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REVISION 1

SUMMARY REPORT

Bethel Airport AFFF Release Site Characterization

BETHEL, ALASKA

SHANNON & WILSON

April 2021

Shannon & Wilson No: 104507-002

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Submitted To: Alaska Department of Transportation & Public Facilities
PO Box 196900
Anchorage, Alaska 99519
Attn: Sammy Cummings

Subject: REVISION 1 SUMMARY REPORT, BETHEL AIRPORT AFFF RELEASE SITE CHARACTERIZATION, BETHEL, ALASKA

Shannon & Wilson prepared this report to summarize site characterization activities related to the July 2019 aqueous film-forming foam (AFFF) release at the Bethel Airport (BET) in Bethel, Alaska. Our scope of services was specified in our Work Plan dated April 2020 and authorized on July 27, 2020 by Alaska Department of Transportation & Public Facilities (DOT&PF) under our Professional Services Agreement Number 25-19-1-013 Per- and Polyfluoroalkyl Substance (PFAS) Related Environmental & Engineering Services. The services were conducted August 2020 on behalf of the DOT&PF.

We appreciate the opportunity to be of service to you on this project. If you have questions concerning this report, or we may be of further service, please contact us.

Sincerely,

SHANNON & WILSON

Ashley Jaramillo
Senior Chemist
Role: Project Manager/Primary Author

Christopher Darrah, C.P.G., CPESC
Vice President
Role: Contract Manager

AMJ:KRF:CBD/amj

EXECUTIVE SUMMARY

On July 8, 2019, a Grant Aviation aircraft caught fire after a crash landing at the Bethel Airport (BET). BET Department of Transportation & Public Facilities (DOT&PF) aircraft rescue and firefighting (ARFF) staff responded and released approximately 80 gallons of 3% Ansulite brand AFFF concentrate mixed with a commensurate amount of water to extinguish the fire. Consequently, the Alaska Department of Environmental Conservation (DEC) assigned the site a contaminated sites file number of 2407.38.030. DEC also requested, at a minimum, characterization of the site to determine if any unacceptable risks to human health or the environment exist from PFAS assumed to be present in the AFFF.

The purpose of this project was to sample surface and subsurface soil and surface water (if present) at the AFFF release site to determine the degree of contamination resulting from the Grant Aviation plane crash and subsequent AFFF release. The objectives of this project were to identify the AFFF release site and location the plane came to rest and to delineate, to the extent practicable, contamination in surface and subsurface soil and surface water samples collected within the AFFF release site boundaries. Site characterization activities were conducted in accordance with the *Revision 1 Bethel Airport AFFF Release Site Characterization Work Plan*, dated April 2020 and approved by DEC on May 26, 2020.

In August of 2020, Shannon & Wilson, Inc. (S&W) staff traveled to Bethel to perform site characterization activities at the AFFF release site. No surface water was observed within the project area; therefore, no surface water samples were collected. To guide analytical sample collection, S&W staff field screened surface and subsurface soils in the project area for petroleum contaminants. Field screening results indicated areas of potential petroleum contamination. S&W staff subsequently collected analytical samples from the AFFF release site for analysis of gasoline range organics (GRO), diesel range organics (DRO), residual range organics (RRO), volatile organic compounds (VOCs), and polycyclic aromatic hydrocarbons (PAHs). The source of the GRO, DRO, PAH, and VOCs detected is likely from aviation fuel that leaked after the plane crashed. Samples were sent to Eurofins TestAmerica in West Sacramento, California.

Analytical results were compared to Alaska's 18 AAC 75.341 *Table B1 Method Two – Migration to Groundwater (MTG)* and *Table B2, Method Two – Under 40-Inch Zone MTG*. Analytical results indicate areas of contamination above DEC MTG soil cleanup levels in surface soil samples for PFOS, PFOA GRO, DRO, o-xylenes, total xylenes, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzne and naphthalene. Subsurface soils had exceedances of the DEC MTG soil cleanup level for PFOA, DRO, and naphthalene.

Analytical results confirmed the visual observations made in the field and identified the AFFF release site and location the plane came to rest.

S&W recommends conducting additional soil sampling for PFAS to further delineate PFAS contamination near the AFFF release area. We recommend excavating soils exceeding the DEC MTG soil cleanup level, to the extent practical, and disposing of the materials properly. Field screening should be used to determine if clean limits have been reached for petroleum compounds. Confirmation sidewall and excavation base samples should also be collected. These recommendations are based on soil conditions observed at the BET, the results of testing performed on soil samples collected from the site, publicly available literature and data reviewed for this project, our understanding of the project, and information provided by the DOT&PF and other members of the project team.

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ACRONYMS

AAC	Alaska Administrative Code
AFFF	aqueous film-forming foam
ARFF	aircraft rescue and firefighting
BET	Bethel Airport
bgs	below ground surface
°C	degrees Celsius
COC	chain of custody
COPC	contaminant of potential concern
CSM	conceptual site model
DEC	Alaska Department of Environmental Conservation
DOT&PF	Alaska Department of Transportation & Public Facilities
DRO	diesel range organics
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
GRO	gasoline range organics
LCS/LCSD	laboratory control sample/laboratory control sample duplicate
LDRC	laboratory data review checklist
MB	method blank
MS/MSD	matrix spike/matrix spike duplicate
MTG	migration to groundwater
PAH	polycyclic aromatic hydrocarbons
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PID	photoionization detector
ppm	part per million
QA/QC	quality assurance/quality control
RL	reporting limit
RPD	relative percent difference
RRO	residual range organics
µg/kg	micrograms per kilogram
VOC	volatile organic compound

1 INTRODUCTION

Shannon & Wilson, Inc. has prepared this report to summarize the August 2020 site characterization activities associated with the July 2019 aqueous film-forming foam (AFFF) release at the Bethel Airport (BET) in Bethel, Alaska (Figure 1). The site is an active Alaska Department of Environmental Conservation (DEC) contaminated site due to the release of AFFF following a Grant Aviation plane crash on July 8, 2019 (DEC File Number 2407.38.030, Hazard ID 27139).

This report was prepared for the Alaska Department of Transportation & Public Facilities (DOT&PF) in accordance with the terms and conditions of our contract, relevant DEC guidance documents, and 18 Alaska Administrative Code (AAC) 75.335.

1.1 Background

On July 8, 2019, a Grant Aviation aircraft caught fire after a crash landing at the BET. The plane came to rest in a grassy area located between runways 1L/19R and 1R/19L and southeast of runway 12/30 (Figure 2). BET DOT&PF aircraft rescue and firefighting (ARFF) staff responded and released approximately 80 gallons of 3% Ansulite brand AFFF concentrate with proportionate water to extinguish the fire. The geographic coordinates of the crash site based on information from DEC's Contaminated Sites Database are latitude 60.7759 and longitude -160.8374.

AFFF is known to contain per- and polyfluoroalkyl substances (PFAS), a category of organic compounds considered emerging contaminants. Perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) are two PFAS commonly found at sites where AFFF was used. Due to their persistence, toxicity, and bioaccumulative potential, these compounds are of increasing concern to environmental and health agencies.

On September 20, 2019, DEC issued DOT&PF two letters regarding the release of AFFF at the Grant Aviation plane crash at the BET. The first letter, a notification of hazardous substance liability, assigned the crash site a DEC contaminated sites file number of 2407.38.030. The second letter requested, at a minimum, characterization of the site to determine if any unacceptable risks to human health or the environment exist from PFAS assumed to be present in the AFFF. On behalf of DOT&PF, Shannon & Wilson submitted the *Revision 1 Bethel Airport AFFF Release Site Characterization Work Plan* (Work Plan), dated April 2020, to DEC in response to the second letter. The Work Plan was approved by DEC on May 26, 2020.

