In its current status, this military installation remains one of Niagara County's largest employers (NFP, June 2012).

Climate

The climate at NFARS is characterized as humid continental with hot to warm summers and cold winters. The average annual precipitation is approximately 35 inches and the average annual snowfall is 77 inches. The average annual temperature in the NFARS area is approximately 48 degrees Fahrenheit. The average annual high temperature is approximately 57 degrees Fahrenheit, and the average annual low temperature is approximately 38 degrees Fahrenheit (US Climate Data, 2017).

2.2 FT007/FPTA NO. 3/SITE 9 – AFFF AREA 1

FT007/Fire Protection Training Area (FPTA) No. 03/Site 9 is a former fire training area (FTA) on the west side of the Air Reserve Station, approximately 400 feet east of the current FTA and 770 feet north of the main runway (Figures 2 and 6, Appendix A). FT007/FPTA No. 03/Site 9 is surrounded by open, well-maintained, grassed areas. The site was active beginning in the early 1960s through the late 1990s.

The operational history of FT007/FPTA No. 03/Site 9 includes the use of AFFF and dry chemicals to put out training fires ignited with JP-4 and other flammable liquids. The volume of AFFF used is unknown. Beginning in 1979, JP-4 was the only accelerant used to ignite training fires. Previously, unknown mixtures of combustibles were likely used and there is no record of a retention pond for the collection of excess liquids. Training operations were conducted at this site between 20 and 30 times per year. During its active-use period, FT007/FPTA No. 03/Site 9 did not have a functional containment system. The training area consisted of a large, oval pit with a low earthen berm that drains into an intermittent stream to the north of the pit (Portage, Inc., 2012).

FT007/FPTA No. 03/Site 9 was investigated and monitored under the Installation Restoration Program (IRP). Soil sampling from previous investigations found metal contaminants within regional background ranges with elevated nickel and vanadium levels. Groundwater sampling found similar results for metals, along with benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbons (TPH). The BTEX and TPH constituents appeared to be migrating off site, volatilizing or biodegrading between investigations (Science Applications International Corporation [SAIC], May 1991). The extent of contamination for soil and groundwater was found to be generally limited (USAF, October 1994) and the site was ultimately recommended for 'No Further Action' (E&E, June 1999).

2.3 HANGAR 850 – AFFF AREA 2

Hangar 850 is an aircraft maintenance hangar south of Wagner Drive with ramp access to Delta Row (Figures 2 and 9, Appendix A). Hangar 850 has an AFFF fire suppression system in a mechanical room

on the northwest side of the building. The mechanical room contains one 2,500-gallon aboveground storage tank of 3% AFFF with a working capacity of 2,300 gallons.

Hangar 850 has had multiple releases of AFFF. The largest spill occurred in 2010 when a lightning strike short-circuited the fire suppression system control panels. The release was approximately 48,000 gallons of AFFF concentrate and water mixed. AFFF released during this event was mostly contained inside of the hangar, though a small amount was observed to have discharged into the sanitary and storm sewers. NFARS personnel responded to the release immediately and conducted a cleanup action resulting in the removal and proper disposal of residual AFFF. New York State Department of Environmental Conservation (NYSDEC) concurred that the spill had been properly addressed.

According to NFARS spill records, several other smaller spills have occurred at Hangar 850. In 1995, approximately 10 gallons were released from the mechanical room door. In 1996, approximately 2,100 gallons of AFFF concentrate were released into the hangar due to system overpressure. NYSDEC was notified, and the spill was contained and removed with a vacuum truck. This spill was verified not to have entered the stormwater system. In 2013, during a water test of the firefighting system at Hangar 850, approximately 5,000 gallons of 0.5% AFFF were released. During this release, nearby storm drains were plugged and the sluice gates were closed. The hangar doors were also closed with the majority of the material being removed via vacuum truck. Very little residual foam was noted on the apron south of the hangar. The releases discussed above create a total spill volume of approximately 2,135 gallons of AFFF concentrate.

Directly east of Building 850 at IRP Site 12, a removal action was conducted at a former drum storage area to remove chlorinated volatile organic compounds from the soil in 2015. Approximately 75 cubic yards of soil were removed from an 8.5-foot-deep excavation (Versar, June 2016). The extent of the excavation is shown in Appendix A, Figure 10. Areas surrounding the building that are not paved will allow for groundwater infiltration. Hangar 850 is approximately 1,500 feet to the north of Cayuga Creek with the aircraft apron between. Contaminants released from Hangar 850 onto the apron would drain to the south and west, reaching either Cayuga Creek or the stormwater system east of the apron.

2.4 BUILDING 706 – AFFF AREA 3

The former Building 706 is a former aircraft maintenance hangar that has been demolished. The remaining footprint of the building is immediately east of Hangar 707 along Krug Avenue (Figures 2 and 12, Appendix A). The majority of the area surrounding former Building 706 is paved. Surface water flows into surrounding drainage features or onto the aircraft apron. Once on the apron, surface water flows into grassed areas to the east and south. Directly south of the building footprint is Fox Row. According to the building plans, the mechanical room was on the western side of the building. No records were found regarding the size of the AFFF system (ASL, August 2016).

According to Air Reserve Station spill records, only one release of AFFF occurred at former Building 706. In 1995, 216 gallons of AFFF concentrate mixed with approximately 798 gallons of water spilled on the west side of the building. The spill occurred due to the failure of personnel to pre-rinse a truck prior to an operational test (ASL, August 2016).

2.5 BUILDING 700 – AFFF AREA 4

Building 700 is the former fire station that now houses the Air Reserve Station Explosive Ordnance Disposal and Bioenvironmental units. The building is north of Otis Drive and west of Franklin Drive (Figures 2 and 15, Appendix A). The building formerly contained a 1,000-gallon tank used for AFFF storage that is now housed at the current fire station (ASL, August 2016).

In 2007, a spill of 3–5 gallons of AFFF was documented at the south-side ramp area. There is also a spray test area in the grassy area to the south/southeast of the fire station. Records found by ASL were unclear as to the precise location; however, it was estimated to be between the former fire station and FPTA No. 01.

During interviews conducted for the PA, current fire chief and assistant fire chief did not have knowledge or records of the volume of AFFF released during each testing event at the spray test area.

2.6 BLUE ANGELS CRASH SITE – AFFF AREA 5

A fatal Blue Angels crash occurred on the airfield during the 1985 Western New York Air Show. The incident involved two A-4F Skyhawks that collided midair. One of the planes crashed outside of the perimeter fence on the eastern side of the Air Reserve Station after the pilot ejected; the other plane crashed in a grassy area just north of the main east/west runway (10L/28R) and south of Taxiway Alpha (Figures 2 and 18, Appendix A). During the response, an unknown volume of AFFF was used to extinguish the fire (ASL, August 2016).

2.7 FOX ROW/TAXIWAY ALPHA – AFFF AREA 6

Several AFFF releases occurred in the Fox Row/Taxiway Alpha area (Figures 2 and 21, Appendix A). During an exercise in May 2010, a fire truck departed from Fox Row and accidentally released AFFF from an open valve. Spill records show that approximately 25 gallons of concentrate were released. Although the spill response team tried to hold water back from the stormwater system by closing the sluice gate, water foamed as it was slowly released to the outfalls (ASL, August 2016).

Other AFFF releases have occurred from Hangar 850, Building 706, and other buildings that border this area. Currently, the site is a heavily used, paved area for both vehicles and aircraft.

2.8 OUTFALLS 004, 005, 007, AND 009 – AFFF AREA 7

Outfalls 004, 005, 007, and 009 are part of the stormwater management system at NFARS. Their locations are shown on Figures 2 and 24 in Appendix A and the geographic coordinates of these sites are

- Outfall 004: 43°06’43.66” N latitude and 78°55’59.24” W longitude,
- Outfall 005: 43°06’43.06” N latitude and 78°56’33.26” W longitude,
- Outfall 007: 43°06’25.36” N latitude and 78°56’21.16” W longitude, and
- Outfall 009: 43°06’42.75” N latitude and 78°56’22.97” W longitude.

While no release events have occurred at the specific locations of the outfalls, these four outfalls provide a location to monitor stormwater drainage for all release events that have occurred at NFARS (ASL, August 2016).

The four outfalls are well vegetated at their discharge points into Cayuga Creek. The pathways leading to their final destination are either concrete, steel-lined, or well vegetated ditches, usually with standing or flowing water.

The outfalls are visually monitored per the current NYSDEC State Pollutant Discharge Elimination System (SPDES) Multi Sector General Permit for Stormwater Discharges associated with Industrial Activity (GP-0-17-004). Analytical sampling of the outfalls is not required.

2.9 HULBY STREET – AFFF AREA 8

In 1987, a 4-gallon spill of AFFF was reported to have occurred on the southern side of the street across from Building 316, the emergency management building (Figures 2 and 27, Appendix A). There is an open field directly across from the building that has historically been used for emergency training exercises. In the spill report for the event, it was reported that "burn pans were dumped on the side of the road" and the remarks section of the report notes that an exercise was being conducted. No removal action was conducted for this spill (ASL, August 2016).

No previous groundwater investigations have occurred in this area. The spill area was likely unpaved at the time and would have allowed AFFF to infiltrate into the subsurface. Several roads are in the area of the spill; though, without a definitive location, it cannot be confirmed that the release entered the stormwater system.

3.0 FIELD ACTIVITIES AND FINDINGS

A readiness review (Appendix C) was conducted for all field personnel prior to mobilizing to the site. The readiness review covered anticipated hazards, types and proper use of equipment needed for the field activities, sampling procedures, and procedures to be used to prevent cross-contamination of samples with PFAS-containing compounds.

3.1 FIELD ACTIVITIES AND SAMPLING PROCEDURES

ASL performed the site inspection activities between August 14 and 23, 2017. Fieldwork was conducted in accordance with the QAPP (ASL, January 2016) and the NFARS site-specific addendum to the QAPP (ASL, August 2017). Field activities included collecting groundwater samples by installing and sampling temporary wells or sampling existing monitoring wells, collecting surface soil and subsurface soil samples (from hand auger and/or direct push technology [DPT] soil borings), and collecting surface water and sediment samples

Sample locations were selected in areas most likely to have been impacted by known or suspected AFFF releases. Tables summarizing analytical data are presented in the Analytical Results subsection for each AFFF area discussion. A readiness review was conducted for all field personnel prior to mobilizing to the site. The readiness review (documented in Appendix C) covered anticipated hazards, types and proper use of equipment needed for the field activities, sampling procedures, and procedures to be used to prevent cross-contamination of samples with PFAS-containing compounds.

Field forms and boring logs are presented in Appendix C. The validation report and chains of custody are presented in Appendix D. Physiochemical sample results are presented in Appendix E. Groundwater level data is presented in Appendix F.

Soil, sediment, and groundwater samples were submitted via onsite courier to Maxxam Analytics International Corporation of Mississauga, Ontario, Canada, under chain of custody procedures. These samples were analyzed for 18 PFAS compounds using modified EPA Method 537, including the following three PFAS compounds, which are the only ones to have associated health-based screening levels.

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

Data Quality

Third-party data validation was conducted on 100% of the analytical data by MEC^{X}. The data validation report for the laboratory data for modified EPA Method 537 and chains of custody are presented in Appendix D. Some samples were received outside of the 4 +/- 2 degrees Celsius (°C) temperature criteria. It is unclear why the samples were received by the laboratory out of temperature range since this set of samples was packed the same as the other sample sets and delivered to the laboratory by the same courier. Analytical results for detected analytes in those samples were qualified as estimated values (J qualifier). Analytical results for analytes that were not detected were rejected (R qualifier). After consulting with AFCEC, it was determined there was adequate usable data for decision making at each area. The rejected non-detect sample results are included in the report qualified as R, indicating the analyte was not detected at the concentration indicated. The result was rejected during validation because the sample was received outside the 4 +/- 2 degree temperature criterion. The rejected data was not used to determine presence or absence of PFAS at any of the AFFF areas sampled.

The precision (97.7%) and accuracy results (98.5%) were acceptable for the project. These calculations are based on the total number of data records validated. Each analyte result is considered a data record, and 1,674 records were validated (93 samples, 18 analytes per sample). Of the 1,674 target data points, 222 data points were rejected, resulting in a completeness of 86.7%. The precision result of 97.7% indicates 2.3% of the data records were qualified during validation (with a “J” or “UJ” indicating estimated values) due to precision concerns. The accuracy result of 98.5% indicates 1.5% of the data records were qualified during validation (with a “J” or “UJ”) due to accuracy concerns. The data validation report, laboratory case narratives, and laboratory analytical data sheets are presented in Appendix D.

Field Quality Control

Field duplicate samples were collected at a frequency of one for every 10 samples for each media sampled. Matrix spike/matrix spike duplicate samples were collected at a frequency of one for every 20 samples for each media. Equipment rinseate blanks were collected daily during sampling activities. Four rinseate blanks were collected from soil/sediment sampling equipment and three from groundwater sampling equipment during sampling activities. Soil sampling devices used for rinseates included stainless steel spoons, while devices for water matrix rinseates included water level indicator tapes and peristaltic pump tubing. A source blank was collected from the water source used for decontamination of drilling equipment.

Soil Physiochemical Parameters

To provide basic soil parameter information, ASL collected representative composite surface soil and subsurface soil samples for physiochemical parameters from each area. These analyses included potential of hydrogen (pH), particle size distribution, percent solids, and total organic carbon (TOC), as summarized in Table E-1 in Appendix E.

Sampling Methodology

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

Groundwater samples were collected from existing monitoring wells or temporary monitoring wells installed at DPT soil borings. Temporary wells were constructed with 1.0-inch-diameter polyvinyl

chloride (PVC) prepacked well screens and risers. Due to the shallow nature of the temporary wells installed, the annular space surrounding the well screen was filled with clean filter sand and a bentonite seal was installed above the sand to prevent surface water runoff from entering the screened interval. In some instances, this seal was installed at ground surface (surface seal) and in others, the seal was installed below surface (bentonite seal). Following the completion of sampling activities, all temporary wells were abandoned by removing the well materials and backfilling the boreholes with bentonite chips. Well materials were disposed of as construction waste.

Groundwater samples were collected from the AFFF areas using a peristaltic pump. Disposable high-density polyethylene tubing was inserted to the approximate midpoint of the saturated portion of the screened interval at each location. Following installation of temporary wells, several locations were found to be lacking sufficient water to sample. Locations that were dry are noted in the applicable sections below.

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.

Surveying
Sample points were located by Millard, Mackay & Delles Land Surveyors LLP of Cheektowaga, New York, on August 22, 2017. Northing and easting coordinates were recorded in the New York State Plane (West Zone) Coordinate System based on the North American Datum 1983. Elevations were referenced to North American Vertical Datum 1983 (2011), Epoch 2010.

Sample locations, site-specific lithology, groundwater flow direction, analytical results, and conclusions for each AFFF area are presented in Sections 3.3 through 3.10.

3.2 PFAS CROSS-CONTAMINATION AVOIDANCE PROCEDURES

Field personnel complied with PFAS cross-contamination avoidance procedures and considerations, which are included in ASL Standard Operating Procedure 028 “Field Sampling Protocols to Avoid Cross-Contamination at Perfluorinated Compounds (PFCs) Sites:”

3.2.1 Field Equipment

- Teflon®-containing materials (Teflon® tubing, bailers, tape, plumbing paste, or other Teflon® materials) were not used because Teflon® contains fluorinated compounds.
- High-density polyethylene (HDPE) and silicon materials are acceptable.
- Peristaltic pumps were used to collect all groundwater samples. Field notes were recorded in a bound logbook that did not have waterproof paper. All personnel changed gloves between recording and sampling activities to prevent cross-contamination.
- Post-It Notes® were not allowed on site.
- Only Sharpie® brand markers were used. Pens were used to document field activities in the logbooks and on field forms, to label sample containers, and to prepare the chains of custody.
- Chemical (blue) ice packs were not used to store samples, food, or drinks.

3.2.2 Field Clothing and Personal Protective Equipment

- The sampling personnel wore field clothing made of synthetic and natural fibers (preferably cotton). The clothing had to have been laundered at least six times without using a fabric softener

since it was purchased. New clothing was not allowed because it could contain PFAS-related treatments.

- Only rain gear made from polyurethane and wax-coated materials was allowed.
- Clothing or boots containing Gore-Tex™ was not allowed because it consists of a PFAS membrane.
- Tyvek® clothing was not allowed on site because it contains fluorinated compounds.
- Disposable nitrile gloves were worn at all times when field activities were being conducted, and a new pair was donned prior to the following activities at each sample location:
    - Decontamination of reusable sampling equipment;
    - Contact with sample bottles or water containers;
    - Insertion of anything into the well (HDPE tubing, water depth probes, etc.);
    - Insertion of silicon tubing into the peristaltic pump;
    - Completion of monitor well purging;
    - Sample collection; and
    - Handling of any quality assurance/QC samples, including field blanks and equipment blanks.
- A new pair of nitrile gloves was worn after handling any non-dedicated sampling equipment, after contact with surfaces that had not been decontaminated, or when field personnel thought it was necessary.

3.2.3 Sample Containers

- All samples were collected in polypropylene or HDPE bottles with screw caps made of the same materials. The liners of lined screw caps were not made of Teflon® and did not contain PFAS.
- Glass sample containers were not used.
- Container labels were completed using a Sharpie® pen after the caps had been placed on each bottle.

3.2.4 Wet Weather

- Field personnel who were sampling during wet weather (such as rainfall or snowfall) wore appropriate clothing that did not pose a risk of cross-contamination. Sampling personnel avoided synthetic gear treated with water-repellant finishes containing PFAS. Only rain gear made from polyurethane and wax-coated materials was allowed.
- Field personnel wore gloves when erecting or moving a gazebo tent overtop used for protection from rain at sampling locations because the canopy material may have been treated with a PFAS-based coating. Gloves were changed immediately after handling the tent, and any further contact with the tent was avoided until all sampling activities were finished and the team was ready to move on to the next sample location.

3.2.5 Equipment Decontamination

Field sampling equipment, including oil/water interface meters and water level indicators, were decontaminated using Alconox® or Liquinox® soap. Decon 90® was not used during decontamination activities. Laboratory-certified PFAS-free water was used for the final decontamination rinse of sampling equipment. Larger equipment, such as drill rigs, was decontaminated using potable water and a high-pressure washer and then rinsed with potable water.

3.2.6 Personnel Hygiene

- Field personnel did not use cosmetics, moisturizers, hand cream, or other related products as part of their personal hygiene routine before a sampling event because these products may contain surfactants and be a potential source of PFAS.
- Because many manufactured sunblock and insect repellants contain PFAS, only sunblock and insect repellants that contain 100% natural ingredients were allowed.
- For restroom breaks, field personnel left the exclusion zone (EZ) before removing PPE. Before returning to the EZ, field personnel washed as normal, allowing extra time to rinse with water after using soap. Field personnel used a mechanical dryer to avoid using paper towels if possible.

3.2.7 Food Considerations

Field personnel did not eat or drink inside the EZ.

3.2.8 Visitors

Site visitors remained outside the EZ during all sampling activities.

3.3 FT007/FPTA NO. 3/SITE 9 – AFFF AREA 1

3.3.1 Sample Locations

To assess possible releases of PFAS during training exercises at AFFF Area 1, three soil borings and three temporary wells were installed in the vicinity of the former fire training pit. Surface and subsurface soil samples were collected from three soil borings, and groundwater samples collected at all three boring locations from temporary wells. The temporary wells were screened near the top of the uppermost saturated zone with total depths of 10 feet bgs. Temporary wells were constructed using 1-inch PVC riser and prepacked screens; NIGRA01-001 and NIGRA01-002 had 5-foot screens while NIGRA01-003 had a 10-foot screen. Two co-located surface water and sediment samples were collected from the drainage canals surrounding the former fire training area. Sampling locations are shown on Figure 6 (Appendix A).

3.3.2 Lithology

The soil at AFFF Area 1 generally consists of fat clay (CH) and sandy lean clay (CL). The surficial water table was observed between approximately 7 and 8 feet bgs. All borings were terminated when refusal was encountered at the top of bedrock. All borings were terminated at the top of the Lockport Dolostone and wells screened in glacial deposits. Detailed boring logs are included in Appendix C.

3.3.3 Groundwater Flow

Based on water levels from the temporary wells gauged on August 22, 2017, the uppermost water-bearing zone in AFFF Area 1 was at elevations ranging from 584.29 feet to 584.67 feet above mean sea level (amsl). Localized shallow groundwater flows south, consistent with historical groundwater flow. Groundwater elevations and depths to groundwater can be found in Table F-1 of Appendix F. The shallow groundwater likely discharges into Cayuga Creek and out to the Niagara River, as shown on Figure 6 (Appendix A).

3.3.4 Analytical Results

Surface Soil

Three surface soil samples (NIGRA01-001-SS-001, NIGRA01-002-SS-001, and NIGRA1-003-SS-001) were collected at AFFF Area 1 from 0 to 6 inches bgs. PFBS was detected in all three samples at estimated concentrations below the screening level. PFOA was detected in all three samples below the screening level and PFOS was detected in all three samples at concentrations exceeding the screening level. Surface soil analytical results are shown in Table 3 and on Figure 7 (Appendix A).

Table 3 FT007/FPTA NO. 3/Site 9 AFFF Area 1 Surface Soil Analytical Results

	Sample ID	**NIGRA01-001-SS-001**	**NIGRA01-002-SS-001**	**NIGRA01-003-SS-001**
	Depth (feet)	**0–0.5**	**0–0.5**	**0–0.5**
	Sample Date	**08/15/17**	**08/15/17**	**08/15/17**
Analyte	**Screening Level (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	59 R	**6.4 J**	**2.6 J**
Perfluorooctanoic acid (PFOA)	126[b]	**62 J**	**39 J**	**5.6 J**
Perfluorooctane sulfonate (PFOS)	126[b]	**4,000 J**	**1,600 J**	**1,700**

Bold values indicate analyte was detected at the concentration indicated. Shaded results indicate value exceeds screening criteria.
[a]EPA Regional Screening Levels for Residential Soil (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b]Screening levels were calculated using the EPA Regional Screening Level Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search). The RSL calculations are presented in Appendix B.
µg/kg = micrograms per kilograms AFFF = aqueous film forming foam ID = identification SS = surface soil
NIGRA = Niagara Falls Air Reserve Station J = Reported concentration is an estimated value.
R=the analyte was not detected at the concentration indicated; the result was rejected during validation because the sample was received outside the 4 +/- 2 degree temperature criterion.

Subsurface Soil

Three subsurface soil samples (NIGRA01-001-SO-007, NIGRA01-002-SO-008, and NIGRA01-003-SO-010) were collected at AFFF Area 1. PFBS and PFOA were not detected in any of the three samples. PFOS was detected in two samples (NIGRA01-002-SO-008 and NIGRA01-003-SO-010) at estimated concentrations below the screening level. Subsurface soil analytical results are shown in Table 4 and on Figure 7 (Appendix A).

Table 4 FT007/FPTA NO. 3/Site 9 AFFF Area 1 Subsurface Soil Analytical Results

	Sample ID	**NIGRA01-001-SO-007**	**NIGRA01-002-SO-008**	**NIGRA01-003-SO-010**
	Depth (feet)	**6–7**	**7–8**	**9–10**
	Sample Date	**08/15/17**	**08/15/17**	**08/15/17**
Analyte	**Screening Level (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.66 U	0.60 U	0.66 U
Perfluorooctanoic acid (PFOA)	126[b]	0.66 U	0.60 U	0.66 U
Perfluorooctane sulfonate (PFOS)	126[b]	0.66 U	**0.92 J**	**0.37 J**

Bold values indicate analyte was detected at the concentration indicated.
[a]EPA Regional Screening Levels for Residential Soil (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b] Screening levels were calculated using the EPA Regional Screening Level Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search). The RSL calculations are presented in Appendix B.
µg/kg = micrograms per kilograms AFFF = aqueous film forming foam ID = identification
NIGRA = Niagara Falls Air Reserve Station SO = subsurface soil J = Reported concentration is an estimated value.
U = The analyte was not detected above the reported sample quantification limit.

Soil Physiochemical Analyses
To provide basic soil parameter information, composite surface (NIGRA01-006-SS-001) and subsurface (NIGRA01-006-SO-010) soil samples composed of equal aliquots from the borings samples were collected at AFFF Area 1. The samples were submitted for analysis of pH, TOC, percent solids, and grain size. The physiochemical laboratory data sheets and results are presented in Appendix E.

Groundwater
Three primary groundwater samples (NIGRA01-001-GW-007, NIGRA01-002-GW-008, and NIGRA01-003-GW-008) were collected at AFFF Area 1. PFBS was detected in all samples at concentrations below the RSL. PFOA, PFOS, and combined PFOA and PFOS were detected at concentrations above the EPA HA in all three samples. Groundwater analytical results are shown in Table 5 and on Figure 8 (Appendix A).

Table 5 FT007/FPTA NO. 3/Site 9 AFFF Area 1 Groundwater Analytical Results

	Sample ID	**NIGRA01-001-GW-007**	**NIGRA01-002-GW-008**	**NIGRA01-003-GW-008**
	Sample Date	**08/18/17**	**08/18/17**	**08/18/17**
Analyte	**Screening Level (µg/L)**	**Result (µg/L)**	**Result (µg/L)**	**Result (µg/L)**
Perfluorobutane sulfonate (PFBS)	40[a]	**26**	**30**	**31**
Perfluorooctanoic acid (PFOA)	0.07[b]	**110**	**110**	**110**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**910**	**330**	**1,200**
PFOA + PFOS	0.07[c]	**1,020**	**440**	**1,310**

Bold values indicate concentration detected at concentration indicated. Shaded results indicate value exceeds screening criteria.
[a] EPA Regional Screening Levels (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b]EPA, May 2016a. Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA) and EPA, May 2016b. Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).
[c]The EPA Health Advisory value for drinking water of 0.07 µg/L applies to the combined detected concentrations of PFOS and PFOA.
µg/L = micrograms per liter dup = field duplicate AFFF = aqueous film forming foam
GW = groundwater ID = identification

Sediment
Two primary sediment samples (NIGRA01-004-SD-001 and NIGRA01-005-SD-001) and one duplicate sample NIGRA01-004-SD-901 (dup) were collected at AFFF Area 1. PFBS, PFOA, and PFOS were detected in both primary samples and the duplicate sample. PFBS was detected in both primary samples and the duplicate sample at estimated concentrations below the screening level. PFOA was detected below the screening level in both primary samples but above the screening level in the duplicate. PFOS was detected in both NIGRA01-004-SD-001 and its duplicate NIGRA01-004-SD-901 at estimated concentrations above the calculated screening level. Sediment analytical results are shown in Table 6 and on Figure 7 (Appendix A).

Table 6 FT007/FPTA NO. 3/Site 9 AFFF Area 1 Sediment Analytical Results

	Sample ID	NIGRA01-004-SD-001	NIGRA01-004-SD-901 (dup)	NIGRA01-005-SD-001
	Depth (feet)	0–0.5	0–0.5	0–0.5
	Sample Date	08/15/17	08/15/17	08/15/17
Analyte	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	**11 J**	130 R	**4.5 J**
Perfluorooctanoic acid (PFOA)	126[b]	**57 J**	**140 J**	**18 J**
Perfluorooctane sulfonate (PFOS)	126[b]	**3,100 J**	**7,500 J**	**1,200 J**

Bold values indicate analyte was detected at the concentration indicated. Shaded results indicate value exceeds screening criteria.
[a]EPA Regional Screening Levels for Residential Soil (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b] Screening levels were calculated using the EPA Regional Screening Level Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search). The RSL calculations are presented in Appendix B.
µg/kg = micrograms per kilograms
AFFF = aqueous film forming foam
dup = duplicate
ID = identification
J = Reported concentration is an estimated value.
NIGRA = Niagara Falls Air Reserve Station
SD = sediment
R=the analyte was not detected at the concentration indicated; the result was rejected during validation because the sample was received outside the 4 +/- 2 degree temperature criterion.

Surface Water

Two primary surface water samples (NIGRA01-004-SW-001 and NIGRA01-005-SW-001) and one duplicate sample (NIGRA01-004-SW-901) were collected at AFFF Area 1. PFBS was detected in both primary samples and the duplicate at estimated concentrations below the EPA HA. Estimated concentrations of PFOA and PFOS as well as the combined PFOA and PFOS estimated concentration in the samples were above the EPA HA of 0.07 µg/L. Surface water analytical results are shown in Table 7 and on Figure 8 (Appendix A).

Table 7 FT007/FPTA NO. 3/Site 9 AFFF Area 1 Surface Water Analytical Results

	Sample ID	NIGRA01-004-SW-001	NIGRA01-004-SW-901 (dup)	NIGRA01-005-SW-001
	Sample Date	08/15/17	08/15/17	08/15/17
Analyte	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane sulfonate (PFBS)	40[a]	**0.74 J**	**0.64 J**	**1.6 J**
Perfluorooctanoic acid (PFOA)	0.07[b]	**1.1 J**	**1.1 J**	**3.3 J**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**7.2 J**	**7.7 J**	**21 J**
PFOA + PFOS	0.07[c]	**8.3 J**	**8.8 J**	**24.3 J**

Bold values indicate concentration detected at concentration indicated. Shaded results indicate value exceeds screening criteria.
[a] EPA Regional Screening Levels (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b]EPA, May 2016a. Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA) and EPA, May 2016b. Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).
[c]The EPA Health Advisory value for drinking water of 0.07 µg/L applies to the combined detected concentrations of PFOS and PFOA.
µg/L = micrograms per liter
AFFF = aqueous film forming foam
dup = field duplicate
ID = identification
J = reported concentration is an estimated value.
SW = surface water

3.3.5 Conclusions

Apparent use of AFFF during training activities at FT007/PFTA No. 3/Site 9 has resulted in releases of PFAS to the environment. Groundwater, surface soil, surface water, and sediment are all media that have been determined to be impacted above screening levels. Combined PFOA and PFOS concentrations in

groundwater samples collected from three temporary wells installed at the FTA ranged from 440 µg/L to 1310 µg/L, all exceeding the screening level. Surface water concentrations ranged from 8.3 µg/L to 24.3 µg/L, all exceeding the screening level. Surface soil concentrations ranged from 1,300 µg/kg to 4,000 µg/kg, all exceeding the screening level. One sediment sample exceeded the screening level with a concentration of 3,100 µg/kg in the primary sample and 7,500 µg/kg in its duplicate. Therefore, concentrations of PFAS above screening levels in the surface soil, groundwater, surface water, and sediment have been confirmed at AFFF Area 1. Concentrations of PFAS above screening levels in subsurface soil have not been confirmed.

3.4 HANGAR 850 – AFFF AREA 2

3.4.1 Sample Locations

To assess possible PFAS impacts from historical releases of AFFF at Hangar 850, four soil borings and four temporary wells were installed around Hangar 850. Surface soil and subsurface soil, samples were collected from each boring. Temporary wells were installed at all boring locations and groundwater samples were collected. The temporary wells were screened near the top of the uppermost saturated zone with total depths of 19 to 20 feet bgs and constructed with 10-foot-long, prepacked screens. The sample locations are shown on Figure 9 (Appendix A).

3.4.2 Lithology

The soil at AFFF Area 2 generally consists of lean clay (CH) and fat clay (CL). The surficial water table was observed between 11 and 14 feet bgs. All borings were terminated at the top of the Lockport Dolostone and wells were screened in glacial deposits. Detailed boring logs are included in Appendix C.

3.4.3 Groundwater Flow

Water levels were gauged at the newly installed temporary wells and at five existing wells west of Building 850 on August 22, 2017. The uppermost water-bearing zone in AFFF Area 2 was at elevations ranging from 576.32 feet amsl to 591.86 feet amsl, Groundwater elevations and depths to groundwater can be found in Table F-1 of Appendix F. Localized, shallow groundwater flows to the southeast toward the open unnamed tributary that discharges into Cayuga Creek, as shown on Figure 9 (Appendix A).

3.4.4 Analytical Results

Surface Soil
Four primary surface soil samples (NIGRA02-001-SS-001, NIGRA02-002-SS-001, NIGRA02-003-SS-001 and, NIGRA02-004-SS-001) as well as one duplicate sample (NIGRA02-001-SS-901) were collected at AFFF Area 2 from 0 to 6 inches bgs. PFBS was detected in two primary samples (NIGRA02-003-SS-001 and NIGRA02-004-SS-001) as well as the duplicate sample (NIGRA02-01-SS-901). PFOA and PFOS were detected in all four samples and the duplicate at concentrations below the screening level. Surface soil analytical results are shown in Table 8 and on Figure 10 (Appendix A).

Table 8 Hangar 850 AFFF Area 2 Surface Soil Analytical Results

	Sample ID	NIGRA02-001-SS-001	NIGRA02-001-SS-901 (dup)	NIGRA02-002-SS-001	NIGRA02-003-SS-001	NIGRA02-004-SS-001
	Depth (feet)	**0–0.5**	**0–0.5**	**0–0.5**	**0–0.5**	**0–0.5**
	Sample Date	**08/16/17**	**08/16/17**	**08/17/17**	**08/17/17**	**08/17/17**
Analyte	**Screening Level (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.62 U	**0.23 J**	0.69 R	**0.25 J**	**0.20 J**
Perfluorooctanoic acid (PFOA)	126[b]	**8.8 J**	**8.5**	**3.0 J**	**2.1 J**	**3.6 J**
Perfluorooctane sulfonate (PFOS)	126[b]	**12**	**13**	**38 J**	**70 J**	**3.4 J**

Bold values indicate analyte was detected at the concentration indicated.
[a]EPA Regional Screening Levels for Residential Soil (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf]
[b] Screening levels were calculated using the EPA Regional Screening Level Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search). The RSL calculations are presented in Appendix B.
µg/kg = micrograms per kilograms AFFF = aqueous film forming foam dup = field duplicate
ID = identification J = Reported concentration is an estimated value.
NIGRA = Niagara Falls Air Reserve Station SS = surface soil
R = the analyte was not detected at the concentration indicated; the result was rejected during validation because the sample was received outside the 4 +/- 2 degree temperature criterion.
U = The analyte was not detected above the reported sample quantification limit.

Subsurface Soil

Four primary subsurface soil samples (NIGRA02-001-SO-011, NIGRA02-002-SO-014, NIGRA02-003-SO-014, and NIGRA02-004-SO-012) and one duplicate (NIGRA02-001-SO-911) were collected AFFF Area 2. PFBS, PFOA, and PFOS were not detected in any of the samples. Subsurface soil analytical results are shown in Table 9 and on Figure 10 (Appendix A).

Table 9 Hangar 850 AFFF Area 2 Subsurface Soil Analytical Results

	Sample ID	NIGRA02-001-SO-011	NIGRA02-001-SO-911 (dup)	NIGRA02-002-SO-014	NIGRA02-003-SO-014	NIGRA02-004-SO-012
	Depth (feet)	**10–11**	**10–11**	**13–14**	**13–14**	**11–12**
	Sample Date	**08/16/17**	**08/16/17**	**08/17/17**	**08/17/17**	**08/17/17**
Analyte	**Screening Level (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.59 U	0.74 U	0.68 R	0.67 R	0.62 R
Perfluorooctanoic acid (PFOA)	126[b]	0.59 U	0.74 U	0.68 R	0.67 R	0.62 R
Perfluorooctane sulfonate (PFOS)	126[b]	0.59 U	0.74 U	0.68 R	0.67 R	0.62 R

[a]EPA Regional Screening Levels for Residential Soil (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b] Screening levels were calculated using the EPA Regional Screening Level Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search). The RSL calculations are presented in Appendix B.
µg/kg = micrograms per kilograms AFFF = aqueous film forming foam
dup = field duplicate ID = identification
NIGRA = Niagara Falls Air Reserve Station SO = subsurface soil
U = The analyte was not detected above the reported sample quantification limit.
R= The analyte was not detected at the concentration indicated; the result was rejected during validation because the sample was received outside the 4 +/- 2 degree temperature criterion.

Soil Physiochemical Analyses
To provide basic soil parameter information, composite surface (NIGRA02-006-SS-001) and subsurface (NIGRA02-006-SO-011) soil samples composed of equal aliquots from the borings samples were collected at AFFF Area 2. The samples were submitted for analysis of pH, TOC, percent solids, and grain size. The physiochemical laboratory data sheets and results are presented in Appendix E.

Groundwater
Four primary groundwater samples (NIGRA02-001-GW-015, NIGRA02-002-GW-0014, NIGRA02-003-GW-0016, and NIGRA02-004-GW-015 [each from a temporary well]) and one duplicate sample (NIGRA02-001-GW-915) were collected at AFFF Area 2. PFBS was detected in two of five samples, both at concentrations below the RSLs. PFOA and/or PFOS were detected in all five samples. Combined PFOA and PFOS concentrations were all below the EPA HA of 0.07 µg/L with the exception of NIGRA02-002-GW-014 at 0.458 µg/L. Groundwater analytical results are shown in Table 10 and on Figure 11 (Appendix A).

Table 10 Hangar 850 AFFF Area 2 Groundwater Analytical Data

	Sample ID	**NIGRA02-001-GW-015**	**NIGRA02-001-GW-915 (dup)**	**NIGRA02-002-GW-014**	**NIGRA02-003-GW-016**	**NIGRA02-004-GW-015**
	Sample Date	**08/18/17**	**08/18/17**	**08/21/17**	**08/21/17**	**08/21/17**
Analyte	**Screening Level (µg/L)**	**Result (µg/L)**	**Result (µg/L)**	**Result (µg/L)**	**Result (µg/L)**	**Result (µg/L)**
Perfluorobutane sulfonate (PFBS)	40[a]	0.010 U	0.010 U	**0.013 J**	**0.024**	0.010 U
Perfluorooctanoic acid (PFOA)	0.07[b]	0.010 U	0.010 U	**0.40**	**0.0062 J**	0.010 U
Perfluorooctane sulfonate (PFOS)	0.07[b]	**0.012 J**	**0.0092 J**	**0.058**	**0.0072 J**	**0.011 J**
PFOA + PFOS	0.07[c]	**0.012 J**	**0.0092 J**	**0.458**	**0.0134 J**	**0.011 J**

Bold values indicate concentration detected at concentration indicated.
Shaded results indicate value exceeds screening criteria
[a]EPA Regional Screening Levels (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b]EPA, May 2016a. Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA) and EPA, May 2016b. Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).
[c]The EPA Health Advisory value for drinking water of 0.07 µg/L applies to the combined detected concentrations of PFOS and PFOA.
µg/L = micrograms per liter dup = field duplicate AFFF = aqueous film forming foam
GW = groundwater ID = identification
U = analyte was not detected above the reported value
J = reported concentration is an estimated value

Sediment
One sediment sample (NIGRA02-005-SD-001) was collected from AFFF Area 2. PFBS and PFOA were not detected. PFOS was detected at a concentration below the screening level. The sediment analytical results are shown in Table 11 and on Figure 10 (Appendix A).

Table 11 Hangar 850 AFFF Area 2 Sediment Analytical Results

	Sample ID	NIGRA02-005-SD-001
	Depth (feet)	0–0.5
	Sample Date	08/17/17
Analyte	**Screening Level (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.91 R
Perfluorooctanoic acid (PFOA)	126[b]	0.91 R
Perfluorooctane sulfonate (PFOS)	126[b]	**1.1 J**

Bold values indicate analyte was detected at the concentration indicated.
[a]EPA Regional Screening Levels for Residential Soil (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b] Screening levels were calculated using the EPA Regional Screening Level Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search). The RSL calculations are presented in Appendix B.
µg/kg = micrograms per kilograms
AFFF = aqueous film forming foam
dup = field duplicate
ID = identification
J = Reported concentration is an estimated value.
NIGRA = Niagara Falls Air Reserve Station
SD = sediment
R=the analyte was not detected at the concentration indicated; the result was rejected during validation because the sample was received outside the 4 +/- 2 degree temperature criterion.

Surface Water

A surface water sample (NIGRA02-005-SW-001) was co-located with the sediment sample. PFBS, PFOA, and PFOS were not detected in the sample. Surface water analytical results are shown in Table 12 and on Figure 11 (Appendix A).

Table 12 Hangar 850 AFFF Area 2 Surface Water Analytical Results

	Sample ID	NIGRA02-005-SW-001
	Sample Date	08/17/17
Analyte	**Screening Level (µg/L)**	**Result (µg/L)**
Perfluorobutane sulfonate (PFBS)	40[a]	0.010 R
Perfluorooctanoic acid (PFOA)	0.07[b]	0.010 R
Perfluorooctane sulfonate (PFOS)	0.07[b]	0.010 R
PFOA + PFOS	0.07[c]	ND

[a] EPA Regional Screening Levels (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b]EPA, May 2016a. Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA) and EPA, May 2016b. Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).
[c]The EPA Health Advisory value for drinking water of 0.07 µg/L applies to the combined detected concentrations of PFOS and PFOA.
µg/L = micrograms per liter
AFFF = aqueous film forming foam
ID = identification
ND = not detected at the Method Detection Limit
SW = surface water
R=the analyte was not detected at the concentration indicated; the result was rejected during validation because the sample was received outside the 4 +/- 2 degree temperature criterion.

3.4.5 Conclusions

Accidental releases of AFFF at Hangar 850 have resulted in releases of PFAS to the environment. However, only groundwater has been determined to be impacted above screening levels. Combined PFOA and PFOS concentrations in groundwater samples collected from four temporary wells installed at the Hangar 850 ranged from 0.0092 µg/L to 0.458 µg/L, with only one sample exceeding the screening level. PFAS were detected in the surface soil and sediment but did not exceed the screening level. Therefore, concentrations of PFAS above screening levels in the groundwater have been confirmed at

AFFF Area 2. Concentrations of PFAS above screening levels in surface soil, subsurface soil, surface water, and sediment have not been confirmed.

3.5 BUILDING 706 – AFFF AREA 3

3.5.1 Sample Locations

To assess possible PFAS impacts from historical releases of AFFF at former Building 706, two borings were installed. Surface soil and subsurface soil samples were collected from the two borings. Temporary wells were installed in both borings screened near the top of the uppermost saturated zone and constructed with 5-foot-long, prepacked screens with total depths of six feet bgs. Groundwater samples were collected from the two temporary wells. The soil and groundwater sample locations are shown on Figure 12 (Appendix A).

3.5.2 Lithology

The soil at the AFFF Area 3 generally consists of sandy lean clay (CL) and poorly graded gravel (GP). Bedrock was found at approximately 6 feet bgs. The surficial water table was observed between 4 and 6 feet bgs. All borings were terminated at the top of the Lockport Dolostone and wells screened in glacial deposits. Detailed boring logs are included in Appendix C.

3.5.3 Groundwater Flow

Based on water levels from the temporary wells gauged on August 22, 2017, the uppermost water bearing zone in AFFF Area 3 was at elevations ranging from 585.68 feet to 586.06 feet amsl. Groundwater elevations and depths to groundwater can be found in Table F-1 of Appendix F. Shallow groundwater flowed south, as shown on Figures 4 and 12 (Appendix A).

3.5.4 Analytical Results

Surface Soil
Two surface soil samples (NIGRA03-001-SS-001 and NIGRA03-002-SS-001) were collected at AFFF Area 3 from 0 to 6 inches bgs. PFBS was not detected in either sample; PFOA and PFOS were detected in both samples at concentrations below the RSLs. PFBS, PFOA, and PFOS surface soil analytical results are shown in Table 13 and on Figure 13 (Appendix A).

Table 13 Building 706 AFFF Area 3 Surface Soil Analytical Results

	Sample ID	**NIGRA03-001-SS-001**	**NIGRA03-002-SS-001**
	Depth (feet)	**0–0.5**	**0–0.5**
	Sample Date	**08/14/17**	**08/14/17**
Analyte	**Screening Level (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.66 U	0.66 U
Perfluorooctanoic acid (PFOA)	126[b]	**2.2**	**3.8**
Perfluorooctane sulfonate (PFOS)	126[b]	**2.3**	**5.6**

Bold values indicate analyte was detected at the concentration indicated.
[a]EPA Regional Screening Levels for Residential Soil (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b] Screening levels were calculated using the EPA Regional Screening Level Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search). The RSL calculations are presented in Appendix B.
µg/kg = micrograms per kilograms AFFF = aqueous film forming foam ID = identification SS = surface soil
NIGRA = Niagara Falls Air Reserve Station U = The analyte was not detected above the reported sample quantification limit.

Subsurface Soil
Two subsurface soil samples (NIGRA03-001-SO-006 and NIGRA03-002-SO-003) were collected at AFFF Area 3. PFBS was not detected in either subsurface soil sample at AFFF Area 3. PFOA was not detected in NIGRA03-002-SO-006 but was detected in NIGRA03-002-SO-003 at an estimated concentration below the screening level. PFOS was detected in both samples at concentrations below the screening level. Subsurface soil analytical results are shown in Table 14 and on Figure 13 (Appendix A).

Table 14 Building 706 AFFF Area 3 Subsurface Soil Analytical Results

	Sample ID	**NIGRA03-001-SO-006**	**NIGRA03-002-SO-003**
	Depth (feet)	**5–6**	**2–3**
	Sample Date	**08/14/17**	**08/14/17**
Analyte	**Screening Level (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.53 U	0.59 U
Perfluorooctanoic acid (PFOA)	126[b]	0.53 U	**0.40 J**
Perfluorooctane sulfonate (PFOS)	126[b]	**0.38 J**	**0.90 J**

Bold values indicate analyte was detected at the concentration indicated.
[a]EPA Regional Screening Levels for Residential Soil (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b] Screening levels were calculated using the EPA Regional Screening Level Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search). The RSL calculations are presented in Appendix B.
µg/kg = micrograms per kilograms
AFFF = aqueous film forming foam
NIGRA = Niagara Falls Air Reserve Station
ID = identification
J = Reported concentration is an estimated value.
SO = subsurface soil
U = The analyte was not detected above the reported sample quantification limit

Soil Physiochemical Analyses
To provide basic soil parameter information, composite surface (NIGRA03-003-SS-001) and subsurface (NIGRA03-003-SO-006) soil samples composed of equal aliquots from the borings samples were collected at AFFF Area 3. The samples were submitted for analysis of pH, TOC, percent solids, and grain size. The physiochemical laboratory data sheets and results are presented in Appendix E.

Groundwater
Two groundwater samples (NIGRA03-001-GW-006 and NIGRA03-002-GW-005) were collected at AFFF Area 3. PFOS and combined PFOA and PFOS were detected above the screening level in NIGRA03-002-GW-005. PFBS detections in both samples as well as PFOA, PFOS, and combined PFOA and PFOS detections in NIGRA03-002-GW-006 were below screening levels .Groundwater analytical results are shown in Table 15 and on Figure 14 (Appendix A).

Table 15 Building 706 AFFF Area 3 Groundwater Analytical Results

	Sample ID	NIGRA03-001-GW-006	NIGRA03-002-GW-005
	Sample Date	08/18/17	08/16/17
Analyte	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane sulfonate (PFBS)	40[a]	**0.014 J**	**0.022 J**
Perfluorooctanoic acid (PFOA)	0.07[b]	**0.011 J**	**0.021 J**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**0.029**	**0.14 J**
PFOA + PFOS	0.07[c]	**0.040 J**	**0.161 J**

Bold values indicate concentration detected at concentration indicated. Shaded results indicate value exceeds screening criteria.
[a]EPA Regional Screening Levels (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b]EPA, May 2016a. Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA) and EPA, May 2016b. Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).
[c]The EPA Health Advisory value for drinking water of 0.07 µg/L applies to the combined detected concentrations of PFOS and PFOA.
µg/L = micrograms per liter AFFF = aqueous film forming foam GW = groundwater
ID = identification NIGRA = Niagara Falls Air Reserve Station J = reported concentration is an estimated value

3.5.5 Conclusions

Accidental releases of AFFF at former Building 706 have resulted in releases of PFAS to the environment. However, only groundwater has been determined to be impacted above screening levels. Combined PFOA and PFOS concentrations in groundwater samples collected from two temporary wells installed at the former Building 706 ranged from 0.040 µg/L to 0.161 µg/L with only one sample exceeding the screening level. PFAS were detected in the surface soil and subsurface soil but did not exceed the screening level. Therefore, concentrations of PFAS above screening levels in the groundwater have been confirmed at AFFF Area 3. Therefore, concentrations of PFAS above screening levels in the soil have not been confirmed at AFFF Area 3.

3.6 BUILDING 700 – AFFF AREA 4

3.6.1 Sample Locations

To assess possible PFAS impacts from historical releases of AFFF at Building 700, three borings were installed in AFFF Area 4. Surface soil and subsurface soil samples were collected from all three borings. Temporary wells were installed in each borings screened near the top of the uppermost saturated zone with total depths of 4 to 8 feet bgs. Two wells were constructed with 5-foot-long, prepacked screens, and one was constructed with a 2.5-foot-long, prepacked screen. Groundwater samples were collected from two of three temporary wells. Location NIGRA04-002 remained dry throughout the fieldwork. The sample locations are shown on Figure 15 (Appendix A).

3.6.2 Lithology

The soil at the AFFF Area 4 generally consists of gravelly or sandy clay (CL) to gravelly sand (SW). The surficial water table was not determined during drilling and all wells were installed at the top of bedrock. All borings were terminated at the top of the Lockport Dolostone and wells screened in glacial deposits. Detailed boring logs are included in Appendix C.

3.6.3 Groundwater Flow

Groundwater was only observed in two of three temporary wells during the fieldwork. Groundwater elevation in temporary wells installed in AFFF Area 4 were used to determine groundwater flow in AFFF Area 4. Based on water levels gauged on August 22, 2017, the uppermost water bearing zone in AFFF Area 4 was at elevations ranging from 585.61 feet amsl to 585.84 feet amsl. Groundwater elevations and depths to groundwater can be found in Table F-1 of Appendix F. Shallow groundwater flowed south, as shown on Figure 15 (Appendix A).

3.6.4 Analytical Results

Surface Soil

Three primary surface soil samples (NIGRA04-001-SS-001, NIGRA04-002-SS-001, and NIGRA04-003-SS-001) and one duplicate (NIGRA04-002-SS-901) were collected at AFFF Area 4 from 0 to 6 inches bgs. PFBS was detected in two (NIGRA04-002-SS-001 and NIGRA04-003-SS-001) of four samples at concentrations below the RSLs. PFOA was detected in all four samples at concentrations below the screening level. PFOS was detected in all four samples above the screening level. Surface soil analytical results are shown in Table 16 and on Figure 16 (Appendix A).

Table 16 Building 700 AFFF Area 4 Surface Soil Analytical Results

	Sample ID	**NIGRA04-001-SS-001**	**NIGRA04-001-SS-901 (dup)**	**NIGRA04-002-SS-001**	**NIGRA04-003-SS-001**
	Depth (feet)	**0–0.5**	**0–0.5**	**0–0.5**	**0–0.5**
	Sample Date	**08/15/17**	**08/15/17**	**08/15/17**	**08/15/17**
Analyte	**Screening Level (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	6.0 U	0.66 U	**1.5**	**0.55 J**
Perfluorooctanoic acid (PFOA)	126[b]	**7.8 J**	**6.3**	**2.3**	**1.2**
Perfluorooctane sulfonate (PFOS)	126[b]	**780 J**	**480 J**	**440**	**410**

Bold values indicate analyte was detected at the concentration indicated. Shaded results indicate value exceeds screening criteria.
[a]EPA Regional Screening Levels for Residential Soil (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b] Screening levels were calculated using the EPA Regional Screening Level Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search). The RSL calculations are presented in Appendix B.
µg/kg = micrograms per kilograms
AFFF = aqueous film forming foam
NIGRA = Niagara Falls Air Reserve Station
dup = field duplicate
ID = identification
J = Reported concentration is an estimated value.
SS = surface soil
U = The analyte was not detected above the reported sample quantification limit

Subsurface Soil

Three primary subsurface soil samples (NIGRA04-001-SO-007, NIGRA04-002-SO-004, and NIGRA04-003-SO-005) and one duplicate subsurface soil sample (NIGRA04-002-SO-907) were collected at AFFF Area 4. PFBS was detected in two of the four samples at concentration below the screening level. PFOA was detected in all four samples at concentrations below the screening level. PFOS was detected in one sample (NIGRA04-002-SO-004) at concentrations above the screening level. Subsurface soil analytical results are shown in Table 17 and on Figure 16 (Appendix A).

Table 17 Building 700 AFFF Area 4 Subsurface Soil Analytical Results

	Sample ID	NIGRA04-001-SO-007	NIGRA04-001-SO-907	NIGRA04-002-SO-004	NIGRA04-003-SO-005
	Depth (feet)	6–7	6–7	3–4	4–5
	Sample Date	08/16/17	08/16/17	08/16/17	08/16/17
Analyte	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.52 U	**0.26 J**	5.5 U	**0.35 J**
Perfluorooctanoic acid (PFOA)	126[b]	**0.49 J**	**0.84 J**	**13**	**0.56 J**
Perfluorooctane sulfonate (PFOS)	126[b]	**50 J**	**89 J**	**230**	**11**

Bold values indicate analyte was detected at the concentration indicated. Shaded results indicate value exceeds screening criteria.
[a]EPA Regional Screening Levels for Residential Soil (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b] Screening levels were calculated using the EPA Regional Screening Level Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search). The RSL calculations are presented in Appendix B.
µg/kg = micrograms per kilograms
AFFF = aqueous film forming foam
NIGRA = Niagara Falls Air Reserve Station
ID = identification
J = Reported concentration is an estimated value.
SO = subsurface soil
U = The analyte was not detected above the reported sample quantification limit

Soil Physiochemical Analyses

To provide basic soil parameter information, composite surface (NIGRA04-004-SS-001) and subsurface (NIGRA04-006-SO-007) soil samples composed of equal aliquots from the borings samples were collected at AFFF Area 4. The samples were submitted for analysis of pH, TOC, percent solids, and grain size. The physiochemical laboratory data sheets and results are presented in Appendix E.

Groundwater

Two primary groundwater samples (NIGRA04-001-GW-005 and NIGRA04-003-GW-005) and one duplicate (NIGRA04-001-GW-905) were collected at AFFF Area 4. Location NIGRA04-002 had a groundwater sample planned but the temporary well that was installed remained dry throughout the course of fieldwork. PFBS was detected in all three samples at concentrations below the RSL. The combined PFOA/PFOS concentrations in all three samples were above the EPA HA. Groundwater analytical results are shown in Table 18 and on Figure 17 (Appendix A).

Table 18 Building 700 AFFF Area 4 Groundwater Analytical Results

	Sample ID	NIGRA04-001-GW-005	NIGRA04-001-GW-905 (dup)	NIGRA04-003-GW-005
	Sample Date	**08/21/17**	**08/21/17**	**08/21/17**
Analyte	**Screening Level (µg/L)**	**Result (µg/L)**	**Result (µg/L)**	**Result (µg/L)**
Perfluorobutane sulfonate (PFBS)	40[a]	**0.95**	**0.94**	**0.65**
Perfluorooctanoic acid (PFOA)	0.07[b]	**1.1**	**1.1**	**0.47**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**22**	**25**	**2.1**
PFOA + PFOS	0.07[c]	**23.1**	**26.1**	**2.57**

Bold values indicate concentration detected at concentration indicated. Shaded results indicate value exceeds screening criteria.
[a] EPA Regional Screening Levels (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b]EPA, May 2016a. Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA) and EPA, May 2016b. Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).
[c]The EPA Health Advisory value for drinking water of 0.07 µg/L applies to the combined detected concentrations of PFOS and PFOA.
µg/L = micrograms per liter dup = field duplicate AFFF = aqueous film forming foam
GW = groundwater ID = identification NIGRA = Niagara Falls Air Reserve Station

3.6.5 Conclusions

Accidental releases of AFFF at Building 700 have resulted in releases of PFAS to the environment. Surface soil, subsurface soil, and groundwater have been determined to be impacted above screening levels. Combined PFOA and PFOS concentrations in groundwater samples collected from two temporary wells installed at Building 700 ranged from 2.57 µg/L to 26.1 µg/L. PFAS were also detected in surface soil at concentrations above the screening level and in subsurface soil at concentrations below the screening level.

3.7 BLUE ANGELS CRASH SITE – AFFF AREA 5

3.7.1 Sample Locations

To assess possible PFAS impacts from an emergency response event resulting in the use of AFFF at the Blue Angels crash site, three borings were installed. Surface soil and subsurface soil samples were collected from each boring. Temporary wells were installed all three borings screened near the top of the uppermost saturated zone with total depths of 3.65 to 7 feet bgs. NIGRA05-002 was constructed with a 2.5-foot, prepacked screen, and NIGRA05-001 and NIGRA05-003 were each constructed with 5-foot, prepacked screens. Groundwater samples were collected from two of the three temporary wells. One location (NIGRA05-002) remained dry throughout the fieldwork. The sample locations are shown on Figure 18 (Appendix A).

3.7.2 Lithology

The soil at the AFFF Area 5 generally consists of lean clay (CL) and fat clay (CH). The surficial water table was observed at approximately 2.5 to 5.5 feet bgs. All borings were terminated at the top of the Lockport Dolostone and wells screened in glacial deposits. Detailed boring logs are included in Appendix C.

3.7.3 Groundwater Flow

Due to airfield access restrictions, the temporary wells installed at Area 5 were not included in the Air Reserve Station's AFFF area groundwater survey. Groundwater levels were taken the day following the groundwater level survey; however, one temporary well was dry so a localized groundwater flow direction could not be determined due to a lack of data. Groundwater elevations calculated from surrounding areas indicate that the groundwater flow is to the south-southwest, as shown on Figures 4 and 18 (Appendix A).

3.7.4 Analytical Results

Surface Soil

Three surface soil samples (NIGRA05-001-SS-001, NIGRA05-002-SS-001, and NIGRA05-003-SS-001) were collected at AFFF Area 5 from 0 to 6 inches bgs. PFBS and PFOA were detected in one of three samples (NIGRA05-001-SS-001) at concentrations below the screening levels. PFOS was detected in the same sample at concentrations above the screening level. Surface soil analytical results are shown in Table 19 and on Figure 19 (Appendix A).

Table 19 Blue Angels Crash Site Area 5 Surface Soil Analytical Results

	Sample ID	**NIGRA05-001-SS-001**	**NIGRA05-002-SS-001**	**NIGRA05-003-SS-001**
	Depth (feet)	**0–0.5**	**0–0.5**	**0–0.5**
	Sample Date	**08/22/17**	**08/22/17**	**08/22/17**
Analyte	**Screening Level (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	**4.4**	0.72 U	0.57 U
Perfluorooctanoic acid (PFOA)	126[b]	**5.7**	0.72 U	0.57 U
Perfluorooctane sulfonate (PFOS)	126[b]	**180**	0.72 U	0.57 U

Bold values indicate analyte was detected at the concentration indicated. Shaded results indicate value exceeds screening criteria.
[a]EPA Regional Screening Levels for Residential Soil (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b] Screening levels were calculated using the EPA Regional Screening Level Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search). The RSL calculations are presented in Appendix B.
µg/kg = micrograms per kilograms
AFFF = aqueous film forming foam
NIGRA = Niagara Falls Air Reserve Station
ID = identification
SS = surface soil
U = The analyte was not detected above the reported sample quantification limit.

Subsurface Soil

Three primary subsurface soil samples (NIGRA05-001-SO-004, NIGRA05-002-SO-002, and NIGRA05-003-SO-005) and one duplicate (NIGRA05-001-SO-904) were collected at AFFF Area 5. PFBS, PFOA, and PFOS were detected in NIGRA05-001-SO-004 and its duplicate (NIGRA05-001-SO-904) at concentrations below the screening levels. Subsurface soil analytical results are shown in Table 20 and on Figure 19 (Appendix A).

Table 20 Blue Angels Crash Site AFFF Area 5 Subsurface Soil Analytical Results

	Sample ID	NIGRA05-001-SO-004	NIGRA05-001-SO-904 (dup)	NIGRA05-002-SO-002	NIGRA05-003-SO-005
	Depth (feet)	**3–4**	**3–4**	**1–2**	**4–5**
	Sample Date	**08/22/17**	**08/22/17**	**08/22/17**	**08/22/17**
Analyte	**Screening Level (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	**1.1 J**	**3.4 J**	0.66 U	0.58 U
Perfluorooctanoic acid (PFOA)	126[b]	**1.3 J**	**2.8 J**	0.66 U	0.58 U
Perfluorooctane sulfonate (PFOS)	126[b]	**1.4 J**	**4.4 J**	0.66 U	0.58 U

Bold values indicate analyte was detected at the concentration indicated.
[a]EPA Regional Screening Levels for Residential Soil (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b] Screening levels were calculated using the EPA Regional Screening Level Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search). The RSL calculations are presented in Appendix B.
µg/kg = micrograms per kilograms AFFF = aqueous film forming foam NIGRA = Niagara Falls Air Reserve Station
dup = field duplicate ID = identification J = Reported concentration is an estimated value.
SO = subsurface soil U = The analyte was not detected above the reported sample quantification limit

Soil Physiochemical Analyses

To provide basic soil parameter information, composite surface (HMSTD05-004-SS-001) and subsurface (HMSTD05-004-SO-004) soil samples composed of equal aliquots from the borings samples were collected at AFFF Area 5. The samples were submitted for analysis of pH, TOC, percent solids, and grain size. The physiochemical laboratory data sheets and results are presented in Appendix E.

Groundwater

Two of three planned groundwater samples (NIGRA05-001-GW-005 and NIGRA05-003-GW-006) were collected from AFFF Area 5. The temporary well at location NIGRA05-002 remained dry through the sampling effort. PFBS, PFOA, and PFOS were detected in one sample (NIGRA05-001-GW-005). PFBS was detected at a concentration below the RSL. PFOS was detected in both samples and exceeded the HA in NIGRA05-001-GW-005. Combined PFOA and PFOS were detected in both groundwater samples but only exceeded the EPA HA of 0.07 µg/L in one sample (NIGRA05-001-GW-005). Groundwater analytical results are shown in Table 21 and on Figure 20 (Appendix A).

Table 21 Blue Angels Crash Site AFFF Area 5 Groundwater Analytical Results

	Sample ID	NIGRA05-001-GW-005	NIGRA05-003-GW-006
	Sample Date	**08/22/17**	**08/22/17**
Analyte	**Screening Level (µg/L)**	**Result (µg/L)**	**Result (µg/L)**
Perfluorobutane sulfonate (PFBS)	40[a]	**0.29**	0.010 U
Perfluorooctanoic acid (PFOA)	0.07[b]	**0.17**	0.010 U
Perfluorooctane sulfonate (PFOS)	0.07[b]	**1.0 J**	**0.025 J**
PFOA + PFOS	0.07[c]	**1.17 J**	**0.025 J**

Bold values indicate concentration detected at concentration indicated. Shaded results indicate value exceeds screening criteria.
[a] EPA Regional Screening Levels (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b]EPA, May 2016a. Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA) and EPA, May 2016b. Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS). [c]The EPA Health Advisory value for drinking water of 0.07 µg/L applies to the combined detected concentrations of PFOS and PFOA.
µg/L = micrograms per liter AFFF = aqueous film forming foam ID = identification
GW = groundwater J = reported concentration is an estimated value
U = analyte was not detected above the reported value

3.7.5 Conclusions

Releases of AFFF during an emergency response at the Blue Angels crash site have resulted in releases of PFAS to the environment. Surface soil and groundwater have been determined to be impacted above screening levels. Combined PFOA and PFOS concentrations in groundwater samples collected from two temporary wells installed at the Blue Angels crash site ranged from 0.025 µg/L to 1.17 µg/L with only one sample exceeding the screening level. PFAS were detected in the surface soil and subsurface soil but did not exceed the subsurface soil screening level. Therefore, PFAS concentrations above screening levels in groundwater and surface soil have been confirmed at AFFF Area 5.

3.8 FOX ROW/TAXIWAY ALPHA – AFFF AREA 6

3.8.1 Sample Locations

To assess possible PFAS impacts from historical releases of AFFF along Fox Row/Taxiway Alpha, four borings were installed and three existing wells were sampled. Surface soil and subsurface soil samples were collected from each boring. Groundwater samples were collected from three of the four soil boring locations from temporary wells and from three existing wells. The sample locations are shown on Figure 21.

3.8.2 Lithology

The soil at AFFF Area 6 generally consists generally consists of lean clay (CL) and fat clay (CH). The surficial water table was observed in the soil at 2.5 feet bgs. All borings were terminated at the top of the Lockport Dolostone and wells screened in glacial deposits. Detailed boring logs are included in Appendix C.

3.8.3 Groundwater Flow

Groundwater was observed during drilling at approximately 7.5 to 12 feet bgs. Groundwater elevation data was collected from newly installed temporary wells, three existing wells that were sampled, and nine existing wells. Based on water levels gauged on August 22, 2017, the uppermost water bearing zone in AFFF Area 6 was at elevations ranging from 579.44 feet amsl to 585.70 feet amsl. Groundwater elevations and depths to groundwater can be found in Table F-1 of Appendix F. Groundwater flow is to the south, as shown on Figure 21 (Appendix A).

3.8.4 Analytical Results

Surface Soil
Four primary surface soil samples (NIGRA6-001-SS-001, NIGRA06-002-SS-001, NIGRA06-003-SS-001, and NIGRA06-004-SS-001) and one duplicate (NIGRA06-001-SS-901) were collected at AFFF Area 6 from 0 to 6 inches bgs. PFBS was not detected in any of the samples. PFOA and PFOS were detected in all four primary samples and the duplicate at concentrations below the screening level. Surface soil analytical results are shown in Table 22 and on Figure 22 (Appendix A).

Table 22 Fox Row/Taxiway Alpha Area 6 Surface Soil Analytical Results

	Sample ID	NIGRA06-001-SS-001	NIGRA06-002-SS-001	NIGRA06-002-SS-901 (dup)	NIGRA06-003-SS-001	NIGRA06-004-SS-001
	Depth (feet)	**0–0.5**	**0–0.5**	**0–0.5**	**0–0.5**	**0–0.5**
	Sample Date	**08/16/17**	**08/16/17**	**08/16/17**	**08/16/17**	**08/17/17**
Analyte	**Screening Level (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.58 U	0.68 U	0.71 U	0.77 UJ	0.66 U
Perfluorooctanoic acid (PFOA)	126[b]	**1.5**	**2.8 J**	**2.0 J**	**1.3 J**	**0.80 J**
Perfluorooctane sulfonate (PFOS)	126[b]	**17**	**33**	**33**	**12 J**	**53**

Bold values indicate analyte was detected at the concentration indicated.
[a]EPA Regional Screening Levels for Residential Soil (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b] Screening levels were calculated using the EPA Regional Screening Level Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search). The RSL calculations are presented in Appendix B.
µg/kg = micrograms per kilograms AFFF = aqueous film forming foam
NIGRA = Niagara Falls Air Reserve Station dup = field duplicate ID = identification
J = Reported concentration is an estimated value. SS = surface soil
U = The analyte was not detected above the reported sample quantification limit

Subsurface Soil

Four primary subsurface soil samples (NIGRA06-001-SO-012, NIGRA06-002-SO-012, MIGRA06-003-SO-007, and NIGRA06-004-SO-002) were collected at AFFF Area 6. PFBS was not detected any of the samples. PFOA and PFOS were detected in only one sample (NIGRA06-004-SO-012), both at estimated concentrations below the screening level. Subsurface soil analytical results are shown in Table 23 and on Figure 22 (Appendix A).

Table 23 Fox Row/Taxiway Alpha AFFF Area 6 Subsurface Soil Analytical Results

	Sample ID	NIGRA06-001-SO-012	NIGRA06-002-SO-012	NIGRA06-003-SO-007	NIGRA06-004-SO-002
	Depth (feet)	**11–12**	**11–12**	**6–7**	**1–2**
	Sample Date	**08/16/17**	**08/16/17**	**08/17/17**	**08/17/17**
Analyte	**Screening Level (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.75 U	0.70 U	0.58 U	0.70 R
Perfluorooctanoic acid (PFOA)	126[b]	0.75 U	0.70 U	0.58 U	**0.77 J**
Perfluorooctane sulfonate (PFOS)	126[b]	0.75 U	0.70 U	0.58 U	**11 J**

Bold values indicate analyte was detected at the concentration indicated.
[a]EPA Regional Screening Levels for Residential Soil (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b] Screening levels were calculated using the EPA Regional Screening Level Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search). The RSL calculations are presented in Appendix B.
µg/kg = micrograms per kilograms AFFF = aqueous film forming foam NIGRA = Niagara Falls Air Reserve Station
ID = identification J = Reported concentration is an estimated value. SO = subsurface soil
U = The analyte was not detected above the reported sample quantification limit
R=the analyte was not detected at the concentration indicated; the result was rejected during validation because the sample was received outside the 4 +/- 2 degree temperature criterion.

Soil Physiochemical Analyses
To provide basic soil parameter information, composite surface (NIGRA06-005-SS-001) and subsurface (NIGRA06-005-SO-012) soil samples composed of equal aliquots from the borings samples were collected at AFFF Area 6. The samples were submitted for analysis of pH, TOC, percent solids, and grain size. The physiochemical laboratory data sheets and results are presented in Appendix E.

Groundwater
Six primary groundwater samples (NIGRA06-MW7-1D-010, NIGRA06-MW7-2-005, NIGRA06-MW7-3D-014, NIGRA06-001-GW-015, NIGRA06-002-GW-015, and NIGRA06-003-GW-009) and one duplicate (NIGRA06-001-GW-915) were collected from AFFF Area 6. PFBS was detected in five of the six primary samples at concentrations below the RSL. PFOA and PFOS were detected in five of the six primary samples and combined PFOA and PFOS concentrations exceeded the EPA HA in NIGRA06-MW7-1D-010, NIGRA06-MW7-2-005, and NIGRA06-MW7-3D-014 at concentrations ranging from 0.0898 µg/L to 54 µg/L. Groundwater analytical results are shown in Table 24 and on Figure 23 (Appendix A).

Table 24 Fox Row/Taxiway Alpha AFFF Area 6 Groundwater Analytical Results

	Sample ID	NIGRA06-MW7-1D-010	NIGRA06-MW7-2-005	NIGRA06-MW7-3D-014	NIGRA06-001-GW-015	NIGRA06-001-GW-915 (dup)	NIGRA06-002-GW-015	NIGRA06-003-GW-009
	Sample Date	**08/15/17**	**08/15/17**	**08/17/17**	**08/17/17**	**08/17/17**	**08/18/17**	**08/21/17**
Analyte	**Screening Level (µg/L)**	**Result (µg/L)**	**Result (µg/L)**	**Result (µg/L)**	**Result (µg/L)**	**Result (µg/L)**	**Result (µg/L)**	**Result (µg/L)**
Perfluorobutane sulfonate (PFBS)	40[a]	**3.4 J**	**1.4 J**	**0.0085 J**	0.010 UJ	0.010 UJ	**0.011 J**	**0.039**
Perfluorooctanoic acid (PFOA)	0.07[b]	**5.0 J**	**3.0 J**	**0.0088 J**	0.010 UJ	0.010 UJ	**0.0053 J**	**0.0061 J**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**49 J**	**45 J**	**0.081**	0.010 UJ	0.010 UJ	**0.010 J**	**0.061**
PFOA + PFOS	0.07[c]	**54.0 J**	**48.0 J**	**0.0898 J**	ND	ND	**0.0153 J**	**0.0671 J**

Bold values indicate concentration detected at concentration indicated. Shaded results indicate value exceeds screening criteria.
[a] EPA Regional Screening Levels (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b]EPA, May 2016a. Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA) and EPA, May 2016b. Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).
[c]The EPA Health Advisory value for drinking water of 0.07 µg/L applies to the combined detected concentrations of PFOS and PFOA.
µg/L = micrograms per liter AFFF = aqueous film forming foam dup = field duplicate ID = identification GW = groundwater
MW = monitor well ND = not detected at the Method Detection Limit J = Reported concentration is an estimated value.
U = analyte was not detected above the reported value

3.8.5 Conclusions

Accidental releases of AFFF in the Fox Row/Taxiway Alpha area have resulted in releases of PFAS to the environment. However, only groundwater has been determined to be impacted above screening levels. Combined PFOA and PFOS concentrations in groundwater samples collected from three temporary wells and three existing wells in the area of Fox Row/Taxiway Alpha ranged from non-detect to 54 µg/L, with three samples exceeding the screening level. PFAS were detected in the surface soil and subsurface soil but did not exceed the screening level. Therefore, concentrations of PFAS above screening levels in the groundwater have been confirmed at AFFF Area 6 and concentrations of PFAS above screening levels in surface soil and subsurface soil have not been confirmed at AFFF Area 6.

3.9 OUTFALLS 004, 005, 007, AND 009 – AFFF AREA 7

3.9.1 Sample Locations

To assess possible releases of PFAS from operations throughout NFARS, four outfalls that drain from areas throughout the installation were chosen for sampling at AFFF Area 7. Four co-located surface water and sediment samples were taken—one pair at each outfall. Because no borings were conducted at these locations, no lithology was described, no soil or groundwater samples were collected, and no groundwater flow direction at this area was determined. The sample locations are shown on Figure 24.

3.9.2 Lithology

Lithology was not described for locations at AFFF Area 7 because no soil borings were installed.

3.9.3 Groundwater Flow

Soil borings and temporary wells were not installed near the outfall locations. Groundwater flow at NFARS is generally to the south, as shown on Figure 24 (Appendix A).

3.9.4 Analytical Results

Sediment
Four sediment samples (NIGRA07-001-SD-001, NIGRA07-002-SD-001, NIGRA07-003-SD-001, NIGRA07-004-SD-001) were collected from AFFF Area 7. PFBS was detected in one of four samples at NIGRA07-003-SD-001. PFOA was detected in all four samples at concentrations below the screening level. PFOS was detected in all four samples and exceeded the screening level in one (NIGRA07-002-SD-001). Sediment analytical results are shown in Table 25 and on Figure 25 (Appendix A).

Table 25 Outfalls 004, 005, 007, and 009 Area 7 Sediment Analytical Results

		Outfall 004	Outfall 009	Outfall 005	Outfall 007
	Sample ID	NIGRA07-001-SD-001	NIGRA07-002-SD-001	NIGRA07-003-SD-001	NIGRA07-004-SD-001
	Depth (feet)	0–0.5	0–0.5	0–0.5	0–0.5
	Sample Date	08/16/17	08/16/17	08/16/17	08/22/17
Analyte	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.94 UJ	**0.83 J**	0.86 UJ	0.84 U
Perfluorooctanoic acid (PFOA)	126[b]	**1.0 J**	**4.1 J**	**0.58 J**	**0.47 J**
Perfluorooctane sulfonate (PFOS)	126[b]	**54 J**	**160 J**	**11 J**	**11**

Bold values indicate analyte was detected at the concentration indicated. Shaded results indicate value exceeds screening criteria.
[a]EPA Regional Screening Levels for Residential Soil (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b] Screening levels were calculated using the EPA Regional Screening Level Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search). The RSL calculations are presented in Appendix B.
µg/kg = micrograms per kilograms
AFFF = aqueous film forming foam
NIGRA = Niagara Falls Air Reserve Station
ID = identification
J = Reported concentration is an estimated value.
SD = sediment
U = The analyte was not detected above the reported sample quantification limit

Surface Water

Four surface water samples (NIGRA07-001-SW-001, NIGRA07-002-SW-001, NIGRA07-003-SW-001, NIGRA07-004-SW-001) were co-located with the sediment samples. PFBS was detected in three of four samples, all at concentrations below the screening level. PFOA and PFOS were detected all four samples and exceeded the EPA HA of 0.07 µg/L for both individual and combined PFOA and PFOS results in two samples. Surface water analytical results are shown in Table 26 and on Figure 26 (Appendix A).

Table 26 Outfalls 004, 005, 007, and 009 AFFF Area 7 Surface Water Analytical Results

	Sample ID	NIGRA07-001-SW-001	NIGRA07-002-SW-001	NIGRA07-003-SW-001	NIGRA07-004-SW-001
	Outfall	Outfall 004	Outfall 009	Outfall 005	Outfall 007
	Sample Date	08/16/17	08/16/17	08/16/17	08/22/17
Analyte	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane sulfonate (PFBS)	40[a]	**0.080 J**	**0.0059 J**	0.010 UJ	**0.10**
Perfluorooctanoic acid (PFOA)	0.07[b]	**0.16 J**	**0.013 J**	**0.0075 J**	**0.21**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**1.9 J**	**0.049 J**	**0.012 J**	**2.8 J**
PFOA + PFOS	0.07[c]	**2.06 J**	**0.062 J**	**0.0195 J**	**3.01 J**

Bold values indicate concentration detected at concentration indicated. Shaded results indicate value exceeds screening criteria.
[a] EPA Regional Screening Levels (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf]. [b] EPA, May 2016a. Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA) and EPA, May 2016b. Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS). [c] The EPA Health Advisory value for drinking water of 0.07 µg/L applies to the combined detected concentrations of PFOS and PFOA.
µg/L = micrograms per liter
AFFF = aqueous film forming foam
ID = identification
J = reported concentration is an estimated value.
NIGRA = Niagara Falls Air Reserve Station
SW = surface water
U = The analyte was not detected above the reported sample quantification limit

3.9.5 Conclusions

Combined PFOA and PFOS concentrations in surface water samples collected from four outfalls ranged from 0.0195 µg/L to 3.01 µg/L, with only two samples exceeding the screening level. PFAS were detected in the co-located sediment samples and exceeded the screening level at Outfall 009. Therefore, concentrations of PFAS above screening levels in the surface water have been confirmed at AFFF Area 7 and concentrations of PFAS above screening levels in the sediment at the outfalls have been confirmed at AFFF Area 7. The PFAS impacts observed at Outfall 007 are likely attributable to Site 9 (AFFF Area 1) and possibly the Blue Angels Crash Site (AFFF Area 5). The PFAS impacts observed at Outfall 009 are likely attributable to Buildings 700/706 (AFFF Areas 3 and 4) and/or Fox Row/Taxiway Alpha (AFFF Area 6) releases. Lastly, the PFAS impacts observed at Outfall 004 could be due to the Building 700 test spray area (AFFF Area 3).

3.10 HULBY STREET – AFFF AREA 8

3.10.1 Sample Locations

To assess possible releases of PFAS from equipment testing at AFFF Area 8, three borings were installed. Surface soil and subsurface soil samples were collected from three borings. Temporary wells were installed in three borings screened near the top of the uppermost saturated zone with total depths of 10 to 11 feet bgs and constructed with 5-foot-long, prepacked screens. Groundwater samples were collected from the three temporary wells. Sample locations are shown in Figure 27 (Appendix A).

3.10.2 Lithology

The soil at AFFF Area 8 generally consists of lean clay (CL) and fat clay (CH). The surficial water table was observed at approximately 9 feet bgs. All borings were terminated at the top of the Lockport Dolostone and wells screened in glacial deposits. Detailed boring logs are included in Appendix C.

3.10.3 Groundwater Flow

Based on water levels from the temporary wells gauged on July 14, 2017, the uppermost water bearing zone in AFFF Area 8 ranged from 587.42 feet to 588.29 feet amsl. Groundwater elevations and depths to groundwater can be found in Table F-1 of Appendix F. Shallow groundwater flowed south as shown on Figure 27 (Appendix A).

3.10.4 Analytical Results

Surface Soil
Three surface soil samples (NIGRA08-001-SS-001, NIGRA08-002-SS-001, and NIGRA08-003-SS-001) were collected at AFFF Area 8 from 0 to 6 inches bgs. PFOS was detected all in three samples below the screening level and PFOA was detected in two samples below the screening level; PFBS was not detected in any of the samples. Surface soil analytical results are shown in Table 27 and on Figure 28 (Appendix A).

Table 27 Hulby Street AFFF Area 8 Surface Soil Analytical Results

	Sample ID	NIGRA08-001-SS-001	NIGRA08-002-SS-001	NIGRA08-003-SS-001
	Depth (feet)	0–0.5	0–0.5	0–0.5
	Sample Date	08/14/17	08/14/17	08/14/17
Analyte	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.73 R	0.60 R	0.72 R
Perfluorooctanoic acid (PFOA)	126[b]	**0.51 J**	**0.52 J**	0.72 R
Perfluorooctane sulfonate (PFOS)	126[b]	**5.7 J**	**7.9 J**	**0.95 J**

Bold values indicate analyte was detected at the concentration indicated.
[a]EPA Regional Screening Levels for Residential Soil (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b] Screening levels were calculated using the EPA Regional Screening Level Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search). The RSL calculations are presented in Appendix B.
µg/kg = micrograms per kilograms
AFFF = aqueous film forming foam
NIGRA = Niagara Falls Air Reserve Station
ID = identification
J = Reported concentration is an estimated value.
SS = surface soil
R=the analyte was not detected at the concentration indicated; the result was rejected during validation because the sample was received outside the 4 +/- 2 degree temperature criterion.

Subsurface Soil

Three subsurface soil samples (NIGRA08-001-SO-008, NIGRA08-002-SO-010, and NIGRA08-003-SO-008) were collected at AFFF Area 8. PFBS and PFOA were not detected in the samples. PFOS was detected in estimated concentrations below the screening level. Subsurface soil analytical results are shown in Table 28 and on Figure 28 (Appendix A).

Table 28 Hulby Street AFFF Area 8 Subsurface Soil Analytical Results

	Sample ID	NIGRA08-001-SO-008	NIGRA08-002-SO-010	NIGRA08-003-SO-008
	Depth (feet)	7–8	9–10	7–8
	Sample Date	08/14/17	08/14/17	08/14/17
Analyte	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.66 U	0.59 U	0.58 U
Perfluorooctanoic acid (PFOA)	126[b]	0.66 U	0.59 U	0.58 U
Perfluorooctane sulfonate (PFOS)	126[b]	**0.40 J**	**0.27 J**	**0.23 J**

Bold values indicate analyte was detected at the concentration indicated.
[a]EPA Regional Screening Levels for Residential Soil (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b] Screening levels were calculated using the EPA Regional Screening Level Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search). The RSL calculations are presented in Appendix B.
µg/kg = micrograms per kilograms
AFFF = aqueous film forming foam
NIGRA = Niagara Falls Air Reserve Station
ID = identification
J = Reported concentration is an estimated value.
SO = subsurface soil
U = The analyte was not detected above the reported sample quantification limit

Soil Physiochemical Analyses

To provide basic soil parameter information, composite surface (NIGRA08-004-SS-001) and subsurface (NIGRA08-004-SO-008) soil samples composed of equal aliquots from the borings samples were

collected at AFFF Area 8. The samples were submitted for analysis of pH, TOC, percent solids, and grain size. The physiochemical laboratory data sheets and results are presented in Appendix E.

Groundwater
Three groundwater samples (NIGRA08-001-GW-011, NIGRA08-002-GW-010, and NIGRA08-003-GW-009) were collected at AFFF Area 8. PFBS, PFOA, and PFOS were not detected in NIGRA08-003-GW-009 and were detected below screening levels in NIGRA08-001-GW-011. However, PFOS and combined PFOA and PFOS exceeded the screening level at NIGRA08-002-GW-010. Groundwater analytical results are shown in Table 29 and on Figure 29 (Appendix A).

Table 29 Hulby Street AFFF Area 8 Groundwater Analytical Results

	Sample ID	**NIGRA08-001-GW-011**	**NIGRA08-002-GW-010**	**NIGRA08-003-GW-009**
	Sample Date	**08/16/17**	**08/18/17**	**08/16/17**
Analyte	**Screening Level (µg/L)**	**Result (µg/L)**	**Result (µg/L)**	**Result (µg/L)**
Perfluorobutane sulfonate (PFBS)	40[a]	**0.0077 J**	0.010 U	0.010 UJ
Perfluorooctanoic acid (PFOA)	0.07[b]	**0.0077 J**	0.010 U	0.010 UJ
Perfluorooctane sulfonate (PFOS)	0.07[b]	**0.015 J**	**0.10**	0.010 UJ
PFOA + PFOS	0.07[c]	**0.0227 J**	**0.10**	ND

Bold values indicate concentration detected at concentration indicated. Shaded results indicate value exceeds screening criteria
[a] EPA Regional Screening Levels (May 2018) [https://semspub.epa.gov/work/HQ/197235.pdf].
[b]EPA, May 2016a. Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA) and EPA, May 2016b. Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).
[c]The EPA Health Advisory value for drinking water of 0.07 µg/L applies to the combined detected concentrations of PFOS and PFOA.
µg/L = micrograms per liter AFFF = aqueous film forming foam GW = groundwater ID = identification
ND = not detected at the Method Detection Limit J = reported concentration is an estimated value
U = analyte was not detected above the reported value

3.10.5 Conclusions

Accidental releases of AFFF during training exercises near Hulby Street have resulted in releases of PFAS to the environment. However, only groundwater has been determined to be impacted above screening levels. Combined PFOA and PFOS concentrations in groundwater samples collected from three temporary wells installed at Area 8 ranged from non-detect to 0.10 µg/L with only one sample exceeding the screening level. PFAS were detected in the surface soil and subsurface soil but did not exceed the screening level. Therefore, concentrations of PFAS above screening levels in the groundwater have been confirmed at AFFF Area 8. Concentrations of PFAS above screening levels in surface soil and subsurface soil have not been confirmed at AFFF Area 8.

3.11 INVESTIGATION-DERIVED WASTE

3.11.1 Waste Soil and Water

The Air Force has awarded a separate contract to others for the removal and proper disposal of investigation-derived waste generated during this SI. Waste soil and water were placed in Department of Transportation-approved steel drums (two drums of soil and two drums of water) and staged at the hazardous waste drum storage building. A representative sample was collected from each media, submitted to the project laboratory, and analyzed for PFAS, toxicity (toxicity characteristic leaching

procedure), ignitability, corrosivity (pH), and reactivity. These analytical results have been submitted to the Air Force electronically.

3.11.2 Construction Waste

Construction 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

4.1 NIAGARA FALLS AIR RESERVE STATION HYDROGEOLOGY

Overburden thickness throughout NFARS ranges from approximately 3 feet near Cayuga Creek to nearly 18 feet in the northwestern portion of the facility. The overburden is comprised of three main types of material: reworked topsoil/fill, lacustrine deposits, and glacial till. Areas near Cayuga Creek may contain fluvial deposits. This SI investigation provides a preliminary, limited evaluation of potential PFAS impacts in shallow overburden groundwater at suspected AFFF source areas. The majority of historical groundwater contamination for various contaminants at NFARS has been found and addressed in fractured shallow bedrock. Investigation into the shallow bedrock was outside the scope of this investigation and has not been evaluated.

The fine-grained nature of the unconsolidated overburden (till and lacustrine deposits) produces a very low hydraulic conductivity in the area. This leads to high surface runoff with low infiltration rates. Water movement through the overburden is restricted except in areas with sand lenses and dehydration cracking. Hydraulic conductivities throughout the NFARS have been reported to range from as low as 7.6×10^{-9} centimeters per second (cm/sec) up to 1.08×10^{-3} cm/sec (ASL, August 2016).

Bedrock below the thin layer of overburden is Middle Silurian Lockport Dolostone, which consists of gray to brownish gray, fine- to coarse-grained, and massive- to thinly bedded dolostone. Regionally, the Lockport Dolostone consists of three formations: the Guelph Formation, the Eramosa Formation, and the Upper Goat Island Formation. In the locale of NFARS's Guelph Formation, the uppermost unit is not present. Underlying the Guelph Formation, the Eramosa Formation is present in the area of NFARS; however, it is missing the upper 10–20 feet. The Eramosa Formation is a dolomite and is described as a biostromal, bituminous, medium- to massive-bedded dolomite. Below the Eramosa Formation lies the Upper Goat Island Formation, which is a light to dark gray, medium- to thin-bedded argillaceous dolomite with thin shale partings and locally present vugs (ASL, August 2016). A stratigraphic column for the area can be found on Figure 3 of Appendix A.

The New York and New England Carbonate Rock Aquifer is a principal aquifer that underlies a considerable portion of the southern half of Niagara County. Three bedrock aquifers are contained within this principal aquifer. These include the Lockport aquifer occurring in the Lockport Dolomite formation; the Camillus aquifer occurring in the Camillus Shale and the Syracuse formations; and the limestone aquifer occurring in the Onondaga Limestone, Akron Dolomite, and the Bertie Limestone formations. All three bedrock aquifers yield small to moderate quantities of water and are not used for significant public withdrawals of water. The large majority of public water supplies provided by the county's water district are obtained from the Niagara River.

The population both on and off the installation within a 4-mile radius of the NFARS site primarily relies on drinking water provided by surface water intakes on the Niagara River, slightly more than 8 miles to the south and upstream of the Cayuga Creek entry to the Niagara River (ASL, August 2016).

Regional groundwater flow in the area of NFARS is south to southwest. Localized flow directions vary based on proximity to Cayuga Creek, which enters the facility from the northeastern quadrant and flows west, paralleling the aircraft aprons and runway before exiting to the south. Local flow directions have been observed to the east, southeast, south, and southwest at various previously investigated sites. Shallow groundwater flow directions also vary based on seasonal water-level fluctuations (ASL, August 2016).

There are nine wells designated for commercial or domestic use within 4 miles of the installation to the south and southwest. The 4-mile radius follows guidance prescribed by the EPA document *Federal Facilities Remedial Site Inspection Summary Guide* (EPA, July 2005). These wells are listed below in Table 30. Information on these nine wells was obtained from the DEC Water Well Program Information Search Wizard and from documents provided by NYSDEC reviewers. Information such as designated use is not available through the water well program and was provided by document reviewers and is shown on Figure 5 of Appendix A. Table G-1 (Appendix G) presents the information provided by NYSDEC through e-mail communication and documents 66 wells within a 4-mile radius of NFARS.

Wells NI1242, NI1248, and NI1251 are approximately 3.5 miles southwest and downgradient of the installation. These wells are installed in bedrock to a depth of 200 feet bgs, are likely geologically isolated from the surficial aquifer due to their depth, and, therefore, are unlikely to be impacted by PFAS. Well NI1237 is a commercial well of an unknown depth installed near Well NI1242. Well NI1259 is a commercial-use well that is installed immediately adjacent to NI1251 (a domestic-use well). Although the depths of Wells NI1237 and NI1259 are unknown, they are commercial-use wells and are unlikely to present a human health risk. The domestic-use well next to NI1259 indicates that this well is not used for potable water and the area of NI1237 is heavily industrialized, suggesting that it is also unlikely to be used for potable water. Although commercial-use well NI1270 is within 4 miles of the installation boundary, it is greater than 4 miles from any of the investigated AFFF areas and, therefore, does not present an immediate risk to human health.

Wells E2770, E3085, and E3139 are all located to the south of NFARS on Grand Island. All three are designated for domestic use. Their geographic location, on the south side of Niagara River, suggests that they are hydraulically isolated from any potential contamination at NFARS and do not present an immediate risk to human health.

Table 30 Wells within 4 Miles Downgradient of NFARS

Well No.	Use	Depth	Source	Location
NI1237	Commercial	Unknown	Provided by NYSDEC	North of Niagara River
NI1242	Commercial	200	NY Well Database and NYSDEC	North of Niagara River
NI1248	Domestic	200	NY Well Database and NYSDEC	North of Niagara River
NI1251	Domestic	200	NY Well Database and NYSDEC	North of Niagara River
NI1259	Commercial	Unknown	Provided by NYSDEC	North of Niagara River

Well No.	Use	Depth	Source	Location
NI1270	Commercial	Unknown	Provided by NYSDEC	North of Niagara River
E2770	Domestic	58	NY Well Database and NYSDEC	South of Niagara River
E3085	Domestic	68	NY Well Database and NYSDEC	South of Niagara River
E3139	Domestic	Unknown	Provided by NYSDEC	South of Niagara River

No. = number NY = New York
NYSDEC = New York State Department of Environmental Conservation

Registered wells north of the base (shown on Figure 5) are upgradient of NFARS and are not at risk from PFAS-impacted groundwater.

Specific groundwater pathways for each AFFF area are discussed in Sections 4.2 through 4.10.

4.2 FT007/FPTA NO. 3/SITE 9 – AFFF AREA 1

Shallow groundwater has been impacted by use of AFFF during training exercises at AFFF Area 1. PFOA, PFOS, and combined PFOA and PFOS were detected in three groundwater samples at concentrations above the EPA HA of 0.07 µg/L.

Based on water levels from the temporary wells gauged on August 22, 2017, groundwater in the uppermost water-bearing zone in AFFF Area 1 flows to the south and is likely discharging to Cayuga Creek.

As discussed in Section 4.1, there is no immediate threat from PFOA- and PFOS-impacted groundwater to known drinking water sources within a 4-mile radius of AFFF Area 1. Known wells are likely geologically or hydraulically isolated from the surficial aquifer. Any potentially impacted groundwater that may discharge to Cayuga Creek or the Niagara River would be downstream of the drinking water intake. Therefore, the groundwater pathway for human ingestion of impacted groundwater is incomplete.

4.3 HANGAR 850 – AFFF AREA 2

Shallow groundwater has been impacted by the accidental release of AFFF at Hangar 850. PFAS were detected in all groundwater samples collected at the hangar and exceeded the screening level in one sample.

Based on water levels from the temporary wells gauged on August 22, 2017, groundwater in the uppermost water-bearing zone in AFFF Area 2 flows to the east/southeast.

As discussed in Section 4.1, there is no immediate threat 2 from PFOA- and PFOS-impacted groundwater to known drinking water sources within a 4-mile radius of AFFF Area 2. Known wells are likely geologically or hydraulically isolated from the surficial aquifer. Any potentially impacted groundwater that may discharge to Cayuga Creek or the Niagara River would be downstream of the drinking water intake. Therefore, the groundwater pathway for human ingestion of impacted groundwater is incomplete.

4.4 BUILDING 706 – AFFF AREA 3

Shallow groundwater has been impacted by release of 216 gallons of AFFF in 1995 at AFFF Area 3. PFOA and PFOS were detected in the two groundwater samples collected at former Building 706 and PFOS and combined PFOA and PFOS exceeded the individual and combined screening level in one of the samples.

Based on water levels from the temporary wells gauged on August 22, 2017, groundwater in the uppermost water-bearing zone in AFFF Area 3 flows to the south.

As discussed in Section 4.1, there is no immediate threat from PFOA- and PFOS-impacted groundwater to known drinking water sources within a 4-mile radius of AFFF Area 3. Known wells are likely geologically or hydraulically isolated from the surficial aquifer. Any potentially impacted groundwater that may discharge to Cayuga Creek or the Niagara River would be downstream of the drinking water intake. Therefore, the groundwater pathway for human ingestion of impacted groundwater is incomplete.

4.5 BUILDING 700 – AFFF AREA 4

Shallow groundwater has been impacted by use of AFFF during spray testing at AFFF Area 4. PFOA, PFOS, and combined PFOA and PFOS were detected at concentrations above the EPA HA of 0.07 µg/L in the two primary samples and one duplicate sample collected at AFFF Area 4.

Based on water levels from the temporary wells gauged on August 22, 2017, groundwater in the uppermost water-bearing zone in AFFF Area 4 flows to the south.

As discussed in Section 4.1, there is no immediate threat from PFOA- and PFOS-impacted groundwater to known drinking water sources within a 4-mile radius of AFFF Area 4. Known wells are likely geologically or hydraulically isolated from the surficial aquifer. Any potentially impacted groundwater that may discharge to Cayuga Creek or the Niagara River would be downstream of the drinking water intake. Therefore, the groundwater pathway for human ingestion of impacted groundwater is incomplete.

4.6 BLUE ANGELS CRASH SITE – AFFF AREA 5

Shallow groundwater has been impacted by use of AFFF for emergency response at AFFF Area 5. PFOA and/or PFOS were detected in both of the samples collected and the combined PFOA and PFOS concentration exceeded the screening level in one of the two samples.

Based on water levels from the temporary wells gauged on August 22, 2017, and historical information, groundwater in the uppermost water-bearing zone in AFFF Area 5 flows to the south.

As discussed in Section 4.1, there is no immediate threat from PFOA- and PFOS-impacted groundwater to known drinking water sources within a 4-mile radius of AFFF Area 5. Known wells are likely geologically or hydraulically isolated from the surficial aquifer. Any potentially impacted groundwater that may discharge to Cayuga Creek or the Niagara River would be downstream of the drinking water intake. Therefore, the groundwater pathway for human ingestion of impacted groundwater is incomplete.

4.7 FOX ROW/TAXIWAY ALPHA – AFFF AREA 6

Shallow groundwater has been impacted by the accidental release of AFFF during a training exercise and other accidental releases in the area of AFFF Area 6. PFOA and/or PFOS were detected in five of six primary samples and exceeded the screening level for combined PFOA and PFOS in three of the samples.

Based on water levels from the temporary wells gauged on August 22, 2017, groundwater in the uppermost water-bearing zone in AFFF Area 6 flows to the south.

As discussed in Section 4.1, there is no immediate threat from PFOA- and PFOS-impacted groundwater to known drinking water sources within a 4-mile radius of AFFF Area 6. Known wells are likely geologically or hydraulically isolated from the surficial aquifer. Any potentially impacted groundwater that may discharge to Cayuga Creek or the Niagara River would be downstream of the drinking water intake. Therefore, the groundwater pathway for human ingestion of impacted groundwater is incomplete.

4.8 OUTFALLS 004, 005, 007, AND 009 – AFFF AREA 7

Groundwater was not identified as a medium of concern at AFFF Area 7.

4.9 HULBY STREET – AFFF AREA 8

Shallow groundwater has been impacted by use of AFFF during training exercises at AFFF Area 8. PFOS and/or PFOA were detected in two of three groundwater samples collected and exceeded the screening level for PFOA and PFOS combined in one sample.

Based on water levels from the temporary wells gauged on August 22, 2017, groundwater in the uppermost water-bearing zone in AFFF Area 8 flows to the south.

As discussed in Section 4.1, there is no immediate threat from PFOA- and PFOS-impacted groundwater to known drinking water sources within a 4-mile radius of AFFF Area 8. Known wells are likely geologically or hydraulically isolated from the surficial aquifer. Any potentially impacted groundwater that may discharge to Cayuga Creek or the Niagara River would be downstream of the drinking water intake. Therefore, the groundwater pathway for human ingestion of impacted groundwater is incomplete.