1.2 Purpose and Objectives

The purpose of this project was to sample surface and subsurface soil and surface water (if present) at the AFFF release site to determine the degree of contamination resulting from the Grant Aviation plane crash and subsequent AFFF release on July 8, 2019. The objectives of this project were to identify the AFFF release site and location of where the plane came to rest and to delineate, to the extent practicable, contamination in surface and subsurface soil and surface water samples collected within the AFFF release site boundaries.

1.3 Contaminants of Potential Concern and Action Levels

The primary contaminants of potential concern (COPCs) are PFAS, specifically PFOS and PFOA. However, Appendix F of DEC's *Field Sampling Guidance* identifies the following additional COPCs for sites associated with fire training facilities, fires, and facilities where AFFF was used: gasoline range organics (GRO), diesel range organics (DRO), residual range organics (RRO), volatile organic compounds (VOCs), and polycyclic aromatic hydrocarbons (PAHs). We requested 18 PFAS analytes be analyzed; however, only PFOS and PFOA are currently regulated with established cleanup levels. To evaluate analytical data, results were compared to Alaska's 18 AAC 75.341 *Table B1 Method Two – Migration to Groundwater* and *Table B2, Method Two – Under 40-Inch Zone Migration to Groundwater*. The current soil cleanup levels for the site COPCs are summarized below in Exhibit 1-1.

Exhibit 1-1: Applicable Regulatory and Action Levels

Agency	Media	Compound	Level
DEC	Soil	GRO	300 mg/kg[1]
DEC	Soil	DRO	250 mg/kg[1]
DEC	Soil	RRO	11,000 mg/kg[1]
DEC	Soil	VOCs	Analyte dependent[2]
DEC	Soil	PAHs	Analyte dependent[2]
DEC	Soil	PFOS	3.0 µg/kg[2]
DEC	Soil	PFOA	1.7 µg/kg[2]

NOTES

1 DEC migration to groundwater soil-cleanup level reported in 18 AAC 75.341, Table B2.

2 DEC migration to groundwater soil-cleanup level reported in 18 AAC 75.341, Table B1.

DEC = Alaska Department of Environmental Conservation, DRO = diesel range organics, GRO = gasoline range organics, µg/kg = micrograms per kilogram, mg/kg = milligrams per kilogram, PAH = polycyclic aromatic hydrocarbons, PFOA = perfluorooctanoic acid, PFOS = perfluorooctanesulfonic acid, RRO = residual range organics, VOC = volatile organic compound

1.4 Scope of Services

The scope of services summarized in this report includes implementation of the April 2020 Work Plan. Field activities included:

- field screening using a photoionization detector (PID);
- collection of 49 primary and five field-duplicate surface soil samples;
- collection of three primary and one field duplicate subsurface soil samples;
- laboratory analysis for the above listed samples; and
- evaluation and reporting of the analytical data.

The field activities described in this summary report revolve around DEC's request for site characterization of the AFFF release site. Historical releases of AFFF are presumed to have occurred at the BET; however, the work conducted as a part the AFFF release site characterization does not address other releases of AFFF at the BET.

This report was prepared for the exclusive use of the DOT&PF and its representatives. This work presents our professional judgment as to the conditions of the site. Information presented here is based on the sampling and analyses we performed. This report should not be used for other purposes without our approval or if any of the following occurs:

- Project details change, or new information becomes available, such as revised regulatory levels or the discovery of additional source areas.
- Conditions change due to natural forces or human activity at, under, or adjacent to the project site.
- Assumptions stated in this report have changed.
- If the site ownership or land use has changed.
- Regulations, laws, or cleanup levels change.
- If the site's regulatory status has changed.

If any of these occur, we should be retained to review the applicability of our recommendations. This report should not be used for other purposes without Shannon & Wilson's review. If a service is not specifically indicated in this report, do not assume it was performed.

2 FIELD ACTIVITIES

This section summarizes the site characterization field activities performed during August of 2020. The following Shannon & Wilson personnel collected analytical samples for this project. These individuals are State of Alaska Qualified Samplers per 18 AAC 75.333[b] and 18 AAC 78.088[b]. Staff resumes are included in Appendix B.

- Adam Wyborny, Environmental Engineer
- Veselina Yakimova, Geologist

Field personnel are aware of the potential for cross-contamination of PFAS from numerous everyday items. Appropriate precautions were taken to prevent cross-contamination, including discontinuing the use of personal protective equipment and field supplies known to contain PFAS, using liner bags to contain samples before and after sample collection, hand washing, and donning a fresh pair of disposable nitrile gloves before sample collection. Additionally, samples were collected in laboratory-supplied, high-density polyethylene containers to prevent PFAS from adhering to the container.

2.1 Site Preparation

Shannon & Wilson field staff coordinated with BET DOT&PF staff to identify the crash location and resulting AFFF release area prior to the start field activities. Shannon & Wilson field staff staked out the corners of the area measuring 105-feet by 105-feet. The sampling grid was comprised of seven rows (1-7) of seven columns (A-F) and situated such that the eastern edge of the grid was adjacent to Runway 1R/19L. The grid consisted of a total of 49 grid cells of 15-feet by 15-feet each, as defined in the Work Plan. BET DOT&PF staff also helped to identify the approximate Plane Crash Location and where the plane came to rest which was identifiable by the stressed vegetation at the site (Exhibit 2-1). Figure 3 provides a site diagram of the grid cells including the approximate Plane Crash Location.

Exhibit 2-1: Stressed vegetation identifying the site of the crash.

2.2 Field Screening

Three field screening samples were collected from each of the 49 grid cells for a total of 147 field screening samples for the site. Field screening was accomplished using the heated

headspace method and measured with a PID, as detailed in the Work Plan. Field screening samples were collected at a depth of approximately one foot below ground surface (bgs). Field screening results were less than 20 parts per million (ppm), except for field screening samples collected from grid cells C5, D4, and D5 which are identified in Figure 3, the approximate Plane Crash Location. Field screening results are presented in Appendix A, Field Forms.

Exhibit 2-2: Staff preparing the grid of the site.

2.3 Surface Soil Sampling

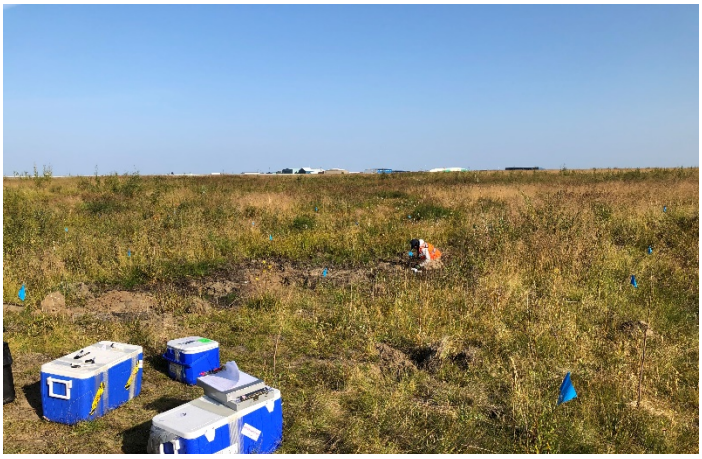

Exhibit 2-3: Staff collecting surface soil samples in the project area.

Surface soil samples were collected between 0.5-feet and 1-foot bgs, below the vegetative mat. One PFAS surface soil sample was collected from each of the 49 grid cells. Petroleum samples (GRO, DRO, RRO, VOC, and PAH parameters) were limited to two of the three cells where field screening results were greater than 20 ppm (C5 and D4) and from the location with the highest PID reading for a given grid cell.