5.0 SURFACE WATER PATHWAY

The closest natural surface water body to NFARS is Cayuga Creek. The middle reach of Cayuga Creek flows along the southern boundary of NFARS and has an approximate bed elevation of 572 feet amsl). It is a tributary of the Niagara River and lies within the Erie-Niagara Drainage Basin of western New York State in Niagara County, New York, as well as being part of the Niagara Tonawanda Creek Watershed. The sub watershed area for the Cayuga Creek Main stem is approximately 16.4 square miles. Beginning to the north of NFARS in the town of Lewiston, it flows south through NFARS and the City of Niagara Falls before joining with Bergholtz Creek and then the Little River before finally discharging into the Niagara River 5 miles upstream of Niagara Falls (ASL, August, 2016).

The Cayuga Creek is not used for drinking or industrial makeup water. Cayuga Creek is an impaired creek and is classified as a Class C stream, indicating that it categorically has water quality suitable for primary and secondary contact, including recreation and fishing. However, the New York State Department of Health's "Health Advice on Eating Sportfish and Game" (April 2018) specifically advises against eating any fish from Cayuga Creek due to impacts by dioxin.

The population both on and off the installation within a 4-mile radius of NFARS primarily relies on drinking water provided by surface water intakes on the Niagara River, slightly more than 8 miles to the south and upstream of the Cayuga Creek entry to the Niagara River.

Specific surface water pathways for each AFFF area are discussed in Sections 5.1 through 5.9. PFOA and combined PFOA and PFOS were in the surface water above screening levels and are discussed in Sections 5.1 through 5.9.

5.1 FT007/FPTA NO. 3/SITE 9 – AFFF AREA 1

At AFFF Area 1, surface water flows into a surficial drainage features that surrounds the site. This drainage feature empties into a canal that flows south to Cayuga Creek through Outfall 007. A detailed description of Cayuga Creek and its watershed can be found in Section 5.0. AFFF Area 1 is not located within registered wetlands but there are registered wetland areas nearby.

The primary surface water intake for the area on the Niagara River is slightly more than 8 miles to the south and upstream of where Cayuga Creek discharges into the Niagara River (ASL, August 2016).

PFOA, PFOS, and the combined PFOA and PFOS estimated concentrations in both the primary and the duplicate surface water samples collected from the drainage ditch surrounding AFFF Area 1 exceeded the EPA HA of 0.07 µg/L.

Human ingestion of combined PFOA and PFOS from impacted surface water from AFFF Area 1 is not probable and ingestion of water from the ditches is not likely. The surface water intake for the region is upstream of the discharge point for Cayuga Creek and there are no surface water intakes within 15 miles downstream of the installation within the United States. Therefore, the surface water pathway is incomplete at AFFF Area 1 and there is no immediate impact to human health.

5.2 HANGAR 850 – AFFF AREA 2

At AFFF Area 2, surface water flows into an unnamed tributary on the eastern side of Hangar 850 that then empties into the middle reach of Cayuga Creek. A detailed description of Cayuga Creek and its watershed can be found in Section 5.0.

PFAS was not detected in the surface water sample collected from the unnamed tributary east of Hangar 850; therefore, the surface water pathway is incomplete at AFFF Area 2 and there is no immediate impact to human health.

5.3 BUILDING 706 – AFFF AREA 3

Surface water was not identified as a media of concern at AFFF Area 3.

5.4 BUILDING 700 – AFFF AREA 4

Surface water was not identified as a media of concern at AFFF Area 4.

5.5 BLUE ANGELS CRASH SITE – AFFF AREA 5

Surface water was not identified as a media of concern at AFFF Area 5.

5.6 FOX ROW/TAXIWAY ALPHA – AFFF AREA 6

Surface water was not identified as a media of concern at AFFF Area 6.

5.7 OUTFALLS 004, 005, 007, AND 009 – AFFF AREA 7

Outfalls 004, 005, 007, and 009 were sampled to assess possible releases of PFAS from operations throughout NFARS. These four outfalls serve as the primary discharge points for surface water from the installation into the middle reach of Cayuga Creek. A detailed description of Cayuga Creek and its watershed can be found in Section 5.0.

PFOA and PFOS were detected in each of the surface water samples collected and exceeded the screening level at Outfalls 004 and 007.

Human ingestion of combined PFOA and PFOS from impacted surface water from AFFF Area 7 is not probable and ingestion of water from the ditches is not likely. Local use of Cayuga Creek is unlikely to include direct ingestion of the creek water. The surface water intake for the region is upstream of the discharge point for Cayuga Creek and there are no surface water intakes within 15 miles downstream of the installation within the United States. Therefore, the surface water pathway is incomplete at AFFF Area 7 and there is no immediate impact to human health.

5.8 HULBY STREET – AFFF AREA 8

Surface water was not identified as a media of concern at AFFF Area 8.

6.0 SOIL, SEDIMENT, AND AIR EXPOSURE PATHWAYS

6.1 FT007/FPTA NO.3/SITE 9 – AFFF AREA 1

Surface soil and sediment at AFFF Area 1 have been impacted by past use of AFFF at the former FPTA. PFOS was detected in each of three surface soil samples and in one of two primary sediment samples at levels above the calculated screening level.

Human ingestion of PFAS from impacted surface soils or sediment from AFFF Area 1 is not probable. AFFF Area 1 is a former fire training area and is not currently in use. Workers or Air Reserve Station personnel could be exposed to PFAS-impacted surface soils or sediment at the site or in downstream ditches. However, ingestion of soil or sediment from the site or ditches is not likely. Therefore, the soil and air pathways are potentially complete at AFFF Area 1 and there is no immediate impact to human health.

6.2 HANGAR 850 – AFFF AREA 2

Where detected, PFAS concentrations in surface, subsurface soil, and sediment samples collected at Hangar 850 were below screening levels. Lacking concentrations of PFBS, PFOA, or PFOS above screening levels, the soil and air pathways are incomplete at AFFF Area 2.

6.3 BUILDING 706 – AFFF AREA 3

Where detected, PFAS concentrations in surface and subsurface soil collected at former Building 706 were below screening levels. Sediment was not identified as a media of concern at AFFF Area 3 and was not sampled. Lacking concentrations of PFBS, PFOA, or PFOS above screening levels, the soil and air pathways are incomplete at AFFF Area 3.

6.4 BUILDING 700 – AFFF AREA 4

Surface soil and subsurface soil at AFFF Area 4 have been impacted by accidental release of AFFF at Building 700. PFOS was detected in each of four surface soil samples and in one of four subsurface soil samples at levels above the calculated screening level.

Human ingestion of PFAS from impacted surface soils or sediment from AFFF Area 4 is not probable. Though AFFF Area 4 is a former fire station currently in use as an office building, workers are unlikely to participate in activities resulting in soil excavation. Workers or Air Reserve Station personnel could be exposed to PFAS-impacted surface soils or subsurface soils at the site; however, ingestion of soil from the area is not likely. Therefore, the soil and air pathways are potentially complete at AFFF Area 4 and there is no immediate impact to human health.

6.5 BLUE ANGELS CRASH SITE – AFFF AREA 5

Surface soil and subsurface soil at AFFF Area 5 have been impacted by accidental release of AFFF at the Blue Angels crash site. PFOS was detected in one of three surface soil samples at levels above the calculated screening level. Sediment was not identified as a media of concern at AFFF Area 5 and was not sampled. Surface soil at AFFF Area 5 has been impacted by the release of AFFF during an emergency response event.

Human ingestion of PFAS from impacted surface soils at AFFF Area 5 is not probable. AFFF Area 5 is a grassy area between the runway and taxiways. Workers or Air Reserve Station personnel could be exposed to PFAS-impacted surface soils at the site; however, ingestion of soil from the area is not likely. Therefore, the soil and air pathways are potentially complete at AFFF Area 5 and there is no immediate impact to human health.

6.6 FOX ROW/TAXIWAY ALPHA – AFFF AREA 6

Where detected, PFAS concentrations in surface and subsurface soil collected at the Fox Row/Taxiway Alpha site were below screening levels. Lacking concentrations of PFBS, PFOA, or PFOS above screening levels, the soil and air pathways are incomplete at AFFF Area 6.

6.7 OUTFALLS 004, 005, 007, AND 009 – AFFF AREA 7

Where detected, PFAS concentrations in sediment collected at the outfalls were below screening levels except at Outfall 009. Surface soil and subsurface soil were not identified as a media of concern at AFFF Area 7 and were not sampled. Sediment at AFFF Area 7 has been impacted by the release of AFFF at Outfall 009. PFOS was detected in the sediment sample there at concentrations above the calculated screening level. Human ingestion of PFAS from impacted sediment from AFFF Area 7 is not probable. AFFF Area 7 encompasses four outfalls and only one outfall had concentrations of PFAS in the sediment that exceeded the screening level. Workers or Air Reserve Station personnel could be exposed to PFAS-impacted sediment at the Outfall 009 or in downstream ditches. However, ingestion of sediment from the outfall or ditches is not likely. Therefore, the soil and air pathways are potentially complete at AFFF Area 7 and there is no immediate impact to human health.

6.8 HULBY STREET – AFFF AREA 8

Where detected, PFAS concentrations in surface and subsurface soil collected at the Hulby Street site were below screening levels. Sediment was not identified as a media of concern at AFFF Area 6 and was

not sampled. Lacking concentrations of PFBS, PFOA, or PFOS above screening levels, the soil and air pathways are incomplete at AFFF Area 8.

7.0 UPDATES TO CONCEPTUAL SITE MODELS

The following sections contain updates to the conceptual site models (CSMs) for AFFF Areas 1 through 8 and address PFOA and PFOS in soil, groundwater, surface water, and sediment. PFBS has been eliminated as a contaminant of concern, based on analytical results presented in Section 3.0, and will not be discussed further.

7.1 FT007/FPTA NO. 3/SITE 9 – AFFF AREA 1

The QAPP addendum (ASL, August 2017) CSM identified surface soil, subsurface soil, groundwater, sediment, and surface water as media of concern at AFFF Area 1. As indicated in Sections 3.3.4., 4.2, 5.1, and 6.1, PFAS concentrations in surface soil, groundwater, surface water, and sediment exceeded screening levels. PFAS concentrations in subsurface soil did not exceed screening levels.

Groundwater, surface water, surface soil, subsurface soil, and sediment are all media that have been impacted by PFAS at Area 1; however, off-site migration is unlikely for all media of concern except surface water and groundwater. As discussed in Section 4.1, all wells within a 4-mile radius of AFFF Area 1 are unlikely to have been impacted since they are geologically or hydrologically isolated from shallow PFAS-impacted groundwater.

As discussed in Section 5.1, Cayuga Creek discharges to the Niagara River but the surface water intake for the area is upstream of the Cayuga Creek discharge point. Based on the locations and characteristics of the wells and the surface water intake, the human ingestion pathway for PFAS from impacted groundwater or surface water is incomplete.

As indicated in Section 6.1, human ingestion from exposure to the sediment is unlikely, but it could represent an ongoing source of surface water and groundwater impacts.

7.2 HANGAR 850 – AFFF AREA 2

The QAPP addendum (ASL, August 2017) CSM identified surface soil, subsurface soil, groundwater, sediment, and surface water are media of concern at AFFF Area 2. As indicated in Sections 3.4.4., 4.3, 5.2, and 6.2, PFAS concentrations in groundwater exceeded screening levels. Surface soil, subsurface soil, sediment, and surface water detections did not exceed screening levels.

Groundwater, surface water, and surface soil are all media that have been impacted by PFAS at Area 2; however, off-site migration is unlikely for all media of concern except groundwater. As discussed in Section 4.1, all wells within a 4-mile radius of AFFF Area 2 are unlikely to have been impacted since they are geologically or hydrologically isolated from shallow PFAS-impacted groundwater.

As discussed in Section 5.2, Cayuga Creek discharges to the Niagara River but the surface water intake for the area is upstream of the Cayuga Creek discharge point. Based on the locations and characteristics of the wells and the surface water intake the human ingestion pathway for PFAS from impacted groundwater or surface water is incomplete.

7.3 BUILDING 706 – AFFF AREA 3

The QAPP addendum (ASL, August 2017) CSM identified surface soil, subsurface soil, and groundwater as media of concern at AFFF Area 3. As indicated in Sections 3.5.4., 4.4, and 6.3, PFAS concentrations in groundwater detections exceeded screening levels. Surface soil and subsurface soil detections did not exceed screening levels.

Groundwater is the only media that has been impacted by PFAS at AFFF Area 3. As discussed in Section 4.1, all wells within a 4-mile radius of AFFF Area 3 are unlikely to have been impacted since they are geologically or hydrologically isolated from shallow PFAS-impacted groundwater.

As discussed in Section 5.3, Cayuga Creek discharges to the Niagara River but the surface water intake for the area is upstream of the Cayuga Creek discharge point. Based on the locations and characteristics of the wells and the surface water intake, the human ingestion pathway for PFAS from impacted groundwater is incomplete.

7.4 BUILDING 700 – AFFF AREA 4

The QAPP addendum (ASL, August 2017) CSM identified surface soil, subsurface soil, and groundwater as media of concern at AFFF Area 4. As indicated in Sections 3.6.4., 4.5, and 6.4, PFAS concentrations in groundwater, surface soil and subsurface soil exceeded screening levels.

Groundwater, surface soil, and subsurface soil are all media that have been impacted by PFAS at AFFF Area 4; however, off-site migration is unlikely for all media of concern except groundwater. None of the nine wells within a 4-mile radius and downgradient of NFARS discussed in Section 4.1 are within 4 miles of AFFF Area 4.

As discussed in Section 5.4, Cayuga Creek discharges to the Niagara River but the surface water intake for the area is upstream of the Cayuga Creek discharge point. Based on the locations and characteristics of the wells and the surface water intake, the human ingestion pathway for PFAS from impacted groundwater is incomplete.

7.5 BLUE ANGELS CRASH SITE – AFFF AREA 5

The QAPP addendum (ASL, August 2017) CSM identified surface soil, subsurface soil, and groundwater as media of concern at AFFF Area 5. As indicated in Sections 3.7.4., 4.6, and 6.5, PFAS concentrations in groundwater and surface soil detections exceeded screening levels. Subsurface soil detections did not exceed screening levels.

Groundwater and surface soil are media that have been impacted by PFAS at AFFF Area 5; however, off-site migration is unlikely for all media of concern except groundwater. As discussed in Section 4.1, all wells within a 4-mile radius of AFFF Area 5 are unlikely to have been impacted since they are geologically or hydrologically isolated from shallow PFAS-impacted groundwater.

As discussed in Section 5.5, Cayuga Creek discharges to the Niagara River but the surface water intake for the area is upstream of the Cayuga Creek discharge point. Based on the locations and characteristics of the wells and the surface water intake, the human ingestion pathway for PFAS from impacted groundwater is incomplete.

7.6 FOX ROW/TAXIWAY ALPHA – AFFF AREA 6

The QAPP addendum (ASL, August 2017) CSM identified surface soil, subsurface soil, and groundwater as media of concern at AFFF Area 6. As indicated in Sections 3.8.4., 4.7, and 6.6, PFAS concentrations in groundwater detections exceeded screening levels. Surface soil and subsurface soil detections did not exceed screening levels.

Groundwater, surface soil, and subsurface soil are all media that have been impacted by PFAS at AFFF Area 6 and off-site migration is unlikely for all media of concern except groundwater. As discussed in Section 4.1, all wells within a 4-mile radius of AFFF Area 6 are unlikely to have been impacted since they are geologically or hydrologically isolated from shallow PFAS-impacted groundwater.

As discussed in Section 5.6, Cayuga Creek discharges to the Niagara River but the surface water intake for the area is upstream of the Cayuga Creek discharge point. Based on the locations and characteristics of the wells and the surface water intake, the human ingestion pathway for PFAS from impacted groundwater is incomplete.

7.7 OUTFALLS 004, 005, 007, AND 009 – AFFF AREA 7

The CSM for Outfalls 004, 005, 007, and 009 presented in the QAPP addendum (ASL, May 2017) identified sediment and surface water as media potentially impacted by previous releases of AFFF at Area 7.

Based on the findings discussed in Sections 3.9 and 5.7, surface water was impacted by PFAS at levels above the screening level at Outfalls 004 and 007.

Based on the findings discussed in Sections 3.9 and 6.7, sediment was impacted by PFAS at levels above the screening level at Outfall 009.

As discussed in Section 5.7, Cayuga Creek discharges to the Niagara River but the surface water intake for the area is upstream of the Cayuga Creek discharge point. Based on the locations and characteristics of the wells and the surface water intake, the human ingestion pathway for PFAS from impacted surface water and sediment is incomplete.

7.8 HULBY STREET – AFFF AREA 8

The QAPP addendum (ASL, August 2017) CSM identified surface soil, subsurface soil, and groundwater as media of concern at AFFF Area 8. As indicated in Sections 3.10.4., 4.9, and 6.8, PFAS concentrations in groundwater detections exceeded screening levels. Surface soil and subsurface soil detections did not exceed screening levels.

Groundwater surface soil, and subsurface soil are media that have been impacted by PFAS at AFFF Area 8; however, off-site migration is unlikely for all media of concern except groundwater. None of the nine wells within a 4-mile radius and downgradient of NFARS discussed in Section 4.1 are within 4 miles of AFFF Area 8.

As discussed in Section 5.8, Cayuga Creek discharges to the Niagara River but the surface water intake for the area is upstream of the Cayuga Creek discharge point. Based on the locations and characteristics of the wells and the surface water intake the human ingestion pathway for PFAS from impacted groundwater is incomplete.

8.0 CONCLUSIONS AND RECOMMENDATIONS

ASL completed SIs at eight known or suspected areas of AFFF releases at NFARS documented in the PA (ASL, August 2016) and as detailed in the site-specific QAPP addendum (ASL, August 2017). Sampling was conducted during this SI at AFFF Areas 1 through 8:

- FT007/FPTA No. 3/Site 9 (AFFF Area 1);
- Hangar 850 (AFFF Area 2);
- Building 706 (AFFF Area 3);
- Building 700 (AFFF Area 4);
- Blue Angels Crash Site (AFFF Area 5);
- Fox Row/Taxiway Alpha (AFFF Area 6);
- Outfalls 004, 005, 007, and 009 (AFFF Area 7); and
- Hulby Street (AFFF Area 8).

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 the EPA lifetime HA for drinking water;
- determine if PFBS is present in soil, sediment, groundwater, or surface water at the inspection areas at concentrations exceeding generic RSLs;
- determine if PFOA and PFOS are present in soil or sediment at the inspection areas at concentrations exceeding screening levels; and
- identify potential receptor pathways with potential impacts to human health.

Selected sample media were different for the eight areas but included surface soil, subsurface soil, groundwater, sediment, and surface water. Sampling was primarily limited to the immediate release areas and biased toward locations most likely to have been impacted by releases of AFFF.

All samples were analyzed for PFBS, PFOA, and PFOS using modified EPA Method 537. Soil and sediment PFBS analytical results were compared to published EPA RSLs. PFOA and PFOS soil and sediment analytical results were compared to screening levels (126 µg/kg for both PFOA and PFOS). Groundwater and surface water PFBS analytical results were compared to the published EPA RSLs; PFOA and PFOS analytical results were compared to the EPA HA of 0.07 µg/L for the combined concentrations of PFOA and PFOS.

The QAPP addendum identified surface soil and subsurface soil as known or potentially impacted media of concern at seven of eight areas and sediment was identified at three of eight areas. Where sampled, PFBS, PFOA, and PFOS concentrations in surface soil, subsurface soil, and sediment were below RSLs at all areas except at AFFF Areas 1, 4, 5, and 7.

The QAPP addendum identified groundwater as a known or potentially impacted media of concern at each seven of eight AFFF areas. Groundwater was sampled at seven of eight AFFF areas during the SI and PFAS concentrations exceeded the screening level at each area.

The QAPP addendum also identified surface water as a known or potentially impacted media of concern at AFFF Areas 1, 2, and 7. Surface water at AFFF Areas 1 and 7 exceeded the EPA HA.

Table 31 summarizes detected concentrations of PFBS, PFOA, and PFOS for each media sampled at each area. A brief summary of key findings and conclusions for each site (focusing on PFOA and PFOS exceedances) are included below.

Table 31 Summary of PFBS, PFOA, and PFOS Detections and Screening Level Exceedances

AFFF Area	ERP ID	Parameter	Screening Value	Maximum Detected Concentration	Number of Samples / Number of Exceedances	Exceeds Screening Value	Potentially Complete Drinking Water Exposure Pathway	Recommendation
AFFF Area 1 FT007/FPTA No. 3/Site 9	**FT007**	**Surface Soil**	**(µg/kg)**	**(µg/kg)**			No	Advance Area to RI
		PFBS	130,000	6.4 J	3/0	No		
		PFOA	126	62 J	3/0	No		
		PFOS	126	**4,000 J**	**3/3**	**Yes**		
		Subsurface Soil	**(µg/kg)**	**(µg/kg)**				
		PFBS	130,000	ND	3/0	No		
		PFOA	126	ND	3/0	No		
		PFOS	126	0.92 J	3/0	No		
		Groundwater	**(µg/L)**	**(µg/L)**				
		PFBS	40	31	3/0	No		
		PFOA	0.07	**110**	**3/3**	**Yes**		
		PFOS	0.07	**1,200**	**3/3**	**Yes**		
		PFOA + PFOS	0.07	**1,310**	**3/3**	**Yes**		
		Surface Water	**(µg/kg)**	**(µg/L)**				
		PFBS	40	1.6 J	3/0	No		
		PFOA	0.07	**3.3 J**	**3/3**	**Yes**		
		PFOS	0.07	**21 J**	**3/3**	**Yes**		
		PFOA + PFOS	0.07	**24.3 J**	**3/3**	**Yes**		
		Sediment	**(µg/kg)**	**(µg/kg)**				
		PFBS	130,000	11 J	3/0	No		
		PFOA	126	**140 J**	**3/1**	**Yes**		
		PFOS	126	**7,500 J**	**3/3**	**Yes**		
AFFF Area 2 Hangar 850	**None (New Area)**	**Surface Soil**	**(µg/kg)**	**(µg/kg)**			No	Advance Area to RI
		PFBS	130,000	0.25 J	4/0	No		
		PFOA	126	8.8 J	4/0	No		
		PFOS	126	70 J	4/0	No		
		Subsurface Soil	**(µg/kg)**	**(µg/kg)**				
		PFBS	130,000	0.59 U	4/0	No		
		PFOA	126	0.59 U	4/0	No		
		PFOS	126	0.59 U	4/0	No		
		Groundwater	**(µg/L)**	**(µg/L)**				

AFFF Area	ERP ID	Parameter	Screening Value	Maximum Detected Concentration	Number of Samples / Number of Exceedances	Exceeds Screening Value	Potentially Complete Drinking Water Exposure Pathway	Recommendation
		PFBS	40	0.024	4/0	No		
		PFOA	0.07	**0.40**	**4/1**	**Yes**		
		PFOS	0.07	0.058	4/0	No		
		PFOA + PFOS	0.07	**0.458**	**4/1**	**Yes**		
		Surface Water	**(µg/kg)**	**(µg/L)**				
		PFBS	40	ND*	1/0	No		
		PFOA	0.07	ND*	1/0	No		
		PFOS	0.07	ND*	1/0	No		
		PFOA + PFOS	0.07	ND	1/0	No		
		Sediment	**(µg/kg)**	**(µg/kg)**				
		PFBS	130,000	ND*	1/0	No		
		PFOA	126	ND*	1/0	No		
		PFOS	126	1.1 J	1/0	No		
AFFF Area 3 Building 706	**None (New Area)**	**Surface Soil**	**(µg/kg)**	**(µg/kg)**			No	Advance Area to RI
		PFBS	130,000	ND	2/0	No		
		PFOA	126	3.8	2/0	No		
		PFOS	126	5.6	2/0	No		
		Subsurface Soil	**(µg/kg)**	**(µg/kg)**				
		PFBS	130,000	ND	2/0	No		
		PFOA	126	0.40 J	2/0	No		
		PFOS	126	0.90 J	2/0	No		
		Groundwater	**(µg/L)**	**(µg/L)**				
		PFBS	40	0.022 J	2/0	No		
		PFOA	0.07	0.011 J	2/0	No		
		PFOS	0.07	**0.14 J**	**2/1**	**Yes**		
		PFOA + PFOS	0.07	**0.161 J**	**2/1**	**Yes**		
AFFF Area 4 Building 700	**None (New Area)**	**Surface Soil**	**(µg/kg)**	**(µg/kg)**			No	Advance Area to RI
		PFBS	130,000	1.5	3/0	No		
		PFOA	126	7.8 J	3/0	No		
		PFOS	126	**780 J**	**3/3**	**Yes**		
		Subsurface Soil	**(µg/kg)**	**(µg/kg)**				
		PFBS	130,000	0.35 J	3/0	No		
		PFOA	126	13	3/0	No		

AFFF Area	ERP ID	Parameter	Screening Value	Maximum Detected Concentration	Number of Samples / Number of Exceedances	Exceeds Screening Value	Potentially Complete Drinking Water Exposure Pathway	Recommendation
		PFOS	126	**230**	**3/1**	**Yes**		
		Groundwater	**(µg/L)**	**(µg/L)**				
		PFBS	40	0.95	2/0	No		
		PFOA	0.07	**1.1**	**2/2**	**Yes**		
		PFOS	0.07	**25**	**2/2**	**Yes**		
		PFOA + PFOS	0.07	**26.1**	**2/2**	**Yes**		
AFFF Area 5 Blue Angels Crash Site	**None (New Area)**	**Surface Soil**	**(µg/kg)**	**(µg/kg)**			No	Advance Area to RI
		PFBS	130,000	4.4	3/0	No		
		PFOA	126	5.7	3/0	No		
		PFOS	126	**180**	**3/1**	**Yes**		
		Subsurface Soil	**(µg/kg)**	**(µg/kg)**				
		PFBS	130,000	1.1 J	3/0	No		
		PFOA	126	1.3 J	3/0	No		
		PFOS	126	1.4 J	3/0	No		
		Groundwater	**(µg/L)**	**(µg/L)**				
		PFBS	40	0.29	2/0	No		
		PFOA	0.07	**0.17**	**2/1**	**Yes**		
		PFOS	0.07	**1.0 J**	**2/1**	**Yes**		
		PFOA + PFOS	0.07	**1.17 J**	**2/1**	**Yes**		
AFFF Area 6 Fox Row/ Taxiway Alpha	**None (New Area)**	**Surface Soil**	**(µg/kg)**	**(µg/kg)**			No	Advance Area to RI
		PFBS	130,000	ND	5/0	No		
		PFOA	126	2.8 J	5/0	No		
		PFOS	126	53	5/0	No		
		Subsurface Soil	**(µg/kg)**	**(µg/kg)**				
		PFBS	130,000	ND	4/0	No		
		PFOA	126	0.77 J	4/0	No		
		PFOS	126	11 J	4/0	No		
		Groundwater	**(µg/L)**	**(µg/L)**				
		PFBS	40	3.4 J	6/0	No		
		PFOA	0.07	**5.0 J**	**6/2**	**Yes**		
		PFOS	0.07	**49 J**	**6/3**	**Yes**		
		PFOA + PFOS	0.07	**54 J**	**6/3**	**Yes**		

AFFF Area	ERP ID	Parameter	Screening Value	Maximum Detected Concentration	Number of Samples / Number of Exceedances	Exceeds Screening Value	Potentially Complete Drinking Water Exposure Pathway	Recommendation
AFFF Area 7 Outfalls 004, 005, 007, and 009[a]	**None (New Area)**	**Surface Water**	**(µg/kg)**	**(µg/L)**			No	Advance Area to RI
		PFBS	40	0.10	4/0	No		
		PFOA	0.07	**0.21**	**4/2**	**Yes**		
		PFOS	0.07	**2.8 J**	**4/2**	**Yes**		
		PFOA + PFOS	0.07	**3.01 J**	**4/2**	**Yes**		
		Sediment	**(µg/kg)**	**(µg/kg)**				
		PFBS	130,000	0.83 J	4/0	No		
		PFOA	126	4.1 J	4/0	No		
		PFOS	126	**160 J**	**4/1**	**Yes**		
AFFF Area 8 Hulby Street	**None (New Area)**	**Surface Soil**	**(µg/kg)**	**(µg/kg)**			No	Advance Area to RI
		PFBS	130,000	ND*	3/0	No		
		PFOA	126	0.52 J	3/0	No		
		PFOS	126	7.9 J	3/0	No		
		Subsurface Soil	**(µg/kg)**	**(µg/kg)**				
		PFBS	130,000	ND	3/0	No		
		PFOA	126	ND	3/0	No		
		PFOS	126	0.40 J	3/0	No		
		Groundwater	**(µg/L)**	**(µg/L)**				
		PFBS	40	0.0077 J	3/0	No		
		PFOA	0.07	0.0077 J	3/0	No		
		PFOS	0.07	**0.10**	**3/1**	**Yes**		
		PFOA + PFOS	0.07	**0.10**	**3/1**	**Yes**		

Bold values exceeded screening levels.

AFFF = aqueous film forming foam
ERP = Environmental Restoration Program
ID = identification
J = reported concentration is an estimated value
ND = not detected
No. = number
PFBS = perfluorobutane sulfonate
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate
RI = remedial investigation
U = The analyte was not detected above the reported sample quantification limit.
µg/L = micrograms per liter
µg/kg = micrograms per kilogram
* analyte was not detected; the result was rejected during validation because the sample was received outside the 4 +/- 2 degree temperature criterion
[a] Only Outfalls 004 and 007 had confirmed exceedances in surface water and only Outfall 009 had an exceedance in sediment. Only these three outfalls will advance to the RI phase.

8.1 FT007/FPTA NO. 3/SITE 9 – AFFF AREA 1

Use of AFFF during training exercises at FT007/FPTA No.3/Site 9 has resulted in PFAS impacts to surface soil, sediment, groundwater, and surface water at concentrations above screening levels. PFOS was detected in surface soil and sediment at maximum concentrations of 4,000 µg/kg and 7,500 µg/kg, respectively. PFOA and PFOS were detected in groundwater and surface water at maximum combined concentrations of 1,310 µg/L and 24.3 µg/L, respectively. Due to the surface water flow patterns and the likelihood that surface soil and sediment will continue to act as sources of PFAS contamination, there is the potential for migration of impacted groundwater and surface water offsite.

As discussed in Section 4.1, there are no wells downgradient of the base that represent a potential risk to human health. Further, area drinking water is obtained from an intake on the Niagara River upstream from the base.

Although the releases of AFFF in the area have resulted in PFAS concentrations in groundwater, surface soil, sediment, and surface water above the screening levels, no complete human exposure pathways have been identified for AFFF Area 1. However, because of the presence of PFAS concentrations exceeding human health screening levels in the media listed, an RI is recommended to determine the extent of contamination in the area of FT007/FPTA No. 3/Site 9.

8.2 HANGAR 850 – AFFF AREA 2

Accidental releases of AFFF at Hangar 850 have resulted in PFAS impacts the environment. PFOA and PFOS were detected in groundwater at a maximum combined concentration of 0.458 µg/L (above the 0.070 µg/L EPA HA). Impacted groundwater is likely discharging to Cayuga Creek to the south and may also be migrating off the installation to the southwest.

As discussed in Section 4.1, there are no wells downgradient of the base that represent a potential risk to human health. Further, area drinking water is obtained from an intake on the Niagara River upstream from the base.

Although the releases of AFFF in the area have resulted in PFAS concentrations in groundwater above the screening levels, no complete human exposure pathways have been identified for AFFF Area 2. However, because of the presence of PFAS concentrations exceeding human health screening levels in groundwater, an RI is recommended to determine the extent of contamination in the area of Hangar 850.

8.3 BUILDING 706 – AFFF AREA 3

Accidental releases of AFFF at the former Building 706 have resulted in PFAS impacts to the environment. PFOA and PFOS were detected in groundwater at a maximum combined concentration of 0.161 µg/L (above the 0.070 µg/L EPA HA). Impacted groundwater is likely discharging to Cayuga Creek to the south and may also be migrating off the installation to the southwest.

As discussed in Section 4.1, there are no wells downgradient of the base that represent a potential risk to human health. Further, area drinking water is obtained from an intake on the Niagara River upstream from the base.

Although the releases of AFFF in the area have resulted in PFAS concentrations in groundwater above the screening levels, no complete human exposure pathways have been identified for AFFF Area 3. However, because of the presence of PFAS concentrations exceeding human health screening levels in groundwater, an RI is recommended to determine the extent of contamination in the area of Building 706.

8.4 BUILDING 700 – AFFF AREA 4

Accidental releases of AFFF at Building 700 have resulted in PFAS impacts to the environment. PFOA and PFOS were detected in groundwater at a maximum combined concentration of 26.1 µg/L (above the 0.070 µg/L EPA HA). Impacted groundwater is likely discharging to Cayuga Creek to the south and may also be migrating off the installation to the southwest. PFOA was detected in surface soil at a maximum concentration of 780 µg/kg and in subsurface soil at a maximum concentration of 230 µg/kg Due to the surface water flow patterns and the likelihood that surface soil and subsurface soil will continue to act as sources of PFAS contamination, there is the potential for migration of impacted groundwater offsite.

As discussed in Section 4.1, there are no wells downgradient of the base that represent a potential risk to human health. Further, area drinking water is obtained from an intake on the Niagara River upstream from the base.

Although the releases of AFFF in the area have resulted in PFAS concentrations in groundwater, surface soil, and subsurface soil above the screening levels, no complete human exposure pathways have been identified for AFFF Area 4. However, because of the presence of PFAS concentrations exceeding human health screening levels in the media previously listed, an RI is recommended to determine the extent of contamination in the area of Building 700.

8.5 BLUE ANGELS CRASH SITE – AFFF AREA 5

An emergency response event to an aircraft crash at the Blue Angels crash site has resulted in PFAS impacts to the environment. PFOA and PFOS were detected in groundwater at a maximum combined concentration of 1.17 µg/L (above the 0.070 µg/L EPA HA). Impacted groundwater is likely discharging to Cayuga Creek to the south and may also be migrating off the installation to the southwest. PFOS was detected in surface soil at a maximum concentration of 180 µg/kg. Due to the surface water flow patterns and the likelihood that surface soil will continue to act as sources of PFAS contamination, there is the potential for migration of impacted groundwater offsite.

As discussed in Section 4.1, there are no wells downgradient of the base that represent a potential risk to human health. Further, area drinking water is obtained from an intake on the Niagara River upstream from the base.

Although the releases of AFFF in the area have resulted in PFAS concentrations in groundwater and surface soil above the screening levels, no complete human exposure pathways have been identified for AFFF Area 5. However, because of the presence of PFAS concentrations exceeding human health screening levels in groundwater and surface soil, an RI is recommended to determine the extent of contamination in the area of the Blue Angels crash site.

8.6 FOX ROW/TAXIWAY ALPHA – AFFF AREA 6

Accidental releases of AFFF in the area known as Fox Row/Taxiway Alpha have resulted in PFAS impacts to the environment. PFOA and PFOS were detected in groundwater at a maximum combined concentration of 54.0 µg/L (above the 0.070 µg/L EPA HA). Impacted groundwater is likely discharging to Cayuga Creek to the south and may also be migrating off the installation to the southwest.

As discussed in Section 4.1, there are no wells downgradient of the base that represent a potential risk to human health. Further, area drinking water is obtained from an intake on the Niagara River upstream from the base.

Although the releases of AFFF in the area have resulted in PFAS concentrations in groundwater above the screening levels, no complete human exposure pathways have been identified for AFFF Area 6. However, because of the presence of PFAS concentrations exceeding human health screening levels in groundwater, an RI is recommended to determine the extent of contamination in the area of Fox Row/Taxiway Alpha.

8.7 OUTFALLS 004, 005, 007, AND 009 – AFFF AREA 7

Accidental releases of AFFF and intentional use of AFFF at incident responses or for training at areas throughout NFARS have discharged through the outfalls of AFFF Area 7 and have resulted in PFAS impacts to the environment at Outfalls 004, 007, and 009. PFOA and PFOS were detected in surface water at a maximum combined concentration of 3.01 µg/L (above the 0.070 µg/L EPA HA). Impacted surface water is likely discharging to Cayuga Creek to the south and may also be migrating off the installation to the southwest. PFOS was detected in sediment at a maximum concentration of 160 µg/kg. Due to the surface water flow patterns and the likelihood that sediment will continue to act as a source of PFAS contamination, there is the potential for migration of impacted surface water off-site.

Surface water at NFARS discharges into the Niagara River via Cayuga Creek. The nearest surface water intake for drinking water is approximately 8 miles upstream from the discharge point of the Cayuga River into the Niagara River. The drinking water provided by the surface water intake will not be impacted by runoff from NFARS because it is upstream of the discharge point.

Although the releases of AFFF in the area have resulted in PFAS concentrations in surface water and sediment above the screening levels, no complete human exposure pathways have been identified for AFFF Area 7. However, because of the presence of PFAS concentrations exceeding human health screening levels in surface water and sediment, an RI is recommended to determine the sources and the extent of contamination at Outfalls 004, 007, and 009.

8.8 HULBY STREET – AFFF AREA 8

Use of AFFF during training exercises at the Hulby Street area has resulted in PFAS impacts to the environment. PFOA and PFOS were detected in groundwater at a maximum combined concentration of 0.10 µg/L (above the 0.070 µg/L EPA HA). Impacted groundwater is likely discharging to Cayuga Creek to the south and may also be migrating off the installation to the southwest.

As discussed in Section 4.1, there are no wells downgradient of the base that represent a potential risk to human health. Further, area drinking water is obtained from an intake on the Niagara River upstream from the base.

Although the releases of AFFF in the area have resulted in PFAS concentrations in groundwater above the screening levels, no complete human exposure pathways have been identified for AFFF Area 8. However, because of the presence of PFAS concentrations exceeding human health screening levels in groundwater, an RI is recommended to determine the extent of contamination in the area of Hulby Street.

9.0 REFERENCES

Aerostar SES LLC (ASL), January 2016. *Final Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) for Site Inspections of Fire Fighting Foam Usage at Various Air Force Bases in the United States.*

ASL, August 2016. *Final Preliminary Assessment Report for Perfluorinated Compounds at Niagara Falls Air Reserve Station Niagara County, New York.*

ASL, August 2017. *Final Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) for Site Inspections of Fire Fighting Foam Usage at Various Air Force Bases in the Eastern United States Addendum 15 Field Sampling Plan for Niagara Falls Air Reserve Station Niagara County, New York.*

Department of Defense (DoD), June 2009. "Emerging Contaminants."

E&E, June 1999. *No Further Action Planned Decision Document – IRP Site 9 Fire Training Pit No. 3 Niagara Falls International Airport Air Reserve Station, AR File Number 328, Ecology and Environment.*

Environmental Protection Agency (EPA), March 2012. *Intergovernmental Data Quality Task Force Uniform Federal Policy for Quality Assurance Project Plans Optimized UFP-QAPP Worksheets.*

EPA, July 2005. *Federal Facilities Remedial Site Inspection Summary Guide.*

EPA, May 2016a. *Drinking Water Health Advisory for Perflourooctanoic Acid (PFOA).*

EPA, May 2016b. *Drinking Water Health Advisory for Perflourooctane Sulfonate (PFOS).*

EPA, May 2016c. *Health Effects Support Document for Perfluorooctane Sulfonate (PFOS).*

EPA, May 2016d. *Health Effects Support Document for Perfluorooctanoic Acid (PFOA).*

EPA, May 2018. Regional Screening Levels (https://semspub.epa.gov/work/HQ/197235.pdf).

EPA Regional Screening Level Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).

EPA. "*Third Unregulated Contaminant Monitoring Rule*," under "*Monitoring Unregulated Drinking Water Contaminants*," accessed on January 26, 2017, https://www.epa.gov/dwucmr/third-unregulated-contaminant-monitoring-rule#assess.

Portage, Inc., March 2012. *Niagara Falls Air Reserve Station IRP Site 9 (FT007) – Fire Training Pit No. 3 Data Analysis for Unrestricted Use Determination.*

SAIC, May 1991. *Installation Restoration Program Remedial Investigation/Feasibility Study (RI/FS) Report 1987–1990*.

United States Army Corp of Engineers (USACE), February 2016. *"Performance Work Statement for Site Investigations of Fire Fighting Foam Usage at Various Air Force Bases in the Eastern United States."*

United States Air Force (USAF), August 2012. *Interim AF Guidance on Sampling and Response Actions for Perfluorinated Compounds at Active and BRAC Installations*.

USAF, March 2002. *Niagara Falls International Airport Management Action Plan*.

USAF, October 1994. *Decision Document Fire Training Area No. 3 IRP Site FT07 (Site 9).*

USAF, 2016. *USAF/IE Policy on Perfluorinated Compounds of Concern*.

US Climate Data website, accessed November 2017, https://www.usclimatedata.com/climate/niagara-falls/new-york/united-states/usny1010.

Versar, June 2016. *Final Remedial Action Completion Report for DS003 – Site 12 Niagara Falls Air Reserve Station, New York.*

Appendix A

Figures

Figure 1
Location of Niagara Falls Air Reserve Station,
Niagara County, New York

Legend

Installation Boundary

Service Layer Credits: Esri StreetMap North America

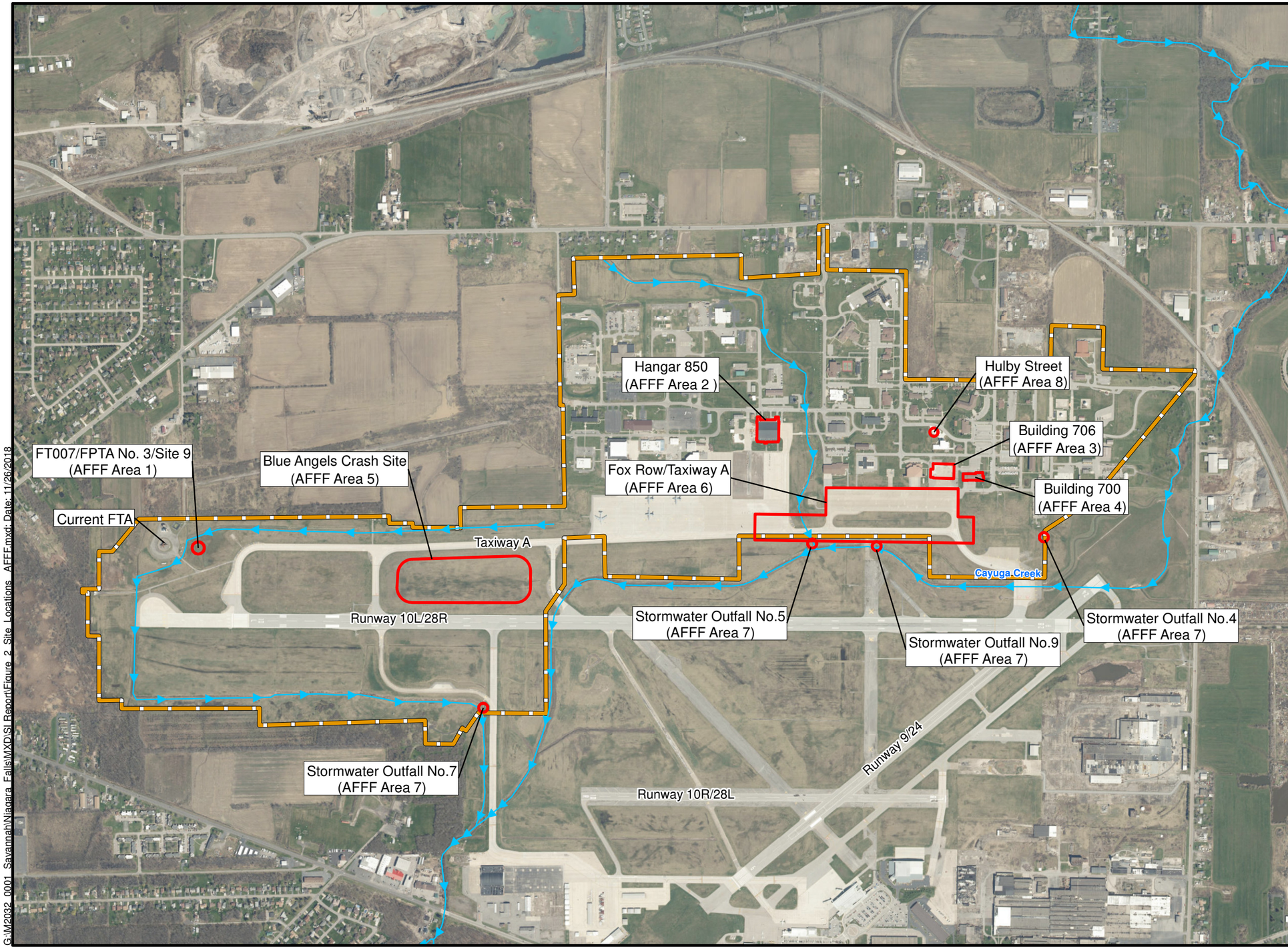
Drawn: tmorse

Date: 11/26/2018

0 1 Miles

N

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_1_Location_of_Niagara.mxd; Date: 11/26/2018



Legend

- AFFF Inspection Area
- Installation Boundary
- Streams

N

0 0.125 0.25

Miles

Niagara Falls Air Reserve Station
Niagara County, New York

Figure 2
Niagara Falls Air Reserve Station
AFFF Area Site Inspection Locations

Aerostar SES LLC

Drawn: tmorse | Date: 11/26/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

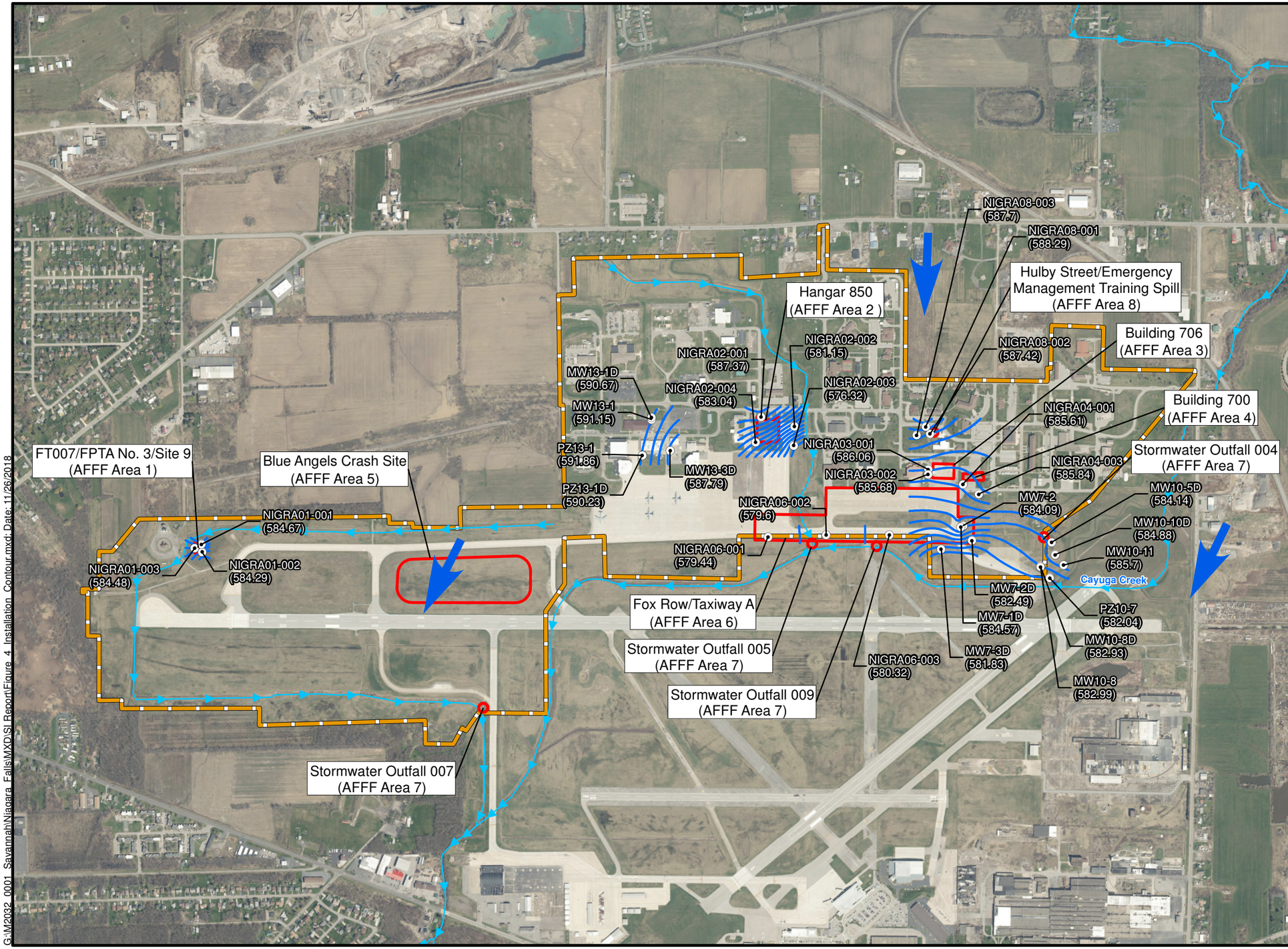
G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_2_Site_Locations_AFFF.mxd; Date: 11/26/2018

Period	Formation	Member	Lithology	Thickness (feet)
Middle Silurian	Lockport Dolostone	Oak Orchard (Guelph)	Brownish gray to medium grained dolostone. Locally saccharoidal with thin intervals of curved bedding (Algal and reef structures).	80
		Eramosa	Gray to dark gray. Fine grained dolostone containing abundant carbonaceous partings.	18
		Goat Island	Tannish gray, fine grained dolostone	20
		Gasport Limestone	Light gray, coarse grained limestone containing abundant crinoid fragments.	22
	Rochester Shale	**	Light gray shaly to fine grained dolostone partially laminated.	10
			Dark gray calcareous shale	60

**DECEW Dolostone

Source: USAF, March 2002. *Niagara Falls International Airport Management Action Plan*

Figure 3 Stratigraphic Column of the area near Niagara Falls Air Reserve Station



Legend

- Groundwater Sample
- AFFF Inspection Area
- Installation Boundary
- Streams
- Groundwater Elevation Contour
- Groundwater Flow Direction

NIGRA04-001
(585.61) = Groundwater Elevation (ft NAVD 88) measured on August 22, 2017.

N

0 0.125 0.25
Miles

Niagara Falls Air Reserve Station
Niagara County, New York

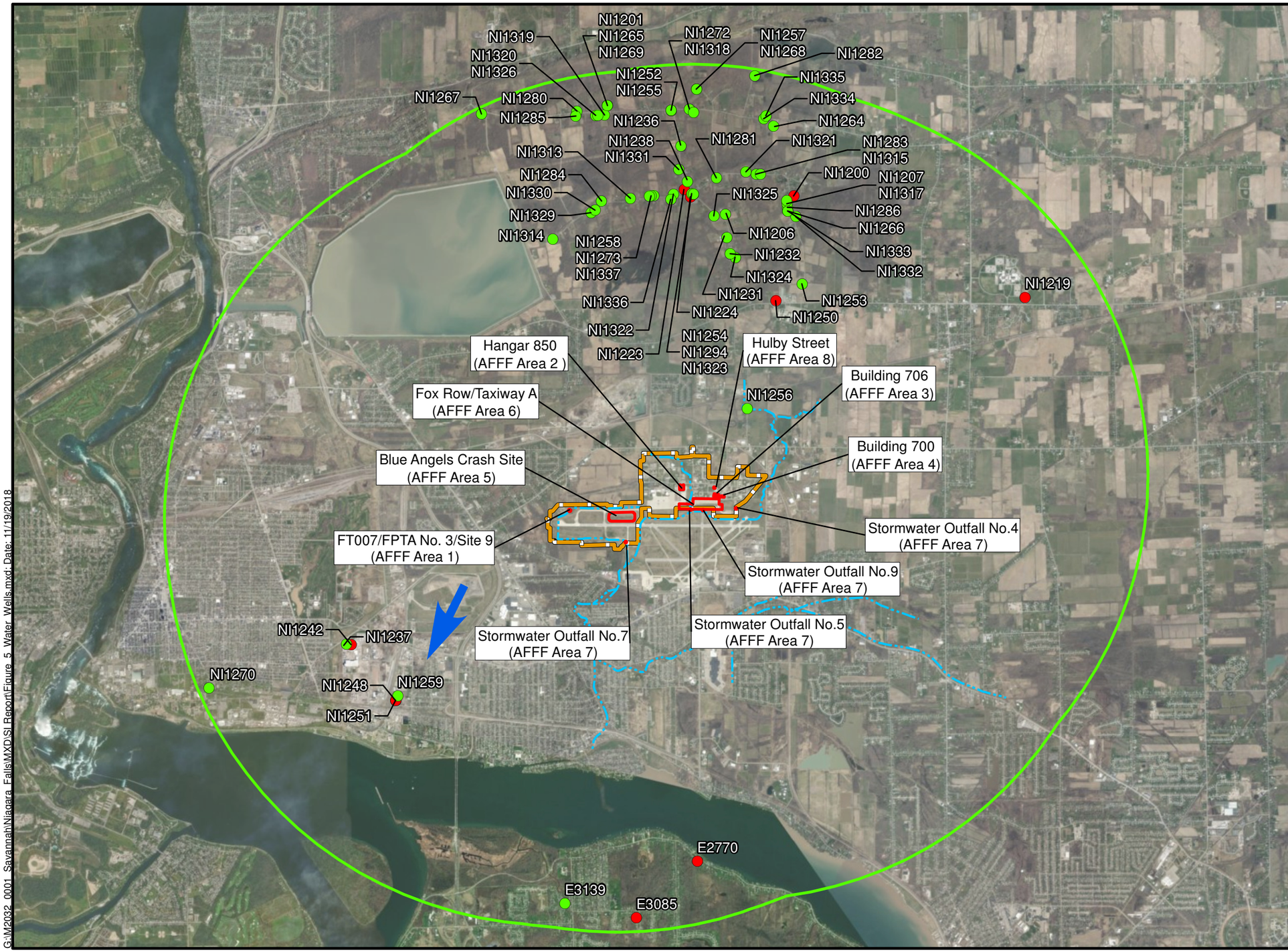
Figure 4
Installation Potentiometric Map

Aerostar SES LLC

Drawn: tmorse | Date: 11/26/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_4_Installation_Contour.mxd; Date: 11/26/2018



Niagara Falls Air Reserve Station
Niagara County, New York

Figure 5
Water Wells
within 4-Miles of
Niagara Falls Air Reserve Station

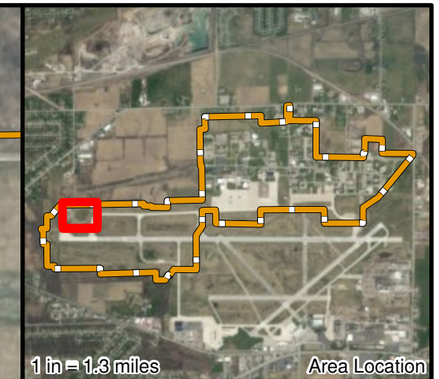
Aerostar SES LLC

Drawn: tmorse

Date: 11/19/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_5_Water_Wells.mxd; Date: 11/19/2018



Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- Surface Water and Sediment Samples
- AFFF Inspection Area
- Installation Boundary
- Groundwater Elevation Contour
- Groundwater Flow Direction

NIGRA01-001
(584.67) = Groundwater Elevation (ft NAVD 88) measured on August 22, 2017.

N

0 30 60 90
Feet

Niagara Falls Air Reserve Station
Niagara County, New York

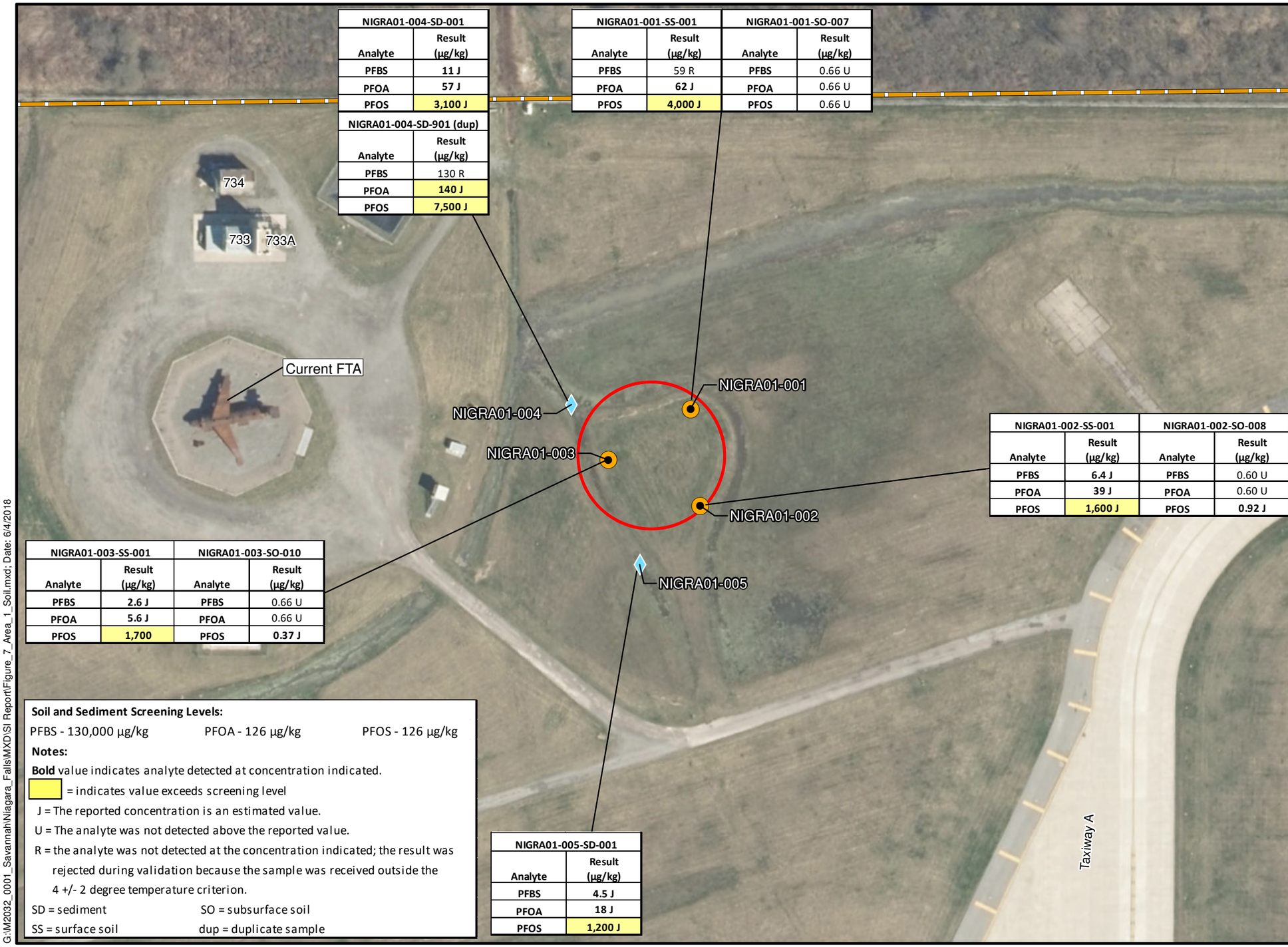
Figure 6
FT007/FPTA No. 3/ Site 9
(AFFF Area 1)
Sample Locations and Potentiometric Contours

Aerostar SES LLC

Drawn: tmorse | Date: 11/26/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_6_Area_1_SI.mxd; Date: 11/26/2018



NIGRA01-004-SD-001	
Analyte	Result (µg/kg)
PFBS	11 J
PFOA	57 J
PFOS	3,100 J

NIGRA01-004-SD-901 (dup)	
Analyte	Result (µg/kg)
PFBS	130 R
PFOA	140 J
PFOS	7,500 J

NIGRA01-001-SS-001	
Analyte	Result (µg/kg)
PFBS	59 R
PFOA	62 J
PFOS	4,000 J

NIGRA01-001-SO-007	
Analyte	Result (µg/kg)
PFBS	0.66 U
PFOA	0.66 U
PFOS	0.66 U

NIGRA01-002-SS-001		NIGRA01-002-SO-008	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	6.4 J	PFBS	0.60 U
PFOA	39 J	PFOA	0.60 U
PFOS	1,600 J	PFOS	0.92 J

NIGRA01-003-SS-001		NIGRA01-003-SO-010	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	2.6 J	PFBS	0.66 U
PFOA	5.6 J	PFOA	0.66 U
PFOS	1,700	PFOS	0.37 J

NIGRA01-005-SD-001	
Analyte	Result (µg/kg)
PFBS	4.5 J
PFOA	18 J
PFOS	1,200 J

Soil and Sediment Screening Levels:

PFBS - 130,000 µg/kg PFOA - 126 µg/kg PFOS - 126 µg/kg

Notes:

Bold value indicates analyte detected at concentration indicated.

= indicates value exceeds screening level

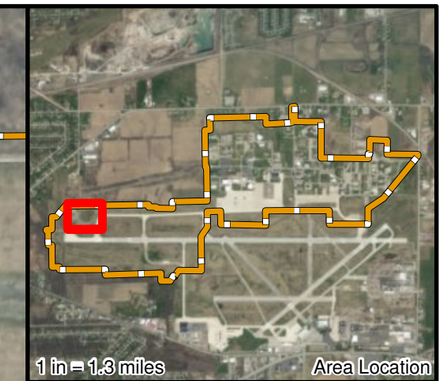
J = The reported concentration is an estimated value.

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

R = the analyte was not detected at the concentration indicated; the result was rejected during validation because the sample was received outside the 4 +/- 2 degree temperature criterion.

SD = sediment SO = subsurface soil

SS = surface soil dup = duplicate sample



Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- Surface Water and Sediment Samples
- AFFF Inspection Area
- Installation Boundary

N

0 30 60 90

Feet

Niagara Falls Air Reserve Station
Niagara County, New York

Figure 7
FT007/FPTA No. 3/ Site 9
(AFFF Area 1) PFBS, PFOA, and PFOS in Soil and Sediment

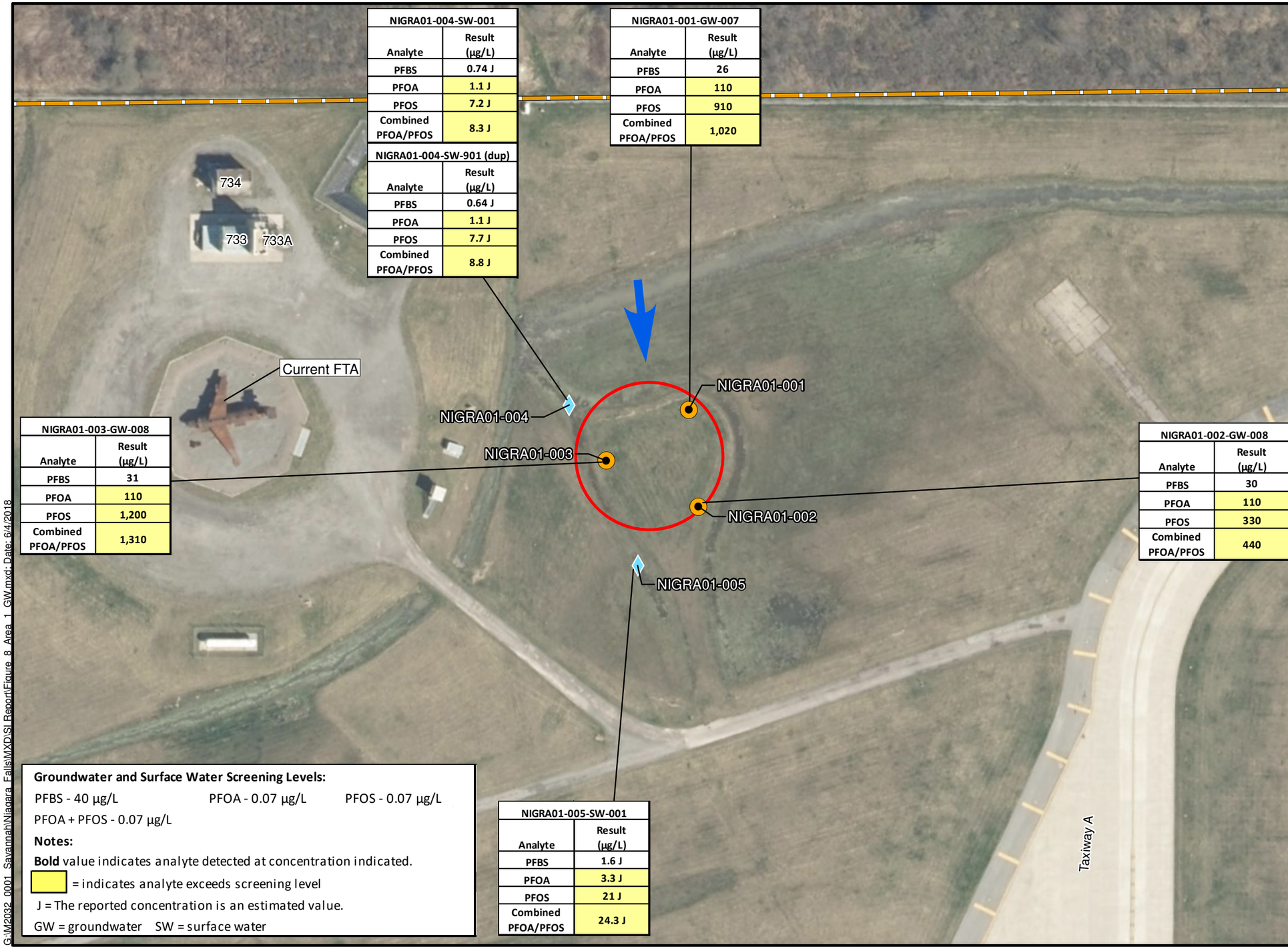
Aerostar SES LLC

Drawn: tmorse

Date: 6/4/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_7_Area_1_Soil.mxd; Date: 6/4/2018



NIGRA01-004-SW-001	
Analyte	Result (µg/L)
PFBS	0.74 J
PFOA	1.1 J
PFOS	7.2 J
Combined PFOA/PFOS	8.3 J

NIGRA01-004-SW-901 (dup)	
Analyte	Result (µg/L)
PFBS	0.64 J
PFOA	1.1 J
PFOS	7.7 J
Combined PFOA/PFOS	8.8 J

NIGRA01-001-GW-007	
Analyte	Result (µg/L)
PFBS	26
PFOA	110
PFOS	910
Combined PFOA/PFOS	1,020

NIGRA01-003-GW-008	
Analyte	Result (µg/L)
PFBS	31
PFOA	110
PFOS	1,200
Combined PFOA/PFOS	1,310

NIGRA01-002-GW-008	
Analyte	Result (µg/L)
PFBS	30
PFOA	110
PFOS	330
Combined PFOA/PFOS	440

NIGRA01-005-SW-001	
Analyte	Result (µg/L)
PFBS	1.6 J
PFOA	3.3 J
PFOS	21 J
Combined PFOA/PFOS	24.3 J

Groundwater and Surface Water Screening Levels:

PFBS - 40 µg/L PFOA - 0.07 µg/L PFOS - 0.07 µg/L

PFOA + PFOS - 0.07 µg/L

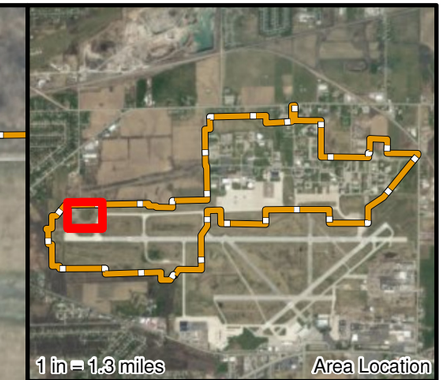
Notes:

Bold value indicates analyte detected at concentration indicated.

= indicates analyte exceeds screening level

J = The reported concentration is an estimated value.

GW = groundwater SW = surface water



Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- Surface Water and Sediment Samples
- AFFF Inspection Area
- Installation Boundary
- Groundwater Flow Direction

N

0 30 60 90

Feet

Niagara Falls Air Reserve Station
Niagara County, New York

Figure 8
FT007/FPTA No. 3/ Site 9 (AFFF Area 1)
PFBS, PFOA, and PFOS in Groundwater and Surface Water

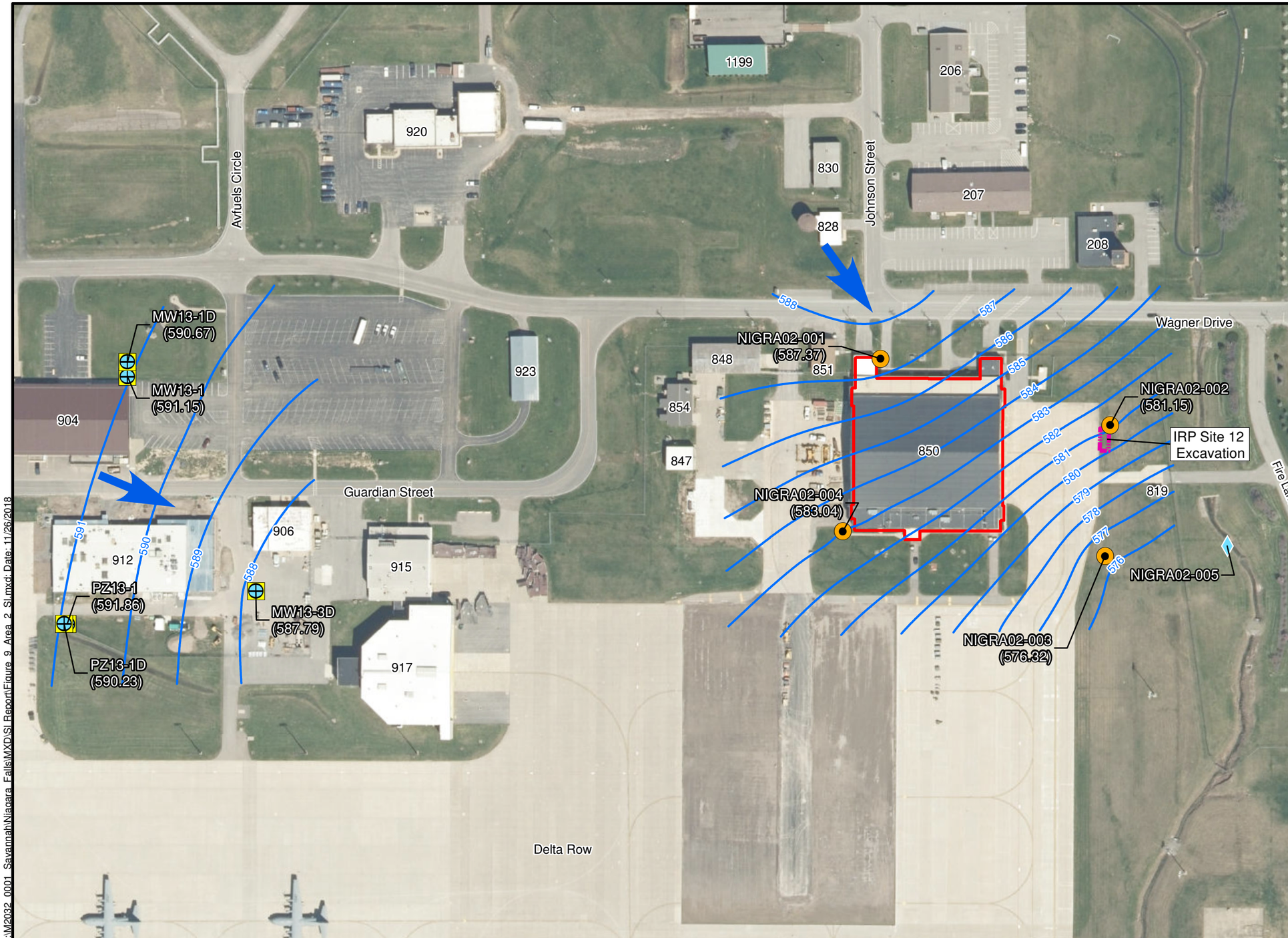
Aerostar SES LLC

Drawn: tmorse

Date: 6/4/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_8_Area_1_GW.mxd; Date: 6/4/2018



Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- Existing Monitoring Well (Groundwater Level Measurement)
- Surface Water and Sediment Samples
- AFFF Inspection Area
- IRP Site 12 Excavation
- Installation Boundary
- Groundwater Elevation Contour
- Groundwater Flow Direction

NIGRA02-001
(587.37) = Groundwater Elevation (ft NAVD 88) measured on August 22, 2017.

N

0 80 160
Feet

Niagara Falls Air Reserve Station
Niagara County, New York

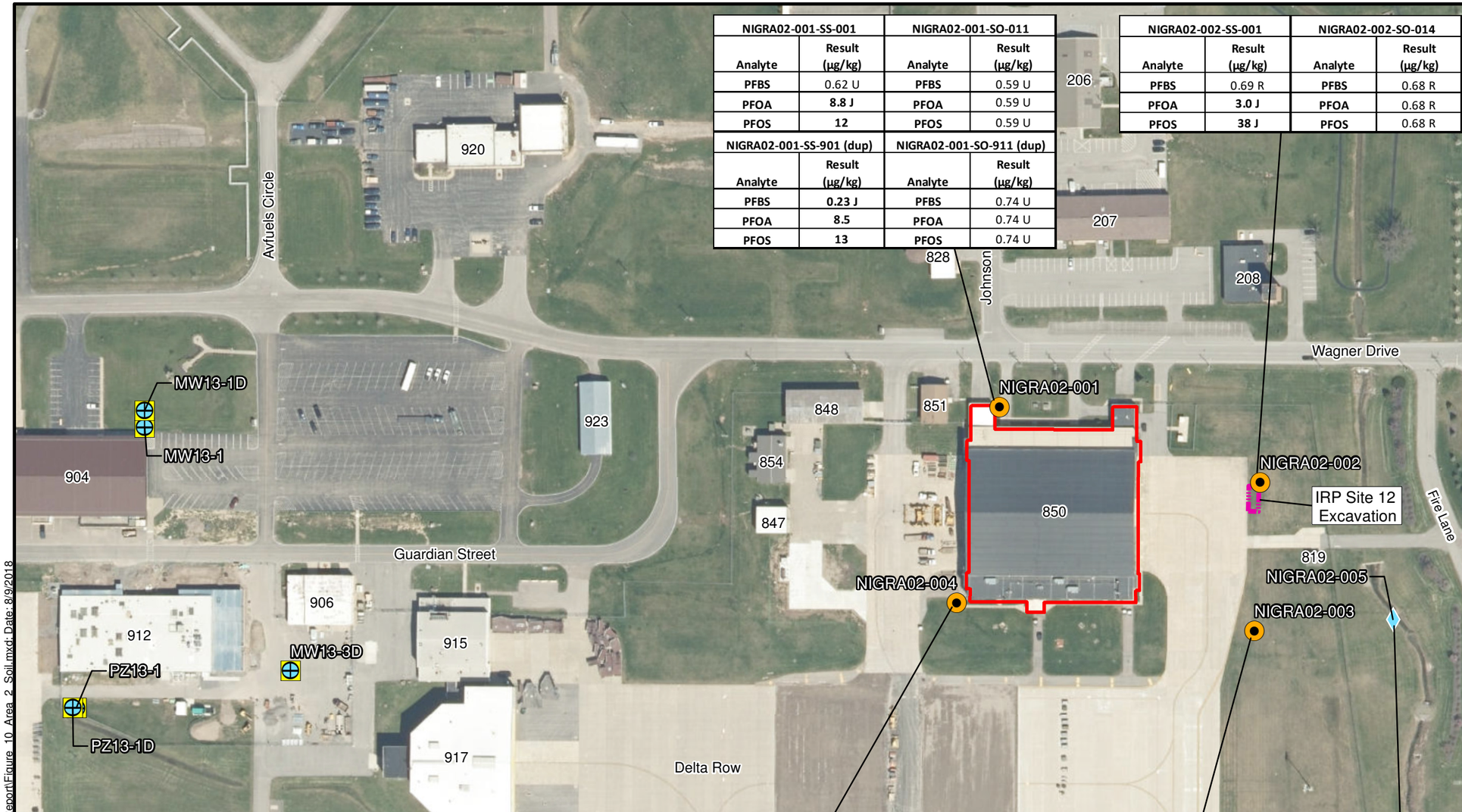
Figure 9
Hangar 850 (AFFF Area 2)
Sample Locations and Potentiometric Contours

Aerostar SES LLC

Drawn: tmorse | Date: 11/26/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_9_Area_2_SI.mxd; Date: 11/26/2018



NIGRA02-001-SS-001		NIGRA02-001-SO-011	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.62 U	PFBS	0.59 U
PFOA	**8.8 J**	PFOA	0.59 U
PFOS	**12**	PFOS	0.59 U
NIGRA02-001-SS-901 (dup)		**NIGRA02-001-SO-911 (dup)**	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	**0.23 J**	PFBS	0.74 U
PFOA	**8.5**	PFOA	0.74 U
PFOS	**13**	PFOS	0.74 U

NIGRA02-002-SS-001		NIGRA02-002-SO-014	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.69 R	PFBS	0.68 R
PFOA	**3.0 J**	PFOA	0.68 R
PFOS	**38 J**	PFOS	0.68 R

NIGRA02-004-SS-001		NIGRA02-004-SO-012	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	**0.20 J**	PFBS	0.62 R
PFOA	**3.6 J**	PFOA	0.62 R
PFOS	**3.4 J**	PFOS	0.62 R

NIGRA02-003-SS-001		NIGRA02-003-SO-014	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	**0.25 J**	PFBS	0.67 R
PFOA	**2.1 J**	PFOA	0.67 R
PFOS	**70 J**	PFOS	0.67 R

NIGRA02-005-SD-001	
Analyte	Result (µg/kg)
PFBS	0.91 R
PFOA	0.91 R
PFOS	**1.1 J**

Soil and Sediment Screening Levels:

PFBS - 130,000 µg/kg PFOA - 126 µg/kg PFOS - 126 µg/kg

Notes:

Bold value indicates analyte detected at concentration indicated.

J = The reported concentration is an estimated value.

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

R = the analyte was not detected at the concentration indicated; the result was rejected during validation because the sample was received outside the 4 +/- 2 degree temperature criterion.

SD = sediment SO = subsurface soil

SS = surface soil dup = duplicate sample

Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- Existing Monitoring Well (Groundwater Level Measurement)
- Surface Water and Sediment Samples
- AFFF Inspection Area
- IRP Site 12 Excavation
- Installation Boundary

N

0 80 160

Feet

Niagara Falls Air Reserve Station
Niagara County, New York

Figure 10
Hangar 850 (AFFF Area 2)
(AFFF Area 3) PFBS, PFOA, and PFOS in Soil and Sediment

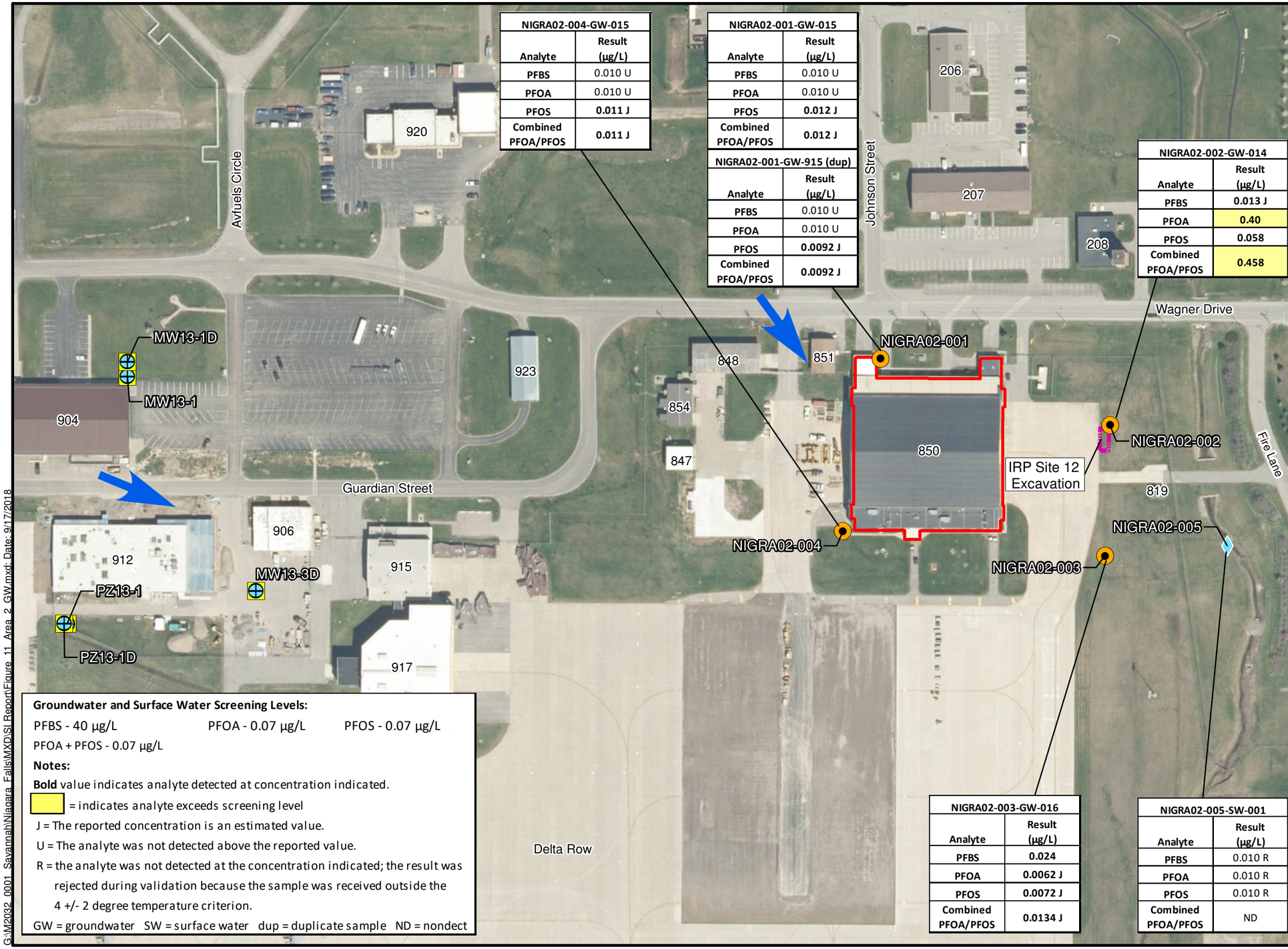
Aerostar SES LLC

Drawn: tmorse

Date: 8/9/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI_Report\Figure_10_Area_2_Soil.mxd; Date: 8/9/2018



NIGRA02-004-GW-015	
Analyte	Result (µg/L)
PFBS	0.010 U
PFOA	0.010 U
PFOS	**0.011 J**
Combined PFOA/PFOS	**0.011 J**

NIGRA02-001-GW-015	
Analyte	Result (µg/L)
PFBS	0.010 U
PFOA	0.010 U
PFOS	**0.012 J**
Combined PFOA/PFOS	**0.012 J**

NIGRA02-001-GW-915 (dup)	
Analyte	Result (µg/L)
PFBS	0.010 U
PFOA	0.010 U
PFOS	**0.0092 J**
Combined PFOA/PFOS	**0.0092 J**

NIGRA02-002-GW-014	
Analyte	Result (µg/L)
PFBS	**0.013 J**
PFOA	**0.40**
PFOS	**0.058**
Combined PFOA/PFOS	**0.458**

NIGRA02-003-GW-016	
Analyte	Result (µg/L)
PFBS	**0.024**
PFOA	**0.0062 J**
PFOS	**0.0072 J**
Combined PFOA/PFOS	**0.0134 J**

NIGRA02-005-SW-001	
Analyte	Result (µg/L)
PFBS	0.010 R
PFOA	0.010 R
PFOS	0.010 R
Combined PFOA/PFOS	ND

Groundwater and Surface Water Screening Levels:

PFBS - 40 µg/L PFOA - 0.07 µg/L PFOS - 0.07 µg/L

PFOA + PFOS - 0.07 µg/L

Notes:

Bold value indicates analyte detected at concentration indicated.

= indicates analyte exceeds screening level

J = The reported concentration is an estimated value.

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

R = the analyte was not detected at the concentration indicated; the result was rejected during validation because the sample was received outside the 4 +/- 2 degree temperature criterion.

GW = groundwater SW = surface water dup = duplicate sample ND = nondect

Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- Existing Monitoring Well (Groundwater Level Measurement)
- Surface Water and Sediment Samples
- AFFF Inspection Area
- IRP Site 12 Excavation Area
- Installation Boundary
- Groundwater Flow Direction

N

0 80 160

Feet

Niagara Falls Air Reserve Station
Niagara County, New York

Figure 11
Hangar 850 (AFFF Area 2)
PFBS, PFOA, and PFOS in Groundwater and Surface Water

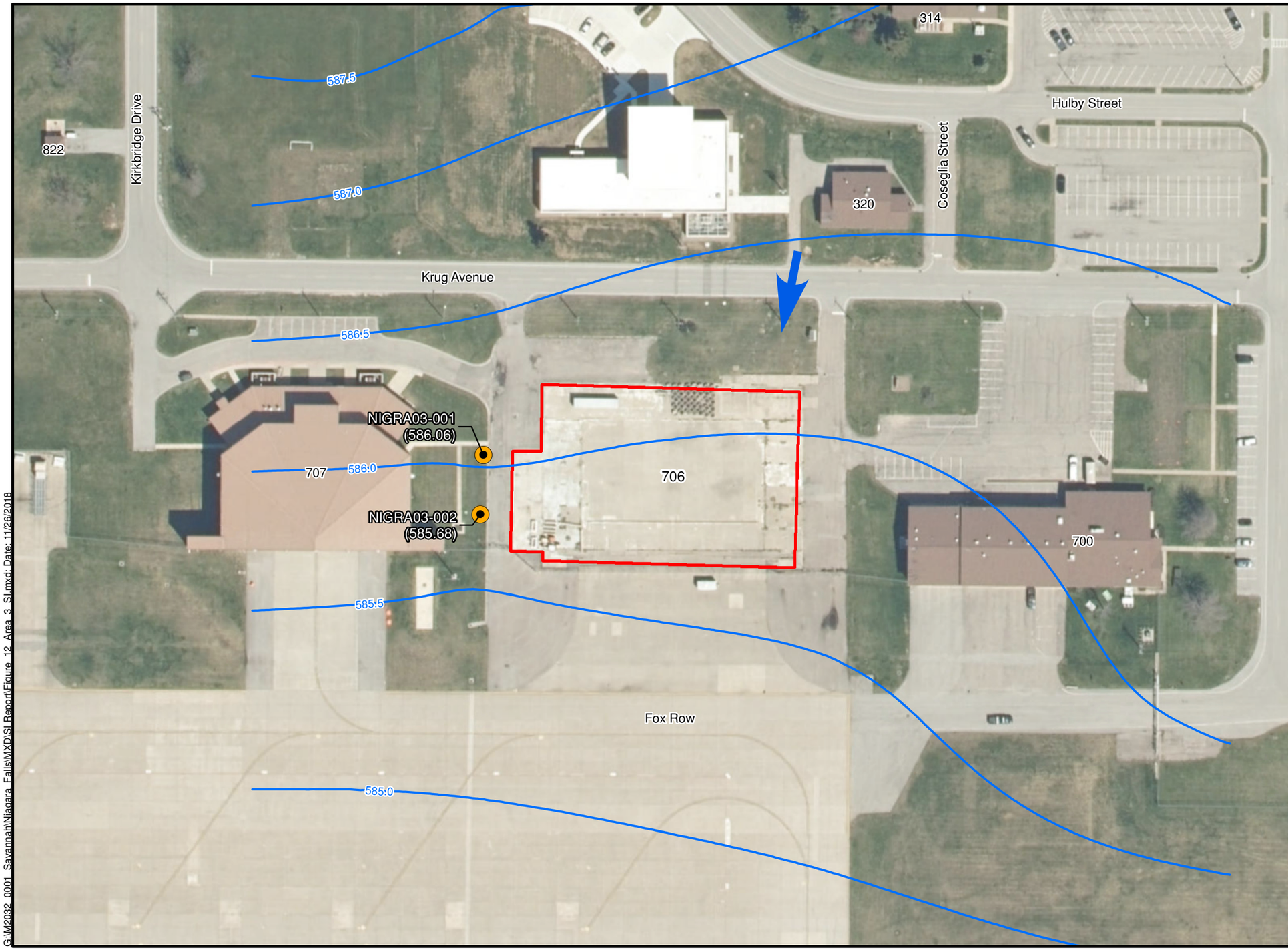
Aerostar SES LLC

Drawn: tmorse

Date: 9/17/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_11_Area_2_GW.mxd; Date: 9/17/2018



Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- AFFF Inspection Area
- Installation Boundary
- Groundwater Elevation
- Groundwater Flow Direction

NIGRA03-001
(586.06) = Groundwater Elevation (ft NAVD 88) measured on August 22, 2017.

Note: See Figure 4 for all data points used to develop GW contours.

N

0 30 60 90
Feet

Niagara Falls Air Reserve Station
Niagara County, New York

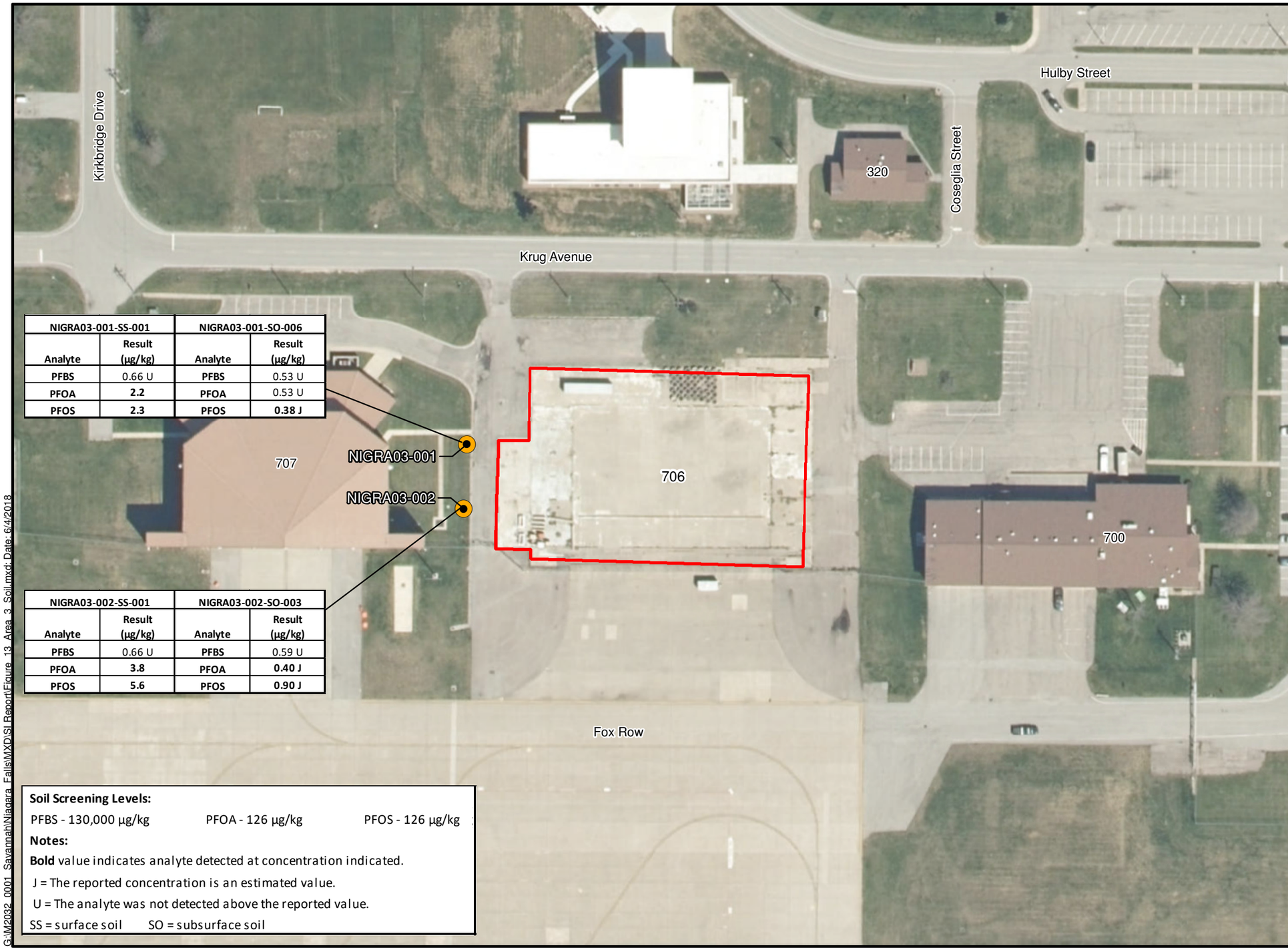
Figure 12
Building 706 (AFFF Area 3)
Sample Locations and Potentiometric Contours

Aerostar SES LLC

Drawn: tmorse | Date: 11/26/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_12_Area_3_SI.mxd; Date: 11/26/2018



NIGRA03-001-SS-001		NIGRA03-001-SO-006	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.66 U	PFBS	0.53 U
PFOA	**2.2**	PFOA	0.53 U
PFOS	**2.3**	PFOS	**0.38 J**

NIGRA03-002-SS-001		NIGRA03-002-SO-003	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.66 U	PFBS	0.59 U
PFOA	**3.8**	PFOA	**0.40 J**
PFOS	**5.6**	PFOS	**0.90 J**

Soil Screening Levels:

PFBS - 130,000 µg/kg PFOA - 126 µg/kg PFOS - 126 µg/kg

Notes:

Bold value indicates analyte detected at concentration indicated.

J = The reported concentration is an estimated value.

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

SS = surface soil SO = subsurface soil

Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- AFFF Inspection Area
- Installation Boundary

N

0 30 60 90

Feet

Niagara Falls Air Reserve Station
Niagara County, New York

Figure 13
Building 706 (AFFF Area 3)
PFBS, PFOA, and PFOS in Soil

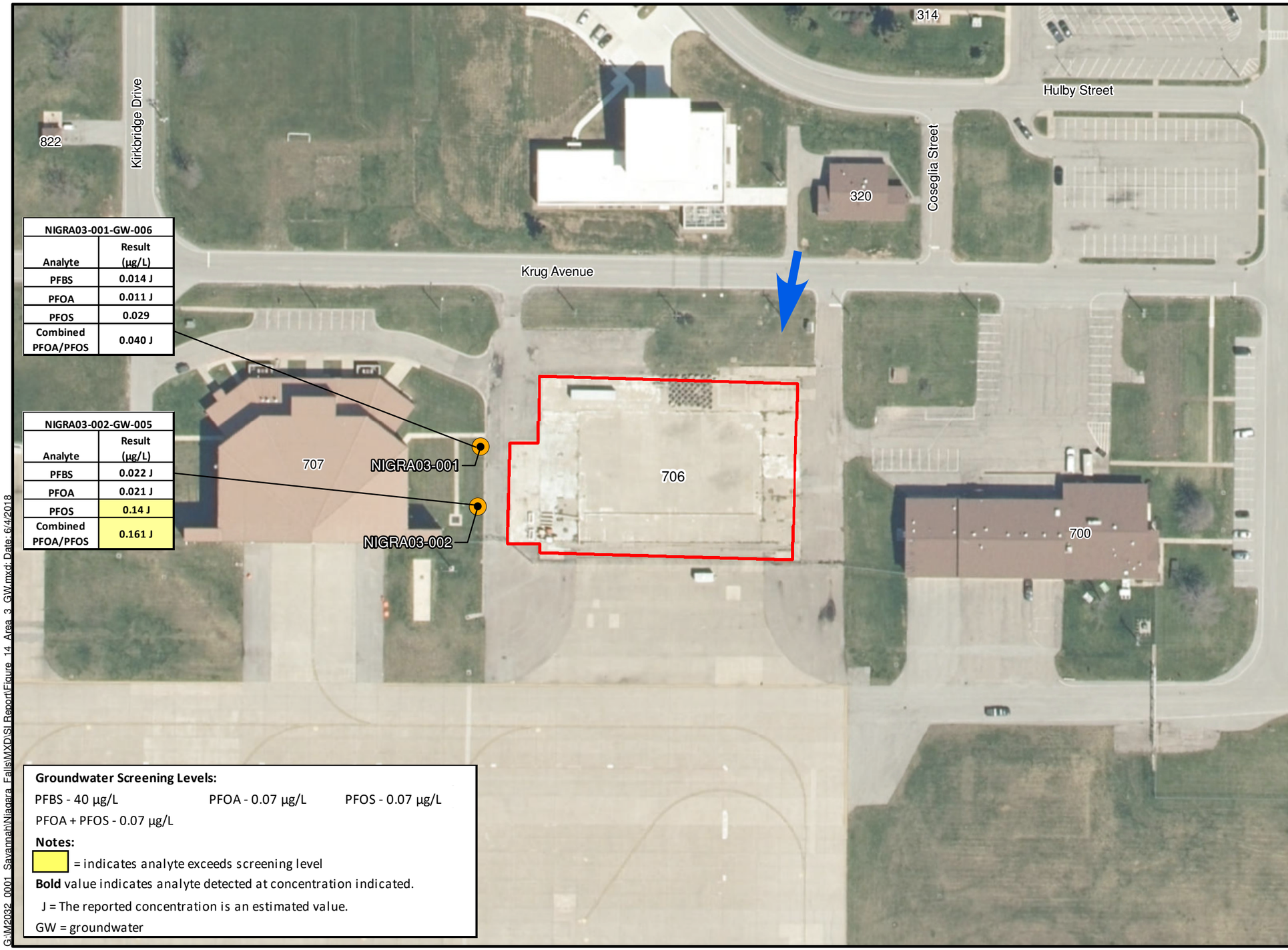
Aerostar SES LLC

Drawn: tmorse

Date: 6/4/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_13_Area_3_Soil.mxd; Date: 6/4/2018



NIGRA03-001-GW-006	
Analyte	Result (µg/L)
PFBS	0.014 J
PFOA	0.011 J
PFOS	0.029
Combined PFOA/PFOS	0.040 J

NIGRA03-002-GW-005	
Analyte	Result (µg/L)
PFBS	0.022 J
PFOA	0.021 J
PFOS	0.14 J
Combined PFOA/PFOS	0.161 J

Groundwater Screening Levels:

PFBS - 40 µg/L PFOA - 0.07 µg/L PFOS - 0.07 µg/L

PFOA + PFOS - 0.07 µg/L

Notes:

= indicates analyte exceeds screening level

Bold value indicates analyte detected at concentration indicated.