A hand shovel was used to dig to the target depth, then a new, disposable stainless-steel spoon was used to fill the laboratory-provided sample jars. Analytical samples were submitted for the following analyses:

- 18 PFAS by U.S. Environmental Protection Agency (EPA) Method 537M;
- GRO, DRO, and RRO by Alaska Methods AK101, AK102, and AK103, respectively;
- VOCs by EPA Method SW8260D; and
- PAHs by EPA Method SW8270D-SIM.

Sampling logs are included in Appendix A, Field Forms.

2.4 Subsurface Soil Sampling

Subsurface soil samples were limited to only the grid cells identified as the Plane Crash Location, which, per the work plan, was only assumed to be three grid cells. In actuality, the approximate Plane Crash Location was larger than the assumed three grid cells (Figure 3). As a result, subsurface soil samples were collected from locations within the approximate Plane Crash Location between cells C4 and D4, C5 and D5, and from within C5. Subsurface soil samples were collected between 2-feet to 2.5-feet bgs using a hand shovel to dig to the target depth, then a new, disposable stainless-steel spoon to fill the laboratory-provided sample jars. Analytical samples were submitted for the analyses listed above in Section 2.3.

2.5 Investigative Derived Waste

Excess soil was not generated during sampling. Soils collected for field-screening purposes were placed back at the location they originated. No decontamination fluids were generated. Other investigation derived waste included non-reusable equipment such as nitrile gloves which were disposed of in the Bethel landfill.

2.6 Deviations from the Work Plan

In general, we conducted our services in accordance with the approved Work Plan, except for the following deviations.

- No surface water samples were collected since surface water was not present in the project area at the time field activities were conducted.
- The Work Plan states that surface soil samples for petroleum parameters will be collected where field screening results are greater than 20 ppm with a maximum of one sample per grid cell. Petroleum surface soil samples were only collected from two of the three grid cells where field screening results were greater than 20 ppm (C5 and D4). Due to sampler oversight no surface soil petroleum samples were collected from grid cell D5, which also had field screening results of greater than 20 ppm. A subsurface sample was collected for petroleum compounds on the boundary of cells C5 and D5. Exceedances of DRO and PAH analyte indeno(1,2,3-cd)pyrene were observed.
- Subsurface soil samples were limited to only the grid cells identified as the Plane Crash Location, which, per the work plan, was only assumed to be three grid cells. In actuality, the approximate Plane Crash Location was larger than the assumed three grid cells (Figure 3). As a result, subsurface soil samples were collected from locations within the approximate Plane Crash Location between cells C4 and D4, C5 and D5, and from within C5.

3 ANALYTICAL RESULTS

Analytical samples collected for this project were submitted to Eurofins TestAmerica Laboratories, Inc. (TestAmerica) in West Sacramento, California, for determination of the analyses listed in Section 2.3. The laboratory maintains current certifications approved by DEC Contaminated Sites to conduct the requested analyses.

PFAS analytical results are presented in Table 1. Petroleum analytical results are presented in Table 2. The analytical laboratory report and corresponding DEC Laboratory Data-Review Checklist (LDRC) are included in Appendix C. A quality assurance/quality control (QA/QC) summary of the analytical results is provided in Appendix D.

Soil results were compared to Alaska's 18 AAC 75.341 *Tables B1 Method Two – Migration to Groundwater and B2, Method Two – Under 40-Inch Zone Migration to Groundwater*.

3.1 Surface Soil Samples

We collected 49 surface soil samples and five field duplicates from the site. The following analytes were detected above their respective migration to groundwater (MTG) soil cleanup level in the noted samples. The letter and number combination at the end of each sample name refers to the grid cell for which the sample was collected.

- PFAS
  - PFOS: *20BET-SS-A4* and *20BET-SS-A5*
  - PFOA: *20BET-SS-B4*, *20BET-SS-C10 (*field duplicate for *20BET-SS-C5), 20BET-SS-C6*, and *20BET-SS-D5*
- Petroleum
  - The field duplicate pair samples *20BET-SS-D4* / *20BET-SS-D10* and *20BET-SS-C5* / *20BET-SS-C10* had exceedances in for the analytes:
    - GRO, DRO, o-xylene, total xylenes, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, and naphthalene (by PAH analysis).

Grid cells which have a surface soil MTG cleanup level exceedance are shown in Figure 4 and analytical tables for PFAS and petroleum analytes are included in Table 1 and Table 2, respectively.

3.2 Subsurface Soil Samples

We collected three subsurface soil samples and one field duplicate from the site. The following analytes were detected above their respective MTG soil cleanup level in the noted samples. Samples *20BET-Sub-01*, field duplicate pair *20BET-Sub-02* and *20BET-Sub-20*, and

20BET-Sub-03 were collected from the following locations between grid cells C4 and D4, and C5 and D5, and from within grid cell C5.

- PFAS
  - PFOA: *20BET-Sub-20 (*field duplicate for *20BET-Sub-02)*
- Petroleum
  - The field duplicate pair samples *20BET-Sub-02* / *20BET-Sub-20* and 20BET-Sub-03 had exceedances for the analytes:
    - DRO and naphthalene (by PAH analysis).

The locations of the subsurface soil samples and their respective exceedances are shown in Figure 5 and analytical tables for PFAS and petroleum analytes are included in Table 1 and Table 2, respectively.

4 UPDATED CONCEPTUAL SITE MODEL

The preliminary conceptual site model (CSM) presented in our Work Plan has been updated to incorporate analytical results obtained as a part of field work. The DEC CSM scoping form and graphic form are presented in Appendix E.

4.1 Description of Potential Receptors

We consider commercial/industrial workers, site visitors, and construction workers to be current or future potential receptors.

4.2 Potential Exposure Pathways

Potential human exposure pathways include inhalation of outdoor air and/or fugitive dust; dermal absorption of contaminants from soil, direct contact with contaminated sediment; and incidental soil, and /or groundwater ingestion.

5 DISCUSSION AND RECOMMENDATIONS

Discussion and recommendations are presented below.

5.1 AFFF Release and Plane Crash Location

Based on discussions with DOT&PF staff, field observations (stressed vegetation), elevated field screening readings, and corresponding analytical results, the location of the AFFF release and where the plane came to rest was identified. The source of the GRO, DRO,

PAH, and VOCs detected at the plane crash location is likely from aviation fuel that leaked after the plane crashed.

Figure 3 shows a site diagram of the grid cells and the Plane Crash Location.

5.2 Comparison to Regulatory Limits and Discussion

PFOS and/or PFOA were observed above MTG cleanup levels in surface soil samples collected from grid cells A4, A5, B4, C5, C6, and D5 (Table 1, Figure 4). PFOS and/or PFOA were also observed above the MTG cleanup levels in one of the subsurface soil samples collected from within the approximate Plane Crash Location between cells C5 and D5 (Table 1; Figure 5). Other PFAS analytes were also detected in surface and subsurface soil samples. PFAS analytical results for the project samples are presented in Table 1.

Petroleum analytes GRO, DRO, naphthalene, o-xylene, total xylenes, 1,3,5-trimethylbenzene, and 1,2,4-trimethylbenzene were detected above their respective MTG cleanup level in surface soil samples collected from grid cells D4 and C5 (Table 2, Figure 4). DRO and naphthalene were detected above their respective MTG cleanup level in subsurface soil samples collected from between grid cells C5 and D5, and from within grid cell C5. Other petroleum analytes were also detected in surface and subsurface soil samples. Petroleum analytical results for the project samples are presented in Table 2.