J = The reported concentration is an estimated value.

GW = groundwater

Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- AFFF Inspection Area
- Installation Boundary
- Groundwater Flow Direction

N

0 30 60 90

Feet

Niagara Falls Air Reserve Station
Niagara County, New York

Figure 14
Building 706 (AFFF Area 3)
PFBS, PFOA, and PFOS
in Groundwater

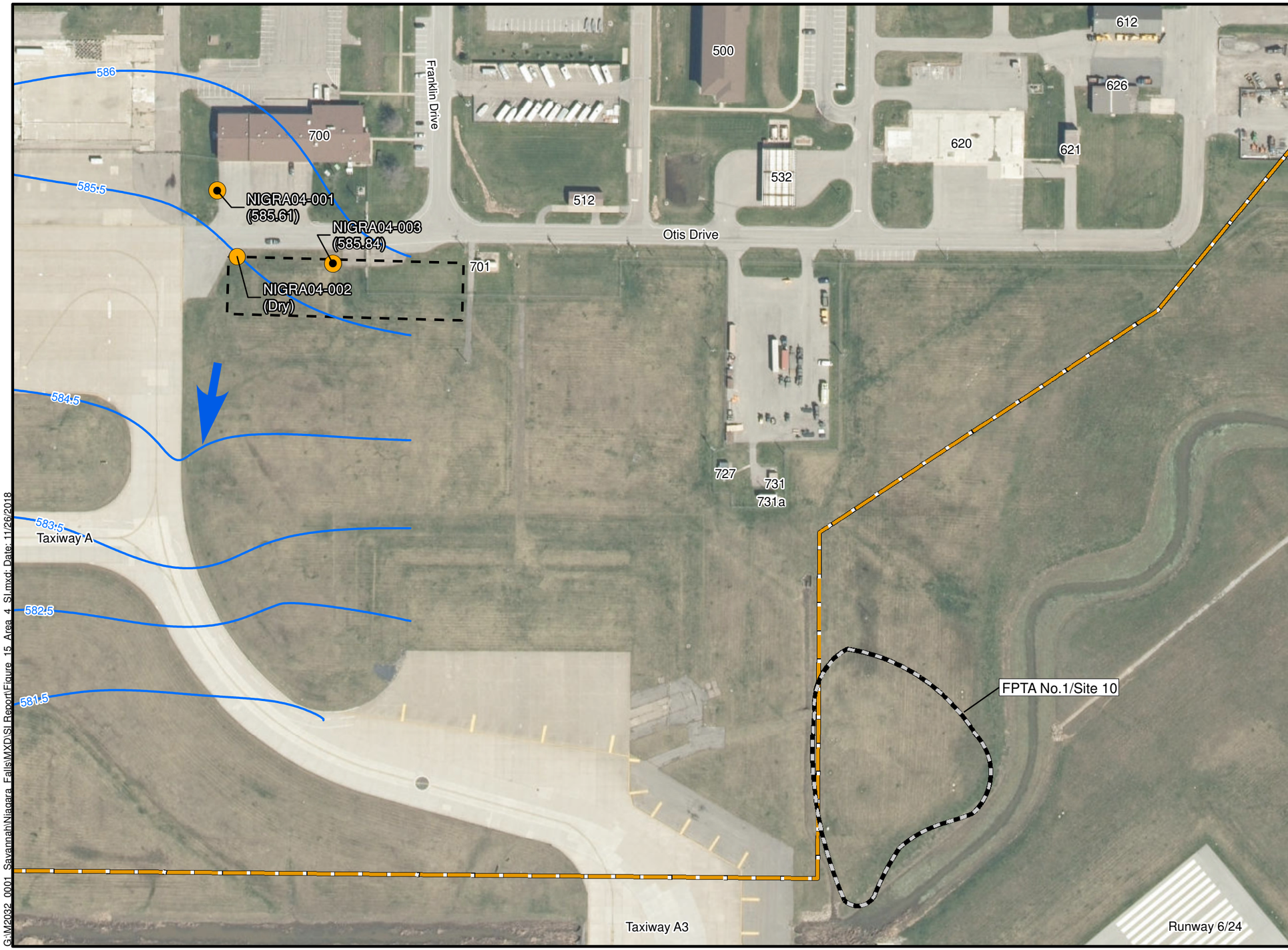
Aerostar SES LLC

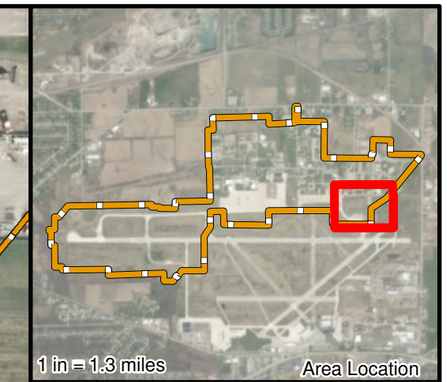
Drawn: tmorse

Date: 6/4/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_14_Area_3_GW.mxd; Date: 6/4/2018





Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- DPT Boring Surface and Subsurface Soil Samples
- AFFF Inspection Area
- FPTA No.1/Site 10
- Approximate Spray Test Area
- Installation Boundary
- Groundwater Elevation Contour
- Groundwater Flow Direction

NIGRA04-001
(585.61) = Groundwater Elevation (ft NAVD 88) measured on August 22, 2017.

Note: FPTA No. 01/Site 10 boundary obtained from NFARS supplied GIS layer "EnvRemediationSite_A".

N

0 50 100 150
Feet

Niagara Falls Air Reserve Station
Niagara County, New York

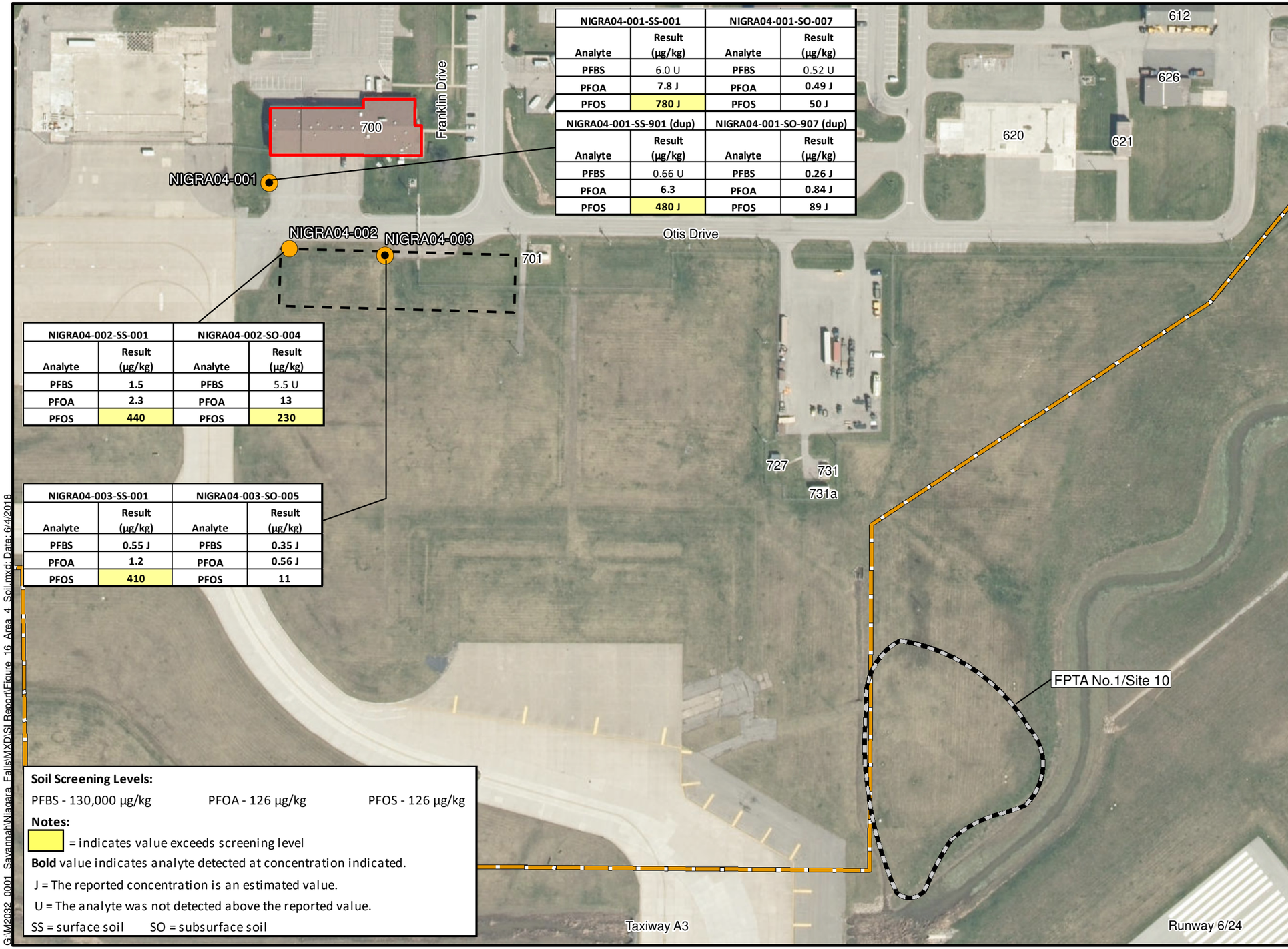
Figure 15
Building 700 (AFFF Area 4) Sample Locations and Potentiometric Contours

Aerostar SES LLC

Drawn: tmorse | Date: 11/26/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_15_Area_4_SI.mxd; Date: 11/26/2018



NIGRA04-001-SS-001		NIGRA04-001-SO-007	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	6.0 U	PFBS	0.52 U
PFOA	**7.8 J**	PFOA	**0.49 J**
PFOS	**780 J**	PFOS	**50 J**

NIGRA04-001-SS-901 (dup)		NIGRA04-001-SO-907 (dup)	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.66 U	PFBS	**0.26 J**
PFOA	**6.3**	PFOA	**0.84 J**
PFOS	**480 J**	PFOS	**89 J**

NIGRA04-002-SS-001		NIGRA04-002-SO-004	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	**1.5**	PFBS	5.5 U
PFOA	**2.3**	PFOA	**13**
PFOS	**440**	PFOS	**230**

NIGRA04-003-SS-001		NIGRA04-003-SO-005	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	**0.55 J**	PFBS	**0.35 J**
PFOA	**1.2**	PFOA	**0.56 J**
PFOS	**410**	PFOS	**11**

Soil Screening Levels:

PFBS - 130,000 µg/kg PFOA - 126 µg/kg PFOS - 126 µg/kg

Notes:

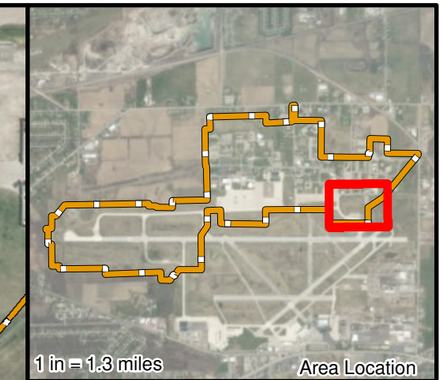
= indicates value exceeds screening level

Bold value indicates analyte detected at concentration indicated.

J = The reported concentration is an estimated value.

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

SS = surface soil SO = subsurface soil



Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- DPT Boring Surface and Subsurface Soil Samples
- AFFF Inspection Area
- FPTA No.1/Site 10
- Approximate Spray Test Area
- Installation Boundary

N

0 50 100 150

Feet

Niagara Falls Air Reserve Station
Niagara County, New York

Figure 16
Building 700 (AFFF Area 4) PFBS, PFOA, and PFOS in Soil

Aerostar SES LLC

Drawn: tmorse | Date: 6/4/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_16_Area_4_Soil.mxd; Date: 6/4/2018

NIGRA04-001-GW-005	
Analyte	Result (µg/L)
PFBS	0.95
PFOA	1.1
PFOS	22
Combined PFOA/PFOS	23.1

NIGRA04-001-GW-905 (dup)	
Analyte	Result (µg/L)
PFBS	0.94
PFOA	1.1
PFOS	25
Combined PFOA/PFOS	26.1

NIGRA04-003-GW-005	
Analyte	Result (µg/L)
PFBS	0.65
PFOA	0.47
PFOS	2.1
Combined PFOA/PFOS	2.57

Groundwater Screening Levels:

PFBS - 40 µg/L PFOA - 0.07 µg/L PFOS - 0.07 µg/L

PFOA + PFOS - 0.07 µg/L

Notes:

= indicates analyte exceeds screening level

Bold value indicates analyte detected at concentration indicated.

GW = groundwater

Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- DPT Boring Surface and Subsurface Soil Samples
- AFFF Inspection Area
- FPTA No.1/Site 10
- Approximate Spray Test Area
- Installation Boundary
- Groundwater Flow Direction

N

0 50 100 150

Feet

Niagara Falls Air Reserve Station
Niagara County, New York

Figure 17
Building 700 (AFFF Area 4) PFBS, PFOA, and PFOS in Groundwater

Aerostar SES LLC

Drawn: tmorse

Date: 6/4/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_17_Area_4_GW.mxd; Date: 6/4/2018

Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- AFFF Inspection Area
- Installation Boundary
- Streams
- Assumed Groundwater Flow Direction

NIGRA05-001
(586.93) = Groundwater Elevation (ft NAVD 88) measured on August 22, 2017.

N

0 100 200
Feet

Niagara Falls Air Reserve Station
Niagara County, New York

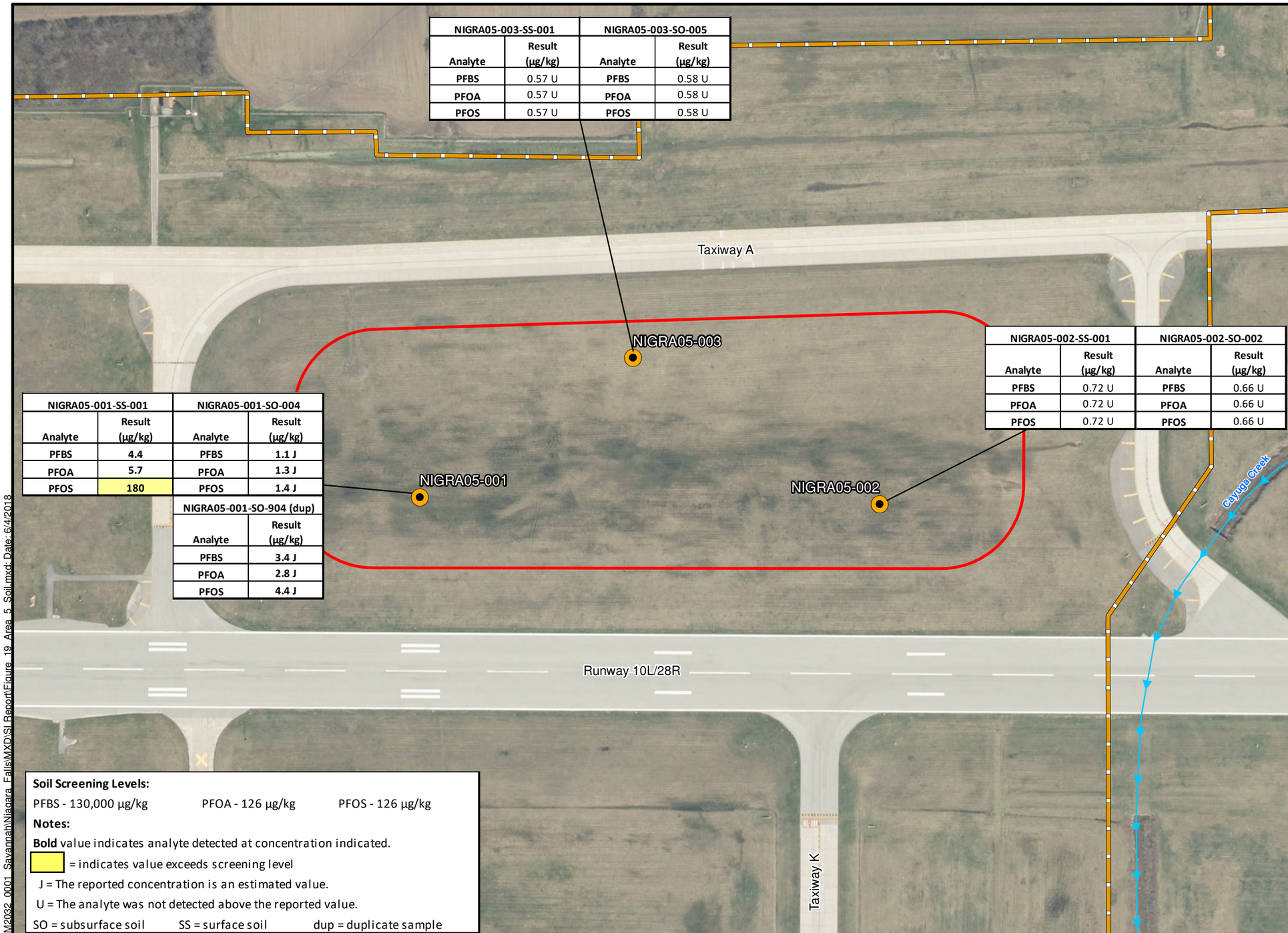
Figure 18
Blue Angels Crash Site
(AFFF Area 5) Sample Locations

Aerostar SES LLC

Drawn: tmorse | Date: 11/26/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_18_Area_5_SI.mxd; Date: 11/26/2018



NIGRA05-003-SS-001		NIGRA05-003-SO-005	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.57 U	PFBS	0.58 U
PFOA	0.57 U	PFOA	0.58 U
PFOS	0.57 U	PFOS	0.58 U

NIGRA05-002-SS-001		NIGRA05-002-SO-002	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.72 U	PFBS	0.66 U
PFOA	0.72 U	PFOA	0.66 U
PFOS	0.72 U	PFOS	0.66 U

NIGRA05-001-SS-001		NIGRA05-001-SO-004	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	4.4	PFBS	1.1 J
PFOA	5.7	PFOA	1.3 J
PFOS	180	PFOS	1.4 J

NIGRA05-001-SO-904 (dup)	
Analyte	Result (µg/kg)
PFBS	3.4 J
PFOA	2.8 J
PFOS	4.4 J

Soil Screening Levels:

PFBS - 130,000 µg/kg PFOA - 126 µg/kg PFOS - 126 µg/kg

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.

SO = subsurface soil SS = surface soil dup = duplicate sample

Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- AFFF Inspection Area
- Installation Boundary
- Streams

N

0 100 200

Feet

Niagara Falls Air Reserve Station
Niagara County, New York

Figure 19
Blue Angels Crash Site (AFFF Area 5) PFBS, PFOA, and PFOS in Soil

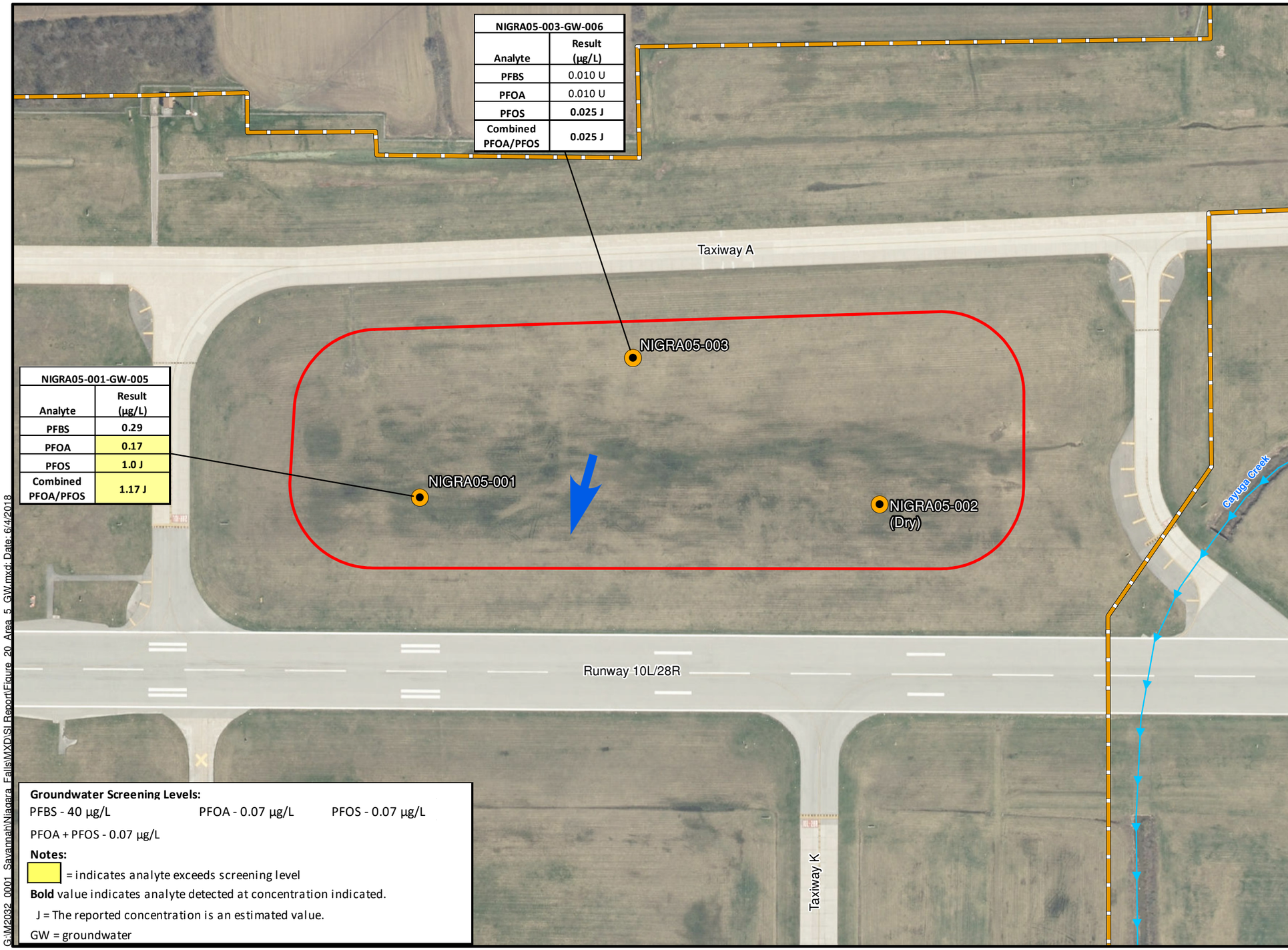
Aerostar SES LLC

Drawn: tmorse

Date: 6/4/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_19_Area_5_Soil.mxd; Date: 6/4/2018



NIGRA05-003-GW-006	
Analyte	Result (µg/L)
PFBS	0.010 U
PFOA	0.010 U
PFOS	**0.025 J**
Combined PFOA/PFOS	**0.025 J**

NIGRA05-001-GW-005	
Analyte	Result (µg/L)
PFBS	**0.29**
PFOA	**0.17**
PFOS	**1.0 J**
Combined PFOA/PFOS	**1.17 J**

Groundwater Screening Levels:

PFBS - 40 µg/L PFOA - 0.07 µg/L PFOS - 0.07 µg/L

PFOA + PFOS - 0.07 µg/L

Notes:

= indicates analyte exceeds screening level

Bold value indicates analyte detected at concentration indicated.

J = The reported concentration is an estimated value.

GW = groundwater

Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- AFFF Inspection Area
- Installation Boundary
- Streams
- Assumed Groundwater Flow Direction

N

0 100 200

Feet

Niagara Falls Air Reserve Station
Niagara County, New York

Figure 20
Blue Angels Crash Site (AFFF Area 5) PFBS, PFOA, and PFOS in Groundwater

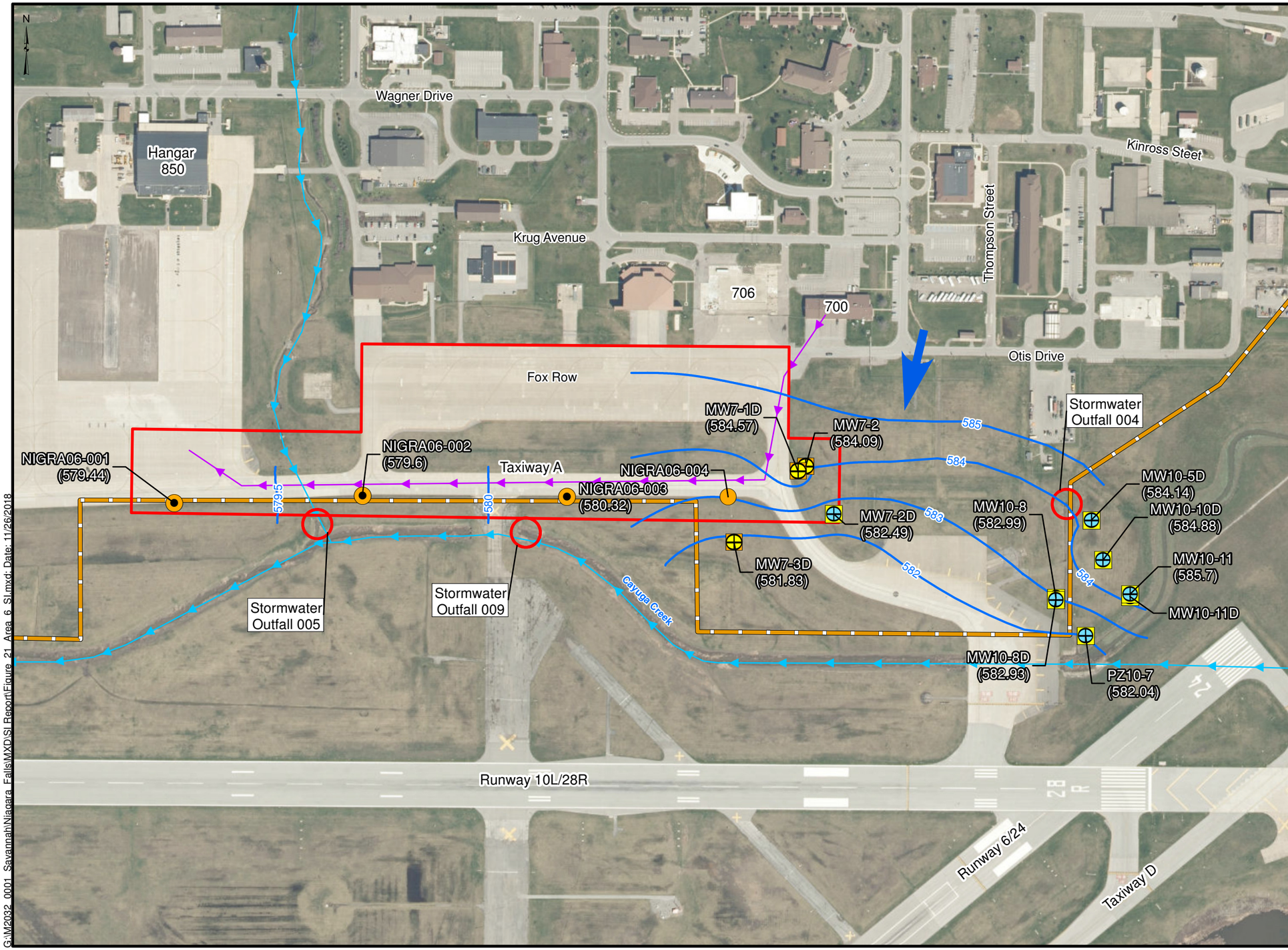
Aerostar SES LLC

Drawn: tmorse

Date: 6/4/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_20_Area_5_GW.mxd; Date: 6/4/2018



Niagara Falls Air Reserve Station
Niagara County, New York

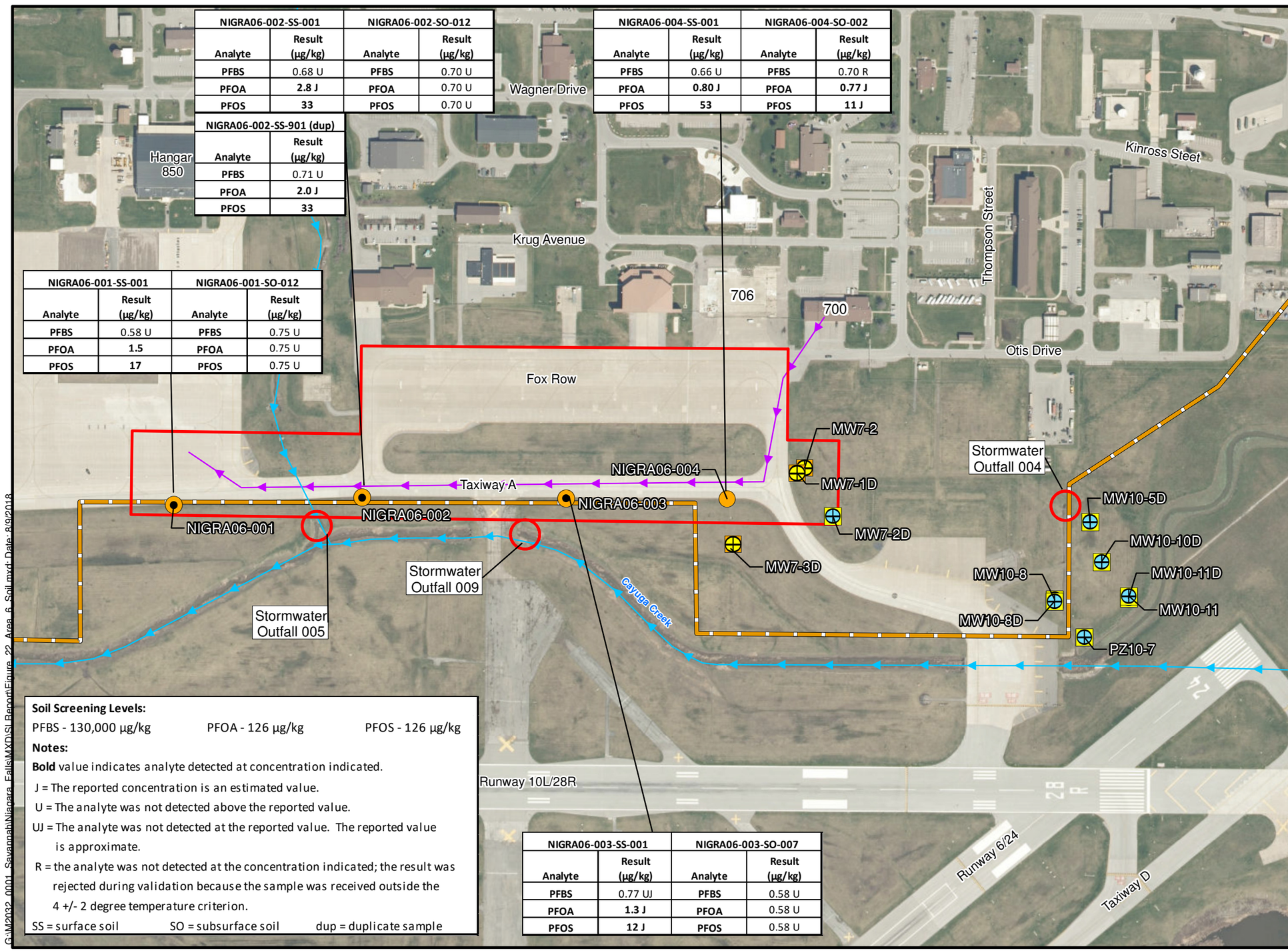
Figure 21
Fox Row/Taxiway Alpha (AFFF Area 6) Sample Locations and Potentiometric Contours

Aerostar SES LLC

Drawn: tmorse | Date: 11/26/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_21_Area_6_SI.mxd; Date: 11/26/2018



NIGRA06-002-SS-001		NIGRA06-002-SO-012	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.68 U	PFBS	0.70 U
PFOA	**2.8 J**	PFOA	0.70 U
PFOS	**33**	PFOS	0.70 U

NIGRA06-002-SS-901 (dup)	
Analyte	Result (µg/kg)
PFBS	0.71 U
PFOA	**2.0 J**
PFOS	**33**

NIGRA06-004-SS-001		NIGRA06-004-SO-002	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.66 U	PFBS	0.70 R
PFOA	**0.80 J**	PFOA	**0.77 J**
PFOS	**53**	PFOS	**11 J**

NIGRA06-001-SS-001		NIGRA06-001-SO-012	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.58 U	PFBS	0.75 U
PFOA	**1.5**	PFOA	0.75 U
PFOS	**17**	PFOS	0.75 U

NIGRA06-003-SS-001		NIGRA06-003-SO-007	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.77 UJ	PFBS	0.58 U
PFOA	**1.3 J**	PFOA	0.58 U
PFOS	**12 J**	PFOS	0.58 U

Soil Screening Levels:

PFBS - 130,000 µg/kg PFOA - 126 µg/kg PFOS - 126 µg/kg

Notes:

Bold value indicates analyte detected at concentration indicated.

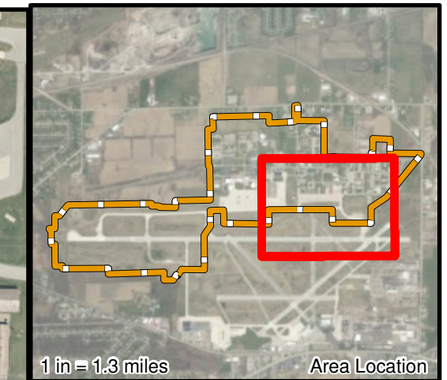
J = The reported concentration is an estimated value.

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

UJ = The analyte was not detected at the reported value. The reported value is approximate.

R = the analyte was not detected at the concentration indicated; the result was rejected during validation because the sample was received outside the 4 +/- 2 degree temperature criterion.

SS = surface soil SO = subsurface soil dup = duplicate sample



Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- DPT Boring Surface and Subsurface Soil Samples
- Existing Groundwater Monitoring Well Sampled
- Existing Monitoring Well (Groundwater Level Measurement)
- Travel Direction of Leaking Firetruck
- AFFF Inspection Area
- Installation Boundary
- Streams

N

0 170 340

Feet

Niagara Falls Air Reserve Station
Niagara County, New York

Figure 22
Fox Row/Taxiway Alpha (AFFF Area 6) PFBS, PFOA, and PFOS in Soil

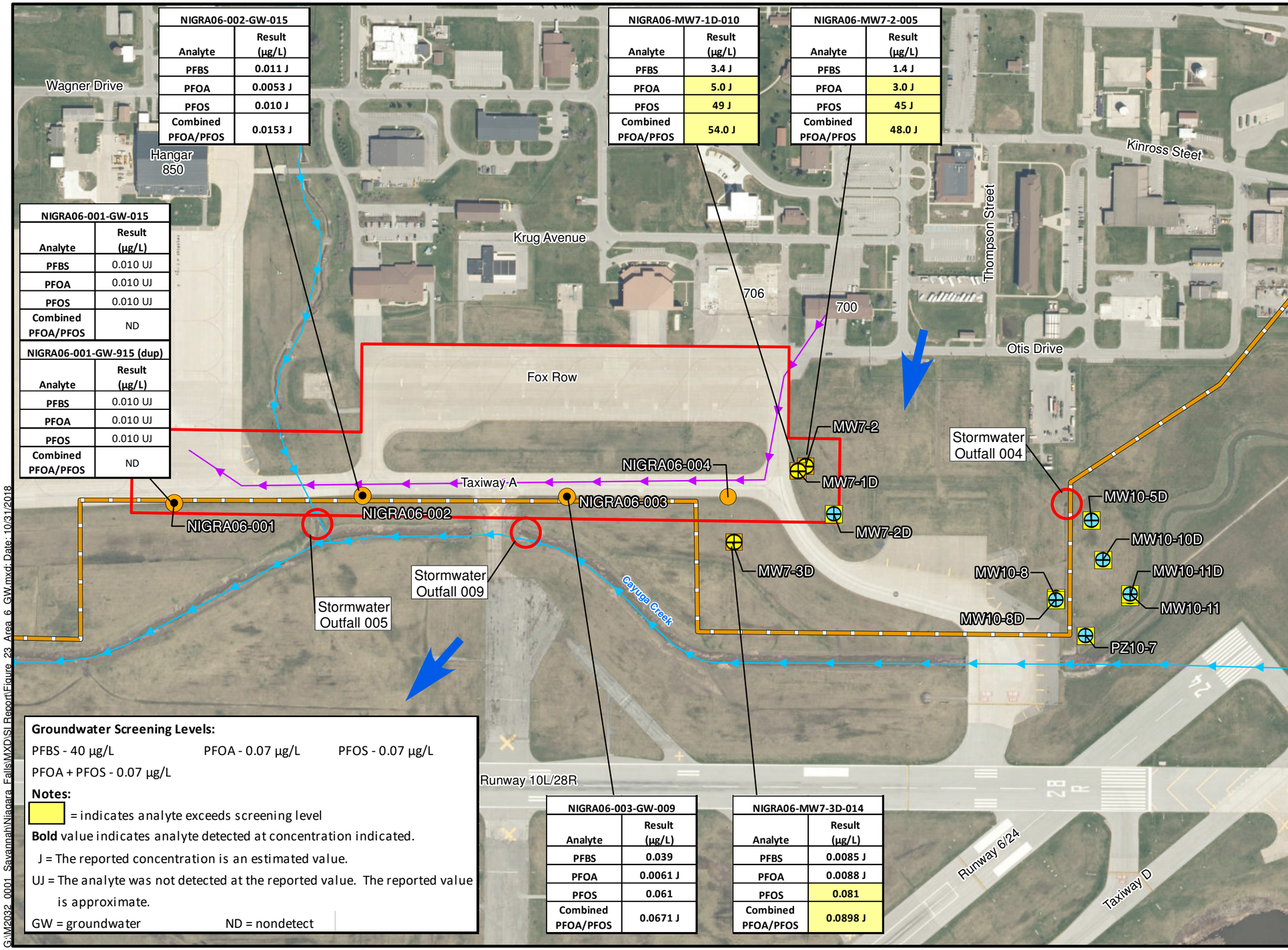
Aerostar SES LLC

Drawn: tmorse

Date: 8/9/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032.0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_22_Area_6_Soil.mxd Date: 8/9/2018



NIGRA06-002-GW-015	
Analyte	Result (µg/L)
PFBS	0.011 J
PFOA	0.0053 J
PFOS	0.010 J
Combined PFOA/PFOS	0.0153 J

NIGRA06-MW7-1D-010	
Analyte	Result (µg/L)
PFBS	3.4 J
PFOA	5.0 J
PFOS	49 J
Combined PFOA/PFOS	54.0 J

NIGRA06-MW7-2-005	
Analyte	Result (µg/L)
PFBS	1.4 J
PFOA	3.0 J
PFOS	45 J
Combined PFOA/PFOS	48.0 J

NIGRA06-001-GW-015	
Analyte	Result (µg/L)
PFBS	0.010 UJ
PFOA	0.010 UJ
PFOS	0.010 UJ
Combined PFOA/PFOS	ND

NIGRA06-001-GW-915 (dup)	
Analyte	Result (µg/L)
PFBS	0.010 UJ
PFOA	0.010 UJ
PFOS	0.010 UJ
Combined PFOA/PFOS	ND

NIGRA06-003-GW-009	
Analyte	Result (µg/L)
PFBS	0.039
PFOA	0.0061 J
PFOS	0.061
Combined PFOA/PFOS	0.0671 J

NIGRA06-MW7-3D-014	
Analyte	Result (µg/L)
PFBS	0.0085 J
PFOA	0.0088 J
PFOS	0.081
Combined PFOA/PFOS	0.0898 J

Groundwater Screening Levels:

PFBS - 40 µg/L PFOA - 0.07 µg/L PFOS - 0.07 µg/L

PFOA + PFOS - 0.07 µg/L

Notes:

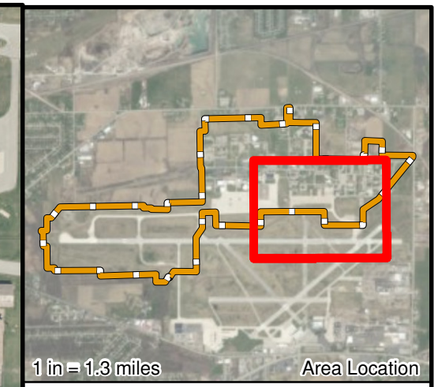
= indicates analyte exceeds screening level

Bold value indicates analyte detected at concentration indicated.

J = The reported concentration is an estimated value.

UJ = The analyte was not detected at the reported value. The reported value is approximate.

GW = groundwater ND = nondetect



Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- DPT Boring Surface and Subsurface Soil Samples
- Existing Groundwater Monitoring Well Sampled
- Existing Monitoring Well (Groundwater Level Measurement)
- Travel Direction of Leaking Firetruck
- AFFF Inspection Area
- Installation Boundary
- Streams
- Groundwater Flow Direction

N

0 170 340

Feet

Niagara Falls Air Reserve Station
Niagara County, New York

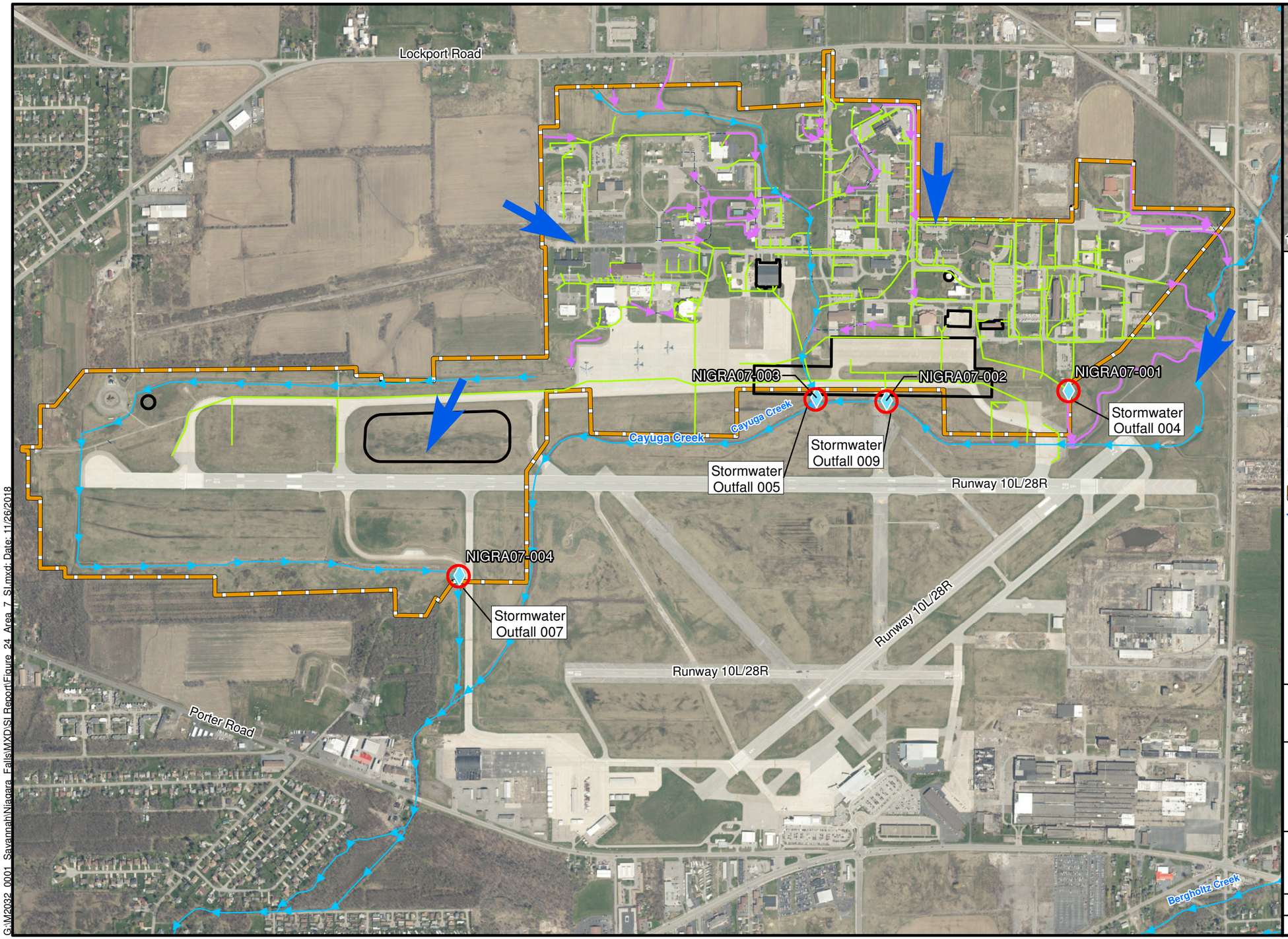
Figure 23
Fox Row/Taxiway Alpha (AFFF Area 6) PFBS, PFOA, and PFOS in Groundwater

Aerostar SES LLC

Drawn: tmorse Date: 10/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_23_Area_6_GW.mxd; Date: 10/31/2018



Legend

- Surface Water and Sediment Samples
- Culvert
- Open Drainage
- Gravity Line
- Streams
- AFFF Inspection Area (AFFF Areas 1-6 and 8. See Figure 2 for area labels.)
- AFFF Inspection Area (AFFF Area 7)
- Installation Boundary
- Groundwater Flow Direction

N

0 500 1,000

Feet

Niagara Falls Air Reserve Station
Niagara County, New York

Figure 24
Outfalls 004, 005, 007, and 009
(AFFF Area 7) Sample Locations

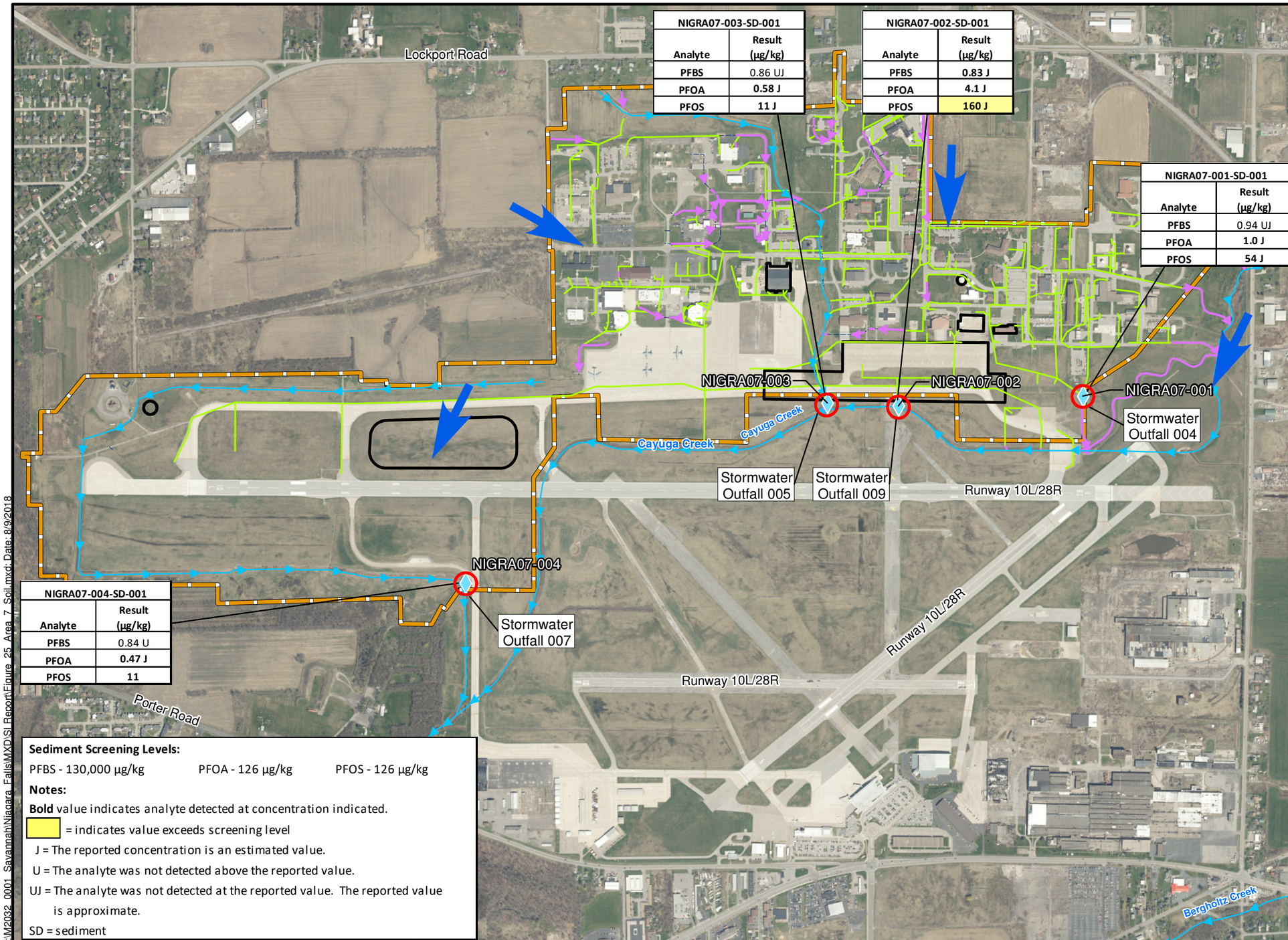
Aerostar SES LLC

Drawn: tmorse

Date: 11/26/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_24_Area_7_SI.mxd; Date: 11/26/2018



Legend

- Surface Water and Sediment Samples
- Culvert
- Open Drainage
- Gravity Line
- Streams
- AFFF Inspection Area (AFFF Areas 1-6 and 8. See figure 2 for area labels.)
- AFFF Inspection Area (AFFF Area 7)
- Installation Boundary
- Groundwater Flow Direction

N

0 500 1,000
Feet

Sediment Screening Levels:

PFBS - 130,000 µg/kg PFOA - 126 µg/kg PFOS - 126 µg/kg

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.

UJ = The analyte was not detected at the reported value. The reported value is approximate.

SD = sediment

Niagara Falls Air Reserve Station
Niagara County, New York

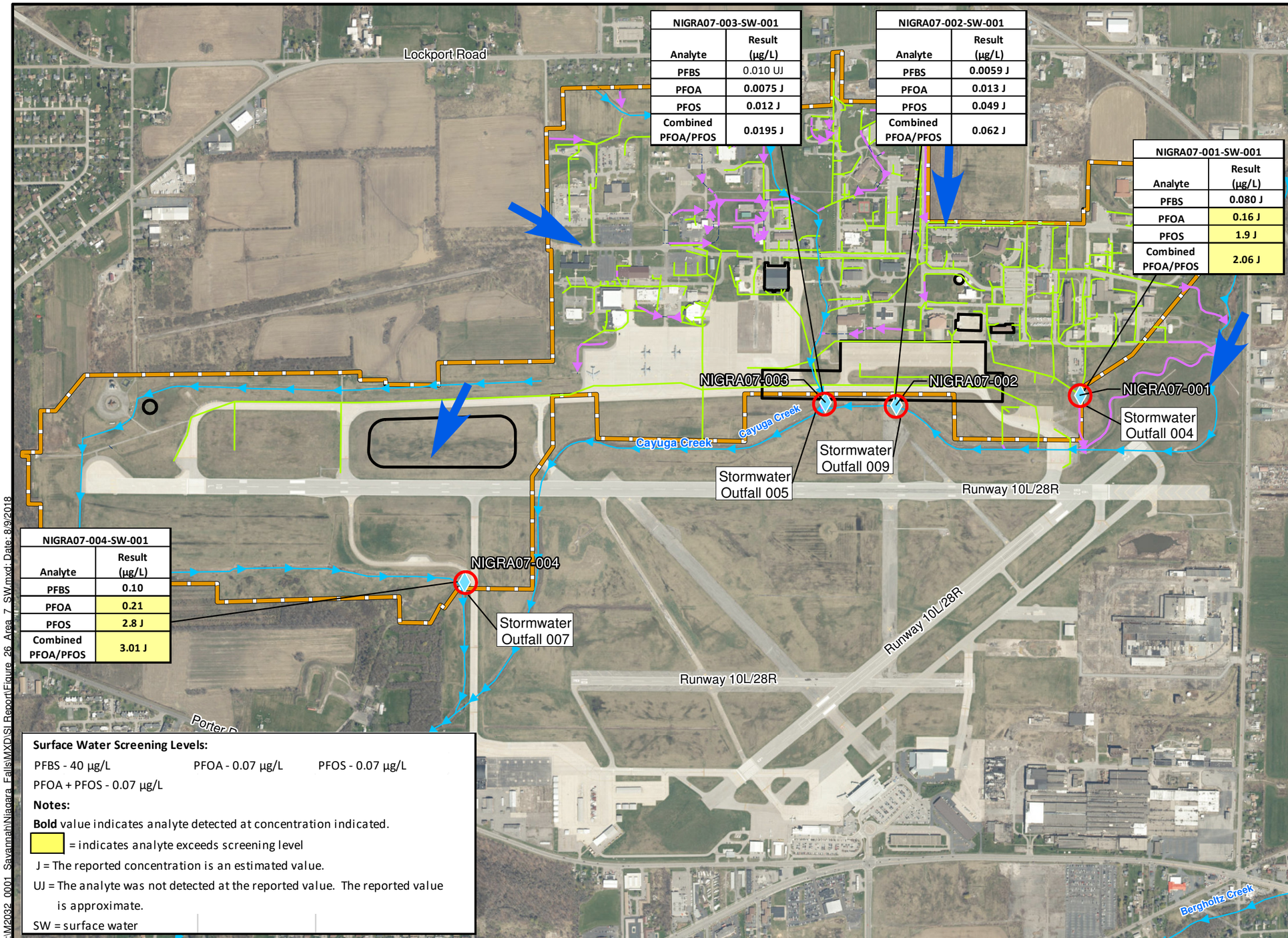
Figure 25
Outfalls 004, 005, 007, and 009 (AFFF Area 7) PFBS, PFOA, and PFOS in Sediment

Aerostar SES LLC

Drawn: tmorse | Date: 8/9/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_25_Area_7_Soil.mxd; Date: 8/9/2018



NIGRA07-003-SW-001	
Analyte	Result (µg/L)
PFBS	0.010 UJ
PFOA	0.0075 J
PFOS	0.012 J
Combined PFOA/PFOS	0.0195 J

NIGRA07-002-SW-001	
Analyte	Result (µg/L)
PFBS	0.0059 J
PFOA	0.013 J
PFOS	0.049 J
Combined PFOA/PFOS	0.062 J

NIGRA07-001-SW-001	
Analyte	Result (µg/L)
PFBS	0.080 J
PFOA	0.16 J
PFOS	1.9 J
Combined PFOA/PFOS	2.06 J

NIGRA07-004-SW-001	
Analyte	Result (µg/L)
PFBS	0.10
PFOA	0.21
PFOS	2.8 J
Combined PFOA/PFOS	3.01 J

Surface Water Screening Levels:

PFBS - 40 µg/L PFOA - 0.07 µg/L PFOS - 0.07 µg/L

PFOA + PFOS - 0.07 µg/L

Notes:

Bold value indicates analyte detected at concentration indicated.

= indicates analyte exceeds screening level

J = The reported concentration is an estimated value.

UJ = The analyte was not detected at the reported value. The reported value is approximate.

SW = surface water

Legend

- Surface Water and Sediment Samples
- Culvert
- Open Drainage
- Gravity Line
- Streams
- AFFF Inspection Area (AFFF Areas 1-6 and 8. See figure 2 for area labels.)
- AFFF Inspection Area (AFFF Area 7)
- Installation Boundary
- Groundwater Flow Direction

N

0 500 1,000

Feet

Niagara Falls Air Reserve Station
Niagara County, New York

Figure 26
Outfalls 004, 005, 007, and 009 (AFFF Area 7) PFBS, PFOA, and PFOS in Surface Water

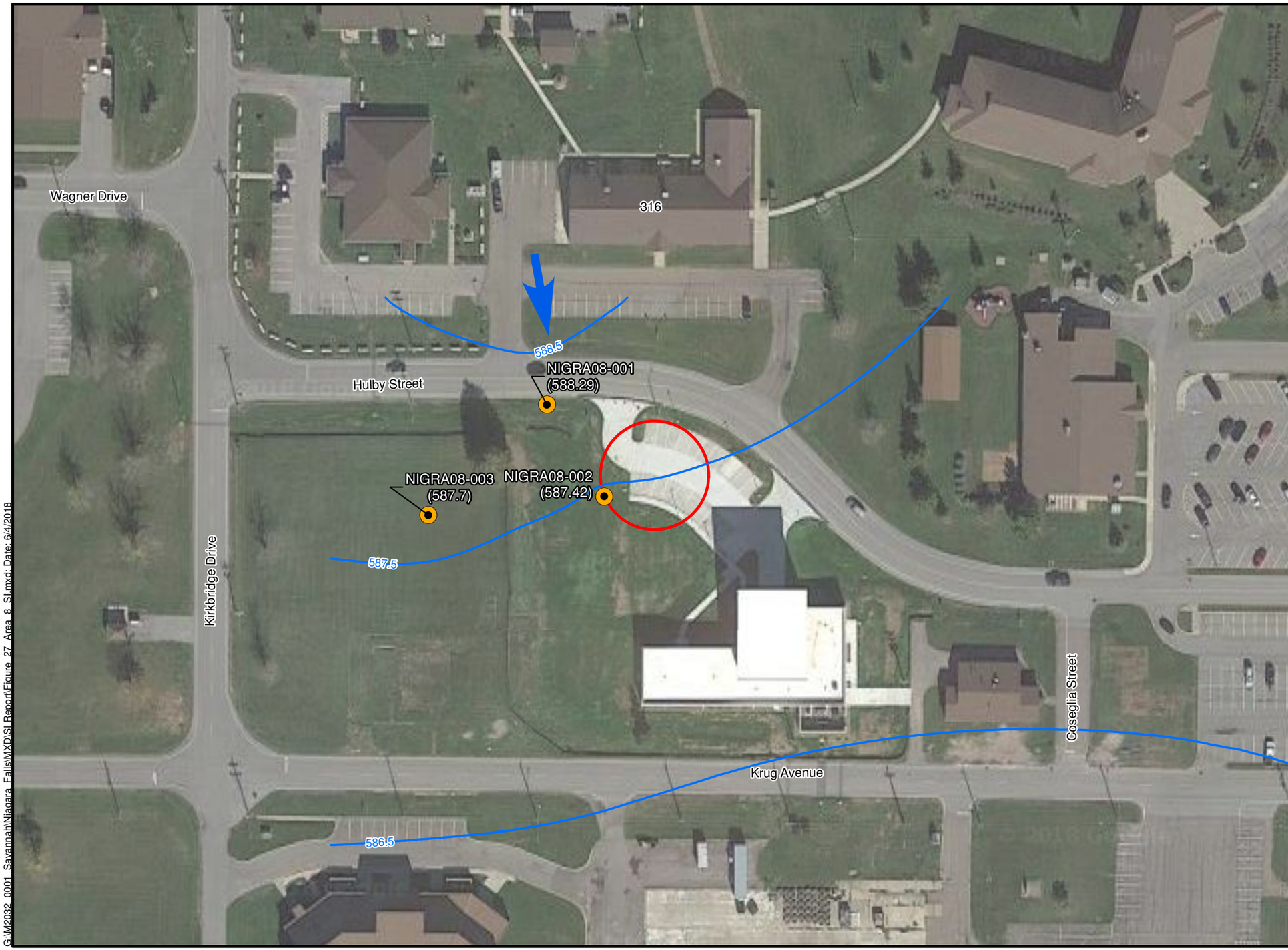
Aerostar SES LLC

Drawn: tmorse

Date: 8/9/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_26_Area_7_SW.mxd; Date: 8/9/2018



Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- AFFF Inspection Area
- Installation Boundary
- Groundwater Elevation Contour
- Groundwater Flow Direction

N

0 45 90

Feet

Niagara Falls Air Reserve Station
Niagara County, New York

Figure 27
Hulby Street (AFFF Area 8)
Sample Locations and
Potentiometric Contours

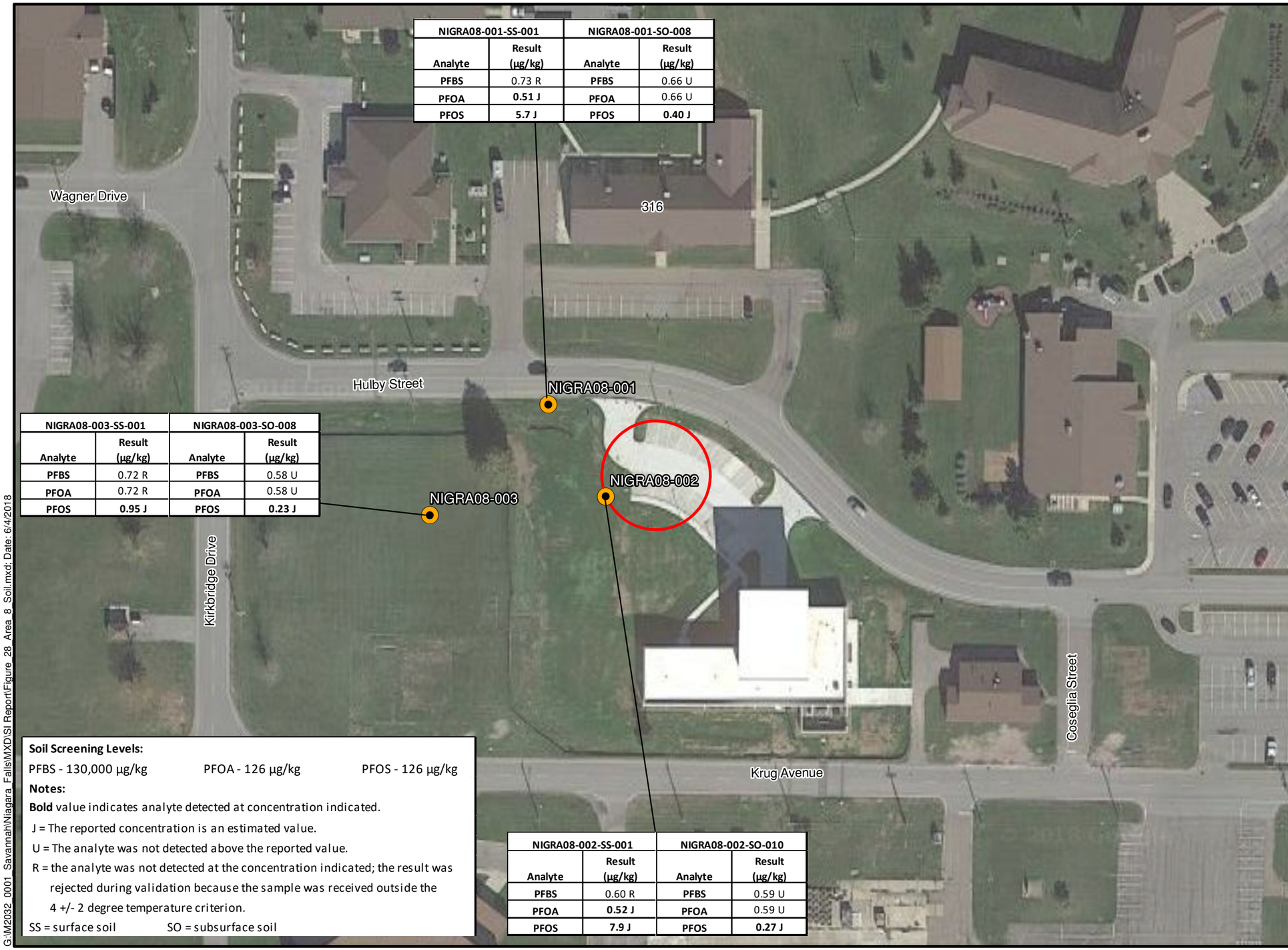
Aerostar SES LLC

Drawn: tmorse

Date: 6/4/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_27_Area_8_SI.mxd; Date: 6/4/2018



NIGRA08-001-SS-001		NIGRA08-001-SO-008	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.73 R	PFBS	0.66 U
PFOA	**0.51 J**	PFOA	0.66 U
PFOS	**5.7 J**	PFOS	**0.40 J**

NIGRA08-003-SS-001		NIGRA08-003-SO-008	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.72 R	PFBS	0.58 U
PFOA	0.72 R	PFOA	0.58 U
PFOS	**0.95 J**	PFOS	**0.23 J**

NIGRA08-002-SS-001		NIGRA08-002-SO-010	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.60 R	PFBS	0.59 U
PFOA	**0.52 J**	PFOA	0.59 U
PFOS	**7.9 J**	PFOS	**0.27 J**

Soil Screening Levels:

PFBS - 130,000 µg/kg PFOA - 126 µg/kg PFOS - 126 µg/kg

Notes:

Bold value indicates analyte detected at concentration indicated.

J = The reported concentration is an estimated value.

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

R = the analyte was not detected at the concentration indicated; the result was rejected during validation because the sample was received outside the 4 +/- 2 degree temperature criterion.

SS = surface soil SO = subsurface soil

Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- AFFF Inspection Area
- Installation Boundary

N

0 45 90

Feet

Niagara Falls Air Reserve Station
Niagara County, New York

Figure 28
Hulby Street (AFFF Area 8)
PFBS, PFOA, and PFOS in Soil

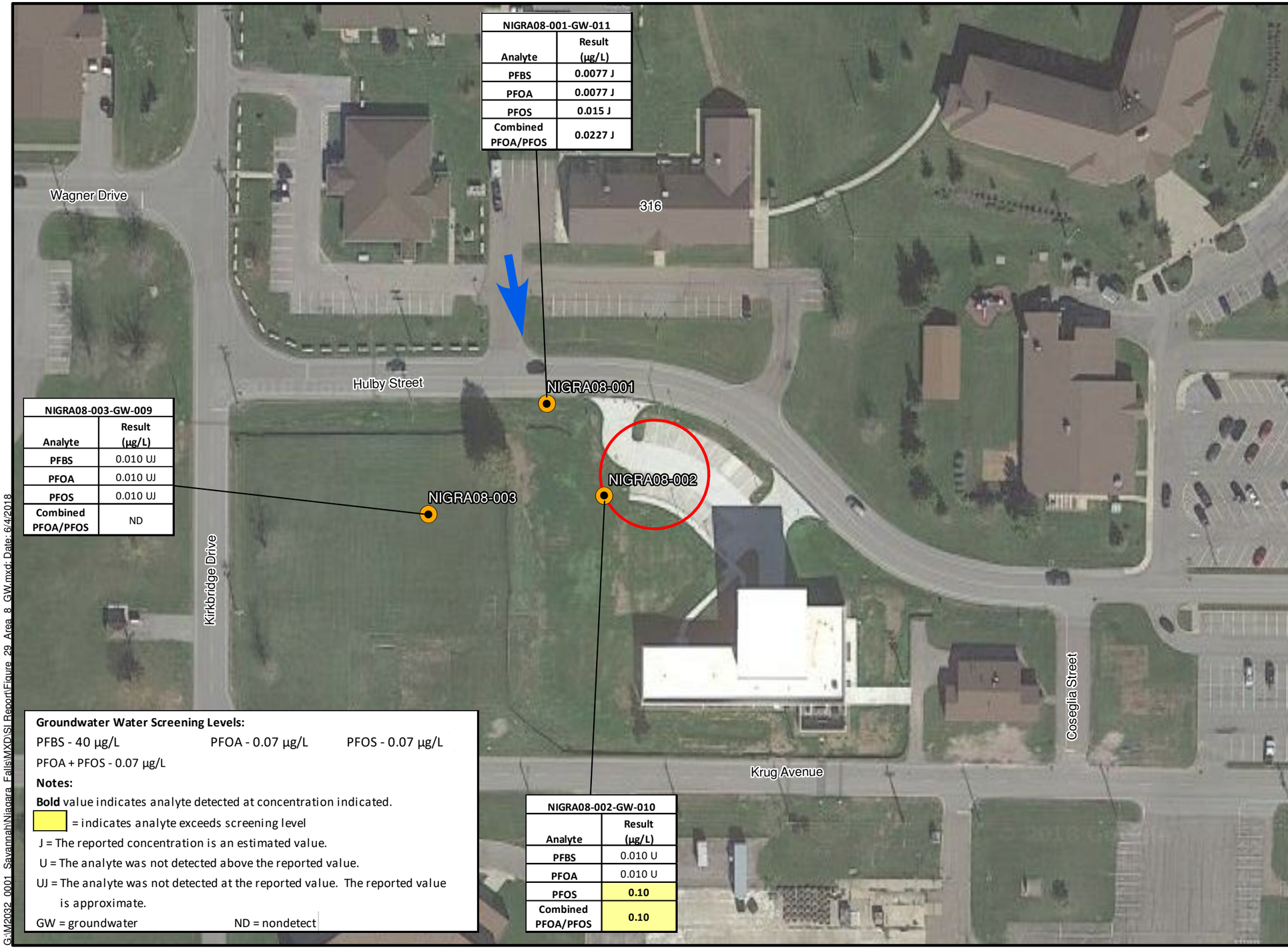
Aerostar SES LLC

Drawn: tmorse

Date: 6/4/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_28_Area_8_Soil.mxd; Date: 6/4/2018



NIGRA08-001-GW-011	
Analyte	Result (µg/L)
PFBS	0.0077 J
PFOA	0.0077 J
PFOS	0.015 J
Combined PFOA/PFOS	0.0227 J

NIGRA08-003-GW-009	
Analyte	Result (µg/L)
PFBS	0.010 UJ
PFOA	0.010 UJ
PFOS	0.010 UJ
Combined PFOA/PFOS	ND

NIGRA08-002-GW-010	
Analyte	Result (µg/L)
PFBS	0.010 U
PFOA	0.010 U
PFOS	**0.10**
Combined PFOA/PFOS	**0.10**

Groundwater Water Screening Levels:

PFBS - 40 µg/L PFOA - 0.07 µg/L PFOS - 0.07 µg/L

PFOA + PFOS - 0.07 µg/L

Notes:

Bold value indicates analyte detected at concentration indicated.

= indicates analyte exceeds screening level

J = The reported concentration is an estimated value.

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

UJ = The analyte was not detected at the reported value. The reported value is approximate.

GW = groundwater ND = nondetect

Legend

- DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- AFFF Inspection Area
- Installation Boundary
- Groundwater Flow Direction

N

0 45 90

Feet

Niagara Falls Air Reserve Station
Niagara County, New York

Figure 29
Hulby Street (AFFF Area 8)
PFBS, PFOA, and PFOS
in Groundwater

Aerostar SES LLC

Drawn: tmorse

Date: 6/4/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Niagara_Falls\MXD\SI Report\Figure_29_Area_8_GW.mxd; Date: 6/4/2018

Appendix B

RSL Calculations for PFOS and PFOA

Default
Resident Equation Inputs for Soil

Variable	Value
THQ (target hazard quotient) unitless	0.1
TR (target risk) unitless	1E-06
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

Default
Resident Equation Inputs for Soil

Variable	Value
EF_{0-2} (mutagenic exposure frequency) days/year	350
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	166833.3
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
AT_{res} (averaging time - resident carcinogenic)	365
$City_{PEF}$ (Climate Zone) Selection	Default
A_s (PEF acres)	0.5
Q/C_{wind} (g/m^2-s per kg/m^3)	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 dependent on U_m/U_t) unitless	0.194

Default
Resident Equation Inputs for Soil

Variable	Value
$City_{VF}$ (Climate Zone) Selection	Default
A_c (VF acres)	0.5
Q/C_{vol} (g/m^2-s per kg/m^3)	68.18
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
$Theta_a$ (air-filled soil porosity) L_{air}/L_{soil}	0.28396
$Theta_w$ (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} (g/m^2-s per kg/m^3)	68.18
A_c (VF mass-limit acres)	0.5
T (exposure interval) yr	26
d_c (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
T_w (groundwater temperature) Celsius	25

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 #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; 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); U = User-provided

Chemical	CAS Number	Mutagen?	VOC?	Ingestion SF (mg/kg-day) $^{-1}$	SFO Ref	Inhalation Unit Risk (ug/m ^{3})$^{-1}$	IUR Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m ^{3})	RfC Ref	GIABS	ABS	RBA	Soil Saturation Concentration (mg/kg)	S (mg/L)
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	No	No	-		-		2.00E-05	D	-		1	0.1	1	-	6.80E+02
Perfluorooctanoic acid (PFOA)	335-67-1	No	No	7.00E-02	D	-		2.00E-05	D	-		1	0.1	1	-	9.50E+03

K_{oc} (cm3/g)	K_d (cm³/g)	HLC (atm-m ^{3}/mole)	Henry's Law Constant (unitless)	H` and HLC Ref	Normal Boiling Point T_{boil} (K)	BP Ref	Critical Temperature T_{crit} (K)	T_{crit} Ref	D_{ia} (cm ^{2}/s)	D_{iw} (cm ^{2}/s)	D_A (cm ^{2}/s)	Particulate Emission Factor (m ^{3}/kg)	Volatilization Factor (m ^{3}/kg)
3.72E+02	-	-	-		532.15	PHYSPROP	-		2.07E-02	5.25E-06	-	1.36E+09	-
1.15E+02	-	-	-		465.55	PHYSPROP	-		2.26E-02	5.79E-06	-	1.36E+09	-

Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=0.1 (mg/kg)	Dermal SL Child THQ=0.1 (mg/kg)	Inhalation SL Child THQ=0.1 (mg/kg)	Noncarcinogenic SL Child THI=0.1 (mg/kg)	Ingestion SL Adult THQ=0.1 (mg/kg)	Dermal SL Adult THQ=0.1 (mg/kg)	Inhalation SL Adult THQ=0.1 (mg/kg)	Noncarcinogenic SL Adult THI=0.1 (mg/kg)	Screening Level (mg/kg)
-	-	-	-	1.56E-01	6.59E-01	-	1.26E-01	1.67E+00	3.95E+00	-	1.17E+00	1.26E-01 nc
9.93E+00	3.53E+01	-	7.75E+00	1.56E-01	6.59E-01	-	1.26E-01	1.67E+00	3.95E+00	-	1.17E+00	1.26E-01 nc

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	Inhalation Unit Risk Notes
Perfluorooctane sulfonic acid (PFOS)	1763-23-1											
Perfluorooctanoic acid (PFOA)	335-67-1											

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	Oral Slope Factor Notes
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	NA

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	Oral Chronic Reference Dose Notes
NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA

Inhalation Chronic Toxicity Metadata

Chemical	CASNUM	Chronic Inhalation Reference Concentration (mg/m³)	Toxicity Source	Inhalation Chronic Reference Concentration Basis	Inhalation Chronic Reference Concentration Confidence Level	Inhalation Chronic Reference Concentration Critical Effect	Inhalation Chronic Reference Concentration Target Organ
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	-					
Perfluorooctanoic acid (PFOA)	335-67-1	-					

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	Inhalation Chronic Reference Concentration Notes

Appendix C

Field Forms and Boring Logs

SES FIELD READINESS REVIEW FORM

Employee Name: CHRIS NAPOLEON

EMPLOYEE NUMBER: 130276

Job Number: M2032.0001

Job Location: NFARS

Job Tasks:

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

Equipment Needed:

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

GW Sampling: YSI, peristaltic pump, multiRAE, 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 fieldwork:

- Airfield drivers and security training will be conducted Monday morning at the facilities conveince.
- Mid Project QC outline revision 8 reviewed with personnel.
- Work hours are 0715-1600. We cannot work the weekend or outside these hours.
- We will be escorted at all times on the flightline by AFCEC personnel. We have only one escort so we will be working as a group the majority of the time.
- Dig permits have been submitted, and the FAA Waiver is due back early next week.

Equipment Packed for travel on: 08/10-17 by Jeremy Meshew

Travel Dates: 08/13/17 mobilize up to NFARS. Work is scheduled to end 08/25/17

Site Supervisor Signature

Greg Carlson

SES FIELD READINESS REVIEW FORM

Employee Name: Jeremy Klein

Employee Number: 130286

Job Number: M2032.0001

Job Location: NFARS

Job Tasks:

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

Equipment Needed:

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

GW Sampling: YSI, peristaltic pump, multiRAE, 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 fieldwork:

- Airfield drivers and security training will be conducted Monday morning at the facilities conveince.
- Mid Project QC outline revision 8 reviewed with personnel.
- Work hours are 0715-1600. We cannot work the weekend or outside these hours.
- We will be escorted at all times on the flightline by AFCEC personnel. We have only one escort so we will be working as a group the majority of the time.
- Dig permits have been submitted, and the FAA Waiver is due back early next week.

Equipment Packed for travel on: 08/10-17 by Jeremy Meshew

Travel Dates: 08/13/17 mobilize up to NFARS. Work is scheduled to end 08/25/17

Site Supervisor Signature

Greg Carlson

SES FIELD READINESS REVIEW FORM

Employee Name: JEREMY MESHEW

EMPLOYEE NUMBER: 130238

Job Number: M2032.0001

Job Location: NFARS

Job Tasks:

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

Equipment Needed:

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

GW Sampling: YSI, peristaltic pump, multiRAE, 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 fieldwork:

- Airfield drivers and security training will be conducted Monday morning at the facilities conveince.
- Mid Project QC outline revision 8 reviewed with personnel.
- Work hours are 0715-1600. We cannot work the weekend or outside these hours.
- We will be escorted at all times on the flightline by AFCEC personnel. We have only one escort so we will be working as a group the majority of the time.
- Dig permits have been submitted, and the FAA Waiver is due back early next week.

Equipment Packed for travel on: 08/10-17 by Jeremy Meshew

Travel Dates: 08/13/17 mobilize up to NFARS. Work is scheduled to end 08/25/17

Site Supervisor Signature

Greg Carlson

SES FIELD READINESS REVIEW FORM

Employee Name: Miles Eckert

Employee Number: 130024

Job Number: M2032.0001

Job Location: NFARS

Job Tasks:

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

Equipment Needed:

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

GW Sampling: YSI, peristaltic pump, multiRAE, 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 fieldwork:

- Airfield drivers and security training will be conducted Monday morning at the facilities conveince.
- Mid Project QC outline revision 8 reviewed with personnel.
- Work hours are 0715-1600. We cannot work the weekend or outside these hours.
- We will be escorted at all times on the flightline by AFCEC personnel. We have only one escort so we will be working as a group the majority of the time.
- Dig permits have been submitted, and the FAA Waiver is due back early next week.

Equipment Packed for travel on: 08/10-17 by Jeremy Meshew

Travel Dates: 08/13/17 mobilize up to NFARS. Work is scheduled to end 08/25/17

Site Supervisor Signature

Greg Carlson

Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA01-001

Start Date	: 08/15/17
End Date	: 08/15/17
Northing	: 1134055.27
Easting	: 1045724.93
Surface Elev. (ft)*	: 585.87
Total Depth (ft)**	: 9.25

Site Name	: AFFF Area 1
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: 8.15
Logged By	: Jeremy Meshew

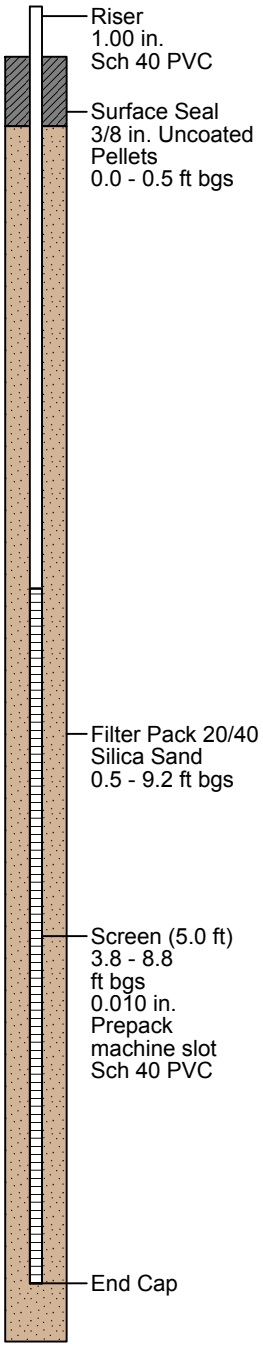
Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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 - 2.0) GRAVELLY SANDY LEAN CLAY, 10YR 3/2, very dark grayish brown, non plastic, medium toughness, 20% gravel, 20% sand, fine sand and fine gravel, sub-angular to angular sand and gravel, dry	0	CL			SS	NIGRA01-001-SS-001 Note: Interval 0.0 - 0.5 ft
2	1	100	(2.0 - 3.5) FAT CLAY, high plasticity, 15% silt, 10YR 3/2, very dark grayish brown, medium toughness, slightly moist, no odor	0	CH				
4	1	100	(3.5 - 7.15) SANDY LEAN CLAY, medium plasticity, 5YR 3/3, dark reddish brown, 15% sand, very fine grained sand mottling, medium toughness, dry, no odor	0	CL				
7	2	100	(7.15 - 8.15) FAT CLAY, high plasticity, 2.5YR 4/2, weak red, medium toughness, very fine grained, dry, no odor	0	CH			SO	NIGRA01-001-SO-007 Note: Interval 7.0 - 8.0 ft
8	2	100	(8.15 - 9.25) LEAN CLAY, medium plasticity, 2.5YR 4/2, weak red, very fine grained, with < 5% sand and < 5% gravel, sub-angular to angular sand and gravel, medium toughness, very moist, no odor	0	CL		▼		

Refusal - End of Borehole 9.25 ft bgs

Temporary Well:
NIAGRA01-001
Elev (TOC): 587.38



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA01-002

(Page 1 of 1)

Start Date	: 08/15/17
End Date	: 08/15/17
Northing	: 1133969.34
Easting	: 1045733.37
Surface Elev. (ft)*	: 585.99
Total Depth (ft)**	: 10.0

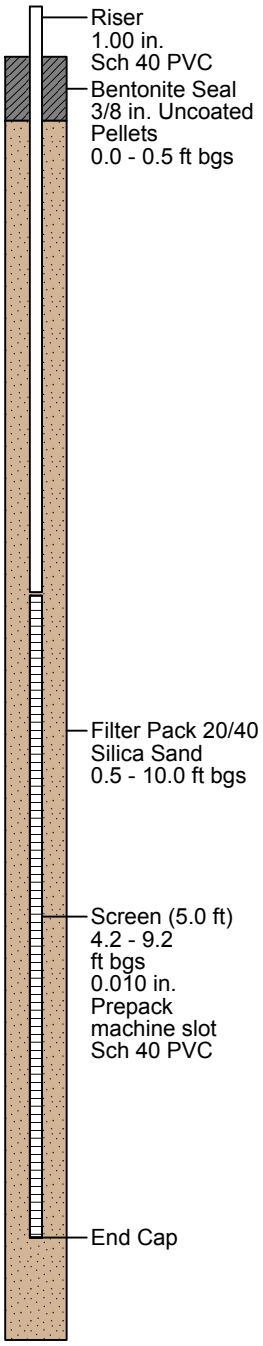
Site Name	: AFFF Area 1
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: 8.8
Logged By	: Jeremy Meshew

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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 - 2.0) GRAVELLY SANDY LEAN CLAY, 10YR 3/2, very dark grayish brown, non plastic, medium to high toughness, 20% gravel, 20% sand, fine sand and fine gravel, sub-angular to angular sand and gravel, moist to slightly moist	0	CL			SS	NIGRA01-002-SS-001 Note: Interval 0.0 - 0.5 ft
2	1	100	(2.0 - 3.5) FAT CLAY, high plasticity, 15% silt, 10YR 3/2, very dark grayish brown, medium toughness, very fine grained, slightly moist, no odor	0	CH				
4	1	100	(3.5 - 7.0) SANDY LEAN CLAY, medium plasticity, 5YR 3/3, dark reddish brown, 15% sand, very fine grained sand mottling, medium toughness, slightly moist, no odor	0	CL				
7	2	100	(7.0 - 8.8) FAT CLAY, high plasticity, 2.5YR 4/2, weak red, medium toughness, very fine grained, dry, no odor	0	CH			SO	NIGRA01-002-SO-008 Note: Interval 7.8 - 8.8 ft
9	2	100	(8.8 - 10.0) LEAN CLAY, non-plastic to medium plasticity, 2.5YR 4/2, weak red, very fine grained, with < 5% sand and < 5% gravel, sub-angular to angular sand and gravel, medium toughness, very moist, no odor	0	CL		▼		
10			Refusal - End of Borehole 10.0 ft bgs						

Temporary Well:
NIAGRA01-002
Elev (TOC): 587.08



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA01-003

Start Date	: 08/15/17
End Date	: 08/15/17
Northing	: 1134010.03
Easting	: 1045651.50
Surface Elev. (ft)*	: 586.16
Total Depth (ft)**	: 10.0

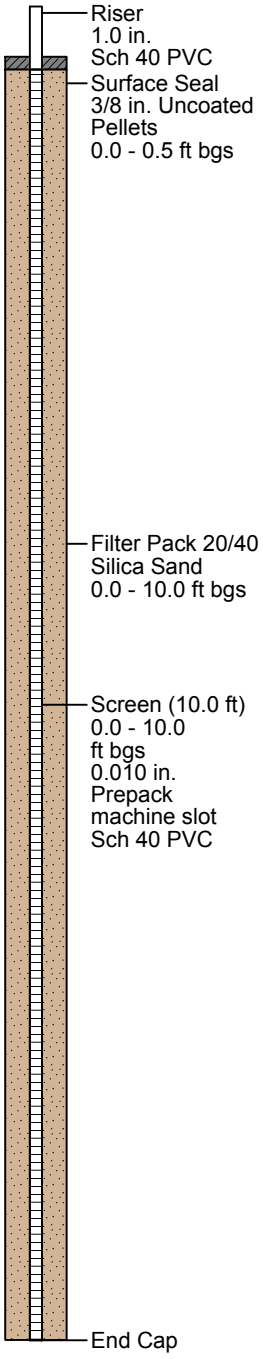
Site Name	: AFFF Area 1
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: Not Encountered
Logged By	: Jeremy Meshew

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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			(0.0 - 2.0) GRAVELLY SANDY LEAN CLAY, 10YR 3/2, very dark grayish brown, non plastic, medium to high toughness, 20% gravl, 20% sand, fine sand to coarse grained gravel, sub-angular to angular sand and gravel, slightly moist		CL			SS	NIGRA01-003-SS-001 Note: Interval 0.0 - 0.5 ft
1									
2	1	100	(2.0 - 3.5) FAT CLAY, high plasticity, 15% silt, 10YR 3/2, very dark grayish brown, medium toughness, very fine grained, slightly moist, no odor		CH				
3									
4			(3.5 - 7.0) SANDY LEAN CLAY, medium plasticity, 5YR 3/3, dark reddish brown, 15% sand, very fine grained sand mottling, medium toughness, slightly moist, no odor						
5				0	CL				
6									
7	2	100	(7.0 - 8.8) FAT CLAY, high plasticity, 2.5YR 4/2, weak red, medium toughness, very fine grained, dry, no odor		CH				
8									
9			(8.8 - 10.0) LEAN CLAY, non-plastic to medium plasticity, 2.5YR 4/2, weak red, very fine grained, with < 5% sand and < 5% gravel, sub-angular to angular sand and gravel, medium toughness, very moist, no odor	0	CL			SO	NIGRA01-003-SO-010 Note: Interval 9.0 - 10.0 ft
10			Refusal - End of Borehole 10.0 ft bgs						

Temporary Well:
NIAGRA01-003
Elev (TOC): 587.92



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA02-001

(Page 1 of 1)

Start Date	: 08/16/17
End Date	: 08/16/17
Northing	: 1135436.95
Easting	: 1051814.90
Surface Elev. (ft)*	: 591.16
Total Depth (ft)**	: 20.0

Site Name	: AFFF Area 2
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: 12.0
Logged By	: Jeremy Meshew

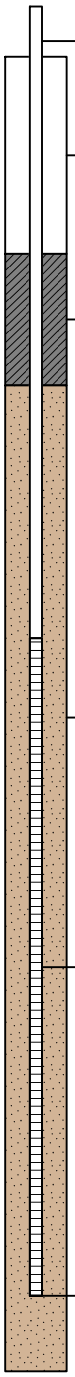
Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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 - 1.0) GRAVELLY SANDY LEAN CLAY, 10YR 4/3, brown, low to medium plasticity, medium toughness, 20% coarse grained gravel, 20% fine grained sand, sub-round to round sand and gravel, dry, slight fuel odor	0	CL			SS	NIGRA02-001-SS-001 Note: Interval 0.0 - 0.5 ft
1–5	2		(1.0 - 5.0) FAT CLAY, high plasticity, medium toughness, 10YR 4/1, dark gray, dry, slight fuel odor		CH				
5–6	3	100	(5.0 - 6.0) SANDY LEAN CLAY, 5YR 4/3, dark reddish gray, 20% fine grained sand, sub-round to rounded, medium plasticity, medium to high toughness, dry, no odor	0	CL				
6–10			(6.0 - 12.0) FAT CLAY, high plasticity, 5YR 4/2, dark reddish gray, high toughness, dry, no odor		CH				
10–12	4	100		0			▼	SO	NIGRA02-001-SO-012 Note: Interval 11.0 - 12.0 ft
12–15			(12.0 - 18.5) GRAVELLY SANDY LEAN CLAY, 5YR 5/4, reddish brown, 25% coarse grained gravel, 10% fine grained sand, 20% silt, very fine grained silt & clay, sub-round to round sand and gravel, non-plastic, low toughness, wet, no odor	0	CL				
15–18	5	100							
18–20			(18.5 - 20.0) LEAN CLAY, low plasticity, 5YR 5/4, reddish brown, high toughness, dry, no odor		CL				

End of Borehole 20.0 ft bgs

Temporary Well:
NIAGRA02-001
Elev (TOC): 592.65



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA02-002

Start Date	: 08/17/17
End Date	: 08/17/17
Northing	: 1135331.87
Easting	: 1052178.12
Surface Elev. (ft)*	: 588.92
Total Depth (ft)**	: 20.0

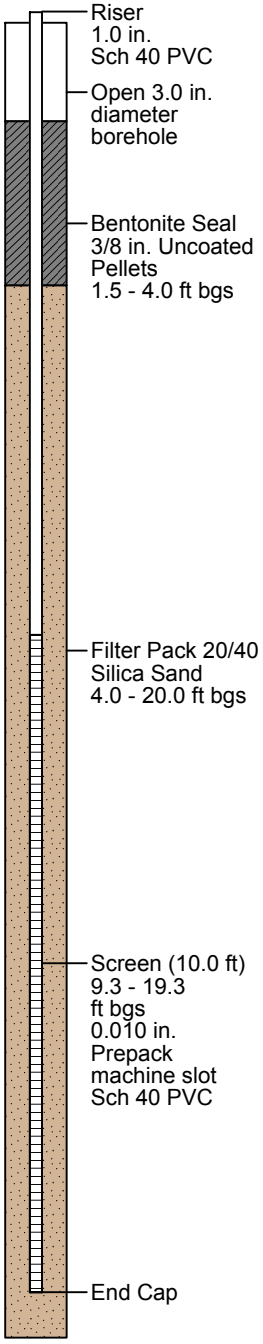
Site Name	: AFFF Area 2
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: 15.0
Logged By	: Jeremy Meshew

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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 - 1.0) GRAVELLY SANDY LEAN CLAY, 10YR 4/3, brown, low to medium plasticity, medium toughness, 20% coarse grained gravel, 20% fine grained sand, sub-round to round sand and gravel, dry, slight fuel odor	0	CL			SS	NIGRA02-002-SS-001 Note: Interval 0.0 - 0.5 ft
1			(1.0 - 15.0) FAT CLAY, high plasticity, medium toughness, 10YR 4/1, dark gray, dry, no odor						
2									
3	2								
4				0					
5	3	100			CH				
6									
7									
8									
9									
10				0					
11									
12	4	100							
13									
14								SO	NIGRA02-002-SO-015 Note: Interval 14.0 - 15.0 ft
15			(15.0 - 20.0) GRAVELLY SANDY LEAN CLAY, 5YR 5/4, reddish brown, 20% coarse grained gravel, 10% fine grained sand, 20% silt, very fine grained silt & clay, sub-round to round sand and gravel, non-plastic, low toughness, wet, no odor	0			▼		
16									
17	5	100			CL				
18									
19									
20			End of Borehole 20.0 ft bgs						

Temporary Well:
NIAGRA02-002
Elev (TOC): 589.08



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA02-003

Start Date	: 08/17/17
End Date	: 08/17/17
Northing	: 1135125.41
Easting	: 1052170.13
Surface Elev. (ft)*	: 588.62
Total Depth (ft)**	: 20.0

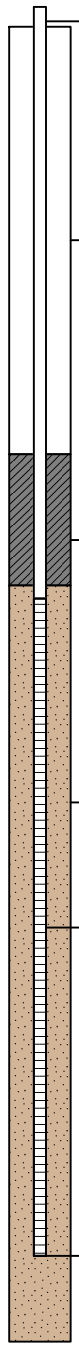
Site Name	: AFFF Area 2
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: 15.0
Logged By	: Jeremy Meshew

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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 - 1.0) GRAVELLY SANDY LEAN CLAY, 10YR 4/3, brown, non-plastic to low plasticity, medium toughness, 20% coarse grained gravel, 20% fine grained sand, sub-round to round sand and gravel, dry, slight fuel odor	0	CL			SS	NIGRA02-003-SS-001 Note: Interval 0.0 - 0.5 ft
1			(1.0 - 20.0) FAT CLAY, high plasticity, medium toughness, 5YR 4/2, dark reddish gray, dry, no odor		CH				
2									
3	2								
4				0					
5	3	100							
6									
7									
8									
9									
10	4	100	10.0 - 15.0 ft bgs moist	0					
11									
12									
13									
14								SO	NIGRA02-003-SO-015 Note: Interval 14.0 - 15.0 ft
15	5	100	15.0 - 20.0 ft bgs wet	0			▼		
16									
17									
18									
19									
20			End of Borehole 20.0 ft bgs						

Temporary Well:
NIAGRA02-003
Elev (TOC): 588.93



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA02-004

Start Date	: 08/17/17
End Date	: 08/17/17
Northing	: 1135164.41
Easting	: 1051755.26
Surface Elev. (ft)*	: 590.55
Total Depth (ft)**	: 20.0

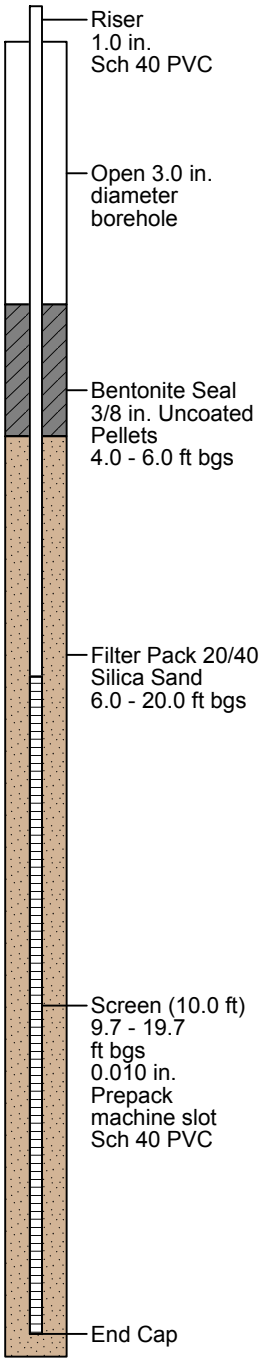
Site Name	: AFFF Area 2
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: 12.5
Logged By	: Jeremy Meshew

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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 - 1.0) GRAVELLY SANDY LEAN CLAY, 10YR 4/3, brown, non-plastic to low plasticity, medium toughness, 20% coarse grained gravel, 20% fine grained sand, sub-round to round sand and angular to sub-angular gravel, dry, no odor	0	CL			SS	NIGRA02-004-SS-001 Note: Interval 0.0 - 0.5 ft
1			(1.0 - 20.0) FAT CLAY, high plasticity, medium toughness, 5YR 4/2, dark reddish gray, dry, no odor						
2	2								
3									
4				0					
5	3	100							
6									
7									
8									
9									
10				0	CH				
11								SO	NIGRA02-004-SO-012 Note: Interval 11.0 - 12.0 ft
12	4	100	12.5 - 15.0 ft bgs very moist to wet, lower toughness				▼		
13									
14									
15				0					
16									
17									
18	5	100							
19									
20			End of Borehole 20.0 ft bgs						

Temporary Well:
NIAGRA02-004
Elev (TOC): 591.09



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA03-001

Start Date	: 08/14/17
End Date	: 08/14/17
Northing	: 1134866.58
Easting	: 1053635.05
Surface Elev. (ft)*	: 589.68
Total Depth (ft)**	: 6.0

Site Name	: AFFF Area 3
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: 6.0
Logged By	: Jeremy Meshew