5.3 Recommendations

Based on the site characterization activities described in this report we recommend a remedial action plan be prepared for review and approval by DEC to include the following:

- Conduct additional surface soil sampling for PFAS to the west of the project area to further delineate PFAS contamination.
- Excavate soils with concentrations exceeding the DEC MTG soil cleanup levels, to the extent practical (without affecting the integrity of the adjacent runway).
- Conduct field screening using a PID to guide excavation for petroleum compounds.
- Collect confirmation sidewall and excavation base samples.

Our recommendations are based on:

- Soil conditions observed on the BET.
- The results of testing performed on soil samples collected from the site.
- Publicly available literature and data we reviewed for this project.
- Our understanding of the project and information provided by the DOT&PF, and other members of the project team.

- The limitations of our approved scope described in our Work Plan dated April 2020 and June 2020 Proposed Scope of Services.

The information included in this report is based on limited sampling and should be considered representative of the times and locations at which the sampling occurred. Regulatory agencies may reach different conclusions than Shannon & Wilson. We have prepared and included in, "Important Information about your Geotechnical/Environmental Report," to assist you and others in understanding the use and limitations of this report.

6 REFERENCES

Alaska Department of Environmental Conservation (DEC), 2017, 18 AAC 75: Oil and other hazardous substances pollution control: Juneau, Alaska, July, available: http://dec.alaska.gov/commish/regulations/.

Alaska Department of Environmental Conservation (DEC), 2017, Guidance on Developing Conceptual Site Models.

Alaska Department of Environmental Conservation (DEC), 2017, Field Sampling Guidance: Juneau, Alaska, DEC Division of Spill Prevention and Response, Contaminated Sites Program, August, available: http://dec.alaska.gov/spar/csp/guidance_forms/csguidance.htm.

Alaska Department of Environmental Conservation (DEC), 2017, Site characterization work plan and reporting guidance for investigation of contaminated sites: Juneau, Alaska, DEC Division of Spill Prevention and Response, Contaminated Sites Program, March, available: http://dec.alaska.gov/spar/csp/guidance_forms/csguidance.htm.

Table 1 - PFAS Analytical Results (µg/kg)

		Sample Type	Primary	Primary	Primary	Primary	Primary	Dup of 20BET-SS-A5	Primary	Primary	Primary
		Grid Cell Location	A1	A2	A3	A4	A5	A5	A6	A7	B1
Method	Analyte	Cleanup Level[1]	20BET-SS-A1	20BET-SS-A2	20BET-SS-A3	20BET-SS-A4	20BET-SS-A5	20BET-SS-A10	20BET-SS-A6	20BET-SS-A7	20BET-SS-B1
537M	Perfluorohexanesulfonic acid (PFHxS)	—	<0.21	<0.21	0.064 J	<0.22	<0.21	<0.22	<0.21	0.091 J	<0.21
	Perfluorohexanoic acid (PFHxA)	—	2.8	8.3	11	19	24	25	10	14	1.5
	Perfluoroheptanoic acid (PFHpA)	—	1.9	2.4	1.8	1.8	3.1	2.9	1.1	3.8	0.59
	Perfluorononanoic acid (PFNA)	—	0.076 J	0.043 J	0.32	0.28	0.31	0.23 J	0.16 J	0.14 J	<0.21
	Perfluorobutanesulfonic acid (PFBS)	—	<0.21	<0.21	<0.24	<0.22	<0.21	<0.22	<0.21	<0.25	<0.21
	Perfluorodecanoic acid (PFDA)	—	<0.21	<0.21	0.090 J	0.33	0.26	0.19 J	0.15 J	0.048 J	<0.21
	Perfluoroundecanoic acid (PFUnA)	—	<0.21	<0.21	<0.24	0.15 J	0.067 J	0.055 J	<0.21	<0.25	<0.21
	Perfluorododecanoic acid (PFDoA)	—	<0.21	<0.21	<0.24	<0.22	<0.21	<0.22	<0.21	<0.25	<0.21
	Perfluorotridecanoic acid (PFTrDA)	—	<0.21	<0.21	<0.24	<0.22	<0.21	<0.22	<0.21	<0.25	<0.21
	Perfluorotetradecanoic acid (PFTeA)	—	<0.21	<0.21	<0.24	<0.22	<0.21	<0.22	<0.21	<0.25	<0.21
	N-Methyl perfluorooctane sulfonamido-acetic acid (N-MeFOSAA)	—	<2.1	<2.1	<2.4	<2.2	<2.1	<2.2	<2.1	<2.5	<2.1
	N-Ethyl perfluorooctane sulfonamido-acetic acid (N-EtFOSAA)	—	<2.1	<2.1	<2.4	<2.2	<2.1	<2.2	<2.1	<2.5	<2.1
	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	—	<0.21	<0.21	<0.24	<0.22	<0.21	<0.22	<0.21	<0.25	<0.21
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	—	<0.21	<0.21	<0.24	<0.22	<0.21	<0.22	<0.21	<0.25	<0.21
	4,8-Dioxa-3H-perfluorononanoic acid (DONA)	—	<0.21	<0.21	<0.24	<0.22	<0.21	<0.22	<0.21	<0.25	<0.21
	Hexafluoropropylene oxide dimer acid (HFPO-DA)	—	<0.26	<0.27	<0.30	<0.28	<0.26	<0.28	<0.26	<0.31	<0.26
	Perfluorooctanesulfonic acid (PFOS)	3.0	<0.53	<1.3 B*	<1.6 B*	**3.3 JH***	**3.9 JH***	2.7 JH*	<1.6 B*	<0.62 B*	<0.52 B*
	Perfluorooctanoic acid (PFOA)	1.7	0.39	0.26	0.67	1.2	1.2	0.96	1.1	1.1	0.23

NOTES:

Results were obtained from Eurofins TestAmerica Laboratories, Inc. work order 320-63955-1.

1 DEC Soil-Cleanup Levels from 18 AAC 75.341 Table B1. Method Two - Migration to Groundwater and Table B2. Method Two - Under 40 Inch Zone - Migration to Groundwater

< Analyte not detected; listed as less than the RL unless otherwise flagged due to quality-control failures.

J Estimated concentration, detected greater than the DL and less than the RL. Flag applied by the laboratory.

J* Estimated concentration due to quality control failures. Flag applied by Shannon & Wilson, Inc.

JH* Estimated concentration, biased high due to quality control failures. Flag applied by Shannon & Wilson, Inc.

B* Result is considered not detected due to quality control failures; see checklist for details. Flag applied by Shannon & Wilson, Inc.

Bold Detected concentration exceeds regulatory limit.

DEC = Alaska Department of Conservation; DL = detection limit; Dup = field duplicate; µg/kg = microgram per kilogram; PAHs = polycyclic aromatic hydrocarbons; RL = reporting Limit; VOCs = volatile organic compounds.