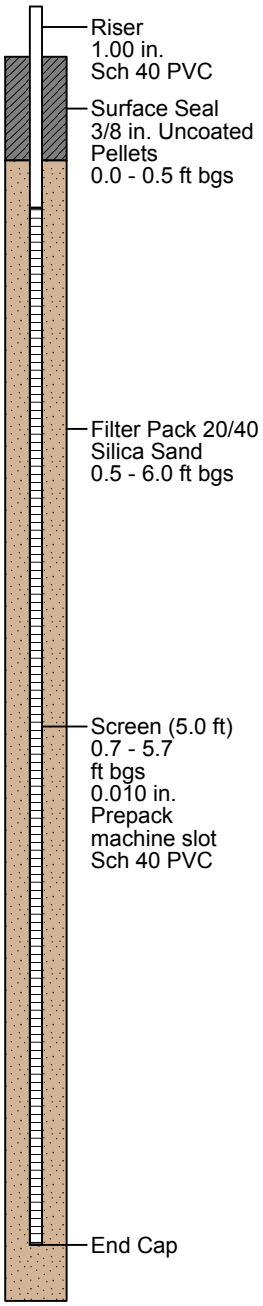
Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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			(0.0 - 1.0) SANDY LEAN CLAY, 10YR 4/2, dark grayish brown, non plastic, low toughness, 20% fine grained sand, organics, dry, no odor		CL			SS	NIGRA03-001-SS-001 Note: Interval 0.0 - 0.5 ft
1			(1.0 - 6.0) LEAN CLAY with sand, 5YR 4/4, reddish brown, 10% fine grained sand, low plasticity, low toughness, no odor, dry						
2	1	100							
3				0	CL				
4									
5									
	2	100						SO	NIGRA03-001-SO-006 Note: Interval 5.0 - 6.0 ft
6				0			▼		

End of Borehole 6.0 ft bgs

Temporary Well:
NIAGRA03-001
Elev (TOC): 591.69



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA03-002

Start Date	: 08/14/17
End Date	: 08/14/17
Northing	: 1134813.60
Easting	: 1053632.47
Surface Elev. (ft)*	: 589.32
Total Depth (ft)**	: 6.0

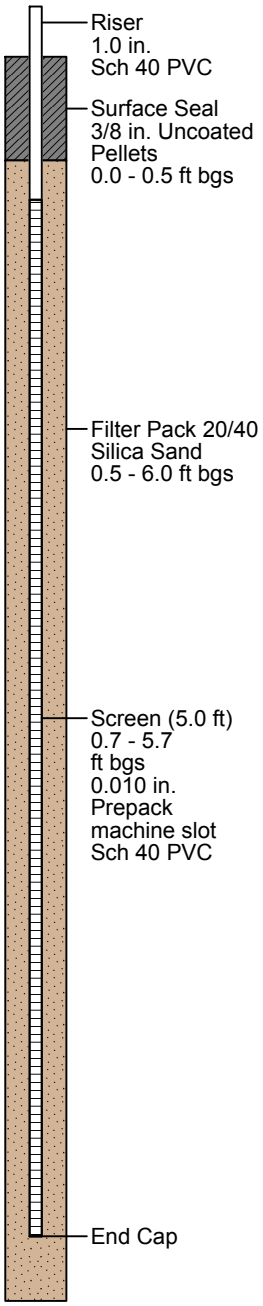
Site Name	: AFFF Area 3
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: 6.0
Logged By	: Jeremy Meshew

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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			(0.0 - 1.0) SANDY LEAN CLAY, 10YR 4/2, very dark gray, low toughness, 20% very fine to fine sand, no odor, organic, dry		CL			SS	NIGRA03-002-SS-001 Note: Interval 0.0 - 0.5 ft
1			(1.0 - 4.0) SANDY LEAN CLAY, 5YR 4/4, reddish brown, medium toughness, 15% very fine to fine sand, no odor, dry						
2	1	100			CL			SO	NIGRA03-002-SO-003 Note: Interval 2.0 - 3.0 ft
3				0					
4			(4.0 - 5.0) GRAVELLY LEAN CLAY, non-plastic, 5YR 4/4, reddish brown, 20% very fine to coarse sub-angular to angular gravel, medium toughness, very moist, no odor		CL		▼		
5	2	100	(5.0 - 6.0) GRAVEL, poorly graded, 10YR 3/1, very dark gray, sub-angular to angular, high toughness, wet, no odor		GP				
6			Refusal - End of Borehole 6.0 ft bgs	0					

Temporary Well:
NIAGRA03-002
Elev (TOC): 591.32



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA04-001

Start Date	: 08/15/17
End Date	: 08/16/17
Northing	: 1134707.90
Easting	: 1054012.69
Surface Elev. (ft)*	: 590.24
Total Depth (ft)**	: 7.82

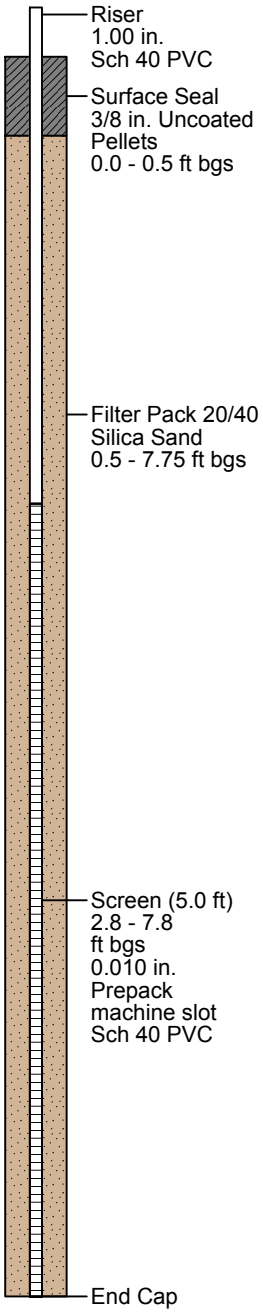
Site Name	: AFFF Area 4
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: Not Encountered
Logged By	: Jeremy Meshew

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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 - 0.5) GRAVELLY SANDY LEAN CLAY, 10YR 3/2, very dark grayish brown, non-plastic, medium toughness, 25% coarse grained gravel, 20% fine grained sand, sub-round to round sand and angular to sub-angular gravel, moist (due to recent rain), no odor	0	CL			SS	NIGRA04-001-SS-001 NIGRA04-001-SS-901 Note: Interval 0.0 - 0.5 ft
1			(0.5 - 5.5) GRAVELLY LEAN CLAY, non-plastic, 5YR 4/4, reddish brown, 10% coarse grained sub-angular to angular gravel, medium toughness, dry, no odor		CL				
5	2	65	(5.5 - 7.75) SAND, Well graded with gravel, 10YR 4/3, brown, fine grained sand with 25% coarse gravel, sub-round to rounded, some clay, slightly moist, no odor	0	SW			SO	NIGRA04-001-SO-007 NIGRA04-001-SO-907 Note: Interval 6.0 - 7.0 ft
8			Refusal - End of Borehole 7.82 ft bgs						

Temporary Well:
NIAGRA04-001
Elev (TOC): 590.55



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA04-002

Start Date	: 08/15/17
End Date	: 08/16/17
Northing	: 1134610.08
Easting	: 1054042.44
Surface Elev. (ft)*	: 589.70
Total Depth (ft)**	: 4.0

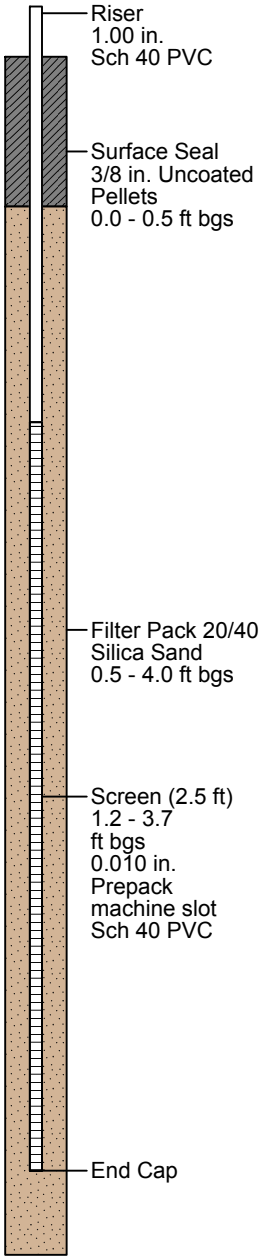
Site Name	: AFFF Area 4
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: Not Encountered
Logged By	: Jeremy Meshew

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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			(0.0 - 1.0) GRAVELLY SANDY LEAN CLAY, 10YR 3/2, very dark grayish brown, non-plastic, medium toughness, 25% coarse grained gravel, 20% fine grained sand, sub-round to round sand and angular to sub-angular gravel, moist (due to recent rain), no odor		CL			SS	NIGRA04-002-SS-001 Note: Interval 0.0 - 0.5 ft
1	1	100	(1.0 - 2.0) LEAN CLAY, 5YR 4/4, reddish brown, non-plastic, 20% fines, 10% coarse grained sand, sub-angular to angular gravel, medium toughness, dry, no odor		CL				
2			(2.0 - 4.0) GRAVELLY SAND with clay, 10YR 5/3, brown, medium toughness, 25% gravel, fine grained sand, sub-round to round sand and gravel, dry, no odor						
3	2	100		0	CL				
				0				SO	NIGRA04-002-SO-004 Note: Interval 3.0 - 4.0 ft
4			Refusal - End of Borehole 4.0 ft bgs						

Temporary Well:
NIAGRA04-002
Elev (TOC): 590.07



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA04-003

Start Date	: 08/15/17
End Date	: 08/16/17
Northing	: 1134599.91
Easting	: 1054184.50
Surface Elev. (ft)*	: 589.85
Total Depth (ft)**	: 5.5

Site Name	: AFFF Area 4
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: Not encountered
Logged By	: Jeremy Meshew

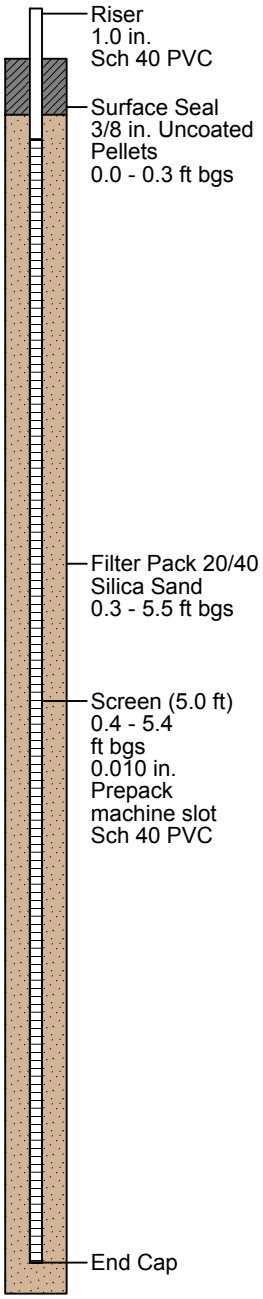
Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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 - 0.5) GRAVELLY SANDY LEAN CLAY, 10YR 4/1, dark gray, non-plastic, medium toughness, 25% coarse grained gravel, 20% fine grained sand, sub-round to round sand and angular to sub-angular gravel, moist (due to recent rain), no odor		CL			SS	NIGRA04-003-SS-001 Note: Interval 0.0 - 0.5 ft
1	2	100	(0.5 - 4.0) GRAVELLY LEAN CLAY, 5YR 4/4, reddish brown, non-plastic to low plasticity, 20% fines, 10% coarse grained sand, sub-angular to angular gravel, medium toughness, wet (due to recent rain), no odor	0	CL				
4	3	100	(4.0 - 5.5) GRAVELLY SAND with clay, 10YR 5/3, brown, medium toughness, 25% gravel, fine grained sand, sub-round to round sand and gravel, coarse gravel, dry, no odor	0	SW			SO	NIGRA04-003-SO-005 Note: Interval 4.0 - 5.0 ft

Refusal - End of Borehole 5.5 ft bgs

Temporary Well:
NIAGRA04-003
Elev (TOC): 590.08



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA05-001

(Page 1 of 1)

Start Date	: 08/22/17
End Date	: 08/22/17
Northing	: 1133560.57
Easting	: 1048110.12
Surface Elev. (ft)*	: 586.66
Total Depth (ft)**	: 7.0

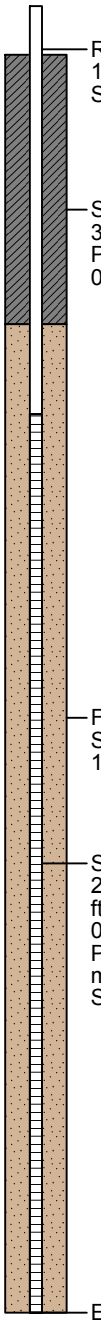
Site Name	: AFFF Area 5
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: 5.0
Logged By	: Jeremy Meshew

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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 - 5.0) LEAN CLAY, 5YR 4/3, reddish brown, medium toughness, dry, no odor	0	CL			SS	NIGRA05-001-SS-001 Note: Interval 0.0 - 0.5 ft
1									
2									
3								SO	NIGRA05-001-SO-004 NIGRA05-001-SO-904 Note: Interval 3.0 - 4.0 ft
4									
5	2	70	(5.0 - 7.0) GRAVELLY LEAN CLAY, 5Y 5/1, gray, non-plastic to low plasticity, 20% fines, < 5% sub-round to round sand, 20% coarse sub-angular to angular gravel, medium toughness, wet, no odor	0	CL		▼		
6									
7			Refusal - End of Borehole 7.0 ft bgs						

Temporary Well:
NIAGRA05-001
Elev (TOC): 586.93



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA05-002

Start Date	: 08/22/17
End Date	: 08/22/17
Northing	: 1133546.75
Easting	: 1049020.13
Surface Elev. (ft)*	: 585.94
Total Depth (ft)**	: 3.65

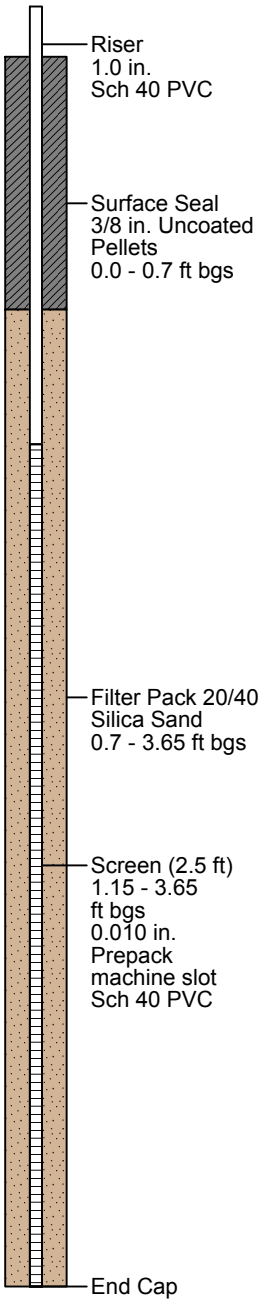
Site Name	: AFFF Area 5
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: 2.5
Logged By	: Jeremy Meshew

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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			(0.0 - 3.65) FAT CLAY, high plasticity, 5YR 4/3, reddish brown, no odor, dry then moist at 2.5 ft bgs, wet below 2.5 ft bgs						
								SS	NIGRA05-002-SS-001 Note: Interval 0.0 - 0.5 ft
1									
				0				SO	NIGRA05-002-SO-002 Note: Interval 1.0 - 2.0 ft
	1	100			CH				
2									
							▼		
3									
4			Refusal - End of Borehole 3.65 ft bgs						

Temporary Well:
NIAGRA05-002
Elev (TOC): 586.20



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA05-003

Start Date	: 08/22/17
End Date	: 08/22/17
Northing	: 1133835.64
Easting	: 1048532.18
Surface Elev. (ft)*	: 588.59
Total Depth (ft)**	: 6.5

Site Name	: AFFF Area 5
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: 5.5
Logged By	: Jeremy Meshew

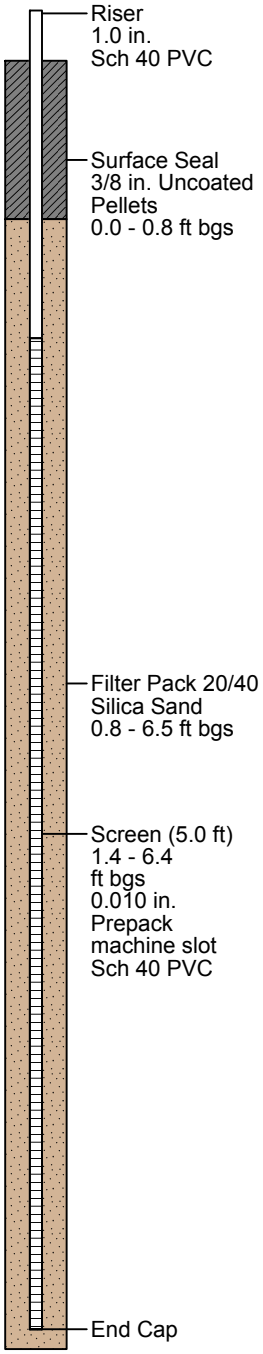
Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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			(0.0 - 6.0) FAT CLAY, high plasticity, 5YR 4/3, reddish brown, no odor, dry then moist at 5.5 ft bgs, wet below 5.5 ft bgs					SS	NIGRA05-002-SS-001 Note: Interval 0.0 - 0.5 ft
1				0				SO	NIGRA05-002-SO-002 Note: Interval 2.0 - 3.0 ft
2	1	96							
3					CH				
4									
5							▼		
6	2	150							

Refusal - End of Borehole 6.5 ft bgs

Temporary Well:
NIAGRA05-003
Elev (TOC): 588.88



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA06-001

Start Date	: 08/16/17
End Date	: 08/16/17
Northing	: 1134132.70
Easting	: 1051891.05
Surface Elev. (ft)*	: 587.93
Total Depth (ft)**	: 20.0

Site Name	: AFFF Area 6
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: 12.0
Logged By	: Jeremy Meshew

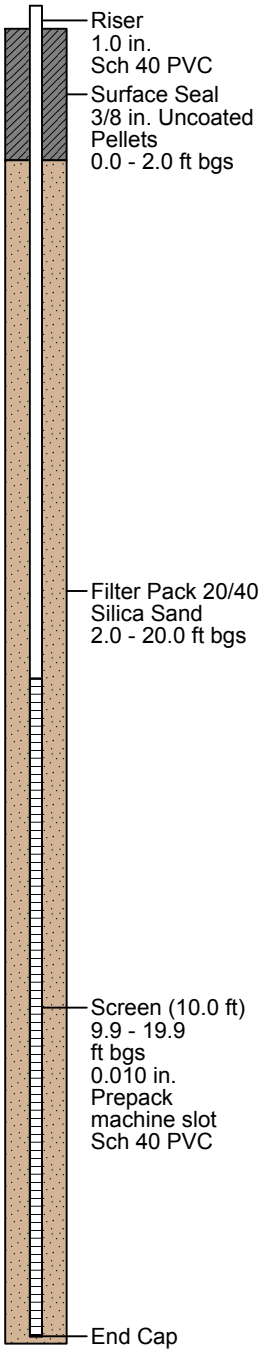
Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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
0–3	1, 2	100	(0.0 - 6.0) LEAN CLAY, non-plastic to low plasticity, 10YR 5/1, gray, dry, no odor	0, 0	CL			SS	NIGRA06-001-SS-001 Note: Interval 0.0 - 0.5 ft
6–10	3	80	(6.0 - 10.0) LEAN CLAY, non-plastic to low plasticity, 5YR 4/2, dark reddish gray, dry, no odor		CL				
10–15	4	110	(10.0 - 15.0) FAT CLAY, high plasticity, 5YR 4/2, dark reddish gray, slightly to very moist, no odor	0, 0	CH		▼	SO	NIGRA06-001-SO-012 Note: Interval 11.0 - 12.0 ft
15–20	5	100	(15.0 - 20.0) GRAVELLY SANDY LEAN CLAY, 5YR 5/4, reddish brown, non-plastic to low plasticity, 20% sub-round to round sand, 25% coarse to fine sub-angular to angular gravel, low toughness, wet, no odor	0, 0	CL				

End of Borehole 20.0 ft bgs

Temporary Well:
NIAGRA06-001
Elev (TOC): 588.28



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA06-002

Start Date	: 08/16/17
End Date	: 08/16/17
Northing	: 1134157.46
Easting	: 1052524.66
Surface Elev. (ft)*	: 587.58
Total Depth (ft)**	: 18.68

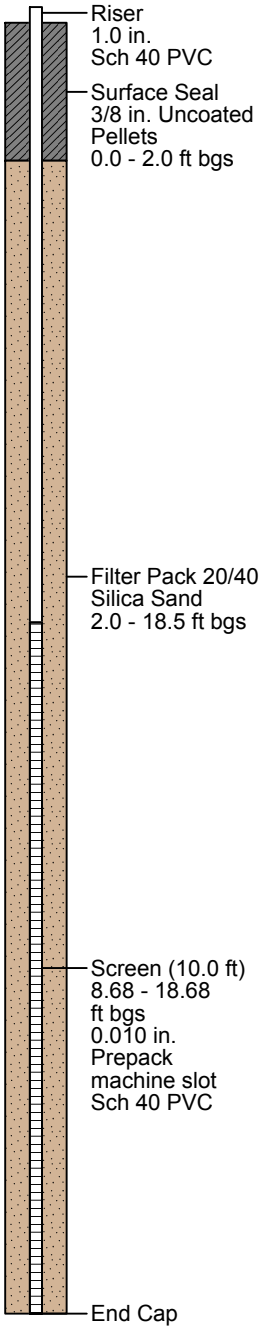
Site Name	: AFFF Area 6
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: 12.5
Logged By	: Jeremy Meshew

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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 - 5.0) FAT CLAY, high plasticity, 10YR 4/2, dark grayish brown, dry, no odor	0	CH			SS	NIGRA06-002-SS-001 NIGRA06-002-SS-901 Note: Interval 0.0 - 0.5 ft
3	2								
5	3	80	(5.0 - 15.0) FAT CLAY, high plasticity, 5YR 4/2, dark reddish gray, dry, no odor	0	CH				
10			slightly moist, 10.0 - 12.0 ft bgs	0				SO	NIGRA06-002-SO-012 Note: Interval 11.0 - 12.0 ft
12	4	110	moist, 12.5 ft bgs				▼		
15	5	100	(15.0 - 18.68) GRAVELLY SANDY LEAN CLAY, 5YR 5/4, reddish brown, non-plastic to low plasticity, 20% sub-round to round sand, 25% coarse to fine sub-angular to angular gravel, low toughness, wet, no odor	0	CL				
18				0					
19			Refusal - End of Borehole 18.68 ft bgs						

Temporary Well:
NIAGRA06-002
Elev (TOC): 587.81



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA06-003

Start Date	: 08/16/17
End Date	: 08/17/17
Northing	: 1134154.54
Easting	: 1053211.95
Surface Elev. (ft)*	: 588.22
Total Depth (ft)**	: 10.0

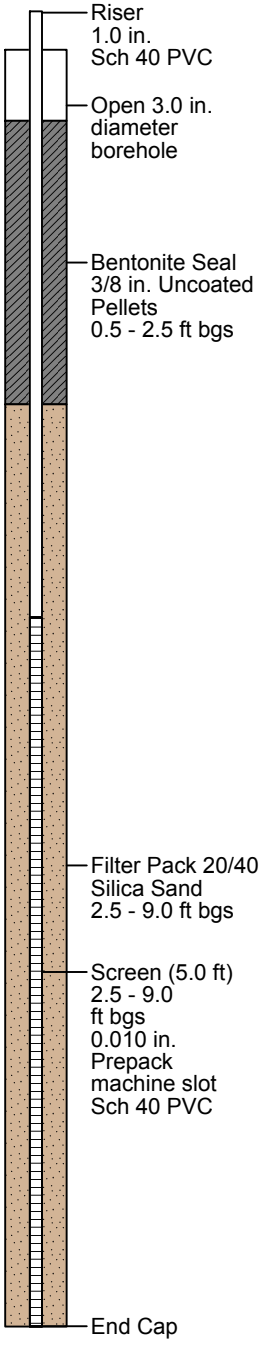
Site Name	: AFFF Area 6
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: 8.0
Logged By	: Jeremy Meshew

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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) FAT CLAY, high plasticity, 10YR 4/2, dark grayish brown, medium toughness, very fine grained, dry, no odor	0	CH			SS	NIGRA06-003-SS-001 Note: Interval 0.0 - 0.5 ft
1									
2									
3									
4									
5									
6								SO	NIGRA06-003-SO-007 Note: Interval 6.0 - 7.0 ft
7	2	110	(7.0 - 9.0) GRAVELLY LEAN CLAY, non-plastic, 5YR 5/4, reddish brown, < 5% fine sand, 25% coarse sub-angular to angular gravel, sub-round to round sand, medium toughness, moist to very moist, no odor	0	CL		▼		
8									
9			Refusal - End of Borehole 9.0 ft bgs						

Temporary Well:
NIAGRA06-003
Elev (TOC): 588.49



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA06-004

(Page 1 of 1)

Start Date	: 08/17/17
End Date	: 08/17/17
Northing	: 1134153.32
Easting	: 1053753.88
Surface Elev. (ft)*	: 588.79
Total Depth (ft)**	: 2.0

Site Name	: AFFF Area 6
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 2.25 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: 2.0
Logged By	: Jeremy Meshew

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 feet (ft)
**Below Ground Surface (bgs) feet (ft)

Temporary Well not installed

Elev (TOC): N/A

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0			(0.0 - 2.0) FAT CLAY, high plasticity, 10YR 4/2, dark grayish brown, no odor, dry then moist at 2.0 ft bgs						
								SS	NIGRA06-004-SS-001 Note: Interval 0.0 - 0.5 ft
1	1	100			CH				
				0				SO	NIGRA06-004-SO-002 Note: Interval 1.0 -2.0 ft
2			Refusal, End of Borehole 2.0 ft bgs				▼		

Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA08-001

Start Date	: 08/14/17
End Date	: 08/14/17
Northing	: 1135329.87
Easting	: 1053607.12
Surface Elev. (ft)*	: 592.00
Total Depth (ft)**	: 10.0

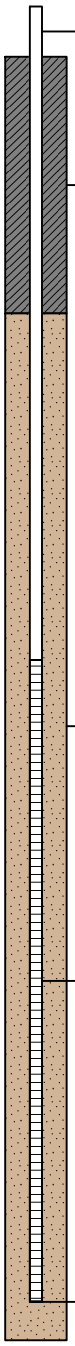
Site Name	: AFFF Area 8
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: 9.0
Logged By	: Jeremy Meshew

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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) FAT CLAY, high plasticity, 10YR 4/2, dark grayish brown, medium toughness, very fine grained, dry, no odor	0	CH			SS	NIGRA08-001-SS-001 Note: Interval 0.0 - 0.5 ft
7	2	100	(8.0 - 10.0) GRAVELLY LEAN CLAY, non-plastic, 5YR 5/4, reddish brown, < 5% fine sand, 25% coarse sub-angular to angular gravel, sub-round to round sand, medium toughness, moist to very moist, no odor	0	CL		▼	SO	NIGRA08-001-SO-008 Note: Interval 7.0 - 8.0 ft
10			Refusal - End of Borehole 10.0 ft bgs						

Temporary Well:
NIAGRA08-001
Elev (TOC): 592.71



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA08-002

Start Date	: 08/14/17
End Date	: 08/14/17
Northing	: 1135254.19
Easting	: 1053654.30
Surface Elev. (ft)*	: 593.28
Total Depth (ft)**	: 10.0

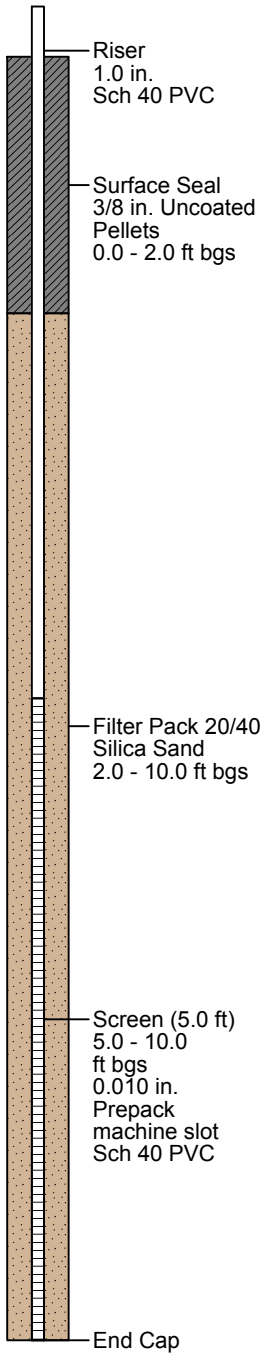
Site Name	: AFFF Area 8
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: Not Encountered
Logged By	: Jeremy Meshew

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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 - 5.0) SANDY LEAN CLAY, 5YR 3/1, dark reddish gray, low toughness, no odor, organic, dry	0	CL			SS	NIGRA06-003-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	100	(5.0 - 7.0) LEAN CLAY, 5YR 4/4, reddish brown, non plastic, low toughness, 20% fines, 10% very fine to fine sand, no odor, dry		CL				
7			(7.0 - 10.0) GRAVELLY LEAN CLAY, non-plastic, 5YR 4/4, reddish brown, 20% very fine to fine sub-angular to angular gravel, low to medium toughness, dry, no odor	0	CL			SO	NIGRA08-002-SO-010 Note: Interval 9.0 - 10.0 ft
10			Refusal - End of Borehole 10.0 ft bgs						

Temporary Well:
NIAGRA08-002
Elev (TOC): 596.30



Aerostar SES LLC

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

Niagara Falls Air Reserve Station

BORING LOG - NIGRA08-003

Start Date	: 08/14/17
End Date	: 08/14/17
Northing	: 1135238.81
Easting	: 1053509.36
Surface Elev. (ft)*	: 592.30
Total Depth (ft)**	: 11.0

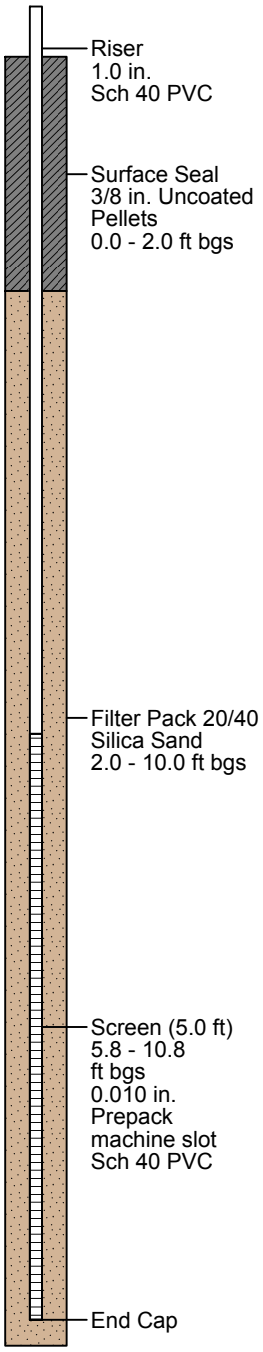
Site Name	: AFFF Area 8
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7820DT
Driller	: Rich Reagan
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 08/22/17
DTW During Drilling (ft)	: 9.0
Logged By	: Jeremy Meshew

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) 2011 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			(0.0 - 1.0) SANDY LEAN CLAY, 7.5YR 3/1, very dark gray, low toughness, 20% very fine to fine sand, no odor, organic, dry		CL			SS	NIGRA08-003-SS-001 Note: Interval 0.0 - 0.5 ft
1			(1.0 - 8.0) LEAN CLAY, 5YR 3/1, dark reddish gray, low toughness, no odor, organic, dry						
2	1	100							
3									
4					CL				
5				0					
6									
7									
7	2	100						SO	NIGRA08-003-SO-008 Note: Interval 7.0 - 8.0 ft
8			(8.0 - 11.0) LEAN CLAY, 5YR 4/4, reddish brown, non plastic, low toughness, no odor, very moist 10% gravel, 9.0 - 11.0 ft bgs						
9				0	CL		▼		
10									
10	3	80							
11			Refusal - End of Borehole 11.0 ft bgs						

Temporary Well:
NIAGRA08-003
Elev (TOC): 593.53



AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/18/17

Sample Technician(s): Miles Eckert

Station ID: ~~NIGRA01~~ NIGRA01-001 (ME)

Location Description: See Boring Log

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: MF2 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: MF2 Sample Container:

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

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

GROUNDWATER SAMPLE

Sample ID: NIGRA01-001-GW-007 Sample Collection Time: 1248

Sample Depth: 7' Collection Method: Peristaltic Pump

Analysis/Method: 537 M Sample Container: 2 125 ml PE

Preservative: None Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS: Well pumped dry 3 times

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/18/17

Sample Technician(s): Miles Eckert

Station ID: NIGRA01-002

Location Description: See Boring Log

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

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

GROUNDWATER SAMPLE

Sample ID:	NIGRA01-002-GW-008	Sample Collection Time:	1237
Sample Depth:	8'	Collection Method:	Peristaltic Pump
Analysis/Method:	537 M	Sample Container:	2 125 ml PE
Preservative:	None	Water Quality (circle one):	Clear Cloudy Turbid Other

REMARKS: Due to time constraint, well volume, & recharge rate, sample was turned into a grab sample after purging one well volume.

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/15/17

Sample Technician(s): J. Klein, M. Eckert

Station ID: NIGRA01-004

Location Description: 270° W to brown power box near FTA, 340°N ~~350 N NE~~ ~~from site entry/access road~~
21 m to power box

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: NIGRA01-004-SD-001 Sample Collection Time: 1013

Sample Depth: 0.5" Sediment Description: organic clay

Collection Method: Spoon Analysis/Method: 537 M PFOS

Sample Container: ~~#7~~ 250mL PE Preservative: N/A

SURFACE WATER SAMPLE

Sample ID: NIGRA01-004-SW-001 Sample Collection Time: 1010

Sample Depth: 0.5" Collection Method: Dip/Grab

Analysis/Method: 537 m PFOS Sample Container: 125mL 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 SAMPLE

Sample ID: Sample Collection Time:

Sample Depth: Collection Method:

Analysis/Method: Sample Container:

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

REMARKS:

MS/MSD & Duplicate

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/15/17

Sample Technician(s): J. Klein, M. Eckert

Station ID: NIGRA01-005

Location Description: 150' N NE ~~345' N~~ 20m from site entry /access road

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: NIGRA01-005-SD-001 Sample Collection Time: 1045

Sample Depth: 0.5' Sediment Description: organic clay

Collection Method: Spoon Analysis/Method: 537 m PFOS

Sample Container: 250 mL PE Preservative: N/A

SURFACE WATER SAMPLE

Sample ID: NIGRA01-005-SW-001 Sample Collection Time: 1040

Sample Depth: ~~0.5'~~ 0.5' Collection Method: Dip/Grab

Analysis/Method: 537m PFOS Sample Container: 125 mL 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 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 (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/21/17

Sample Technician(s): Miles Eckert

Station ID: NIGRA02-003

Location Description: See Boring Log

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

SEDIMENT SAMPLE

Sample ID: ME

Sample Collection Time:

Sample Depth:

Sediment Description:

Collection Method:

Analysis/Method:

Sample Container:

Preservative:

SURFACE WATER SAMPLE

Sample ID: ME

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 SAMPLE

Sample ID: NIGRA02-003-GW-01

Sample Collection Time: 0815

Sample Depth: 15.8'

Collection Method: Peristaltic Pump

Analysis/Method: 537 M

Sample Container: 2 125 ml PE

Preservative: None

Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS: Well was pumped dry 3 times during development, and has slow recharge and a small well volume.

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/21/17

Sample Technician(s): J. Klein, I. Mershek, M. Eckert

Station ID: NIGRA02-004

Location Description: N/A

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 SAMPLE

Sample ID: NIGRA02-004-GW-015 Sample Collection Time: 0835

Sample Depth: 15-19 Collection Method: Grab / PP

Analysis/Method: 537-m PFOS Sample Container: 125 mL PE (2)

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

REMARKS: * Grab sample due to minimal recharge

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/17/2017

Sample Technician(s): Miles Eckert / Jeremy Meshew

Station ID: NIGRA02-005

Location Description: 150' downstream on west bank from Bldg. 819 access road

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: NIGRA02-005-SD-001 Sample Collection Time: 1630

Sample Depth: 0.5' Sediment Description: Sandy Silt

Collection Method: Spoon Analysis/Method: 537 m PFOS

Sample Container: 250 ml PE Preservative: N/A

SURFACE WATER SAMPLE

Sample ID: NIGRA02-005-SW-001 Sample Collection Time: 1630

Sample Depth: 0.5' Collection Method: Dip/Grab

Analysis/Method: 537 m PFOS Sample Container: 2 125 ml 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 SAMPLE

Sample ID: Sample Collection Time:

Sample Depth: N/A 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: Niagara Falls Air Reserve Station

Date: 8/10/17

Sample Technician(s): J. Klein

Station ID: NIGRA 03-001

Location Description: N/A

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 SAMPLE

Sample ID: NIGRA03-001-GW-006 Sample Collection Time: 1520

Sample Depth: ~~5.07~~ & 6.5' Collection Method: Grab / PP

Analysis/Method: 537 M PFOS Sample Container: 125 mL PE (2)

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

REMARKS:

* Grab sample due to minimal recharge over the course of 3 days. (developed 3 different times on 3 ~~different~~ consecutive days).

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/21/17

Sample Technician(s): J. Klein

Station ID: NIGRA04-001

Location Description: N/A

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 SAMPLE

Sample ID: NIGRA04-001-GW-005 Sample Collection Time: 0910

Sample Depth: 5.5' Collection Method: Grab/PP

Analysis/Method: 537 m PFOS Sample Container: 125 mL PE (2)

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

REMARKS:

* Grab sample due to minimal recharge.

* Duplicate moved from NIGRA04-003 to this location (NIGRA04-001) because 003 had very little water in well.

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/21/17

Sample Technician(s): Miles Eckert

Station ID: NIGRA04-003

Location Description: See Boring Log

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: N/E Sediment Description:

Collection Method: Analysis/Method:

Sample Container: Preservative:

SURFACE WATER SAMPLE

Sample ID: Sample Collection Time:

Sample Depth: N/E 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 SAMPLE

Sample ID: NIGRA04-003-GW-005 Sample Collection Time: 0909

Sample Depth: 5.2' Collection Method: Peristaltic Pump

Analysis/Method: 537 M Sample Container: 2 125 ml PE

Preservative: None Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS: Well had slow recharge and small well volume, pumped dry twice, and 3 well volumes purged during development. Therefore, grab sample was taken.

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/22/17

Sample Technician(s): Miles Eckert / Jeremy Meshell

Station ID: NIGRA05-001

Location Description: See Boring Log

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:

MF

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

MF

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

GROUNDWATER SAMPLE

Sample ID: NIGRA05-001-GW-005 Sample Collection Time: 0855

Sample Depth: 4.70' Collection Method: Peristaltic Pump

Analysis/Method: 537 m PFOS Sample Container: 2 125 ml PE

Preservative: None Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS: Due to time and site constraints, well was not developed and a grab sample was taken.

- No development log was completed.

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/22/17

Sample Technician(s): Miles Eckert

Station ID: NIGRA05-002

Location Description: See Boring Log

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

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

ME

GROUNDWATER SAMPLE

Sample ID: ~~N/A~~ NIGRA05-002 Sample Collection Time: N/A

Sample Depth: N/A Collection Method: N/A

Analysis/Method: N/A Sample Container: N/A

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

REMARKS: Well never produced any water. Therefore, no grab sample was collected.

- No development log was completed.

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/22/17

Sample Technician(s): Miles Eckert

Station ID: NIGRA05-003

Location Description: See Boring log

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: NE Sediment Description:

Collection Method: Analysis/Method:

Sample Container: Preservative:

SURFACE WATER SAMPLE

Sample ID: Sample Collection Time:

Sample Depth: NE 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 SAMPLE

Sample ID: NIGRA05-003-GW-006 Sample Collection Time: 1145

Sample Depth: 6.5' Collection Method: Peristaltic Pump

Analysis/Method: 537 m PFOS Sample Container: 2 125 ml PE

Preservative: None Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS: Due to time & site constraints, well was not developed and a grab sample was taken.

- No development log was completed.

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/17/17

Sample Technician(s): J. Klein

Station ID: NIGRA06-001

Location Description: N/A

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 SAMPLE

Sample ID: NIGRA06-001-GW-015 Sample Collection Time: 0925

Sample Depth: 15.0' Collection Method: Grab / PP

Analysis/Method: 537 m PFOS Sample Container: 125 mL PE (2)

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

REMARKS:

* Duplicate

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/18/17

Sample Technician(s): Miles Eckert

Station ID: NIGRA06-002

Location Description: See Boring Log

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: ME Sediment Description:

Collection Method: Analysis/Method:

Sample Container: Preservative:

SURFACE WATER SAMPLE

Sample ID: Sample Collection Time:

Sample Depth: ME 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 SAMPLE (ME)

Sample ID: NIGRA06-002-GW-015 Sample Collection Time: 8/18/17 0755

Sample Depth: 15' Collection Method: Peristaltic Pump

Analysis/Method: 537 M Sample Container: 2 125 ml PE

Preservative: None Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS: Well was pumped dry 3 times

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/21/17

Sample Technician(s): J. Klein, J. Meshew, M. Eckert

Station ID: NIGRA06-003

Location Description: N/A

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 SAMPLE

Sample ID: NIGRA06-003-GW-009 Sample Collection Time: 0945

Sample Depth: 9.0' Collection Method: Grab / PP

Analysis/Method: 537 m PFOS Sample Container: 125 mL PE (2)

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: Niagara Falls Air Reserve Station

Date: 8/16/17

Sample Technician(s): J. Klein

Station ID: NIGRA07-003

Location Description: 360° N to Outfall 5 Culvert, 8 meters to Culvert

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

SEDIMENT SAMPLE

Sample ID: NIGRA07-003-SD-001

Sample Collection Time: 0830

Sample Depth: 0.5'

Sediment Description: Organic silty clay

Collection Method: Spoon

Analysis/Method: 537 m PFOS

Sample Container: 250 mL PE

Preservative: N/A

SURFACE WATER SAMPLE

Sample ID: NIGRA07-003-SW-001

Sample Collection Time: 0830

Sample Depth: 0.5'

Collection Method: Dip/Grab

Analysis/Method: 537 m PFOS

Sample Container: 125 mL PE (2)

Preservative: N/A

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

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

GROUNDWATER 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 (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/16/17

Sample Technician(s): J. Klein

Station ID: N1GRA07-002

Location Description: 300' NW to outfall 9 culvert, 7m to culvert

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: N1GRA07-002-SD-001 Sample Collection Time: 0830

Sample Depth: 0.5' Sediment Description: Organic Silty Clay

Collection Method: Spoon Analysis/Method: 537 m PFOS

Sample Container: 250 mL PE Preservative: N/A

SURFACE WATER SAMPLE

Sample ID: N1GRA07-002-SW-001 Sample Collection Time: 0830

Sample Depth: 0.5' Collection Method: Dip/Grab

Analysis/Method: 537m PFOS Sample Container: 125 mL PE (2)

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

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

GROUNDWATER 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 (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/16/17

Sample Technician(s): J. Klein

Station ID: NIGRA 07-001

Location Description: 150° SSE to MW10-5D
32m to MW10-5D

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: NIGRA07-001-SD-001 Sample Collection Time: 1245

Sample Depth: 0.5' Sediment Description: Organic Silty Clay

Collection Method: Spoon Analysis/Method: 537 m PFOS

Sample Container: 250 mL PE Preservative: N/A

SURFACE WATER SAMPLE

Sample ID: NIGRA07-001-SW-001 Sample Collection Time: 1245

Sample Depth: 0.5' Collection Method: Grab / Dip

Analysis/Method: 537 m PFOS Sample Container: 125 mL PE (2)

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

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

GROUNDWATER 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 (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8.22.17

Sample Technician(s): Jeremy A Meshew

Station ID: NIGRA07-004

Location Description: Samples located approximately 20' South of adjacent culvert off taxiway K.

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: NIGRA07-004-SD-001 Sample Collection Time: 1135

Sample Depth: 0'-0.5' BGS Sediment Description: Silty Clay

Collection Method: Spoon Analysis/Method: EPA 537M

Sample Container: 250mL PE Jar Preservative: None

SURFACE WATER SAMPLE

Sample ID: NIGRA07-004-SW-001 Sample Collection Time: 1135

Sample Depth: 0'-0.5' BGS Collection Method: Dipped Sample Jar

Analysis/Method: ~~EPA~~ JM 8.22 EPA 537M Sample Container: 2, 125mL PE Jars

Preservative: None Water Quality (circle one): (Clear) Cloudy Turbid Other

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

GROUNDWATER 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 (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/18/17

Sample Technician(s): J. Klein

Station ID: ~~NIGRA08-002-T-00-k~~ NIGRA08-002

Location Description: N/A

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 SAMPLE

Sample ID: NIGRA08-002-GW-~~008~~ 010-k Sample Collection Time: 1458

Sample Depth: 10.69' Collection Method: Grab / PP

Analysis/Method: 537 m PFOS Sample Container: 125 mL PE (2)

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

REMARKS:

* Grab sample due to minimal recharge over time. (3 day of development).

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Niagara Falls Air Reserve Station

Date: 8/16/17

Sample Technician(s): J. Klein

Station ID: NIGRA08-001

Location Description: N/A

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 SAMPLE

Sample ID: NIGRA08-001-GW-011 Sample Collection Time: 1530

Sample Depth: 0.5' Collection Method: Peristaltic

Analysis/Method: 537 m PFOS Sample Container: 125 mL PE (2)

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

REMARKS:

* Grab sample due to lack of recharge

AerostarSES

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah) M2032-0001 | Installation: Niagara Falls Air Reserve Station

WELL NO: NIGRA01-003 | SAMPLE ID: NIGRA01-003-GW-~~006~~ 008 A | DATE: 8/18/17

PURGING DATA

WELL DIAMETER (inches): 1 | TUBING DIAMETER (inches): 1/4 | WELL SCREEN INTERVAL DEPTH: 11.6 Ft - 6.6 Ft | STATIC DEPTH TO WATER (feet): 2.96 | 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) = (11.6 Ft - 2.96 Ft) x 0.041 gal/ft = 0.354 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 8.6 Ft) + 0.25 gal = 0.005 gal

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

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 8.6 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 8.6 | PURGING INITIATED AT: 1216 | PURGING ENDED AT: 1227 | TOTAL VOLUME PURGED (gallons): 1200 mL

TIME	VOLUME PURGED (gallons) mL	CUMUL. VOLUME PURGED (gallons) mL	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)
1221	0	0	200	3.12	6.35	17.47	2.445	2.13	118.2	26.1	clear	swampy sulfur
1223	400	400	200	3.13	6.26	18.05	2.132	2.16	107.2	18.7	clear	
1225	400	800	200	3.13	6.26	18.11	2.117	2.11	105.9	11.6	clear	
1227	400	1200	200	3.14	6.25	18.16	2.109	2.03	104.3	9.31	clear	

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; 6" = 1.02; 8" = 1.47; 12" = 6.00
TUBING INSIDE DIA. CAPACITY (Gal/Ft): 1/8" = 0.0005; 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: Jeremy Klein / ASL | SAMPLER(S) SIGNATURE(S): [signature] | SAMPLING INITIATED AT: 1227 | SAMPLING ENDED AT: 1232

PUMP OR TUBING DEPTH IN WELL (feet): 8.6 | 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	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)
NIGRA01-003-GW-008	2	PE	125	537m	APP	✓	200

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)	Installation: Niagara Falls Air Reserve Station

WELL NO: NIGRA02-001	SAMPLE ID: NIGRA02-001-GW-015	DATE: 8/18/17

PURGING DATA

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: 10.17 Ft 20.17 Ft	STATIC DEPTH TO WATER (feet): 5.03	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) = (20.17 Ft - 5.03 Ft) × 0.04 gal/ft = 0.606 Gal (2,290 ml)

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 × 15.2 Ft) + 0.174 gal = 0.214 gal

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

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 15.2	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 15.2	PURGING INITIATED AT: 1446	PURGING ENDED AT: 1506	TOTAL VOLUME PURGED (gallons) ml: 3,000

TIME	VOLUME PURGED (gallons) ml	CUMUL. VOLUME PURGED (gallons) ml	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)
1447	150	150	150	7.62	8.32	17.8	1,775	4.01	75.8	264	cloudy clear	None
1455	1,200	1,350	150	10.52	7.77	17.7	2,031	4.45	38.8	90.8	ME clear	
1500	750	2,100	150	12.30	7.68	17.4	2,170	4.16	39.6	51.2		
1502	300	2,400	150	12.84	7.64	17.2	2,139	4.42	37.5	18.4		
1504	300	2,700	150	13.24	7.63	17.1	2,141	4.60	35.1	17.9		
1506	300	3,000	150	13.95	7.64	17.1	2,066	4.61	33.9	15.3		
						ME						

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: Miles Eckert / ASL	SAMPLER(S) SIGNATURE(S): [signature]	SAMPLING INITIATED AT: 1508 / SAMPLING ENDED AT: 1520
PUMP OR TUBING DEPTH IN WELL (feet): 15.2	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	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)
NIGRA02-001-GW-015	6	PE	125	537M	APP	✓	150
NIGRA02-001-GW-915	2	PE	125	537M	APP	✓	150
		ME					

REMARKS: MS/MSD & Dupe

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)	Installation: Niagara Falls Air Reserve Station
WELL NO: NIGRA02-002	SAMPLE ID: NIGRA02-002-GW-014 DATE: 8/21/17

PURGING DATA

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: 9.41 Ft - 19.41 Ft	STATIC DEPTH TO WATER (feet): 4.69	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) = (19.41 Ft - 4.69 Ft) x 0.04 gal/ft = 0.607 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 14.41 Ft) + 0.25 gal = 0.287 gal

Location (Circle one): Monitoring Well Temporary Well Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 14.41	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 14.	PURGING INITIATED AT: 0754	PURGING ENDED AT: 0808	TOTAL VOLUME PURGED (gallons): 1600mL

TIME	VOLUME PURGED ~~(gallons)~~ mL	CUMUL. VOLUME PURGED ~~(gallons)~~ mL	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)
0800	0	0	350	8.01	7.69	15.4	0.125	7.83	203.5	32.5	clear	None
0804	800	800	200	9.92	7.36	15.3	0.1150	6.48	215.0	21.5		
0806	400	1200	200	11.73	7.38	15.4	0.1130	6.72	212.0	18.4		
0808	400	1600	200	13.45	7.40	15.4	0.1153	6.38	207.8	15.6		

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: Jeremy Klein / AEL	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 0808	SAMPLING ENDED AT: 0813
PUMP OR TUBING DEPTH IN WELL (feet): 14.41	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)
NIGRA02-002-GW-014	2	PE	125	537M	APP	✓	200

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)	Installation: Niagara Falls Air Reserve Station
WELL NO: NIGRA03-002	SAMPLE ID: NIGRA03-002-GW-005 DATE: 8/16/17

PURGING DATA

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: 2.64 Ft - 7.64 Ft	STATIC DEPTH TO WATER (feet): 5.33	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) = (7.64 Ft - 5.33 Ft) x 0.04 gal/ft = 0.09 Gal (340 ml)

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 5.2 Ft) + 0.174 gal = 0.188 gal

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

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 5.2	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 5.2	PURGING INITIATED AT: 1602	PURGING ENDED AT: 1619	TOTAL VOLUME PURGED ~~(gallons)~~ ml: 2,550

TIME	VOLUME PURGED ~~(gallons)~~ ml	CUMUL. VOLUME PURGED ~~(gallons)~~ ml	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)
1605	450	450	150	5.34	7.64	20.3	1,008	3.13	58.4	38.6	cloudy	None
1610	750	1,200	↓	5.35	7.56	20.0	1,014	1.53	54.5	80.1	clear	↓
1615	750	1,950	↓	↓	7.50	20.1	1,015	1.42	52.9	19.5	↓	↓
1617	300	2,250	↓	↓	7.49	20.1	1,013	1.39	52.8	14.6	↓	↓
1619	300	2,550	↓	↓	7.47	20.0	1,016	1.49	52.8	9.75	↓	↓

ME

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: Miles Eckert / ASL	SAMPLER(S) SIGNATURE(S): [signature]	SAMPLING INITIATED AT: 1621	SAMPLING ENDED AT: ENDED AT: 1624
PUMP OR TUBING DEPTH IN WELL (feet): 5.2	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	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)
NIGRA03-002-GW-005	2	PE	125	537M	APP	✓	150

ME

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)	Installation: Niagara Falls Air Reserve Station

WELL NO: MW7-1D	SAMPLE ID: NIGRA06-MW7-1D-010	DATE: 8/15/17

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: 9.1 Ft - 11.6 Ft	STATIC DEPTH TO WATER (feet): 5.92	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) = (11.6 Ft - 5.92 Ft) x 0.16 gal/ft = 0.909 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 10.35 Ft) + 0.174 gal = 0.201 gal

Location (Circle one): Monitoring Well Temporary Well Other BTR 9/8/17

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 10.35	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 10.35	PURGING INITIATED AT: 1451	PURGING ENDED AT: 1509	TOTAL VOLUME PURGED (gallons): 1.44

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)
1456	0.40	0.40	0.08	6.90	8.17	15.2	0.63	1.10	-87.4	2.62	clear	~~None~~ MF slight HC
1503	0.56	0.96	↓	7.10	8.37	15.2	0.63	1.66	-100.0	1.87	↓	slt HC
1505	0.16	1.12	↓	7.13	8.51	15.3	0.63	1.44	-102.3	0.55	↓	↓
1507	0.16	1.28	↓	7.16	8.43	15.3	0.63	1.49	-103.3	0.57	↓	↓
1509	0.16	1.44	↓	~~7.16~~ MF 7.19	8.41	15.3	0.63	1.34	-106.7	0.38	↓	↓

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/FL): 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: Miles Eckert / ASL	SAMPLER(S) SIGNATURE(S): [signature]	SAMPLING INITIATED AT: 1511	SAMPLING ENDED AT: 1513
PUMP OR TUBING DEPTH IN WELL (feet): 10.35	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	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)
NIGRA06-MW7-1D-010	2	PE	125	537M	APP	✓	300

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)

0

AerostarSES

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah)	Installation: Niagara Falls Air Reserve Station
WELL NO: MW7-2	SAMPLE ID: NIGRA06-MW7-2-005 DATE: 8/15/17

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: 4 Ft - 7 Ft	STATIC DEPTH TO WATER (feet): 3.77	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) = (7 Ft 3.77 Ft) x 0.16 gal/ft = 0.516 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 5.5 Ft) + 0.25 gal = 0.264 gal

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

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 5.5	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 5.5	PURGING INITIATED AT: 1447	PURGING ENDED AT: 1501	TOTAL VOLUME PURGED (gallons): 600 mL

TIME	VOLUME PURGED ~~(gallons)~~ mL	CUMUL. VOLUME PURGED ~~(gallons)~~ mL	PURGE RATE ~~(gpm)~~ mL/min	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. mS/cm ~~µS/cm~~	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1455	0	0	100	4.07	6.54	17.35	0.538	1.72	75.6	17.7	clear	none
1457	200	200	100	4.14	6.58	17.29	0.547	1.56	1.72	13.2	clear	none
1459	200	400	100	4.19	6.59	17.18	0.552	1.48	-5.3	12.3	clear	none
1501	200	600	100	4.23	6.58	17.19	0.557	1.39	-8.6	10.6	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: Jeremy Bear / ASL	SAMPLER(S) SIGNATURE(S): Jeremy Bear	SAMPLING INITIATED AT: 1501	SAMPLING ENDED AT: ENDED AT: 1506
PUMP OR TUBING DEPTH IN WELL (feet): 5.5	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)
NIGRA06-MW7-2-005	2	PE	125	537 M	APP	✓	100 mL/min

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) | Installation: Niagara Falls Air Reserve Station

WELL NO: ~~NIGRA06-014~~ MW7-3D | SAMPLE ID: NIGRA06-MW7-3D-014 | DATE: 8/17/17

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	11.6 Ft - 16.1 Ft	3.48	PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (16.1 Ft - 3.48 Ft) x 0.16 gal/ft = 2.02 Gal (7,645 ml)

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 13.6 Ft) + 0.174 gal = 0.209 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~~ ml)
13.6	13.6	0825	0841	3,450

TIME	VOLUME PURGED (~~gallons~~ ml)	CUMUL. VOLUME PURGED (~~gallons~~ ml)	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)
0827	600	600	300	5.05	7.68	13.5	309.0	1.25	195.1	49.9	clear	None
0832	1,500	2,100	300	7.45	7.30	14.0	290.2	2.12	193.3	43.4		
0837	750	2,850	150	~~7.56~~ 7.58	7.56	14.3	281.8	2.20	149.5	18.9		
0839	300	3,150		9.13	7.65	14.3	284.1	2.10	132.3	16.8		
0841	300	3,450		9.60	7.70	14.3	284.4	2.08	116.2	15.0		
				10.09								

MLE

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:
Miles Eckert / ASL	[signature]	0843	0851

PUMP OR TUBING DEPTH IN WELL (feet): 13.6 | TUBING MATERIAL CODE: PE | FIELD-FILTERED: Y (N) Filter Size ___ µm | Filtration Equipment Type:

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)
NIGRA06-MW7-3D-014	6	PE	125	537 M	APP	✓	150

MLE

REMARKS: Depth to Water did not stabilize. Due to site constraints, could not pump 3 well volumes
* MS/MSD

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)	Installation: Niagara Falls Air Reserve Station

WELL NO: NIGRA08-003	SAMPLE ID: NIGRA08-003-GW-009	DATE: 8/16/17

PURGING DATA

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: 6.89 Ft - 11.89 Ft	STATIC DEPTH TO WATER (feet): 5.85	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) = (11.89 Ft - 5.85 Ft) x 0.04 gal/ft = 0.242 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 9.4 Ft) + 0.174 gal = 0.198 gal

Location (Circle one): Monitoring Well Temporary Well Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 9.4	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 9.4	PURGING INITIATED AT: 1444	PURGING ENDED AT: 1517	TOTAL VOLUME PURGED (~~gallons~~ ml): 6,850

TIME	VOLUME PURGED (~~gallons~~ ml)	CUMUL. VOLUME PURGED (~~gallons~~ ml)	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)
1446	600	600	300	6.02	7.49	14.1	1,793	1.71	120.1	408	cloudy	None
1454	2,400	3,000	300	6.33	6.98	14.1	1,782	0.49	-37.8	79.5	clear	
1458	1,000	4,000	250	6.38	7.00	14.2	1,794	0.36	-48.7	280	cloudy	
1503	750	4,750	150	6.41	7.06	14.8	1,795	0.34	-58.8	137	clear	
1511	1,200	5,950		6.44	7.10	14.7	1,822	0.30	-65.6	46.3		
1513	300	6,250		6.45	7.11	14.6	1,828	0.28	-66.6	19.3		
1515	300	6,550		6.46	7.10	14.7	1,830	0.27	-68.9	15.2		
1517	300	6,850		6.47	7.11	14.6	1,836	0.25	-70.3	16.4		

MF

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" = 0.005; 1/2" = 0.010; 5/8" = 0.015
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Miles Eckert / ASL	SAMPLER(S) SIGNATURE(S): [signature]	SAMPLING INITIATED AT: 1519	SAMPLING ENDED AT: ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet): 9.4	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	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)
NIGRA08-003-GW-009	6	PE	125	537 M	APP	✓	150

ME

REMARKS: MS/MSD

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

WELL DEVELOPMENT LOG

Project Name: AFFF SI (Savannah Corps)
ASL Project No: M2032.0001
Installation: Niagara Falls ARS
Site: 1
Date: 8/17/17
Sample Technician: J. Klein
Well ID No.: NIGRA01-001

Initial Measurements

Well Total Depth:	~~2.29~~ 10.15 ft BTOC	Water Level:	~~10.15~~ 2.29 ft BTOC

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (10.15 Ft - 5.15 Ft) x 0.041 gal/ft = 0.322 Gal

Calculated Well Volume:	0.322 Gallons	Well Diameter:	1 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): 300 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
1433	300	749.2	14.33	3.541	7.61	3.92	6.51	130.8	0.25	
1435	300	overrange	15.02	3.495	7.11	6.27	4.07	144.9	0.33	
1437	300	overrange	15.39	3.387	6.93	8.19	3.87	148.5	0.5	Pumped dry
1446	300	overrange	15.79	3.370	7.84	7.24	3.25	140.2	0.46	
1448	300	overrange	15.64	3.261	6.73	10.39	3.44	139.5	0.75	Pumped dry
1455	300	865	15.79	3.198	6.68	8.69	3.97	137.0	1.0	
1457	300	746	15.62	3.126	6.67	9.84	4.42	135.1	1.25	Pumped dry
									~~1.33~~	
									~~1.50~~	
Results At End Of Purging:		746	15.62	3.126	6.67	9.84	4.42	135.1	1.25	

COMMENTS: Pumped dry 3 times

AerostarSES LLC

WELL DEVELOPMENT LOG

Project Name: AFFF SI (Savannah Corps)
ASL Project No: M2032.0001
Installation: Niagara Falls ARS
Site: 1
Date: 8/17/17
Sample Technician: Miles Eckert
Well ID No.: NIGRA01-002

Initial Measurements

Well Total Depth:	10.18 ft BTOC	Water Level:	2.19 ft BTOC
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = (10.18 Ft - 2.19 Ft) x 0.041 gal/ft = 0.328 Gal			
Calculated Well Volume:	0.328 Gallons	Well Diameter:	1 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): 350 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
1447	350	OR	17.7	2.68	7.93	9.43	1.43	136.8	0.22	pumped dry
1500	NB ~~350~~ 200	OR	14.9	3.19	7.88	9.50	4.96	140.3	0.27	pumped dry
1515	200	OR	18.1	2.95	7.79	8.80	4.97	140.5	0.33	pumped dry
Results At End Of Purging:		OR	18.1	2.95	7.79	8.80	4.97	140.5	0.33	

MEE

COMMENTS: Well Pumped dry 3 times

AerostarSES LLC

WELL DEVELOPMENT LOG

Project Name: AFFF SI (Savannah Corps)
ASL Project No: M2032.0001
Installation: Niagara Falls ARS
Site: 1
Date: 8/17/17
Sample Technician: J. Klein
Well ID No.: NIGRA01 - 003

Initial Measurements

Well Total Depth: 11.6 ft BTOC		Water Level: 3.01 ft BTOC	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = (11.6 Ft 3.01 Ft) x 0.041 gal/ft = 0.352 Gal			
Calculated Well Volume: 0.352 Gallons		Well Diameter: 1 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): ~~300~~ 350 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
1513	~~350~~ 350	74.6	14.29	1.941	7.09	3.14	8.05	169.7	0.25	
1515	~~300~~ 350	overrange	15.67	2.874	6.48	3.19	3.30	166.2	0.5	
1517	350	965	16.10	2.789	6.51	3.21	2.69	160.6	0.75	
1519	350	797	16.40	2.721	6.51	3.24	2.27	155.2	1.0	
1521	350	922	16.56	2.668	6.51	3.23	2.659	135.0	1.25	
1523	350	549	16.71	2.615	6.50	3.23	2.610	129.4	1.5	
Results At End Of Purging:		549	16.71	2.615	6.50	3.23	2.610	129.4	1.5	

COMMENTS:

AerostarSES, LLC

WELL DEVELOPMENT LOG

Project Name: AFFF SI (Savannah) Corps
ASL Project No: M2032.0001
Installation: Niagara Falls ARS
Site: 2
Date: 8/17/17
Sample Technician: Miles Eckert
Well ID No.: NIGRA02-001

Initial Measurements

Well Total Depth:	20.19 ft BTOC	Water Level:	5.15 ft BTOC
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = (20.19 Ft - 5.15 Ft) x 0.041 gal/ft = 0.617 Gal (2,335 ml)			
Calculated Well Volume:	0.617 Gallons	Well Diameter:	1 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): ME ~~200~~ 150 + 300 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
1558	150	728	15.8	1.21	8.48	8.65	1.64	-41.8	0.04	
1600	150	417	16.2	1.21	8.38	10.45	2.01	-58.5	0.12	
1602	150	239	16.6	1.22	8.30	10.68	2.24	-56.6	0.20	
1604	150	108	17.1	1.25	8.19	10.68	3.19	-46.1	0.28	
1609	300	474	16.2	1.54	8.09	13.60	5.31	-10.2	0.48	
1613	300	OR	15.6	1.38	8.05	19.21	2.89	-27.7	0.80	Pumped dry
1638	300	OR	20.3	1.54	8.12	13.26	3.87	-79.0	1.04	
1641	300	OR	15.2	1.40	8.09	17.70	2.43	-79.1	1.20	Pumped dry
1706	300	OR	17.9	1.45	8.07	14.35	3.73	-58.6	1.36	
1708	300	OR	15.2	1.40	8.06	17.72	2.18	-66.2	1.52	Pumped dry
Results At End Of Purging:		OR	15.2	1.40	8.06	17.72	2.18	-66.2	1.52	

ME

COMMENTS: Well pumped dry 3 times

AerostarSES LLC

WELL DEVELOPMENT LOG

Project Name: ~~NIG~~ AFFF SI Investigation (Sumah Corps)
ASL Project No: M2032.0001
Installation: Niagara Falls ARS
Site: 2
Date: 8/17/17
Sample Technician: J. Klein
Well ID No.: NIGRA02-002

Initial Measurements

Well Total Depth: 19.41 ft BTOC		Water Level: 18.05 ft BTOC	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY			
(only fill out if applicable) = (19.41 Ft - 18.05 Ft) x gal/ft = 0.056 Gal			
Calculated Well Volume: 0.056 Gallons		Well Diameter: 1 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): 100 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
1222	100	Overrange	17.01	.936	8.19	19.21	16.24	170.3	0.07	Pumped dry
0834	100	20.5	15.57	0.750	7.57	5.05	14.91	179.1	0.15	
0836	100	23.3	14.48	1.399	7.14	7.72	8.00	167.4	0.20	
0841	100	41.0	14.48	1.238	6.64	10.67	8.28	147.2	0.33	
0846	100	251	14.58	1.155	6.74	13.41	8.24	134.0	0.5	
Results At End Of Purging:		251	14.58	1.115	6.74	13.41	8.24	134.0	0.5	

30

COMMENTS:

AerostarSES LLC

WELL DEVELOPMENT LOG

Project Name: AFFF SI (Savannah Corps)
ASL Project No: M2032.0001
Installation: Niagara Falls ARS
Site: 2
Date: 8/18/17
Sample Technician: Miles Eckert
Well ID No.: NIGRA02-003

Initial Measurements

Well Total Depth: 18.80 ft BTOC		Water Level: 17.34 ft BTOC	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = (18.80 Ft - 17.34 Ft) x 0.041 gal/ft = 0.060 Gal (227 ml)			
Calculated Well Volume: 0.060 Gallons		Well Diameter: 1 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): 150 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
0835	150	488	15.5	1.34	7.77	18.03	7.88	138.0	0.08	Pumped dry
0940	150	314	17.2	1.44	7.90	18.07	7.51	130.7	0.16	Pumped dry
1037	150	300	25.0	1.71	7.76	18.45	6.93	54.7	0.23	Pumped dry
Results At End Of Purging:		300	25.0	1.71	7.76	18.45	6.93	54.7	0.23	

ME

COMMENTS: Well was pumped dry 3 times, has slow recharge, and a small well volume.

AerostarSES, LLC

WELL DEVELOPMENT LOG

Project Name: AFFF SI (Savannah Corps)
ASL Project No: M2032.0001
Installation: NFARS
Site: 2
Date: 8/18/17
Sample Technician: J. Klein
Well ID No.: MIGRA02-004

Initial Measurements

Well Total Depth:	20.19 ft BTOC	Water Level:	14.59 ft BTOC

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (20.19 Ft 14.59 Ft) x 0.041 gal/ft = 0.229 Gal

Calculated Well Volume:	0.229 Gallons	Well Diameter:	1 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): 100 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
0921	100	32.9	16.16	0.990	7.29	17.28	14.04	164.9	0.05	
0923	100	32.7	15.47	1.858	7.11	17.93	7.01	130.0	0.19	
0925	100	288	15.32	1.836	7.03	18.91	5.89	88.3	0.25	
0927	100	Overrange	15.27	1.819	6.99	19.29	5.27	65.0	0.30	
0929	100	Overrange	15.19	1.809	7.00	20.06	4.87	50.7	0.30	Pumped dry
1020	100	397	17.24	1.942	6.95	20.09	9.63	47.6	0.33	Pumped dry
1117	100	OR	18.43	2.095	7.01	19.37	4.80	-34.4	0.40	Pumped dry
Results At End Of Purging:		Overrange	18.43	2.095	7.01	19.37	4.80	-34.4	0.40	

COMMENTS: * pumped dry 3 times

AerostarSES LLC

WELL DEVELOPMENT LOG

Project Name: AFFF SI (Savannah Corps)
ASL Project No: M2032.0001
Installation: Niagara Falls ARS
Site: 3
Date: 8/16/17
Sample Technician: J. Klein
Well ID No.: NIGRA 03 - 001

Initial Measurements

Well Total Depth: 7.57 ft BTOC		Water Level: 6.06 ft BTOC	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY			
(only fill out if applicable) = (7.57 Ft - 6.06 Ft) x 0.041 gal/ft = 0.061 Gal			
Calculated Well Volume: 0.061 Gallons		Well Diameter: 1	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): 100 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
1610	100	overrange	19.74	1.501	7.82	6.27	4.35	146.1	~~0.25~~	0.09
1612 ~~1615~~	100	overrange	19.89	1.611	7.45	6.61	3.71	150.0	~~0.35~~	0.15 Pumped dry
1624	100	386	18.95	0.785	7.61	6.87	7.65	97.2	0.25	Pumped dry
Results At End Of Purging:		386	18.95	0.785	7.61	6.87	7.65	97.2	0.25	

COMMENTS: * Pumped dry on 8/15/17 after a heavy rain to remove potential ~~water~~ rain water in well. No readings taken due to minimal amount of water

* Pumped dry 3 times (8/15 & 8/16)

AerostarSES, LLC

WELL DEVELOPMENT LOG

Project Name: AFFF Site Investigation (Savannah Corps)
ASL Project No: M2032.0001
Installation: Niagara Falls ARS
Site: 3
Date: 8/14/17
Sample Technician: J. Klein, M. Eckert
Well ID No.: NIGRA03-062

Initial Measurements

Well Total Depth: 7.64 ft BTOC		Water Level: 5.62 ft BTOC	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY			
(only fill out if applicable) = (7.64 Ft - 5.62 Ft) x 0.041 gal/ft = 0.082 Gal			
Calculated Well Volume: 0.082 Gallons		Well Diameter: 1 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): 300 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
1622	300mL/min	50.9	20.7	0.128	8.21	5.62	2.44	121.2	0.25	
1627	300mL/min	24.8	20.7	0.127	8.55	5.62	1.24	79.9	0.5	
1632	300mL/min	12.9	20.3	0.126	8.48	5.62	0.86	63.4	0.75	
1634	300mL/min	11.1	20.3	0.126	8.47	5.62	0.84	57.4	1.0	
1636	300mL/min	11.7	20.4	0.126	8.48	5.62	0.82	54.8	1.25	
Results At End Of Purging:		11.7	20.4	0.126	8.48	5.62	0.82	54.8	1.25	

COMMENTS:

AerostarSES LLC

WELL DEVELOPMENT LOG

Project Name: AFFF SI (Savannah Corps)
ASL Project No: M2032.0001
Installation: NFARS
Site: 4
Date: 8/18/17
Sample Technician: J. Klein
Well ID No.: NLGRA04-001

Initial Measurements

Well Total Depth: 8.1 ft BTOC		Water Level: 4.77 ft BTOC	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY			
(only fill out if applicable) = (8.1 Ft - 4.77 Ft) x 0.041 gal/ft = 0.136 Gal			
Calculated Well Volume: 0.136 Gallons		Well Diameter: 1 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): 100 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
1334	100	831	20.48	0.596	7.59	5.90	9.48	240.4	0.010	
1336	100	overrange	20.42	0.992	7.14	6.25	3.51	130.6	0.05	
1338	100	OR	20.14	0.997	6.77	7.53	2.89	124.3	0.20	*
1340	100	OR	20.32	0.936	6.61	7.92	2.73	115.3	0.25	Pumped Dry
1407	100	OR	21.65	0.995	6.66	6.42	3.61	104.2	0.33	
1409	100	OR	20.98	0.952	6.66	7.85	6.32	101.5	0.40	Pumped dry
1427	100	OR	21.67	0.995	6.69	6.58	3.79	70.2	0.5	
1429	100	OR	21.43	0.982	6.71	7.72	3.94	72.5	0.60	Pumped dry
Results At End Of Purging:		~~Average~~ overrange	21.43	0.982	6.71	7.72	3.94	72.5	0.60	

COMMENTS: * Pumped dry 3 times

AerostarSES, LLC

WELL DEVELOPMENT LOG

Project Name: AFFF Site Investigation (Savannah Corps)

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

Installation: ~~Alpena ANG~~ ME Niagara Falls ARS

Date: 8/21/17

Sample Technician: Miles Eckert

Well ID No.: NIGRA04-002

Initial Measurements

Well Total Depth: 3.92 ft below TOC

Water Level: N/A ft below TOC

Calculated Well Volume: N/A Gallons

Well Diameter: 1 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): N/A

Flow rate (incl. units): N/A

Time	Flow Rate (ml/min)	Turbidity (NTUs)	Temp (°C)	Cond. (mS/Cm)	pH	Salinity (%)	DO (mg/l)	ORP	Total Gal Pumped	Comments
						ME				
Results At End Of Purging:										

COMMENTS: Well was installed on Friday, August 18, 2017. After 3 days, the well did not produce water and could not be developed.

AerostarSES LLC

WELL DEVELOPMENT LOG

Project Name:	SI AFFF Savannah
ASL Project No:	M2032.0001
Installation:	~~Homestead Air Reserve Base~~ (ME) Niagara Falls ARS
Site:	4
Date:	8/18/17
Sample Technician:	Miles Eckert
Well ID No.:	NIGRA04-003

Initial Measurements

Well Total Depth:	5.59 ft BTOC	Water Level:	3.91 ft BTOC
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY			
(only fill out if applicable) =	(5.59 Ft - 3.91 Ft) x 0.041 gal/ft = 0.069 Gal (260 ml)		
Calculated Well Volume:	0.069 Gallons	Well Diameter:	1 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): 250 & 150 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
1320	250	OR	28.3	0.026	7.84	3.33	7.03	150.0	0.066	
1322	250	OR	20.9	1.75	7.91	5.10	4.14	143.2	0.198	pumped dry
1422	150	OR	20.3	1.34	7.97	5.15	4.13	125.7	0.238	pumped dry
Results At End Of Purging:		OR	20.3	1.34	7.97	5.15	4.13	125.7	0.238	

ME

COMMENTS: well was pumped dry twice, and 3 well volumes were purged during development. Well also had slow recharge.

AerostarSES LLC

WELL DEVELOPMENT LOG

Project Name: AFFF SI (Savannah Corps)
ASL Project No: M2032.0001
Installation: Niagara Falls ARS
Site: 6
Date: 8/16/17
Sample Technician: J. Klein
Well ID No.: NIGRA06-001

Initial Measurements

Well Total Depth: 20.18 ft BTOC		Water Level: 19.49 ft BTOC	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY			
(only fill out if applicable) = (20.18 Ft - 19.49 Ft) x 0.041 gal/ft = Gal			
Calculated Well Volume: 0.028 Gallons		Well Diameter: 1 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): 200 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
0959	200ml/min	176	16.82	1.131	6.88	20.09	7.32	226.2	0.15	Pumped dry
1011	200mL/min	80.2	16.37	1.177	7.24	20.09	6.39	203.2	0.25	Pumped - ~~Pumped dry before reading~~
1026	200	45.2	16.66	1.313	7.36	20.01	8.23	168.1	0.33	Pumped dry
Results At End Of Purging:		45.2	16.66	1.313	7.36	20.01	8.23	168.1	0.33	

COMMENTS:
Pumped dry 3 times.

AerostarSES LLC

WELL DEVELOPMENT LOG

Project Name: AFFF SI (Savannah Corps)
ASL Project No: M2032.0001
Installation: Niagara Falls ARS
Site: B
Date: ~~8/16/17~~ 8/17/17
Sample Technician: J. Klein
Well ID No.: NIGRA06-002

Initial Measurements

Well Total Depth: 18.88 ft BTOC		Water Level: 14.39 ft BTOC	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY			
(only fill out if applicable) = (18.88 Ft - 14.39 Ft) x 0.041 gal/ft = 0.184 Gal			
Calculated Well Volume: 0.184 Gallons		Well Diameter: 1 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): 100 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
8/17/17	0830	100	910	13.52	2.558	6.91	15.84	3.67	37.1	0.15	
	0835	100	852	13.62	2.590	6.91	16.32	53.7	9.9	0.25	0838 pumped dry
	0849	100	734	13.79	2.603	6.89	18.41	27.3	-12.2	0.33	0852 pumped dry
	0903	100	642	13.92	2.688	6.87	18.32	33.2	-14.2	0.5	0903 pumped dry
Results At End Of Purging:			642	13.92	2.688	6.87	18.32	33.2	-14.2	0.5	

COMMENTS:
~~* Set-up to develop on 8/16/17 – had to pack up before sampling due to airfield time constraints. Will resume developing another day.~~
* Pumped dry 3 times

AerostarSES, LLC

WELL DEVELOPMENT LOG

Project Name: AFFF SI (Savannah Corps)
ASL Project No: M2032.0001
Installation: NFARS
Site: 6
Date: 8/10/17
Sample Technician: J. Klein
Well ID No.: NIGRA06-003

Initial Measurements

Well Total Depth: 9.24 ft BTOC		Water Level: 8.92 ft BTOC	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = (9.24 Ft - 8.92 Ft) x 0.041 gal/ft = 0.013 Gal			
Calculated Well Volume: 0.013 Gallons		Well Diameter: 1 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): 100 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
0738	100	32.8	17.30	0.012	6.75	9.16	11.53	240.2	0.009	Pumped dry
Results At End Of Purging:		32.8	17.30	0.012	6.75	9.16	11.53	240.2	0.009	

COMMENTS: * So little water, only pumped dry once and will return in 24 hr to sample (considered developed)

AerostarSES LLC

WELL DEVELOPMENT LOG

Project Name: AFFF SI (Site Investigation)
ASL Project No: M2032.0001
Installation: Niagara Falls ARS
Site: 8
Date: 8/14/17
Sample Technician: J. Klein, M. Eckert
Well ID No.: NIGRA08-001

Initial Measurements

Well Total Depth: 10.2 ft BTOC		Water Level: 7.53 ft BTOC	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY			
(only fill out if applicable) = (10.2 Ft - 7.53 Ft) x 0.041 gal/ft = 0.109 Gal			
Calculated Well Volume: 0.109 Gallons		Well Diameter: 1 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): 150 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
1414	150ml/min	280	20.3	0.299	8.13	10.1	3.76	-19.9	0.25	Pumped dry
1516	150ml/min	84.3	20.2	0.304	8.23	9.92	2.99	5.4	0.5	Pumped dry
1558	150ml/min	282	20.3	0.301	8.09	9.98	4.56	-4.1	0.75	Pumped dry
Results At End Of Purging:		282	20.3	0.301	8.09	9.98	4.56	-4.1	0.75	

COMMENTS: Pumped dry 3 times – well developed

AerostarSES LLC

WELL DEVELOPMENT LOG

Project Name: AFFF SI (Savannah Corps)
ASL Project No: M2032.0001
Installation: Niagara Falls ARS
Site:
Date: ~~8/16/16~~ 8/16/17
Sample Technician: J. Klein
Well ID No.: NIGRA08-002

Initial Measurements

Well Total Depth: 13.19 ft BTOC		Water Level: 11.14 ft BTOC	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = (13.19 Ft - 11.14 Ft) x 0.041 gal/ft = 0.084 Gal			
Calculated Well Volume: 0.084 Gallons		Well Diameter: 1 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): 100 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
~~1453~~ 1453	100	over range	18.23	1.216	7.66	12.54	8.36	176.7	0.15	Pumped dry ~~Pumped dry before readings~~
8/17/17 1607	100	681	18.43	1.248	7.51	10.88	10.65	-72.3	0.25	
1609	100	915	15.49	2.150	7.47	13.06	7.46	-157.3	0.33	Pumped dry
Results At End Of Purging:		915	15.49	2.150	7.47	13.06	7.46	-157.3	0.33	

COMMENTS: * Pumped dry on 8/15/17 after a heavy rain to remove potential rain water in well. -No readings taken. ~~b/c of minimal amount of water.~~

* Pumped dry 3 times (8/15, 8/16 & 8/17)

AerostarSES, LLC

WELL DEVELOPMENT LOG

(ME)

Project Name: ~~Niagara Falls ARS~~ AFFF SI (Savannah)
ASL Project No: M2032.0001
Installation: Niagara Falls ARS
Site: 8
Date: 8/14/17
Sample Technician: M. Eckert
Well ID No.: NIGRA08-003

Initial Measurements

Well Total Depth: 11.89 ft BTOC		Water Level: 5.94 ft BTOC	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH BTOC – STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = (11.89 Ft - 5.94 Ft) x 0.041 gal/ft = 0.244 Gal			
Calculated Well Volume: 0.244 Gallons		Well Diameter: 1" 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): 300 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
1529	300	OR	14.40	1.634	5.43	6.11	54.64	95.4	0.317	
1533	300	643	14.09	1.617	5.76	6.20	8.80	28.3	0.634	
1537	300	760	13.93	1.610	5.78	6.26	0.62	5.3	0.951	
1541	300	602	13.59	1.598	5.87	6.34	0.55	-28.0	1.268	
Results At End Of Purging:		602	13.59	1.598	5.87	6.34	0.55	-28.0	1.268	

COMMENTS:

Depth To Water Record

AerostarSES LLC

Project Name: SI of AFFF Areas ~~(Omaha)~~ Savannah
ASL Project No: M2032.~~0003~~0001
Installation: NFARS
Date: 8/22/17
Sample Technician: J. Klein/M. Eckert
Sheet:

Well:	NIGRA01-001	Well:	NIGRA06-003	Well:	NIGRA08-002
Time:	0844	Time:	1137	Time:	1340
DTW:	~~2.89~~ 2.71 FT BTOC	DTW:	8.17 FT BTOC	DTW:	8.88' FT BTOC
Well:	NIGRA01-002	Well:	MW7-3D	Well:	NIGRA08-001
Time:	0845	Time:	1144	Time:	1341
DTW:	2.89 FT BTOC	DTW:	3.73 FT BTOC	DTW:	4.42' FT BTOC
Well:	NIGRA01-003	Well:	NIGRA04-001	Well:	NIGRA08-003
Time:	0846	Time:	1150	Time:	1342
DTW:	3.44 FT BTOC	DTW:	4.94 FT BTOC	DTW:	5.83' FT BTOC
Well:	NIGRA02-001	Well:	NIGRA04-002	Well:	MW7-2D
Time:	1416	Time:	1152	Time:	1440
DTW:	5.28 FT BTOC	DTW:	DRY FT BTOC	DTW:	4.54' FT BTOC
Well:	NIGRA02-002	Well:	NIGRA04-003	Well:	MW10-8
Time:	0934	Time:	1154	Time:	1452
DTW:	7.93 FT BTOC	DTW:	~~4.24~~ 4.24 FT BTOC	DTW:	4.59' FT BTOC
Well:	NIGRA02-003	Well:	MW7-2	Well:	MW10-8D
Time:	0938	Time:	1203	Time:	1454
DTW:	12.61 FT BTOC	DTW:	4.22 FT BTOC	DTW:	4.50 FT BTOC
Well:	NIGRA02-004	Well:	MW7-1D	Well:	PZ10-7
Time:	0947	Time:	1205	Time:	1501
DTW:	8.05 FT BTOC	DTW:	5.97 FT BTOC	DTW:	4.22 FT BTOC
Well:	NIGRA06-001	Well:	NIGRA03-001	Well:	MW10-10D
Time:	1124	Time:	1330	Time:	1510
DTW:	8.89 FT BTOC	DTW:	5.63' FT BTOC	DTW:	3.18 FT BTOC
Well:	NIGRA06-002	Well:	NIGRA03-002	Well:	MW10-11
Time:	1132	Time:	1332	Time:	1523
DTW:	8.21 FT BTOC	DTW:	5.64' FT BTOC	DTW:	0.93 FT BTOC

Depth To Water Record

AerostarSES LLC

Project Name: SI of AFFF Areas ~~(Omaha)~~ (MC) Savannah
ASL Project No: M2032.~~0003~~ (MC) 0001
Installation: NFARS
Date: 8/22/17
Sample Technician: M. Eckert
Sheet:

Well:	MW10-11D	Well:	MW13-1D	Well:	
Time:	1524	Time:	1619	Time:	
DTW:	3.61 FT BTOC	DTW:	7.13 FT BTOC	DTW:	FT BTOC
Well:	MW10-6D	Well:		Well:	
Time:	1540	Time:		Time:	
DTW:	Well has been abandoned FT BTOC	DTW:	FT BTOC	DTW:	FT BTOC
Well:	MW10-5D	Well:		Well:	
Time:	1552	Time:		Time:	
DTW:	4.74 FT BTOC	DTW:	FT BTOC	DTW:	FT BTOC
Well:	MW13-3D	Well:		Well:	
Time:	1608	Time:		Time:	
DTW:	4.16 FT BTOC	DTW:	FT BTOC	DTW:	FT BTOC
Well:	PZ13-1	Well:		Well:	
Time:	1610	Time:		Time:	
DTW:	3.40 FT BTOC	DTW:	FT BTOC	DTW:	FT BTOC
Well:	PZ13-1D	Well:		Well:	
Time:	1611	Time:		Time:	
DTW:	4.99 FT BTOC	DTW:	FT BTOC	DTW:	FT BTOC
Well:	MW13-6	Well:		Well:	
Time:	1615	Time:		Time:	
DTW:	Covered in Dirt. New Construction. FT BTOC	DTW:	FT BTOC	DTW:	FT BTOC
Well:	MW13-6D	Well:		Well:	
Time:	1615	Time:		Time:	
DTW:	Covered in Dirt. New Construction. FT BTOC	DTW:	FT BTOC	DTW:	FT BTOC
Well:	MW13-1	Well:		Well:	
Time:	1618	Time:		Time:	
DTW:	7.65 FT BTOC	DTW:	FT BTOC	DTW:	FT BTOC

Removed

Appendix D

Validation Reports

and

Laboratory Data

DATA VALIDATION REPORT

M2032.0001 (Savannah) Niagara

SAMPLE DELIVERY GROUP: B7I1791, B7I1792, B7I1832, B7I1879, B7I2484

Prepared for

Aerostar SES LLC

September 27, 2017

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS iii

I. INTRODUCTION 1

II. Sample Management 5

III. Method Analysis – Perfluorinated Compounds by Modified EPA Method 537 Modified 9
- III.1. Holding Times 9
- III.2. Calibration 9
  - III.2.1. Initial Calibration 9
  - III.2.2. Continuing Calibration 9
- III.3. Quality Control Samples 10
  - III.3.1. Method Blanks 10
  - III.3.2. Laboratory Control Samples 11
  - III.3.3. Matrix Spike/Matrix Spike Duplicate 11
- III.4. Field QC Samples 11
  - III.4.1. Field Blanks and Equipment Blanks 12
  - III.4.2. Field Duplicates 12
- III.5. Internal Standards Performance 13
- III.6. Compound Identification 14
- III.7. Compound Quantification and Reported Detection Limits 14
- III.8. System Performance 14

IV. Summary and Conclusions 15
- IV.1. Precision 15
- IV.2. Accuracy 15
- IV.3. Representativeness 15
- IV.4. Comparability 15
- IV.5. Completeness 16

V. References 17

TABLES

1 – Sample Identification

2 – Data Qualifier Reference

3 – Reason Code Reference

4 – Method Blank Detects

5 – Surrogate Recoveries

6 – FB/EB Detects

7 –FD RPDs

8 –Internal Standards Percent Recovery

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) Niagara

Contract: W9128F-15-D-0051

MEC^X Project No.: 1529.001H.01

Sample Delivery Groups: **B7I1791,** B7I1792, B7I1832, B7I1879, B7I2484

Project Manager: Jenny Vance

Matrix: Soil/Water

QC Level: Stage 2B, Stage 4

No. of Samples: 101

Laboratory: Maxxam

TABLE 1 - SAMPLE IDENTIFICATION

Sample Name	Lab Sample Name	Matrix	Collection	Method	Validation Level
NIGRA01-001-SO-007	EZK127	SO	2017-08-15 09:35	EPA 537 m	Stage 2B
NIGRA01-002-SO-008	EZK128	SO	2017-08-15 10:15	EPA 537 m	Stage 2B
NIGRA01-003-SO-010	EZK126	SO	2017-08-15 09:15	EPA 537 m	Stage 2B
NIGRA01-003-SS-001	EZK125	SO	2017-08-15 08:20	EPA 537 m	Stage 2B
NIGRA02-001-SO-011	EZK144	SO	2017-08-16 15:30	EPA 537 m	Stage 4
NIGRA02-001-SO-911	EZK145	SO	2017-08-16 15:30	EPA 537 m	Stage 2B
NIGRA02-001-SS-001	EZK142	SO	2017-08-16 14:40	EPA 537 m	Stage 2B
NIGRA02-001-SS-901	EZK143	SO	2017-08-16 14:40	EPA 537 m	Stage 2B
NIGRA03-001-SO-006	EZK123	SO	2017-08-14 14:55	EPA 537 m	Stage 2B
NIGRA03-001-SS-001	EZK121	SO	2017-08-14 14:15	EPA 537 m	Stage 2B
NIGRA03-002-SO-003	EZK124	SO	2017-08-14 15:30	EPA 537 m	Stage 4
NIGRA03-002-SS-001	EZK122	SO	2017-08-14 14:40	EPA 537 m	Stage 2B
NIGRA04-001-SO-007	EZK138	SO	2017-08-16 12:55	EPA 537 m	Stage 2B
NIGRA04-001-SO-907	EZK139	SO	2017-08-16 12:55	EPA 537 m	Stage 2B
NIGRA04-001-SS-001	EZK131	SO	2017-08-15 15:00	EPA 537 m	Stage 2B
NIGRA04-001-SS-901	EZK132	SO	2017-08-15 15:00	EPA 537 m	Stage 2B
NIGRA04-002-SO-004	EZK140	SO	2017-08-16 13:15	EPA 537 m	Stage 2B
NIGRA04-002-SS-001	EZK129	SO	2017-08-15 14:20	EPA 537 m	Stage 2B

Sample Name	Lab Sample Name	Matrix	Collection	Method	Validation Level
NIGRA04-003-SO-005	EZK141	SO	2017-08-16 13:45	EPA 537 m	Stage 2B
NIGRA04-003-SS-001	EZK130	SO	2017-08-15 14:55	EPA 537 m	Stage 2B
NIGRA06-001-SO-012	EZK134	SO	2017-08-16 08:45	EPA 537 m	Stage 2B
NIGRA06-001-SS-001	EZK133	SO	2017-08-16 08:05	EPA 537 m	Stage 2B
NIGRA06-002-SO-012	EZK137	SO	2017-08-16 10:40	EPA 537 m	Stage 4
NIGRA06-002-SS-001	EZK135	SO	2017-08-16 09:50	EPA 537 m	Stage 2B
NIGRA06-002-SS-901	EZK136	SO	2017-08-16 09:50	EPA 537 m	Stage 2B
NIGRA06-003-SO-007	EZK146	SO	2017-08-17 08:05	EPA 537 m	Stage 2B
NIGRA06-004-SS-001	EZK147	SO	2017-08-17 08:25	EPA 537 m	Stage 2B
NIGRA06-MW7-3D-014	EZK148	WG	2017-08-17 08:43	EPA 537 m	Stage 2B
NIGRA08-001-SO-008	EZK118	SO	2017-08-14 12:30	EPA 537 m	Stage 2B
NIGRA08-002-SO-010	EZK119	SO	2017-08-14 13:00	EPA 537 m	Stage 2B
NIGRA08-003-SO-008	EZK120	SO	2017-08-14 13:35	EPA 537 m	Stage 4
NIGRA03-002-GW-005	EZK343	WG	2017-08-16 16:21	EPA 537 m	Stage 2B
NIGRA06-001-GW-015	EZK345	WG	2017-08-17 09:25	EPA 537 m	Stage 4
NIGRA06-001-GW-915	EZK346	WG	2017-08-17 09:25	EPA 537 m	Stage 2B
NIGRA06-003-SS-001	EZK337	SO	2017-08-16 10:50	EPA 537 m	Stage 2B
NIGRA07-001-SD-001	EZK339	SE	2017-08-16 12:45	EPA 537 m	Stage 4
NIGRA07-001-SW-001	EZK340	WS	2017-08-16 12:45	EPA 537 m	Stage 2B
NIGRA07-002-SD-001	EZK335	SE	2017-08-16 08:50	EPA 537 m	Stage 2B
NIGRA07-002-SW-001	EZK336	WS	2017-08-16 08:50	EPA 537 m	Stage 2B
NIGRA07-003-SD-001	EZK333	SE	2017-08-16 08:30	EPA 537 m	Stage 2B
NIGRA07-003-SW-001	EZK334	WS	2017-08-16 08:30	EPA 537 m	Stage 2B
NIGRA08-001-GW-011	EZK341	WG	2017-08-16 15:30	EPA 537 m	Stage 2B
NIGRA08-003-GW-009	EZK342	WG	2017-08-16 15:19	EPA 537 m	Stage 2B
NIGRA-RS-003	EZK338	WQ	2017-08-16 12:35	EPA 537 m	Stage 2B
NIGRA-RS-004	EZK347	WQ	2017-08-17 09:50	EPA 537 m	Stage 2B
NIGRA-SB-001	EZK344	WQ	2017-08-17 07:20	EPA 537 m	Stage 2B
NIGRA01-001-SS-001	EZK690	SO	2017-08-15 08:28	EPA 537 m	Stage 2B

Sample Name	Lab Sample Name	Matrix	Collection	Method	Validation Level
NIGRA01-002-SS-001	EZK691	SO	2017-08-15 09:02	EPA 537 m	Stage 2B
NIGRA01-004-SD-001	EZK694	SE	2017-08-15 10:15	EPA 537 m	Stage 2B
NIGRA01-004-SD-901	EZK695	SE	2017-08-15 10:15	EPA 537 m	Stage 2B
NIGRA01-004-SW-001	EZK692	WS	2017-08-15 10:10	EPA 537 m	Stage 2B
NIGRA01-004-SW-901	EZK693	WS	2017-08-15 10:10	EPA 537 m	Stage 2B
NIGRA01-005-SD-001	EZK697	SE	2017-08-15 10:45	EPA 537 m	Stage 2B
NIGRA01-005-SW-001	EZK696	WS	2017-08-15 10:40	EPA 537 m	Stage 2B
NIGRA02-002-SO-014	EZK680	SO	2017-08-17 10:50	EPA 537 m	Stage 2B
NIGRA02-002-SS-001	EZK679	SO	2017-08-17 09:45	EPA 537 m	Stage 2B
NIGRA02-003-SO-014	EZK681	SO	2017-08-17 11:55	EPA 537 m	Stage 2B
NIGRA02-003-SS-001	EZK700	SO	2017-08-17 09:59	EPA 537 m	Stage 2B
NIGRA02-004-SO-012	EZK682	SO	2017-08-17 13:25	EPA 537 m	Stage 2B
NIGRA02-004-SS-001	EZK701	SO	2017-08-17 11:27	EPA 537 m	Stage 2B
NIGRA02-005-SD-001	EZK684	SE	2017-08-17 16:30	EPA 537 m	Stage 2B
NIGRA02-005-SW-001	EZK683	WS	2017-08-17 16:30	EPA 537 m	Stage 4
NIGRA06-004-SO-002	EZK678	SO	2017-08-17 08:45	EPA 537 m	Stage 2B
NIGRA06-MW7-1D-010	EZK699	WG	2017-08-15 15:11	EPA 537 m	Stage 2B
NIGRA06-MW7-2-005	EZK698	WG	2017-08-15 15:01	EPA 537 m	Stage 2B
NIGRA08-001-SS-001	EZK685	SO	2017-08-14 12:00	EPA 537 m	Stage 2B
NIGRA08-002-SS-001	EZK686	SO	2017-08-14 12:20	EPA 537 m	Stage 2B
NIGRA08-003-SS-001	EZK687	SO	2017-08-14 12:55	EPA 537 m	Stage 2B
NIGRA-RS-001	EZK688	WQ	2017-08-14 11:50	EPA 537 m	Stage 2B
NIGRA-RS-002	EZK689	WQ	2017-08-15 08:07	EPA 537 m	Stage 2B
NIGRA05-001-GW-005	EZN229	WG	2017-08-22 08:55	EPA 537 m	Stage 2B
NIGRA05-001-SO-004	EZN227	SO	2017-08-22 08:40	EPA 537 m	Stage 4
NIGRA05-001-SO-904	EZN228	SO	2017-08-22 08:40	EPA 537 m	Stage 2B
NIGRA05-001-SS-001	EZN226	SO	2017-08-22 08:30	EPA 537 m	Stage 2B
NIGRA05-002-SO-002	EZN234	SO	2017-08-22 09:47	EPA 537 m	Stage 2B
NIGRA05-002-SS-001	EZN233	SO	2017-08-22 09:42	EPA 537 m	Stage 2B

Sample Name	Lab Sample Name	Matrix	Collection	Method	Validation Level
NIGRA05-003-GW-006	EZN235	WG	2017-08-22 11:45	EPA 537 m	Stage 2B
NIGRA05-003-SO-005	EZN231	SO	2017-08-22 09:13	EPA 537 m	Stage 2B
NIGRA05-003-SS-001	EZN230	SO	2017-08-22 09:07	EPA 537 m	Stage 2B
NIGRA07-004-SD-001	EZN239	SE	2017-08-22 11:35	EPA 537 m	Stage 2B
NIGRA07-004-SW-001	EZN238	WS	2017-08-22 11:35	EPA 537 m	Stage 2B
NIGRA-IDW-WS	EZN236	SO	2017-08-22 12:00	EPA 537 m	Stage 2B
NIGRA-IDW-WW	EZN237	WG	2017-08-22 12:00	EPA 537 m	Stage 2B
NIGRARS-007	EZN232	WQ	2017-08-22 09:35	EPA 537 m	Stage 2B
NIGRA01-001-GW-007	EZK115	WG	2017-08-18 12:48	EPA 537 m	Stage 2B
NIGRA01-002-GW-008	EZK114	WG	2017-08-18 12:37	EPA 537 m	Stage 2B
NIGRA01-003-GW-008	EZK101	WG	2017-08-18 12:27	EPA 537 m	Stage 4
NIGRA02-001-GW-015	EZK104	WG	2017-08-18 15:08	EPA 537 m	Stage 2B
NIGRA02-001-GW-915	EZK105	WG	2017-08-18 15:08	EPA 537 m	Stage 2B
NIGRA02-002-GW-014	EZK107	WG	2017-08-21 08:08	EPA 537 m	Stage 2B
NIGRA02-003-GW-016	EZK116	WG	2017-08-21 08:15	EPA 537 m	Stage 2B
NIGRA02-004-GW-015	EZK108	WG	2017-08-21 08:35	EPA 537 m	Stage 2B
NIGRA03-001-GW-006	EZK103	WG	2017-08-18 15:20	EPA 537 m	Stage 2B
NIGRA04-001-GW-005	EZK109	WG	2017-08-21 09:10	EPA 537 m	Stage 2B
NIGRA04-001-GW-905	EZK110	WG	2017-08-21 09:10	EPA 537 m	Stage 2B
NIGRA04-003-GW-005	EZK117	WG	2017-08-21 09:09	EPA 537 m	Stage 4
NIGRA06-002-GW-015	EZK112	WG	2017-08-18 07:55	EPA 537 m	Stage 2B
NIGRA06-003-GW-009	EZK111	WG	2017-08-21 09:45	EPA 537 m	Stage 2B
NIGRA08-002-GW-010	EZK102	WG	2017-08-18 14:58	EPA 537 m	Stage 2B
NIGRARS-005	EZK113	WQ	2017-08-18 12:10	EPA 537 m	Stage 2B
NIGRA-RS-006	EZK106	WQ	2017-08-21 07:45	EPA 537 m	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) B7I1791, B7I1792, B7I1832, B7I1879, B7I2484:

- The COCs noted custody seals were present and intact upon receipt.
- Sample cooler temperatures were generally <10°C, though some were above the upper temperature limit of ≤6°C. Data for samples from coolers with temperatures >10°C were qualified.
- SDG B7I1832: In SDG B7I1832, one temperature measurement out of three was >10°C at 11°C. It was noted on the Chain of Custody that the samples were "on ice". Sample data has been qualified as estimated (J/UJ).
- SDG B7I1879: For SDG B7I1879, cooler temperature measurements were 12.2, 13.6 and 12.0°C. Nondetects have been rejected (R) and detected compounds were qualified as estimated (J).
- SDG B7I1791: Cooler temperatures were 6.5, 6.6, and 6.2°C, greater than the upper temperature limit of ≤6°C. These exceedances were not considered sufficient to require qualification of the data.
- SDG B7I1792: Cooler temperatures were 8.6, 6.7, and 9.6°C, greater than the upper temperature limit of ≤6°C. These exceedances were not considered sufficient to require qualification of the data.
- SDG B7I2484: no issues were noted.