Table 1 - PFAS Analytical Results (µg/kg)

		Sample Type	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
		Grid Cell Location	B2	B3	B4	B5	B6	B7	C1	C2	C3
Method	Analyte	Cleanup Level[1]	20BET-SS-B2	20BET-SS-B3	20BET-SS-B4	20BET-SS-B5	20BET-SS-B6	20BET-SS-B7	20BET-SS-C1	20BET-SS-C2	20BET-SS-C3
537M	Perfluorohexanesulfonic acid (PFHxS)	—	<0.21	<0.21	<1.1	<1.1	<0.20	<0.34	<0.20	<0.20	<0.21
	Perfluorohexanoic acid (PFHxA)	—	3.1	15	47	35	2.0	20	1.6	9.0	16
	Perfluoroheptanoic acid (PFHpA)	—	0.73	1.5	9.1	3.5	0.65	6.4	0.38	1.3	2.2
	Perfluorononanoic acid (PFNA)	—	0.13 J	0.28 J*	0.31 J	0.37 J	0.047 J	0.80	<0.20	0.085 J	0.22
	Perfluorobutanesulfonic acid (PFBS)	—	<0.21	<0.21	<0.21	<0.22	<0.20	<0.34	<0.20	<0.20	<0.21
	Perfluorodecanoic acid (PFDA)	—	0.11 J	0.36	0.35	0.31	<0.20	<0.34	<0.20	0.10 J	0.090 J
	Perfluoroundecanoic acid (PFUnA)	—	<0.21	0.065 J	<1.1	<1.1	<0.20	<0.34	<0.20	<0.20	<0.22
	Perfluorododecanoic acid (PFDoA)	—	<0.21	0.085 J	<1.1	<1.1	<0.20	<0.34	<0.20	<0.20	<0.22
	Perfluorotridecanoic acid (PFTrDA)	—	<0.21	<0.21	<1.1	<0.22	<0.20	<0.34	<0.20	<0.20	<0.21
	Perfluorotetradecanoic acid (PFTeA)	—	<0.21	<0.21	<1.1	<1.1	<0.20	<0.34	<0.20	<0.20	<0.22
	N-Methyl perfluorooctane sulfonamido-acetic acid (N-MeFOSAA)	—	<2.1	<2.1	<2.1	<2.2	<2.0	<3.4	<2.0	<2.0	<2.1
	N-Ethyl perfluorooctane sulfonamido-acetic acid (N-EtFOSAA)	—	<2.1	<2.1	<2.1	<2.2	<2.0	<3.4	<2.0	<2.0	<2.1
	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	—	<0.21	<0.21	<0.21	<0.22	<0.20	<0.34	<0.20	<0.20	<0.21
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	—	<0.21	<0.21	<0.21	<0.22	<0.20	<0.34	<0.20	<0.20	<0.21
	4,8-Dioxa-3H-perfluorononanoic acid (DONA)	—	<0.21	<0.21	<0.21	<0.22	<0.20	<0.34	<0.20	<0.20	<0.21
	Hexafluoropropylene oxide dimer acid (HFPO-DA)	—	<0.26	<0.26	<0.27	<0.28	<0.25	<0.42	<0.25	<0.25	<0.26
	Perfluorooctanesulfonic acid (PFOS)	3.0	<0.98 B*	<2.2 B*	2.8 JH*	<2.3 B*	<0.50 B*	<0.84 B*	<0.50 B*	<0.61 B*	<0.77 B*
	Perfluorooctanoic acid (PFOA)	1.7	0.54	1.1	**1.7**	1.4	0.37	1.4	0.23	0.45	1.2

NOTES:

Results were obtained from Eurofins TestAmerica Laboratories, Inc. work order 320-63955-1.

1 DEC Soil-Cleanup Levels from 18 AAC 75.341 Table B1. Method Two - Migration to Groundwater and Table B2. Method Two - Under 40 Inch Zone - Migration to Groundwater

< Analyte not detected; listed as less than the RL unless otherwise flagged due to quality-control failures.

J Estimated concentration, detected greater than the DL and less than the RL. Flag applied by the laboratory.

J* Estimated concentration due to quality control failures. Flag applied by Shannon & Wilson, Inc.

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B* Result is considered not detected due to quality control failures; see checklist for details. Flag applied by Shannon & Wilson, Inc.

Bold Detected concentration exceeds regulatory limit.

DEC = Alaska Department of Conservation; DL = detection limit; Dup = field duplicate; µg/kg = microgram per kilogram; PAHs = polycyclic aromatic hydrocarbons; RL = reporting Limit; VOCs = volatile organic compounds.

Table 1 - PFAS Analytical Results (µg/kg)

		Sample Type	Primary	Primary	Dup of 20BET-SS-C5	Primary	Primary	Primary	Primary	Primary	Primary
		Grid Cell Location	C4	C5	C5	C6	C7	D1	D2	D3	D4
Method	**Analyte**	**Cleanup Level[1]**	**20BET-SS-C4**	**20BET-SS-C5**	**20BET-SS-C10**	**20BET-SS-C6**	**20BET-SS-C7**	**20BET-SS-D1**	**20BET-SS-D2**	**20BET-SS-D3**	**20BET-SS-D4**
537M	Perfluorohexanesulfonic acid (PFHxS)	—	<0.21	<0.22	<1.1	<2.3	<0.22	<0.22	<0.21	<0.22	0.063 J
	Perfluorohexanoic acid (PFHxA)	—	20	28	27	20	3	2.8	17	17	21
	Perfluoroheptanoic acid (PFHpA)	—	6.0 J*	2.2	2.5	8.3	0.86	0.63	1.2	1.7	2.3
	Perfluorononanoic acid (PFNA)	—	0.50	0.12 J	<1.1	0.95 J	0.049 J	0.066 J	0.13 J	0.34	0.11 J
	Perfluorobutanesulfonic acid (PFBS)	—	<0.21	<0.22	<1.1	<2.3	<0.22	<0.22	<0.21	<0.22	<0.24
	Perfluorodecanoic acid (PFDA)	—	0.28	0.10 J*	<1.1	0.31 J	<0.22	0.026 J	0.095 J	0.49	0.24
	Perfluoroundecanoic acid (PFUnA)	—	0.053 J	<0.22	<1.1	<2.3	<0.22	<0.22	0.037 J	0.057 J	<0.24
	Perfluorododecanoic acid (PFDoA)	—	<0.21	<0.22	<1.1	<2.3	<0.22	<0.22	<0.21	0.10 J	<0.24
	Perfluorotridecanoic acid (PFTrDA)	—	<0.21	<0.22	<1.1	<2.3	<0.22	<0.22	<0.21	<0.22	<0.24
	Perfluorotetradecanoic acid (PFTeA)	—	<0.21	<0.22	<1.1	2.3 J*	<0.22	<0.22	<0.21	<0.22	<0.24
	N-Methyl perfluorooctane sulfonamido-acetic acid (N-MeFOSAA)	—	<2.1	<2.2	<11	<23	<2.2	<2.2	<2.1	<2.2	<2.4
	N-Ethyl perfluorooctane sulfonamido-acetic acid (N-EtFOSAA)	—	<2.1	<2.2	<11	<23	<2.2	<2.2	<2.1	<2.2	<2.4
	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	—	<0.21	<0.22	<1.1	<2.3	<0.22	<0.22	<0.21	<0.22	<0.24
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	—	<0.21	<0.22	<1.1	<2.3	<0.22	<0.22	<0.21	<0.22	<0.24
	4,8-Dioxa-3H-perfluorononanoic acid (DONA)	—	<0.21	<0.22	<1.1	<2.3	<0.22	<0.22	<0.21	<0.22	<0.24
	Hexafluoropropylene oxide dimer acid (HFPO-DA)	—	<0.26	<0.28	<1.4	<2.9	<0.28	<0.27	<0.26	<0.28	<0.29
	Perfluorooctanesulfonic acid (PFOS)	3.0	<1.3 B*	<1.0 B*	2.0 JH*	<5.8	<0.78 B*	<0.54 B*	1.5 JH*	2.8 B	1.7 JH*
	Perfluorooctanoic acid (PFOA)	1.7	0.93	1.5	**1.8**	**1.9 J**	0.24	0.26	0.82	1.2	1.2

NOTES:

Results were obtained from Eurofins TestAmerica Laboratories, Inc. work order 320-63955-1.

1 DEC Soil-Cleanup Levels from 18 AAC 75.341 Table B1. Method Two - Migration to Groundwater and Table B2. Method Two - Under 40 Inch Zone - Migration to Groundwater

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Bold Detected concentration exceeds regulatory limit.