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.
JB	The reported concentration is less than 5 times the concentration reported in an associated field or lab blank and the associated numerical value is an approximate concentration of the analyte in the sample.
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 $r^2 < 0.99$

Reason Code	Definition
04D	ICAL % Recovery
05	Continuing calibration results outside specified criteria
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

Reason Code	Definition
20*	Pesticide clean-up checks
21	Target compound identification
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 MODIFIED

K. Zilis of MEC^X reviewed these SDGs October 12 to October 18, 2017

III.1. HOLDING TIMES

SDGs B7I1791, B7I1832, B7I1879, B7I2484

The holding times specified in the QAPP were met. Samples were extracted within 28 days of collection and analyzed within 45 days of extraction.

In SDG B71792, sample NIGRA06-MW7-3D-014 was re-extracted past the 28 day holding time. The target compounds reported from this re-extraction were qualified as estimated nondetects (UJ) as noted in Table 4 below.

Table 4-Extraction Holding Time

SDG B7I1792

Extraction Batch	Analyte	Affected Samples
5159897	PFTeDA PFTriDA	EZK148

III.2. CALIBRATION

Calibration criteria were met, with exceptions noted in the tables below.

III.2.1. *INITIAL CALIBRATION*

SDGs B7I1791, B7I1792, B7I1832, B7I1879, B7I2484

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. This deviation from EPA Method 537 is an acceptable deviation for DoD projects.

III.2.2. *CONTINUING CALIBRATION*

With exceptions listed in the table below, 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%. Results associated with the calibration outliers were qualified as estimated (J for detects and UJ for nondetects).

Table 5-Continuing Calibration Recoveries

SDG B7I1791

ICV or CCV date / time / instrument	Analyte	Recovery	Affected Samples
All compliant	NA	NA	NA

SDG B7I1792

ICV or CCV date / time / instrument	Analyte	Recovery	Affected Samples
ICV 09/08/2017 / 1:17P / LCMS04	8:2-FTS	127%	NIGRA08-001-SO-008 NIGRA08-002-SO-010 NIGRA08-003-SO-008 NIGRA03-001-SS-001 NIGRA03-002-SS-001 NIGRA03-001-SO-006 NIGRA03-002-SO-003 NIGRA01-003-SO-010 NIGRA01-001-SO-007 NIGRA01-002-SS-008 NIGRA04-002-SS-001 NIGRA04-003-SS-001 NIGRA04-001-SS-001 NIGRA04-001-SS-001 NIGRA06-001-SS-001

SDG B7I1832

ICV or CCV date / time / instrument	Analyte	Recovery	Affected Samples
All compliant	NA	NA	NA

SDG B7I1879

ICV or CCV date / time / instrument	Analyte	Recovery	Affected Samples
All compliant	NA	NA	NA

SDG B7I2484

ICV or CCV date / time / instrument	Analyte	Recovery	Affected Samples
09/09/2017 / 6:38P / LCMS04	PFOS	127%	NIGRA05-001-GW-005 NIGRA05-003-GW-006 NIGRA-IDW-WW NIGRA07-007-SW-001

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).

SDGs B7I1791, B7I1792, B7I1832, B7I1879, B7I2484
The method blanks had no detects.

III.3.2. *LABORATORY CONTROL SAMPLES*

SDGs B7I1791, B7I1792, B7I1832, B7I1879, B7I2484
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. *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 the exceptions noted below, recoveries and RPDs affecting sample data were within the control limits of 70-130% and ≤30%, respectively.

SDG B7I1791
Matrix spikes were performed on water sample NIGRA02-001-GW-015. All recoveries and RPDs were within QC limits.

SDG B7I1792
Matrix spikes were performed on soil samples NIGRA04-001-SS-001, NIGRA02-001-SO-011, NIGRA02-001-SS-001 and water sample NIGRA06-MW7-3D-014. NIGRA04-001-SS-001 was not analyzed undiluted and spike recoveries were not calculated. All matrix spike recoveries and RPDs were within QC limits for NIGRA02-001-SO-011 and water sample NIGRA06-MW7-3D-014. The RPD for PFOA was outside criteria at 32% comparing spike results for NIGRA02-001-SS-001. PFOA was qualified as estimated (J) in the site sample.

SDG B7I1832
Matrix spikes were performed on water sample NIGRA08-003-GW. All recoveries and RPDs were within QC limits. MEC^X evaluated method accuracy for soils based on the soil LCS results.

SDG B7I1879
Matrix spikes were not evaluated in this SDG. MS/MSD were performed on soil sample NIGRA01-004-SD-001 but results were not calculated because the native sample was not analyzed undiluted. Due to high concentrations of target compounds, a laboratory duplicate was performed on water sample NIGRA01-004-SW-001.

SDG B7I2484
MS/MSD analyses were performed on soil sample NIGRA05-002-SO-002. All recoveries and RPDs were within QC limits. Matrix spikes were not performed on water samples in this SDG. MEC^X evaluated method accuracy and precision for soils and method accuracy for waters based on the QC samples and soil and water LCS 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*

Field and equipment blanks were collected for soil and groundwater samples at the frequency designated in the QAPP. The field and equipment blanks are listed below. PFAS analytes were not detected in any of these blanks, so no qualifications were applied to the associated samples.

Table 6-FB/EB Detects

SDG B7I1791

Field or Equipment Blank	Detects	Concentration
NIGRA-RS-005	none	N/A
NIGRA-RS-006	none	N/A

SDG B7I1832

Field or Equipment Blank	Detects	Concentration
NIGRA-RS-003 (EB)	none	N/A
NIGRA-RS-004 (EB)	none	N/A
NIGRA-SB-001 (AB)	none	N/A

SDG B7I1879

Field or Equipment Blank	Detects	Concentration
NIGRA-RS-001	none	N/A
NIGRA-RS-002	none	N/A

SDG B7I2484

Field or Equipment Blank	Detects	Concentration
NIGRARS-007	none	N/A

III.4.2. *FIELD DUPLICATES*

Field duplicate pairs are listed below. RPDs for detections ≥the LOQ were within the control limits of ≤30% for soils and waters and detected values below the LOQ, in one or both samples of a pair, were within control limit of ± the LOQ, with exceptions noted in the tables below. In the case of samples analyzed at different dilutions, the greater of the two LOQs was used for comparison. Target analyte results for the outlier RPDs were qualified as estimated (J) in both samples of a pair.

Table 7-FD RPDs

SDG B7I1791

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
NIGRA02-001-GW-015	NIGRA02-001-GW-915	N/A	none
NIGRA04-001-GW-005	NIGRA04-001-GW-905	N/A	none

SDG B7I1792

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
NIGRA04-001-SS-001	NIGRA04-001-SS-901	FOSA PFOS	37% 48%
NIGRA06-002-SS-001	NIGRA06-002-SS-901	PFOA	33%

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
NIGRA04-001-SO-007	NIGRA04-001-SO-907	8:2 FTS PFHxS FOSA PFOS	64% 36% 71% 56%
NIGRA02-001-SS-001	NIGRA02-001-SS-901	6:2 FTS 8:2 FTS	128% 40%

SDG B7I1832

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
NIGRA06-001-GW-015	NIGRA06-001-GW-915	N/A	none

SDG B7I1879

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
NIGRA01-004-SD-001	NIGRA01-004-SD-901	PFHxS FOSA PFOS	76% 114% 83%
NIGRA01-004-SW-001	NIGRA01-004-SW-901	N/A	None

SDG B7I2484

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
NIGRA05-001-SO-004	NIGRA05-001-SO-904	PFBS PFHpA PFHxS PFHxA PFOA PFOS PFPA	102% 89% 79% 101% 73% 103% 80%

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) in the affected sample.

Table 8-Internal Standards Percent Recovery

SDGs B7I1791, B7I1832, B7I1879

These SDGs had no internal standard outliers.

SDG B7I1792

Internal Standard	% Recovery	Affected Sample	Associated Target Analyte(s)
M2-PFTeA	48%	NIGRA06-MW7-3D-014	PFTeA PFTriA

SDG B7I2484

Internal Standard	% Recovery	Affected Sample	Associated Target Analyte(s)
M2- PFTeA	45%	NIGRA07-004-SW-001	PFTeA PFTriA

III.6. Compound Identification

SDGs B7I1791, B7I1792, B7I1832, B7I1879, B7I2484

Compound identification was verified for the following samples: NIGRA01-003-GW-008 and NIGRA04-003-GW-005 (B7I1791), NIGRA02-001-SO-011, NIGRA03-002-SO-003, NIGRA06-002-SO-012 and NIGRA08-003-SO-008 (B7I1792), NIGRA06-001-GW-015 and NIGRA07-001-SD-001 (B7I1832), NIGRA02-005-SW-001 (B7I1879) and NIGRA05-001-SO-004 (B7I2484). 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

SDGs B7I1791, B7I1792, B7I1832, B7I1879, B7I2484

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. However, water samples and soil extracts were prescreened to obtain estimated concentrations so that extracts could be appropriately diluted. Some samples with high concentrations of PFCs were not analyzed undiluted. Reporting limits have been adjusted accordingly. Analytes were reported from the least dilute analysis possible 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 B7I1791, B7I1792, B7I1832, B7I1879, B7I2484

No issues were noted with system performance.

IV. SUMMARY AND CONCLUSIONS

MEC^X evaluated a total of 1,674 data records from field samples during the validation and qualified 668 records (39.9% of the data) as estimated nondetects (UJ), estimated values (J) or rejected (R). The qualification was required for elevated cooler temperatures, holding time exceedances, continuing calibration outliers, MS/MSD RPD exceedances, internal standard recovery 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.

With the exception of the elevated cooler temperatures, the quality of the data was acceptable. The precision (97.7%) and accuracy (98.5%) were acceptable for the project. Data quality indicators (DQI) (representativeness and comparability) met the project objectives. The completeness goal of 90% for the project was not met. 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 matrix spikes and the RPD for the field duplicate pair analysis. Precision was measured at 97.7%. 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 holding times, calibration, 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 98.5%.

Samples were qualified for holding time exceedances, continuing calibration outliers, and internal standard outliers.

IV.3. REPRESENTATIVENESS

The measures of representativeness – sample handling, analytical blank analysis, were not met. Samples in this evaluation were received above the method specified requirements resulting in 222 results being rejected and 390 results being qualified as estimated (UJ for nondetects and J for detects); an impact to 36.6% of the data. 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. The laboratory utilized a modification of EPA Method 537 which was consistent with Department of Defense (DoD) Quality Systems Manual (QSM) version 5.1 guidance. 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. Of the 1,674 target data points, 222 data points were rejected, resulting in a completeness of 86.7%. Data were nondetects rejected for elevated cooler temperatures.

The data completeness for the project falls slightly below the project goals of 90% as stated in Step 6 of Worksheet #11 in the Final Quality Assurance Project Plan Site Inspections of Fire Fighting Foam Usage at Various Air Force Bases in the Eastern United States. The data users should evaluate compound by compound to determine the overall usability of the data as some target compounds may meet the 90% completeness goal.

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, 2017. *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 15, Field Sampling Plan for Niagara Falls Air Reserve Base, Niagara County, New York*, August 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: B7I1791

Analysis Method: EPA 537 m

Sample Name NIGRA01-001-GW-007 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK115 **Sample Date/Time:** 2017-08-18 12:48 **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	8.5	2.0	5.0	8.0	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<6.0	2.7	6.0	8.0	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	26	1.5	5.0	8.0	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	24	1.5	4.0	8.0	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<6.0	2.4	6.0	8.0	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<4.0	1.3	4.0	8.0	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<5.0	1.7	5.0	8.0	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	27	1.5	3.0	8.0	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	870	24	50	80	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	230	1.1	3.0	8.0	ug/L			
PERFLUORONONANOIC ACID	375-95-1	7.7	1.3	4.0	8.0	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<40	15	40	80	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	910	23	50	80	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	110	1.4	3.0	8.0	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	53	1.6	4.0	8.0	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<50	22	50	80	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<60	28	60	80	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<5.0	1.8	5.0	8.0	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA01-002-GW-008 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK114 **Sample Date/Time:** 2017-08-18 12:37 **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	86	2.0	5.0	8.0	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	3.7	2.7	6.0	8.0	ug/L	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	30	1.5	5.0	8.0	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	26	1.5	4.0	8.0	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<6.0	2.4	6.0	8.0	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<4.0	1.3	4.0	8.0	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<5.0	1.7	5.0	8.0	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	30	1.5	3.0	8.0	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	790	24	50	80	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	210	1.1	3.0	8.0	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<40	13	40	80	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	4.9	1.5	4.0	8.0	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	330	2.3	5.0	8.0	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	110	1.4	3.0	8.0	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	68	1.6	4.0	8.0	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<50	22	50	80	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<60	28	60	80	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<5.0	1.8	5.0	8.0	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA01-003-GW-008 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK101 **Sample Date/Time:** 2017-08-18 12:27 **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	75	2.0	5.0	8.0	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	11	2.7	6.0	8.0	ug/L			
PERFLUOROBUTANE SULFONATE	29420-43-3	31	1.5	5.0	8.0	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	36	1.5	4.0	8.0	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<60	24	60	80	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<4.0	1.3	4.0	8.0	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<5.0	1.7	5.0	8.0	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	21	1.5	3.0	8.0	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	750	24	50	80	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	210	1.1	3.0	8.0	ug/L			
PERFLUORONONANOIC ACID	375-95-1	14	1.3	4.0	8.0	ug/L			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	22	1.5	4.0	8.0	ug/L			
PERFLUOROOCTANE SULFONATE	1763-23-1	1200	23	50	80	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	110	1.4	3.0	8.0	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	56	1.6	4.0	8.0	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<50	22	50	80	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<60	28	60	80	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<5.0	1.8	5.0	8.0	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA02-001-GW-015 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK104 **Sample Date/Time:** 2017-08-18 15:08 **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	0.0075	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	<0.010	0.0048	0.010	0.020	ug/L	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	0.018	0.0043	0.010	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	<0.010	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	0.0038	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	0.012	0.0026	0.010	0.020	ug/L	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	0.030	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 NIGRA02-001-GW-915 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK105 **Sample Date/Time:** 2017-08-18 15:08 **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	0.018	0.0043	0.010	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	<0.010	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	0.0038	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	0.0092	0.0026	0.010	0.020	ug/L	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	0.032	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 NIGRA02-002-GW-014 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK107 **Sample Date/Time:** 2017-08-21 08:08 **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	0.35	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	0.013	0.0048	0.010	0.020	ug/L	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	0.77	0.0043	0.010	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	0.72	0.0033	0.010	0.020	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	0.12	0.0034	0.010	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	1.8	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.036	0.0038	0.010	0.020	ug/L			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.058	0.0026	0.010	0.020	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.40	0.0046	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	5.0	0.027	0.10	0.20	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 NIGRA02-003-GW-016 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK116 **Sample Date/Time:** 2017-08-21 08:15 **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	<0.010	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	0.024	0.0048	0.010	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.018	0.0043	0.010	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	0.0079	0.0033	0.010	0.020	ug/L	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.038	0.0034	0.010	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.062	0.0029	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	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	0.0072	0.0026	0.010	0.020	ug/L	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	0.0062	0.0046	0.010	0.020	ug/L	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.099	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 NIGRA02-004-GW-015 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK108 **Sample Date/Time:** 2017-08-21 08:35 **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	<0.010	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	<0.010	0.0043	0.010	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	0.0038	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	0.011	0.0026	0.010	0.020	ug/L	J	J	
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 NIGRA03-001-GW-006 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK103 **Sample Date/Time:** 2017-08-18 15:20 **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	<0.010	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	0.014	0.0048	0.010	0.020	ug/L	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	0.030	0.0043	0.010	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	0.023	0.0034	0.010	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.058	0.0029	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	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	0.029	0.0026	0.010	0.020	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.011	0.0046	0.010	0.020	ug/L	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.097	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 NIGRA04-001-GW-005 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK109 **Sample Date/Time:** 2017-08-21 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	4.0	0.032	0.10	0.20	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.52	0.036	0.10	0.20	ug/L			
PERFLUOROBUTANE SULFONATE	29420-43-3	0.95	0.048	0.10	0.20	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.96	0.043	0.10	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	0.64	0.033	0.10	0.20	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	7.3	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	0.16	0.038	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.13	0.036	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	22	0.13	0.10	1.0	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	1.1	0.046	0.10	0.20	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	1.7	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 NIGRA04-001-GW-905 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK110 **Sample Date/Time:** 2017-08-21 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	4.6	0.032	0.10	0.20	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.55	0.036	0.10	0.20	ug/L			
PERFLUOROBUTANE SULFONATE	29420-43-3	0.94	0.048	0.10	0.20	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.75	0.043	0.10	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	0.59	0.033	0.10	0.20	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	6.8	0.034	0.10	0.20	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	2.1	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.15	0.038	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.12	0.036	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	25	0.13	0.50	1.0	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	1.1	0.046	0.10	0.20	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	1.6	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 NIGRA04-003-GW-005 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK117 **Sample Date/Time:** 2017-08-21 09:09 **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	0.21	0.0032	0.010	0.020	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.0099	0.0036	0.010	0.020	ug/L	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.65	0.0048	0.010	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.38	0.0043	0.010	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	0.36	0.0033	0.010	0.020	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	4.6	0.034	0.10	0.20	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	2.1	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.030	0.0038	0.010	0.020	ug/L			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.016	0.0036	0.010	0.020	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	2.1	0.026	0.10	0.20	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.47	0.0046	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	1.2	0.027	0.10	0.20	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 NIGRA06-002-GW-015 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK112 **Sample Date/Time:** 2017-08-18 07:55 **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	0.011	0.0048	0.010	0.020	ug/L	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	<0.010	0.0043	0.010	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	0.019	0.0034	0.010	0.020	ug/L	J	J	
PERFLUOROHEXANOIC ACID	307-24-4	0.022	0.0029	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	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	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	0.0053	0.0046	0.010	0.020	ug/L	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.029	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 NIGRA06-003-GW-009 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK111 **Sample Date/Time:** 2017-08-21 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	<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	0.039	0.0048	0.010	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.039	0.0043	0.010	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	0.013	0.0033	0.010	0.020	ug/L	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.046	0.0034	0.010	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.058	0.0029	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	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	0.061	0.0026	0.010	0.020	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.0061	0.0046	0.010	0.020	ug/L	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.074	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 NIGRA08-002-GW-010 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK102 **Sample Date/Time:** 2017-08-18 14:58 **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	<0.010	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	<0.010	0.0043	0.010	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	0.024	0.0034	0.010	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.0099	0.0029	0.010	0.020	ug/L	J	J	
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.0065	0.0036	0.010	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	<0.010	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 NIGRARS-005 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK113 **Sample Date/Time:** 2017-08-18 12:10 **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	<0.010	0.0043	0.010	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	0.0038	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 NIGRA-RS-006 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK106 **Sample Date/Time:** 2017-08-21 07:45 **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	<0.010	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	<0.010	0.0043	0.010	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	0.0038	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: B7I1792

Analysis Method: EPA 537 m

Sample Name NIGRA01-001-SO-007 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK127 **Sample Date/Time:** 2017-08-15 09:35 **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	<0.66	0.25	0.66	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	UJ	05B
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	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.66	0.21	0.66	1.1	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.66	0.29	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.66	0.23	0.66	1.1	ug/kg	U	U	
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	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.66	0.20	0.66	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA01-002-SO-008 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK128 **Sample Date/Time:** 2017-08-15 10:15 **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	<0.60	0.23	0.60	1.0	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.60	0.32	0.60	1.0	ug/kg	U	UJ	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.17	0.60	1.0	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.60	0.23	0.60	1.0	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.60	0.23	0.60	1.0	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.40	0.13	0.40	1.0	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.60	0.22	0.60	1.0	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.60	0.17	0.60	1.0	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.60	0.23	0.60	1.0	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.60	0.19	0.60	1.0	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.60	0.17	0.60	1.0	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.60	0.26	0.60	1.0	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.92	0.21	0.60	1.0	ug/kg	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	<0.60	0.26	0.60	1.0	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.60	0.18	0.60	1.0	ug/kg	U	U	
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	<0.60	0.18	0.60	1.0	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA01-003-SO-010 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK126 **Sample Date/Time:** 2017-08-15 09:15 **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	<0.66	0.25	0.66	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	UJ	05B
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	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.66	0.21	0.66	1.1	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.66	0.29	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.37	0.23	0.66	1.1	ug/kg	J	J	
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	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.66	0.20	0.66	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA01-003-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK125 **Sample Date/Time:** 2017-08-15 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	<6.6	2.5	6.6	11	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<6.6	3.5	6.6	11	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	2.6	1.9	6.6	11	ug/kg	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	<6.6	2.5	6.6	11	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	11	2.5	6.6	11	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	<4.4	1.4	4.4	11	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<6.6	2.4	6.6	11	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<6.6	1.9	6.6	11	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	55	2.5	6.6	11	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	4.9	2.1	6.6	11	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	2.6	1.9	6.6	11	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	20	2.9	6.6	11	ug/kg			
PERFLUOROOCTANE SULFONATE	1763-23-1	1700	23	66	110	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	5.6	2.9	6.6	11	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	2.2	2.0	6.6	11	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<4.4	1.2	4.4	11	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	1.9	1.3	4.4	11	ug/kg	J	J	
PERFLUOROUNDECANOIC ACID	2058-94-8	8.4	2.0	6.6	11	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name NIGRA02-001-SO-011 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK144 **Sample Date/Time:** 2017-08-16 15:30 **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	<0.59	0.23	0.59	0.99	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.59	0.32	0.59	0.99	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.59	0.17	0.59	0.99	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.59	0.23	0.59	0.99	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.59	0.23	0.59	0.99	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.40	0.13	0.40	0.99	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.59	0.22	0.59	0.99	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.59	0.17	0.59	0.99	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.59	0.23	0.59	0.99	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.59	0.19	0.59	0.99	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.59	0.17	0.59	0.99	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.59	0.26	0.59	0.99	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.59	0.21	0.59	0.99	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.59	0.26	0.59	0.99	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.59	0.18	0.59	0.99	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.40	0.11	0.40	0.99	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.40	0.12	0.40	0.99	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.59	0.18	0.59	0.99	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA02-001-SO-911 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK145 **Sample Date/Time:** 2017-08-16 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	<0.74	0.28	0.74	1.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.74	0.39	0.74	1.2	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.74	0.21	0.74	1.2	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.74	0.28	0.74	1.2	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.74	0.28	0.74	1.2	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.49	0.16	0.49	1.2	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.74	0.27	0.74	1.2	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.74	0.21	0.74	1.2	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.74	0.28	0.74	1.2	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.74	0.23	0.74	1.2	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.74	0.21	0.74	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.74	0.32	0.74	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.74	0.26	0.74	1.2	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.74	0.32	0.74	1.2	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.74	0.22	0.74	1.2	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.49	0.14	0.49	1.2	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.49	0.15	0.49	1.2	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.74	0.22	0.74	1.2	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA02-001-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK142 **Sample Date/Time:** 2017-08-16 14:40 **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	5.3	0.24	0.62	1.0	ug/kg		J	17
8:2 FLUOROTELOMER SULFONATE	39108-34-4	1.4	0.33	0.62	1.0	ug/kg		J	17
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.62	0.18	0.62	1.0	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	1.0	0.24	0.62	1.0	ug/kg			
PERFLUORODECANE SULFONATE	335-77-3	0.32	0.24	0.62	1.0	ug/kg	J	J	
PERFLUORODECANOIC ACID	335-76-2	1.7	0.14	0.42	1.0	ug/kg			
PERFLUORODODECANOIC ACID	307-55-1	<0.62	0.23	0.62	1.0	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	2.4	0.18	0.62	1.0	ug/kg			
PERFLUOROHEXANE SULFONATE	108427-53-8	5.4	0.24	0.62	1.0	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	8.1	0.20	0.62	1.0	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	3.7	0.18	0.62	1.0	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.62	0.27	0.62	1.0	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	12	0.22	0.62	1.0	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	8.8	0.27	0.62	1.0	ug/kg		J	08B
PERFLUOROPENTANOIC ACID	2706-90-3	5.7	0.19	0.62	1.0	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.42	0.11	0.42	1.0	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.42	0.12	0.42	1.0	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.45	0.19	0.62	1.0	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name NIGRA02-001-SS-901 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK143 **Sample Date/Time:** 2017-08-16 14:40 **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	24	0.21	0.55	0.92	ug/kg		J	17
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.93	0.29	0.55	0.92	ug/kg		J	17
PERFLUOROBUTANE SULFONATE	29420-43-3	0.23	0.16	0.55	0.92	ug/kg	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	1.2	0.21	0.55	0.92	ug/kg			
PERFLUORODECANE SULFONATE	335-77-3	<0.55	0.21	0.55	0.92	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	2.0	0.12	0.37	0.92	ug/kg			
PERFLUORODODECANOIC ACID	307-55-1	0.41	0.20	0.55	0.92	ug/kg	J	J	
PERFLUOROHEPTANOIC ACID	375-85-9	2.1	0.16	0.55	0.92	ug/kg			
PERFLUOROHEXANE SULFONATE	108427-53-8	5.3	0.21	0.55	0.92	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	8.6	0.17	0.55	0.92	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	4.0	0.16	0.55	0.92	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.55	0.24	0.55	0.92	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	13	0.19	0.55	0.92	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	8.5	0.24	0.55	0.92	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	5.9	0.17	0.55	0.92	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.37	0.10	0.37	0.92	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.37	0.11	0.37	0.92	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.46	0.17	0.55	0.92	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name NIGRA03-001-SO-006 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK123 **Sample Date/Time:** 2017-08-14 14:55 **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	<0.53	0.20	0.53	0.88	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.53	0.28	0.53	0.88	ug/kg	U	UJ	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.53	0.15	0.53	0.88	ug/kg	U	U	
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	<0.35	0.11	0.35	0.88	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.53	0.19	0.53	0.88	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.53	0.15	0.53	0.88	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.53	0.20	0.53	0.88	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.53	0.17	0.53	0.88	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.53	0.15	0.53	0.88	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.53	0.23	0.53	0.88	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.38	0.18	0.53	0.88	ug/kg	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	<0.53	0.23	0.53	0.88	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.53	0.16	0.53	0.88	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.35	0.097	0.35	0.88	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.35	0.11	0.35	0.88	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.53	0.16	0.53	0.88	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA03-001-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK121 **Sample Date/Time:** 2017-08-14 14:15 **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	<0.66	0.25	0.66	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	UJ	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	0.55	0.25	0.66	1.1	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	1.8	0.14	0.44	1.1	ug/kg			
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.81	0.19	0.66	1.1	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.46	0.25	0.66	1.1	ug/kg	J	J	
PERFLUOROHEXANOIC ACID	307-24-4	0.60	0.21	0.66	1.1	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	1.4	0.19	0.66	1.1	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.66	0.29	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	2.3	0.23	0.66	1.1	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	2.2	0.29	0.66	1.1	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	1.1	0.20	0.66	1.1	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.70	0.20	0.66	1.1	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name NIGRA03-002-SO-003 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK124 **Sample Date/Time:** 2017-08-14 15:30 **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	<0.59	0.23	0.59	0.98	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.59	0.31	0.59	0.98	ug/kg	U	UJ	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.59	0.17	0.59	0.98	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.59	0.23	0.59	0.98	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.59	0.23	0.59	0.98	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.39	0.13	0.39	0.98	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.59	0.22	0.59	0.98	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.42	0.17	0.59	0.98	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.38	0.23	0.59	0.98	ug/kg	J	J	
PERFLUOROHEXANOIC ACID	307-24-4	<0.59	0.19	0.59	0.98	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.59	0.17	0.59	0.98	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.59	0.25	0.59	0.98	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.90	0.21	0.59	0.98	ug/kg	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	0.40	0.25	0.59	0.98	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.59	0.18	0.59	0.98	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.39	0.11	0.39	0.98	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.39	0.12	0.39	0.98	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.59	0.18	0.59	0.98	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA03-002-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK122 **Sample Date/Time:** 2017-08-14 14:40 **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	<0.66	0.25	0.66	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.57	0.35	0.66	1.1	ug/kg	J	J	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	0.50	0.25	0.66	1.1	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	2.2	0.14	0.44	1.1	ug/kg			
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	1.4	0.19	0.66	1.1	ug/kg			
PERFLUOROHEXANE SULFONATE	108427-53-8	0.76	0.25	0.66	1.1	ug/kg	J	J	
PERFLUOROHEXANOIC ACID	307-24-4	0.80	0.21	0.66	1.1	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	2.9	0.19	0.66	1.1	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.66	0.29	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	5.6	0.23	0.66	1.1	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	3.8	0.29	0.66	1.1	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	1.2	0.20	0.66	1.1	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.87	0.20	0.66	1.1	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name NIGRA04-001-SO-007 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK138 **Sample Date/Time:** 2017-08-16 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	1.7	0.20	0.52	0.87	ug/kg			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	3.5	0.28	0.52	0.87	ug/kg		J	17
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.52	0.15	0.52	0.87	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.52	0.20	0.52	0.87	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.52	0.20	0.52	0.87	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.35	0.11	0.35	0.87	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.52	0.19	0.52	0.87	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.41	0.15	0.52	0.87	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	1.8	0.20	0.52	0.87	ug/kg		J	17
PERFLUOROHEXANOIC ACID	307-24-4	0.83	0.17	0.52	0.87	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	0.26	0.15	0.52	0.87	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	2.7	0.23	0.52	0.87	ug/kg		J	17
PERFLUOROOCTANE SULFONATE	1763-23-1	50	1.8	5.2	8.7	ug/kg		J	17
PERFLUOROOCTANOIC ACID	335-67-1	0.49	0.23	0.52	0.87	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.49	0.16	0.52	0.87	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.35	0.096	0.35	0.87	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.35	0.10	0.35	0.87	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.52	0.16	0.52	0.87	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA04-001-SO-907 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK139 **Sample Date/Time:** 2017-08-16 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	1.8	0.24	0.62	1.0	ug/kg			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	6.8	0.33	0.62	1.0	ug/kg		J	17
PERFLUOROBUTANE SULFONATE	29420-43-3	0.26	0.18	0.62	1.0	ug/kg	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	<0.62	0.24	0.62	1.0	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	0.93	0.24	0.62	1.0	ug/kg	J	J	
PERFLUORODECANOIC ACID	335-76-2	<0.41	0.13	0.41	1.0	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.62	0.23	0.62	1.0	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.47	0.18	0.62	1.0	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	2.6	0.24	0.62	1.0	ug/kg		J	17
PERFLUOROHEXANOIC ACID	307-24-4	1.2	0.20	0.62	1.0	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	0.44	0.18	0.62	1.0	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	5.7	0.27	0.62	1.0	ug/kg		J	17
PERFLUOROOCTANE SULFONATE	1763-23-1	89	2.2	6.2	10	ug/kg		J	17
PERFLUOROOCTANOIC ACID	335-67-1	0.84	0.27	0.62	1.0	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.65	0.19	0.62	1.0	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.41	0.11	0.41	1.0	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.41	0.12	0.41	1.0	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.62	0.19	0.62	1.0	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA04-001-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK131 **Sample Date/Time:** 2017-08-15 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	2.8	2.3	6.0	10	ug/kg	J	J	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	6.9	3.2	6.0	10	ug/kg	J	J	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<6.0	1.7	6.0	10	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	2.5	2.3	6.0	10	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	6.7	2.3	6.0	10	ug/kg	J	J	
PERFLUORODECANOIC ACID	335-76-2	<4.0	1.3	4.0	10	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<6.0	2.2	6.0	10	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	4.3	1.7	6.0	10	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	15	2.3	6.0	10	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	<6.0	1.9	6.0	10	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<6.0	1.7	6.0	10	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	42	2.6	6.0	10	ug/kg		J	17
PERFLUOROOCTANE SULFONATE	1763-23-1	780	21	60	100	ug/kg		J	17
PERFLUOROOCTANOIC ACID	335-67-1	7.8	2.6	6.0	10	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	5.5	1.8	6.0	10	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<4.0	1.1	4.0	10	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<4.0	1.2	4.0	10	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<6.0	1.8	6.0	10	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA04-001-SS-901 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK132 **Sample Date/Time:** 2017-08-15 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	0.59	0.25	0.66	1.1	ug/kg	J	J	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	2.1	0.35	0.66	1.1	ug/kg		J	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	1.9	0.25	0.66	1.1	ug/kg			
PERFLUORODECANE SULFONATE	335-77-3	5.8	0.25	0.66	1.1	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	1.6	0.14	0.44	1.1	ug/kg			
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	2.3	0.19	0.66	1.1	ug/kg			
PERFLUOROHEXANE SULFONATE	108427-53-8	13	0.25	0.66	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	2.2	0.21	0.66	1.1	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	2.0	0.19	0.66	1.1	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	29	0.29	0.66	1.1	ug/kg		J	17
PERFLUOROOCTANE SULFONATE	1763-23-1	480	2.3	6.6	11	ug/kg		J	17
PERFLUOROOCTANOIC ACID	335-67-1	6.3	0.29	0.66	1.1	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	3.7	0.20	0.66	1.1	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.98	0.20	0.66	1.1	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name NIGRA04-002-SO-004 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK140 **Sample Date/Time:** 2017-08-16 13:15 **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	<5.5	2.1	5.5	9.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<5.5	2.9	5.5	9.2	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<5.5	1.6	5.5	9.2	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<5.5	2.1	5.5	9.2	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<5.5	2.1	5.5	9.2	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<3.7	1.2	3.7	9.2	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<5.5	2.0	5.5	9.2	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<5.5	1.6	5.5	9.2	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	50	2.1	5.5	9.2	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	4.3	1.7	5.5	9.2	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	<5.5	1.6	5.5	9.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<5.5	2.4	5.5	9.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	230	1.9	5.5	9.2	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	13	2.4	5.5	9.2	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	<5.5	1.7	5.5	9.2	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<3.7	1.0	3.7	9.2	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<3.7	1.1	3.7	9.2	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<5.5	1.7	5.5	9.2	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA04-002-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK129 **Sample Date/Time:** 2017-08-15 14:20 **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	0.32	0.25	0.66	1.1	ug/kg	J	J	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	UJ	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	1.5	0.19	0.66	1.1	ug/kg			
PERFLUOROBUTANOIC ACID	375-22-4	0.96	0.25	0.66	1.1	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	4.0	0.25	0.66	1.1	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	29	0.25	0.66	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	2.0	0.21	0.66	1.1	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	2.6	0.29	0.66	1.1	ug/kg			
PERFLUOROOCTANE SULFONATE	1763-23-1	440	2.3	6.6	11	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	2.3	0.29	0.66	1.1	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	1.3	0.20	0.66	1.1	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.36	0.20	0.66	1.1	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name NIGRA04-003-SO-005 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK141 **Sample Date/Time:** 2017-08-16 13:45 **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	<0.65	0.25	0.65	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.65	0.35	0.65	1.1	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.35	0.18	0.65	1.1	ug/kg	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	<0.65	0.25	0.65	1.1	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.65	0.25	0.65	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.43	0.14	0.43	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.65	0.24	0.65	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.46	0.18	0.65	1.1	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	4.6	0.25	0.65	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	0.75	0.21	0.65	1.1	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	0.35	0.18	0.65	1.1	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.65	0.28	0.65	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	11	0.23	0.65	1.1	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	0.56	0.28	0.65	1.1	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.65	0.19	0.65	1.1	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.43	0.12	0.43	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.43	0.13	0.43	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.65	0.19	0.65	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA04-003-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK130 **Sample Date/Time:** 2017-08-15 14:55 **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	<0.66	0.25	0.66	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	UJ	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	0.55	0.19	0.66	1.1	ug/kg	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	0.82	0.25	0.66	1.1	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	3.3	0.25	0.66	1.1	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.60	0.19	0.66	1.1	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	21	0.25	0.66	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	1.5	0.21	0.66	1.1	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	0.78	0.19	0.66	1.1	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.59	0.29	0.66	1.1	ug/kg	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	410	2.3	6.6	11	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	1.2	0.29	0.66	1.1	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	1.4	0.20	0.66	1.1	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.66	0.20	0.66	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA06-001-SO-012 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK134 **Sample Date/Time:** 2017-08-16 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	<0.75	0.29	0.75	1.3	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.75	0.40	0.75	1.3	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.75	0.21	0.75	1.3	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.75	0.29	0.75	1.3	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.75	0.29	0.75	1.3	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.50	0.16	0.50	1.3	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.75	0.28	0.75	1.3	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.75	0.21	0.75	1.3	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.75	0.29	0.75	1.3	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.75	0.24	0.75	1.3	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.75	0.21	0.75	1.3	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.75	0.33	0.75	1.3	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.75	0.26	0.75	1.3	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.75	0.33	0.75	1.3	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.75	0.23	0.75	1.3	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.50	0.14	0.50	1.3	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.50	0.15	0.50	1.3	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.75	0.23	0.75	1.3	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA06-001-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK133 **Sample Date/Time:** 2017-08-16 08:05 **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	0.23	0.22	0.58	0.97	ug/kg	J	J	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.58	0.31	0.58	0.97	ug/kg	U	UJ	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.58	0.16	0.58	0.97	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	0.33	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	<0.39	0.13	0.39	0.97	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.58	0.21	0.58	0.97	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.83	0.16	0.58	0.97	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	1.2	0.22	0.58	0.97	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	0.76	0.18	0.58	0.97	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	0.85	0.16	0.58	0.97	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.58	0.25	0.58	0.97	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	17	0.20	0.58	0.97	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	1.5	0.25	0.58	0.97	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	1.4	0.17	0.58	0.97	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.39	0.11	0.39	0.97	ug/kg	U	U	
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 NIGRA06-002-SO-012 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK137 **Sample Date/Time:** 2017-08-16 10:40 **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	<0.70	0.27	0.70	1.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.70	0.37	0.70	1.2	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.70	0.20	0.70	1.2	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.70	0.27	0.70	1.2	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.70	0.27	0.70	1.2	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.46	0.15	0.46	1.2	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.70	0.26	0.70	1.2	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.70	0.20	0.70	1.2	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.70	0.27	0.70	1.2	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.70	0.22	0.70	1.2	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.70	0.20	0.70	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.70	0.30	0.70	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.70	0.24	0.70	1.2	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.70	0.30	0.70	1.2	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.70	0.21	0.70	1.2	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.46	0.13	0.46	1.2	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.46	0.14	0.46	1.2	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.70	0.21	0.70	1.2	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA06-002-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK135 **Sample Date/Time:** 2017-08-16 09:50 **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	<0.68	0.26	0.68	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.68	0.36	0.68	1.1	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.68	0.19	0.68	1.1	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	0.71	0.26	0.68	1.1	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	<0.68	0.26	0.68	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	0.58	0.15	0.45	1.1	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	<0.68	0.25	0.68	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	1.6	0.19	0.68	1.1	ug/kg			
PERFLUOROHEXANE SULFONATE	108427-53-8	3.0	0.26	0.68	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	1.4	0.21	0.68	1.1	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	1.5	0.19	0.68	1.1	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.68	0.29	0.68	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	33	0.24	0.68	1.1	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	2.8	0.29	0.68	1.1	ug/kg		J	17
PERFLUOROPENTANOIC ACID	2706-90-3	1.9	0.20	0.68	1.1	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.45	0.12	0.45	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.45	0.14	0.45	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.24	0.20	0.68	1.1	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name NIGRA06-002-SS-901 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK136 **Sample Date/Time:** 2017-08-16 09:50 **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	<0.71	0.27	0.71	1.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.71	0.38	0.71	1.2	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.71	0.20	0.71	1.2	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.71	0.27	0.71	1.2	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.71	0.27	0.71	1.2	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.47	0.15	0.47	1.2	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.71	0.26	0.71	1.2	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	1.1	0.20	0.71	1.2	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	3.2	0.27	0.71	1.2	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	1.4	0.22	0.71	1.2	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	1.1	0.20	0.71	1.2	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.71	0.31	0.71	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	33	0.25	0.71	1.2	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	2.0	0.31	0.71	1.2	ug/kg		J	17
PERFLUOROPENTANOIC ACID	2706-90-3	1.7	0.21	0.71	1.2	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.47	0.13	0.47	1.2	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.47	0.14	0.47	1.2	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.71	0.21	0.71	1.2	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA06-003-SO-007 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK146 **Sample Date/Time:** 2017-08-17 08:05 **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	<0.58	0.22	0.58	0.96	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.58	0.31	0.58	0.96	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.58	0.16	0.58	0.96	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.58	0.22	0.58	0.96	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.58	0.22	0.58	0.96	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.38	0.12	0.38	0.96	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.58	0.21	0.58	0.96	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.58	0.16	0.58	0.96	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.58	0.22	0.58	0.96	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.58	0.18	0.58	0.96	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.58	0.16	0.58	0.96	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.58	0.25	0.58	0.96	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.58	0.20	0.58	0.96	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.58	0.25	0.58	0.96	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.58	0.17	0.58	0.96	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.38	0.11	0.38	0.96	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.38	0.12	0.38	0.96	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.58	0.17	0.58	0.96	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA06-004-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK147 **Sample Date/Time:** 2017-08-17 08:25 **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	<0.66	0.25	0.66	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	U	
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	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.55	0.19	0.66	1.1	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.69	0.25	0.66	1.1	ug/kg	J	J	
PERFLUOROHEXANOIC ACID	307-24-4	0.73	0.21	0.66	1.1	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	0.93	0.19	0.66	1.1	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.66	0.29	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	53	0.23	0.66	1.1	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	0.80	0.29	0.66	1.1	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.91	0.20	0.66	1.1	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.66	0.20	0.66	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA06-MW7-3D-014 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK148 **Sample Date/Time:** 2017-08-17 08:43 **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	0.0085	0.0048	0.010	0.020	ug/L	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	<0.010	0.0043	0.010	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	0.0057	0.0033	0.010	0.020	ug/L	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.083	0.0034	0.010	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.014	0.0029	0.010	0.020	ug/L	J	J	
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	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	0.0088	0.0046	0.010	0.020	ug/L	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.014	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	UJ	02A; 10A
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	02A; 10A
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA08-001-SO-008 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK118 **Sample Date/Time:** 2017-08-14 12:30 **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	<0.66	0.25	0.66	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	UJ	05B
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	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.66	0.21	0.66	1.1	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.66	0.29	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.40	0.23	0.66	1.1	ug/kg	J	J	
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	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.66	0.20	0.66	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA08-002-SO-010 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK119 **Sample Date/Time:** 2017-08-14 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	<0.59	0.23	0.59	0.98	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.59	0.31	0.59	0.98	ug/kg	U	UJ	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.59	0.17	0.59	0.98	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.59	0.23	0.59	0.98	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.59	0.23	0.59	0.98	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.39	0.13	0.39	0.98	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.59	0.22	0.59	0.98	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.59	0.17	0.59	0.98	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.59	0.23	0.59	0.98	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.59	0.19	0.59	0.98	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.59	0.17	0.59	0.98	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.59	0.25	0.59	0.98	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.27	0.21	0.59	0.98	ug/kg	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	<0.59	0.25	0.59	0.98	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.59	0.18	0.59	0.98	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.39	0.11	0.39	0.98	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.39	0.12	0.39	0.98	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.59	0.18	0.59	0.98	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA08-003-SO-008 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK120 **Sample Date/Time:** 2017-08-14 13:35 **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	<0.58	0.22	0.58	0.97	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.58	0.31	0.58	0.97	ug/kg	U	UJ	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.58	0.16	0.58	0.97	ug/kg	U	U	
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	U	
PERFLUORODECANOIC ACID	335-76-2	<0.39	0.13	0.39	0.97	ug/kg	U	U	
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	U	
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	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.23	0.20	0.58	0.97	ug/kg	J	J	
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	<0.39	0.11	0.39	0.97	ug/kg	U	U	
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	

Validated Sample Result Forms: B7I1832

Analysis Method: EPA 537 m

Sample Name NIGRA03-002-GW-005 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK343 **Sample Date/Time:** 2017-08-16 16:21 **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	0.016	0.0032	0.010	0.020	ug/L	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANE SULFONATE	29420-43-3	0.022	0.0048	0.010	0.020	ug/L		J	01
PERFLUOROBUTANOIC ACID	375-22-4	0.027	0.0043	0.010	0.020	ug/L		J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	0.039	0.0033	0.010	0.020	ug/L		J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.16	0.0034	0.010	0.020	ug/L		J	01
PERFLUOROHEXANOIC ACID	307-24-4	0.075	0.0029	0.010	0.020	ug/L		J	01
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONATE	1763-23-1	0.14	0.0026	0.010	0.020	ug/L		J	01
PERFLUOROOCTANOIC ACID	335-67-1	0.021	0.0046	0.010	0.020	ug/L		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	0.11	0.0027	0.010	0.020	ug/L		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA06-001-GW-015 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK345 **Sample Date/Time:** 2017-08-17 09:25 **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	<0.010	0.0032	0.010	0.020	ug/L	U	UJ	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.010	0.0048	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.010	0.0034	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.010	0.0029	0.010	0.020	ug/L	U	UJ	01
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.010	0.0026	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.010	0.0027	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA06-001-GW-915 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK346 **Sample Date/Time:** 2017-08-17 09:25 **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	<0.010	0.0032	0.010	0.020	ug/L	U	UJ	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.010	0.0048	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.0052	0.0034	0.010	0.020	ug/L	J	J	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.010	0.0029	0.010	0.020	ug/L	U	UJ	01
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.010	0.0026	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.010	0.0027	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA06-003-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK337 **Sample Date/Time:** 2017-08-16 10:50 **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	<0.77	0.29	0.77	1.3	ug/kg	U	UJ	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.77	0.41	0.77	1.3	ug/kg	U	UJ	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.77	0.22	0.77	1.3	ug/kg	U	UJ	01
PERFLUOROBUTANOIC ACID	375-22-4	0.58	0.29	0.77	1.3	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.77	0.29	0.77	1.3	ug/kg	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.51	0.17	0.51	1.3	ug/kg	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.77	0.28	0.77	1.3	ug/kg	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	0.58	0.22	0.77	1.3	ug/kg	J	J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.59	0.29	0.77	1.3	ug/kg	J	J	01
PERFLUOROHEXANOIC ACID	307-24-4	0.79	0.24	0.77	1.3	ug/kg	J	J	01
PERFLUORONONANOIC ACID	375-95-1	0.58	0.22	0.77	1.3	ug/kg	J	J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.77	0.33	0.77	1.3	ug/kg	U	UJ	01
PERFLUOROOCTANE SULFONATE	1763-23-1	12	0.27	0.77	1.3	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	1.3	0.33	0.77	1.3	ug/kg	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	1.0	0.23	0.77	1.3	ug/kg	J	J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.51	0.14	0.51	1.3	ug/kg	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.51	0.15	0.51	1.3	ug/kg	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.77	0.23	0.77	1.3	ug/kg	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA07-001-SD-001 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EZK339 **Sample Date/Time:** 2017-08-16 12:45 **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	0.90	0.36	0.94	1.6	ug/kg	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	1.7	0.50	0.94	1.6	ug/kg		J	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.94	0.27	0.94	1.6	ug/kg	U	UJ	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.94	0.36	0.94	1.6	ug/kg	U	UJ	01
PERFLUORODECANE SULFONATE	335-77-3	0.82	0.36	0.94	1.6	ug/kg	J	J	01
PERFLUORODECANOIC ACID	335-76-2	0.35	0.20	0.63	1.6	ug/kg	J	J	01
PERFLUORODODECANOIC ACID	307-55-1	0.54	0.35	0.94	1.6	ug/kg	J	J	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.94	0.27	0.94	1.6	ug/kg	U	UJ	01
PERFLUOROHEXANE SULFONATE	108427-53-8	4.1	0.36	0.94	1.6	ug/kg		J	01
PERFLUOROHEXANOIC ACID	307-24-4	0.70	0.30	0.94	1.6	ug/kg	J	J	01
PERFLUORONONANOIC ACID	375-95-1	0.51	0.27	0.94	1.6	ug/kg	J	J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	2.1	0.41	0.94	1.6	ug/kg		J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	54	3.3	9.4	16	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	1.0	0.41	0.94	1.6	ug/kg	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	1.0	0.28	0.94	1.6	ug/kg	J	J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.63	0.17	0.63	1.6	ug/kg	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.26	0.19	0.63	1.6	ug/kg	J	J	01
PERFLUOROUNDECANOIC ACID	2058-94-8	0.39	0.28	0.94	1.6	ug/kg	J	J	01

Analysis Method: EPA 537 m

Sample Name NIGRA07-001-SW-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK340 **Sample Date/Time:** 2017-08-16 12:45 **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	0.15	0.0032	0.010	0.020	ug/L		J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.022	0.0036	0.010	0.020	ug/L		J	01
PERFLUOROBUTANE SULFONATE	29420-43-3	0.080	0.0048	0.010	0.020	ug/L		J	01
PERFLUOROBUTANOIC ACID	375-22-4	0.085	0.0043	0.010	0.020	ug/L		J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	0.12	0.0033	0.010	0.020	ug/L		J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.94	0.0034	0.010	0.020	ug/L		J	01
PERFLUOROHEXANOIC ACID	307-24-4	0.35	0.0029	0.010	0.020	ug/L		J	01
PERFLUORONONANOIC ACID	375-95-1	0.019	0.0038	0.010	0.020	ug/L	J	J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.016	0.0036	0.010	0.020	ug/L	J	J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	1.9	0.026	0.10	0.20	ug/L		J	01
PERFLUOROOCTANOIC ACID	335-67-1	0.16	0.0046	0.010	0.020	ug/L		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	0.38	0.0027	0.010	0.020	ug/L		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA07-002-SD-001 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EZK335 **Sample Date/Time:** 2017-08-16 08:50 **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	2.8	0.75	2.0	3.3	ug/kg	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	2.9	1.0	2.0	3.3	ug/kg	J	J	01
PERFLUOROBUTANE SULFONATE	29420-43-3	0.83	0.56	2.0	3.3	ug/kg	J	J	01
PERFLUOROBUTANOIC ACID	375-22-4	1.1	0.75	2.0	3.3	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	<2.0	0.75	2.0	3.3	ug/kg	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	0.58	0.43	1.3	3.3	ug/kg	J	J	01
PERFLUORODODECANOIC ACID	307-55-1	<2.0	0.72	2.0	3.3	ug/kg	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	1.9	0.56	2.0	3.3	ug/kg	J	J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	13	0.75	2.0	3.3	ug/kg		J	01
PERFLUOROHEXANOIC ACID	307-24-4	3.2	0.62	2.0	3.3	ug/kg	J	J	01
PERFLUORONONANOIC ACID	375-95-1	3.1	0.56	2.0	3.3	ug/kg	J	J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	3.8	0.85	2.0	3.3	ug/kg		J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	160	6.9	20	33	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	4.1	0.85	2.0	3.3	ug/kg		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	4.1	0.59	2.0	3.3	ug/kg		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<1.3	0.36	1.3	3.3	ug/kg	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<1.3	0.39	1.3	3.3	ug/kg	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<2.0	0.59	2.0	3.3	ug/kg	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA07-002-SW-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK336 **Sample Date/Time:** 2017-08-16 08:50 **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	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANE SULFONATE	29420-43-3	0.0059	0.0048	0.010	0.020	ug/L	J	J	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	0.0091	0.0033	0.010	0.020	ug/L	J	J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.040	0.0034	0.010	0.020	ug/L		J	01
PERFLUOROHEXANOIC ACID	307-24-4	0.018	0.0029	0.010	0.020	ug/L	J	J	01
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONATE	1763-23-1	0.049	0.0026	0.010	0.020	ug/L		J	01
PERFLUOROOCTANOIC ACID	335-67-1	0.013	0.0046	0.010	0.020	ug/L	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	0.022	0.0027	0.010	0.020	ug/L		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA07-003-SD-001 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EZK333 **Sample Date/Time:** 2017-08-16 08:30 **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	<0.86	0.33	0.86	1.4	ug/kg	U	UJ	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.86	0.46	0.86	1.4	ug/kg	U	UJ	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.86	0.24	0.86	1.4	ug/kg	U	UJ	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.86	0.33	0.86	1.4	ug/kg	U	UJ	01
PERFLUORODECANE SULFONATE	335-77-3	<0.86	0.33	0.86	1.4	ug/kg	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.58	0.19	0.58	1.4	ug/kg	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.86	0.32	0.86	1.4	ug/kg	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.86	0.24	0.86	1.4	ug/kg	U	UJ	01
PERFLUOROHEXANE SULFONATE	108427-53-8	1.1	0.33	0.86	1.4	ug/kg	J	J	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.86	0.27	0.86	1.4	ug/kg	U	UJ	01
PERFLUORONONANOIC ACID	375-95-1	<0.86	0.24	0.86	1.4	ug/kg	U	UJ	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.86	0.37	0.86	1.4	ug/kg	U	UJ	01
PERFLUOROOCTANE SULFONATE	1763-23-1	11	0.30	0.86	1.4	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	0.58	0.37	0.86	1.4	ug/kg	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	1.0	0.26	0.86	1.4	ug/kg	J	J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.58	0.16	0.58	1.4	ug/kg	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.58	0.17	0.58	1.4	ug/kg	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.86	0.26	0.86	1.4	ug/kg	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA07-003-SW-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK334 **Sample Date/Time:** 2017-08-16 08:30 **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	0.0084	0.0032	0.010	0.020	ug/L	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.010	0.0048	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.012	0.0034	0.010	0.020	ug/L	J	J	01
PERFLUOROHEXANOIC ACID	307-24-4	0.014	0.0029	0.010	0.020	ug/L	J	J	01
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONATE	1763-23-1	0.012	0.0026	0.010	0.020	ug/L	J	J	01
PERFLUOROOCTANOIC ACID	335-67-1	0.0075	0.0046	0.010	0.020	ug/L	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	0.021	0.0027	0.010	0.020	ug/L		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA08-001-GW-011 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK341 **Sample Date/Time:** 2017-08-16 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	<0.010	0.0032	0.010	0.020	ug/L	U	UJ	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANE SULFONATE	29420-43-3	0.0077	0.0048	0.010	0.020	ug/L	J	J	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.036	0.0034	0.010	0.020	ug/L		J	01
PERFLUOROHEXANOIC ACID	307-24-4	0.010	0.0029	0.010	0.020	ug/L	J	J	01
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONATE	1763-23-1	0.015	0.0026	0.010	0.020	ug/L	J	J	01
PERFLUOROOCTANOIC ACID	335-67-1	0.0077	0.0046	0.010	0.020	ug/L	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.010	0.0027	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA08-003-GW-009 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK342 **Sample Date/Time:** 2017-08-16 15:19 **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	0.0085	0.0032	0.010	0.020	ug/L	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.010	0.0048	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.010	0.0034	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.010	0.0029	0.010	0.020	ug/L	U	UJ	01
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.010	0.0026	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.010	0.0027	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA-RS-003 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK338 **Sample Date/Time:** 2017-08-16 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	<0.010	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	<0.010	0.0043	0.010	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	0.0038	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 NIGRA-RS-004 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK347 **Sample Date/Time:** 2017-08-17 09:50 **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	<0.010	0.0043	0.010	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	0.0038	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 NIGRA-SB-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK344 **Sample Date/Time:** 2017-08-17 07:20 **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	<0.010	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	<0.010	0.0043	0.010	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	0.0038	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: B7I1879

Analysis Method: EPA 537 m

Sample Name NIGRA01-001-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK690 **Sample Date/Time:** 2017-08-15 08:28 **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	33	23	59	98	ug/kg	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<59	31	59	98	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<59	17	59	98	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	<59	23	59	98	ug/kg	U	R	01
PERFLUORODECANE SULFONATE	335-77-3	<59	23	59	98	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	14	13	39	98	ug/kg	J	J	01
PERFLUORODODECANOIC ACID	307-55-1	<59	22	59	98	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<59	17	59	98	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	410	23	59	98	ug/kg		J	01
PERFLUOROHEXANOIC ACID	307-24-4	27	19	59	98	ug/kg	J	J	01
PERFLUORONONANOIC ACID	375-95-1	<59	17	59	98	ug/kg	U	R	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	540	25	59	98	ug/kg		J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	4000	210	590	980	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	62	25	59	98	ug/kg	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	<59	18	59	98	ug/kg	U	R	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<39	11	39	98	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	24	12	39	98	ug/kg	J	J	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<59	18	59	98	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA01-002-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK691 **Sample Date/Time:** 2017-08-15 09:02 **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	10	2.6	6.9	11	ug/kg	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<6.9	3.7	6.9	11	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	6.4	1.9	6.9	11	ug/kg	J	J	01
PERFLUOROBUTANOIC ACID	375-22-4	5.5	2.6	6.9	11	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	<6.9	2.6	6.9	11	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	4.4	1.5	4.6	11	ug/kg	J	J	01
PERFLUORODODECANOIC ACID	307-55-1	<6.9	2.5	6.9	11	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	3.6	1.9	6.9	11	ug/kg	J	J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	250	2.6	6.9	11	ug/kg		J	01
PERFLUOROHEXANOIC ACID	307-24-4	25	2.2	6.9	11	ug/kg		J	01
PERFLUORONONANOIC ACID	375-95-1	20	1.9	6.9	11	ug/kg		J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	24	3.0	6.9	11	ug/kg		J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	1600	24	69	110	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	39	3.0	6.9	11	ug/kg		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	12	2.1	6.9	11	ug/kg		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<4.6	1.3	4.6	11	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<4.6	1.4	4.6	11	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	5.1	2.1	6.9	11	ug/kg	J	J	01

Analysis Method: EPA 537 m

Sample Name NIGRA01-004-SD-001 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EZK694 **Sample Date/Time:** 2017-08-15 10:15 **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	18	4.7	12	20	ug/kg	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<12	6.5	12	20	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	11	3.5	12	20	ug/kg	J	J	01
PERFLUOROBUTANOIC ACID	375-22-4	6.3	4.7	12	20	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	27	4.7	12	20	ug/kg		J	01
PERFLUORODECANOIC ACID	335-76-2	4.2	2.7	8.2	20	ug/kg	J	J	01
PERFLUORODODECANOIC ACID	307-55-1	<12	4.5	12	20	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	5.9	3.5	12	20	ug/kg	J	J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	340	4.7	12	20	ug/kg		J	01; 17
PERFLUOROHEXANOIC ACID	307-24-4	59	3.9	12	20	ug/kg		J	01
PERFLUORONONANOIC ACID	375-95-1	20	3.5	12	20	ug/kg		J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	120	5.3	12	20	ug/kg		J	01; 17
PERFLUOROOCTANE SULFONATE	1763-23-1	3100	43	120	210	ug/kg		J	01; 17
PERFLUOROOCTANOIC ACID	335-67-1	57	5.3	12	20	ug/kg		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	13	3.7	23	20	ug/kg	J	J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<8.2	2.2	8.2	20	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	16	2.5	8.2	20	ug/kg	J	J	01
PERFLUOROUNDECANOIC ACID	2058-94-8	29	3.7	12	20	ug/kg		J	01

Analysis Method: EPA 537 m

Sample Name NIGRA01-004-SD-901 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EZK695 **Sample Date/Time:** 2017-08-15 10:15 **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	98	51	130	220	ug/kg	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<130	71	130	220	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<130	38	130	220	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	<130	51	130	220	ug/kg	U	R	01
PERFLUORODECANE SULFONATE	335-77-3	65	51	130	220	ug/kg	J	J	01
PERFLUORODECANOIC ACID	335-76-2	30	29	89	220	ug/kg	J	J	01
PERFLUORODODECANOIC ACID	307-55-1	<130	49	130	220	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<130	38	130	220	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	760	51	130	220	ug/kg		J	01; 17
PERFLUOROHEXANOIC ACID	307-24-4	82	42	130	220	ug/kg	J	J	01
PERFLUORONONANOIC ACID	375-95-1	69	38	130	220	ug/kg	J	J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	440	58	130	220	ug/kg		J	01; 17
PERFLUOROOCTANE SULFONATE	1763-23-1	7500	470	1300	2200	ug/kg		J	01; 17
PERFLUOROOCTANOIC ACID	335-67-1	140	58	130	220	ug/kg	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	<130	40	130	220	ug/kg	U	R	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<89	25	89	220	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	50	27	89	220	ug/kg	J	J	01
PERFLUOROUNDECANOIC ACID	2058-94-8	69	40	130	220	ug/kg	J	J	01

Analysis Method: EPA 537 m

Sample Name NIGRA01-004-SW-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK692 **Sample Date/Time:** 2017-08-15 10:10 **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	0.25	0.0064	0.020	0.040	ug/L		J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.020	0.0072	0.020	0.040	ug/L	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	0.74	0.0096	0.020	0.040	ug/L		J	01
PERFLUOROBUTANOIC ACID	375-22-4	0.56	0.0086	0.020	0.040	ug/L		J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.020	0.0092	0.020	0.040	ug/L	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.020	0.0080	0.020	0.040	ug/L	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.020	0.0056	0.020	0.040	ug/L	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	0.48	0.0066	0.020	0.040	ug/L		J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	8.7	0.068	0.20	0.40	ug/L		J	01
PERFLUOROHEXANOIC ACID	307-24-4	4.5	0.058	0.20	0.40	ug/L		J	01
PERFLUORONONANOIC ACID	375-95-1	0.097	0.0076	0.020	0.040	ug/L		J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.037	0.0072	0.020	0.040	ug/L	J	J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	7.2	0.052	0.20	0.40	ug/L		J	01
PERFLUOROOCTANOIC ACID	335-67-1	1.1	0.0092	0.020	0.040	ug/L		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	1.4	0.0054	0.020	0.040	ug/L		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.20	0.076	0.20	0.40	ug/L	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.20	0.066	0.20	0.40	ug/L	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.020	0.0086	0.020	0.040	ug/L	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA01-004-SW-901 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK693 **Sample Date/Time:** 2017-08-15 10:10 **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	0.26	0.0064	0.020	0.040	ug/L		J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.020	0.0072	0.020	0.040	ug/L	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	0.64	0.0096	0.020	0.040	ug/L		J	01
PERFLUOROBUTANOIC ACID	375-22-4	0.54	0.0086	0.020	0.040	ug/L		J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.020	0.0092	0.020	0.040	ug/L	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.020	0.0080	0.020	0.040	ug/L	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.020	0.0056	0.020	0.040	ug/L	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	0.46	0.0066	0.020	0.040	ug/L		J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	9.4	0.068	0.20	0.40	ug/L		J	01
PERFLUOROHEXANOIC ACID	307-24-4	4.7	0.058	0.20	0.40	ug/L		J	01
PERFLUORONONANOIC ACID	375-95-1	0.11	0.0076	0.020	0.040	ug/L		J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.039	0.0072	0.020	0.040	ug/L	J	J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	7.7	0.052	0.20	0.40	ug/L		J	01
PERFLUOROOCTANOIC ACID	335-67-1	1.1	0.0092	0.020	0.040	ug/L		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	1.4	0.0054	0.020	0.040	ug/L		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.20	0.076	0.20	0.40	ug/L	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.20	0.066	0.20	0.40	ug/L	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.020	0.0086	0.020	0.040	ug/L	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA01-005-SD-001 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EZK697 **Sample Date/Time:** 2017-08-15 10:45 **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	9.2	3.2	8.4	14	ug/kg	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<8.4	4.5	8.4	14	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	4.5	2.4	8.4	14	ug/kg	J	J	01
PERFLUOROBUTANOIC ACID	375-22-4	4.3	3.2	8.4	14	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	<8.4	3.2	8.4	14	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	2.8	1.8	5.6	14	ug/kg	J	J	01
PERFLUORODODECANOIC ACID	307-55-1	<8.4	3.1	8.4	14	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<8.4	2.4	8.4	14	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	88	3.2	8.4	14	ug/kg		J	01
PERFLUOROHEXANOIC ACID	307-24-4	16	2.7	8.4	14	ug/kg		J	01
PERFLUORONONANOIC ACID	375-95-1	6.7	2.4	8.4	14	ug/kg	J	J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	31	3.7	8.4	14	ug/kg		J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	1200	30	84	140	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	18	3.7	8.4	14	ug/kg		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	8.4	2.5	8.4	14	ug/kg	J	J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<5.6	1.5	5.6	14	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	1.7	1.7	5.6	14	ug/kg	J	J	01
PERFLUOROUNDECANOIC ACID	2058-94-8	4.0	2.5	8.4	14	ug/kg	J	J	01

Analysis Method: EPA 537 m

Sample Name NIGRA01-005-SW-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK696 **Sample Date/Time:** 2017-08-15 10:40 **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	1.1	0.032	0.10	0.20	ug/L		J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.10	0.036	0.10	0.20	ug/L	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	1.6	0.048	0.10	0.20	ug/L		J	01
PERFLUOROBUTANOIC ACID	375-22-4	1.7	0.043	0.10	0.20	ug/L		J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.10	0.046	0.10	0.20	ug/L	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.10	0.040	0.10	0.20	ug/L	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.10	0.028	0.10	0.20	ug/L	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	1.3	0.033	0.10	0.20	ug/L		J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	20	0.17	0.50	1.0	ug/L		J	01
PERFLUOROHEXANOIC ACID	307-24-4	8.7	0.029	0.10	0.20	ug/L		J	01
PERFLUORONONANOIC ACID	375-95-1	0.37	0.038	0.10	0.20	ug/L		J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.10	0.036	0.10	0.20	ug/L	J	J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	21	0.13	0.50	1.0	ug/L		J	01
PERFLUOROOCTANOIC ACID	335-67-1	3.3	0.046	0.10	0.20	ug/L		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	4.5	0.027	0.10	0.20	ug/L		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.10	0.038	0.10	0.20	ug/L	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.10	0.033	0.10	0.20	ug/L	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.10	0.043	0.10	0.20	ug/L	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA02-002-SO-014 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK680 **Sample Date/Time:** 2017-08-17 10:50 **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	<0.68	0.26	0.68	1.1	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.68	0.36	0.68	1.1	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.68	0.19	0.68	1.1	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.68	0.26	0.68	1.1	ug/kg	U	R	01
PERFLUORODECANE SULFONATE	335-77-3	<0.68	0.26	0.68	1.1	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.45	0.15	0.45	1.1	ug/kg	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.68	0.25	0.68	1.1	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.68	0.19	0.68	1.1	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.68	0.26	0.68	1.1	ug/kg	U	R	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.68	0.21	0.68	1.1	ug/kg	U	R	01
PERFLUORONONANOIC ACID	375-95-1	<0.68	0.19	0.68	1.1	ug/kg	U	R	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.68	0.29	0.68	1.1	ug/kg	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.68	0.24	0.68	1.1	ug/kg	U	R	01
PERFLUOROOCTANOIC ACID	335-67-1	<0.68	0.29	0.68	1.1	ug/kg	U	R	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.68	0.20	0.68	1.1	ug/kg	U	R	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.45	0.12	0.45	1.1	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.45	0.14	0.45	1.1	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.68	0.20	0.68	1.1	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA02-002-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK679 **Sample Date/Time:** 2017-08-17 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	5.9	0.26	0.69	1.2	ug/kg		J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	3.1	0.37	0.69	1.2	ug/kg		J	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.69	0.20	0.69	1.2	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	1.1	0.26	0.69	1.2	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.69	0.26	0.69	1.2	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	9.8	0.15	0.46	1.2	ug/kg		J	01
PERFLUORODODECANOIC ACID	307-55-1	1.7	0.25	0.69	1.2	ug/kg		J	01
PERFLUOROHEPTANOIC ACID	375-85-9	1.1	0.20	0.69	1.2	ug/kg	J	J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.42	0.26	0.69	1.2	ug/kg	J	J	01
PERFLUOROHEXANOIC ACID	307-24-4	3.1	0.22	0.69	1.2	ug/kg		J	01
PERFLUORONONANOIC ACID	375-95-1	3.3	0.20	0.69	1.2	ug/kg		J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.39	0.30	0.69	1.2	ug/kg	J	J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	38	0.24	0.69	1.2	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	3.0	0.30	0.69	1.2	ug/kg		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	5.5	0.21	0.69	1.2	ug/kg		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	0.90	0.13	0.46	1.2	ug/kg	J	J	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.88	0.14	0.46	1.2	ug/kg	J	J	01
PERFLUOROUNDECANOIC ACID	2058-94-8	4.1	0.21	0.69	1.2	ug/kg		J	01

Analysis Method: EPA 537 m

Sample Name NIGRA02-003-SO-014 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK681 **Sample Date/Time:** 2017-08-17 11:55 **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	<0.67	0.26	0.67	1.1	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.67	0.36	0.67	1.1	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.67	0.19	0.67	1.1	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.67	0.26	0.67	1.1	ug/kg	U	R	01
PERFLUORODECANE SULFONATE	335-77-3	<0.67	0.26	0.67	1.1	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.67	0.24	0.67	1.1	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.67	0.19	0.67	1.1	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.67	0.26	0.67	1.1	ug/kg	U	R	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.67	0.21	0.67	1.1	ug/kg	U	R	01
PERFLUORONONANOIC ACID	375-95-1	<0.67	0.19	0.67	1.1	ug/kg	U	R	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.67	0.29	0.67	1.1	ug/kg	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.67	0.23	0.67	1.1	ug/kg	U	R	01
PERFLUOROOCTANOIC ACID	335-67-1	<0.67	0.29	0.67	1.1	ug/kg	U	R	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.67	0.20	0.67	1.1	ug/kg	U	R	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.67	0.20	0.67	1.1	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA02-003-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK700 **Sample Date/Time:** 2017-08-17 09:59 **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	<0.62	0.24	0.62	1.0	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.62	0.33	0.62	1.0	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	0.25	0.18	0.62	1.0	ug/kg	J	J	01
PERFLUOROBUTANOIC ACID	375-22-4	1.0	0.24	0.62	1.0	ug/kg		J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.62	0.24	0.62	1.0	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.42	0.14	0.42	1.0	ug/kg	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.62	0.23	0.62	1.0	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	0.70	0.18	0.62	1.0	ug/kg	J	J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	4.5	0.24	0.62	1.0	ug/kg		J	01
PERFLUOROHEXANOIC ACID	307-24-4	1.7	0.20	0.62	1.0	ug/kg		J	01
PERFLUORONONANOIC ACID	375-95-1	1.2	0.18	0.62	1.0	ug/kg		J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.34	0.27	0.62	1.0	ug/kg	J	J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	70	2.2	6.2	10	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	2.1	0.27	0.62	1.0	ug/kg		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	2.9	0.19	0.62	1.0	ug/kg		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.42	0.11	0.42	1.0	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.42	0.12	0.42	1.0	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.62	0.19	0.62	1.0	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA02-004-SO-012 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK682 **Sample Date/Time:** 2017-08-17 13:25 **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	<0.62	0.24	0.62	1.0	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.62	0.33	0.62	1.0	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.62	0.18	0.62	1.0	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.62	0.24	0.62	1.0	ug/kg	U	R	01
PERFLUORODECANE SULFONATE	335-77-3	<0.62	0.24	0.62	1.0	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.41	0.13	0.41	1.0	ug/kg	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.62	0.23	0.62	1.0	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.62	0.18	0.62	1.0	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.62	0.24	0.62	1.0	ug/kg	U	R	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.62	0.20	0.62	1.0	ug/kg	U	R	01
PERFLUORONONANOIC ACID	375-95-1	<0.62	0.18	0.62	1.0	ug/kg	U	R	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.62	0.27	0.62	1.0	ug/kg	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.62	0.22	0.62	1.0	ug/kg	U	R	01
PERFLUOROOCTANOIC ACID	335-67-1	<0.62	0.27	0.62	1.0	ug/kg	U	R	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.62	0.19	0.62	1.0	ug/kg	U	R	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.41	0.11	0.41	1.0	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.41	0.12	0.41	1.0	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.62	0.19	0.62	1.0	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA02-004-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK701 **Sample Date/Time:** 2017-08-17 11:27 **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	<0.65	0.25	0.65	1.1	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.65	0.35	0.65	1.1	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	0.20	0.19	0.65	1.1	ug/kg	J	J	01
PERFLUOROBUTANOIC ACID	375-22-4	0.61	0.25	0.65	1.1	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	1.5	0.25	0.65	1.1	ug/kg		J	01
PERFLUORODECANOIC ACID	335-76-2	0.82	0.14	0.44	1.1	ug/kg	J	J	01
PERFLUORODODECANOIC ACID	307-55-1	<0.65	0.24	0.65	1.1	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	0.82	0.19	0.65	1.1	ug/kg	J	J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	1.2	0.25	0.65	1.1	ug/kg		J	01
PERFLUOROHEXANOIC ACID	307-24-4	1.3	0.21	0.65	1.1	ug/kg		J	01
PERFLUORONONANOIC ACID	375-95-1	0.57	0.19	0.65	1.1	ug/kg	J	J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.65	0.28	0.65	1.1	ug/kg	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	3.4	0.23	0.65	1.1	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	3.6	0.28	0.65	1.1	ug/kg		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	1.9	0.20	0.65	1.1	ug/kg		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.65	0.20	0.65	1.1	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA02-005-SD-001 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EZK684 **Sample Date/Time:** 2017-08-17 16:30 **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	<0.91	0.35	0.91	1.5	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.91	0.49	0.91	1.5	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.91	0.26	0.91	1.5	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.91	0.35	0.91	1.5	ug/kg	U	R	01
PERFLUORODECANE SULFONATE	335-77-3	<0.91	0.35	0.91	1.5	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.61	0.20	0.61	1.5	ug/kg	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.91	0.33	0.91	1.5	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.91	0.26	0.91	1.5	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.91	0.35	0.91	1.5	ug/kg	U	R	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.91	0.29	0.91	1.5	ug/kg	U	R	01
PERFLUORONONANOIC ACID	375-95-1	<0.91	0.26	0.91	1.5	ug/kg	U	R	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.91	0.40	0.91	1.5	ug/kg	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	1.1	0.32	0.91	1.5	ug/kg	J	J	01
PERFLUOROOCTANOIC ACID	335-67-1	<0.91	0.40	0.91	1.5	ug/kg	U	R	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.91	0.27	0.91	1.5	ug/kg	U	R	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.61	0.17	0.61	1.5	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.61	0.18	0.61	1.5	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	0.27	0.27	0.91	1.5	ug/kg	J	J	01

Analysis Method: EPA 537 m

Sample Name NIGRA02-005-SW-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK683 **Sample Date/Time:** 2017-08-17 16:30 **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	<0.010	0.0032	0.010	0.020	ug/L	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.010	0.0048	0.010	0.020	ug/L	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.010	0.0043	0.010	0.020	ug/L	U	R	01
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.010	0.0034	0.010	0.020	ug/L	U	R	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.010	0.0029	0.010	0.020	ug/L	U	R	01
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	0.010	0.020	ug/L	U	R	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.010	0.0026	0.010	0.020	ug/L	U	R	01
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	R	01
PERFLUOROPENTANOIC ACID	2706-90-3	0.011	0.0027	0.010	0.020	ug/L	J	J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA06-004-SO-002 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK678 **Sample Date/Time:** 2017-08-17 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	<0.70	0.27	0.70	1.2	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.70	0.37	0.70	1.2	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.70	0.20	0.70	1.2	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	0.34	0.27	0.70	1.2	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.70	0.27	0.70	1.2	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.47	0.15	0.47	1.2	ug/kg	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.70	0.26	0.70	1.2	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.70	0.20	0.70	1.2	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	1.6	0.27	0.70	1.2	ug/kg		J	01
PERFLUOROHEXANOIC ACID	307-24-4	0.32	0.22	0.70	1.2	ug/kg	J	J	01
PERFLUORONONANOIC ACID	375-95-1	0.44	0.20	0.70	1.2	ug/kg	J	J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.70	0.30	0.70	1.2	ug/kg	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	11	0.25	0.70	1.2	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	0.77	0.30	0.70	1.2	ug/kg	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	0.46	0.21	0.70	1.2	ug/kg	J	J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.47	0.13	0.47	1.2	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.47	0.14	0.47	1.2	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.70	0.21	0.70	1.2	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA06-MW7-1D-010 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK699 **Sample Date/Time:** 2017-08-15 15:11 **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	2.9	0.032	0.10	0.20	ug/L		J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.10	0.036	0.10	0.20	ug/L	J	J	01
PERFLUOROBUTANE SULFONATE	29420-43-3	3.4	0.048	0.10	0.20	ug/L		J	01
PERFLUOROBUTANOIC ACID	375-22-4	2.6	0.043	0.10	0.20	ug/L		J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.10	0.046	0.10	0.20	ug/L	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.10	0.040	0.10	0.20	ug/L	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.10	0.028	0.10	0.20	ug/L	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	3.2	0.033	0.10	0.20	ug/L		J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	69	0.34	1.0	2.0	ug/L		J	01
PERFLUOROHEXANOIC ACID	307-24-4	11	0.29	1.0	2.0	ug/L		J	01
PERFLUORONONANOIC ACID	375-95-1	0.86	0.038	0.10	0.20	ug/L		J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.10	0.036	0.10	0.20	ug/L	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	49	0.26	1.0	2.0	ug/L		J	01
PERFLUOROOCTANOIC ACID	335-67-1	5.0	0.046	0.10	0.20	ug/L		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	6.4	0.027	0.10	0.20	ug/L		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.10	0.038	0.10	0.20	ug/L	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.10	0.033	0.10	0.20	ug/L	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.10	0.043	0.10	0.20	ug/L	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA06-MW7-2-005 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK698 **Sample Date/Time:** 2017-08-15 15:01 **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	0.93	0.032	0.10	0.20	ug/L		J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.10	0.036	0.10	0.20	ug/L	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	1.4	0.048	0.10	0.20	ug/L		J	01
PERFLUOROBUTANOIC ACID	375-22-4	1.2	0.043	0.10	0.20	ug/L		J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.10	0.046	0.10	0.20	ug/L	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.10	0.040	0.10	0.20	ug/L	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.10	0.028	0.10	0.20	ug/L	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	2.0	0.033	0.10	0.20	ug/L		J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	28	0.34	1.0	2.0	ug/L		J	01
PERFLUOROHEXANOIC ACID	307-24-4	4.6	0.029	0.10	0.20	ug/L		J	01
PERFLUORONONANOIC ACID	375-95-1	0.72	0.038	0.10	0.20	ug/L		J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.10	0.036	0.10	0.20	ug/L	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	45	0.26	1.0	2.0	ug/L		J	01
PERFLUOROOCTANOIC ACID	335-67-1	3.0	0.046	0.10	0.20	ug/L		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	4.0	0.027	0.10	0.20	ug/L		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.10	0.038	0.10	0.20	ug/L	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.10	0.033	0.10	0.20	ug/L	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.10	0.043	0.10	0.20	ug/L	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA08-001-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK685 **Sample Date/Time:** 2017-08-14 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	<0.73	0.28	0.73	1.2	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.73	0.39	0.73	1.2	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.73	0.21	0.73	1.2	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	0.51	0.28	0.73	1.2	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.73	0.28	0.73	1.2	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	0.23	0.16	0.48	1.2	ug/kg	J	J	01
PERFLUORODODECANOIC ACID	307-55-1	<0.73	0.27	0.73	1.2	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.73	0.21	0.73	1.2	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.76	0.28	0.73	1.2	ug/kg	J	J	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.73	0.23	0.73	1.2	ug/kg	U	R	01
PERFLUORONONANOIC ACID	375-95-1	0.38	0.21	0.73	1.2	ug/kg	J	J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.73	0.31	0.73	1.2	ug/kg	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	5.7	0.25	0.73	1.2	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	0.51	0.31	0.73	1.2	ug/kg	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.73	0.22	0.73	1.2	ug/kg	U	R	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.48	0.13	0.48	1.2	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.48	0.15	0.48	1.2	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.73	0.22	0.73	1.2	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA08-002-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK686 **Sample Date/Time:** 2017-08-14 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	<0.60	0.23	0.60	1.0	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.60	0.32	0.60	1.0	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.17	0.60	1.0	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	0.29	0.23	0.60	1.0	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.60	0.23	0.60	1.0	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.40	0.13	0.40	1.0	ug/kg	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.60	0.22	0.60	1.0	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.60	0.17	0.60	1.0	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	1.4	0.23	0.60	1.0	ug/kg		J	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.60	0.19	0.60	1.0	ug/kg	U	R	01
PERFLUORONONANOIC ACID	375-95-1	<0.60	0.17	0.60	1.0	ug/kg	U	R	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.60	0.26	0.60	1.0	ug/kg	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	7.9	0.21	0.60	1.0	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	0.52	0.26	0.60	1.0	ug/kg	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	0.30	0.18	0.60	1.0	ug/kg	J	J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.40	0.11	0.40	1.0	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.40	0.12	0.40	1.0	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.60	0.18	0.60	1.0	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA08-003-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK687 **Sample Date/Time:** 2017-08-14 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	<0.72	0.28	0.72	1.2	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.72	0.38	0.72	1.2	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.72	0.20	0.72	1.2	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.72	0.28	0.72	1.2	ug/kg	U	R	01
PERFLUORODECANE SULFONATE	335-77-3	<0.72	0.28	0.72	1.2	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.48	0.16	0.48	1.2	ug/kg	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.72	0.26	0.72	1.2	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.72	0.20	0.72	1.2	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.49	0.28	0.72	1.2	ug/kg	J	J	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.72	0.23	0.72	1.2	ug/kg	U	R	01
PERFLUORONONANOIC ACID	375-95-1	<0.72	0.20	0.72	1.2	ug/kg	U	R	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.72	0.31	0.72	1.2	ug/kg	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	0.95	0.25	0.72	1.2	ug/kg	J	J	01
PERFLUOROOCTANOIC ACID	335-67-1	<0.72	0.31	0.72	1.2	ug/kg	U	R	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.72	0.22	0.72	1.2	ug/kg	U	R	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.48	0.13	0.48	1.2	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.48	0.14	0.48	1.2	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.72	0.22	0.72	1.2	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA-RS-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK688 **Sample Date/Time:** 2017-08-14 11:50 **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	<0.010	0.0043	0.010	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	0.0038	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 NIGRA-RS-002 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK689 **Sample Date/Time:** 2017-08-15 08:07 **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	<0.010	0.0043	0.010	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	0.0038	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: B7I2484

Analysis Method: EPA 537 m

Sample Name NIGRA05-001-GW-005 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZN229 **Sample Date/Time:** 2017-08-22 08:55 **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	0.17	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	0.29	0.0048	0.010	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.13	0.0043	0.010	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	0.21	0.0033	0.010	0.020	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	2.2	0.034	0.10	0.20	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.63	0.0029	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.040	0.0038	0.010	0.020	ug/L			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	1.0	0.026	0.10	0.20	ug/L		J	05B
PERFLUOROOCTANOIC ACID	335-67-1	0.17	0.0046	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.50	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 NIGRA05-001-SO-004 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZN227 **Sample Date/Time:** 2017-08-22 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	<0.54	0.21	0.54	0.90	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.54	0.29	0.54	0.90	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	1.1	0.15	0.54	0.90	ug/kg		J	17
PERFLUOROBUTANOIC ACID	375-22-4	<0.54	0.21	0.54	0.90	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.54	0.21	0.54	0.90	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.36	0.12	0.36	0.90	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.54	0.20	0.54	0.90	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	1.3	0.15	0.54	0.90	ug/kg		J	17
PERFLUOROHEXANE SULFONATE	108427-53-8	19	0.21	0.54	0.90	ug/kg		J	17
PERFLUOROHEXANOIC ACID	307-24-4	2.1	0.17	0.54	0.90	ug/kg		J	17
PERFLUORONONANOIC ACID	375-95-1	<0.54	0.15	0.54	0.90	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.54	0.23	0.54	0.90	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	1.4	0.19	0.54	0.90	ug/kg		J	17
PERFLUOROOCTANOIC ACID	335-67-1	1.3	0.23	0.54	0.90	ug/kg		J	17
PERFLUOROPENTANOIC ACID	2706-90-3	0.94	0.16	0.54	0.90	ug/kg		J	17
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.36	0.099	0.36	0.90	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.36	0.11	0.36	0.90	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.54	0.16	0.54	0.90	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA05-001-SO-904 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZN228 **Sample Date/Time:** 2017-08-22 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	<0.55	0.21	0.55	0.92	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.55	0.29	0.55	0.92	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	3.4	0.16	0.55	0.92	ug/kg		J	17
PERFLUOROBUTANOIC ACID	375-22-4	<0.55	0.21	0.55	0.92	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.55	0.21	0.55	0.92	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.37	0.12	0.37	0.92	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.55	0.20	0.55	0.92	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	3.4	0.16	0.55	0.92	ug/kg		J	17
PERFLUOROHEXANE SULFONATE	108427-53-8	44	2.1	5.5	9.2	ug/kg		J	17
PERFLUOROHEXANOIC ACID	307-24-4	6.4	0.17	0.55	0.92	ug/kg		J	17
PERFLUORONONANOIC ACID	375-95-1	<0.55	0.16	0.55	0.92	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.55	0.24	0.55	0.92	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	4.4	0.19	0.55	0.92	ug/kg		J	17
PERFLUOROOCTANOIC ACID	335-67-1	2.8	0.24	0.55	0.92	ug/kg		J	17
PERFLUOROPENTANOIC ACID	2706-90-3	2.2	0.17	0.55	0.92	ug/kg		J	17
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.37	0.10	0.37	0.92	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.37	0.11	0.37	0.92	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.55	0.17	0.55	0.92	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA05-001-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZN226 **Sample Date/Time:** 2017-08-22 08:30 **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	< 0.72	0.28	0.72	1.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	< 0.72	0.38	0.72	1.2	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	4.4	0.20	0.72	1.2	ug/kg			
PERFLUOROBUTANOIC ACID	375-22-4	1.1	0.28	0.72	1.2	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	< 0.72	0.28	0.72	1.2	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.48	0.16	0.48	1.2	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	< 0.72	0.26	0.72	1.2	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	3.6	0.20	0.72	1.2	ug/kg			
PERFLUOROHEXANE SULFONATE	108427-53-8	56	2.8	7.2	12	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	8.8	0.23	0.72	1.2	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	2.8	0.20	0.72	1.2	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	< 0.72	0.31	0.72	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	180	2.5	7.2	12	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	5.7	0.31	0.72	1.2	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	3.7	0.22	0.72	1.2	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.48	0.13	0.48	1.2	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.48	0.14	0.48	1.2	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	< 0.72	0.22	0.72	1.2	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA05-002-SO-002 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZN234 **Sample Date/Time:** 2017-08-22 09:47 **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	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	U	
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	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.66	0.21	0.66	1.1	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.66	0.29	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.66	0.23	0.66	1.1	ug/kg	U	U	
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	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.66	0.20	0.66	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA05-002-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZN233 **Sample Date/Time:** 2017-08-22 09:42 **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	<0.72	0.28	0.72	1.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.72	0.38	0.72	1.2	ug/kg	U	U	
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	<0.48	0.16	0.48	1.2	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.72	0.26	0.72	1.2	ug/kg	U	U	
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	<0.72	0.31	0.72	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.72	0.25	0.72	1.2	ug/kg	U	U	
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	<0.48	0.13	0.48	1.2	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.48	0.14	0.48	1.2	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.72	0.22	0.72	1.2	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA05-003-GW-006 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZN235 **Sample Date/Time:** 2017-08-22 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	<0.010	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	<0.010	0.0043	0.010	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	0.020	0.0034	0.010	0.020	ug/L	J	J	
PERFLUOROHEXANOIC ACID	307-24-4	0.0064	0.0029	0.010	0.020	ug/L	J	J	
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	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	0.025	0.0026	0.010	0.020	ug/L		J	05B
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	0.0073	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 NIGRA05-003-SO-005 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZN231 **Sample Date/Time:** 2017-08-22 09:13 **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	<0.58	0.22	0.58	0.97	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.58	0.31	0.58	0.97	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.58	0.16	0.58	0.97	ug/kg	U	U	
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	U	
PERFLUORODECANOIC ACID	335-76-2	<0.39	0.13	0.39	0.97	ug/kg	U	U	
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	U	
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	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.58	0.20	0.58	0.97	ug/kg	U	U	
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	<0.39	0.11	0.39	0.97	ug/kg	U	U	
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 NIGRA05-003-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZN230 **Sample Date/Time:** 2017-08-22 09:07 **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	0.22	0.57	0.95	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.57	0.30	0.57	0.95	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.57	0.16	0.57	0.95	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.57	0.22	0.57	0.95	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.57	0.22	0.57	0.95	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.38	0.12	0.38	0.95	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.57	0.21	0.57	0.95	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.57	0.16	0.57	0.95	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.92	0.22	0.57	0.95	ug/kg	J	J	
PERFLUOROHEXANOIC ACID	307-24-4	<0.57	0.18	0.57	0.95	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.57	0.16	0.57	0.95	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.57	0.25	0.57	0.95	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.57	0.20	0.57	0.95	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.57	0.25	0.57	0.95	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.57	0.17	0.57	0.95	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.38	0.10	0.38	0.95	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.38	0.11	0.38	0.95	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.57	0.17	0.57	0.95	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA07-004-SD-001 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EZN239 **Sample Date/Time:** 2017-08-22 11:35 **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	<0.84	0.32	0.84	1.4	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.84	0.45	0.84	1.4	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.84	0.24	0.84	1.4	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.84	0.32	0.84	1.4	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.84	0.32	0.84	1.4	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.56	0.18	0.56	1.4	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.84	0.31	0.84	1.4	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.84	0.24	0.84	1.4	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	2.1	0.32	0.84	1.4	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	<0.84	0.27	0.84	1.4	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.84	0.24	0.84	1.4	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.84	0.36	0.84	1.4	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	11	0.29	0.84	1.4	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	0.47	0.36	0.84	1.4	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.84	0.25	0.84	1.4	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.56	0.15	0.56	1.4	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.56	0.17	0.56	1.4	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.84	0.25	0.84	1.4	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA07-004-SW-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZN238 **Sample Date/Time:** 2017-08-22 11:35 **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	0.19	0.0032	0.010	0.020	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.0096	0.0036	0.010	0.020	ug/L	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.10	0.0048	0.010	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.089	0.0043	0.010	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	0.17	0.0033	0.010	0.020	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	1.5	0.034	0.10	0.20	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.36	0.0029	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.035	0.0038	0.010	0.020	ug/L			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.0057	0.0036	0.010	0.020	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	2.8	0.026	0.10	0.20	ug/L		J	05B
PERFLUOROOCTANOIC ACID	335-67-1	0.21	0.0046	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.39	0.0027	0.010	0.020	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	10A
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	10A
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA-IDW-WS **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZN236 **Sample Date/Time:** 2017-08-22 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	<0.66	0.25	0.66	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	U	
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	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	16	0.25	0.66	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	2.3	0.21	0.66	1.1	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	1.3	0.19	0.66	1.1	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	26	0.29	0.66	1.1	ug/kg			
PERFLUOROOCTANE SULFONATE	1763-23-1	240	2.3	6.6	11	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	3.0	0.29	0.66	1.1	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	0.69	0.20	0.66	1.1	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.40	0.13	0.44	1.1	ug/kg	J	J	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.90	0.20	0.66	1.1	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name NIGRA-IDW-WW **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZN237 **Sample Date/Time:** 2017-08-22 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	0.90	0.032	0.10	0.20	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.26	0.036	0.10	0.20	ug/L			
PERFLUOROBUTANE SULFONATE	29420-43-3	0.10	0.048	0.10	0.20	ug/L	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	1.0	0.043	0.10	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	<v	0.028	v	0.20	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	1.0	0.033	v	0.20	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	3.2	0.034	0.10	0.20	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	2.9	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.18	0.038	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.49	0.036	0.10	0.20	ug/L			
PERFLUOROOCTANE SULFONATE	1763-23-1	18	0.13	0.50	1.0	ug/L		J	05B
PERFLUOROOCTANOIC ACID	335-67-1	1.2	0.046	0.10	0.20	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	5.3	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 NIGRARS-007 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZN232 **Sample Date/Time:** 2017-08-22 09:35 **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	<0.010	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	<0.010	0.0043	0.010	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	0.0038	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: B7I1791

Analysis Method: EPA 537 m

Sample Name NIGRA01-001-GW-007 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK115 **Sample Date/Time:** 2017-08-18 12:48 **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	8.5	2.0	5.0	8.0	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<6.0	2.7	6.0	8.0	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	26	1.5	5.0	8.0	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	24	1.5	4.0	8.0	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<6.0	2.4	6.0	8.0	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<4.0	1.3	4.0	8.0	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<5.0	1.7	5.0	8.0	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	27	1.5	3.0	8.0	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	870	24	50	80	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	230	1.1	3.0	8.0	ug/L			
PERFLUORONONANOIC ACID	375-95-1	7.7	1.3	4.0	8.0	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<40	15	40	80	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	910	23	50	80	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	110	1.4	3.0	8.0	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	53	1.6	4.0	8.0	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<50	22	50	80	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<60	28	60	80	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<5.0	1.8	5.0	8.0	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA01-002-GW-008 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK114 **Sample Date/Time:** 2017-08-18 12:37 **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	86	2.0	5.0	8.0	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	3.7	2.7	6.0	8.0	ug/L	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	30	1.5	5.0	8.0	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	26	1.5	4.0	8.0	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<6.0	2.4	6.0	8.0	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<4.0	1.3	4.0	8.0	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<5.0	1.7	5.0	8.0	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	30	1.5	3.0	8.0	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	790	24	50	80	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	210	1.1	3.0	8.0	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<40	13	40	80	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	4.9	1.5	4.0	8.0	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	330	2.3	5.0	8.0	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	110	1.4	3.0	8.0	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	68	1.6	4.0	8.0	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<50	22	50	80	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<60	28	60	80	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<5.0	1.8	5.0	8.0	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA01-003-GW-008 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK101 **Sample Date/Time:** 2017-08-18 12:27 **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	75	2.0	5.0	8.0	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	11	2.7	6.0	8.0	ug/L			
PERFLUOROBUTANE SULFONATE	29420-43-3	31	1.5	5.0	8.0	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	36	1.5	4.0	8.0	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<60	24	60	80	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<4.0	1.3	4.0	8.0	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<5.0	1.7	5.0	8.0	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	21	1.5	3.0	8.0	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	750	24	50	80	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	210	1.1	3.0	8.0	ug/L			
PERFLUORONONANOIC ACID	375-95-1	14	1.3	4.0	8.0	ug/L			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	22	1.5	4.0	8.0	ug/L			
PERFLUOROOCTANE SULFONATE	1763-23-1	1200	23	50	80	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	110	1.4	3.0	8.0	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	56	1.6	4.0	8.0	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<50	22	50	80	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<60	28	60	80	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<5.0	1.8	5.0	8.0	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA02-001-GW-015 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK104 **Sample Date/Time:** 2017-08-18 15:08 **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	0.0075	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	<0.010	0.0048	0.010	0.020	ug/L	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	0.018	0.0043	0.010	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	<0.010	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	0.0038	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	0.012	0.0026	0.010	0.020	ug/L	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	0.030	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 NIGRA02-001-GW-915 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK105 **Sample Date/Time:** 2017-08-18 15:08 **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	0.018	0.0043	0.010	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	<0.010	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	0.0038	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	0.0092	0.0026	0.010	0.020	ug/L	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	0.032	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 NIGRA02-002-GW-014 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK107 **Sample Date/Time:** 2017-08-21 08:08 **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	0.35	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	0.013	0.0048	0.010	0.020	ug/L	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	0.77	0.0043	0.010	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	0.72	0.0033	0.010	0.020	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	0.12	0.0034	0.010	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	1.8	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.036	0.0038	0.010	0.020	ug/L			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.058	0.0026	0.010	0.020	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.40	0.0046	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	5.0	0.027	0.10	0.20	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 NIGRA02-003-GW-016 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK116 **Sample Date/Time:** 2017-08-21 08:15 **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	<0.010	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	0.024	0.0048	0.010	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.018	0.0043	0.010	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	0.0079	0.0033	0.010	0.020	ug/L	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.038	0.0034	0.010	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.062	0.0029	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	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	0.0072	0.0026	0.010	0.020	ug/L	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	0.0062	0.0046	0.010	0.020	ug/L	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.099	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 NIGRA02-004-GW-015 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK108 **Sample Date/Time:** 2017-08-21 08:35 **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	<0.010	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	<0.010	0.0043	0.010	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	0.0038	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	0.011	0.0026	0.010	0.020	ug/L	J	J	
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 NIGRA03-001-GW-006 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK103 **Sample Date/Time:** 2017-08-18 15:20 **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	<0.010	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	0.014	0.0048	0.010	0.020	ug/L	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	0.030	0.0043	0.010	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	0.023	0.0034	0.010	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.058	0.0029	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	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	0.029	0.0026	0.010	0.020	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.011	0.0046	0.010	0.020	ug/L	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.097	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 NIGRA04-001-GW-005 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK109 **Sample Date/Time:** 2017-08-21 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	4.0	0.032	0.10	0.20	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.52	0.036	0.10	0.20	ug/L			
PERFLUOROBUTANE SULFONATE	29420-43-3	0.95	0.048	0.10	0.20	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.96	0.043	0.10	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	0.64	0.033	0.10	0.20	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	7.3	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	0.16	0.038	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.13	0.036	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	22	0.13	0.10	1.0	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	1.1	0.046	0.10	0.20	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	1.7	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 NIGRA04-001-GW-905 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK110 **Sample Date/Time:** 2017-08-21 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	4.6	0.032	0.10	0.20	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.55	0.036	0.10	0.20	ug/L			
PERFLUOROBUTANE SULFONATE	29420-43-3	0.94	0.048	0.10	0.20	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.75	0.043	0.10	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	0.59	0.033	0.10	0.20	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	6.8	0.034	0.10	0.20	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	2.1	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.15	0.038	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.12	0.036	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	25	0.13	0.50	1.0	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	1.1	0.046	0.10	0.20	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	1.6	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 NIGRA04-003-GW-005 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK117 **Sample Date/Time:** 2017-08-21 09:09 **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	0.21	0.0032	0.010	0.020	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.0099	0.0036	0.010	0.020	ug/L	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.65	0.0048	0.010	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.38	0.0043	0.010	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	0.36	0.0033	0.010	0.020	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	4.6	0.034	0.10	0.20	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	2.1	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.030	0.0038	0.010	0.020	ug/L			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.016	0.0036	0.010	0.020	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	2.1	0.026	0.10	0.20	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.47	0.0046	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	1.2	0.027	0.10	0.20	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 NIGRA06-002-GW-015 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK112 **Sample Date/Time:** 2017-08-18 07:55 **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	0.011	0.0048	0.010	0.020	ug/L	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	<0.010	0.0043	0.010	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	0.019	0.0034	0.010	0.020	ug/L	J	J	
PERFLUOROHEXANOIC ACID	307-24-4	0.022	0.0029	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	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	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	0.0053	0.0046	0.010	0.020	ug/L	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.029	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 NIGRA06-003-GW-009 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK111 **Sample Date/Time:** 2017-08-21 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	<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	0.039	0.0048	0.010	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.039	0.0043	0.010	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	0.013	0.0033	0.010	0.020	ug/L	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.046	0.0034	0.010	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.058	0.0029	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	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	0.061	0.0026	0.010	0.020	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.0061	0.0046	0.010	0.020	ug/L	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.074	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 NIGRA08-002-GW-010 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK102 **Sample Date/Time:** 2017-08-18 14:58 **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	<0.010	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	<0.010	0.0043	0.010	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	0.024	0.0034	0.010	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.0099	0.0029	0.010	0.020	ug/L	J	J	
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.0065	0.0036	0.010	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	<0.010	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 NIGRARS-005 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK113 **Sample Date/Time:** 2017-08-18 12:10 **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	<0.010	0.0043	0.010	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	0.0038	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 NIGRA-RS-006 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK106 **Sample Date/Time:** 2017-08-21 07:45 **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	<0.010	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	<0.010	0.0043	0.010	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	0.0038	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: B7I1792

Analysis Method: EPA 537 m

Sample Name NIGRA01-001-SO-007 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK127 **Sample Date/Time:** 2017-08-15 09:35 **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	<0.66	0.25	0.66	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	UJ	05B
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	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.66	0.21	0.66	1.1	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.66	0.29	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.66	0.23	0.66	1.1	ug/kg	U	U	
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	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.66	0.20	0.66	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA01-002-SO-008 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK128 **Sample Date/Time:** 2017-08-15 10:15 **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	<0.60	0.23	0.60	1.0	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.60	0.32	0.60	1.0	ug/kg	U	UJ	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.17	0.60	1.0	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.60	0.23	0.60	1.0	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.60	0.23	0.60	1.0	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.40	0.13	0.40	1.0	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.60	0.22	0.60	1.0	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.60	0.17	0.60	1.0	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.60	0.23	0.60	1.0	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.60	0.19	0.60	1.0	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.60	0.17	0.60	1.0	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.60	0.26	0.60	1.0	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.92	0.21	0.60	1.0	ug/kg	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	<0.60	0.26	0.60	1.0	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.60	0.18	0.60	1.0	ug/kg	U	U	
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	<0.60	0.18	0.60	1.0	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA01-003-SO-010 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK126 **Sample Date/Time:** 2017-08-15 09:15 **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	<0.66	0.25	0.66	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	UJ	05B
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	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.66	0.21	0.66	1.1	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.66	0.29	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.37	0.23	0.66	1.1	ug/kg	J	J	
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	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.66	0.20	0.66	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA01-003-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK125 **Sample Date/Time:** 2017-08-15 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	<6.6	2.5	6.6	11	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<6.6	3.5	6.6	11	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	2.6	1.9	6.6	11	ug/kg	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	<6.6	2.5	6.6	11	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	11	2.5	6.6	11	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	<4.4	1.4	4.4	11	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<6.6	2.4	6.6	11	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<6.6	1.9	6.6	11	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	55	2.5	6.6	11	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	4.9	2.1	6.6	11	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	2.6	1.9	6.6	11	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	20	2.9	6.6	11	ug/kg			
PERFLUOROOCTANE SULFONATE	1763-23-1	1700	23	66	110	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	5.6	2.9	6.6	11	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	2.2	2.0	6.6	11	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<4.4	1.2	4.4	11	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	1.9	1.3	4.4	11	ug/kg	J	J	
PERFLUOROUNDECANOIC ACID	2058-94-8	8.4	2.0	6.6	11	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name NIGRA02-001-SO-011 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK144 **Sample Date/Time:** 2017-08-16 15:30 **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	<0.59	0.23	0.59	0.99	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.59	0.32	0.59	0.99	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.59	0.17	0.59	0.99	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.59	0.23	0.59	0.99	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.59	0.23	0.59	0.99	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.40	0.13	0.40	0.99	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.59	0.22	0.59	0.99	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.59	0.17	0.59	0.99	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.59	0.23	0.59	0.99	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.59	0.19	0.59	0.99	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.59	0.17	0.59	0.99	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.59	0.26	0.59	0.99	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.59	0.21	0.59	0.99	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.59	0.26	0.59	0.99	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.59	0.18	0.59	0.99	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.40	0.11	0.40	0.99	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.40	0.12	0.40	0.99	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.59	0.18	0.59	0.99	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA02-001-SO-911 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK145 **Sample Date/Time:** 2017-08-16 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	<0.74	0.28	0.74	1.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.74	0.39	0.74	1.2	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.74	0.21	0.74	1.2	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.74	0.28	0.74	1.2	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.74	0.28	0.74	1.2	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.49	0.16	0.49	1.2	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.74	0.27	0.74	1.2	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.74	0.21	0.74	1.2	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.74	0.28	0.74	1.2	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.74	0.23	0.74	1.2	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.74	0.21	0.74	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.74	0.32	0.74	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.74	0.26	0.74	1.2	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.74	0.32	0.74	1.2	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.74	0.22	0.74	1.2	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.49	0.14	0.49	1.2	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.49	0.15	0.49	1.2	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.74	0.22	0.74	1.2	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA02-001-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK142 **Sample Date/Time:** 2017-08-16 14:40 **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	5.3	0.24	0.62	1.0	ug/kg		J	17
8:2 FLUOROTELOMER SULFONATE	39108-34-4	1.4	0.33	0.62	1.0	ug/kg		J	17
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.62	0.18	0.62	1.0	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	1.0	0.24	0.62	1.0	ug/kg			
PERFLUORODECANE SULFONATE	335-77-3	0.32	0.24	0.62	1.0	ug/kg	J	J	
PERFLUORODECANOIC ACID	335-76-2	1.7	0.14	0.42	1.0	ug/kg			
PERFLUORODODECANOIC ACID	307-55-1	<0.62	0.23	0.62	1.0	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	2.4	0.18	0.62	1.0	ug/kg			
PERFLUOROHEXANE SULFONATE	108427-53-8	5.4	0.24	0.62	1.0	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	8.1	0.20	0.62	1.0	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	3.7	0.18	0.62	1.0	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.62	0.27	0.62	1.0	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	12	0.22	0.62	1.0	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	8.8	0.27	0.62	1.0	ug/kg		J	08B
PERFLUOROPENTANOIC ACID	2706-90-3	5.7	0.19	0.62	1.0	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.42	0.11	0.42	1.0	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.42	0.12	0.42	1.0	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.45	0.19	0.62	1.0	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name NIGRA02-001-SS-901 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK143 **Sample Date/Time:** 2017-08-16 14:40 **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	24	0.21	0.55	0.92	ug/kg		J	17
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.93	0.29	0.55	0.92	ug/kg		J	17
PERFLUOROBUTANE SULFONATE	29420-43-3	0.23	0.16	0.55	0.92	ug/kg	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	1.2	0.21	0.55	0.92	ug/kg			
PERFLUORODECANE SULFONATE	335-77-3	<0.55	0.21	0.55	0.92	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	2.0	0.12	0.37	0.92	ug/kg			
PERFLUORODODECANOIC ACID	307-55-1	0.41	0.20	0.55	0.92	ug/kg	J	J	
PERFLUOROHEPTANOIC ACID	375-85-9	2.1	0.16	0.55	0.92	ug/kg			
PERFLUOROHEXANE SULFONATE	108427-53-8	5.3	0.21	0.55	0.92	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	8.6	0.17	0.55	0.92	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	4.0	0.16	0.55	0.92	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.55	0.24	0.55	0.92	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	13	0.19	0.55	0.92	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	8.5	0.24	0.55	0.92	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	5.9	0.17	0.55	0.92	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.37	0.10	0.37	0.92	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.37	0.11	0.37	0.92	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.46	0.17	0.55	0.92	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name NIGRA03-001-SO-006 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK123 **Sample Date/Time:** 2017-08-14 14:55 **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	<0.53	0.20	0.53	0.88	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.53	0.28	0.53	0.88	ug/kg	U	UJ	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.53	0.15	0.53	0.88	ug/kg	U	U	
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	<0.35	0.11	0.35	0.88	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.53	0.19	0.53	0.88	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.53	0.15	0.53	0.88	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.53	0.20	0.53	0.88	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.53	0.17	0.53	0.88	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.53	0.15	0.53	0.88	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.53	0.23	0.53	0.88	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.38	0.18	0.53	0.88	ug/kg	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	<0.53	0.23	0.53	0.88	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.53	0.16	0.53	0.88	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.35	0.097	0.35	0.88	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.35	0.11	0.35	0.88	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.53	0.16	0.53	0.88	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA03-001-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK121 **Sample Date/Time:** 2017-08-14 14:15 **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	<0.66	0.25	0.66	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	UJ	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	0.55	0.25	0.66	1.1	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	1.8	0.14	0.44	1.1	ug/kg			
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.81	0.19	0.66	1.1	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.46	0.25	0.66	1.1	ug/kg	J	J	
PERFLUOROHEXANOIC ACID	307-24-4	0.60	0.21	0.66	1.1	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	1.4	0.19	0.66	1.1	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.66	0.29	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	2.3	0.23	0.66	1.1	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	2.2	0.29	0.66	1.1	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	1.1	0.20	0.66	1.1	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.70	0.20	0.66	1.1	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name NIGRA03-002-SO-003 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK124 **Sample Date/Time:** 2017-08-14 15:30 **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	<0.59	0.23	0.59	0.98	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.59	0.31	0.59	0.98	ug/kg	U	UJ	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.59	0.17	0.59	0.98	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.59	0.23	0.59	0.98	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.59	0.23	0.59	0.98	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.39	0.13	0.39	0.98	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.59	0.22	0.59	0.98	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.42	0.17	0.59	0.98	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.38	0.23	0.59	0.98	ug/kg	J	J	
PERFLUOROHEXANOIC ACID	307-24-4	<0.59	0.19	0.59	0.98	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.59	0.17	0.59	0.98	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.59	0.25	0.59	0.98	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.90	0.21	0.59	0.98	ug/kg	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	0.40	0.25	0.59	0.98	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.59	0.18	0.59	0.98	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.39	0.11	0.39	0.98	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.39	0.12	0.39	0.98	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.59	0.18	0.59	0.98	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA03-002-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK122 **Sample Date/Time:** 2017-08-14 14:40 **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	<0.66	0.25	0.66	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.57	0.35	0.66	1.1	ug/kg	J	J	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	0.50	0.25	0.66	1.1	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	2.2	0.14	0.44	1.1	ug/kg			
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	1.4	0.19	0.66	1.1	ug/kg			
PERFLUOROHEXANE SULFONATE	108427-53-8	0.76	0.25	0.66	1.1	ug/kg	J	J	
PERFLUOROHEXANOIC ACID	307-24-4	0.80	0.21	0.66	1.1	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	2.9	0.19	0.66	1.1	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.66	0.29	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	5.6	0.23	0.66	1.1	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	3.8	0.29	0.66	1.1	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	1.2	0.20	0.66	1.1	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.87	0.20	0.66	1.1	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name NIGRA04-001-SO-007 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK138 **Sample Date/Time:** 2017-08-16 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	1.7	0.20	0.52	0.87	ug/kg			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	3.5	0.28	0.52	0.87	ug/kg		J	17
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.52	0.15	0.52	0.87	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.52	0.20	0.52	0.87	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.52	0.20	0.52	0.87	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.35	0.11	0.35	0.87	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.52	0.19	0.52	0.87	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.41	0.15	0.52	0.87	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	1.8	0.20	0.52	0.87	ug/kg		J	17
PERFLUOROHEXANOIC ACID	307-24-4	0.83	0.17	0.52	0.87	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	0.26	0.15	0.52	0.87	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	2.7	0.23	0.52	0.87	ug/kg		J	17
PERFLUOROOCTANE SULFONATE	1763-23-1	50	1.8	5.2	8.7	ug/kg		J	17
PERFLUOROOCTANOIC ACID	335-67-1	0.49	0.23	0.52	0.87	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.49	0.16	0.52	0.87	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.35	0.096	0.35	0.87	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.35	0.10	0.35	0.87	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.52	0.16	0.52	0.87	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA04-001-SO-907 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK139 **Sample Date/Time:** 2017-08-16 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	1.8	0.24	0.62	1.0	ug/kg			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	6.8	0.33	0.62	1.0	ug/kg		J	17
PERFLUOROBUTANE SULFONATE	29420-43-3	0.26	0.18	0.62	1.0	ug/kg	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	<0.62	0.24	0.62	1.0	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	0.93	0.24	0.62	1.0	ug/kg	J	J	
PERFLUORODECANOIC ACID	335-76-2	<0.41	0.13	0.41	1.0	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.62	0.23	0.62	1.0	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.47	0.18	0.62	1.0	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	2.6	0.24	0.62	1.0	ug/kg		J	17
PERFLUOROHEXANOIC ACID	307-24-4	1.2	0.20	0.62	1.0	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	0.44	0.18	0.62	1.0	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	5.7	0.27	0.62	1.0	ug/kg		J	17
PERFLUOROOCTANE SULFONATE	1763-23-1	89	2.2	6.2	10	ug/kg		J	17
PERFLUOROOCTANOIC ACID	335-67-1	0.84	0.27	0.62	1.0	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.65	0.19	0.62	1.0	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.41	0.11	0.41	1.0	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.41	0.12	0.41	1.0	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.62	0.19	0.62	1.0	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA04-001-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK131 **Sample Date/Time:** 2017-08-15 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	2.8	2.3	6.0	10	ug/kg	J	J	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	6.9	3.2	6.0	10	ug/kg	J	J	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<6.0	1.7	6.0	10	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	2.5	2.3	6.0	10	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	6.7	2.3	6.0	10	ug/kg	J	J	
PERFLUORODECANOIC ACID	335-76-2	<4.0	1.3	4.0	10	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<6.0	2.2	6.0	10	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	4.3	1.7	6.0	10	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	15	2.3	6.0	10	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	<6.0	1.9	6.0	10	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<6.0	1.7	6.0	10	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	42	2.6	6.0	10	ug/kg		J	17
PERFLUOROOCTANE SULFONATE	1763-23-1	780	21	60	100	ug/kg		J	17
PERFLUOROOCTANOIC ACID	335-67-1	7.8	2.6	6.0	10	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	5.5	1.8	6.0	10	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<4.0	1.1	4.0	10	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<4.0	1.2	4.0	10	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<6.0	1.8	6.0	10	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA04-001-SS-901 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK132 **Sample Date/Time:** 2017-08-15 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	0.59	0.25	0.66	1.1	ug/kg	J	J	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	2.1	0.35	0.66	1.1	ug/kg		J	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	1.9	0.25	0.66	1.1	ug/kg			
PERFLUORODECANE SULFONATE	335-77-3	5.8	0.25	0.66	1.1	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	1.6	0.14	0.44	1.1	ug/kg			
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	2.3	0.19	0.66	1.1	ug/kg			
PERFLUOROHEXANE SULFONATE	108427-53-8	13	0.25	0.66	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	2.2	0.21	0.66	1.1	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	2.0	0.19	0.66	1.1	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	29	0.29	0.66	1.1	ug/kg		J	17
PERFLUOROOCTANE SULFONATE	1763-23-1	480	2.3	6.6	11	ug/kg		J	17
PERFLUOROOCTANOIC ACID	335-67-1	6.3	0.29	0.66	1.1	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	3.7	0.20	0.66	1.1	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.98	0.20	0.66	1.1	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name NIGRA04-002-SO-004 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK140 **Sample Date/Time:** 2017-08-16 13:15 **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	<5.5	2.1	5.5	9.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<5.5	2.9	5.5	9.2	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<5.5	1.6	5.5	9.2	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<5.5	2.1	5.5	9.2	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<5.5	2.1	5.5	9.2	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<3.7	1.2	3.7	9.2	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<5.5	2.0	5.5	9.2	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<5.5	1.6	5.5	9.2	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	50	2.1	5.5	9.2	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	4.3	1.7	5.5	9.2	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	<5.5	1.6	5.5	9.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<5.5	2.4	5.5	9.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	230	1.9	5.5	9.2	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	13	2.4	5.5	9.2	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	<5.5	1.7	5.5	9.2	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<3.7	1.0	3.7	9.2	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<3.7	1.1	3.7	9.2	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<5.5	1.7	5.5	9.2	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA04-002-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK129 **Sample Date/Time:** 2017-08-15 14:20 **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	0.32	0.25	0.66	1.1	ug/kg	J	J	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	UJ	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	1.5	0.19	0.66	1.1	ug/kg			
PERFLUOROBUTANOIC ACID	375-22-4	0.96	0.25	0.66	1.1	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	4.0	0.25	0.66	1.1	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	29	0.25	0.66	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	2.0	0.21	0.66	1.1	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	2.6	0.29	0.66	1.1	ug/kg			
PERFLUOROOCTANE SULFONATE	1763-23-1	440	2.3	6.6	11	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	2.3	0.29	0.66	1.1	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	1.3	0.20	0.66	1.1	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.36	0.20	0.66	1.1	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name NIGRA04-003-SO-005 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK141 **Sample Date/Time:** 2017-08-16 13:45 **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	<0.65	0.25	0.65	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.65	0.35	0.65	1.1	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.35	0.18	0.65	1.1	ug/kg	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	<0.65	0.25	0.65	1.1	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.65	0.25	0.65	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.43	0.14	0.43	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.65	0.24	0.65	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.46	0.18	0.65	1.1	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	4.6	0.25	0.65	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	0.75	0.21	0.65	1.1	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	0.35	0.18	0.65	1.1	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.65	0.28	0.65	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	11	0.23	0.65	1.1	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	0.56	0.28	0.65	1.1	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.65	0.19	0.65	1.1	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.43	0.12	0.43	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.43	0.13	0.43	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.65	0.19	0.65	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA04-003-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK130 **Sample Date/Time:** 2017-08-15 14:55 **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	<0.66	0.25	0.66	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	UJ	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	0.55	0.19	0.66	1.1	ug/kg	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	0.82	0.25	0.66	1.1	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	3.3	0.25	0.66	1.1	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.60	0.19	0.66	1.1	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	21	0.25	0.66	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	1.5	0.21	0.66	1.1	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	0.78	0.19	0.66	1.1	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.59	0.29	0.66	1.1	ug/kg	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	410	2.3	6.6	11	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	1.2	0.29	0.66	1.1	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	1.4	0.20	0.66	1.1	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.66	0.20	0.66	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA06-001-SO-012 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK134 **Sample Date/Time:** 2017-08-16 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	<0.75	0.29	0.75	1.3	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.75	0.40	0.75	1.3	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.75	0.21	0.75	1.3	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.75	0.29	0.75	1.3	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.75	0.29	0.75	1.3	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.50	0.16	0.50	1.3	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.75	0.28	0.75	1.3	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.75	0.21	0.75	1.3	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.75	0.29	0.75	1.3	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.75	0.24	0.75	1.3	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.75	0.21	0.75	1.3	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.75	0.33	0.75	1.3	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.75	0.26	0.75	1.3	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.75	0.33	0.75	1.3	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.75	0.23	0.75	1.3	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.50	0.14	0.50	1.3	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.50	0.15	0.50	1.3	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.75	0.23	0.75	1.3	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA06-001-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK133 **Sample Date/Time:** 2017-08-16 08:05 **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	0.23	0.22	0.58	0.97	ug/kg	J	J	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.58	0.31	0.58	0.97	ug/kg	U	UJ	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.58	0.16	0.58	0.97	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	0.33	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	<0.39	0.13	0.39	0.97	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.58	0.21	0.58	0.97	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.83	0.16	0.58	0.97	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	1.2	0.22	0.58	0.97	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	0.76	0.18	0.58	0.97	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	0.85	0.16	0.58	0.97	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.58	0.25	0.58	0.97	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	17	0.20	0.58	0.97	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	1.5	0.25	0.58	0.97	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	1.4	0.17	0.58	0.97	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.39	0.11	0.39	0.97	ug/kg	U	U	
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 NIGRA06-002-SO-012 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK137 **Sample Date/Time:** 2017-08-16 10:40 **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	<0.70	0.27	0.70	1.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.70	0.37	0.70	1.2	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.70	0.20	0.70	1.2	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.70	0.27	0.70	1.2	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.70	0.27	0.70	1.2	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.46	0.15	0.46	1.2	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.70	0.26	0.70	1.2	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.70	0.20	0.70	1.2	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.70	0.27	0.70	1.2	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.70	0.22	0.70	1.2	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.70	0.20	0.70	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.70	0.30	0.70	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.70	0.24	0.70	1.2	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.70	0.30	0.70	1.2	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.70	0.21	0.70	1.2	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.46	0.13	0.46	1.2	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.46	0.14	0.46	1.2	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.70	0.21	0.70	1.2	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA06-002-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK135 **Sample Date/Time:** 2017-08-16 09:50 **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	<0.68	0.26	0.68	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.68	0.36	0.68	1.1	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.68	0.19	0.68	1.1	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	0.71	0.26	0.68	1.1	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	<0.68	0.26	0.68	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	0.58	0.15	0.45	1.1	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	<0.68	0.25	0.68	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	1.6	0.19	0.68	1.1	ug/kg			
PERFLUOROHEXANE SULFONATE	108427-53-8	3.0	0.26	0.68	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	1.4	0.21	0.68	1.1	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	1.5	0.19	0.68	1.1	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.68	0.29	0.68	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	33	0.24	0.68	1.1	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	2.8	0.29	0.68	1.1	ug/kg		J	17
PERFLUOROPENTANOIC ACID	2706-90-3	1.9	0.20	0.68	1.1	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.45	0.12	0.45	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.45	0.14	0.45	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.24	0.20	0.68	1.1	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name NIGRA06-002-SS-901 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK136 **Sample Date/Time:** 2017-08-16 09:50 **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	<0.71	0.27	0.71	1.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.71	0.38	0.71	1.2	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.71	0.20	0.71	1.2	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.71	0.27	0.71	1.2	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.71	0.27	0.71	1.2	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.47	0.15	0.47	1.2	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.71	0.26	0.71	1.2	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	1.1	0.20	0.71	1.2	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	3.2	0.27	0.71	1.2	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	1.4	0.22	0.71	1.2	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	1.1	0.20	0.71	1.2	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.71	0.31	0.71	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	33	0.25	0.71	1.2	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	2.0	0.31	0.71	1.2	ug/kg		J	17
PERFLUOROPENTANOIC ACID	2706-90-3	1.7	0.21	0.71	1.2	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.47	0.13	0.47	1.2	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.47	0.14	0.47	1.2	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.71	0.21	0.71	1.2	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA06-003-SO-007 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK146 **Sample Date/Time:** 2017-08-17 08:05 **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	<0.58	0.22	0.58	0.96	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.58	0.31	0.58	0.96	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.58	0.16	0.58	0.96	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.58	0.22	0.58	0.96	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.58	0.22	0.58	0.96	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.38	0.12	0.38	0.96	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.58	0.21	0.58	0.96	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.58	0.16	0.58	0.96	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.58	0.22	0.58	0.96	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.58	0.18	0.58	0.96	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.58	0.16	0.58	0.96	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.58	0.25	0.58	0.96	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.58	0.20	0.58	0.96	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.58	0.25	0.58	0.96	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.58	0.17	0.58	0.96	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.38	0.11	0.38	0.96	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.38	0.12	0.38	0.96	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.58	0.17	0.58	0.96	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA06-004-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK147 **Sample Date/Time:** 2017-08-17 08:25 **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	<0.66	0.25	0.66	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	U	
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	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.55	0.19	0.66	1.1	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.69	0.25	0.66	1.1	ug/kg	J	J	
PERFLUOROHEXANOIC ACID	307-24-4	0.73	0.21	0.66	1.1	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	0.93	0.19	0.66	1.1	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.66	0.29	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	53	0.23	0.66	1.1	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	0.80	0.29	0.66	1.1	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.91	0.20	0.66	1.1	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.66	0.20	0.66	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA06-MW7-3D-014 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK148 **Sample Date/Time:** 2017-08-17 08:43 **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	0.0085	0.0048	0.010	0.020	ug/L	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	<0.010	0.0043	0.010	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	0.0057	0.0033	0.010	0.020	ug/L	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.083	0.0034	0.010	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.014	0.0029	0.010	0.020	ug/L	J	J	
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	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	0.0088	0.0046	0.010	0.020	ug/L	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.014	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	UJ	02A; 10A
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	02A; 10A
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA08-001-SO-008 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK118 **Sample Date/Time:** 2017-08-14 12:30 **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	<0.66	0.25	0.66	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	UJ	05B
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	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.66	0.21	0.66	1.1	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.66	0.29	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.40	0.23	0.66	1.1	ug/kg	J	J	
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	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.66	0.20	0.66	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA08-002-SO-010 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK119 **Sample Date/Time:** 2017-08-14 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	<0.59	0.23	0.59	0.98	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.59	0.31	0.59	0.98	ug/kg	U	UJ	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.59	0.17	0.59	0.98	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.59	0.23	0.59	0.98	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.59	0.23	0.59	0.98	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.39	0.13	0.39	0.98	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.59	0.22	0.59	0.98	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.59	0.17	0.59	0.98	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.59	0.23	0.59	0.98	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.59	0.19	0.59	0.98	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.59	0.17	0.59	0.98	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.59	0.25	0.59	0.98	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.27	0.21	0.59	0.98	ug/kg	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	<0.59	0.25	0.59	0.98	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.59	0.18	0.59	0.98	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.39	0.11	0.39	0.98	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.39	0.12	0.39	0.98	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.59	0.18	0.59	0.98	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA08-003-SO-008 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK120 **Sample Date/Time:** 2017-08-14 13:35 **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	<0.58	0.22	0.58	0.97	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.58	0.31	0.58	0.97	ug/kg	U	UJ	05B
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.58	0.16	0.58	0.97	ug/kg	U	U	
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	U	
PERFLUORODECANOIC ACID	335-76-2	<0.39	0.13	0.39	0.97	ug/kg	U	U	
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	U	
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	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.23	0.20	0.58	0.97	ug/kg	J	J	
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	<0.39	0.11	0.39	0.97	ug/kg	U	U	
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	

Validated Sample Result Forms: B7I1832

Analysis Method: EPA 537 m

Sample Name NIGRA03-002-GW-005 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK343 **Sample Date/Time:** 2017-08-16 16:21 **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	0.016	0.0032	0.010	0.020	ug/L	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANE SULFONATE	29420-43-3	0.022	0.0048	0.010	0.020	ug/L		J	01
PERFLUOROBUTANOIC ACID	375-22-4	0.027	0.0043	0.010	0.020	ug/L		J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	0.039	0.0033	0.010	0.020	ug/L		J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.16	0.0034	0.010	0.020	ug/L		J	01
PERFLUOROHEXANOIC ACID	307-24-4	0.075	0.0029	0.010	0.020	ug/L		J	01
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONATE	1763-23-1	0.14	0.0026	0.010	0.020	ug/L		J	01
PERFLUOROOCTANOIC ACID	335-67-1	0.021	0.0046	0.010	0.020	ug/L		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	0.11	0.0027	0.010	0.020	ug/L		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA06-001-GW-015 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK345 **Sample Date/Time:** 2017-08-17 09:25 **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	<0.010	0.0032	0.010	0.020	ug/L	U	UJ	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.010	0.0048	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.010	0.0034	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.010	0.0029	0.010	0.020	ug/L	U	UJ	01
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.010	0.0026	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.010	0.0027	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA06-001-GW-915 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK346 **Sample Date/Time:** 2017-08-17 09:25 **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	<0.010	0.0032	0.010	0.020	ug/L	U	UJ	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.010	0.0048	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.0052	0.0034	0.010	0.020	ug/L	J	J	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.010	0.0029	0.010	0.020	ug/L	U	UJ	01
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.010	0.0026	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.010	0.0027	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA06-003-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK337 **Sample Date/Time:** 2017-08-16 10:50 **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	<0.77	0.29	0.77	1.3	ug/kg	U	UJ	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.77	0.41	0.77	1.3	ug/kg	U	UJ	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.77	0.22	0.77	1.3	ug/kg	U	UJ	01
PERFLUOROBUTANOIC ACID	375-22-4	0.58	0.29	0.77	1.3	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.77	0.29	0.77	1.3	ug/kg	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.51	0.17	0.51	1.3	ug/kg	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.77	0.28	0.77	1.3	ug/kg	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	0.58	0.22	0.77	1.3	ug/kg	J	J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.59	0.29	0.77	1.3	ug/kg	J	J	01
PERFLUOROHEXANOIC ACID	307-24-4	0.79	0.24	0.77	1.3	ug/kg	J	J	01
PERFLUORONONANOIC ACID	375-95-1	0.58	0.22	0.77	1.3	ug/kg	J	J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.77	0.33	0.77	1.3	ug/kg	U	UJ	01
PERFLUOROOCTANE SULFONATE	1763-23-1	12	0.27	0.77	1.3	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	1.3	0.33	0.77	1.3	ug/kg	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	1.0	0.23	0.77	1.3	ug/kg	J	J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.51	0.14	0.51	1.3	ug/kg	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.51	0.15	0.51	1.3	ug/kg	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.77	0.23	0.77	1.3	ug/kg	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA07-001-SD-001 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EZK339 **Sample Date/Time:** 2017-08-16 12:45 **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	0.90	0.36	0.94	1.6	ug/kg	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	1.7	0.50	0.94	1.6	ug/kg		J	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.94	0.27	0.94	1.6	ug/kg	U	UJ	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.94	0.36	0.94	1.6	ug/kg	U	UJ	01
PERFLUORODECANE SULFONATE	335-77-3	0.82	0.36	0.94	1.6	ug/kg	J	J	01
PERFLUORODECANOIC ACID	335-76-2	0.35	0.20	0.63	1.6	ug/kg	J	J	01
PERFLUORODODECANOIC ACID	307-55-1	0.54	0.35	0.94	1.6	ug/kg	J	J	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.94	0.27	0.94	1.6	ug/kg	U	UJ	01
PERFLUOROHEXANE SULFONATE	108427-53-8	4.1	0.36	0.94	1.6	ug/kg		J	01
PERFLUOROHEXANOIC ACID	307-24-4	0.70	0.30	0.94	1.6	ug/kg	J	J	01
PERFLUORONONANOIC ACID	375-95-1	0.51	0.27	0.94	1.6	ug/kg	J	J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	2.1	0.41	0.94	1.6	ug/kg		J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	54	3.3	9.4	16	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	1.0	0.41	0.94	1.6	ug/kg	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	1.0	0.28	0.94	1.6	ug/kg	J	J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.63	0.17	0.63	1.6	ug/kg	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.26	0.19	0.63	1.6	ug/kg	J	J	01
PERFLUOROUNDECANOIC ACID	2058-94-8	0.39	0.28	0.94	1.6	ug/kg	J	J	01

Analysis Method: EPA 537 m

Sample Name NIGRA07-001-SW-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK340 **Sample Date/Time:** 2017-08-16 12:45 **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	0.15	0.0032	0.010	0.020	ug/L		J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.022	0.0036	0.010	0.020	ug/L		J	01
PERFLUOROBUTANE SULFONATE	29420-43-3	0.080	0.0048	0.010	0.020	ug/L		J	01
PERFLUOROBUTANOIC ACID	375-22-4	0.085	0.0043	0.010	0.020	ug/L		J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	0.12	0.0033	0.010	0.020	ug/L		J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.94	0.0034	0.010	0.020	ug/L		J	01
PERFLUOROHEXANOIC ACID	307-24-4	0.35	0.0029	0.010	0.020	ug/L		J	01
PERFLUORONONANOIC ACID	375-95-1	0.019	0.0038	0.010	0.020	ug/L	J	J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.016	0.0036	0.010	0.020	ug/L	J	J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	1.9	0.026	0.10	0.20	ug/L		J	01
PERFLUOROOCTANOIC ACID	335-67-1	0.16	0.0046	0.010	0.020	ug/L		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	0.38	0.0027	0.010	0.020	ug/L		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA07-002-SD-001 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EZK335 **Sample Date/Time:** 2017-08-16 08:50 **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	2.8	0.75	2.0	3.3	ug/kg	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	2.9	1.0	2.0	3.3	ug/kg	J	J	01
PERFLUOROBUTANE SULFONATE	29420-43-3	0.83	0.56	2.0	3.3	ug/kg	J	J	01
PERFLUOROBUTANOIC ACID	375-22-4	1.1	0.75	2.0	3.3	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	<2.0	0.75	2.0	3.3	ug/kg	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	0.58	0.43	1.3	3.3	ug/kg	J	J	01
PERFLUORODODECANOIC ACID	307-55-1	<2.0	0.72	2.0	3.3	ug/kg	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	1.9	0.56	2.0	3.3	ug/kg	J	J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	13	0.75	2.0	3.3	ug/kg		J	01
PERFLUOROHEXANOIC ACID	307-24-4	3.2	0.62	2.0	3.3	ug/kg	J	J	01
PERFLUORONONANOIC ACID	375-95-1	3.1	0.56	2.0	3.3	ug/kg	J	J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	3.8	0.85	2.0	3.3	ug/kg		J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	160	6.9	20	33	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	4.1	0.85	2.0	3.3	ug/kg		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	4.1	0.59	2.0	3.3	ug/kg		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<1.3	0.36	1.3	3.3	ug/kg	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<1.3	0.39	1.3	3.3	ug/kg	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<2.0	0.59	2.0	3.3	ug/kg	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA07-002-SW-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK336 **Sample Date/Time:** 2017-08-16 08:50 **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	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANE SULFONATE	29420-43-3	0.0059	0.0048	0.010	0.020	ug/L	J	J	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	0.0091	0.0033	0.010	0.020	ug/L	J	J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.040	0.0034	0.010	0.020	ug/L		J	01
PERFLUOROHEXANOIC ACID	307-24-4	0.018	0.0029	0.010	0.020	ug/L	J	J	01
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONATE	1763-23-1	0.049	0.0026	0.010	0.020	ug/L		J	01
PERFLUOROOCTANOIC ACID	335-67-1	0.013	0.0046	0.010	0.020	ug/L	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	0.022	0.0027	0.010	0.020	ug/L		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA07-003-SD-001 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EZK333 **Sample Date/Time:** 2017-08-16 08:30 **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	<0.86	0.33	0.86	1.4	ug/kg	U	UJ	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.86	0.46	0.86	1.4	ug/kg	U	UJ	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.86	0.24	0.86	1.4	ug/kg	U	UJ	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.86	0.33	0.86	1.4	ug/kg	U	UJ	01
PERFLUORODECANE SULFONATE	335-77-3	<0.86	0.33	0.86	1.4	ug/kg	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.58	0.19	0.58	1.4	ug/kg	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.86	0.32	0.86	1.4	ug/kg	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.86	0.24	0.86	1.4	ug/kg	U	UJ	01
PERFLUOROHEXANE SULFONATE	108427-53-8	1.1	0.33	0.86	1.4	ug/kg	J	J	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.86	0.27	0.86	1.4	ug/kg	U	UJ	01
PERFLUORONONANOIC ACID	375-95-1	<0.86	0.24	0.86	1.4	ug/kg	U	UJ	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.86	0.37	0.86	1.4	ug/kg	U	UJ	01
PERFLUOROOCTANE SULFONATE	1763-23-1	11	0.30	0.86	1.4	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	0.58	0.37	0.86	1.4	ug/kg	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	1.0	0.26	0.86	1.4	ug/kg	J	J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.58	0.16	0.58	1.4	ug/kg	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.58	0.17	0.58	1.4	ug/kg	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.86	0.26	0.86	1.4	ug/kg	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA07-003-SW-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK334 **Sample Date/Time:** 2017-08-16 08:30 **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	0.0084	0.0032	0.010	0.020	ug/L	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.010	0.0048	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.012	0.0034	0.010	0.020	ug/L	J	J	01
PERFLUOROHEXANOIC ACID	307-24-4	0.014	0.0029	0.010	0.020	ug/L	J	J	01
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONATE	1763-23-1	0.012	0.0026	0.010	0.020	ug/L	J	J	01
PERFLUOROOCTANOIC ACID	335-67-1	0.0075	0.0046	0.010	0.020	ug/L	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	0.021	0.0027	0.010	0.020	ug/L		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA08-001-GW-011 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK341 **Sample Date/Time:** 2017-08-16 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	<0.010	0.0032	0.010	0.020	ug/L	U	UJ	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANE SULFONATE	29420-43-3	0.0077	0.0048	0.010	0.020	ug/L	J	J	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.036	0.0034	0.010	0.020	ug/L		J	01
PERFLUOROHEXANOIC ACID	307-24-4	0.010	0.0029	0.010	0.020	ug/L	J	J	01
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONATE	1763-23-1	0.015	0.0026	0.010	0.020	ug/L	J	J	01
PERFLUOROOCTANOIC ACID	335-67-1	0.0077	0.0046	0.010	0.020	ug/L	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.010	0.0027	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA08-003-GW-009 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK342 **Sample Date/Time:** 2017-08-16 15:19 **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	0.0085	0.0032	0.010	0.020	ug/L	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.010	0.0048	0.010	0.020	ug/L	U	UJ	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	UJ	01
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.010	0.0034	0.010	0.020	ug/L	U	UJ	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.010	0.0029	0.010	0.020	ug/L	U	UJ	01
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.010	0.0026	0.010	0.020	ug/L	U	UJ	01
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	UJ	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.010	0.0027	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	UJ	01

Analysis Method: EPA 537 m

Sample Name NIGRA-RS-003 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK338 **Sample Date/Time:** 2017-08-16 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	<0.010	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	<0.010	0.0043	0.010	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	0.0038	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 NIGRA-RS-004 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK347 **Sample Date/Time:** 2017-08-17 09:50 **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	<0.010	0.0043	0.010	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	0.0038	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 NIGRA-SB-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK344 **Sample Date/Time:** 2017-08-17 07:20 **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	<0.010	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	<0.010	0.0043	0.010	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	0.0038	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: B7I1879

Analysis Method: EPA 537 m

Sample Name NIGRA01-001-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK690 **Sample Date/Time:** 2017-08-15 08:28 **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	33	23	59	98	ug/kg	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<59	31	59	98	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<59	17	59	98	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	<59	23	59	98	ug/kg	U	R	01
PERFLUORODECANE SULFONATE	335-77-3	<59	23	59	98	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	14	13	39	98	ug/kg	J	J	01
PERFLUORODODECANOIC ACID	307-55-1	<59	22	59	98	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<59	17	59	98	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	410	23	59	98	ug/kg		J	01
PERFLUOROHEXANOIC ACID	307-24-4	27	19	59	98	ug/kg	J	J	01
PERFLUORONONANOIC ACID	375-95-1	<59	17	59	98	ug/kg	U	R	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	540	25	59	98	ug/kg		J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	4000	210	590	980	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	62	25	59	98	ug/kg	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	<59	18	59	98	ug/kg	U	R	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<39	11	39	98	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	24	12	39	98	ug/kg	J	J	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<59	18	59	98	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA01-002-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK691 **Sample Date/Time:** 2017-08-15 09:02 **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	10	2.6	6.9	11	ug/kg	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<6.9	3.7	6.9	11	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	6.4	1.9	6.9	11	ug/kg	J	J	01
PERFLUOROBUTANOIC ACID	375-22-4	5.5	2.6	6.9	11	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	<6.9	2.6	6.9	11	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	4.4	1.5	4.6	11	ug/kg	J	J	01
PERFLUORODODECANOIC ACID	307-55-1	<6.9	2.5	6.9	11	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	3.6	1.9	6.9	11	ug/kg	J	J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	250	2.6	6.9	11	ug/kg		J	01
PERFLUOROHEXANOIC ACID	307-24-4	25	2.2	6.9	11	ug/kg		J	01
PERFLUORONONANOIC ACID	375-95-1	20	1.9	6.9	11	ug/kg		J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	24	3.0	6.9	11	ug/kg		J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	1600	24	69	110	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	39	3.0	6.9	11	ug/kg		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	12	2.1	6.9	11	ug/kg		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<4.6	1.3	4.6	11	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<4.6	1.4	4.6	11	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	5.1	2.1	6.9	11	ug/kg	J	J	01

Analysis Method: EPA 537 m

Sample Name NIGRA01-004-SD-001 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EZK694 **Sample Date/Time:** 2017-08-15 10:15 **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	18	4.7	12	20	ug/kg	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<12	6.5	12	20	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	11	3.5	12	20	ug/kg	J	J	01
PERFLUOROBUTANOIC ACID	375-22-4	6.3	4.7	12	20	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	27	4.7	12	20	ug/kg		J	01
PERFLUORODECANOIC ACID	335-76-2	4.2	2.7	8.2	20	ug/kg	J	J	01
PERFLUORODODECANOIC ACID	307-55-1	<12	4.5	12	20	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	5.9	3.5	12	20	ug/kg	J	J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	340	4.7	12	20	ug/kg		J	01; 17
PERFLUOROHEXANOIC ACID	307-24-4	59	3.9	12	20	ug/kg		J	01
PERFLUORONONANOIC ACID	375-95-1	20	3.5	12	20	ug/kg		J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	120	5.3	12	20	ug/kg		J	01; 17
PERFLUOROOCTANE SULFONATE	1763-23-1	3100	43	120	210	ug/kg		J	01; 17
PERFLUOROOCTANOIC ACID	335-67-1	57	5.3	12	20	ug/kg		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	13	3.7	23	20	ug/kg	J	J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<8.2	2.2	8.2	20	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	16	2.5	8.2	20	ug/kg	J	J	01
PERFLUOROUNDECANOIC ACID	2058-94-8	29	3.7	12	20	ug/kg		J	01

Analysis Method: EPA 537 m

Sample Name NIGRA01-004-SD-901 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EZK695 **Sample Date/Time:** 2017-08-15 10:15 **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	98	51	130	220	ug/kg	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<130	71	130	220	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<130	38	130	220	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	<130	51	130	220	ug/kg	U	R	01
PERFLUORODECANE SULFONATE	335-77-3	65	51	130	220	ug/kg	J	J	01
PERFLUORODECANOIC ACID	335-76-2	30	29	89	220	ug/kg	J	J	01
PERFLUORODODECANOIC ACID	307-55-1	<130	49	130	220	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<130	38	130	220	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	760	51	130	220	ug/kg		J	01; 17
PERFLUOROHEXANOIC ACID	307-24-4	82	42	130	220	ug/kg	J	J	01
PERFLUORONONANOIC ACID	375-95-1	69	38	130	220	ug/kg	J	J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	440	58	130	220	ug/kg		J	01; 17
PERFLUOROOCTANE SULFONATE	1763-23-1	7500	470	1300	2200	ug/kg		J	01; 17
PERFLUOROOCTANOIC ACID	335-67-1	140	58	130	220	ug/kg	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	<130	40	130	220	ug/kg	U	R	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<89	25	89	220	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	50	27	89	220	ug/kg	J	J	01
PERFLUOROUNDECANOIC ACID	2058-94-8	69	40	130	220	ug/kg	J	J	01

Analysis Method: EPA 537 m

Sample Name NIGRA01-004-SW-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK692 **Sample Date/Time:** 2017-08-15 10:10 **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	0.25	0.0064	0.020	0.040	ug/L		J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.020	0.0072	0.020	0.040	ug/L	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	0.74	0.0096	0.020	0.040	ug/L		J	01
PERFLUOROBUTANOIC ACID	375-22-4	0.56	0.0086	0.020	0.040	ug/L		J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.020	0.0092	0.020	0.040	ug/L	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.020	0.0080	0.020	0.040	ug/L	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.020	0.0056	0.020	0.040	ug/L	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	0.48	0.0066	0.020	0.040	ug/L		J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	8.7	0.068	0.20	0.40	ug/L		J	01
PERFLUOROHEXANOIC ACID	307-24-4	4.5	0.058	0.20	0.40	ug/L		J	01
PERFLUORONONANOIC ACID	375-95-1	0.097	0.0076	0.020	0.040	ug/L		J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.037	0.0072	0.020	0.040	ug/L	J	J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	7.2	0.052	0.20	0.40	ug/L		J	01
PERFLUOROOCTANOIC ACID	335-67-1	1.1	0.0092	0.020	0.040	ug/L		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	1.4	0.0054	0.020	0.040	ug/L		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.20	0.076	0.20	0.40	ug/L	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.20	0.066	0.20	0.40	ug/L	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.020	0.0086	0.020	0.040	ug/L	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA01-004-SW-901 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK693 **Sample Date/Time:** 2017-08-15 10:10 **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	0.26	0.0064	0.020	0.040	ug/L		J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.020	0.0072	0.020	0.040	ug/L	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	0.64	0.0096	0.020	0.040	ug/L		J	01
PERFLUOROBUTANOIC ACID	375-22-4	0.54	0.0086	0.020	0.040	ug/L		J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.020	0.0092	0.020	0.040	ug/L	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.020	0.0080	0.020	0.040	ug/L	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.020	0.0056	0.020	0.040	ug/L	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	0.46	0.0066	0.020	0.040	ug/L		J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	9.4	0.068	0.20	0.40	ug/L		J	01
PERFLUOROHEXANOIC ACID	307-24-4	4.7	0.058	0.20	0.40	ug/L		J	01
PERFLUORONONANOIC ACID	375-95-1	0.11	0.0076	0.020	0.040	ug/L		J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.039	0.0072	0.020	0.040	ug/L	J	J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	7.7	0.052	0.20	0.40	ug/L		J	01
PERFLUOROOCTANOIC ACID	335-67-1	1.1	0.0092	0.020	0.040	ug/L		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	1.4	0.0054	0.020	0.040	ug/L		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.20	0.076	0.20	0.40	ug/L	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.20	0.066	0.20	0.40	ug/L	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.020	0.0086	0.020	0.040	ug/L	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA01-005-SD-001 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EZK697 **Sample Date/Time:** 2017-08-15 10:45 **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	9.2	3.2	8.4	14	ug/kg	J	J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<8.4	4.5	8.4	14	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	4.5	2.4	8.4	14	ug/kg	J	J	01
PERFLUOROBUTANOIC ACID	375-22-4	4.3	3.2	8.4	14	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	<8.4	3.2	8.4	14	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	2.8	1.8	5.6	14	ug/kg	J	J	01
PERFLUORODODECANOIC ACID	307-55-1	<8.4	3.1	8.4	14	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<8.4	2.4	8.4	14	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	88	3.2	8.4	14	ug/kg		J	01
PERFLUOROHEXANOIC ACID	307-24-4	16	2.7	8.4	14	ug/kg		J	01
PERFLUORONONANOIC ACID	375-95-1	6.7	2.4	8.4	14	ug/kg	J	J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	31	3.7	8.4	14	ug/kg		J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	1200	30	84	140	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	18	3.7	8.4	14	ug/kg		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	8.4	2.5	8.4	14	ug/kg	J	J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<5.6	1.5	5.6	14	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	1.7	1.7	5.6	14	ug/kg	J	J	01
PERFLUOROUNDECANOIC ACID	2058-94-8	4.0	2.5	8.4	14	ug/kg	J	J	01

Analysis Method: EPA 537 m

Sample Name NIGRA01-005-SW-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK696 **Sample Date/Time:** 2017-08-15 10:40 **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	1.1	0.032	0.10	0.20	ug/L		J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.10	0.036	0.10	0.20	ug/L	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	1.6	0.048	0.10	0.20	ug/L		J	01
PERFLUOROBUTANOIC ACID	375-22-4	1.7	0.043	0.10	0.20	ug/L		J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.10	0.046	0.10	0.20	ug/L	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.10	0.040	0.10	0.20	ug/L	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.10	0.028	0.10	0.20	ug/L	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	1.3	0.033	0.10	0.20	ug/L		J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	20	0.17	0.50	1.0	ug/L		J	01
PERFLUOROHEXANOIC ACID	307-24-4	8.7	0.029	0.10	0.20	ug/L		J	01
PERFLUORONONANOIC ACID	375-95-1	0.37	0.038	0.10	0.20	ug/L		J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.10	0.036	0.10	0.20	ug/L	J	J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	21	0.13	0.50	1.0	ug/L		J	01
PERFLUOROOCTANOIC ACID	335-67-1	3.3	0.046	0.10	0.20	ug/L		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	4.5	0.027	0.10	0.20	ug/L		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.10	0.038	0.10	0.20	ug/L	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.10	0.033	0.10	0.20	ug/L	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.10	0.043	0.10	0.20	ug/L	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA02-002-SO-014 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK680 **Sample Date/Time:** 2017-08-17 10:50 **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	<0.68	0.26	0.68	1.1	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.68	0.36	0.68	1.1	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.68	0.19	0.68	1.1	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.68	0.26	0.68	1.1	ug/kg	U	R	01
PERFLUORODECANE SULFONATE	335-77-3	<0.68	0.26	0.68	1.1	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.45	0.15	0.45	1.1	ug/kg	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.68	0.25	0.68	1.1	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.68	0.19	0.68	1.1	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.68	0.26	0.68	1.1	ug/kg	U	R	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.68	0.21	0.68	1.1	ug/kg	U	R	01
PERFLUORONONANOIC ACID	375-95-1	<0.68	0.19	0.68	1.1	ug/kg	U	R	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.68	0.29	0.68	1.1	ug/kg	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.68	0.24	0.68	1.1	ug/kg	U	R	01
PERFLUOROOCTANOIC ACID	335-67-1	<0.68	0.29	0.68	1.1	ug/kg	U	R	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.68	0.20	0.68	1.1	ug/kg	U	R	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.45	0.12	0.45	1.1	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.45	0.14	0.45	1.1	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.68	0.20	0.68	1.1	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA02-002-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK679 **Sample Date/Time:** 2017-08-17 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	5.9	0.26	0.69	1.2	ug/kg		J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	3.1	0.37	0.69	1.2	ug/kg		J	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.69	0.20	0.69	1.2	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	1.1	0.26	0.69	1.2	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.69	0.26	0.69	1.2	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	9.8	0.15	0.46	1.2	ug/kg		J	01
PERFLUORODODECANOIC ACID	307-55-1	1.7	0.25	0.69	1.2	ug/kg		J	01
PERFLUOROHEPTANOIC ACID	375-85-9	1.1	0.20	0.69	1.2	ug/kg	J	J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.42	0.26	0.69	1.2	ug/kg	J	J	01
PERFLUOROHEXANOIC ACID	307-24-4	3.1	0.22	0.69	1.2	ug/kg		J	01
PERFLUORONONANOIC ACID	375-95-1	3.3	0.20	0.69	1.2	ug/kg		J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.39	0.30	0.69	1.2	ug/kg	J	J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	38	0.24	0.69	1.2	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	3.0	0.30	0.69	1.2	ug/kg		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	5.5	0.21	0.69	1.2	ug/kg		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	0.90	0.13	0.46	1.2	ug/kg	J	J	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.88	0.14	0.46	1.2	ug/kg	J	J	01
PERFLUOROUNDECANOIC ACID	2058-94-8	4.1	0.21	0.69	1.2	ug/kg		J	01

Analysis Method: EPA 537 m

Sample Name NIGRA02-003-SO-014 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK681 **Sample Date/Time:** 2017-08-17 11:55 **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	<0.67	0.26	0.67	1.1	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.67	0.36	0.67	1.1	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.67	0.19	0.67	1.1	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.67	0.26	0.67	1.1	ug/kg	U	R	01
PERFLUORODECANE SULFONATE	335-77-3	<0.67	0.26	0.67	1.1	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.67	0.24	0.67	1.1	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.67	0.19	0.67	1.1	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.67	0.26	0.67	1.1	ug/kg	U	R	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.67	0.21	0.67	1.1	ug/kg	U	R	01
PERFLUORONONANOIC ACID	375-95-1	<0.67	0.19	0.67	1.1	ug/kg	U	R	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.67	0.29	0.67	1.1	ug/kg	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.67	0.23	0.67	1.1	ug/kg	U	R	01
PERFLUOROOCTANOIC ACID	335-67-1	<0.67	0.29	0.67	1.1	ug/kg	U	R	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.67	0.20	0.67	1.1	ug/kg	U	R	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.67	0.20	0.67	1.1	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA02-003-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK700 **Sample Date/Time:** 2017-08-17 09:59 **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	<0.62	0.24	0.62	1.0	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.62	0.33	0.62	1.0	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	0.25	0.18	0.62	1.0	ug/kg	J	J	01
PERFLUOROBUTANOIC ACID	375-22-4	1.0	0.24	0.62	1.0	ug/kg		J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.62	0.24	0.62	1.0	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.42	0.14	0.42	1.0	ug/kg	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.62	0.23	0.62	1.0	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	0.70	0.18	0.62	1.0	ug/kg	J	J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	4.5	0.24	0.62	1.0	ug/kg		J	01
PERFLUOROHEXANOIC ACID	307-24-4	1.7	0.20	0.62	1.0	ug/kg		J	01
PERFLUORONONANOIC ACID	375-95-1	1.2	0.18	0.62	1.0	ug/kg		J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.34	0.27	0.62	1.0	ug/kg	J	J	01
PERFLUOROOCTANE SULFONATE	1763-23-1	70	2.2	6.2	10	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	2.1	0.27	0.62	1.0	ug/kg		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	2.9	0.19	0.62	1.0	ug/kg		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.42	0.11	0.42	1.0	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.42	0.12	0.42	1.0	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.62	0.19	0.62	1.0	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA02-004-SO-012 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK682 **Sample Date/Time:** 2017-08-17 13:25 **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	<0.62	0.24	0.62	1.0	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.62	0.33	0.62	1.0	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.62	0.18	0.62	1.0	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.62	0.24	0.62	1.0	ug/kg	U	R	01
PERFLUORODECANE SULFONATE	335-77-3	<0.62	0.24	0.62	1.0	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.41	0.13	0.41	1.0	ug/kg	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.62	0.23	0.62	1.0	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.62	0.18	0.62	1.0	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.62	0.24	0.62	1.0	ug/kg	U	R	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.62	0.20	0.62	1.0	ug/kg	U	R	01
PERFLUORONONANOIC ACID	375-95-1	<0.62	0.18	0.62	1.0	ug/kg	U	R	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.62	0.27	0.62	1.0	ug/kg	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.62	0.22	0.62	1.0	ug/kg	U	R	01
PERFLUOROOCTANOIC ACID	335-67-1	<0.62	0.27	0.62	1.0	ug/kg	U	R	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.62	0.19	0.62	1.0	ug/kg	U	R	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.41	0.11	0.41	1.0	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.41	0.12	0.41	1.0	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.62	0.19	0.62	1.0	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA02-004-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK701 **Sample Date/Time:** 2017-08-17 11:27 **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	<0.65	0.25	0.65	1.1	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.65	0.35	0.65	1.1	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	0.20	0.19	0.65	1.1	ug/kg	J	J	01
PERFLUOROBUTANOIC ACID	375-22-4	0.61	0.25	0.65	1.1	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	1.5	0.25	0.65	1.1	ug/kg		J	01
PERFLUORODECANOIC ACID	335-76-2	0.82	0.14	0.44	1.1	ug/kg	J	J	01
PERFLUORODODECANOIC ACID	307-55-1	<0.65	0.24	0.65	1.1	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	0.82	0.19	0.65	1.1	ug/kg	J	J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	1.2	0.25	0.65	1.1	ug/kg		J	01
PERFLUOROHEXANOIC ACID	307-24-4	1.3	0.21	0.65	1.1	ug/kg		J	01
PERFLUORONONANOIC ACID	375-95-1	0.57	0.19	0.65	1.1	ug/kg	J	J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.65	0.28	0.65	1.1	ug/kg	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	3.4	0.23	0.65	1.1	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	3.6	0.28	0.65	1.1	ug/kg		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	1.9	0.20	0.65	1.1	ug/kg		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.65	0.20	0.65	1.1	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA02-005-SD-001 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EZK684 **Sample Date/Time:** 2017-08-17 16:30 **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	<0.91	0.35	0.91	1.5	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.91	0.49	0.91	1.5	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.91	0.26	0.91	1.5	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.91	0.35	0.91	1.5	ug/kg	U	R	01
PERFLUORODECANE SULFONATE	335-77-3	<0.91	0.35	0.91	1.5	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.61	0.20	0.61	1.5	ug/kg	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.91	0.33	0.91	1.5	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.91	0.26	0.91	1.5	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.91	0.35	0.91	1.5	ug/kg	U	R	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.91	0.29	0.91	1.5	ug/kg	U	R	01
PERFLUORONONANOIC ACID	375-95-1	<0.91	0.26	0.91	1.5	ug/kg	U	R	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.91	0.40	0.91	1.5	ug/kg	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	1.1	0.32	0.91	1.5	ug/kg	J	J	01
PERFLUOROOCTANOIC ACID	335-67-1	<0.91	0.40	0.91	1.5	ug/kg	U	R	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.91	0.27	0.91	1.5	ug/kg	U	R	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.61	0.17	0.61	1.5	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.61	0.18	0.61	1.5	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	0.27	0.27	0.91	1.5	ug/kg	J	J	01

Analysis Method: EPA 537 m

Sample Name NIGRA02-005-SW-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK683 **Sample Date/Time:** 2017-08-17 16:30 **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	<0.010	0.0032	0.010	0.020	ug/L	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.010	0.0036	0.010	0.020	ug/L	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.010	0.0048	0.010	0.020	ug/L	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.010	0.0043	0.010	0.020	ug/L	U	R	01
PERFLUORODECANE SULFONATE	335-77-3	<0.010	0.0046	0.010	0.020	ug/L	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.010	0.0040	0.010	0.020	ug/L	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0028	0.010	0.020	ug/L	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.010	0.0033	0.010	0.020	ug/L	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.010	0.0034	0.010	0.020	ug/L	U	R	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.010	0.0029	0.010	0.020	ug/L	U	R	01
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	0.010	0.020	ug/L	U	R	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.010	0.0026	0.010	0.020	ug/L	U	R	01
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	R	01
PERFLUOROPENTANOIC ACID	2706-90-3	0.011	0.0027	0.010	0.020	ug/L	J	J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA06-004-SO-002 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK678 **Sample Date/Time:** 2017-08-17 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	<0.70	0.27	0.70	1.2	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.70	0.37	0.70	1.2	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.70	0.20	0.70	1.2	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	0.34	0.27	0.70	1.2	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.70	0.27	0.70	1.2	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.47	0.15	0.47	1.2	ug/kg	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.70	0.26	0.70	1.2	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.70	0.20	0.70	1.2	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	1.6	0.27	0.70	1.2	ug/kg		J	01
PERFLUOROHEXANOIC ACID	307-24-4	0.32	0.22	0.70	1.2	ug/kg	J	J	01
PERFLUORONONANOIC ACID	375-95-1	0.44	0.20	0.70	1.2	ug/kg	J	J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.70	0.30	0.70	1.2	ug/kg	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	11	0.25	0.70	1.2	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	0.77	0.30	0.70	1.2	ug/kg	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	0.46	0.21	0.70	1.2	ug/kg	J	J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.47	0.13	0.47	1.2	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.47	0.14	0.47	1.2	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.70	0.21	0.70	1.2	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA06-MW7-1D-010 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK699 **Sample Date/Time:** 2017-08-15 15:11 **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	2.9	0.032	0.10	0.20	ug/L		J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.10	0.036	0.10	0.20	ug/L	J	J	01
PERFLUOROBUTANE SULFONATE	29420-43-3	3.4	0.048	0.10	0.20	ug/L		J	01
PERFLUOROBUTANOIC ACID	375-22-4	2.6	0.043	0.10	0.20	ug/L		J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.10	0.046	0.10	0.20	ug/L	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.10	0.040	0.10	0.20	ug/L	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.10	0.028	0.10	0.20	ug/L	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	3.2	0.033	0.10	0.20	ug/L		J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	69	0.34	1.0	2.0	ug/L		J	01
PERFLUOROHEXANOIC ACID	307-24-4	11	0.29	1.0	2.0	ug/L		J	01
PERFLUORONONANOIC ACID	375-95-1	0.86	0.038	0.10	0.20	ug/L		J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.10	0.036	0.10	0.20	ug/L	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	49	0.26	1.0	2.0	ug/L		J	01
PERFLUOROOCTANOIC ACID	335-67-1	5.0	0.046	0.10	0.20	ug/L		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	6.4	0.027	0.10	0.20	ug/L		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.10	0.038	0.10	0.20	ug/L	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.10	0.033	0.10	0.20	ug/L	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.10	0.043	0.10	0.20	ug/L	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA06-MW7-2-005 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK698 **Sample Date/Time:** 2017-08-15 15:01 **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	0.93	0.032	0.10	0.20	ug/L		J	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.10	0.036	0.10	0.20	ug/L	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	1.4	0.048	0.10	0.20	ug/L		J	01
PERFLUOROBUTANOIC ACID	375-22-4	1.2	0.043	0.10	0.20	ug/L		J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.10	0.046	0.10	0.20	ug/L	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.10	0.040	0.10	0.20	ug/L	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.10	0.028	0.10	0.20	ug/L	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	2.0	0.033	0.10	0.20	ug/L		J	01
PERFLUOROHEXANE SULFONATE	108427-53-8	28	0.34	1.0	2.0	ug/L		J	01
PERFLUOROHEXANOIC ACID	307-24-4	4.6	0.029	0.10	0.20	ug/L		J	01
PERFLUORONONANOIC ACID	375-95-1	0.72	0.038	0.10	0.20	ug/L		J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.10	0.036	0.10	0.20	ug/L	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	45	0.26	1.0	2.0	ug/L		J	01
PERFLUOROOCTANOIC ACID	335-67-1	3.0	0.046	0.10	0.20	ug/L		J	01
PERFLUOROPENTANOIC ACID	2706-90-3	4.0	0.027	0.10	0.20	ug/L		J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.10	0.038	0.10	0.20	ug/L	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.10	0.033	0.10	0.20	ug/L	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.10	0.043	0.10	0.20	ug/L	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA08-001-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK685 **Sample Date/Time:** 2017-08-14 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	<0.73	0.28	0.73	1.2	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.73	0.39	0.73	1.2	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.73	0.21	0.73	1.2	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	0.51	0.28	0.73	1.2	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.73	0.28	0.73	1.2	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	0.23	0.16	0.48	1.2	ug/kg	J	J	01
PERFLUORODODECANOIC ACID	307-55-1	<0.73	0.27	0.73	1.2	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.73	0.21	0.73	1.2	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.76	0.28	0.73	1.2	ug/kg	J	J	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.73	0.23	0.73	1.2	ug/kg	U	R	01
PERFLUORONONANOIC ACID	375-95-1	0.38	0.21	0.73	1.2	ug/kg	J	J	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.73	0.31	0.73	1.2	ug/kg	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	5.7	0.25	0.73	1.2	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	0.51	0.31	0.73	1.2	ug/kg	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.73	0.22	0.73	1.2	ug/kg	U	R	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.48	0.13	0.48	1.2	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.48	0.15	0.48	1.2	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.73	0.22	0.73	1.2	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA08-002-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK686 **Sample Date/Time:** 2017-08-14 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	<0.60	0.23	0.60	1.0	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.60	0.32	0.60	1.0	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.17	0.60	1.0	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	0.29	0.23	0.60	1.0	ug/kg	J	J	01
PERFLUORODECANE SULFONATE	335-77-3	<0.60	0.23	0.60	1.0	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.40	0.13	0.40	1.0	ug/kg	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.60	0.22	0.60	1.0	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.60	0.17	0.60	1.0	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	1.4	0.23	0.60	1.0	ug/kg		J	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.60	0.19	0.60	1.0	ug/kg	U	R	01
PERFLUORONONANOIC ACID	375-95-1	<0.60	0.17	0.60	1.0	ug/kg	U	R	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.60	0.26	0.60	1.0	ug/kg	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	7.9	0.21	0.60	1.0	ug/kg		J	01
PERFLUOROOCTANOIC ACID	335-67-1	0.52	0.26	0.60	1.0	ug/kg	J	J	01
PERFLUOROPENTANOIC ACID	2706-90-3	0.30	0.18	0.60	1.0	ug/kg	J	J	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.40	0.11	0.40	1.0	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.40	0.12	0.40	1.0	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.60	0.18	0.60	1.0	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA08-003-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZK687 **Sample Date/Time:** 2017-08-14 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	<0.72	0.28	0.72	1.2	ug/kg	U	R	01
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.72	0.38	0.72	1.2	ug/kg	U	R	01
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.72	0.20	0.72	1.2	ug/kg	U	R	01
PERFLUOROBUTANOIC ACID	375-22-4	<0.72	0.28	0.72	1.2	ug/kg	U	R	01
PERFLUORODECANE SULFONATE	335-77-3	<0.72	0.28	0.72	1.2	ug/kg	U	R	01
PERFLUORODECANOIC ACID	335-76-2	<0.48	0.16	0.48	1.2	ug/kg	U	R	01
PERFLUORODODECANOIC ACID	307-55-1	<0.72	0.26	0.72	1.2	ug/kg	U	R	01
PERFLUOROHEPTANOIC ACID	375-85-9	<0.72	0.20	0.72	1.2	ug/kg	U	R	01
PERFLUOROHEXANE SULFONATE	108427-53-8	0.49	0.28	0.72	1.2	ug/kg	J	J	01
PERFLUOROHEXANOIC ACID	307-24-4	<0.72	0.23	0.72	1.2	ug/kg	U	R	01
PERFLUORONONANOIC ACID	375-95-1	<0.72	0.20	0.72	1.2	ug/kg	U	R	01
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.72	0.31	0.72	1.2	ug/kg	U	R	01
PERFLUOROOCTANE SULFONATE	1763-23-1	0.95	0.25	0.72	1.2	ug/kg	J	J	01
PERFLUOROOCTANOIC ACID	335-67-1	<0.72	0.31	0.72	1.2	ug/kg	U	R	01
PERFLUOROPENTANOIC ACID	2706-90-3	<0.72	0.22	0.72	1.2	ug/kg	U	R	01
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.48	0.13	0.48	1.2	ug/kg	U	R	01
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.48	0.14	0.48	1.2	ug/kg	U	R	01
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.72	0.22	0.72	1.2	ug/kg	U	R	01

Analysis Method: EPA 537 m

Sample Name NIGRA-RS-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK688 **Sample Date/Time:** 2017-08-14 11:50 **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	<0.010	0.0043	0.010	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	0.0038	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 NIGRA-RS-002 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZK689 **Sample Date/Time:** 2017-08-15 08:07 **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	<0.010	0.0043	0.010	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	0.0038	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: B7I2484

Analysis Method: EPA 537 m

Sample Name NIGRA05-001-GW-005 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZN229 **Sample Date/Time:** 2017-08-22 08:55 **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	0.17	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	0.29	0.0048	0.010	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.13	0.0043	0.010	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	0.21	0.0033	0.010	0.020	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	2.2	0.034	0.10	0.20	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.63	0.0029	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.040	0.0038	0.010	0.020	ug/L			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0036	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	1.0	0.026	0.10	0.20	ug/L		J	05B
PERFLUOROOCTANOIC ACID	335-67-1	0.17	0.0046	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.50	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 NIGRA05-001-SO-004 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZN227 **Sample Date/Time:** 2017-08-22 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	<0.54	0.21	0.54	0.90	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.54	0.29	0.54	0.90	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	1.1	0.15	0.54	0.90	ug/kg		J	17
PERFLUOROBUTANOIC ACID	375-22-4	<0.54	0.21	0.54	0.90	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.54	0.21	0.54	0.90	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.36	0.12	0.36	0.90	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.54	0.20	0.54	0.90	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	1.3	0.15	0.54	0.90	ug/kg		J	17
PERFLUOROHEXANE SULFONATE	108427-53-8	19	0.21	0.54	0.90	ug/kg		J	17
PERFLUOROHEXANOIC ACID	307-24-4	2.1	0.17	0.54	0.90	ug/kg		J	17
PERFLUORONONANOIC ACID	375-95-1	<0.54	0.15	0.54	0.90	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.54	0.23	0.54	0.90	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	1.4	0.19	0.54	0.90	ug/kg		J	17
PERFLUOROOCTANOIC ACID	335-67-1	1.3	0.23	0.54	0.90	ug/kg		J	17
PERFLUOROPENTANOIC ACID	2706-90-3	0.94	0.16	0.54	0.90	ug/kg		J	17
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.36	0.099	0.36	0.90	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.36	0.11	0.36	0.90	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.54	0.16	0.54	0.90	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA05-001-SO-904 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZN228 **Sample Date/Time:** 2017-08-22 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	<0.55	0.21	0.55	0.92	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.55	0.29	0.55	0.92	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	3.4	0.16	0.55	0.92	ug/kg		J	17
PERFLUOROBUTANOIC ACID	375-22-4	<0.55	0.21	0.55	0.92	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.55	0.21	0.55	0.92	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.37	0.12	0.37	0.92	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.55	0.20	0.55	0.92	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	3.4	0.16	0.55	0.92	ug/kg		J	17
PERFLUOROHEXANE SULFONATE	108427-53-8	44	2.1	5.5	9.2	ug/kg		J	17
PERFLUOROHEXANOIC ACID	307-24-4	6.4	0.17	0.55	0.92	ug/kg		J	17
PERFLUORONONANOIC ACID	375-95-1	<0.55	0.16	0.55	0.92	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.55	0.24	0.55	0.92	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	4.4	0.19	0.55	0.92	ug/kg		J	17
PERFLUOROOCTANOIC ACID	335-67-1	2.8	0.24	0.55	0.92	ug/kg		J	17
PERFLUOROPENTANOIC ACID	2706-90-3	2.2	0.17	0.55	0.92	ug/kg		J	17
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.37	0.10	0.37	0.92	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.37	0.11	0.37	0.92	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.55	0.17	0.55	0.92	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA05-001-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZN226 **Sample Date/Time:** 2017-08-22 08:30 **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	< 0.72	0.28	0.72	1.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	< 0.72	0.38	0.72	1.2	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	4.4	0.20	0.72	1.2	ug/kg			
PERFLUOROBUTANOIC ACID	375-22-4	1.1	0.28	0.72	1.2	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	< 0.72	0.28	0.72	1.2	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.48	0.16	0.48	1.2	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	< 0.72	0.26	0.72	1.2	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	3.6	0.20	0.72	1.2	ug/kg			
PERFLUOROHEXANE SULFONATE	108427-53-8	56	2.8	7.2	12	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	8.8	0.23	0.72	1.2	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	2.8	0.20	0.72	1.2	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	< 0.72	0.31	0.72	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	180	2.5	7.2	12	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	5.7	0.31	0.72	1.2	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	3.7	0.22	0.72	1.2	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.48	0.13	0.48	1.2	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.48	0.14	0.48	1.2	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	< 0.72	0.22	0.72	1.2	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA05-002-SO-002 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZN234 **Sample Date/Time:** 2017-08-22 09:47 **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	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	U	
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	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.66	0.21	0.66	1.1	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.66	0.29	0.66	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.66	0.23	0.66	1.1	ug/kg	U	U	
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	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.44	0.13	0.44	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.66	0.20	0.66	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA05-002-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZN233 **Sample Date/Time:** 2017-08-22 09:42 **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	<0.72	0.28	0.72	1.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.72	0.38	0.72	1.2	ug/kg	U	U	
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	<0.48	0.16	0.48	1.2	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.72	0.26	0.72	1.2	ug/kg	U	U	
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	<0.72	0.31	0.72	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.72	0.25	0.72	1.2	ug/kg	U	U	
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	<0.48	0.13	0.48	1.2	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.48	0.14	0.48	1.2	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.72	0.22	0.72	1.2	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA05-003-GW-006 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZN235 **Sample Date/Time:** 2017-08-22 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	<0.010	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	<0.010	0.0043	0.010	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	0.020	0.0034	0.010	0.020	ug/L	J	J	
PERFLUOROHEXANOIC ACID	307-24-4	0.0064	0.0029	0.010	0.020	ug/L	J	J	
PERFLUORONONANOIC ACID	375-95-1	<0.010	0.0038	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	0.025	0.0026	0.010	0.020	ug/L		J	05B
PERFLUOROOCTANOIC ACID	335-67-1	<0.010	0.0046	0.010	0.020	ug/L	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	0.0073	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 NIGRA05-003-SO-005 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZN231 **Sample Date/Time:** 2017-08-22 09:13 **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	<0.58	0.22	0.58	0.97	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.58	0.31	0.58	0.97	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.58	0.16	0.58	0.97	ug/kg	U	U	
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	U	
PERFLUORODECANOIC ACID	335-76-2	<0.39	0.13	0.39	0.97	ug/kg	U	U	
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	U	
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	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.58	0.20	0.58	0.97	ug/kg	U	U	
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	<0.39	0.11	0.39	0.97	ug/kg	U	U	
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 NIGRA05-003-SS-001 **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZN230 **Sample Date/Time:** 2017-08-22 09:07 **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	0.22	0.57	0.95	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.57	0.30	0.57	0.95	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.57	0.16	0.57	0.95	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.57	0.22	0.57	0.95	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.57	0.22	0.57	0.95	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.38	0.12	0.38	0.95	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.57	0.21	0.57	0.95	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.57	0.16	0.57	0.95	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.92	0.22	0.57	0.95	ug/kg	J	J	
PERFLUOROHEXANOIC ACID	307-24-4	<0.57	0.18	0.57	0.95	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.57	0.16	0.57	0.95	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.57	0.25	0.57	0.95	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.57	0.20	0.57	0.95	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.57	0.25	0.57	0.95	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.57	0.17	0.57	0.95	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.38	0.10	0.38	0.95	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.38	0.11	0.38	0.95	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.57	0.17	0.57	0.95	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA07-004-SD-001 **Matrix Type:** SE **Result Type:** TRG

Lab Sample Name: EZN239 **Sample Date/Time:** 2017-08-22 11:35 **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	<0.84	0.32	0.84	1.4	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.84	0.45	0.84	1.4	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.84	0.24	0.84	1.4	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.84	0.32	0.84	1.4	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.84	0.32	0.84	1.4	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.56	0.18	0.56	1.4	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.84	0.31	0.84	1.4	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.84	0.24	0.84	1.4	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	2.1	0.32	0.84	1.4	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	<0.84	0.27	0.84	1.4	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.84	0.24	0.84	1.4	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.84	0.36	0.84	1.4	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	11	0.29	0.84	1.4	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	0.47	0.36	0.84	1.4	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.84	0.25	0.84	1.4	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.56	0.15	0.56	1.4	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.56	0.17	0.56	1.4	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.84	0.25	0.84	1.4	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA07-004-SW-001 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZN238 **Sample Date/Time:** 2017-08-22 11:35 **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	0.19	0.0032	0.010	0.020	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.0096	0.0036	0.010	0.020	ug/L	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.10	0.0048	0.010	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.089	0.0043	0.010	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	0.17	0.0033	0.010	0.020	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	1.5	0.034	0.10	0.20	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.36	0.0029	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.035	0.0038	0.010	0.020	ug/L			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.0057	0.0036	0.010	0.020	ug/L	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	2.8	0.026	0.10	0.20	ug/L		J	05B
PERFLUOROOCTANOIC ACID	335-67-1	0.21	0.0046	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.39	0.0027	0.010	0.020	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0038	0.010	0.020	ug/L	U	UJ	10A
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0033	0.010	0.020	ug/L	U	UJ	10A
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0043	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name NIGRA-IDW-WS **Matrix Type:** SO **Result Type:** TRG

Lab Sample Name: EZN236 **Sample Date/Time:** 2017-08-22 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	<0.66	0.25	0.66	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.66	0.35	0.66	1.1	ug/kg	U	U	
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	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.66	0.25	0.66	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.44	0.14	0.44	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.66	0.24	0.66	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.66	0.19	0.66	1.1	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	16	0.25	0.66	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	2.3	0.21	0.66	1.1	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	1.3	0.19	0.66	1.1	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	26	0.29	0.66	1.1	ug/kg			
PERFLUOROOCTANE SULFONATE	1763-23-1	240	2.3	6.6	11	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	3.0	0.29	0.66	1.1	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	0.69	0.20	0.66	1.1	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.44	0.12	0.44	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	0.40	0.13	0.44	1.1	ug/kg	J	J	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.90	0.20	0.66	1.1	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name NIGRA-IDW-WW **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZN237 **Sample Date/Time:** 2017-08-22 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	0.90	0.032	0.10	0.20	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.26	0.036	0.10	0.20	ug/L			
PERFLUOROBUTANE SULFONATE	29420-43-3	0.10	0.048	0.10	0.20	ug/L	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	1.0	0.043	0.10	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	<v	0.028	v	0.20	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	1.0	0.033	v	0.20	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	3.2	0.034	0.10	0.20	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	2.9	0.029	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.18	0.038	0.10	0.20	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.49	0.036	0.10	0.20	ug/L			
PERFLUOROOCTANE SULFONATE	1763-23-1	18	0.13	0.50	1.0	ug/L		J	05B
PERFLUOROOCTANOIC ACID	335-67-1	1.2	0.046	0.10	0.20	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	5.3	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 NIGRARS-007 **Matrix Type:** W **Result Type:** TRG

Lab Sample Name: EZN232 **Sample Date/Time:** 2017-08-22 09:35 **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	<0.010	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	<0.010	0.0043	0.010	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	0.0038	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	

Maxxam Analytics

AerostarSES LLC

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

Chain of Custody Record/ Analysis Request Number:

Page 1 of 2

Project Name: Site Inspection of Aqueous Film Forming Foam Areas, Multiple Sites, United States Air Force Installations

Job No.: ~~M2027.0003 (Omaha)~~ M2032.0001
Installation: NFARS

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

Sampler(s): J. Klein

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
	NIGRA 01-003-GW-008	8/18/17	1227	N	WG	2						
	NIGRA08-002-GW-010	8/18/17	1458	N	WG	2						
	NIGRA03-001-GW-006	8/18/17	1520	N	WG	2						
	NIGRA02-001-GW-015	8/18/17	1508	N	WG	6						
	NIGRA02-001-GW-915	8/18/17	1508	N	WG	2						
	NIGRA-RS-006	8/21/17	0745	EB	WQ	2						
	NIGRA02-002-GW-014	8/21/17	0808	N	WG	2						
	NIGRA02-004-GW-015	8/21/17	0835	N	WG	2						
	NIGRA04-001-GW-005	8/21/17	0910	N	WG	2						
	NIGRA04-001-GW-905	8/21/17	0910	FD	WG	2						
	NIGRA06-003-GW-009	8/21/17	0945	N	WG	2						
	NIGRA-IDW-WS	8/22/17	~~1200~~	N	SO	1						
	~~NIGRA-IDW-WW~~	8/22/17	1200	N	WG	2						
					Total # of Containers	26						

22-Aug-17 13:16
Stephanie Pollen
B7I1791
KES ENV-641

custody seal present & intact
6.5/6.6/6.2

RELINQUISHED BY:
Signature: Jeremy Klein Date/Time: 8/22/17 1700
Printed Name: Jeremy Klein Firm: ASL
Signature: Date/Time:
Printed Name: Firm:

RECEIVED BY:
Signature: Date/Time: 2017/08/22 13:16
Printed Name: LISA MUNSTEK Firm:
Signature: Date/Time:
Printed Name: Firm:

Analyte List:

ANALYTE	ERPIMS PAR CODE	CAS	Contaminant	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorotetradecanoic acid	PFTEA	376-06-7
Perfluorooctanoic acid	PFOA	[illegible]	Perfluorotridecanoic acid	PFTRA	72629-94-8
Perfluorononanoic acid	PFNA	375-95-1	Perfluoroundecanoic acid	PFUNA	2058-94-8
Perfluorohexanesulfonic acid	PFHXSA	[illegible]	6:2 Fluorotelomer sulfonate	6:2FTS	27619-97-2
Perfluoroheptanoic acid	PFHPA	375-85-9	8:2 Fluorotelomer sulfonate	8:2FTS	39108-34-4
Perfluorobutanesulfonic acid	PFBSA	[illegible]	Perfluorobutanoic acid	PFBA	[illegible]
Perfluorodecanoic acid	PFDA	335-76-2	Perfluorooctanesulfonamide	PFOSA	754-91-6
Perfluorobutanoic acid	PFBUA	[illegible]	Perfluoropentanoic Acid	PFPA	2706-90-3
Perfluoroheptanoic acid	PFHXA	307-24-4			

AerostarSES LLC

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

Chain of Custody Record/ Analysis Request Number: 077

Page 2 of 2

Project Name: Site Inspection of Aqueous Film Forming Foam Areas, Multiple Sites, United States Air Force Installations

Job No.: ~~M2027.0003 (Omaha)~~ M2032.0001 (Savannah)
Installation: NFARS

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

Sampler(s): Jeremy A Meshew, Miles Eckert

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
	NIGRA06-002-GW-015	8.18.17	0755	~~WG~~ JM 8.18 N	WG	2			JM			
	NIGRARS-005	8.18.17	1210	EB	WQ	2						Off tubing, associated with NIGRA01-002-GW-008
	NIGRA01-002-GW-008	8.18.17	1237	N	WG	2						
	NIGRA01-001-GW-007	8.18.17	1248	N	WG	2						
	NIGRA02-003-GW-016	8.21.17	0815	N	WG	2						
	NIGRA04-003-GW-005	8.21.17	0909	N	WG	2						
												custody seal present & intact
					Total # of Containers	12						

JM

RELINQUISHED BY:
Signature: [signature] Date/Time: 8/22/17
Printed Name: Jeremy Meshew Firm: ASL
Signature: Date/Time:
Printed Name: Firm:

RECEIVED BY:
Signature: [signature] Date/Time: 2017/08/22 13:16
Printed Name: U.A. MUNSTER Firm:
Signature: Date/Time:
Printed Name: Firm:

Analyte List:

ANALYTE	ERPIMS PAR CODE	CAS	Contaminant	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorotetradecanoic acid	PFTEA	376-06-7
Perfluorooctanoic acid	PFOA	335-67-1	Perfluorotridecanoic acid	PFTRIA	72629-94-8
Perfluorononanoic acid	PFNA	375-95-1	Perfluoroundecanoic acid	PFUNA	2058-94-8
Perfluorobutanesulfonic acid	PFHXSA	375-46-4	6:2 Fluorotelomer sulfonate	62FTS	27619-97-2
Perfluorobutanoic acid	PFHPA	375-85-9	8:2 Fluorotelomer sulfonate	82FTS	39108-34-4
Perfluorobutanesulfonic acid	PFBSA	375-73-5	Perfluorobutanoic acid	PFBA	375-22-4
Perfluorodecanoic acid	PFDA	335-76-2	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorododecanoic acid	PFDOA	307-55-1	Perfluorooctane sulfonamide	FOSA	754-91-6
Perfluorohexanoic acid	PFHXA	307-24-4	Perfluoropentanoic Acid	PFPA	2706-90-3

AerostarSES LLC

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

Chain of Custody Record/ Analysis Request Number:

Page 1 of 3

Project Name: Site Inspection of Aqueous Film Forming Foam Areas, Multiple Sites, United States Air Force Installations

Job No.: ~~M2027.0003 (Omaha)~~ M2032.0001 (Savannah)
Installation: NFARS

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

Sampler(s): J. Meshew

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)
	NIGRA08-001-SO-008	8.14.17	1230	N	SO	1
	NIGRA08-002-SO-010	8.14.17	1300	N	SO	1
	NIGRA08-003-SO-008	8.14.17	1335	N	SO	1
	NIGRA03-001-SS-001	8.14.17	1415	N	SO	1
	NIGRA03-002-SS-001	8.14.17	~~1435~~ 1440 JM	N	SO	1
	NIGRA03-001-SO-006	8.14.17	1455	N	SO	1
	NIGRA03-002-SO-003	8.14.17	1530	N	SO	1
	NIGRA01-003-SS-001	8.15.17	0820	N	SO	1
	NIGRA01-003-SO-010	8.15.17	0915	N	SO	1
	NIGRA01-001-SO-007	8.15.17	0935	N	SO	1
	NIGRA01-002-SO-008	8.15.17	1015	N	SO	1
	NIGRA04-002-SS-001	8.15.17	1420	N	SO	1
	NIGRA04-003-SS-001	8.15.17	1455	N	SO	1
	NIGRA04-001-SS-001	8.15.17	1500	N	SO	2
	NIGRA04-001-SS-001	8.15.17	1500	FD	SO	1
					Total # of Containers	16

22-Aug-17 13:16
Stephanie Pollen
B7I1792
TSP ENV-1170

International Solid Sample
Heat Treat Required
High Risk material
Controlled Storage and Disposal

Custody seal present & intact
+MS/MSD
8.6/6.7/9.6

RELINQUISHED BY:
Signature: Jeremy Meshew JM 8.18 Date/Time: 8.18.17/1700
Printed Name: [signature] Firm: ASL
Signature: Date/Time:
Printed Name: Firm:

RECEIVED BY:
Signature: [signature] Date/Time: 2017/08/22 13:16
Printed Name: LISA MUNSTER Firm:
Signature: Date/Time:
Printed Name: Firm:

Analyte List:

ANALYTE	ERPIMS PAR CODE	CAS	Contaminant	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorotetradecanoic acid	PFTEA	376-06-7
Perfluorooctanoic acid	PFOA	335-67-1	Perfluorotridecanoic acid	PFTRIA	72629-94-8
Perfluorooctanoic acid	PFNA	375-95-1	Perfluoroundecanoic acid	PFUNA	2058-94-8
Perfluorohexanesulfonic acid	PFHXSA	355-46-4	8:2 Fluorotelomer sulfonate	82FTS	27619-97-2
Perfluoroheptanoic acid	PFHPA	375-85-9	8:2 Fluorotelomer sulfonate	82FTS	39108-34-4
Perfluorobutanesulfonic acid	PFBSA	375-73-5	Perfluorobutanoic acid	PFBA	375-22-4
Perfluorodecanoic acid	PFDA	335-76-2	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorododecanoic acid	PFDOA	307-55-1	Perfluorooctane sulfonamide	FOSA	754-61-6
Perfluorobutanoic acid	PFHXA	307-24-4	Perfluoropentanoic Acid	PFPA	2706-90-3

AerostarSES, LLC

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

Chain of Custody Record/ Analysis Request Number:

Page 2 of 3

Project Name: Site Inspection of Aqueous Film Forming Foam Areas, Multiple Sites, United States Air Force Installations

Job No.: ~~M2027.0003 (Omaha)~~ M2032.0001 (Sawmill)

Installation: NFARS

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

Sampler(s): J. Meshew

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
	NIGRA06-001-SS-001	8.16.17	0805	N	SO	1						
	NIGRA06-001-SO-012	8.16.17	0845	N	SO	1						
	NIGRA06-002-SS-001	8.16.17	0950	N	SO	1						
	NIGRA06-002-SS-901	8.16.17	0950	FD	SO	1						
	NIGRA06-002-SO-012	8.16.17	1040	N	SO	1						
	NIGRA04-001-SO-007	8.16.17	1255	N	SO	1						
	NIGRA04-001-SO-907	8.16.17	1255	FD	SO	1						
	NIGRA04-002-SO-004	8.16.17	1315	N	SO	1						
	NIGRA04-003-SO-005	8.16.17	1345	N	SO	1						
	NIGRA02-001-SS-001	8.16.17	1440	N	SO	2						+MS/MSD
	NIGRA02-001-SS-901	8.16.17	1440	FD	SO	1						
	NIGRA02-001-SO-011	8.16.17	1530	N	SO	2						+MS/MSD
	NIGRA02-001-SO-911	8.16.17	1530	FD	SO	1						
	NIGRA06-003-SO-007	8.17.17	0805	N	SO	1						
	NIGRA06-004-SS-001	8.17.17	0825	N	SO	1						
					Total # of Containers	17						

International Solid Sample
Heat Treat Required
High Risk material
Controlled Storage and Disposal

Custody Seal present & intact
8.6/6.7/9.6

RELINQUISHED BY:		RECEIVED BY:	
Signature:	Date/Time: 8/18/17 1700	Signature:	Date/Time: 2017/08/22 13:16
Printed Name: Jeremy A Meshew	Firm: ASL	Printed Name: USA MUNSTER	Firm:
Signature:	Date/Time:	Signature:	Date/Time:
Printed Name:	Firm:	Printed Name:	Firm:

Analyte List:

ANALYTE	ERPIMS PAR CODE	CAS	Contaminant	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorotetradecanoic acid	PFTEA	376-06-7
Perfluorooctanoic acid	PFOA	335-67-1	Perfluorotridecanoic acid	PFTRA	72629-94-8
Perfluorononanoic acid	PFNA	375-95-1	Perfluoroundecanoic acid	PFUNA	2058-94-8
Perfluorohexanesulfonic acid	PFHXSA	355-46-4	6:2 Fluorotelomer sulfonate	6:2FTS	27619-97-2
Perfluoroheptanoic acid	PFHPA	375-85-9	8:2 Fluorotelomer sulfonate	8:2FTS	39108-34-4
Perfluorobutanesulfonic acid	PFBSA	375-73-5	Perfluorobutanoic acid	PFBA	375-22-4
Perfluorodecanoic acid	PFDA	335-76-2	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorohexanoic acid	PFHXA	307-24-4	Perfluorooctanesulfonamide	FOSA	754-91-6
Perfluoroheptanoic acid	PFHXA	307-24-4	Perfluoropentanoic Acid	PFPA	2706-90-3

AerostarSES LLC

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

Chain of Custody Record/ Analysis Request Number:

Page 3 of 3

Project Name: Site Inspection of Aqueous Film Forming Foam Areas, Multiple Sites, United States Air Force Installations

Job No.: ~~M2027.0003 (Omaha)~~ M2032.0001
Installation: NFARS

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

Sampler(s): M. Eckert

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
	NIGRA06-MW7-3D-014	8/17/17	0843	N	WG	6					MS/MSD
					Total # of Containers	6					

International Solid Sample
Heat Treat Required
High Risk material
Controlled Storage and Disposal

custody seal present & intact
8.6/6.7/9.6

RELINQUISHED BY:
Signature: Jenny Klein Date/Time: 8/18/17 1700
Printed Name: Jeremy Klein Firm: ASL

RECEIVED BY:
Signature: Date/Time: 2017/08/22 13:16
Printed Name: LISA MUNSTER Firm:

Signature: Date/Time:
Printed Name: Firm:

Signature: Date/Time:
Printed Name: Firm:

Analyte List:

ANALYTE	ERPIMS PAR CODE	CAS	Contaminant	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorotetradecanoic acid	PFTEA	376-06-7
Perfluorooctanoic acid	PFOA	335-67-1	Perfluorotridecanoic acid	PFTRA	72629-94-8
Perfluorononanoic acid	PFNA	375-95-1	Perfluoroundecanoic acid	PFUNA	2058-94-8
Perfluorohexanesulfonic acid	PFHXSA	355-46-4	6:2 Fluorotelomer sulfonate	6:2FTS	27619-97-2
Perfluoroheptanoic acid	PFHPA	375-85-9	8:2 Fluorotelomer sulfonate	8:2FTS	39108-34-4
Perfluorobutanesulfonic acid	PFBSA	375-73-5	Perfluorooctanoic acid	PFDA	335-67-1
Perfluorohexanoic acid	PFHA	307-24-4	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluoroheptanoic acid	PFHPA	375-85-9	Perfluorooctanesulfonamide	FOSA	754-91-6
Perfluorobutanoic acid	PFBUA	375-22-4	Perfluoropentanoic Acid	PFPA	2706-90-3

Aerostar AIR

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

Chain of Custody Record/ Analysis Request Number:

Page 1 of 1

Project Name: Site Inspection of Aqueous Film Forming Foam Areas, Multiple Sites, United States Air Force Installations

Job No.: ~~M2027.0003 (Omaha)~~ M2032.0001

Installation: Niagara Falls ARS

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

Sampler(s): J. Klein, M. Eckert

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)						
	NIGRA07-003-SD-001	8/16/17	0830	N	SE	1						
	NIGRA07-003-SW-001	8/16/17	0830	N	WS	2						
	NIGRA07-002-SD-001	8/16/17	0850	N	SE	1						
	NIGRA07-002-SW-001	8/16/17	0850	N	WS	2						
	NIGRA06-003-SS-001	8/16/17	1050	N	SO	1						
	NIGRA-RS-003	8/16/17	1235	EB	WQ	2						Taken From Spoon in association w/ NIGRA07-001-SD-001
	NIGRA07-001-SD-001	8/16/17	1245	N	SE	1						
	NIGRA07-001-SW-001	8/16/17	1245	N	WS	2						
	NIGRA08-001-GW-011	8/16/17	1530	N	WG	2						
	NIGRA08-003-GW-009	8/16/17	1519	N	WG	6						MS/MSD
	NIGRA03-002-GW-005	8/16/17	1621	N	WG	2						
	NIGRA-SB-001	8/17/17	0720	N	AB	2						
	NIGRA06-001-GW-015	8/17/17	0925	N	WG	2						
	NIGRA06-001-GW-915	8/17/17	0925	N	WG	2						
	NIGRA-RS-004	8/17/17	0950	EB	WQ	2						

Total # of Containers 30

International Solid Sample
Heat Treat Required
High Risk material
Controlled Storage and Disposal

22-Aug-17 13:16
Stephanie Pollen
B7I1832
GK1 ENV-585

RELINQUISHED BY: Signature: Jeremy Klein Date/Time: 8/22/17 1700 Printed Name: Jeremy Klein Firm: ASL

RECEIVED BY: Signature: Tanvir Singh Date/Time: 2017/08/22 13:16 Printed Name: Tanvir Singh Firm:

Analyte List:

ANALYTE					
Perfluorooctanesulfonic acid	PFOSA		Perfluorooctanoic acid	PFOA	
Perfluorooctanoic acid	PFOA		Perfluoroheptanoic acid	PFHPA	
Perfluorohexanesulfonic acid	PFHXSA		6:2 Fluorotelomer sulfonate	6:2 FTS	
Perfluoroheptanoic acid	PFHPA		8:2 Fluorotelomer sulfonate	8:2 FTS	
Perfluorobutanesulfonic acid	PFBSA		Perfluorobutanoic acid	PFBA	
Perfluorodecanoic acid	PFDA		Perfluorodecanesulfonic acid	PFDS	
Perfluorohexanoic acid	PFHXA		Perfluorooctanesulfonamide	FOSA	
Perfluoropentanoic acid	PFPA		Perfluoropentanesulfonic acid	PFPS	

8.3 | 11.0 | 7.5 on ice · custody seal intact and present

AerostarSES LLC

AIR

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

Chain of Custody Record/ Analysis Request Number:

Page 1 of 3

Project Name: Site Inspection of Aqueous Film Forming Foam Areas, Multiple Sites, United States Air Force Installations

Job No.: ~~M2027.0003 (Omaha)~~ M2032.0001

Installation: NFARS

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

Sampler(s): J. Meshew

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
	NIGRA06-004-SO-002	8.17.17	0845	N	SO	1	
	NIGRA02-002-SS-001	8.17.17	0945	N	SO	1	
	NIGRA02-002-SO-014	8.17.17	1050	N	SO	1	
	NIGRA02-003-SO-014	8.17.17	1155	N	SO	1	
	NIGRA02-004-SO-012	8.17.17	1325	N	SO	1	
	NIGRA02-005-SW-001	8.17.17	1630	N	WS	2	
	NIGRA02-005-SD-001	8.17.17	1630	N	SE	1	
					Total # of Containers	8	

22-Aug-17 13:16
Stephanie Pollen
B7I1879
PS4 ENV-585

International Solid Sample
Heat Treat Required
High Risk material
Controlled Storage and Disposal

RELINQUISHED BY:
Signature: Jeremy A Meshew
Date/Time: ~~8/18/17~~ 8/22/17 1700
Printed Name:
Firm: ASL

RECEIVED BY:
Signature: [illegible]
Date/Time: 2017/08/22 13:16
Printed Name: TAYFOR KACEMI
Firm:

Signature:
Date/Time:
Printed Name:
Firm:

Analyte List:

ANALYTE	ERPIMS PAR CODE	CAS	Contaminant	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorotetradecanoic acid	PFTEA	376-06-7
Perfluorooctanoic acid	PFOA	335-67-1	Perfluorotridecanoic acid	PFTRIA	72629-94-8
Perfluorononanoic acid	PFNA	375-95-1	Perfluoroundecanoic acid	PFUNA	2058-94-8
Perfluorohexanesulfonic acid	PFHXSA	355-46-4	6:2 Fluorotelomer sulfonate	6:2FTS	27619-97-2
Perfluoroheptanoic acid	PFHPA	375-85-9	8:2 Fluorotelomer sulfonate	8:2FTS	39108-34-4
Perfluorobutanesulfonic acid	PFBSA	375-73-5	Perfluorobutanoic acid	PFBA	375-22-4
Perfluorodecanoic acid	PFDA	335-76-2	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluoroheptanesulfonic acid	PFHPA	375-92-8	Perfluorooctanesulfonamide	FOSA	754-91-6
Perfluorohexanoic acid	PFHXA	307-24-4	Perfluoropentanoic Acid	PFPA	2706-90-3

ONICE

temps: 12.2 | 13.6 | 12.0 MM# 385267

CUSTODY PRESENT & INTACTED

AerostarSES, LLC

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

Chain of Custody Record/ Analysis Request Number: 433

Page 2 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: Niagara Falls ARS

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

Sampler(s): J. Klein, M. Eckert

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: PFAS (see list of 18 analytes below)

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
•	NIGRA08-001-SS-001	8/14/17	1200	N	SO	1	
•	NIGRA08-002-SS-001	8/14/17	1220	N	SO	1	
•	NIGRA08-003-SS-001	8/14/17	1255	N	SO	1	
•	NIGRA-RS-001	8/14/17	1150	EB	WQ	2	off spoon in association w/ NIGRA08-001-SS-001
•	NIGRA-RS-002	8/15/17	0807	EB	WQ	2	off spoon in association NIGRA01-002-SS-001
•	NIGRA01-001-SS-001	8/15/17	0828	N	SO	1	
•	NIGRA01-002-SS-001	8/15/17	0902	N	SO	1	
•	NIGRA01-004-SW-001	8/15/17	1010	N	WS	6	MS/MSD
•	NIGRA01-004-SW-901	8/15/17	1010	~~AB~~ FD	WS	2	
•	NIGRA01-004-SD-001	8/15/17	1015	N	SE	2	MS/MSD
•	NIGRA01-004-SD-901	8/15/17	1015	FD	SE	1	
•	NIGRA01-005-SW-001	8/15/17	1040	N	WS	2	
•	NIGRA01-005-SD-001	8/15/17	1045	N	SE	1	
•	NIGRA06-MW7-2-005	8/15/17	1501	N	WG	2	
•	NIGRA06-MW7-1D-010	8/15/17	1511	N	WG	2	
					Total # of Containers	27	

International Solid Sample
Heat Treat Required
High Risk material
Controlled Storage and Disposal

RELINQUISHED BY:		RECEIVED BY:	
Signature: Jenny Klein	Date/Time: ~~8/18/17~~ 8/22/17 1700	Signature: M Eckert	Date/Time: 2017/08/22 13:16
Printed Name: Jeremy Klein	Firm: ASL	Printed Name: TENFER KATCHWA	Firm:
Signature:	Date/Time:	Signature:	Date/Time:
Printed Name:	Firm:	Printed Name:	Firm: ONCLE

Temps: 12.2/13.6/12.0 MM# 385267 CUSTODY SEALS PRESENT & INTACTED

Analyte List:

ANALYTE	ERPIMS PAR CODE	CAS	Contaminant	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorotetradecanoic acid	PFTEA	376-06-7
Perfluorooctanoic acid	PFOA	335-67-1	Perfluorotridecanoic acid	PFTRIA	72629-94-8
Perfluorononanoic acid	PFNA	375-95-1	Perfluoroundecanoic acid	PFUNA	2058-94-8
Perfluorohexanesulfonic acid	PFHXSA	355-46-4	6:2 Fluorotelomer sulfonate	62FTS	27619-97-2
Perfluoroheptanoic acid	PFHPA	375-85-9	8:2 Fluorotelomer sulfonate	82FTS	39108-34-4
Perfluorobutanesulfonic acid	PFBSA	375-73-5	Perfluorobutanoic acid	PFBA	375-22-4
Perfluorodecanoic acid	PFDA	335-76-2	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorododecanoic acid	PFDOA	307-55-1	Perfluorooctane sulfonamide	FOSA	754-91-6
Perfluorohexanoic acid	PFHXA	307-24-4	Perfluoropentanoic Acid	PFPA	2706-90-3

AerostarSES LLC

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

Chain of Custody Record/ Analysis Request Number:

Page 3 of 3

Project Name: Site Inspection of Aqueous Film Forming Foam Areas, Multiple Sites, United States Air Force Installations

Job No.: ~~M2027.0003 (Omaha)~~ M2032-0001
Installation: NIAGARA Falls ARS

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

Sampler(s): J. Klein, M. Eckert

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
	NIGRA02-003-SS-001	8/17/17	0959	N	SO	1	
	NIGRA02-004-SS-001	8/17/17	1127	N	SO	1	
					Total # of Containers	2	

International Solid Sample
Heat Treat Required
High Risk material
Controlled Storage and Disposal

RELINQUISHED BY:
Signature: [signature] Date/Time: ~~8/18/17~~ 8/22/17 1700
Printed Name: Jeremy Klein Firm: ASL
Signature: Date/Time:
Printed Name: Firm:

RECEIVED BY:
Signature: [signature] Date/Time: 2017/08/22 13:16
Printed Name: TAUFIR KATEWAL Firm:
Signature: Date/Time:
Printed Name: Firm: ONICE

Analyte List:

ANALYTE	ERPIMS PAR CODE	CAS	Contaminant	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	[illegible]	Perfluorotetradecanoic acid	PFTEA	[illegible]
Perfluorooctanoic acid	PFOA	[illegible]	Perfluorotridecanoic acid	PFTRIA	[illegible]
Perfluorononanoic acid	PFNA	[illegible]	Perfluoroundecanoic acid	PFUNA	[illegible]
Perfluorohexanesulfonic acid	PFHXSA	[illegible]	6:2 Fluorotelomer sulfonate	6:FTS	[illegible]
Perfluoroheptanoic acid	PFHPA	[illegible]	8:2 Fluorotelomer sulfonate	8:FTS	[illegible]
Perfluorohexanesulfonic acid	PFBXA	[illegible]	Perfluorobutanoic acid	PFBA	[illegible]
Perfluorodecanoic acid	PFDA	[illegible]	Perfluorodecanesulfonic acid	PFDS	[illegible]
Perfluorohexanoic acid	PFDOA	[illegible]	Perfluorooctane sulfonamide	FOSA	[illegible]
Perfluorobutanoic acid	PFHXA	[illegible]	Perfluoroperfluoric Acid	PFPA	[illegible]

temps: 12.2/13.6/12.0 MM#335267 CUSTODY PRESENT & INTACTED.