DEC = Alaska Department of Conservation; DL = detection limit; Dup = field duplicate; µg/kg = microgram per kilogram; PAHs = polycyclic aromatic hydrocarbons; RL = reporting Limit; VOCs = volatile organic compounds.

Table 1 - PFAS Analytical Results (µg/kg)

		Sample Type	Dup of 20BET-SS-D4	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
		Grid Cell Location	D4	D5	D6	D7	E1	E2	E3	E4	E5
Method	**Analyte**	**Cleanup Level[1]**	**20BET-SS-D10**	**20BET-SS-D5**	**20BET-SS-D6**	**20BET-SS-D7**	**20BET-SS-E1**	**20BET-SS-E2**	**20BET-SS-E3**	**20BET-SS-E4**	**20BET-SS-E5**
537M	Perfluorohexanesulfonic acid (PFHxS)	—	<0.23	0.35 J	<0.22	<0.22	<0.21	<0.22	<0.22	0.061 J	0.055 J*
	Perfluorohexanoic acid (PFHxA)	—	20	120	4.4	4.3	2.7	7.4	14	8.7	2.6
	Perfluoroheptanoic acid (PFHpA)	—	2.4	18	0.67	0.91	0.33	0.62	1.8	1.1	1.2
	Perfluorononanoic acid (PFNA)	—	0.11 J	<1.4	<0.22	<0.22	<0.21	<0.22	0.14 J	<0.21	0.081 J
	Perfluorobutanesulfonic acid (PFBS)	—	<0.23	<1.4	<0.22	<0.22	<0.21	<0.22	<0.22	<0.21	<0.21
	Perfluorodecanoic acid (PFDA)	—	0.27	<1.4	<0.22	<0.22	<0.21	0.039 J	0.14 J	0.046 J	0.034 J
	Perfluoroundecanoic acid (PFUnA)	—	<0.23	<1.4	<0.22	<0.22	<0.21	<0.22	<0.22	<0.21	<0.21
	Perfluorododecanoic acid (PFDoA)	—	<0.23	<1.4	<0.22	<0.22	<0.21	<0.22	<0.22	<0.21	<0.21
	Perfluorotridecanoic acid (PFTrDA)	—	<0.23	<1.4	<0.22	<0.22	<0.21	<0.22	<0.22	<0.21	<0.21
	Perfluorotetradecanoic acid (PFTeA)	—	<0.23	<1.4	<0.22	<0.22	<0.21	<0.22	<0.22	<0.21	<0.21
	N-Methyl perfluorooctane sulfonamido-acetic acid (N-MeFOSAA)	—	<2.3	<14	<2.2	<2.2	<2.1	<2.2	<2.2	<2.1	<2.1
	N-Ethyl perfluorooctane sulfonamido-acetic acid (N-EtFOSAA)	—	<2.3	<14	<2.2	<2.2	<2.1	<2.2	<2.2	<2.1	<2.1
	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	—	0.23 JH*	<1.4	<0.22	<0.22	<0.21	<0.22	<0.22	<0.21	<0.21
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	—	<0.23	<1.4	<0.22	<0.22	<0.21	<0.22	<0.22	<0.21	<0.21
	4,8-Dioxa-3H-perfluorononanoic acid (DONA)	—	<0.23	<1.4	<0.22	<0.22	<0.21	<0.22	<0.22	<0.21	<0.21
	Hexafluoropropylene oxide dimer acid (HFPO-DA)	—	<0.29	<1.7	<0.27	<0.27	<0.27	<0.27	<0.27	<0.26	<0.27
	Perfluorooctanesulfonic acid (PFOS)	3.0	1.8	1.6 JH*	<0.54 B*	1.3 JH*	0.37 J	0.41 J	0.78	0.41 J	<0.53
	Perfluorooctanoic acid (PFOA)	1.7	1.3	**1.9**	0.36	0.36	0.16 J	0.42	0.57	0.66	0.43

NOTES:

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Bold Detected concentration exceeds regulatory limit.

DEC = Alaska Department of Conservation; DL = detection limit; Dup = field duplicate; µg/kg = microgram per kilogram; PAHs = polycyclic aromatic hydrocarbons; RL = reporting Limit; VOCs = volatile organic compounds.

Table 1 - PFAS Analytical Results (µg/kg)

		Sample Type	Primary	Primary	Primary	Dup of 20BET-SS-F1	Primary	Primary	Primary	Primary	Primary
		Grid Cell Location	E6	E7	F1	F1	F2	F3	F4	F5	F6
Method	**Analyte**	**Cleanup Level[1]**	**20BET-SS-E6**	**20BET-SS-E7**	**20BET-SS-F1**	**20BET-SS-F10**	**20BET-SS-F2**	**20BET-SS-F3**	**20BET-SS-F4**	**20BET-SS-F5**	**20BET-SS-F6**
537M	Perfluorohexanesulfonic acid (PFHxS)	—	0.051 J	<0.22	<0.22	0.057 J*	<0.22	<0.22	<0.21	<0.21	0.048 J
	Perfluorohexanoic acid (PFHxA)	—	5.1	2.6	4.4	4.4	2.6	5.0	3.1	2.5	7.1
	Perfluoroheptanoic acid (PFHpA)	—	0.91	0.73	0.81	0.74	0.65	1.4	0.49	0.50	2.0
	Perfluorononanoic acid (PFNA)	—	0.079 J	<0.22	<0.22	<0.21	0.052 J	0.071 J	<0.21	<0.21	0.056 J
	Perfluorobutanesulfonic acid (PFBS)	—	<0.24	<0.22	<0.22	<0.21	<0.22	<0.22	<0.21	<0.21	<0.23
	Perfluorodecanoic acid (PFDA)	—	<0.24	<0.22	<0.22	<0.21	<0.22	0.026 J	<0.21	<0.21	<0.23
	Perfluoroundecanoic acid (PFUnA)	—	<0.24	<0.22	<0.22	<0.21	<0.22	<0.22	<0.21	<0.21	<0.23
	Perfluorododecanoic acid (PFDoA)	—	<0.24	<0.22	<0.22	<0.21	<0.22	<0.22	<0.21	<0.21	<0.23
	Perfluorotridecanoic acid (PFTrDA)	—	<0.24	<0.22	<0.22	<0.21	<0.22	<0.22	<0.21	<0.21	<0.23
	Perfluorotetradecanoic acid (PFTeA)	—	<0.24	<0.22	<0.22	<0.21	<0.22	<0.22	<0.21	<0.21	<0.23
	N-Methyl perfluorooctane sulfonamido-acetic acid (N-MeFOSAA)	—	<2.4	<2.2	<2.2	<2.1	<2.2	<2.2	<2.1	<2.1	<2.3
	N-Ethyl perfluorooctane sulfonamido-acetic acid (N-EtFOSAA)	—	<2.4	<2.2	<2.2	<2.1	<2.2	<2.2	<2.1	<2.1	<2.3
	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	—	<0.24	<0.22	<0.22	<0.21	<0.22	<0.22	<0.21	<0.21	<0.23
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	—	<0.24	<0.22	<0.22	<0.21	<0.22	<0.22	<0.21	<0.21	<0.23
	4,8-Dioxa-3H-perfluorononanoic acid (DONA)	—	<0.24	<0.22	<0.22	<0.21	<0.22	<0.22	<0.21	<0.21	<0.23
	Hexafluoropropylene oxide dimer acid (HFPO-DA)	—	<0.30	<0.27	<0.28	<0.27	<0.27	<0.27	<0.26	<0.27	<0.29
	Perfluorooctanesulfonic acid (PFOS)	3.0	<0.60	0.27 J	0.33 J	<0.53 B*	0.26 J	<0.79 B*	<0.52 B*	<0.53 B*	<0.57
	Perfluorooctanoic acid (PFOA)	1.7	0.49	0.20 J	0.17 J	0.17 J	0.29	0.51	0.36	0.29	0.23

NOTES:

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Bold Detected concentration exceeds regulatory limit.

DEC = Alaska Department of Conservation; DL = detection limit; Dup = field duplicate; µg/kg = microgram per kilogram; PAHs = polycyclic aromatic hydrocarbons; RL = reporting Limit; VOCs = volatile organic compounds.

Table 1 - PFAS Analytical Results (µg/kg)

		Sample Type	Primary	Primary	Primary	Primary	Dup of 20BET-SS-G3	Primary	Primary	Primary	Primary
		Grid Cell Location	F7	G1	G2	G3	G3	G4	G5	G6	G7
Method	**Analyte**	**Cleanup Level[1]**	**20BET-SS-F7**	**20BET-SS-G1**	**20BET-SS-G2**	**20BET-SS-G3**	**20BET-SS-G10**	**20BET-SS-G4**	**20BET-SS-G5**	**20BET-SS-G6**	**20BET-SS-G7**
537M	Perfluorohexanesulfonic acid (PFHxS)	—	<0.35	0.046 J	0.091 J*	0.060 J*	0.047 J*	0.098 J*	<0.21	<0.23	0.095 J
	Perfluorohexanoic acid (PFHxA)	—	30	1.9	6.2	1.6	1.7	3.5	1.8	5.0	7.5
	Perfluoroheptanoic acid (PFHpA)	—	7.2	0.75	2.8	0.60	0.56	0.79	0.35	2.1	3.7
	Perfluorononanoic acid (PFNA)	—	0.095 J	0.095 J	0.045 J	0.11 J*	0.048 J*	<0.23	<0.21	0.24	0.12 J*
	Perfluorobutanesulfonic acid (PFBS)	—	<0.35	<0.24	<0.23	<0.21	<0.22	<0.23	<0.21	<0.23	<0.36
	Perfluorodecanoic acid (PFDA)	—	<0.35	0.087 J	<0.23	<0.21	<0.22	<0.23	<0.21	0.034 J	<0.36
	Perfluoroundecanoic acid (PFUnA)	—	<0.35	<0.24	<0.23	<0.21	<0.22	<0.23	<0.21	<0.23	<0.36
	Perfluorododecanoic acid (PFDoA)	—	<0.35	<0.24	<0.23	<0.21	<0.22	<0.23	<0.21	<0.23	<0.36
	Perfluorotridecanoic acid (PFTrDA)	—	<0.35	<0.24	<0.23	<0.21	<0.22	<0.23	<0.21	<0.23	<0.36
	Perfluorotetradecanoic acid (PFTeA)	—	<0.35	<0.24	<0.23	<0.21	<0.22	<0.23	<0.21	<0.23	<0.36
	N-Methyl perfluorooctane sulfonamido-acetic acid (N-MeFOSAA)	—	<3.5	<2.4	<2.3	<2.1	<2.2	<2.3	<2.1	<2.3	<3.6
	N-Ethyl perfluorooctane sulfonamido-acetic acid (N-EtFOSAA)	—	<3.5	<2.4	<2.3	<2.1	<2.2	<2.3	<2.1	<2.3	<3.6
	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	—	<0.35	<0.24	<0.23	<0.21	<0.22	<0.23	<0.21	<0.23	<0.36
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	—	<0.35	<0.24	<0.23	<0.21	<0.22	<0.23	<0.21	<0.23	<0.36
	4,8-Dioxa-3H-perfluorononanoic acid (DONA)	—	<0.35	<0.24	<0.23	<0.21	<0.22	<0.23	<0.21	<0.23	<0.36
	Hexafluoropropylene oxide dimer acid (HFPO-DA)	—	<0.44	<0.30	<0.29	<0.27	<0.27	<0.29	<0.27	<0.28	<0.45
	Perfluorooctanesulfonic acid (PFOS)	3.0	<0.88	<0.67 B*	<0.57 B*	<0.54	0.52 J	0.46 J	0.25 J	<0.57	<0.91
	Perfluorooctanoic acid (PFOA)	1.7	0.44	0.13 J	0.19 J	0.17 J	0.15 J	0.45	0.19 J	0.36	<0.36

NOTES:

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Bold Detected concentration exceeds regulatory limit.

DEC = Alaska Department of Conservation; DL = detection limit; Dup = field duplicate; µg/kg = microgram per kilogram; PAHs = polycyclic aromatic hydrocarbons; RL = reporting Limit; VOCs = volatile organic compounds.

Table 1 - PFAS Analytical Results (µg/kg)

			Sample Type	Primary	Primary	Dup of 20BET-Sub-02	Primary
			Grid Cell Location	C4/D4	C5/D5	C5/D5	C5
Method	**Analyte**	**Cleanup Level[1]**		**20BET-Sub-01**	**20BET-Sub-02**	**20BET-Sub-20**	**20BET-Sub-03**
537M	Perfluorohexanesulfonic acid (PFHxS)	—		<0.24	0.65 JH*	<0.85	0.91 J*
	Perfluorohexanoic acid (PFHxA)	—		38	43	45	44
	Perfluoroheptanoic acid (PFHpA)	—		2.2	0.93	1.4	2.6
	Perfluorononanoic acid (PFNA)	—		<0.24	0.047 J*	0.10 J*	0.11 J
	Perfluorobutanesulfonic acid (PFBS)	—		<0.24	0.038 J	<0.28	<0.22
	Perfluorodecanoic acid (PFDA)	—		<0.24	0.085 J	0.16 J	0.097 J
	Perfluoroundecanoic acid (PFUnA)	—		<0.24	0.25 JH*	<0.28	<0.22
	Perfluorododecanoic acid (PFDoA)	—		<0.24	<0.25	<0.28	<0.22
	Perfluorotridecanoic acid (PFTrDA)	—		<0.24	<0.25	<0.28	<0.22
	Perfluorotetradecanoic acid (PFTeA)	—		<0.24	<0.25	<0.28	<0.22
	N-Methyl perfluorooctane sulfonamido-acetic acid (N-MeFOSAA)	—		<2.4	<2.5	<2.8	<2.2
	N-Ethyl perfluorooctane sulfonamido-acetic acid (N-EtFOSAA)	—		<2.4	<2.5	<2.8	<2.2
	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	—		<0.24	0.25 JH*	<0.28	<0.22
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	—		<0.24	<0.25	<0.28	<0.22
	4,8-Dioxa-3H-perfluorononanoic acid (DONA)	—		<0.24	<0.25	<0.28	<0.22
	Hexafluoropropylene oxide dimer acid (HFPO-DA)	—		<0.30	<0.31	<0.35	<0.28
	Perfluorooctanesulfonic acid (PFOS)	3.0		0.96	0.39 J*	**3.1 J***	1.3
	Perfluorooctanoic acid (PFOA)	1.7		0.10 J	0.24 J*	0.48 J*	0.64

NOTES:

Results were obtained from Eurofins TestAmerica Laboratories, Inc. work order 320-63955-1.

1 DEC Soil-Cleanup Levels from 18 AAC 75.341 Table B1. Method Two - Migration to Groundwater and Table B2. Method Two - Under 40 Inch Zone - Migration to Groundwater

< Analyte not detected; listed as less than the RL unless otherwise flagged due to quality-control failures.

J Estimated concentration, detected greater than the DL and less than the RL. Flag applied by the laboratory.