M2032.0001 Page 3 of 3 D-232 11/21/18

AIR

23-Aug-17 13:42
Stephanie Pollen
B7I2484

Cooler 1 8.22.17

Aerostar SES LLC SEL ENV-1201

Chain of Custody Record/Analysis Request Number: ~~0018~~ 0019

Project Name: Site Investigation of ~~Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations~~ AFFF Areas, Multiple Sites, USAF Installations

Job No.: ~~M3010.0019.0017.05~~ M2032.0001 Jm 8-22-17
Installation: NFARS

Aerostar Project Manager: ~~Paula Bond, pbond@aerostar.net, 865-843-2759~~ Brian Odom, BOdom@specpreenv.com (478)987-4906
Send Data to: Jenny Vance, jvance@aerostar.net, 865-483-7904

Sampler (s): Jeremy A Meshew, Miles Eckert

Laboratory Name/Address: ~~TestAmerica~~ Maxxam Analytics, Inc Jm 8-22
~~880 Riverside Parkway~~ 6740 Campobello Rd.
~~West Sacramento, CA 95605~~ Mississauga, Ontario L5N2L8

Contact: David Alltucker
Phone: 916-374-4383
email: david.alltucker@testamericainc.com

TAT: 10 business days

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

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

MAXXAM Use Only ~~Station 10~~ Jm 8-22	Sample ID	Date Collected	Time Collected	Sample Type	Matrix	Depth (feet)	PFAS (see list of ~~13~~ 18 analytes below) JM 8-22	PFOS/PFOA (see back/next page for this site)					NOTES
			Preservative (Trizma, HCl, HNO_3, Ice, etc.)										
	NIGRA05-001-SS-001	8.22.17	0830	N	SO		1						
	NIGRA05-001-SO-004	8.22.17	0840	N	SO		1						
	NIGRA05-001-SO-004	8.22.17	0840	FD	SO		1						
	NIGRA05-001-GW-005	8.22.17	0855	N	WG		2			JM			
	NIGRA05-003-SS-001	8.22.17	0907	N	SO		1						
	NIGRA05-003-SO-005	8.22.17	0913	N	SO		1						
	NIGRAAS-007	8.22.17	0935	EB	WQ	JM	2						Diff spoon, Assisted w/ NIGRA05-002-SS-001
	NIGRA05-002-SS-001	8.22.17	0942	N	SO		1						
	NIGRA05-002-SO-002	8.22.17	0947	N	SO		2 3 AE						+MS/MSD
	NIGRA05-003-GW-006	8.22.17	1145	N	WG		2						
	NIGRA-IDW-WS	8.22.17	1200	N	SO		1						
	NIGRA-IDW-WW	8.22.17	1200	N	WG		2						
→	NIGRA07-004-SW-001	8-22-17	1135	N	WS		2						
Jm 8.22 →	NIGRA07-004-SD-001	8/22/17 Jm	1135	N	SE		1						
						Total # of Containers	17						

International Solid Sample
Heat Treat Required
High Risk material
Controlled Storage and Disposal

RELINQUISHED BY:		RECEIVED BY:	
Signature: Jeremy A Meshew	Date/Time: 8-23-17/0830	Signature: MARTIN HILL	Date/Time: 2017/08/23 5:9/5:8
Printed Name: Jeremy A Meshew	Firm: ASL	Printed Name: Custody Seal Intact	Firm: 3:42
Signature:	Date/Time:	Signature:	Date/Time:
Printed Name:	Firm:	Printed Name:	Firm:

Jm 8.22 ANALYTE	ERPIMS PAR CODE	CAS	Chemical	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorooctanoic acid	PFOCA	307-24-4
Perfluorooctanoic acid	PFOA	335-67-1	Perfluorotetradecanoic acid	PFTEA	376-06-7
Perfluorononanoic acid	PFNA	375-95-1	Perfluoroheptanoic acid	PFHPA	375-85-9
Perfluorohexanesulfonic acid	PFHXSA	355-46-4	Perfluoroundecanoic acid	PFUNA	2058-94-8
Perfluoroheptanoic acid	PFHPA	375-85-9	Perfluorododecanoic acid	PFDOA	307-55-1
Perfluorobutanesulfonic acid	PFBSA	375-73-5	Perfluorodecanoic acid	PFDA	335-76-2
N-methyl perfluorooctane sulfonamidoacetic acid	NMEFOSAA	2355-31-9	N-ethyl perfluorooctane sulfonamidoacetic acid	NETFOSAA	2991-50-6

Prepared for: Aerostar SES LLC

Project: M2032.0001
NIAGARA FALLS AFB

Analytical Data Package
(Level IV)

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

Maxxam Job #: B7I2484

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

Certification Page

1. Project Narrative

2. Sample Management Records

   2.1 Sample Custody

3. Analytical Results

   3.1 Summary Report

   3.2 Sample Chromatograms

4. QA/QC Data

5. Initial Calibration

6. Continuing Calibration

Last Page

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:

Steph Pollen

Project Manager

Maxxam
A Bureau Veritas Group Company

Stephanie Pollen
2017.09.25 17:08:40 -04'00'

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.
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

Maxxam Job: B7I2484 – Soil Analysis

Sample Analysis

Soil extracts were initially pre-screened and estimated concentrations were obtained so that extracts could be appropriately diluted for analysis on QC batch 5147082 (2017/09/09). Due to high concentrations, dilutions were required for selected analytes in the following samples:

EZN226	*NIGRA05-001-SS-001*	*Perfluorohexanesulfonate (PFHxS), Perfluorooctanesulfonate (PFOS)*
EZN228	*NIGRA05-001-SO-904*	*Perfluorohexanesulfonate (PFHxS)*
EZN236	*NIGRA-IDW-WS*	*Perfluorooctanesulfonate (PFOS)*

Detection limits were adjusted accordingly for these analytes.

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

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: B7I2484 – Water Analysis

Sample Analysis

Samples were initially pre-screened and estimated concentrations were obtained so that appropriate sample volumes could be extracted on QC batch 5136787 (2017/09/11). Due to high concentrations, the following samples were analyzed for selected analytes using reduced sample extraction volumes:

EZN229	*NIGRA05-001-GW-005*	*Perfluorohexanesulfonate (PFHxS), Perfluorooctanesulfonate (PFOS)*
EZN237	*NIGRA-IDW-WW*	*All analytes*
EZN238	*NIGRA07-004-SW-001*	*Perfluorohexanesulfonate (PFHxS), Perfluorooctanesulfonate (PFOS)*

Detection limits were adjusted accordingly.

The extracted internal standard analyte $^{13}C_2$-Perfluorotetradecanoic acid ($^{13}C_2$-PFTeDA) is used to quantify native Perfluorotridecanoic acid (PFTrDA) & Perfluorotetradecanoic acid (PFTeDA). The recovery observed for this extracted internal standard analytes was below the defined lower control limit (LCL) for the following sample:

EZN238 *NIGRA07-004-SW-001*

This observation was confirmed by re-extraction and re-analysis of the sample on QC batch 5159897 (2017/09/16), 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.

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

Client: Aerostar SES LLC
Client Project: M2032.0001

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						
EZN226	NIGRA05-001-SS-001	2017/08/22	2017/08/23	2017/09/01	2017/09/09	2017/09/09
EZN227	NIGRA05-001-SO-004	2017/08/22	2017/08/23	2017/09/01	2017/09/09	2017/09/09
EZN228	NIGRA05-001-SO-904	2017/08/22	2017/08/23	2017/09/01	2017/09/09	2017/09/09
EZN230	NIGRA05-003-SS-001	2017/08/22	2017/08/23	2017/09/01	2017/09/09	2017/09/09
EZN231	NIGRA05-003-SO-005	2017/08/22	2017/08/23	2017/09/01	2017/09/09	2017/09/09
EZN233	NIGRA05-002-SS-001	2017/08/22	2017/08/23	2017/09/01	2017/09/09	2017/09/09
EZN234	NIGRA05-002-SO-002	2017/08/22	2017/08/23	2017/09/01	2017/09/09	2017/09/09
EZN236	NIGRA-IDW-WS	2017/08/22	2017/08/23	2017/09/01	2017/09/09	2017/09/09
EZN239	NIGRA07-004-SD-001	2017/08/22	2017/08/23	2017/09/01	2017/09/09	2017/09/09
PFOS and PFOA in water by SPE/LCMS						
EZN229	NIGRA05-001-GW-005	2017/08/22	2017/08/23	2017/08/25	2017/09/11	2017/09/11
EZN232	NIGRARS-007	2017/08/22	2017/08/23	2017/08/25	2017/09/11	2017/09/11
EZN235	NIGRA05-003-GW-006	2017/08/22	2017/08/23	2017/08/25	2017/09/11	2017/09/11
EZN237	NIGRA-IDW-WW	2017/08/22	2017/08/23	2017/08/25	2017/09/11	2017/09/11
EZN238	NIGRA07-004-SW-001	2017/08/22	2017/08/23	2017/08/25	2017/09/11	2017/09/11 & 2017/09/16

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: Samples were received with cooler temperature under 10 degrees Celsius. Cooler custody seals were present and intact.

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: Sample "NIGRA07-004-SW-001" was re-analyzed for PFTeDA and PFTrDA past recommended hold time.

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

2017/09/25
Date

2. Sample Management Records

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

2.1 Sample Custody

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

AIR

23-Aug-17 13:42
Stephanie Pollen
B7I2484

Cooler 1 8.22.17

Aerostar SES LLC SEL ENV-1201

Chain of Custody Record/Analysis Request Number: ~~0018~~ 0019

Project Name: Site Investigation of ~~Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations~~ AFFF Areas, Multiple Sites, USAF Installations

Job No.: ~~M3010.0019.0017.05~~ M2032.0001 Jm 8-22-17
Installation: NFARS

Aerostar Project Manager: ~~Paula Bond, pbond@aerostar.net, 865-843-2759~~ Brian Odom, BOdom@specpreenv.com (478)987-4906
Send Data to: Jenny Vance, jvance@aerostar.net, 865-483-7904

Sampler (s): Jeremy A Meshew, Miles Eckert

Laboratory Name/Address: ~~TestAmerica~~ Maxxam Analytics, Inc Jm 8-22
~~880 Riverside Parkway~~ 6740 Campobello Rd.
~~West Sacramento, CA 95605~~ Mississauga, Ontario L5N2L8

Contact: David Alltucker
Phone: 916-374-4383
email: david.alltucker@testamericainc.com

TAT: 10 business days

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

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

MAXXAM Use Only ~~Station 10~~ Jm 8-22	Sample ID	Date Collected	Time Collected	Sample Type	Matrix	Depth (feet)	PFAS (see list of ~~13~~ 18 analytes below) (See back/excel for this site)	PFOS/PFOA					NOTES
			Preservative (Trizma, HCl, HNO_3, Ice, etc.)										
	NIGRA05-001-SS-001	8.22.17	0830	N	SO		1						
	NIGRA05-001-SO-004	8.22.17	0840	N	SO		1						
	NIGRA05-001-SO-904	8.22.17	0840	FD	SO		1						
	NIGRA05-001-GW-005	8.22.17	0855	N	WG		2			JM			
	NIGRA05-003-SS-001	8.22.17	0907	N	SO		1						
	NIGRA05-003-SO-005	8.22.17	0913	N	SO		1						
	NIGRAAS-007	8.22.17	0935	EB	WQ	JM	2						Diff spoon, Assisted w/ NIGRA05-002-SS-001
	NIGRA05-002-SS-001	8.22.17	0942	N	SO		1						
	NIGRA05-002-SO-002	8.22.17	0947	N	SO		2 3 AE						+MS/MSD
	NIGRA05-003-GW-006	8.22.17	1145	N	WG		2						
	NIGRA-IDW-WS	8.22.17	1200	N	SO		1						
	NIGRA-IDW-WW	8.22.17	1200	N	WG		2						
→	NIGRA07-004-SW-001	8.22.17	1135	N	WS		2						
Jm 8.22 →	NIGRA07-004-SD-001	8/22/17 Jm	1135	N	SE		1						
						Total # of Containers	17						

International Solid Sample
Heat Treat Required
High Risk material
Controlled Storage and Disposal

RELINQUISHED BY:		RECEIVED BY:	
Signature: Jeremy A Meshew	Date/Time: 8.23.17/0830	Signature: MARTIN HILL	Date/Time: 5.9/5.8/2017/08/23 3:42
Printed Name: Jeremy A Meshew	Firm: ASL	Printed Name: Custody Seal Intact	Firm:
Signature:	Date/Time:	Signature:	Date/Time:
Printed Name:	Firm:	Printed Name:	Firm:

Jm 8.22 ANALYTE	ERPIMS PAR CODE	CAS	Chemical name	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorooctanoic acid	PFOCA	307-24-4
Perfluorooctanoic acid	PFOA	335-67-1	Perfluorotetradecanoic acid	PFTEA	376-06-7
Perfluorononanoic acid	PFNA	375-95-1	Perfluorododecanoic acid	PFTRA	72629-94-8
Perfluorohexanesulfonic acid	PFHXSA	355-46-4	Jm Perfluoroundecanoic acid	PFUNA	2058-94-8
Perfluoroheptanoic acid	PFHPA	375-85-9	Perfluorodecanoic acid	PFDOA	335-76-2
Perfluorobutanesulfonic acid	PFBSA	375-73-5	Perfluorodecanoic acid	PFDA	335-76-2
N-methyl perfluorooctane sulfonamidoacetic acid	NMEFOSAA	2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid	NETFOSAA	2991-50-6

3. Analytical Results

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

3.1 Summary Report

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

Maxxam
A Bureau Veritas Group Company

Your Project #: M2032.0001
Site Location: NIAGARA FALLS AFB
Your C.O.C. #: 0019

Attention:Jenny Vance

Aerostar SES LLC
SES Construction and Fuel Serv
1006 Floyd Culler Court
Oak Ridge, TN
USA 37830

Report Date: 2017/09/19
Report #: R4721123
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7I2484
Received: 2017/08/23, 13:42

Sample Matrix: Ground Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
PFOS and PFOA in water by SPE/LCMS (1)	3	2017/08/25	2017/09/11	CAM SOP-00894	EPA 537 m

Sample Matrix: Soil
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Moisture	8	N/A	2017/08/25	CAM SOP-00445	Carter 2nd ed 51.2 m
PFOS and PFOA in soil by SPE/LCMS (1)	8	2017/09/01	2017/09/09	CAM SOP-00894	EPA537 m

Sample Matrix: SEDIMENT
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Moisture	1	N/A	2017/08/25	CAM SOP-00445	Carter 2nd ed 51.2 m
PFOS and PFOA in soil by SPE/LCMS (1)	1	2017/09/01	2017/09/09	CAM SOP-00894	EPA537 m

Sample Matrix: Surface Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
PFOS and PFOA in water by SPE/LCMS (1)	1	2017/08/25	2017/09/11	CAM SOP-00894	EPA 537 m

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
PFOS and PFOA in water by SPE/LCMS (1)	1	2017/08/25	2017/09/11	CAM SOP-00894	EPA 537 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Your Project #: M2032.0001
Site Location: NIAGARA FALLS AFB
Your C.O.C. #: 0019

Attention:Jenny Vance

Aerostar SES LLC
SES Construction and Fuel Serv
1006 Floyd Culler Court
Oak Ridge, TN
USA 37830

Report Date: 2017/09/19
Report #: R4721123
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7I2484
Received: 2017/08/23, 13:42

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding (lt in the apparent difference.
(1) Per- and polyfluoroalkyl substances (PFAS) id n the certificate of analysis represent the extracted internal standard.

Encryption Key Steph Pollen

Please direct all questions regarding this Certific Project Manager.
Stephanie Pollen, Project Manager
Email: SPollen@maxxam.ca
Phone# (905) 817-5700
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Prepared for: Aerostar SES LLC

Project: M2032.0001
NIAGARA FALLS AFB

Analytical Data Package
(Level IV)

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

Maxxam Job #: B7I1879

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

Certification Page

1. Project Narrative

2. Sample Management Records

   2.1 Sample Custody

3. Analytical Results

   3.1 Summary Report

   3.2 Sample Chromatograms

4. QA/QC Data

5. Initial Calibration

6. Continuing Calibration

Last Page

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:

Steph Pollen

Project Manager

Maxxam
A Bureau Veritas Group Company

Stephanie Pollen
2017.09.22
11:30:35 -04'00'

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.
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

Maxxam Job: B7I1879 – Soil Analysis

Sample Analysis

Soil extracts were initially pre-screened and estimated concentrations were obtained so that extracts could be appropriately diluted for analysis on QC batch 5134365 (2017/09/08). Due to high concentrations, dilutions were required for selected analytes in the following samples:

EZK690	*NIGRA01-001-SS-001*	*All analytes*
EZK691	*NIGRA01-002-SS-001*	*All analytes*
EZK694	*NIGRA01-004-SD-001*	*All analytes*
EZK695	*NIGRA01-004-SD-901*	*All analytes*
EZK697	*NIGRA01-005-SD-001*	*All analytes*
EZK700	*NIGRA02-003-SS-001*	*Perfluorooctanesulfonate (PFOS)*

Detection limits were adjusted accordingly.

Due to Perfluorooctanesulfonate (PFOS) contamination in the instrument blank (IB), the batch was re-injected for this analyte on 2017/09/18.

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 EZK694 *(NIGRA01-004-SD-001)* but not analyzed due to high concentrations of target analytes in the native sample.

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: B7I1879 – Water Analysis

Sample Analysis

Water samples were initially pre-screened and estimated concentrations were obtained so that appropriate sample volumes could be extracted on QC batch 5134834 (2017/08/28). Due to high concentrations of target analytes, the following samples were analyzed using reduced sample extraction volumes:

EZK692 *NIGRA01-004-SW-001*
EZK693 *NIGRA01-004-SW-901*
EZK696 *NIGRA01-005-SW-001*
EZK698 *NIGRA06-MW7-2-005*
EZK699 *NIGRA06-MW7-1D-010*

Detection limits were adjusted accordingly.

The extracted internal standard analyte $^{13}C_2$-Perfluorotetradecanoic acid ($^{13}C_2$-PFTeDA) is used to quantify native Perfluorotridecanoic acid (PFTrDA) & Perfluorotetradecanoic acid (PFTeDA). The recovery observed for this extracted internal standard analyte was below the defined lower control limit (LCL) for the following sample:

EZK683 *NIGRA02-005-SW-001*

The sample was re-extracted and re-analyzed for Perfluorotridecanoic acid (PFTrDA) & Perfluorotetradecanoic acid (PFTeDA) on QC batch 5143385 (2017/09/01). Acceptable recovery was obtained for the associated extracted internal standard analyte.

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 for sample EZK692 (*NIGRA01-004-SW-001)* on QC batch 5134834 (2017/08/28). Due to high concentrations of target analytes in the native sample, a Matrix Duplicate (MD) was analyzed instead.

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

Client: Aerostar SES LLC
Client Project: M2032.0001

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						
EZK678	NIGRA06-004-SO-002	2017/08/17	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
EZK679	NIGRA02-002-SS-001	2017/08/17	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
EZK680	NIGRA02-002-SO-014	2017/08/17	2017/08/22	2017/08/24	2017/09/16	2017/09/08 & 2017/09/18
EZK681	NIGRA02-003-SO-014	2017/08/17	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
EZK682	NIGRA02-004-SO-012	2017/08/17	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
EZK684	NIGRA02-005-SD-001	2017/08/17	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
EZK685	NIGRA08-001-SS-001	2017/08/14	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
EZK686	NIGRA08-002-SS-001	2017/08/14	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
EZK687	NIGRA08-003-SS-001	2017/08/14	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
EZK690	NIGRA01-001-SS-001	2017/08/15	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
EZK691	NIGRA01-002-SS-001	2017/08/15	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
EZK694	NIGRA01-004-SD-001	2017/08/15	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
EZK695	NIGRA01-004-SD-901	2017/08/15	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
EZK697	NIGRA01-005-SD-001	2017/08/15	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
EZK700	NIGRA02-003-SS-001	2017/08/17	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
EZK701	NIGRA02-004-SS-001	2017/08/17	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
PFOS and PFOA in water by SPE/LCMS						
EZK683	NIGRA02-005-SW-001	2017/08/17	2017/08/22	2017/08/24	2017/08/28	2017/08/28 & 2017/09/01
EZK688	NIGRA-RS-001	2017/08/14	2017/08/22	2017/08/24	2017/08/28	2017/08/28
EZK689	NIGRA-RS-002	2017/08/15	2017/08/22	2017/08/24	2017/08/28	2017/08/28
EZK692	NIGRA01-004-SW-001	2017/08/15	2017/08/22	2017/08/24	2017/08/28	2017/08/28
EZK692 Dup	NIGRA01-004-SW-001	2017/08/15	2017/08/22	2017/08/24	2017/08/28	2017/08/28
EZK693	NIGRA01-004-SW-901	2017/08/15	2017/08/22	2017/08/24	2017/08/28	2017/08/28
EZK696	NIGRA01-005-SW-001	2017/08/15	2017/08/22	2017/08/24	2017/08/28	2017/08/28
EZK698	NIGRA06-MW7-2-005	2017/08/15	2017/08/22	2017/08/24	2017/08/28	2017/08/28
EZK699	NIGRA06-MW7-1D-010	2017/08/15	2017/08/22	2017/08/24	2017/08/28	2017/08/28

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: Samples were received with temperature greater than 10 degrees Celsius, client consented to proceed with analysis. Cooler custody seals were present and intact.

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

2017/09/22

Date

2. Sample Management Records

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

2.1 Sample Custody

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

AerostarSES LLC

AIR

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

Chain of Custody Record/ Analysis Request Number:

Page 1 of 3

Project Name: Site Inspection of Aqueous Film Forming Foam Areas, Multiple Sites, United States Air Force Installations

Job No.: ~~M2027.0003 (Omaha)~~ M2032.0001

Installation: NFARS

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

Sampler(s): J. Meshew

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
	NIGRA06-004-SO-002	8.17.17	0845	N	SO	1	
	NIGRA02-002-SS-001	8.17.17	0945	N	SO	1	
	NIGRA02-002-SO-014	8.17.17	1050	N	SO	1	
	NIGRA02-003-SO-014	8.17.17	1155	N	SO	1	
	NIGRA02-004-SO-012	8.17.17	1325	N	SO	1	
	NIGRA02-005-SW-001	8.17.17	1630	N	WS	2	
	NIGRA02-005-SP-001	8.17.17	1630	N	SE	1	

22-Aug-17 13:16
Stephanie Pollen
B7I1879
PS4 ENV-585

International Solid Sample
Heat Treat Required
High Risk material
Controlled Storage and Disposal

Total # of Containers 8

RELINQUISHED BY:
Signature: Jeremy A Meshew Date/Time: ~~8/18/17~~ 8/22/17 1700
Printed Name: Firm: ASL
Signature: Date/Time:
Printed Name: Firm:

RECEIVED BY:
Signature: [signature] Date/Time: 2017/08/22 13:16
Printed Name: TAYLOR KACEMI Firm:
Signature: Date/Time:
Printed Name: Firm:

ONICE

Analyte List:

ANALYTE	ERPIMS PAR CODE	CAS	Contaminant	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorotetradecanoic acid	PFTEA	376-06-7
Perfluorooctanoic acid	PFOA	335-67-1	Perfluorotridecanoic acid	PFTRIA	72629-94-8
Perfluorotetranoic acid	PFNA	375-95-1	Perfluoroundecanoic acid	PFUNA	2058-94-8
Perfluorohexanesulfonic acid	PFHXSA	355-46-4	6:2 Fluorotelomer sulfonate	62FTS	27619-97-2
Perfluoroheptanoic acid	PFHPA	375-85-9	8:2 Fluorotelomer sulfonate	82FTS	39108-34-4
Perfluorobutanesulfonic acid	PFBSA	375-73-5	Perfluorobutanoic acid	PFBA	375-22-4
Perfluorodecanoic acid	PFDA	335-76-2	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorododecanoic acid	PFDOA	307-55-1	Perfluorooctane sulfonamide	FOSA	754-91-6
Perfluorohexanoic acid	PFHXA	307-24-4	Perfluoropentanoic Acid	PFPA	2706-90-3

temps: 12.2 | 13.6 | 12.0 MW# 385267 CUSTODY PRESENT & INTACTED

AerostarSES LLC

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

Chain of Custody Record/ Analysis Request Number: 433

Page 2 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: Niagara Falls ARS

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

Sampler(s): J. Klein, M. Eckert

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
•	NIGRA08-001-SS-001	8/14/17	1200	N	SO	1	
•	NIGRA08-002-SS-001	8/14/17	1220	N	SO	1	
•	NIGRA08-003-SS-001	8/14/17	1255	N	SO	1	
•	NIGRA-RS-001	8/14/17	1150	EB	WQ	2	off spoon in association w/ NIGRA08-001-SS-001
•	NIGRA-RS-002	8/15/17	0807	EB	WQ	2	off spoon in association NIGRA01-002-SS-001
•	NIGRA01-001-SS-001	8/15/17	0828	N	SO	1	
•	NIGRA01-002-SS-001	8/15/17	0902	N	SO	1	
•	NIGRA01-004-SW-001	8/15/17	1010	N	WS	6	MS/MSD
•	NIGRA01-004-SW-901	8/15/17	1010	~~N~~ FD	WS	2	
•	NIGRA01-004-SD-001	8/15/17	1015	N	SE	2	MS/MSD
•	NIGRA01-004-SD-901	8/15/17	1015	FD	SE	1	
•	NIGRA01-005-SW-001	8/15/17	1040	N	WS	2	
•	NIGRA01-005-SD-001	8/15/17	1045	N	SE	1	
•	NIGRA06-MW7-2-005	8/15/17	1501	N	WG	2	
•	NIGRA06-MW7-1D-010	8/15/17	1511	N	WG	2	
					Total # of Containers	27	

International Solid Sample
Heat Treat Required
High Risk material
Controlled Storage and Disposal

RELINQUISHED BY:
Signature: Jeremy Klein Date/Time: 8/22/17 ~~8/18/17~~ 1700
Printed Name: Jeremy Klein Firm: ASL
Signature: Date/Time:
Printed Name: Firm:

RECEIVED BY:
Signature: [signature] Date/Time: 2017/08/22 13:16
Printed Name: TANIFER KATCHWA Firm:
Signature: Date/Time:
Printed Name: Firm: ONICE

Analyte List:

ANALYTE	ERPIMS PAR CODE	CAS	Contaminant	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorotetradecanoic acid	PFTEA	376-06-7
Perfluorooctanoic acid	PFOA	335-67-1	Perfluorotridecanoic acid	PFTRIA	72629-94-8
Perfluorononanoic acid	PFNA	375-95-1	Perfluoroundecanoic acid	PFUNA	2058-94-8
Perfluorohexanesulfonic acid	PFHXSA	355-46-4	6:2 Fluorotelomer sulfonate	62FTS	27619-97-2
Perfluoroheptanoic acid	PFHPA	375-85-9	8:2 Fluorotelomer sulfonate	82FTS	39108-34-4
Perfluorobutanesulfonic acid	PFBSA	375-73-5	Perfluorobutanoic acid	PFBA	375-22-4
Perfluorodecanoic acid	PFDA	335-76-2	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorododecanoic acid	PFDOA	307-55-1	Perfluorooctane sulfonamide	FOSA	754-91-6
Perfluorohexanoic acid	PFHXA	307-24-4	Perfluoropentanoic Acid	PFPA	2708-90-3

Temps: 12.2/13.6/12.0 MW# 385267 CUSTODY SEALS PRESENT & INTACTED

AerostarSES LLC

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

Chain of Custody Record/ Analysis Request Number:

Page 3 of 3

Project Name: Site Inspection of Aqueous Film Forming Foam Areas, Multiple Sites, United States Air Force Installations

Job No.: ~~M2027.0003 (Omaha)~~ M2032-0001
Installation: NIAGARA Falls ARS

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

Sampler(s): J. Klein, M. Eckert

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
	NIGRA02-003-SS-001	8/17/17	0959	N	SO	1	
	NIGRA02-004-SS-001	8/17/17	1127	N	SO	1	
					Total # of Containers	2	

International Solid Sample
Heat Treat Required
High Risk material
Controlled Storage and Disposal

RELINQUISHED BY:
Signature: [signature] Date/Time: ~~8/18/17~~ 8/22/17 1700
Printed Name: Jeremy Klein Firm: ASL
Signature: Date/Time:
Printed Name: Firm:

RECEIVED BY:
Signature: [signature] Date/Time: 2017/08/22 13:16
Printed Name: TAUFIR KATEWAL Firm:
Signature: Date/Time:
Printed Name: Firm: ONICE

Analyte List:

ANALYTE	ERPIMS PAR CODE	CAS	Contaminant	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	[illegible]	Perfluorotetradecanoic acid	PFTEA	[illegible]
Perfluorooctanoic acid	PFOA	[illegible]	Perfluorotridecanoic acid	PFTRIA	[illegible]
Perfluorononanoic acid	PFNA	[illegible]	Perfluoroundecanoic acid	PFUNA	[illegible]
Perfluorohexanesulfonic acid	PFHXSA	[illegible]	6:2 Fluorotelomer sulfonate	6:FTS	[illegible]
Perfluoroheptanoic acid	PFHPA	[illegible]	8:2 Fluorotelomer sulfonate	8:FTS	[illegible]
Perfluorohexanesulfonic acid	PFBXA	[illegible]	Perfluorobutanoic acid	PFBA	[illegible]
Perfluorodecanoic acid	PFDA	[illegible]	Perfluorodecanesulfonic acid	PFDS	[illegible]
Perfluorododecanoic acid	PFDOA	[illegible]	Perfluorooctane sulfonamide	FOSA	[illegible]
Perfluorobutanoic acid	PFBXA	[illegible]	Perfluoropentanoic Acid	PFPA	[illegible]

temps: 12.2/13.6/12.0 MM#335267 CUSTODY PRESENT & INTACTED.

3. Analytical Results

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

3.1 Summary Report

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

Maxxam
A Bureau Veritas Group Company

Your Project #: M2032.0001
Site Location: NIAGARA FALLS AFB
Your C.O.C. #: n/a

Attention:Jenny Vance

Aerostar SES LLC
SES Construction and Fuel Serv
1006 Floyd Culler Court
Oak Ridge, TN
USA 37830

Report Date: 2017/09/19
Report #: R4720702
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7I1879
Received: 2017/08/22, 13:16

Sample Matrix: Ground Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
PFOS and PFOA in water by SPE/LCMS (1)	2	2017/08/24	2017/08/28	CAM SOP-00894	EPA 537 m

Sample Matrix: Soil
Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Moisture	12	N/A	2017/08/24	CAM SOP-00445	Carter 2nd ed 51.2 m
PFOS and PFOA in soil by SPE/LCMS (1)	1	2017/08/24	2017/09/16	CAM SOP-00894	EPA537 m
PFOS and PFOA in soil by SPE/LCMS (1)	11	2017/08/24	2017/09/18	CAM SOP-00894	EPA537 m

Sample Matrix: SEDIMENT
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Moisture	4	N/A	2017/08/24	CAM SOP-00445	Carter 2nd ed 51.2 m
PFOS and PFOA in soil by SPE/LCMS (1)	4	2017/08/24	2017/09/18	CAM SOP-00894	EPA537 m

Sample Matrix: Surface Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
PFOS and PFOA in water by SPE/LCMS (1)	4	2017/08/24	2017/08/28	CAM SOP-00894	EPA 537 m

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
PFOS and PFOA in water by SPE/LCMS (1)	2	2017/08/24	2017/08/28	CAM SOP-00894	EPA 537 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted,

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Your Project #: M2032.0001
Site Location: NIAGARA FALLS AFB
Your C.O.C. #: n/a

Attention:Jenny Vance

Aerostar SES LLC
SES Construction and Fuel Serv
1006 Floyd Culler Court
Oak Ridge, TN
USA 37830

Report Date: 2017/09/19
Report #: R4720702
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7I1879
Received: 2017/08/22, 13:16

procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding (lt in the apparent difference.
(1) Per- and polyfluoroalkyl substances (PFAS) id n the certificate of analysis represent the extracted internal standard.

Encryption Key Steph Pollen

Please direct all questions regarding this Certific Project Manager.
Stephanie Pollen, Project Manager
Email: SPollen@maxxam.ca
Phone# (905) 817-5700
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total Cover Pages : 2

Prepared for: Aerostar SES LLC

Project: M2032.0001
NIAGARA FALLS AFB

Analytical Data Package
(Level IV)

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

Maxxam Job #: B7I1832

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

Certification Page

1. Project Narrative

2. Sample Management Records

   2.1 Sample Custody

3. Analytical Results

   3.1 Summary Report

   3.2 Sample Chromatograms

4. QA/QC Data

5. Initial Calibration

6. Continuing Calibration

Last Page

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:

Project Manager

Maxxam
A Bureau Veritas Group Company

Stephanie Pollen
2017.09.22 09:55:02 -04'00'

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.
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

Maxxam Job: B7I1832 – Soil Analysis

Sample Analysis

Soil extracts were initially pre-screened and estimated concentrations were obtained so that extracts could be appropriately diluted for analysis on QC batch 5134365 (2017/09/08). Due to high concentrations, dilutions were required for Perfluorooctanesulfonate (PFOS) in the following samples:

EZK335 *NIGRA07-002-SD-001*
EZK339 *NIGRA07-001-SD-001*

Detection limits were adjusted accordingly for this analyte.

Due to Perfluorooctanesulfonate (PFOS) contamination in the instrument blank (IB), the batch was re-injected for this analyte on 2017/09/18.

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

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: B7I1832

Sample Analysis

Water samples were initially pre-screened and estimated concentrations were obtained so that appropriate sample volumes could be extracted on QC batch 5134815 (2017/08/30). The following sample was analyzed for Perfluorooctanesulfonate (PFOS) using a reduced sample extraction volume:

EZK340 *NIGRA07-001-SW-001*

Detection limit was adjusted accordingly for this analyte.

The extracted internal standard analyte $^{13}C_2$-Perfluorotetradecanoic acid ($^{13}C_2$-PFTeDA) is used to quantify native Perfluorotridecanoic acid (PFTrDA) & Perfluorotetradecanoic acid (PFTeDA). The recovery observed for this extracted internal standard analyte was below the defined lower control limit (LCL) for the following sample:

EZK336 *NIGRA07-002-SW-001*

The sample was re-extracted and re-analyzed for Perfluorotridecanoic acid (PFTrDA) & Perfluorotetradecanoic acid (PFTeDA) on QC batch 5145492 (2017/09/02), 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. Acceptable recovery was obtained for the associated extracted internal standard.

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

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

Client: Aerostar SES LLC
Client Project: M2032.0001

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						
EZK333	NIGRA07-003-SD-001	2017/08/16	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
EZK335	NIGRA07-002-SD-001	2017/08/16	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
EZK337	NIGRA06-003-SS-001	2017/08/16	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
EZK339	NIGRA07-001-SD-001	2017/08/16	2017/08/22	2017/08/24	2017/09/18	2017/09/08 & 2017/09/18
PFOS and PFOA in water by SPE/LCMS						
EZK334	NIGRA07-003-SW-001	2017/08/16	2017/08/22	2017/08/24	2017/08/30	2017/08/30
EZK336	NIGRA07-002-SW-001	2017/08/16	2017/08/22	2017/08/24	2017/08/30	2017/08/30 & 2017/09/02
EZK338	NIGRA-RS-003	2017/08/16	2017/08/22	2017/08/24	2017/08/30	2017/08/30
EZK340	NIGRA07-001-SW-001	2017/08/16	2017/08/22	2017/08/24	2017/08/30	2017/08/30
EZK341	NIGRA08-001-GW-011	2017/08/16	2017/08/22	2017/08/24	2017/08/30	2017/08/30
EZK342	NIGRA08-003-GW-009	2017/08/16	2017/08/22	2017/08/24	2017/08/30	2017/08/30
EZK343	NIGRA03-002-GW-005	2017/08/16	2017/08/22	2017/08/24	2017/08/30	2017/08/30
EZK344	NIGRA-SB-001	2017/08/17	2017/08/22	2017/08/24	2017/08/30	2017/08/30
EZK345	NIGRA06-001-GW-015	2017/08/17	2017/08/22	2017/08/24	2017/08/30	2017/08/30
EZK346	NIGRA06-001-GW-915	2017/08/17	2017/08/22	2017/08/24	2017/08/30	2017/08/30
EZK347	NIGRA-RS-004	2017/08/17	2017/08/22	2017/08/24	2017/08/30	2017/08/30

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: Samples were received with cooler temperature under 10 degrees Celsius. Cooler custody seals were present and intact.

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: Sample "NIGRA07-002-SW-001" was analyzed for PFTeDA and PFTrDA past the recommended hold time.

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 Pallen

Project Manager- Site Assessment and Remediation/Ultra Trace

2017/09/22
Date

2. Sample Management Records

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

2.1 Sample Custody

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

Aerostar SES AIR

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

Chain of Custody Record/ Analysis Request Number:

Page 1 of 1

Project Name: Site Inspection of Aqueous Film Forming Foam Areas, Multiple Sites, United States Air Force Installations

Job No.: ~~M2027.0003 (Omaha)~~ M2032.0001

Installation: Niagara Falls ARS

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

Sampler(s): J. Klein, M. Eckert

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)						
	NIGRA07-003-SD-001	8/16/17	0830	N	SE	1						
	NIGRA07-003-SW-001	8/16/17	0830	N	WS	2						
	NIGRA07-002-SD-001	8/16/17	0850	N	SE	1						
	NIGRA07-002-SW-001	8/16/17	0850	N	WS	2						
	NIGRA06-003-SS-001	8/16/17	1050	N	SO	1						
	NIGRA-RS-003	8/16/17	1235	EB	WQ	2						Taken From Spoon in association w/ NIGRA07-001-SD-001
	NIGRA07-001-SD-001	8/16/17	1245	N	SE	1						
	NIGRA07-001-SW-001	8/16/17	1245	N	WS	2						
	NIGRA08-001-GW-011	8/16/17	1530	N	WG	2						
	NIGRA08-003-GW-009	8/16/17	1519	N	WG	6						MS/MSD
	NIGRA03-002-GW-005	8/16/17	1621	N	WG	2						
	NIGRA-SB-001	8/17/17	0720	N	AB	2						
	NIGRA06-001-GW-015	8/17/17	0925	N	WG	2						
	NIGRA06-001-GW-915	8/17/17	0925	N	WG	2						
	NIGRA-RS-004	8/17/17	0950	EB	WQ	2						

Total # of Containers 30

International Solid Sample
Heat Treat Required
High Risk material
Controlled Storage and Disposal

22-Aug-17 13:16
Stephanie Pollen
B7I1832
GK1 ENV-585

RELINQUISHED BY:		RECEIVED BY:	
Signature: Jeremy Klein	Date/Time: 8/22/17 1700	Signature: Tanvir Sidhu	Date/Time: 2017/08/22 13:16
Printed Name: Jeremy Klein	Firm: ASL	Printed Name: Tanvir Sidhu	Firm:
Signature:	Date/Time:	Signature:	Date/Time:
Printed Name:	Firm:	Printed Name:	Firm:

Analyte List:

ANALYTE			ANALYTE		
Perfluorooctanesulfonic acid	PFOSA		Perfluorooctanoic acid	PFOA	
Perfluorooctanoic acid	PFOA		Perfluorodecanoic acid	PFDA	
Perfluorodecanesulfonic acid	PFDSA		6:2 Fluorotelomer sulfonate	6:2 FTS	
Perfluoroheptanoic acid	PFHPA		8:2 Fluorotelomer sulfonate	8:2 FTS	
Perfluorohexanesulfonic acid	PFHxS		Perfluorononanoic acid	PFNA	
Perfluorobutanesulfonic acid	PFBS		Perfluoroundecanoic acid	PFUnA	
Perfluorododecanoic acid	PFDoA		Perfluorotridecanoic acid	PFTrDA	
Perfluorobutanoic acid	PFBA		Perfluoroheptanoic acid	PFHpA	

8.3 | 11.0 | 7.5 on ice custody seal intact and present

3. Analytical Results

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

3.1 Summary Report

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

Maxxam
A Bureau Veritas Group Company

Your Project #: M2032.0001
Site Location: NIAGARA FALLS AFB
Your C.O.C. #: na

Attention:Jenny Vance

Aerostar SES LLC
SES Construction and Fuel Serv
1006 Floyd Culler Court
Oak Ridge, TN
USA 37830

Report Date: 2017/09/19
Report #: R4721185
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7I1832
Received: 2017/08/22, 13:16

Sample Matrix: Ground Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
PFOS and PFOA in water by SPE/LCMS (1)	5	2017/08/24	2017/08/30	CAM SOP-00894	EPA 537 m

Sample Matrix: Soil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Moisture	1	N/A	2017/08/24	CAM SOP-00445	Carter 2nd ed 51.2 m
PFOS and PFOA in soil by SPE/LCMS (1)	1	2017/08/24	2017/09/18	CAM SOP-00894	EPA537 m

Sample Matrix: SEDIMENT
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Moisture	3	N/A	2017/08/24	CAM SOP-00445	Carter 2nd ed 51.2 m
PFOS and PFOA in soil by SPE/LCMS (1)	3	2017/08/24	2017/09/18	CAM SOP-00894	EPA537 m

Sample Matrix: Surface Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
PFOS and PFOA in water by SPE/LCMS (1)	3	2017/08/24	2017/08/30	CAM SOP-00894	EPA 537 m

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
PFOS and PFOA in water by SPE/LCMS (1)	3	2017/08/24	2017/08/30	CAM SOP-00894	EPA 537 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Your Project #: M2032.0001
Site Location: NIAGARA FALLS AFB
Your C.O.C. #: na

Attention:Jenny Vance

Aerostar SES LLC
SES Construction and Fuel Serv
1006 Floyd Culler Court
Oak Ridge, TN
USA 37830

Report Date: 2017/09/19
Report #: R4721185
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7I1832
Received: 2017/08/22, 13:16

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding (lt in the apparent difference.
(1) Per- and polyfluoroalkyl substances (PFAS) id n the certificate of analysis represent the extracted internal standard.

Encryption Key Steph Pollen

Please direct all questions regarding this Certific Project Manager.
Stephanie Pollen, Project Manager
Email: SPollen@maxxam.ca
Phone# (905) 817-5700
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics Maxxam Analytics Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Prepared for: Aerostar SES LLC

Project: M2032.0001(SAVANNAH) / NIAGARA FALLS AFB

Analytical Data Package
(Level IV)

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

Maxxam Job #: B7I1792

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

Certification Page

1. Project Narrative

2. Sample Management Records

   2.1 Sample Custody

3. Analytical Results

   3.1 Summary Report

   3.2 Sample Chromatograms

4. QA/QC Data

5. Initial Calibration

6. Continuing Calibration

Last Page

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:

Karolina Pankowska

Project Manager Assistant

Maxxam

A Bureau Veritas Group Company

Digitally signed by Karolina Pankowska
Date: 2017.09.22 14:59:56 -04'00'

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.
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

Maxxam Job: B7I1792 – Soil Analysis

Sample Analysis

Soil extracts were initially pre-screened and estimated concentrations were obtained so that extracts could be appropriately diluted for analysis on QC batches 5139323 (2017/09/08), 5143352 (2017/09/08) and 5143359 (2017/09/08). Due to high concentrations, dilutions were required for selected analytes in the following samples:

EZK125	*NIGRA01-003-SS-001*	*All analytes*
EZK129	*NIGRA04-002-SS-001*	*Perfluorooctanesulfonate (PFOS)*
EZK130	*NIGRA04-003-SS-001*	*Perfluorooctanesulfonate (PFOS)*
EZK131	*NIGRA04-001-SS-001*	*All analytes*
EZK132	*NIGRA04-001-SS-901*	*Perfluorooctanesulfonate (PFOS)*
EZK138	*NIGRA04-001-SO-007*	*Perfluorooctanesulfonate (PFOS)*
EZK139	*NIGRA04-001-SO-907*	*Perfluorooctanesulfonate (PFOS)*

Detection limits were adjusted accordingly.

Due to inconsistencies between diluted and undiluted results, the following sample was re-extracted and re-analyzed on QC batch 5159467 (2017/09/14):

EZK125 *NIGRA01-003-SS-001*

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 EZK131 *(NIGRA04-001-SS-001)* on QC batch 5139323 (2017/09/08) but recoveries could not be calculated as the undiluted native sample was not analyzed due to high concentrations of target analytes.

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: B7I1792 – Water Analysis

Sample Analysis

The water sample was initially analyzed on QC batch 5136787 (2017/09/09).

The extracted internal standard analyte $^{13}C_2$-Perfluorotetradecanoic acid ($^{13}C_2$-PFTeDA) is used to quantify native Perfluorotridecanoic acid (PFTrDA) & Perfluorotetradecanoic acid (PFTeDA). The recovery observed for this extracted internal standard analyte was below the defined lower control limit (LCL). This observation was confirmed by re-extraction and re-analysis of the sample on QC batch 5159897 (2017/09/16), 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.

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 by SPE/LCMS						
EZK118	NIGRA08-001-SO-008	2017/08/14	2017/08/22	2017/08/28	2017/09/08	2017/09/08
EZK119	NIGRA08-002-SO-010	2017/08/14	2017/08/22	2017/08/28	2017/09/08	2017/09/08
EZK120	NIGRA08-003-SO-008	2017/08/14	2017/08/22	2017/08/28	2017/09/08	2017/09/08
EZK121	NIGRA03-001-SS-001	2017/08/14	2017/08/22	2017/08/28	2017/09/08	2017/09/08
EZK122	NIGRA03-002-SS-001	2017/08/14	2017/08/22	2017/08/28	2017/09/08	2017/09/08
EZK123	NIGRA03-001-SO-006	2017/08/14	2017/08/22	2017/08/28	2017/09/08	2017/09/08
EZK124	NIGRA03-002-SO-003	2017/08/14	2017/08/22	2017/08/28	2017/09/08	2017/09/08
EZK125	NIGRA01-003-SS-001	2017/08/15	2017/08/22	2017/09/12	2017/09/14	2017/09/14
EZK126	NIGRA01-003-SO-010	2017/08/15	2017/08/22	2017/08/28	2017/09/08	2017/09/08
EZK127	NIGRA01-001-SO-007	2017/08/15	2017/08/22	2017/08/28	2017/09/08	2017/09/08
EZK128	NIGRA01-002-SO-008	2017/08/15	2017/08/22	2017/08/28	2017/09/08	2017/09/08
EZK129	NIGRA04-002-SS-001	2017/08/15	2017/08/22	2017/08/28	2017/09/08	2017/09/08
EZK130	NIGRA04-003-SS-001	2017/08/15	2017/08/22	2017/08/28	2017/09/08	2017/09/08
EZK131	NIGRA04-001-SS-001	2017/08/15	2017/08/22	2017/08/28	2017/09/08	2017/09/08
EZK132	NIGRA04-001-SS-901	2017/08/15	2017/08/22	2017/08/28	2017/09/08	2017/09/08
EZK133	NIGRA06-001-SS-001	2017/08/16	2017/08/22	2017/08/28	2017/09/08	2017/09/08
EZK134	NIGRA06-001-SO-012	2017/08/16	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK135	NIGRA06-002-SS-001	2017/08/16	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK136	NIGRA06-002-SS-901	2017/08/16	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK137	NIGRA06-002-SO-012	2017/08/16	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK138	NIGRA04-001-SO-007	2017/08/16	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK139	NIGRA04-001-SO-907	2017/08/16	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK140	NIGRA04-002-SO-004	2017/08/16	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK141	NIGRA04-003-SO-005	2017/08/16	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK142	NIGRA02-001-SS-001	2017/08/16	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK143	NIGRA02-001-SS-901	2017/08/16	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK144	NIGRA02-001-SO-011	2017/08/16	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK145	NIGRA02-001-SO-911	2017/08/16	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK146	NIGRA06-003-SO-007	2017/08/17	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK147	NIGRA06-004-SS-001	2017/08/17	2017/08/22	2017/08/25	2017/09/08	2017/09/08
PFOS and PFOA in water by SPE/LCMS						
EZK148	NIGRA06-MW7-3D-014	2017/08/17	2017/08/22	2017/08/25	2017/09/11	2017/09/09 / 2017/09/16

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: Samples were received with cooler temperature under 10 degrees Celsius.
Cooler custody seals were present and intact.

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: Please refer to case narrative.

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.

Karolina Pawlowska

Project Manager Assistant- Site Assessment and Remediation/Ultra Trace

2017/09/22

Date

2. Sample Management Records

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

2.1 Sample Custody

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

AerostarSES LLC

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

Chain of Custody Record/ Analysis Request Number:

Page 1 of 3

Project Name: Site Inspection of Aqueous Film Forming Foam Areas, Multiple Sites, United States Air Force Installations

Job No.: ~~M2027.0003 (Omaha)~~ M2032.0001 (Savannah)
Installation: NFARS

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

Sampler(s): J. Meshew

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)

22-Aug-17 13:16
Stephanie Pollen
B7I1792
TSP ENV-1170

International Solid Sample
Heat Treat Required
High Risk material
Controlled Storage and Disposal

MAXXAM use only	Sample ID	Date Collected	Time Collected	Sample Type	Matrix	PFAS (see list of 18 analytes below)
	NIGRA08-001-SO-008	8.14.17	1230	N	SO	1
	NIGRA08-002-SO-010	8.14.17	1300	N	SO	1
	NIGRA08-003-SO-008	8.14.17	1335	N	SO	1
	NIGRA03-001-SS-001	8.14.17	1415	N	SO	1
	NIGRA03-002-SS-001	8.14.17	~~1435~~ 1440 JM	N	SO	1
	NIGRA03-001-SO-006	8.14.17	1455	N	SO	1
	NIGRA03-002-SO-003	8.14.17	1530	N	SO	1
	NIGRA01-003-SS-001	8.15.17	0820	N	SO	1
	NIGRA01-003-SO-010	8.15.17	0915	N	SO	1
	NIGRA01-001-SO-007	8.15.17	0935	N	SO	1
	NIGRA01-002-SO-008	8.15.17	1015	N	SO	1
	NIGRA04-002-SS-001	8.15.17	1420	N	SO	1
	NIGRA04-003-SS-001	8.15.17	1455	N	SO	1
	NIGRA04-001-SS-001	8.15.17	1500	N	SO	2
	NIGRA04-001-SS-001	8.15.17	1500	FD	SO	1
					Total # of Containers	16

Custody seal present & intact
+MS/MSD
8.6/6.7/9.6

RELINQUISHED BY:
Signature: Jeremy Meshew JM 8.18
Date/Time: 8.18.17/1700
Printed Name: [signature]
Firm: ASL
Signature:
Date/Time:
Printed Name:
Firm:

RECEIVED BY:
Signature: [signature]
Date/Time: 2017/08/22 13:16
Printed Name: LISA MUNSTER
Firm:
Signature:
Date/Time:
Printed Name:
Firm:

Analyte List:

ANALYTE	ERPIMS PAR CODE	CAS	Contaminant	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorotetradecanoic acid	PFTEA	376-06-7
Perfluorooctanoic acid	PFOA	335-67-1	Perfluorotridecanoic acid	PFTRIA	72629-94-8
Perfluorooctanoic acid	PFNA	375-95-1	Perfluoroundecanoic acid	PFUNA	2058-94-8
Perfluorohexanesulfonic acid	PFHXSA	355-46-4	8:2 Fluorotelomer sulfonate	82FTS	27619-97-2
Perfluoroheptanoic acid	PFHPA	375-85-9	8:2 Fluorotelomer sulfonate	82FTS	39108-34-4
Perfluorobutanesulfonic acid	PFBSA	375-73-5	Perfluorobutanoic acid	PFBA	375-22-4
Perfluorodecanoic acid	PFDA	335-76-2	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorododecanoic acid	PFDOA	307-55-1	Perfluorooctane sulfonamide	FOSA	754-61-6
Perfluorobutanoic acid	PFHXA	307-24-4	Perfluoropentanoic Acid	PFPA	2706-90-3

AerostarSES, LLC

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

Chain of Custody Record/ Analysis Request Number:

Page 2 of 3

Project Name: Site Inspection of Aqueous Film Forming Foam Areas, Multiple Sites, United States Air Force Installations

Job No.: ~~M2027.0003 (Omaha)~~ M2032.0001 (Sawmill)

Installation: NFARS

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

Sampler(s): J. Meshew

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
	NIGRA06-001-SS-001	8.16.17	0805	N	SO	1						
	NIGRA06-001-SO-012	8.16.17	0845	N	SO	1						
	NIGRA06-002-SS-001	8.16.17	0950	N	SO	1						
	NIGRA06-002-SS-901	8.16.17	0950	FD	SO	1						
	NIGRA06-002-SO-012	8.16.17	1040	N	SO	1						
	NIGRA04-001-SO-007	8.16.17	1255	N	SO	1						
	NIGRA04-001-SO-907	8.16.17	1255	FD	SO	1						
	NIGRA04-002-SO-004	8.16.17	1315	N	SO	1						
	NIGRA04-003-SO-005	8.16.17	1345	N	SO	1						
	NIGRA02-001-SS-001	8.16.17	1440	N	SO	2						+MS/MSD
	NIGRA02-001-SS-901	8.16.17	1440	FD	SO	1						
	NIGRA02-001-SO-011	8.16.17	1530	N	SO	2						+MS/MSD
	NIGRA02-001-SO-911	8.16.17	1530	FD	SO	1						
	NIGRA06-003-SO-007	8.17.17	0805	N	SO	1						
	NIGRA06-004-SS-001	8.17.17	0825	N	SO	1						
					Total # of Containers	17						

Custody Seal present & intact
8.6/6.7/9.6

International Solid Sample
Heat Treat Required
High Risk material
Controlled Storage and Disposal

RELINQUISHED BY:		RECEIVED BY:	
Signature:	Date/Time: 8/18/17 1700	Signature:	Date/Time: 2017/08/22 13:16
Printed Name: Jeremy A Meshew	Firm: ASL	Printed Name: USA MUNSTER	Firm:
Signature:	Date/Time:	Signature:	Date/Time:
Printed Name:	Firm:	Printed Name:	Firm:

Analyte List:

ANALYTE	ERPIMS PAR CODE	CAS	Contaminant	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorotetradecanoic acid	PFTEA	376-06-7
Perfluorooctanoic acid	PFOA	335-67-1	Perfluorotridecanoic acid	PFTRA	72629-94-8
Perfluorononanoic acid	PFNA	375-95-1	Perfluoroundecanoic acid	PFUNA	2058-94-8
Perfluorobutanesulfonic acid	PFBSA	375-40-4	6:2 Fluorotelomer sulfonate	6:2FTS	27619-97-2
Perfluoroheptanoic acid	PFHPA	375-85-9	8:2 Fluorotelomer sulfonate	8:2FTS	39108-34-4
Perfluorobutanesulfonic acid	PFBSA	375-73-5	Perfluorobutanoic acid	PFBA	375-22-4
Perfluorodecanoic acid	PFDA	335-76-2	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorohexanesulfonic acid	PFHXA	355-46-4	Perfluorooctanesulfonamide	FOSA	754-91-6
Perfluorohexanoic acid	PFHXA	307-24-4	Perfluoropentanoic Acid	PFPA	2706-90-3

AerostarSES LLC

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

Chain of Custody Record/ Analysis Request Number:

Page 3 of 3

Project Name: Site Inspection of Aqueous Film Forming Foam Areas, Multiple Sites, United States Air Force Installations

Job No.: ~~M2027.0003 (Omaha)~~ M2032.0001

Installation: NFARS

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

Sampler(s): M. Eckert

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
	NIGRA06-MW7-3D-014	8/17/17	0843	N	WG	6					MS/MSD
					Total # of Containers	6					

International Solid Sample
Heat Treat Required
High Risk material
Controlled Storage and Disposal

custody seal present & intact
8.6/6.7/9.6

RELINQUISHED BY:
Signature: Jenny Klein
Date/Time: 8/18/17 1700
Printed Name: Jenny Klein
Firm: ASL

RECEIVED BY:
Signature: [illegible]
Date/Time: 2017/08/22 13:16
Printed Name: LISA MUNSTER
Firm:

Signature:
Date/Time:
Printed Name:
Firm:

Signature:
Date/Time:
Printed Name:
Firm:

Analyte List:

ANALYTE	ERPIMS PAR CODE	CAS	Contaminant	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorotetradecanoic acid	PFTEA	376-06-7
Perfluorooctanoic acid	PFOA	335-67-1	Perfluorotridecanoic acid	PFTRA	72629-94-8
Perfluorononanoic acid	PFNA	375-95-1	Perfluoroundecanoic acid	PFUNA	2058-94-8
Perfluorohexanesulfonic acid	PFHXSA	355-46-4	6:2 Fluorotelomer sulfonate	6:2FTS	27619-97-2
Perfluoroheptanoic acid	PFHPA	375-85-9	8:2 Fluorotelomer sulfonate	8:2FTS	39108-34-4
Perfluorobutanesulfonic acid	PFBSA	375-73-5	Perfluorooctanoic acid	PFDA	335-67-1
Perfluoroheptanoic acid	PFBA	375-22-4	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorohexanoic acid	PFHXA	307-24-4	Perfluorooctanesulfonamide	FOSA	754-91-6
Perfluorobutanoic acid	PFBUA	375-22-4	Perfluoropentanoic Acid	PFPA	2706-90-3

3. Analytical Results

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

3.1 Summary Report

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

Maxxam
A Bureau Veritas Group Company

Your Project #: M2032.0001(SAVANNAH)
Site Location: NIAGARA FALLS AFB
Your C.O.C. #: na

Attention:Jenny Vance

Aerostar SES LLC
SES Construction and Fuel Serv
1006 Floyd Culler Court
Oak Ridge, TN
USA 37830

Report Date: 2017/09/19
Report #: R4721121
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7I1792
Received: 2017/08/22, 13:16

Sample Matrix: Ground Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
PFOS and PFOA in water by SPE/LCMS (1)	1	2017/08/25	2017/09/11	CAM SOP-00894	EPA 537 m

Sample Matrix: Soil
Samples Received: 30

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Moisture	30	N/A	2017/08/25	CAM SOP-00445	Carter 2nd ed 51.2 m
PFOS and PFOA in soil by SPE/LCMS (1)	14	2017/08/25	2017/09/08	CAM SOP-00894	EPA537 m
PFOS and PFOA in soil by SPE/LCMS (1)	15	2017/08/28	2017/09/08	CAM SOP-00894	EPA537 m
PFOS and PFOA in soil by SPE/LCMS (1)	1	2017/09/12	2017/09/14	CAM SOP-00894	EPA537 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Per- and polyfluoroalkyl substances (PFAS) identified as surrogates on the certificate of analysis represent the extracted internal standard.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Your Project #: M2032.0001(SAVANNAH)
Site Location: NIAGARA FALLS AFB
Your C.O.C. #: na

Attention:Jenny Vance

Aerostar SES LLC
SES Construction and Fuel Serv
1006 Floyd Culler Court
Oak Ridge, TN
USA 37830

Report Date: 2017/09/19
Report #: R4721121
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7I1792
Received: 2017/08/22, 13:16

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Stephanie Pollen, Project Manager
Email: SPollen@maxxam.ca
Phone# (905) 817-5700
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Prepared for: Aerostar SES LLC

Project: M2032.0001 / NIAGARA FALLS AFB

Analytical Data Package
(Level IV)

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

Maxxam Job #: B7I1791

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

Certification Page

1. Project Narrative

2. Sample Management Records

   2.1 Sample Custody

3. Analytical Results

   3.1 Summary Report

   3.2 Sample Chromatograms

4. QA/QC Data

5. Initial Calibration

6. Continuing Calibration

Last Page

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:

Karolina Pankowska

Project Manager Assistant

Maxxam

A Bureau Veritas Group Company

Digitally signed by Karolina Pankowska
Date: 2017.09.28 13:54:17 -04'00'

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.
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

Maxxam Job: B7I1791

Sample Analysis

Samples were initially pre-screened and estimated concentrations were obtained so that appropriate sample volumes could be extracted on QC batches 5136039 (2017/09/08) and 5143015 (2017/09/06-07). Due to high concentrations, the following samples were analyzed for selected analytes using reduced sample extraction volumes on QC batch 5136039 (2017/09/08):

EZK107	*NIGRA02-002-GW-014*	*Perfluoropentanoic acid (PFPeA), Perfluorohexanoic acid (PFHxA)*
EZK109	*NIGRA04-001-GW-005*	*All analytes*
EZK110	*NIGRA04-001-GW-905*	*All analytes*
EZK117	*NIGRA04-003-GW-005*	*Perfluoropentanoic acid (PFPeA), Perfluorohexanoic acid (PFHxA), Perfluorohexanesulfonate (PFHxS), Perfluorooctanesulfonate (PFOS)*

Detection limits were adjusted accordingly.

Due very high concentrations, the following samples required high level analysis with additional serial dilutions on QC batch 5143015 (2017/09/06-07):

EZK101 *NIGRA01-003-GW-008*
EZK114 *NIGRA01-002-GW-008*
EZK115 *NIGRA01-001-GW-007*

Detection limits were adjusted accordingly. Due to failure of QC acceptance criteria for Perfluorotridecanoic acid (PFTrDA) and Perfluorotetradecanoic acid (PFTeDA) in the post spike sample, these samples were re-extracted and re-analyzed for these analytes on QC batch 5160314 (2017/09/15), 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.

Manual Integration

Due to co-eluting matrix interference, manual integration was performed for Perfluorobutanoic acid (PFBA) in the following sample on QC batch 5136039 (2017/09/08):

EZK111 *NIGRA06-003-GW-009*

Sin Chii Chia, B.Sc.
schia@maxxam.ca
Office 905 817 5700

PROJECT NARRATIVE

Maxxam Analytics
Client Project #: M2032.0001

Client: Aerostar SES LLC
Client Project: M2032.0001

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 water by SPE/LCMS						
EZK101	NIGRA01-003-GW-008	2017/08/18	2017/08/22	2017/08/30	2017/09/06	2017/09/06-07 / 2017/09/15
EZK101 Dup	NIGRA01-003-GW-008	2017/08/18	2017/08/22	2017/08/30	2017/09/06	2017/09/06-07 / 2017/09/15
EZK102	NIGRA08-002-GW-010	2017/08/18	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK103	NIGRA03-001-GW-006	2017/08/18	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK104	NIGRA02-001-GW-015	2017/08/18	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK105	NIGRA02-001-GW-915	2017/08/18	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK106	NIGRA-RS-006	2017/08/21	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK107	NIGRA02-002-GW-014	2017/08/21	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK108	NIGRA02-004-GW-015	2017/08/21	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK109	NIGRA04-001-GW-005	2017/08/21	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK110	NIGRA04-001-GW-905	2017/08/21	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK111	NIGRA06-003-GW-009	2017/08/21	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK112	NIGRA06-002-GW-015	2017/08/18	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK113	NIGRARS-005	2017/08/18	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK114	NIGRA01-002-GW-008	2017/08/18	2017/08/22	2017/08/30	2017/09/06	2017/09/06-07 / 2017/09/15
EZK114 Dup	NIGRA01-002-GW-008	2017/08/18	2017/08/22	2017/08/30	2017/09/06	2017/09/06-07 / 2017/09/15
EZK115	NIGRA01-001-GW-007	2017/08/18	2017/08/22	2017/08/30	2017/09/06	2017/09/06-07 / 2017/09/15
EZK115 Dup	NIGRA01-001-GW-007	2017/08/18	2017/08/22	2017/08/30	2017/09/06	2017/09/06-07 / 2017/09/15
EZK116	NIGRA02-003-GW-016	2017/08/21	2017/08/22	2017/08/25	2017/09/08	2017/09/08
EZK117	NIGRA04-003-GW-005	2017/08/21	2017/08/22	2017/08/25	2017/09/08	2017/09/08

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: Cooler custody seal was present and intact.

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.

Karolina Pawlowska

Project Manager Assistant- Site Assessment and Remediation/Ultra Trace

2017/09/28

Date

2. Sample Management Records

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

2.1 Sample Custody

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

AerostarSES LLC

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

Chain of Custody Record/ Analysis Request Number:

Page 1 of 2

Project Name: Site Inspection of Aqueous Film Forming Foam Areas, Multiple Sites, United States Air Force Installations

Job No.: ~~M2027.0003 (Omaha)~~ M2032.0001
Installation: NFARS

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

Sampler(s): J. Klein

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
	NIGRA 01-003-GW-008	8/18/17	1227	N	WG	2						
	NIGRA08-002-GW-010	8/18/17	1458	N	WG	2						
	NIGRA03-001-GW-006	8/18/17	1520	N	WG	2						
	NIGRA02-001-GW-015	8/18/17	1508	N	WG	6						
	NIGRA02-001-GW-915	8/18/17	1508	N	WG	2						
	NIGRA-RS-006	8/21/17	0745	EB	WQ	2						22-Aug-17 13:16 Stephanie Pollen B7I1791
	NIGRA02-002-GW-014	8/21/17	0808	N	WG	2						
	NIGRA02-004-GW-015	8/21/17	0835	N	WG	2						
	NIGRA04-001-GW-005	8/21/17	0910	N	WG	2						KES ENV-641
	NIGRA04-001-GW-905	8/21/17	0910	FD	WG	2						
	NIGRA06-003-GW-009	8/21/17	0945	N	WG	2						
	NIGRA-IDW-WS	8/22/17	~~1200~~	N	SO	1						
	~~NIGRA-IDW-WW~~	8/22/17	1200	N	WG	2						custody seal present & intact
												6.5/6.6/6.2
					Total # of Containers	26						

RELINQUISHED BY:
Signature: Jenny Klein Date/Time: 8/22/17 1700
Printed Name: Jeremy Klein Firm: ASL

RECEIVED BY:
Signature: Date/Time: 2017/08/22 13:16
Printed Name: LISA MUNSTEK Firm:

Signature: Date/Time:
Printed Name: Firm:

Signature: Date/Time:
Printed Name: Firm:

Analyte List:

ANALYTE	ERPIMS PAR CODE	CAS	Contaminant	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorotetradecanoic acid	PFTEA	376-06-7
Perfluorooctanoic acid	PFOA	335-67-1	Perfluorotridecanoic acid	PFTRA	72629-94-8
Perfluorononanoic acid	PFNA	375-95-1	Perfluoroundecanoic acid	PFUNA	2058-94-8
Perfluorodecanesulfonic acid	PFDOSA	335-77-3	6:2 Fluorotelomer sulfonate	6:2FTS	27619-97-2
Perfluoroheptanoic acid	PFHPA	375-85-9	8:2 Fluorotelomer sulfonate	8:2FTS	39108-34-4
Perfluorobutanesulfonic acid	PFBSA	375-73-5	Perfluorobutanoic acid	PFBA	375-22-4
Perfluorodecanoic acid	PFDA	335-76-2	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorohexanesulfonic acid	PFHXSA	355-46-4	Perfluorooctane sulfonamide	FOSA	754-91-6
Perfluorohexanoic acid	PFHXA	307-24-4	Perfluoropentanoic Acid	PFPA	2706-90-3

AerostarSES LLC

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

Chain of Custody Record/ Analysis Request Number: 077

Page 2 of 2

Project Name: Site Inspection of Aqueous Film Forming Foam Areas, Multiple Sites, United States Air Force Installations

Job No.: ~~M2027.0003 (Omaha)~~ M2032.0001 (Savannah)
Installation: NFARS

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

Sampler(s): Jeremy A Meshew, Miles Eckert

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
	NIGRA06-002-GW-015	8.18.17	0755	~~WGN~~	WG	2						
	NIGRARS-005	8.18.17	1210	EB	WQ	2						Off tubing, associated with NIGRA01-002-GW-008
	NIGRA01-002-GW-008	8.18.17	1237	N	WG	2						
	NIGRA01-001-GW-007	8.18.17	1248	N	WG	2						
	NIGRA02-003-GW-016	8.21.17	0815	N	WG	2						
	NIGRA04-003-GW-005	8.21.17	0909	N	WG	2						
					Total # of Containers	12						

JM

Custody Seal present & intact

RELINQUISHED BY:
Signature: [signature] Date/Time: 8/22/17
Printed Name: Jeremy Meshew Firm: ASL

RECEIVED BY:
Signature: [signature] Date/Time: 2017/08/22 13:16
Printed Name: U.A. MUNSTER Firm:

Signature: Date/Time:
Printed Name: Firm:

Signature: Date/Time:
Printed Name: Firm:

Analyte List:

ANALYTE	ERPIMS PAR CODE	CAS	Contaminant	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorotetradecanoic acid	PFTEA	376-06-7
Perfluorooctanoic acid	PFOA	335-67-1	Perfluorotridecanoic acid	PFTRIA	72629-94-8
Perfluorononanoic acid	PFNA	375-95-1	Perfluoroundecanoic acid	PFUNA	2058-94-8
Perfluorohexanesulfonic acid	PFHXSA	355-46-4	6:2 Fluorotelomer sulfonate	6:2FTS	27619-97-2
Perfluoroheptanoic acid	PFHPA	375-85-9	8:2 Fluorotelomer sulfonate	8:2FTS	39108-34-4
Perfluorobutanesulfonic acid	PFBSA	375-73-5	Perfluorobutanoic acid	PFBA	375-22-4
Perfluorododecanoic acid	PFDA	335-76-2	Perfluorododecanesulfonic acid	PFDS	145-77-3
Perfluorodecanoic acid	PFDOA	307-55-1	Perfluorooctane sulfonamide	FOSA	754-91-6
Perfluorobutanoic acid	PFHXA	307-24-4	Perfluoropentanoic Acid	PFPA	2706-90-3

3. Analytical Results

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

3.1 Summary Report

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

Maxxam
A Bureau Veritas Group Company

Your Project #: M2032.0001
Site Location: NIAGARA FALLS AFB
Your C.O.C. #: na

Attention:Jenny Vance

Aerostar SES LLC
SES Construction and Fuel Serv
1006 Floyd Culler Court
Oak Ridge, TN
USA 37830

Report Date: 2017/09/25
Report #: R4731959
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7I1791
Received: 2017/08/22, 13:16

Sample Matrix: Ground Water
Samples Received: 15

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
PFOS and PFOA in water by SPE/LCMS (1)	12	2017/08/25	2017/09/08	CAM SOP-00894	EPA 537 m
PFOS and PFOA in water by SPE/LCMS (1)	3	2017/08/30	2017/09/06	CAM SOP-00894	EPA 537 m

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
PFOS and PFOA in water by SPE/LCMS (1)	2	2017/08/25	2017/09/08	CAM SOP-00894	EPA 537 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Per- and polyfluoroalkyl substances (PFAS) identified as surrogates on the certificate of analysis represent the extracted internal standard.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Your Project #: M2032.0001
Site Location: NIAGARA FALLS AFB
Your C.O.C. #: na

Attention:Jenny Vance

Aerostar SES LLC
SES Construction and Fuel Serv
1006 Floyd Culler Court
Oak Ridge, TN
USA 37830

Report Date: 2017/09/25
Report #: R4731959
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7I1791
Received: 2017/08/22, 13:16

Encryption Key

Stephanie Pollen
Project Manager
25 Sep 2017 17:21:34

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Stephanie Pollen, Project Manager
Email: SPollen@maxxam.ca
Phone# (905) 817-5700
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B7I1791
Report Date: 2017/09/25

Aerostar SES LLC
Client Project #: M2032.0001
Site Location: NIAGARA FALLS AFB
Sampler Initials: JK

RESULTS OF ANALYSES OF GROUND WATER

Maxxam ID		EZK101	EZK101				
Sampling Date		2017/08/18 12:27	2017/08/18 12:27				
COC Number		na	na				
	UNITS	NIGRA01-003-GW-008	NIGRA01-003-GW-008 Lab-Dup	DL	LOD	LOQ	QC Batch
Miscellaneous Parameters							
6:2 Fluorotelomer sulfonate	ug/L	75 (1)	74	2.0	5.0	8.0	5143015
8:2 Fluorotelomer sulfonate	ug/L	11 (1)	12	2.7	6.0	8.0	5143015
Perfluorobutanoic acid	ug/L	36 (2)	31	1.5	4.0	8.0	5143015
Perfluorobutane Sulfonate (PFBS)	ug/L	31 (2)	30	1.5	5.0	8.0	5143015
Perfluorodecane Sulfonate	ug/L	60 U (3)	60 U	24	60	80	5143015
Perfluoroheptanoic Acid (PFHpA)	ug/L	21 (2)	25	1.5	3.0	8.0	5143015
Perfluorohexanoic Acid (PFHxA)	ug/L	210 (2)	200	1.1	3.0	8.0	5143015
Perfluorohexane Sulfonate (PFHxS)	ug/L	750 (2)	710	24	50	80	5143015
Perfluorononanoic Acid (PFNA)	ug/L	14 (2)	16	1.3	4.0	8.0	5143015
Perfluorooctane Sulfonamide (PFOSA)	ug/L	22 (2)	23	1.5	4.0	8.0	5143015
Perfluoropentanoic Acid (PFPeA)	ug/L	56 (2)	58	1.6	4.0	8.0	5143015
Perfluorotetradecanoic Acid	ug/L	50 U (4)	50 U (5)	22	50	80	5160314
Perfluorotridecanoic Acid	ug/L	60 U (6)	60 U (5)	28	60	80	5160314
Perfluoroundecanoic Acid (PFUnA)	ug/L	5.0 U (7)	5.0 U	1.8	5.0	8.0	5143015

DL = Detection Limit
LOD = Limit of Detection
LOQ = Limit of Quantitation
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

(1) Due to high concentration of the target analyte, sample required high level analysis. Detection limit was adjusted accordingly.
Post spike sample recovery is not applicable due to native concentration.

(2) Due to high concentration of the target analyte, sample required high level analysis with additional serial dilution. Detection limit was adjusted accordingly.
Post spike sample recovery is not applicable due to native concentration.

(3) Due to high concentration of the target analyte, sample required high level analysis with additional serial dilution. Detection limit was adjusted accordingly.
Post spike sample recovery = 109.6%

(4) Due to high concentration of the target analyte, sample required dilution. Detection limit was adjusted accordingly.
Post spike sample recovery = 119%

(5) Due to high concentration of the target analyte, sample required dilution. Detection limit was adjusted accordingly.

(6) Due to high concentration of the target analyte, sample required dilution. Detection limit was adjusted accordingly.
Post spike sample recovery = 112%

(7) Due to high concentration of the target analyte, sample required high level analysis with additional serial dilution. Detection limit was adjusted accordingly.
Post spike sample recovery = 80.8%

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca
Maxxam Analytics

Appendix E

Physiochemical Sample Results

Physiochemical Sample Results Niagara Falls Air Reserve Station

AFFF Area	Sample No.	Sample Date	Percent Passing No. 4 Screen	Percent Passing No. 200 Screen	USCS/ Lithology	TOC (mg/kg)	pH (units)	Percent Solid
AFFF Area 1 – FT007/ FPTA No. 3/Site 9	NIGRA01-006-SS-001	8/15/17	90.0	55.8	ML	27700	7.84	83.1
	NIGRA01-006-SO-010	8/15/17	100.0	83.1	ML	10500	7.77	81.0
AFFF Area 2 – Hangar 850	NIGRA02-006-SS-001	8/16/17	94.5	27.3	GM	30900	7.85	89.2
	NIGRA02-006-SO-011	8/16/17	99.7	80.7	ML	5830	8.34	76.9
AFFF Area 3 – Building 706	NIGRA03-003-SS-001	8/14/17	97.2	71.4	ML	28300	7.85	82.6
	NIGRA03-003-SO-006	8/14/17	90.2	64.9	ML	10900	8.16	85.6
AFFF Area 4 – Building 700	NIGRA04-004-SS-001	8/15/17	73.2	34.3	SM	19600	7.78	80.2
	NIGRA04-004-SO-007	8/15/17	85.9	27.8	SM	49100	8.06	92.1
AFFF Area 5 – Blue Angels Crash Site	NIGRA05-004-SS-001	8/22/17	95.0	66.2	ML	12200	7.90	83.7
	NIGRA05-004-SO-004	8/22/17	94.7	61.2	ML	26400	8.21	87.6
AFFF Area 6 – Fox Row/Taxiway Alpha	NIGRA06-005-SS-001	8/16/17	100	88.8	ML	35500	7.90	77.0
	NIGRA06-005-SO-0012	8/16/17	99.3	85.4	ML	5270	7.79	76.9
AFFF Area 8 – Hulby Street	NIGRA08-004-SS-001	8/14/17	87.5	42.6	SM	42100	7.72	80.7
	NIGRA08-004-SO-008	8/14/17	84.5	48.3	SM	12200	8.30	93.4

AFFF = aqueous film forming foam
ID = identification
NIGRA = Niagara Falls Air Reserve Station
pH = potential of hydrogen
SO = subsurface soil
TOC = total organic carbon
GM = gravel with sand or silt
ML = inorganic silts, non-plastic, or slightly plastic
No. = number
SM = silty sands sand silt mixtures
SS = surface soil
USCS = Unified Soil Classification System

CT LABORATORIES
delivering more than data from your environmental analyses

1230 Lange Court • Baraboo, WI 53913 • 608-356-2760
www.ctlaboratories.com

ANALYTICAL SUMMARY REPORT

This report at a minimum contains the following information:

Analytical Report of Test Results
Description of QC Qualifiers
Chain of Custody (copy)
Quality Control Summary (if applicable)
Case Narrative (if applicable)
Correspondence with Client (if applicable)

This report has been specifically prepared to satisfy project or program requirements. These results are in compliance with NELAC requirements for parameters where accreditation is required or available, unless otherwise noted in the case narrative.

Unless specifically stated to the contrary, soil/sediment/sludge sample results reported on a Dry Weight Basis

ANALYTICAL SAMPLE DATA

JENNY VANCE
AEROSTAR SES LLC
1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Copy: MDiGrazia@maxxam.ca

Project Name: AFFF SI SAVANNAH
Project Phase: NIAGRA FALLS ARS
Project #: M2032.0001
Folder #: 130085
Purchase Order #:
Contract #: 2929

Arrival Temperature: 3.1
Report Date: 09/08/2017
Date Received: 08/23/2017
Reprint Date: 09/08/2017

CT LAB#: 909810 Sample Description: NIGRA01-006-SS-001 Client Sample #: Sampled: 08/15/2017 0820

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
Inorganic Results													
Solids, Percent	***83.1***	%	0.1	0.1	0.1	0.1	1.00			8/24/17 13:10	BMM	EPA 8000C	
pH	***7.84***	S.U.	0.1	0.1	0.1	0.1	1.00			8/24/17 11:00	BKB	EPA 9045D	^
Total Organic Carbon	***27700***	mg/kg	43	90	180	180	1.00	Y		9/1/17 13:35	AGK	L-Kahn/9060A	
Sub Lab Results													
Hydrometer	***attached***						1.00			9/6/17 00:00	SUB		

CT LAB#: 909814 Sample Description: NIGRA01-006-SO-010 Client Sample #: Sampled: 08/15/2017 0915

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
Inorganic Results													
Solids, Percent	***81.0***	%	0.1	0.1	0.1	0.1	1.00			8/24/17 13:10	BMM	EPA 8000C	
pH	***7.77***	S.U.	0.1	0.1	0.1	0.1	1.00			8/24/17 11:00	BKB	EPA 9045D	^
Total Organic Carbon	***10500***	mg/kg	44	93	190	190	1.00			8/31/17 12:04	AGK	L-Kahn/9060A	

Unless specifically stated to the contrary, soil/sediment/sludge sample results reported on a Dry Weight Basis

CT LAB#: 909814 Sample Description: NIGRA01-006-SO-010 Client Sample #: Sampled: 08/15/2017 0915

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
Sub Lab Results													
Hydrometer	***attached***						1.00			9/6/17 00:00	SUB		

CT LAB#: 909815 Sample Description: NIGRA02-006-SS-001 Client Sample #: Sampled: 08/16/2017 1440

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
Inorganic Results													
Solids, Percent	***89.2***	%	0.1	0.1	0.1	0.1	1.00			8/24/17 13:10	BMM	EPA 8000C	
pH	***7.85***	S.U.	0.1	0.1	0.1	0.1	1.00			8/24/17 11:00	BKB	EPA 9045D	^
Total Organic Carbon	***30900***	mg/kg	40	84	170	170	1.00			8/31/17 12:10	AGK	L-Kahn/9060A	
Sub Lab Results													
Hydrometer	***attached***						1.00			9/6/17 00:00	SUB		

CT LAB#: 909816 Sample Description: NIGRA01-006-SO-011 Client Sample #: Sampled: 08/16/2017 1530

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
Inorganic Results													
Solids, Percent	***76.9***	%	0.1	0.1	0.1	0.1	1.00			8/24/17 13:10	BMM	EPA 8000C	
pH	***8.34***	S.U.	0.1	0.1	0.1	0.1	1.00			8/24/17 11:00	BKB	EPA 9045D	^
Total Organic Carbon	***5830***	mg/kg	47	98	200	200	1.00			9/1/17 14:02	AGK	L-Kahn/9060A	
Sub Lab Results													
Hydrometer	***attached***						1.00			9/6/17 00:00	SUB		

Unless specifically stated to the contrary, soil/sediment/sludge sample results reported on a Dry Weight Basis

CT LAB#: 909817 Sample Description: NIGRA03-003-SS-001 Client Sample #: Sampled: 08/14/2017 1415

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
Inorganic Results													
Solids, Percent	***82.6***	%	0.1	0.1	0.1	0.1	1.00			8/24/17 13:10	BMM	EPA 8000C	
pH	***7.85***	S.U.	0.1	0.1	0.1	0.1	1.00			8/24/17 11:00	BKB	EPA 9045D	^
Total Organic Carbon	***28300***	mg/kg	44	91	180	180	1.00			8/31/17 12:26	AGK	L-Kahn/9060A	
Sub Lab Results													
Hydrometer	***attached***						1.00			9/6/17 00:00	SUB		

CT LAB#: 909818 Sample Description: NIGRA03-003-SO-006 Client Sample #: Sampled: 08/14/2017 1455

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
Inorganic Results													
Solids, Percent	***85.6***	%	0.1	0.1	0.1	0.1	1.00			8/24/17 13:10	BMM	EPA 8000C	
pH	***8.16***	S.U.	0.1	0.1	0.1	0.1	1.00			8/24/17 11:00	BKB	EPA 9045D	^
Total Organic Carbon	***10900***	mg/kg	42	88	180	180	1.00			8/31/17 12:33	AGK	L-Kahn/9060A	
Sub Lab Results													
Hydrometer	***attached***						1.00			9/6/17 00:00	SUB		

CT LAB#: 909819 Sample Description: NIGRA04-004-SS-001 Client Sample #: Sampled: 08/15/2017 1420

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
Inorganic Results													
Solids, Percent	***80.2***	%	0.1	0.1	0.1	0.1	1.00			8/24/17 13:10	BMM	EPA 8000C	
pH	***7.78***	S.U.	0.1	0.1	0.1	0.1	1.00			8/24/17 11:00	BKB	EPA 9045D	^

Unless specifically stated to the contrary, soil/sediment/sludge sample results reported on a Dry Weight Basis

CT LAB#: 909819 Sample Description: NIGRA04-004-SS-001 Client Sample #: Sampled: 08/15/2017 1420

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method
Total Organic Carbon	***19600***	mg/kg	45	94	190	190	1.00			8/31/17 12:38	AGK	L-Kahn/9060A
Sub Lab Results												
Hydrometer	***attached***						1.00			9/6/17 00:00	SUB	

CT LAB#: 909820 Sample Description: NIGRA04-004-SO-007 Client Sample #: Sampled: 08/16/2017 1255

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
Inorganic Results													
Solids, Percent	***92.1***	%	0.1	0.1	0.1	0.1	1.00			8/24/17 13:10	BMM	EPA 8000C	
pH	***8.06***	S.U.	0.1	0.1	0.1	0.1	1.00			8/24/17 11:00	BKB	EPA 9045D	^
Total Organic Carbon	***49100***	mg/kg	39	81	160	160	1.00			9/1/17 14:19	AGK	L-Kahn/9060A	
Sub Lab Results													
Hydrometer	***attached***						1.00			9/6/17 00:00	SUB		

CT LAB#: 909821 Sample Description: NIGRA06-005-SS-001 Client Sample #: Sampled: 08/16/2017 0805

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
Inorganic Results													
Solids, Percent	***77.0***	%	0.1	0.1	0.1	0.1	1.00			8/24/17 13:10	BMM	EPA 8000C	
pH	***7.90***	S.U.	0.1	0.1	0.1	0.1	1.00			8/24/17 11:00	BKB	EPA 9045D	^
Total Organic Carbon	***35500***	mg/kg	47	97	190	190	1.00			8/31/17 13:04	AGK	L-Kahn/9060A	
Sub Lab Results													

Unless specifically stated to the contrary, soil/sediment/sludge sample results reported on a Dry Weight Basis

CT LAB#: 909821 Sample Description: NIGRA06-005-SS-001 Client Sample #: Sampled: 08/16/2017 0805

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
Hydrometer	***attached***						1.00			9/6/17 00:00	SUB		

CT LAB#: 909822 Sample Description: NIGRA06-005-SO-012 Client Sample #: Sampled: 08/16/2017 0845

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
Inorganic Results													
Solids, Percent	***76.9***	%	0.1	0.1	0.1	0.1	1.00			8/24/17 13:10	BMM	EPA 8000C	
pH	***7.79***	S.U.	0.1	0.1	0.1	0.1	1.00			8/24/17 11:00	BKB	EPA 9045D	^
Total Organic Carbon	***5270***	mg/kg	47	98	200	200	1.00			9/1/17 14:34	AGK	L-Kahn/9060A	
Sub Lab Results													
Hydrometer	***attached***						1.00			9/6/17 00:00	SUB		

CT LAB#: 909823 Sample Description: NIGRA08-004-SS-001 Client Sample #: Sampled: 08/14/2017 1200

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
Inorganic Results													
Solids, Percent	***80.7***	%	0.1	0.1	0.1	0.1	1.00			8/24/17 13:10	BMM	EPA 8000C	
pH	***7.72***	S.U.	0.1	0.1	0.1	0.1	1.00			8/24/17 11:00	BKB	EPA 9045D	^
Total Organic Carbon	***42100***	mg/kg	45	93	190	190	1.00			9/1/17 14:40	AGK	L-Kahn/9060A	
Sub Lab Results													
Hydrometer	***attached***						1.00			9/6/17 00:00	SUB		

Unless specifically stated to the contrary, soil/sediment/sludge sample results reported on a Dry Weight Basis

CT LAB#: 909824 Sample Description: NIGRA08-004-SO-008 Client Sample #: Sampled: 08/14/2017 1230

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
Inorganic Results													
Solids, Percent	***93.4***	%	0.1	0.1	0.1	0.1	1.00			8/24/17 13:10	BMM	EPA 8000C	
pH	***8.30***	S.U.	0.1	0.1	0.1	0.1	1.00			8/24/17 11:00	BKB	EPA 9045D	^
Total Organic Carbon	***12200***	mg/kg	39	80	160	160	1.00			9/1/17 14:46	AGK	L-Kahn/9060A	
Sub Lab Results													
Hydrometer	***attached***						1.00			9/6/17 00:00	SUB		

CT LAB#: 909825 Sample Description: NIGRA05-004-SS-001 Client Sample #: Sampled: 08/22/2017 0830

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
Inorganic Results													
Solids, Percent	***83.7***	%	0.1	0.1	0.1	0.1	1.00			8/24/17 13:10	BMM	EPA 8000C	
pH	***7.90***	S.U.	0.1	0.1	0.1	0.1	1.00			8/24/17 11:00	BKB	EPA 9045D	^
Total Organic Carbon	***12200***	mg/kg	43	90	180	180	1.00			8/31/17 13:33	AGK	L-Kahn/9060A	
Sub Lab Results													
Hydrometer	***attached***						1.00			9/6/17 00:00	SUB		

CT LAB#: 909826 Sample Description: NIGRA05-004-SO-004 Client Sample #: Sampled: 08/22/2017 0840

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
Inorganic Results													
Solids, Percent	***87.6***	%	0.1	0.1	0.1	0.1	1.00			8/24/17 13:10	BMM	EPA 8000C	
pH	***8.21***	S.U.	0.1	0.1	0.1	0.1	1.00			8/24/17 11:00	BKB	EPA 9045D	^

Unless specifically stated to the contrary, soil/sediment/sludge sample results reported on a Dry Weight Basis

CT LAB#: 909826 Sample Description: NIGRA05-004-SO-004 Client Sample #: Sampled: 08/22/2017 0840

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method
Total Organic Carbon	***26400***	mg/kg	41	86	170	170	1.00			8/31/17 13:39	AGK	L-Kahn/9060A
Sub Lab Results												
Hydrometer	***attached***						1.00			9/6/17 00:00	SUB	

Unless specifically stated to the contrary, soil/sediment/sludge sample results reported on a Dry Weight Basis

Notes:

^ Indicates the laboratory is NELAP accredited for this analyte by the indicated matrix and method. DL (detection limit), LOD (limit of detection), loq (limit of quantitation) as defined by most recent DOD QSM version.

All samples were received intact and properly preserved unless otherwise noted. The results reported relate only to the samples tested. This report shall not be reproduced, except in full, without written approval of this laboratory. The Chain of Custody is attached.

This report has been specifically prepared to satisfy project or program requirements. These results are in compliance with NELAC requirements for the parameters where accreditation is required or available, unless noted in the case narrative.

Submitted by: Eric T. Korthals
Project Manager
608-356-2760

QC Qualifiers

Code	Description
B	Analyte detected in the associated Method Blank.
C	Toxicity present in BOD sample.
D	Diluted Out.
E	Safe, No Total Coliform detected.
F	Unsafe, Total Coliform detected, no E. Coli detected.
G	Unsafe, Total Coliform detected and E. Coli detected.
H	Holding time exceeded.
I	BOD incubator temperature was outside acceptance limits during test period.
J	Estimated value.
L	Significant peaks were detected outside the chromatographic window.
M	Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits.
N	Insufficient BOD oxygen depletion.
O	Complete BOD oxygen depletion.
P	Concentration of analyte differs more than 40% between primary and confirmation analysis.
Q	Laboratory Control Sample outside acceptance limits.
R	See Narrative at end of report.
S	Surrogate standard recovery outside acceptance limits due to apparent matrix effects.
T	Sample received with improper preservation or temperature.
U	Analyte concentration was below detection limit.
V	Raised Quantitation or Reporting Limit due to limited sample amount or dilution for matrix background interference.
W	Sample amount received was below program minimum.
X	Analyte exceeded calibration range.
Y	Replicate/Duplicate precision outside acceptance limits.
Z	Specified calibration criteria was not met.

Current CT Laboratories Certifications

Wisconsin (WDNR) Chemistry ID# 157066030
Wisconsin (DATCP) Bacteriology ID# 105-289
Louisiana NELAP (primary) ID# ACC20160002
Illinois NELAP Lab ID# 200073
Kansas NELAP Lab ID# E-10368
Virginia NELAP Lab ID# 460203
Maryland Lab ID# WI00061
ISO/IEC 17025-2005 A2LA Cert # 3806.01
DoD-ELAP A2LA 3806.01
GA EPD Stipulation ID ACC20160002
Pennsylvania NELAP Lab ID# 68-04201, # 008

WWW.MI-TECH.US

715.359.9400
Mi-Tech Services, Inc.
5707 Schofield Avenue
PO Box 107
Weston, WI 54476

ANALYTICAL REPORT

CT Laboratories
Attn: Mr. Eric Korthals
1230 Lange Court
Baraboo, WI 53913
ekorthals@ctlaboratories.com

PROJECT NAME:	**AFFF SI SITES – NIAGARA FALLS, NY**		
REPORT DATE:	September 1, 2017	CT LABS PO #	130085 MITECH
ANALYSIS:	HYDROMETER	MI-TECH #	10738
METHOD:	ASTM D422	DATE RECEIVED:	08/24/2017

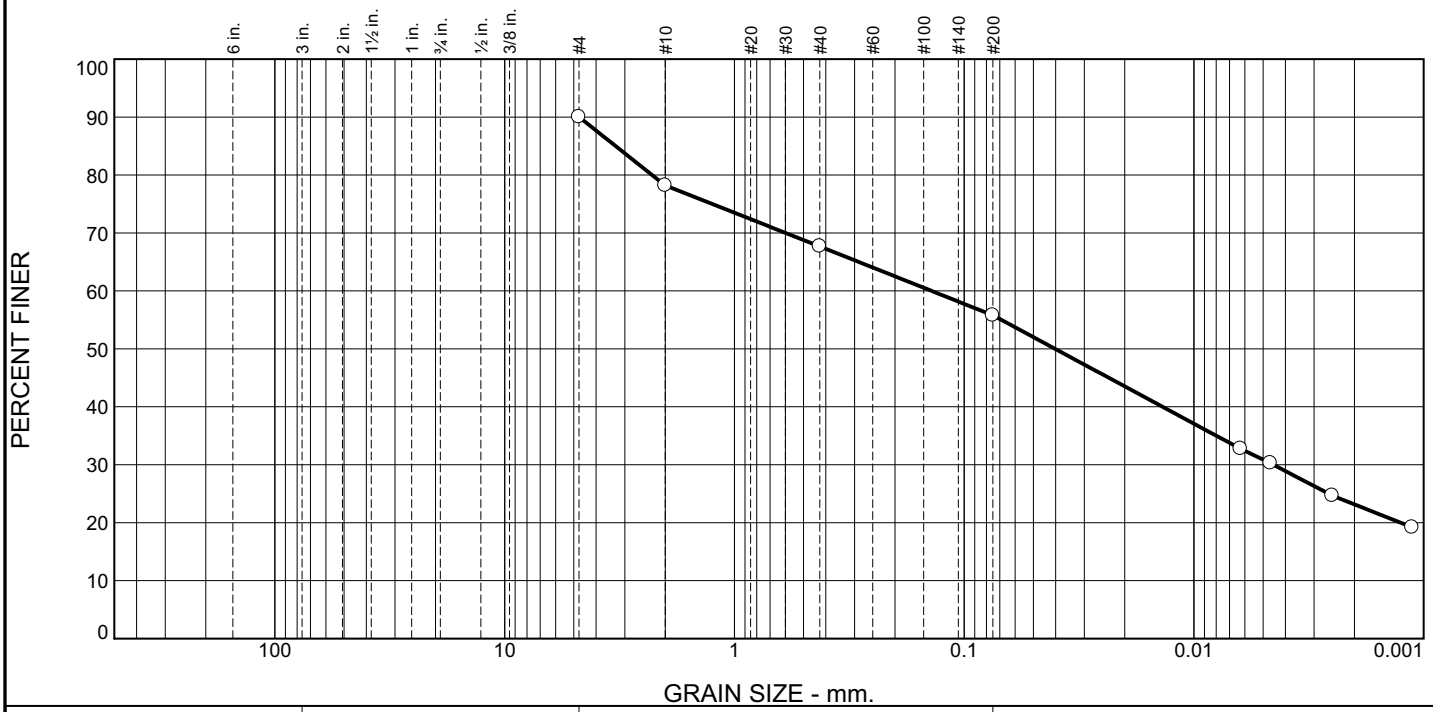
Dear Mr. Korthals:

Analytical results for the above referenced project are enclosed. Thank you for your business.

Sincerely,
Mi-Tech Services, Inc.

David Buckner, PE
Environmental Engineer

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
			11.8	10.5	11.9	24.9	30.9

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	90.0		
#10	78.2		
#40	67.7		
#200	55.8		
0.0063 mm.	32.8		
0.0046 mm.	30.3		
0.0025 mm.	24.7		
0.0011 mm.	19.2		

* (no specification provided)

Client Sample Description

NIGRA01-006-SS-001

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 4.7393 D_{85}= 3.2877 D_{60}= 0.1386
D_{50}= 0.0402 D_{30}= 0.0045 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 8/24/17 **Date Tested:** 8/25/17

Tested By: NJW

Checked By: DWB

Title: ENVIRO ENGINEER

Sample Number: 909810

Date Sampled: 8/15/17

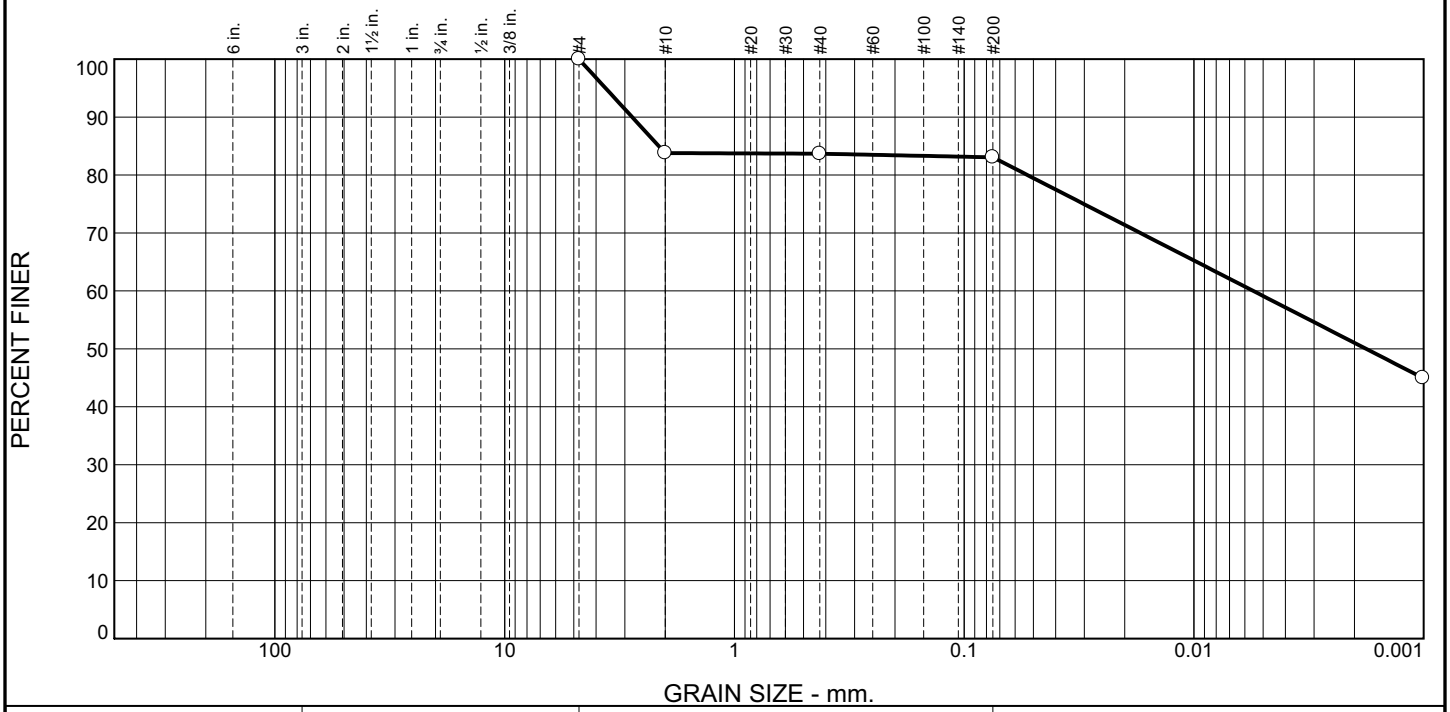
Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories
Project: AFFF SI - NIAGARA FALLS, NY

Project No: 10738 **Figure** 1

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	16.2	0.1	0.6	24.0	59.1

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	83.8		
#40	83.7		
#200	83.1		
0.0010 mm.	45.0		

* (no specification provided)

Client Sample Description

NIGRA01-006-SO-010

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 2.7861 D_{85}= 2.1338 D_{60}= 0.0055
D_{50}= 0.0018 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 8/24/17 **Date Tested:** 8/25/17

Tested By: NJW

Checked By: DWB

Title: ENVIRO ENGINEER

Sample Number: 909814 **Date Sampled:** 8/15/17

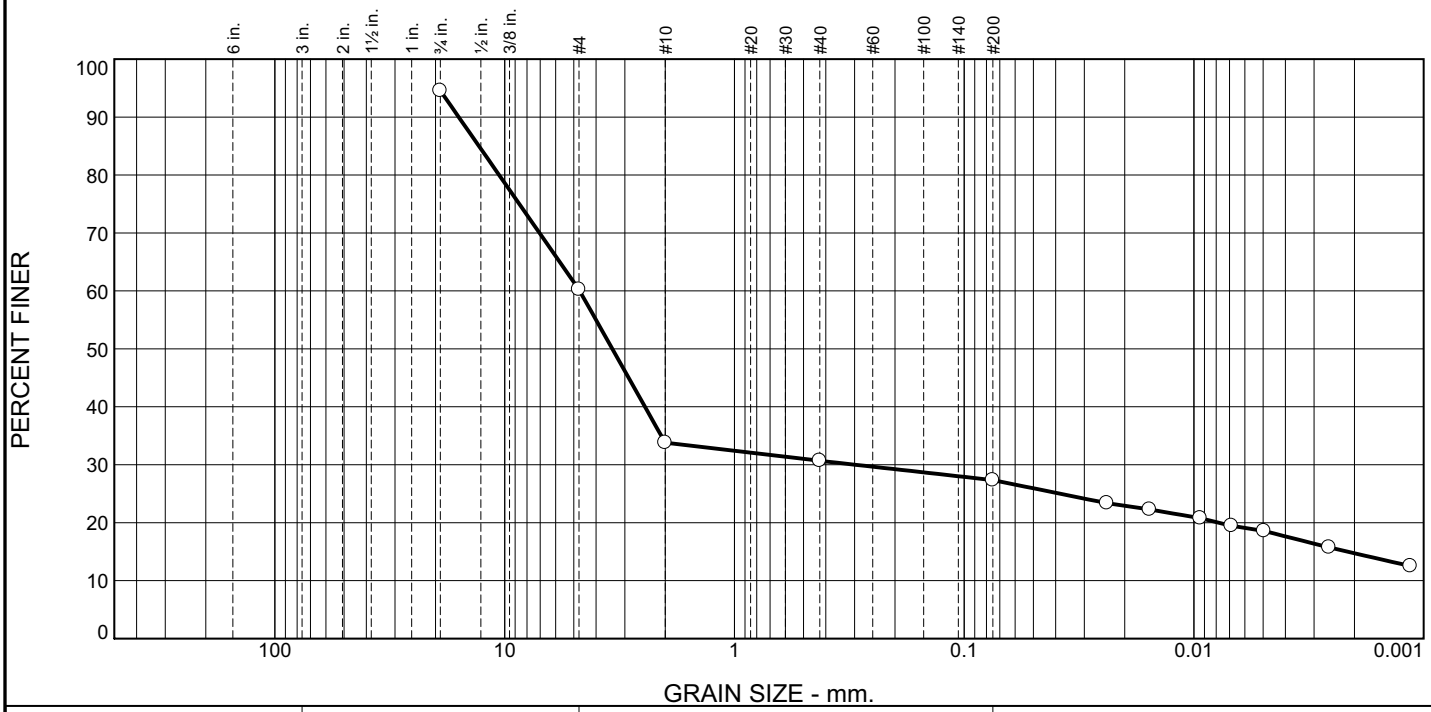
Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories
Project: AFFF SI - NIAGARA FALLS, NY

Project No: 10738 **Figure** 2

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
		34.3	26.4	3.1	3.4	8.7	18.6

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
.75	94.5		
#4	60.2		
#10	33.8		
#40	30.7		
#200	27.3		
0.0239 mm.	23.4		
0.0156 mm.	22.3		
0.0094 mm.	20.8		
0.0069 mm.	19.5		
0.0050 mm.	18.6		
0.0026 mm.	15.7		
0.0011 mm.	12.5		

* (no specification provided)

Client Sample Description

NIGRA02-006-SS-001

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= GM **AASHTO (M 145)=** A-2-4(0)

Coefficients

D_{90}= 15.8471 D_{85}= 12.9436 D_{60}= 4.7138
D_{50}= 3.3985 D_{30}= 0.2984 D_{15}= 0.0021
D_{10}= C_u= C_c=

Remarks

Date Received: 8/24/17 **Date Tested:** 8/25/17

Tested By: NJW

Checked By: DWB

Title: ENVIRO ENGINEER

Sample Number: 909815 **Date Sampled:** 8/16/17

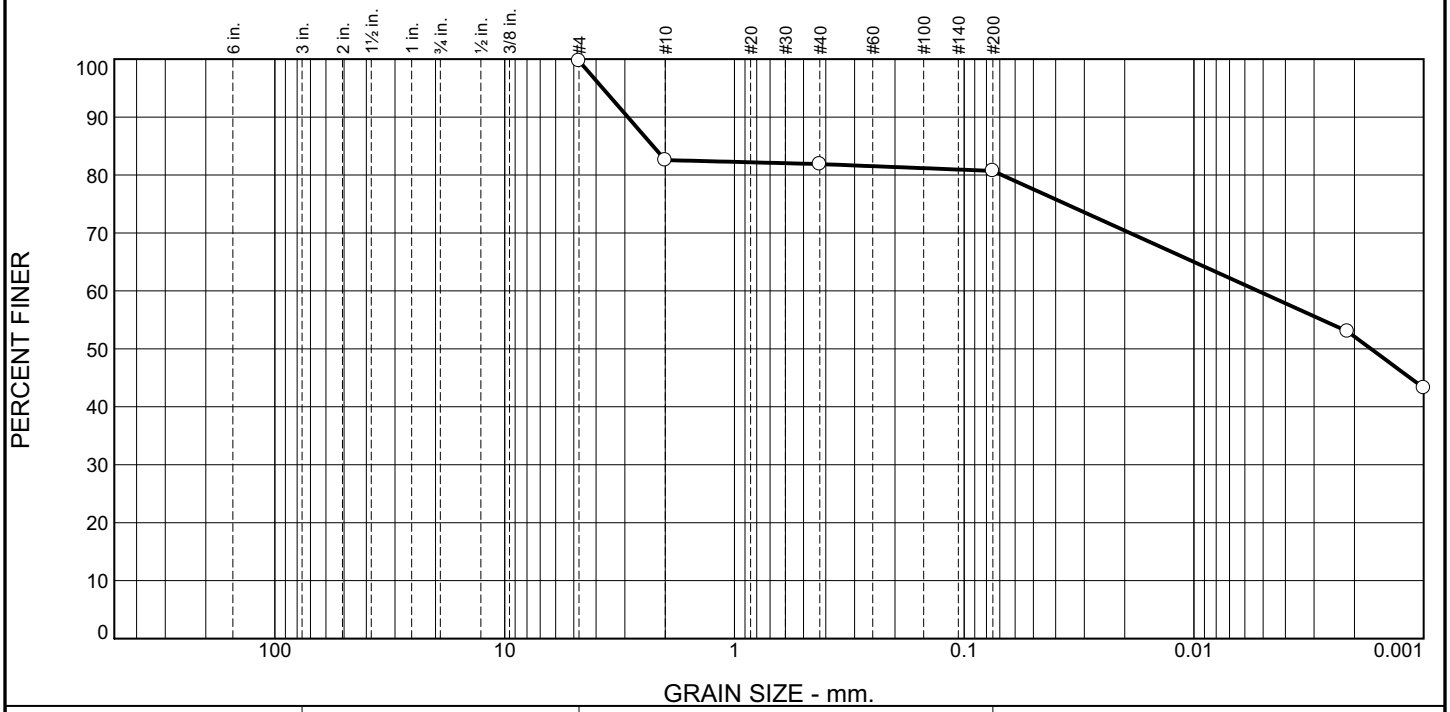
Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories
Project: AFFF SI - NIAGARA FALLS, NY

Project No: 10738 **Figure** 3

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
			17.1	0.7	1.2	21.1	59.6

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	99.7		
#10	82.6		
#40	81.9		
#200	80.7		
0.0021 mm.	53.0		
0.0010 mm.	43.3		

* (no specification provided)

Client Sample Description

NIGRA01-006-SO-011

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 2.9095 D_{85}= 2.2602 D_{60}= 0.0053
D_{50}= 0.0017 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 8/24/17 **Date Tested:** 8/25/17

Tested By: NJW

Checked By: DWB

Title: ENVIRO ENGINEER

Sample Number: 909816 **Date Sampled:** 8/16/17

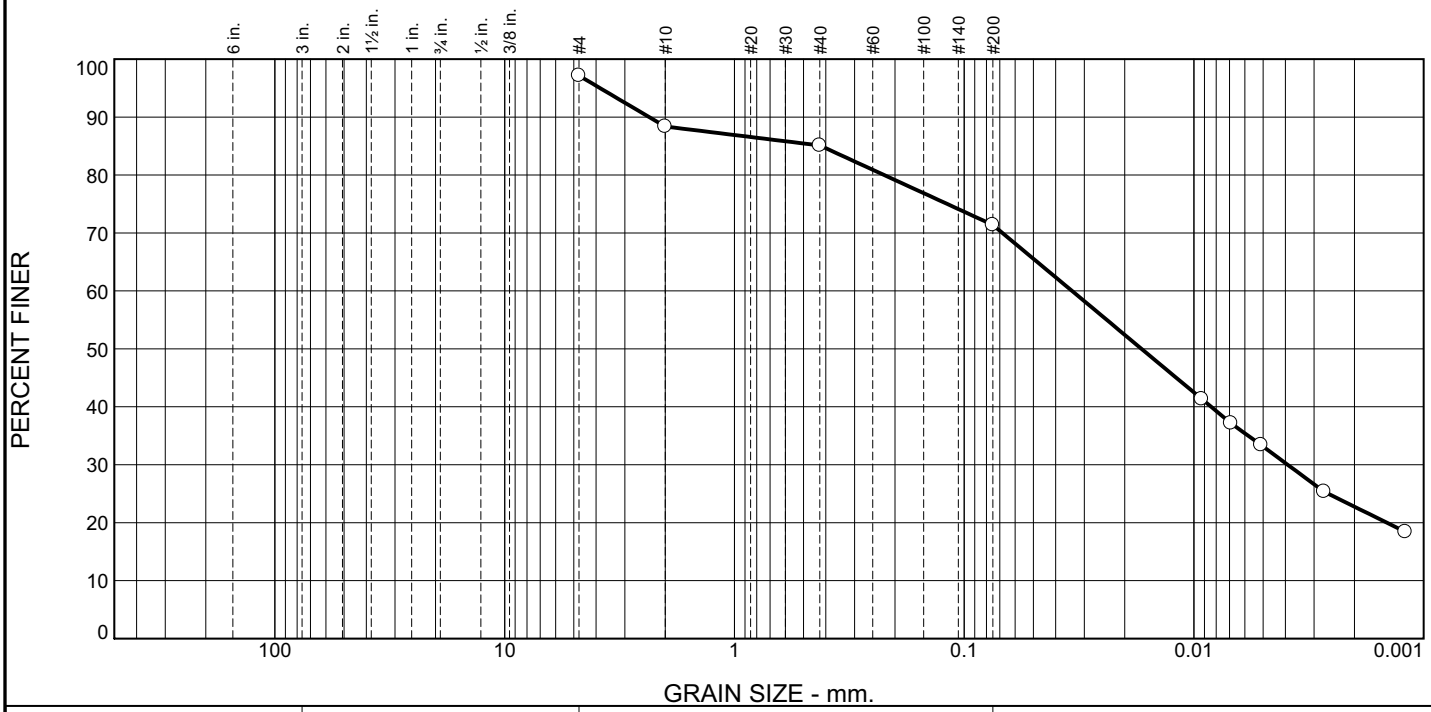
Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories
Project: AFFF SI - NIAGARA FALLS, NY

Project No: 10738 **Figure** 4

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
			8.8	3.3	13.7	38.3	33.1

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	97.2		
#10	88.4		
#40	85.1		
#200	71.4		
0.0092 mm.	41.3		
0.0069 mm.	37.2		
0.0051 mm.	33.4		
0.0027 mm.	25.4		
0.0012 mm.	18.4		

* (no specification provided)

Client Sample Description

NIGRA03-003-SS-001

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 2.3485 D_{85}= 0.4194 D_{60}= 0.0339
D_{50}= 0.0169 D_{30}= 0.0039 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 8/24/17 **Date Tested:** 8/25/17

Tested By: NJW

Checked By: DWB

Title: ENVIRO ENGINEER

Sample Number: 909817

Date Sampled: 8/14/17

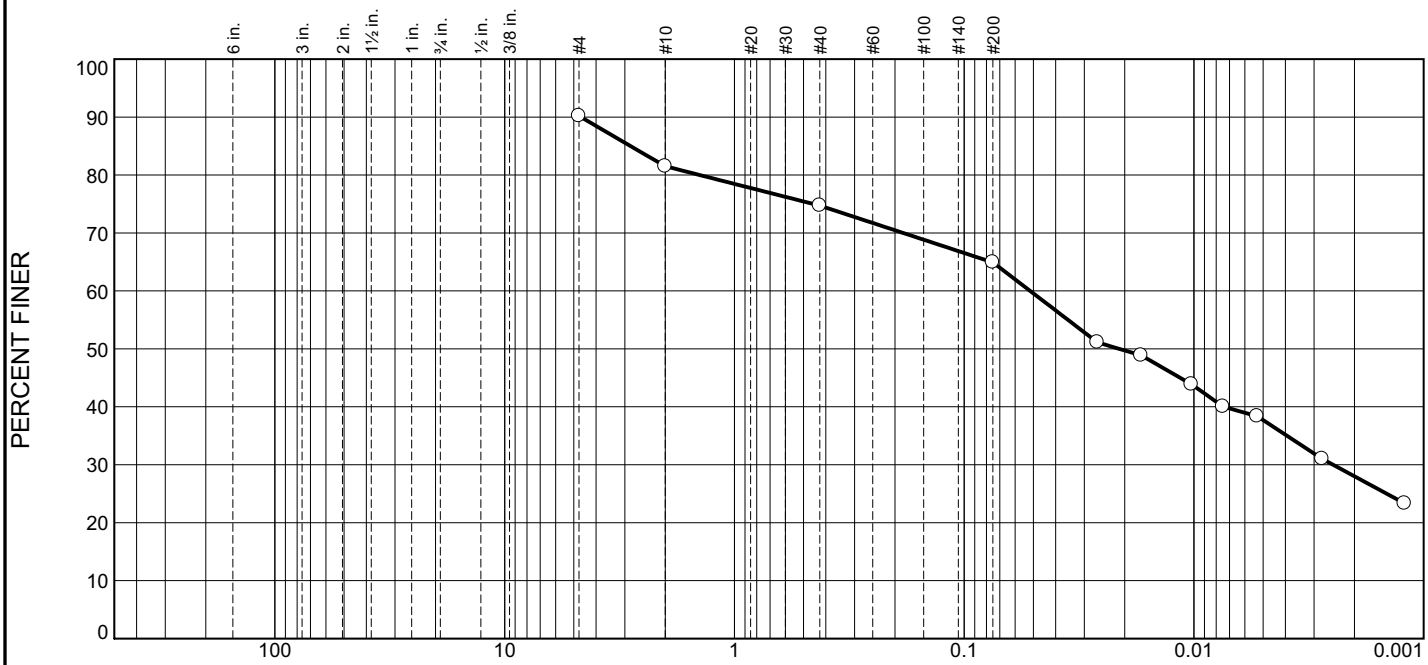
Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories
Project: AFFF SI - NIAGARA FALLS, NY

Project No: 10738 **Figure** 5

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
			8.7	6.8	9.8	27.2	37.7

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	90.2		
#10	81.5		
#40	74.7		
#200	64.9		
0.0263 mm.	51.1		
0.0170 mm.	48.9		
0.0102 mm.	43.9		
0.0075 mm.	40.0		
0.0053 mm.	38.4		
0.0028 mm.	31.0		
0.0012 mm.	23.3		

* (no specification provided)

Client Sample Description

NIGRA03-003-SO-006

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 4.6561 D_{85}= 2.8299 D_{60}= 0.0516
D_{50}= 0.0211 D_{30}= 0.0025 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 8/24/17 **Date Tested:** 8/25/17

Tested By: NJW

Checked By: DWB

Title: ENVIRO ENGINEER

Sample Number: 909818

Date Sampled: 8/14/17

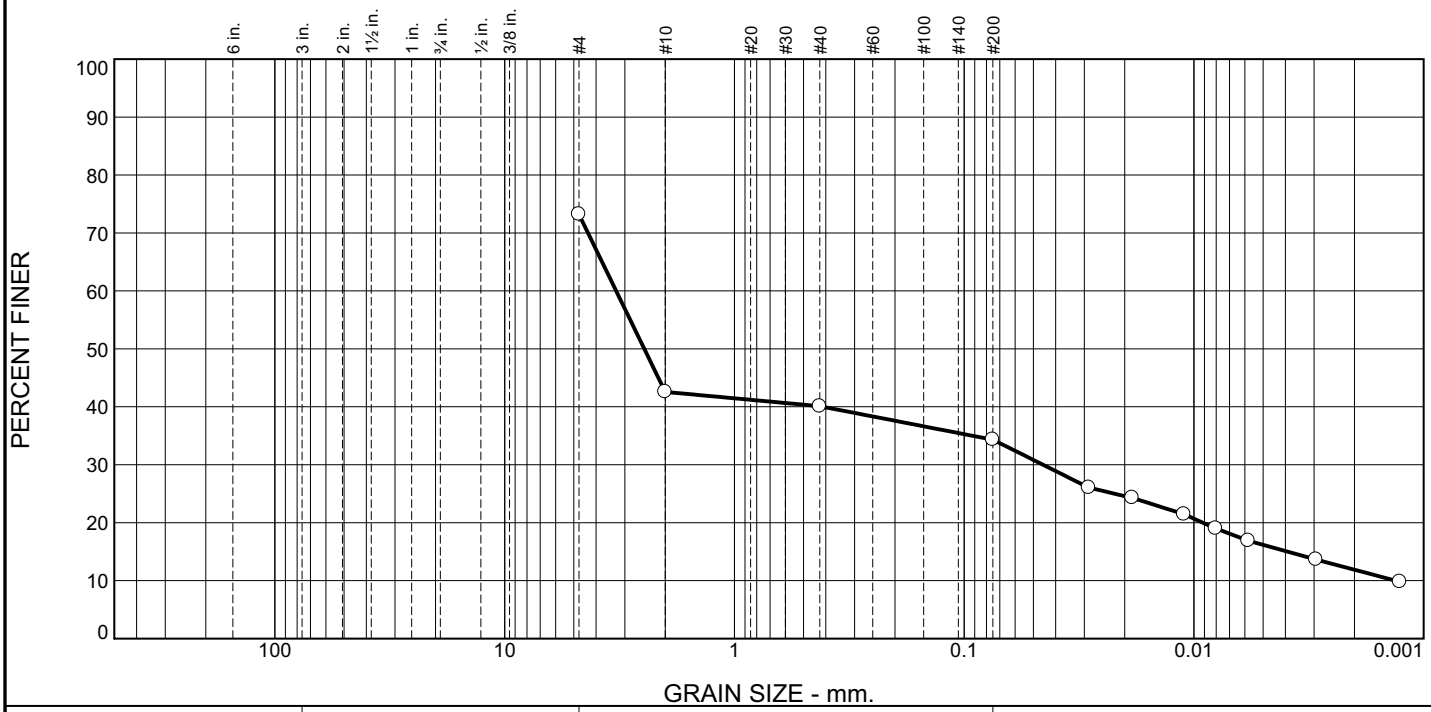
Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories
Project: AFFF SI - NIAGARA FALLS, NY

Project No: 10738 **Figure** 6

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
			30.6	2.5	5.8	18.1	16.2

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	73.2		
#10	42.6		
#40	40.1		
#200	34.3		
0.0287 mm.	26.0		
0.0185 mm.	24.3		
0.0111 mm.	21.5		
0.0080 mm.	19.0		
0.0058 mm.	16.9		
0.0029 mm.	13.6		
0.0013 mm.	9.8		

* (no specification provided)

Client Sample Description

NIGRA04-004-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}= D_{85}= D_{60}= 3.2710
D_{50}= 2.4668 D_{30}= 0.0454 D_{15}= 0.0039
D_{10}= 0.0013 C_u= 2465.28 C_c= 0.47

Remarks

Date Received: 8/24/17 **Date Tested:** 8/25/17
Tested By: NJW
Checked By: DWB
Title: ENVIRO ENGINEER

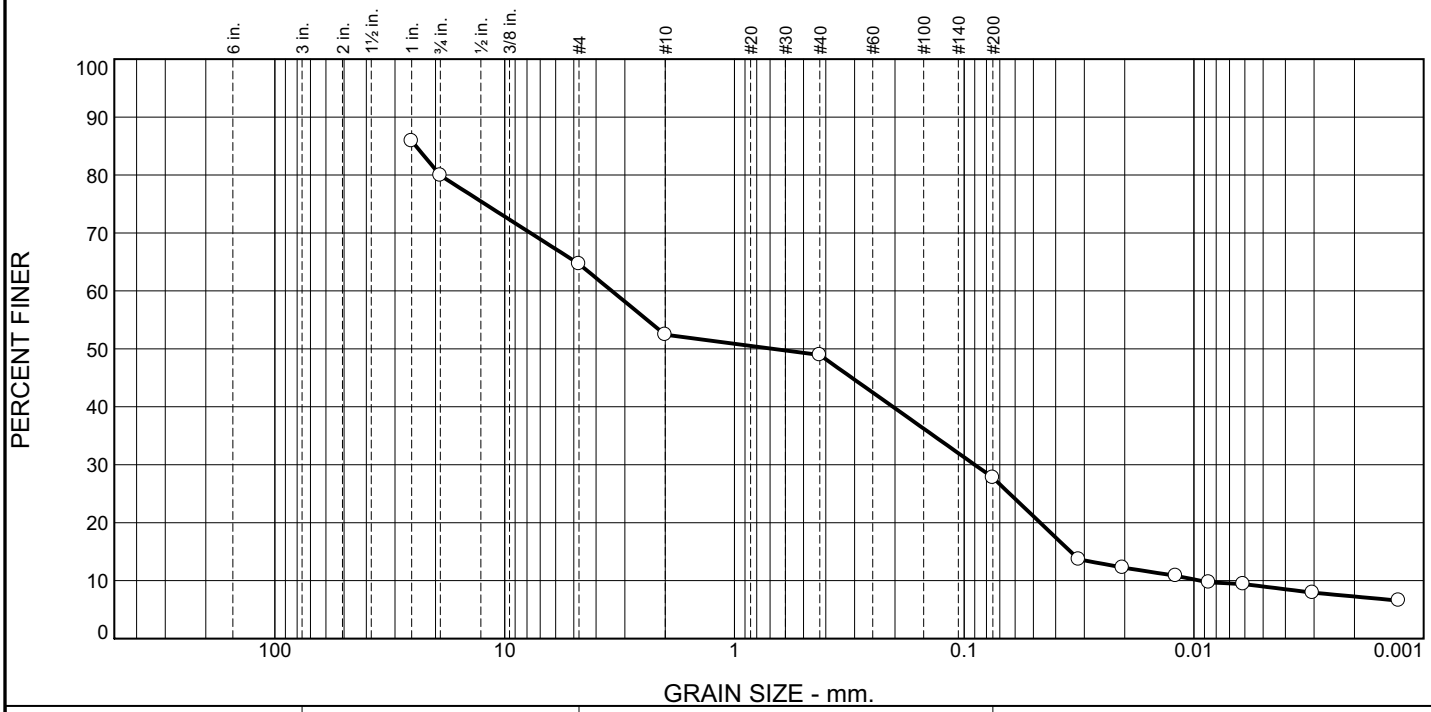
Sample Number: 909819 **Date Sampled:** 8/15/17

Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories
Project: AFFF SI - NIAGARA FALLS, NY
Project No: 10738 **Figure** 7

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
		15.2	12.3	3.5	21.1	18.8	9.0

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1	85.9		
.75	79.9		
#4	64.7		
#10	52.4		
#40	48.9		
#200	27.8		
0.0318 mm.	13.7		
0.0204 mm.	12.3		
0.0120 mm.	10.8		
0.0086 mm.	9.7		
0.0061 mm.	9.4		
0.0030 mm.	7.9		
0.0013 mm.	6.6		

* (no specification provided)

Client Sample Description

NIGRA04-004-SO-007

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}= D_{85}= 24.3373 D_{60}= 3.4157
D_{50}= 0.6798 D_{30}= 0.0900 D_{15}= 0.0344
D_{10}= 0.0094 C_u= 362.66 C_c= 0.25

Remarks

Date Received: 8/24/17 **Date Tested:** 8/25/17

Tested By: NJW

Checked By: DWB

Title: ENVIRO ENGINEER

Sample Number: 909820 **Date Sampled:** 8/16/17

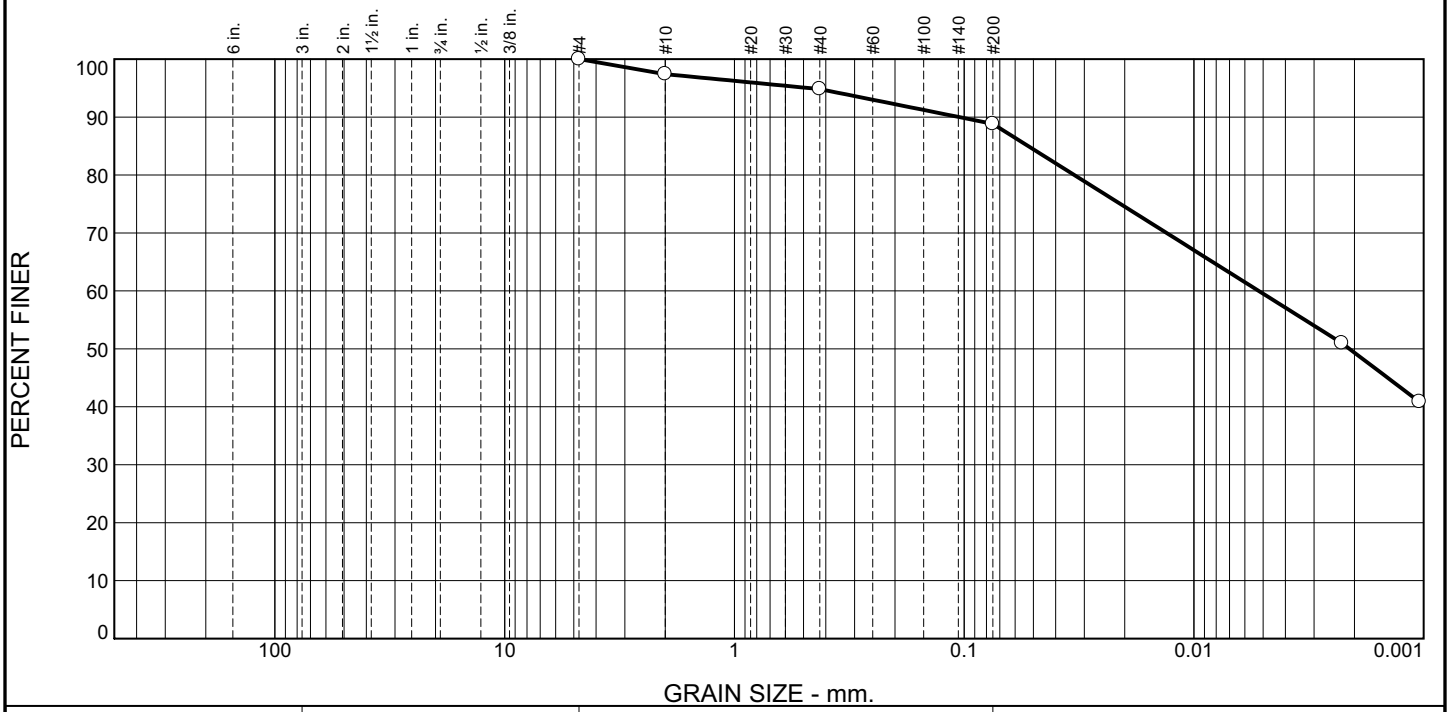
Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories
Project: AFFF SI - NIAGARA FALLS, NY

Project No: 10738 **Figure** 8

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	2.6	2.6	6.0	29.3	59.5

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	97.4		
#40	94.8		
#200	88.8		
0.0023 mm.	51.0		
0.0010 mm.	40.8		

* (no specification provided)

Client Sample Description

NIGRA06-005-SS-001

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 0.1052 D_{85}= 0.0526 D_{60}= 0.0052
D_{50}= 0.0021 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 8/24/17 **Date Tested:** 8/25/17
Tested By: NJW
Checked By: DWB
Title: ENVIRO. ENGINEER

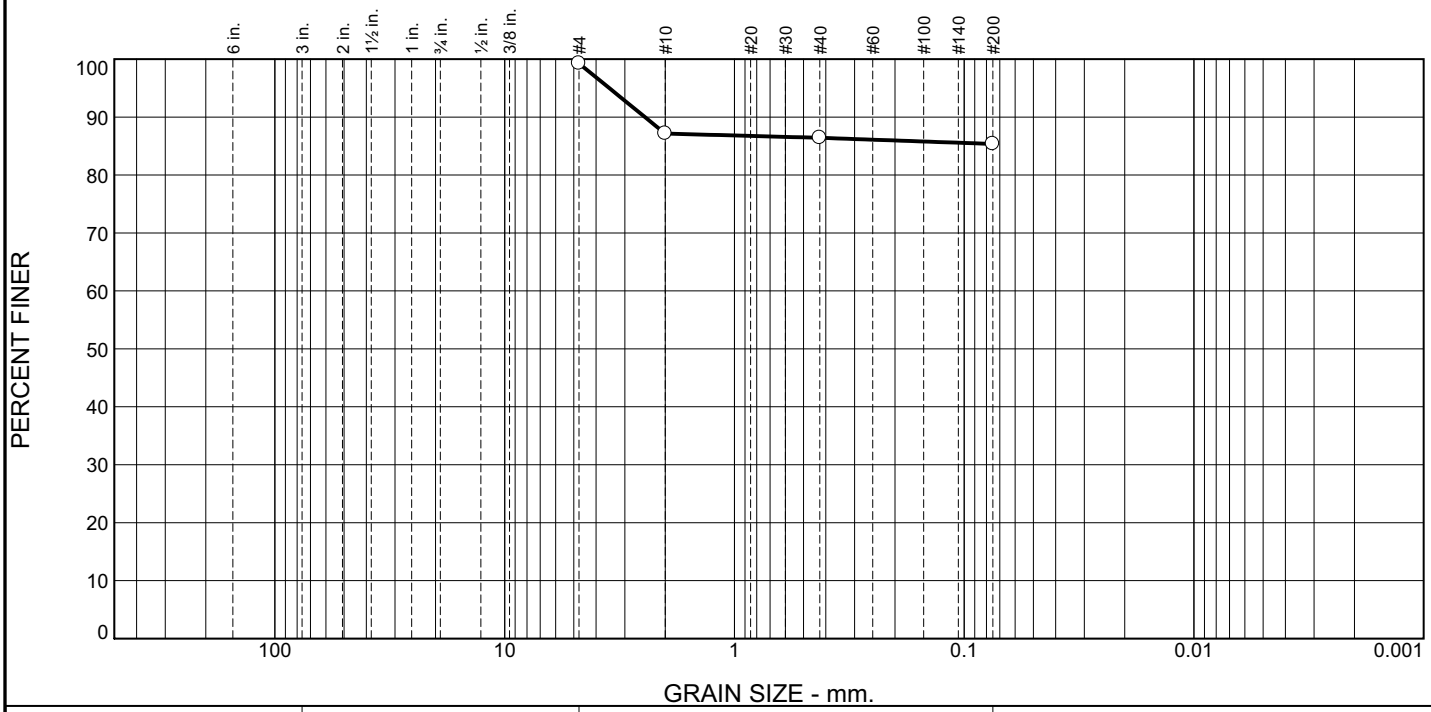
Sample Number: 909821 **Date Sampled:** 8/16/17

Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories
Project: AFFF SI - NIAGARA FALLS, NY
Project No: 10738 **Figure** 9

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
			12.1	0.8	1.0	85.4	

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	99.3		
#10	87.2		
#40	86.4		
#200	85.4		

* (no specification provided)

Client Sample Description

NIGRA06-005-SO-012

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 2.4506 D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 8/24/17 **Date Tested:** 8/25/17

Tested By: NJW

Checked By: DWB

Title: ENVIRO. ENGINEER

Sample Number: 909822

Date Sampled: 8/16/17

Mi-Tech Services, Inc.

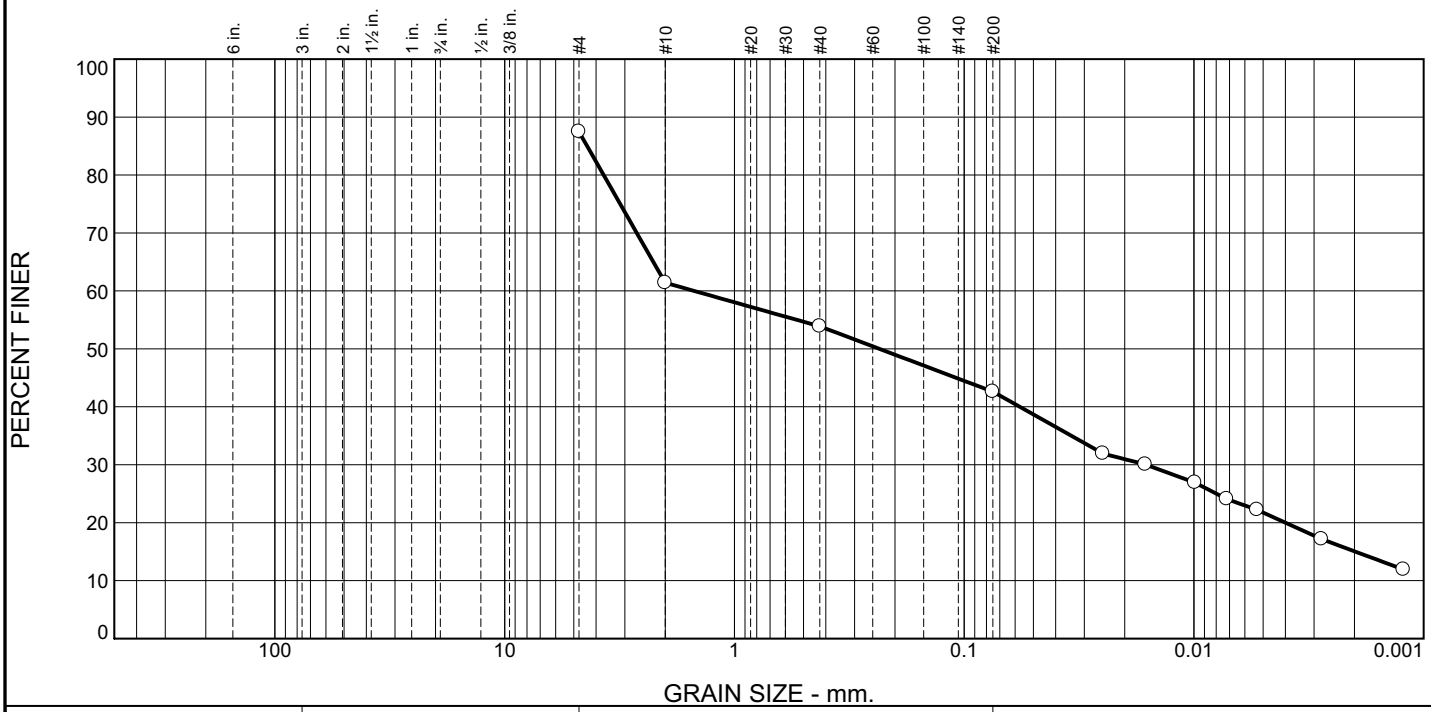
Weston, WI

Client: CT Laboratories

Project: AFFF SI - NIAGARA FALLS, NY

Project No: 10738 **Figure** 10

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
			26.1	7.5	11.3	20.9	21.7

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	87.5		
#10	61.4		
#40	53.9		
#200	42.6		
0.0249 mm.	31.9		
0.0163 mm.	30.0		
0.0099 mm.	26.9		
0.0072 mm.	24.1		
0.0053 mm.	22.2		
0.0028 mm.	17.2		
0.0012 mm.	11.9		

* (no specification provided)

Client Sample Description

NIGRA08-004-SS-001

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= D_{85}= 4.3764 D_{60}= 1.4979
D_{50}= 0.2338 D_{30}= 0.0162 D_{15}= 0.0020
D_{10}= C_u= C_c=

Remarks

Date Received: 8/24/17 **Date Tested:** 8/25/17

Tested By: NJW

Checked By: DWB

Title: ENVIRO. ENGINEER

Sample Number: 909823 **Date Sampled:** 8/14/17

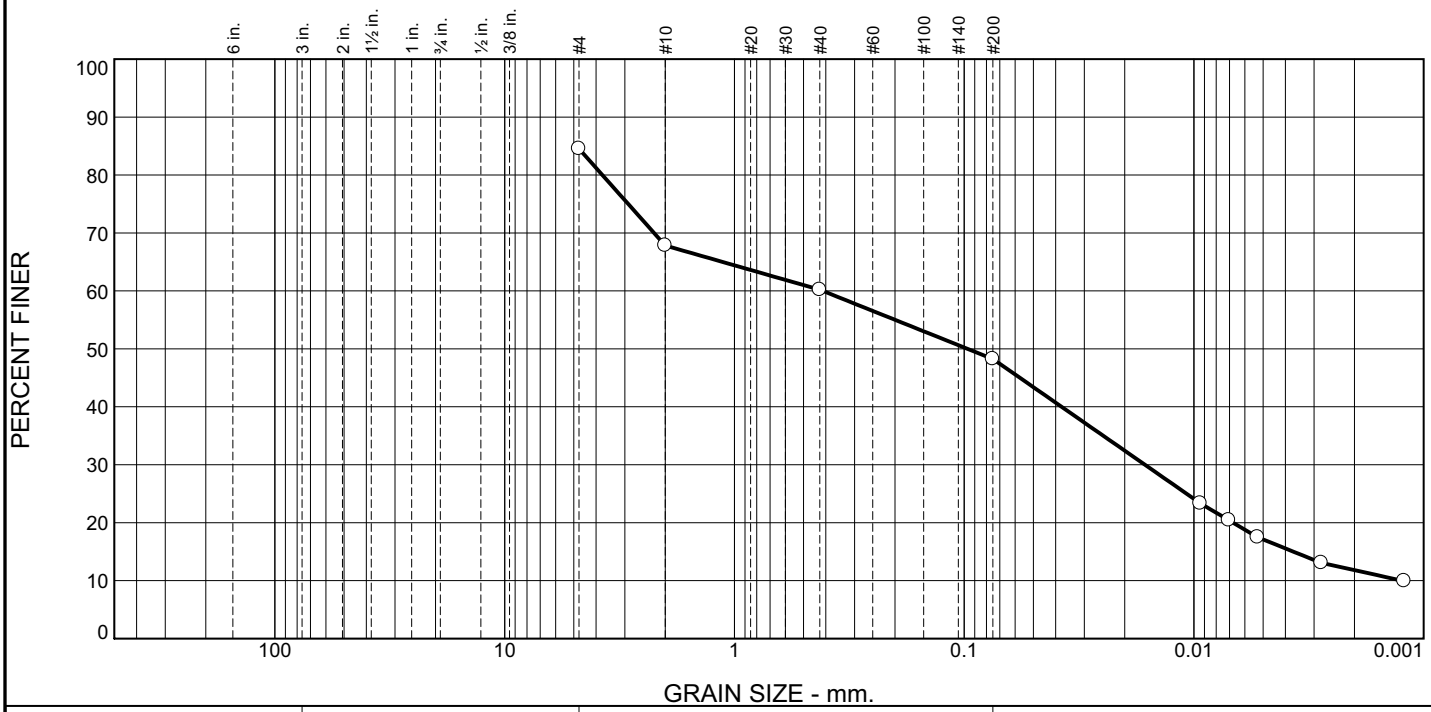
Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories
Project: AFFF SI - NIAGARA FALLS, NY

Project No: 10738 **Figure** 11

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
			16.7	7.6	11.9	31.2	17.1

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	84.5		
#10	67.8		
#40	60.2		
#200	48.3		
0.0094 mm.	23.3		
0.0071 mm.	20.4		
0.0053 mm.	17.5		
0.0028 mm.	13.1		
0.0012 mm.	9.9		

* (no specification provided)

Client Sample Description

NIGRA08-004-SO-008

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= D_{85}= D_{60}= 0.4126
D_{50}= 0.0967 D_{30}= 0.0163 D_{15}= 0.0037
D_{10}= 0.0012 C_u= 332.25 C_c= 0.52

Remarks

Date Received: 8/24/17 **Date Tested:** 8/25/17

Tested By: NJW

Checked By: DWB

Title: ENVIRO. ENGINEER

Sample Number: 909824 **Date Sampled:** 8/14/17

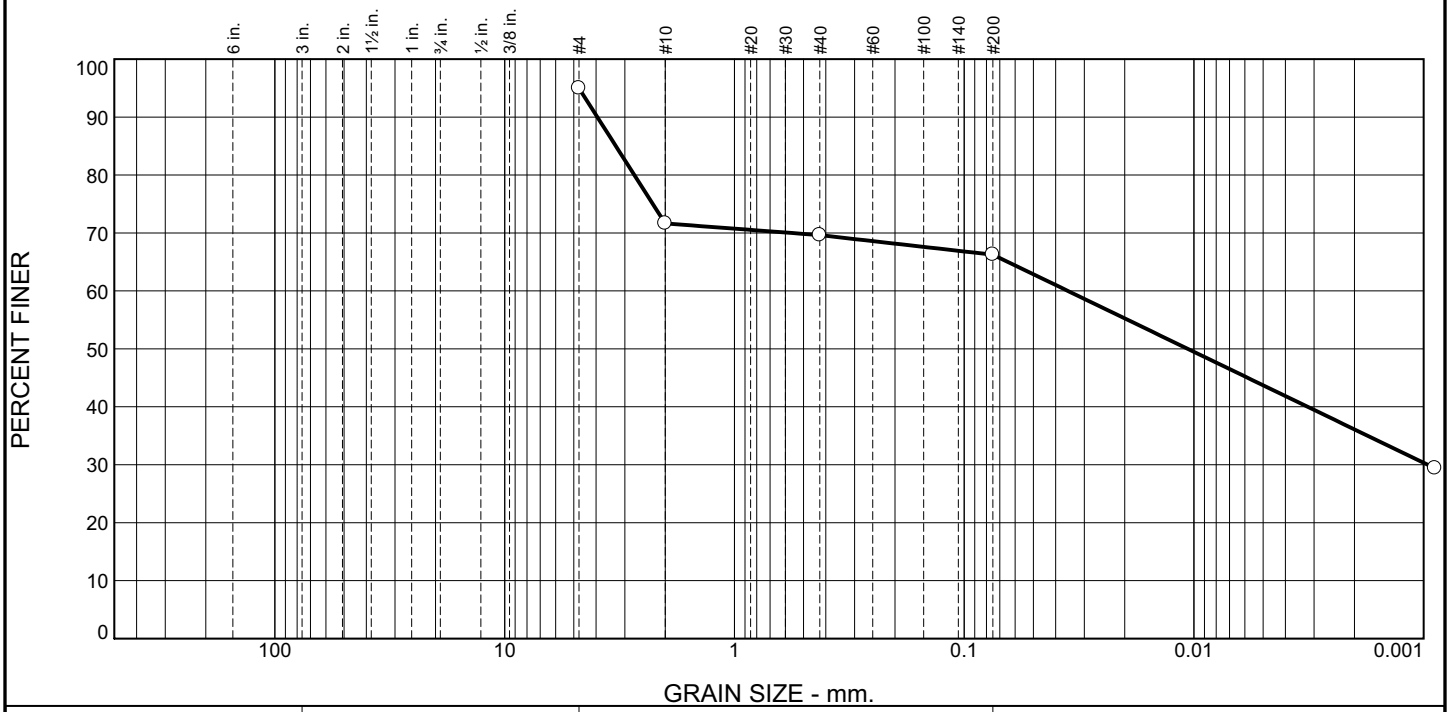
Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories
Project: AFFF SI - NIAGARA FALLS, NY

Project No: 10738 **Figure** 12

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
			23.4	2.0	3.4	22.5	43.7

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	95.0		
#10	71.6		
#40	69.6		
#200	66.2		
0.0009 mm.	29.4		

* (no specification provided)

Client Sample Description

NIGRA05-004-SS-001

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 3.9488 D_{85}= 3.2808 D_{60}= 0.0354
D_{50}= 0.0106 D_{30}= 0.0010 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 8/24/17 **Date Tested:** 8/25/17

Tested By: NJW

Checked By: DWB

Title: ENVIRO. ENGINEER

Sample Number: 909825 **Date Sampled:** 8/22/17

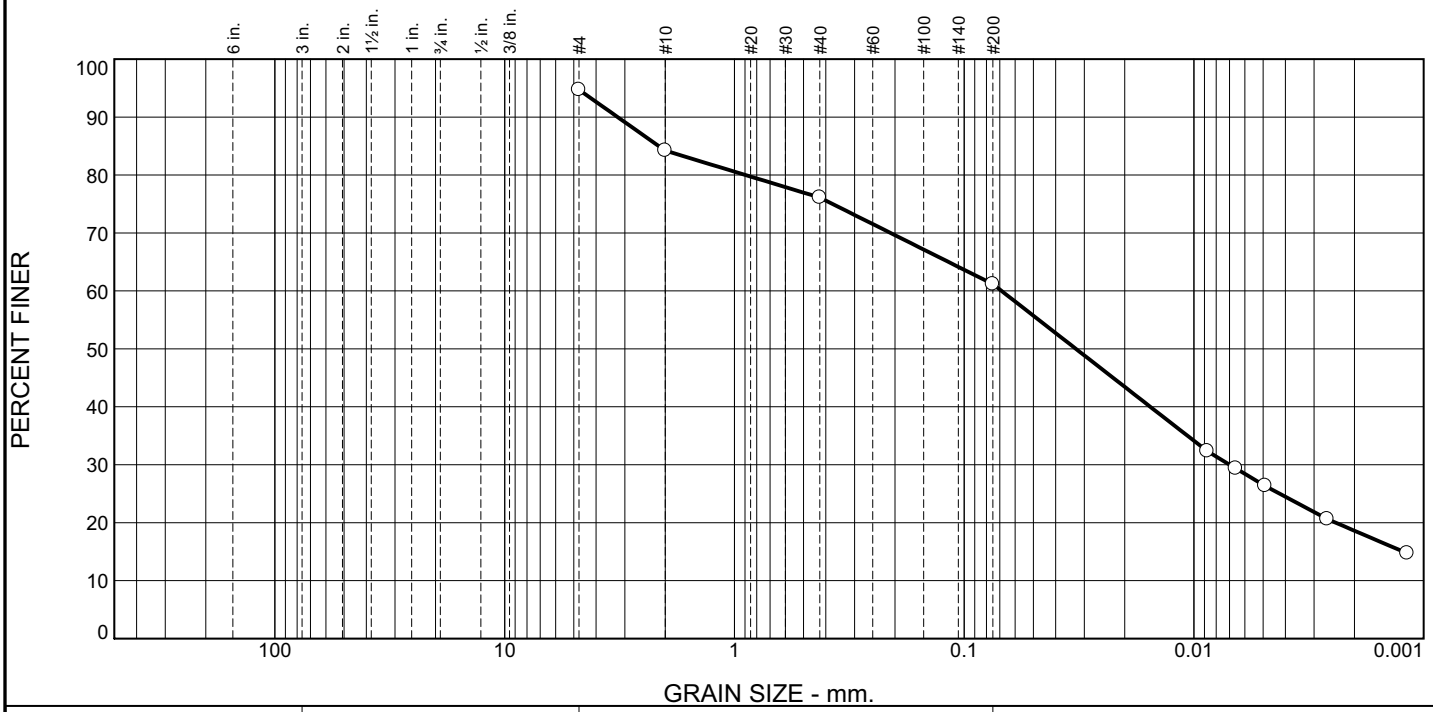
Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories
Project: AFFF SI - NIAGARA FALLS, NY

Project No: 10738 **Figure** 13

Particle Size Distribution Report - Hydrometer Method



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
			10.5	8.1	14.9	34.6	26.6

Test Results (ASTM D 422-63 & ASTM D 2217)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	94.7		
#10	84.2		
#40	76.1		
#200	61.2		
0.0088 mm.	32.4		
0.0066 mm.	29.4		
0.0049 mm.	26.4		
0.0026 mm.	20.6		
0.0012 mm.	14.7		

* (no specification provided)

Client Sample Description

NIGRA05-004-SO-004

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 3.2208 D_{85}= 2.1338 D_{60}= 0.0688
D_{50}= 0.0326 D_{30}= 0.0070 D_{15}= 0.0012
D_{10}= C_u= C_c=

Remarks

Date Received: 8/24/17 **Date Tested:** 8/25/17
Tested By: NJW
Checked By: DWB
Title: ENVIRO ENGINEER

Sample Number: 909826 **Date Sampled:** 8/22/17

Mi-Tech Services, Inc.

Weston, WI

Client: CT Laboratories
Project: AFFF SI - NIAGARA FALLS, NY
Project No: 10738 **Figure** 14

CT LABORATORIES
delivering more than data from your environmental analyses

1230 Lange Court • Baraboo, WI 53913 • 608-356-2760
www.ctlaboratories.com

Sub-Contract Laboratory Chain-of-Custody and Purchase Order

PURCHASE ORDER # 130085 MITECH

The PO# must appear on all invoice and reports!

Upon Receipt of Samples, please verify that samples were received in acceptable condition then sign this form and fax to (608)356-2766 or email to the project manager. Sample temperature, upon receipt, must be recorded on this document unless thermal preservation is not a method requirement.

Ship to: **Mi-Tech**
5707 SCHOFIELD AVE
WESTON, WI 54476

Return Invoice and Results to: **ekorthals@ctlaboratories.com**

CTLaboratories
Eric Korthals
1230 Lange Court
Baraboo WI 53913

Government UPS Shipping Acct ? Y N

Ship by: Speedee [X] UPS Grnd [ ] UPS 2nd [ ] UPS NDA [ ]

Date Due: ~2WKS ***RUSH TURNAROUND NEEDED? Y or N (Circle One)***

Project Name: AFFF SI ~ NIAGRA FALLS **Project State:** NY

Analytical/QC Criteria: NONE INDICATED STATE DOD QSM NELAP (Circle one) OTHER_____

Report results as EDD? N Y (Circle one and indicate type: _____) Data Deliverable Package LEVEL: SD

CTLabs ID#	Sample Date/Time	Matrix	Sample Description	Analyses / Method	Cost
909810	08/15/2017 0820	SOIL	NIGRA01-006-SS-001	HYDROMETER	
909814	08/15/2017 0915	SOIL	NIGRA01-006-SO-010	HYDROMETER	
909815	08/16/2017 1440	SOIL	NIGRA02-006-SS-001	HYDROMETER	
909816	08/16/2017 1530	SOIL	NIGRA01-006-SO-011	HYDROMETER	
909817	08/14/2017 1415	SOIL	NIGRA03-003-SS-001	HYDROMETER	
909818	08/14/2017 1455	SOIL	NIGRA03-003-SO-006	HYDROMETER	
909819	08/15/2017 1420	SOIL	NIGRA04-004-SS-001	HYDROMETER	
909820	08/16/2017 1255	SOIL	NIGRA04-004-SO-007	HYDROMETER	
909821	08/16/2017 0805	SOIL	NIGRA06-005-SS-001	HYDROMETER	
909822	08/16/2017 0845	SOIL	NIGRA06-005-SO-012	HYDROMETER	
909823	08/14/2017 1200	SOIL	NIGRA08-004-SS-001	HYDROMETER	
909824	08/14/2017 1230	SOIL	NIGRA08-004-SO-008	HYDROMETER	
909825	08/22/2017 0830	SOIL	NIGRA05-004-SS-001	HYDROMETER	
909826	08/22/2017 0840	SOIL	NIGRA05-004-SO-004	HYDROMETER	

Relinquished by: _____ Date/Time: 8-23-17 / 1250

Received by: _____ Date/Time: 8/24/17 12:15 Receipt Temperature (C) _____

COMMENTS:

REPORT ALL SOLIDS ON A DRY WEIGHT BASIS UNLESS OTHERWISE INDICATED

Form #: FPM1-01
Effective Date: 02/15/14

CT LABORATORIES
delivering more than data from your environmental analyses
1230 Lange Court • Baraboo, WI 53913 • 608-356-2760
www.ctlaboratories.com

QC SUMMARY REPORT

MAXXAM ANALYTICS **Project Name: AFFF SI SAVANNAH**

SDG #: 130085 **Folder #: 130085** **Project Number: M2032.0001**

Duplicate

Analytical Run #:	141381	Analysis Date:	08/24/2017	Prep Batch #:		Matrix:	SOIL
CTLab #:	911071	Analysis Time:	13:10	Prep Date/Time:		Method:	SW8000C
Parent Sample #:	909826	Analyst:	BMM	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Solids, Percent	88.3	%	87.6					1	8

MAXXAM ANALYTICS **Project Name: AFFF SI SAVANNAH**

SDG #: 130085 **Folder #: 130085** **Project Number: M2032.0001**

Duplicate

Analytical Run #:	141397	Analysis Date:	08/24/2017	Prep Batch #:		Matrix:	SOIL
CTLab #:	910198	Analysis Time:	11:00	Prep Date/Time:		Method:	SW9045C
Parent Sample #:	909826	Analyst:	BKB	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
pH	8.20	S.U.	8.21					0	1

Duplicate

Analytical Run #:	141614	Analysis Date:	09/01/2017	Prep Batch #:		Matrix:	SOIL
CTLab #:	916900	Analysis Time:	13:44	Prep Date/Time:		Method:	LYDKHN
Parent Sample #:	909810	Analyst:	AGK	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Total Organic Carbon	70600	mg/kg	27700					87	30

Duplicate

Analytical Run #:	141614	Analysis Date:	09/01/2017	Prep Batch #:		Matrix:	SOIL
CTLab #:	916901	Analysis Time:	13:50	Prep Date/Time:		Method:	LYDKHN
Parent Sample #:	909810	Analyst:	AGK	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Total Organic Carbon	45700	mg/kg	27700					49	30

Duplicate

Analytical Run #:	141614	Analysis Date:	09/01/2017	Prep Batch #:		Matrix:	SOIL
CTLab #:	916902	Analysis Time:	13:56	Prep Date/Time:		Method:	LYDKHN
Parent Sample #:	909810	Analyst:	AGK	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Total Organic Carbon	24300	mg/kg	27700					13	30

MAXXAM ANALYTICS **Project Name: AFFF SI SAVANNAH**

SDG #: 130085 **Folder #: 130085** **Project Number: M2032.0001**

Lab Control Spike Soil

Analytical Run #:	141614	Analysis Date:	08/31/2017	Prep Batch #:		Matrix:	SOLID
CTLab #:	917000	Analysis Time:	10:47	Prep Date/Time:		Method:	LYDKHN
Parent Sample #:		Analyst:	AGK	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Total Organic Carbon	372000	mg/kg			400000	93	84 --- 113		

MAXXAM ANALYTICS **Project Name: AFFF SI SAVANNAH**

SDG #: 130085 **Folder #: 130085** **Project Number: M2032.0001**

Method Blank Soil

Analytical Run #:	141614	Analysis Date:	08/31/2017	Prep Batch #:		Matrix:	SOLID
CTLab #:	917008	Analysis Time:	10:52	Prep Date/Time:		Method:	LYDKHN
Parent Sample #:		Analyst:	AGK	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Total Organic Carbon	36	mg/kg		U	0		75		

CT LABORATORIES
delivering more than data from your environmental analyses

Sample Condition Report

Folder #: 130085
Client: MAXXAM ANALYTICS

Print Date / Time: 08/23/2017 11:41
Received Date / Time / By: 08/23/2017 10:30 DRT

Project Name: AFFF SI - NIAGRA FALLS ARS
Project Phase:

Log-In Date / Time / By: 08/23/2017 11:41 DRT
Project #: M2032.0001 PM: ETK

Coolers: MAXXAM X2
Custody Seals Present : **Y**

Temperature: 2.4,3.1 C On Ice: **Y**
COC Present:? **Y** Complete? **Y**

Seal Intact? **Y**
Ship Method: FED EX OVERNIGHT
Adequate Packaging: **Y**

Numbers: SIGNED & DATED
Tracking Number: 787475930626/787475930648
Temp Blank Enclosed? **Y**

Notes: SAMPLES RECEIVED IN GOOD CONDITION ON ICE
FOUR CUSTODY SEALS PRESENT, INTACT, SIGNED AND DATED

Sample ID /	Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests
909810	NIGRA01-006-SS-001				
		SOLIDS	1	/	%SOL,pH,TOC
		Total # of Containers of Type	(***SOLIDS***) =	**1**	
909810	NIGRA01-006-SS-001				
		SOLIDS	1	/	SUB HYDRO
		Total # of Containers of Type	(***SOLIDS***) =	**1**	

Sample ID /	Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests
909814	NIGRA01-006-SO-010				
		SOLIDS	1	/	%SOL,pH,TOC
		Total # of Containers of Type	(***SOLIDS***) =	**1**	
909814	NIGRA01-006-SO-010				
		SOLIDS	1	/	SUB HYDRO
		Total # of Containers of Type	(***SOLIDS***) =	**1**	

Sample ID /	Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests
909815	NIGRA02-006-SS-001				
		SOLIDS	1	/	%SOL,pH,TOC
		Total # of Containers of Type	(***SOLIDS***) =	**1**	
909815	NIGRA02-006-SS-001				
		SOLIDS	1	/	SUB HYDRO
		Total # of Containers of Type	(***SOLIDS***) =	**1**	

Sample ID /	Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests
909816	NIGRA01-006-SO-011				
		SOLIDS	1	/	%SOL,pH,TOC
		Total # of Containers of Type	(***SOLIDS***) =	**1**	
909816	NIGRA01-006-SO-011				
		SOLIDS	1	/	SUB HYDRO
		Total # of Containers of Type	(***SOLIDS***) =	**1**	

Sample ID /	Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests
909817	NIGRA03-003-SS-001				

130085

	SOLIDS	1	/	%SOL,pH,TOC

Total # of Containers of Type (*SOLIDS*) = 1

909817	NIGRA03-003-SS-001			
	SOLIDS	1	/	SUB HYDRO

Total # of Containers of Type (*SOLIDS*) = 1

Sample ID /	Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests
909818	NIGRA03-003-SO-006				
		SOLIDS	1	/	%SOL,pH,TOC

Total # of Containers of Type (*SOLIDS*) = 1

909818	NIGRA03-003-SO-006			
	SOLIDS	1	/	SUB HYDRO

Total # of Containers of Type (*SOLIDS*) = 1

Sample ID /	Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests
909819	NIGRA04-004-SS-001				
		SOLIDS	1	/	%SOL,pH,TOC

Total # of Containers of Type (*SOLIDS*) = 1

909819	NIGRA04-004-SS-001			
	SOLIDS	1	/	SUB HYDRO

Total # of Containers of Type (*SOLIDS*) = 1

Sample ID /	Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests
909820	NIGRA04-004-SO-007				
		SOLIDS	1	/	%SOL,pH,TOC

Total # of Containers of Type (*SOLIDS*) = 1

909820	NIGRA04-004-SO-007			
	SOLIDS	1	/	SUB HYDRO

Total # of Containers of Type (*SOLIDS*) = 1

Sample ID /	Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests
909821	NIGRA06-005-SS-001				
		SOLIDS	1	/	%SOL,pH,TOC

Total # of Containers of Type (*SOLIDS*) = 1

909821	NIGRA06-005-SS-001			
	SOLIDS	1	/	SUB HYDRO

Total # of Containers of Type (*SOLIDS*) = 1

Sample ID /	Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests
909822	NIGRA06-005-SO-012				
		SOLIDS	1	/	%SOL,pH,TOC

130085

Total # of Containers of Type (*SOLIDS*) = 1

909822 NIGRA06-005-SO-012

SOLIDS	1	/	SUB HYDRO

Total # of Containers of Type (*SOLIDS*) = 1

Sample ID / Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests

---

909823 NIGRA08-004-SS-001

SOLIDS	1	/	%SOL,pH,TOC

Total # of Containers of Type (*SOLIDS*) = 1

909823 NIGRA08-004-SS-001

SOLIDS	1	/	SUB HYDRO

Total # of Containers of Type (*SOLIDS*) = 1

Sample ID / Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests

---

909824 NIGRA08-004-SO-008

SOLIDS	1	/	%SOL,pH,TOC

Total # of Containers of Type (*SOLIDS*) = 1

909824 NIGRA08-004-SO-008

SOLIDS	1	/	SUB HYDRO

Total # of Containers of Type (*SOLIDS*) = 1

Sample ID / Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests

---

909825 NIGRA05-004-SS-001

SOLIDS	1	/	%SOL,pH,TOC

Total # of Containers of Type (*SOLIDS*) = 1

909825 NIGRA05-004-SS-001

SOLIDS	1	/	SUB HYDRO

Total # of Containers of Type (*SOLIDS*) = 1

Sample ID / Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests

---

909826 NIGRA05-004-SO-004

SOLIDS	1	/	%SOL,pH,TOC

Total # of Containers of Type (*SOLIDS*) = 1

909826 NIGRA05-004-SO-004

SOLIDS	1	/	SUB HYDRO

Total # of Containers of Type (*SOLIDS*) = 1

Condition Code	*Condition Description*
1	Sample Received OK

130085

Rev. 02/2017

CHAIN OF CUSTODY

Company: Aerostar SES
Project Contact: Brian Odom
Telephone: (478)397-4906
Project Name: ~~NFARS~~ AFFF SI JM 8.17
Project #: M2032.0001
Location: NFARS
Sampled By: Jeremy Meshew

CT LABORATORIES

Folder #: 130085
Company: MAXXAM ANALYTI
Project: AFFF SI
Logged By: DRT PM: ET

1230 Lange Court, Baraboo, WI 53913
608-356-2760 Fax 608-356-2766
www.ctlaboratories.com

Program:
QSM RCRA SDWA NPDES
Solid Waste Other _____

PO #

Report To:
EMAIL: jvance@aerostar.net
Company: Aerostar SES
Address: 1006 Floyd Culler Ct. Oak Ridge, TN 37923

Invoice To:*
EMAIL: bodom@specpreenv.com
Company: Aerostar SES
Address: 1006 Floyd Culler Ct. Oak Ridge, TN 37923

*Party listed is responsible for payment of invoice as per CT Laboratories' terms and conditions

Client Special Instructions

Matrix:
GW – groundwater SW - surface water WW - wastewater DW - drinking water
S - soil/sediment SL - sludge A - air M - misc/waste

ANALYSES REQUESTED

Turnaround Time: Normal RUSH*
Date Needed: _____
Rush analysis requires prior CT Laboratories' approval
Surcharges:
24 hr 200%
2-3 days 100%
4-9 days 50%

Fill in Spaces with Bottles per Test

Collection Date	Collection Time	Matrix	Grab/Comp	Sample #	Sample ID Description	Filtered? Y/N	PH, TOC, Hydrometer	Particle Size	Total # Containers	Designated MS/MSD	CT Lab ID # (Lab use only)
8.15.17	0820	SO	Comp	1	NIGRA01-006-SS-001	N	1	1	2		909810
8.15.17	0915	SO	Comp	2	NIGRA01-006-SO-010	N	1	1	2		909814
8.16.17	1440	SO	Comp	3	NIGRA02-006-SS-001	N	1	1	2		909815
8.16.17	1530	SO	Comp	4	NIGRA02-006-SO-011	N	1	1	2		909816
8.14.17	1415	SO	Comp	5	NIGRA03-003-SS-001	N	1	1	2		909817
8.14.17	1455	SO	Comp	6	NIGRA03-003-SO-006	N	1	1	2	JM	909818
8.15.17	1420	SO	Comp	7	NIGRA04-004-SS-001	N	1	1	2		909819
8.16.17	1255	SO	Comp	8	NIGRA04-004-SO-007	N	1	1	2		909820
8.16.17	0805	SO	Comp	9	NIGRA06-005-SS-001	N	1	1	2		909821
8.16.17	0845	SO	Comp	10	NIGRA06-005-SO-012	N	1	1	2		909822
8.14.17	1200	SO	Comp	11	NIGRA08-004-SS-001	N	1	1	2		909823
8.14.17	1239	SO	Comp	12	NIGRA08-004-SO-008	N	1	1	2		909824

JM

Relinquished By:	Date/Time	Received By:	Date/Time
Jeremy A Meshew	8.22.17 ~~8.18.17~~ JM 8.22 / 1700		8/23/17 1830
Received by:	Date/Time	Received for Laboratory by:	Date/Time
M2032.0001		E-38	8/23/17 1135

Lab Use Only
Ice Present Yes No
Temp 3.1 IR Gun 15
Cooler # MAXXAM X2

Aerostar SES LLC
1007 Floyd Culler Court
Oak Ridge, TN 37830
865-481-7837

Chain of Custody Record/Analysis Request Number: 0018

Project Name: Site Investigation of ~~Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations~~ AFFF Multiple Sites, USAF Installations
Invoice to

Job No.: ~~M3040.0019.0017.05~~ M2032.0001 JM 8.22
Installation: NFARS

TAT: 10 business days

Aerostar Project Manager: ~~Paula Bond, pbond@aerostar.net, 865.813.2759~~ Brian Odom BOdom@specprocenv.com
Send Data to: Jenny Vance, jvance@aerostar.net, 865-483-7904

Sampler (s): Jeremy A Meshew, Miles Eckert

Laboratory Name/Address: ~~TestAmerica 880 Riverside Parkway West Sacramento, CA 95605~~ 8.22.17
1230 Lange Court, Baraboo, WI, 53913 :(608) 356-2760 Fax:(608) 356-2766 www.ctlaboratories.com

Contact: David Alltucker
Phone: ~~916-374-4383~~ JM
email: david.alltucker@testamericainc.com

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

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

Station ID	Sample ID	Date Collected	Time Collected	Sample Type	Matrix	Depth (feet)	PFAS (see list of 14 analytes below)	PFOS/PFOA	PH, TOC, Hydometer	Particle Size			NOTES
					Preservative (Trizma, HCl, HNO_3, Ice, etc.)								
	NIGRA05-004.55.001	8.22.17	0830	N	SO				1	1			909825
	NIGRA05-004.50.004	8.22.17	0840	N	SO				1	1			909826
							JM				JM		
		JM				JM							
					Total # of Containers				2	2			

RELINQUISHED BY:		RECEIVED BY:	
Signature: Jeremy A Meshew	Date/Time: JM 8.22 ~~8.22.1700~~ 8.22.17/1900	Signature:	Date/Time: 8/23/17 1030
Printed Name: Jeremy A Meshew	Firm: ASL	Printed Name:	Firm:
Signature:	Date/Time:	Signature:	Date/Time:
Printed Name:	Firm:	Printed Name:	Firm:

ANALYTE	ERPIMS PAR CODE	CAS	Contaminant	ERPIMS PAR CODE	CAS
Perfluorooctanesulfonic acid	PFOS	1763-23-1	Perfluorohexanoic acid	PFHXA	307-24-4
Perfluorooctanoic acid	PFOA	335-67-1	Perfluorotetradecanoic acid	PFTEA	376-06-7
Perfluorononanoic acid	PFNA	375-95-1	Perfluorotridecanoic acid	PFTRIA	72629-94-8
Perfluorohexanesulfonic acid	PFHXSA	355-46-4	Perfluoroundecanoic acid	PFUNA	2058-94-8
Perfluoroheptanoic acid	PFHPA	375-85-9	Perfluorododecanoic acid	PFDOA	307-55-1
Perfluorobutanesulfonic acid	PFBSA	375-73-5	Perfluorodecanoic acid	PFDA	335-76-2
N-methyl perfluorooctane sulfonamidoacetic acid	NMEFOSAA	2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid	NETFOSAA	2991-50-6

Cooler Receipt Form

Ice Present YES NO

Temperature 3.1

IR Gun # 15

Initials JS

Date 8/23/17 Time 1030

Cooler #: maxxam cooler CCl-07567

ORIGIN ID:BUFA (865) 696-6506
JEREMY MESHEW
ASL
EDI ACCT CONTACT EDI 4 BILLING
1006 FLOYD CULLER CT
OAK RIDGE, TN 37830
UNITED STATES US

SHIP DATE: 22AUG17
ACTWGT: 53.30 LB
CAD: 006993855/SSFE1802
DIMS: 24x14x14 IN

BILL THIRD PARTY

Part # 156297-435 RIT2 EXP 11/17
549J1/572E/104C

TO CT LABORATORIES
CT LABORATORIES
1230 LANGE CT

BARABOO WI 53913
(608) 356-2760
INV:
PO:
REF:
DEPT:

FedEx Express

E

J172017062901ev

1 of 4
TRK# 0201 7874 7593 0626
MASTER
NA MSNA

WED - 23 AUG 10:30A
PRIORITY OVERNIGHT

53913
WI-US MSN

CUSTODY SEAL
DATE 8-22-17
SIGNATURE

QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

CUSTODY SEAL
DATE 8-22-17
SIGNATURE

QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

130085

Cooler Receipt Form

Ice Present YES NO

Temperature 2.4

IR Gun # 15

Initials jls

Date 8/23/17 Time 1030

Cooler #: maxxam cooler CI-10676

ORIGIN ID:BUFA (865) 696-6506
JEREMY MESHEW
ASL
EDI ACCT CONTACT EDI 4 BILLING
1006 FLOYD CULLER CT
OAK RIDGE, TN 37830
UNITED STATES US

SHIP DATE: 22AUG17
ACTWGT: 51.10 LB
CAD: 006993855/SSFE1802
DIMS: 24x14x14 IN

BILL THIRD PARTY

Part # 156297-435 RIT2 EXP 11/17 ..
54911/577E/104C

CF LABORATORIES
CT LABORATORIES
1230 LANGE CT

BARABOO WI 53913
(608) 356-2760 REF:
INV:
PO: DEPT:

FedEx
Expres

3 of 4
MPS# 0263 7874 7593 0648
Mstr# 7874 7593 0626 0201

WED - 23 AUG 10:
PRIORITY OVERNIG

NA MSNA

5391
WI-US MSN

QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

CUSTODY SEAL
DATE
SIGNATURE

QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

CUSTODY SEAL
DATE
SIGNATURE

130085

Appendix F

Groundwater Level Data

Table F-1 Groundwater Level Data Niagara Falls Air Reserve Station

AFFF Area Name	Location Number	Easting (feet)[a]	Northing (feet)[a]	Top of Casing Elevation (feet/amsl)[a]	Depth to Groundwater Measurement Date	Depth to Groundwater Measurement (feet btoc)	Ground-water Surface Elevation (feet/amsl)	Well Type (Screen Interval bgs)
AFFF Area 1 – FT007/FPTA No. 3/Site 9	NIGRA01-001	1134055.27	1045724.93	587.38	8/22/2017	2.71	584.67	TW (3.83-8.83)
	NIGRA01-002	1133969.34	1045733.37	587.08	8/22/2017	2.79	584.29	TW (4.17-9.17)
	NIGRA01-003	1134010.03	1045651.50	587.92	8/22/2017	3.44	584.48	TW (0.19-9.81)
AFFF Area 2 – Hangar 850	NIGRA02-001	1135436.95	1051814.90	592.65	8/22/2017	5.28	587.37	TW (8.85-18.85)
	NIGRA02-002	1135331.87	1052178.12	589.08	8/22/2017	7.93	581.15	TW (9.31-19.31)
	NIGRA02-003	1135125.41	1052170.13	588.93	8/22/2017	12.61	576.32	TW (8.7-18.7)
	NIGRA02-004	1135164.41	1051755.26	591.09	8/22/2017	8.05	583.04	TW (9.66-19.66)
	PZ13-1	1135018.15	1050527.67	595.26	8/22/2017	3.40	591.86	Existing (3-5)
	PZ13-1D	1135018.57	1050522.39	595.22	8/22/2017	4.99	590.23	Unknown
	MW13-1	1135408.93	1050622.69	598.80	8/22/2017	7.65	591.15	Existing (5-7.3)
	MW13-1D	1135432.32	1050622.65	597.80	8/22/2017	7.13	590.67	Existing (14-19)
	MW13-3	1135069.94	1050825.97	591.95	8/22/2017	4.16	587.79	Existing (5-9)
	MW13-6	NOT FOUND						
	MW13-6D	NOT FOUND						
AFFF Area 3 – Building 706	NIGRA03-001	1134866.58	1053635.05	591.69	8/22/2017	5.63	586.06	TW (0.73-5.73)

AFFF Area Name	Location Number	Easting (feet)[a]	Northing (feet)[a]	Top of Casing Elevation (feet/amsl)[a]	Depth to Groundwater Measurement Date	Depth to Groundwater Measurement (feet btoc)	Ground-water Surface Elevation (feet/amsl)	Well Type (Screen Interval bgs)
	NIGRA03-002	1134813.60	1053632.47	591.32	8/22/2017	5.64	585.68	TW (0.69-5.69)
AFFF Area 4 – Building 700	NIGRA04-001	1134707.90	1054012.69	590.55	8/22/2017	4.94	585.61	TW (2.82-7.82)
	NIGRA04-002	1134610.08	1054042.44	590.07	8/22/2017	Dry		TW (1.22-3.72)
	NIGRA04-003	1134599.91	1054184.50	590.08	8/22/2017	4.24	585.84	TW (0.36-5.36)
AFFF Area 5 – Blue Angels Crash Site	NIGRA05-001	1133560.57	1048110.12	586.93	Not Measured		586.93	TW (2.0-7.0)
	NIGRA05-002	1133546.75	1049020.13	586.20	Not Measured		586.20	TW (1.15-3.65)
	NIGRA05-003	1133835.64	1048532.18	588.88	Not Measured		588.88	TW (1.4-6.4)
AFFF Area 6 – Fox Row/Taxiway Alpha	NIGRA06-001	1134132.70	1051891.05	588.28	8/22/2017	8.84	579.44	TW (9.89-19.89)
	NIGRA06-002	1134157.46	1052524.66	587.81	8/22/2017	8.21	579.60	TW (8.68-18.68)
	NIGRA06-003	1134154.54	1053211.95	588.49	8/22/2017	8.17	580.32	TW (2.5-9.0)
	NIGRA06-004	1134153.32	1053753.88	Soil boring only				
	MW7-1D	1134239.66	1053989.79	588.54	8/22/2017	3.97	584.57	MW (9.1-11-6)
	MW7-2	1134256.20	1054015.35	588.31	8/22/2017	4.22	584.09	MW (4-7)
	MW7-3D	1134000.63	1053774.46	585.56	8/22/2017	3.73	581.83	MW (11.6-16.1)
	PZ10-7	1133688.21	1054957.02	586.26	8/22/2017	4.22	582.04	MW (6.4-10.4)
	MW7-2D	1134095.21	1054110.24	587.03	8/22/2017	4.54	582.49	MW (10.6-15.6)
	MW10-5D	1134074.94	1054976.44	588.88	8/22/2017	4.74	584.14	MW (9.9-19.9)
	MW10-6D	NOT FOUND						
	MW10-8	1133814.65	1054857.18	587.58	8/22/2017	4.59	582.99	MW (6-9)
	MW10-8D	1133808.54	1054856.77	587.43	8/22/2017	4.50	582.93	MW (14.6-24.3)

AFFF Area Name	Location Number	Easting (feet)[a]	Northing (feet)[a]	Top of Casing Elevation (feet/amsl)[a]	Depth to Groundwater Measurement Date	Depth to Groundwater Measurement (feet btoc)	Ground-water Surface Elevation (feet/amsl)	Well Type (Screen Interval bgs)
	MW10-10D	1133941.00	1055014.98	588.06	8/22/2017	3.18	584.88	MW (5.5-10.5)
	MW10-11	1133826.68	1055106.61	586.63	8/22/2017	0.93	585.70	MW (2.6-7.6)
	MW10-11D	1133818.81	1055106.18	586.40	8/22/2017	3.61	582.79	MW (12.5-17.5)
AFFF Area 8 – Hulby Street	NIGRA08-001	1135329.87	1053607.12	592.71	8/22/2017	4.42	588.29	TW (4.7-9.7)
	NIGRA08-002	1135254.19	1053654.30	596.30	8/22/2017	8.88	587.42	TW (5.0-10.0)
	NIGRA08-003	1135238.81	1053509.36	593.53	8/22/2017	5.83	587.70	TW (5.78-10.78)

Note: [a]Horizontal Datum – NY State Plane Coordinate System (West Zone). Vertical Datum – NAD83 (2011) Epoch 2010 Datum.

AFFF = aqueous film forming foam
amsl = above mean sea level
bgs = below ground surface
Btoc = below top of casing
FPTA = fire protection training area
MW = monitor well
NIGRA = Niagara Falls Air Reserve Station
No. = number
TW = temporary well (PVC prepack screen)

Appendix G

NYSDEC-Provided Well Data

Table G-1 NYSDEC Provided Well Data

NYS DEC Well Number	County	Town	Well Location	Latitude (DMS)	Longitude (DMS)	Latitude (Decimal Degrees, GCS 84)	Longitude (Decimal Degrees, GCS 84)	Well Purpose	NYS DEC Driller Registration Number	Report Date
E2770	ERIE	Grand Island	4950 EAST RIVER RD, GRAND ISLAND	43 03 31.4	78 56 27.0	43.05872222	-78.94083333	Domestic	NYRD10050	8/16/2006
E3085	ERIE	Grand Island	34 GARDEN PARKWAY, GRAND ISLAND	43 03 00.4	78 57 12.2	43.05011111	-78.95338889	Domestic	NYRD10009	
E3139	ERIE	Grand Island	124 HAVENWOOD LN, GRAND ISLAND	43 03 08.6	78 58 09.1	43.05238889	-78.96919444	Domestic	NYRD10009	7/11/2008
NI1200	NIAGARA	Lewiston	5243 CHEW RD., SANBORN	43 09 34.0	78 55 17.2	43.15944444	-78.92144444	Domestic	NYRD10009	5/29/2001
NI1201	NIAGARA	Lewiston	1773 UPPER MOUNTAIN RD, SANBORN					Domestic	NYRD10009	7/3/2001
NI1206	NIAGARA	Lewiston	5355 WALMORE RD, LEWISTON					Domestic	NYRD10009	
NI1207	NIAGARA	Lewiston	5220 CHEW RD, SANBORN, NY					Domestic	NYRD10009	10/23/2003
NI1219	NIAGARA	Cambria	3111 SAUNDERS SETTLEMENT RD, SANBORN	43 08 39.2	78 52 24.5	43.14422222	-78.87347222	Irrigation	NYRD10009	
NI1223	NIAGARA	Lewiston	MOUNT HOPE RD, LEWISTON, WELL 1	43 09 37.3	78 56 39.0	43.16036111	-78.94416667	Domestic	NYRD10009	7/17/2006
NI1224	NIAGARA	Lewiston	MOUNT HOPE RD, LEWISTON, WELL 2	43 09 33.3	78 56 34.2	43.15925	-78.94283333	Domestic	NYRD10009	7/17/2006
NI1231	NIAGARA	Lewiston	5616 WALMORE RD, LEWISTON					Domestic	NYRD10009	11/27/2006
NI1232	NIAGARA	Lewiston	5577 WALMORE RD, LEWISTON					Domestic	NYRD10009	11/27/2006
NI1236	NIAGARA	Lewiston	5025 WALMORE RD					Domestic	NYRD10009	2/5/2008
NI1237	NIAGARA	Niagara Falls	4001 PACKARD RD, NIAGARA FALLS	43 05 28.4	79 00 45.5	43.09122222	-79.01263889	Commercial	NYRD10408	3/18/2008
NI1238	NIAGARA	Lewiston	5153 WALMORE RD, SANBORN					Domestic	NYRD10009	2/14/2008
NI1242	NIAGARA	Niagara Falls	4001 PACKARD RD, NIAGARA FALLS	43 05 28.4	79 00 45.5	43.09122222	-79.01263889	Commercial	NYRD10408	7/10/2008
NI1248	NIAGARA	Niagara Falls	5300 FRONTIER AVE, NIAGARA FALLS	43 04 58.2	79 00 12.2	43.08283333	-79.00338889	Domestic	NYRD10408	3/10/2009
NI1250	NIAGARA	Lewiston	2273 SAUNDERS SETTLEMENT RD, SANBORN	43 08 36.9	78 55 30.3	43.14358333	-78.92508333	Commercial	NYRD10408	4/27/2009
NI1251	NIAGARA	Niagara Falls	5300 FRONTIER AVE, NIAGARA FALLS	43 04 58.2	79 00 12.2	43.08283333	-79.00338889	Domestic	NYRD10408	6/15/2009
NI1252	NIAGARA	Lewiston	1983 UPPER MOUNTAIN ROAD, SANBORN, NY					Domestic	NYRD10408	10/26/2009
NI1253	NIAGARA	Lewiston	5628 CHEW ROAD, SANBORN, NY					Domestic	NYRD10408	10/26/2009
NI1254	NIAGARA	Lewiston	1742 MOUNT HOPE ROAD, SANBORN, NY					Domestic	NYRD10408	10/26/2009
NI1255	NIAGARA	Lewiston	1670 UPPER MOUNTAIN ROAD, SANBORN, NY					Domestic	NYRD10408	10/26/2009
NI1256	NIAGARA	Lewiston	5523 WALMORE ROAD, SANBORN, NY					Domestic	NYRD10408	10/26/2009
NI1257	NIAGARA	Lewiston	4884 SUSIES LANE, SANBORN, NY					Domestic	NYRD10408	10/26/2009
NI1258	NIAGARA	Lewiston	1981 MOUNT HOPE ROAD, SANBORN, NY					Domestic	NYRD10408	10/26/2009
NI1259	NIAGARA	Niagara Falls	5300 FRONTIER AVE, NIAGARA FALLS					Commercial	NYRD10408	1/26/2010
NI1264	NIAGARA	Lewiston	2264 UPPER MOUNTAIN ROAD, SANBORN, NY 14132	43 10 13.4	78 55 32.5	43.17038889	-78.92569444	Commercial	NYRD10408	9/7/2010
NI1265	NIAGARA	Lewiston	TUSCARORA RESERVATION, 1773B UPPER MOUNTAIN ROAD, LEWISTON, NY 14092					Domestic	NYRD10009	8/31/2010
NI1266	NIAGARA	Lewiston	TUSCARORA RESERVATION, 5278 CHEW RD, LEWISTON, NY 14092					Domestic	NYRD10009	8/31/2010
NI1267	NIAGARA	Lewiston	TUSCARORA RESERVATION, 1378 UPPER MOUNTAIN RD, LEWISTON, NY 14092					Domestic	NYRD10009	8/31/2010
NI1268	NIAGARA	Lewiston	TUSCARORA RESERVATION, 4884 SUSIES LANE, LEWISTON, NY 14092					Domestic	NYRD10009	8/31/2010
NI1269	NIAGARA	Lewiston	TUSCARORA RESERVATION, 1773C UPPER MOUNTAIN RD, LEWISTON, NY					Domestic	NYRD10009	8/31/2010
NI1270	NIAGARA	Niagara Falls	150 PORTAGE RD, NIAGARA FALLS	43 05 04.5	79 02 30.5	43.08458333	-79.04180556	Commercial	NYRD10408	10/2/2010
NI1272	NIAGARA	Lewiston	2023 UPPER MT RD, LEWISTON					Domestic	NYRD10009	3/18/2011
NI1273	NIAGARA	Lewiston	1971 MT HOPE RD, LEWISTON					Domestic	NYRD10009	
NI1280	NIAGARA	Lewiston	1681 UPPER MOUNTAIN RD					Domestic	NYRD10009	1/16/2012
NI1281	NIAGARA	Lewiston	2064 MOUNT HOPE RD					Domestic	NYRD10009	1/16/2012
NI1282	NIAGARA	Lewiston	4917 BLACK NOSE SPRING RD					Domestic	NYRD10009	1/16/2012
NI1283	NIAGARA	Lewiston	2275 MOUNT HOPE RD					Domestic	NYRD10009	1/16/2012
NI1284	NIAGARA	Lewiston	1789 MOUNT HOPE RD					Domestic	NYRD10009	1/16/2012
NI1285	NIAGARA	Lewiston	1670 UPPER MOUNTAIN RD					Domestic	NYRD10009	1/13/2012
NI1286	NIAGARA	Niagara	5260 CHEW RD, SANBORN	43 09 31.0	78 55 22.2	43.15861111	-78.92283333	Domestic	NYRD10408	2/6/2012
NI1294	NIAGARA	Lewiston	1749 MOUNT HOPE RD, SANBORN					Domestic	NYRD10009	
NI1313	NIAGARA	Lewiston	1895 Mount Hope Rd, Lewiston, NY 14092 (None)					Domestic	NYRD10009	11/6/2014
NI1314	NIAGARA	Lewiston	1592 Mount Hope Road, Lewiston, NY 14092 (None)					Domestic	NYRD10009	11/6/2014
NI1315	NIAGARA	Lewiston	2291 Mount Hope Road, Lewiston, NY 14092 (None)					Domestic	NYRD10009	11/7/2014
NI1317	NIAGARA	Lewiston	5238 Chew Road, Lewiston, NY 14092 (None)					Domestic	NYRD10009	11/7/2014
NI1318	NIAGARA	Lewiston	2050 Upper Mountain Road, Lewiston, NY 14092 (None)					Domestic	NYRD10009	11/7/2014
NI1319	NIAGARA	Lewiston	1752 Upper Mountain Road, Lewiston, NY 14092 (None)					Domestic	NYRD10009	11/7/2014

Table G-1 NYSDEC Provided Well Data

NYS DEC Well Number	County	Town	Well Location	Latitude (DMS)	Longitude (DMS)	Latitude (Decimal Degrees, GCS 84)	Longitude (Decimal Degrees, GCS 84)	Well Purpose	NYS DEC Driller Registration Number	Report Date
NI1320	NIAGARA	Lewiston	1728 Upper Mountain Road, Lewiston, NY 14092 (None)					Domestic	NYRD10009	11/7/2014
NI1321	NIAGARA	Lewiston	2235 Mount Hope Road, Lewiston, NY 14092 (None)					Domestic	NYRD10009	11/11/2014
NI1322	NIAGARA	Lewiston	2051 Mount Hope Road, Lewiston, NY 14092 (None)					Domestic	NYRD10009	11/11/2014
NI1323	NIAGARA	Lewiston	2006 Mount Hope Road, Lewiston, NY 14092 (None)					Domestic	NYRD10009	11/10/2014
NI1324	NIAGARA	Lewiston	5529 Walmore Road, Lewiston, NY 14092 (None)					Domestic	NYRD10009	11/7/2014
NI1325	NIAGARA	Lewiston	5346 Walmore Road, Lewiston, NY 14092 (None)					Domestic	NYRD10009	11/7/2014
NI1326	NIAGARA	Lewiston	1734 Upper Mountain Road, Lewiston, NY 14092 (None)					Domestic	NYRD10009	11/7/2014
NI1329	NIAGARA	Lewiston	1736 Mount Hope Road, Lewiston, NY 14092 (None)					Domestic	NYRD10009	12/29/2015
NI1330	NIAGARA	Lewiston	1750 Mount Hope Road, Lewiston, NY 14092 (None)					Domestic	NYRD10009	12/29/2015
NI1331	NIAGARA	Lewiston	5116 Walmore Road, Sanborn, NY 14132 (None)					Domestic	NYRD10009	12/29/2015
NI1332	NIAGARA	Lewiston	5285 Chew Road, Sanborn, NY 14132 (None)					Domestic	NYRD10009	12/29/2015
NI1333	NIAGARA	Lewiston	5278A Chew Road, Sanborn, NY 14132 (None)					Domestic	NYRD10009	12/29/2015
NI1334	NIAGARA	Lewiston	2255 Upper Mountain Road, Lockport, NY 14094 (None)					Domestic	NYRD10009	12/29/2015
NI1335	NIAGARA	Lewiston	2254 Upper Mountain Road, Lockport, NY 14094 (None)					Domestic	NYRD10009	12/29/2015
NI1336	NIAGARA	Lewiston	1954B Mt. Hope Road, Lewiston, NY 14092 (None)					Domestic	NYRD10009	12/29/2015
NI1337	NIAGARA	Lewiston	1961 Mt. Hope Road, Lewiston, NY 14092 (None)					Domestic	NYRD10009	12/29/2015