J* Estimated concentration due to quality control failures. Flag applied by Shannon & Wilson, Inc.

JH* Estimated concentration, biased high due to quality control failures. Flag applied by Shannon & Wilson, Inc.

B* Result is considered not detected due to quality control failures; see checklist for details. Flag applied by Shannon & Wilson, Inc.

Bold Detected concentration exceeds regulatory limit.

DEC = Alaska Department of Conservation; DL = detection limit; Dup = field duplicate; µg/kg = microgram per kilogram; PAHs = polycyclic aromatic hydrocarbons; RL = reporting Limit; VOCs = volatile organic compounds.

Table 2 - Petroleum Analytical Results (mg/kg)

		Sample Type	Primary	Dup of 20BET-SS-C5	Primary	Dup of 20BET-SS-D4	Primary	Primary	Dup of 20BET-Sub-02	Primary
		Grid Cell Location	C5	C5	D4	D4	C4/D4	C5/D5	C5/D5	C5
Method	Analyte	Cleanup Level[1]	20BET-SS-C5	20BET-SS-C10	20BET-SS-D4	20BET-SS-D10	20BET-Sub-01	20BET-Sub-02	20BET-Sub-20	20BET-Sub-03
AK101	Gasoline Range Organics	300	**420 JL***	**650 JL***	**420 JL***	**400 JL***	<7.00 J*	11.0 JL*	10.0 J*	3.20 JL*
AK102	Diesel Range Organics	250	**10,000 JL***	**10,000 JL***	**9,900 JL***	**9,000 JL***	31.0 JL*	**290 JL***	**380 JL***	**270 JL***
AK103	Residual Range Organics	11,000	<2,300 J*	<2,400 J*	<2,300 J*	<2,300 J*	200 JL*	180 JL*	290 JL*	280 JL*
SW8260C (VOC)	1,1,1,2-Tetrachloroethane	0.022	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	1,1,1-Trichloroethane	32	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	1,1,2,2-Tetrachloroethane	0.003	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	1,1,2-Trichloroethane	0.0014	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	1,1-Dichloroethane	0.092	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	1,1-Dichloroethene	1.2	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	1,1-Dichloropropene	—	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	1,2,3-Trichlorobenzene	0.15	<0.130 J*	**<0.260 J***	**<0.270 J***	**<0.250 J***	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	1,2,3-Trichloropropane	0.000031	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	1,2,4-Trichlorobenzene	0.082	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	<0.0700 J*	<0.0710 J*	**<0.0890 J***	<0.0640 J*
	1,2,4-Trimethylbenzene	0.61	**6.40 JL***	**8.90 JL***	**6.40 JL***	**7.00 JL***	<0.0700 J*	0.0170 JL*	<0.0890 J*	0.0260 JL*
	1,2-Dibromo-3-chloropropane	—	<0.260 J*	<0.510 J*	<0.530 J*	<0.510 J*	<0.140 J*	<0.140 J*	<0.180 J*	<0.130 J*
	1,2-Dibromoethane	0.00024	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	1,2-Dichlorobenzene	2.4	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	1,2-Dichloroethane	0.0055	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	1,2-Dichloropropane	0.03	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	1,3,5-Trimethylbenzene	0.66	**8.60 JL***	**12.0 JL***	**12.0 JL***	**11.0 JL***	<0.0700 J*	0.220 JL*	0.410 JL*	0.0750 JL*
	1,3-Dichlorobenzene	2.3	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	1,3-Dichloropropane	—	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	1,4-Dichlorobenzene	0.037	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	2,2-Dichloropropane	—	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	2-Butanone (MEK)	15	0.130 J*	0.160 J*	0.170 J*	0.140 J*	0.170 J*	0.170 J*	0.250 J*	0.160 J*
	2-Chlorotoluene	—	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	4-Chlorotoluene	—	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	Acetone	38	<1.30 J*	<2.60 J*	<2.70 J*	<2.50 J*	0.110 JL*	<0.710 J*	0.0890 JL*	0.130 JL*
	Benzene	0.022	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	Bromobenzene	0.36	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*

Table 2 - Petroleum Analytical Results (mg/kg)

		Sample Type	Primary	Dup of 20BET-SS-C5	Primary	Dup of 20BET-SS-D4	Primary	Primary	Dup of 20BET-Sub-02	Primary
		Grid Cell Location	C5	C5	D4	D4	C4/D4	C5/D5	C5/D5	C5
Method	**Analyte**	**Cleanup Level[1]**	**20BET-SS-C5**	**20BET-SS-C10**	**20BET-SS-D4**	**20BET-SS-D10**	**20BET-Sub-01**	**20BET-Sub-02**	**20BET-Sub-20**	**20BET-Sub-03**
SW8260C (VOC)	Bromochloromethane	—	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	Bromodichloromethane	0.0043	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	Bromoform	0.1	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	Bromomethane	0.024	**<0.260 J***	**<0.510 J***	**<0.530 J***	**<0.510 J***	**<0.140 J***	**<0.140 J***	**<0.180 J***	**<0.130 J***
	Carbon disulfide	2.9	<0.260 J*	<0.510 J*	<0.530 J*	<0.510 J*	<0.140 J*	<0.140 J*	<0.180 J*	<0.130 J*
	Carbon tetrachloride	0.021	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	Chlorobenzene	0.46	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	Chloroethane	72	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	Chloroform	0.0071	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	Chloromethane	0.61	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	cis-1,2-Dichloroethene	0.12	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	cis-1,3-Dichloropropene	0.018	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	Dibromochloromethane	0.0027	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	Dibromomethane	0.025	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	Dichlorodifluoromethane	3.9	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	Ethylbenzene	0.13	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	Hexachlorobutadiene	0.02	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	Isopropylbenzene	5.6	0.130 JL*	0.170 JL*	0.110 JL*	0.130 JL*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	m,p-Xylene	—	0.710 JL*	0.880 JL*	0.170 JL*	0.140 JL*	<0.0700 J*	0.0170 JL*	<0.0890 J*	<0.0640 J*
	Methyl isobutyl ketone	18	<0.260 J*	<0.510 J*	<0.530 J*	<0.510 J*	<0.140 J*	<0.140 J*	<0.180 J*	<0.130 J*
	Methylene chloride	0.33	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	Naphthalene	0.038	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	n-Butylbenzene	23	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	n-Propylbenzene	9.1	0.0620 JL*	0.110 JL*	0.150 JL*	0.160 JL*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	o-Xylene	1.5	**4.30 JL***	**5.50 JL***	**2.60 JL***	**2.20 JL***	<0.0700 J*	0.0460 JL*	0.120 JL*	0.0670 JL*
	p-Isopropyltoluene	—	3.60 JL*	4.80 JL*	4.40 JL*	3.80 JL*	<0.0700 J*	<0.0710 J*	<0.0890 J*	0.0120 JL*
	sec-Butylbenzene	42	4.50 JL*	6.30 JL*	5.40 JL*	5.20 JL*	<0.0700 J*	0.0100 JL*	0.0170 JL*	<0.0640 J*
	Styrene	10	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	tert-Butylbenzene	11	0.130 JL*	0.190 JL*	0.170 JL*	0.140 JL*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	Tetrachloroethene	0.19	<0.130 J*	**<0.260 J***	**<0.270 J***	**<0.250 J***	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*

Table 2 - Petroleum Analytical Results (mg/kg)

		Sample Type	Primary	Dup of 20BET-SS-C5	Primary	Dup of 20BET-SS-D4	Primary	Primary	Dup of 20BET-Sub-02	Primary
		Grid Cell Location	C5	C5	D4	D4	C4/D4	C5/D5	C5/D5	C5
Method	Analyte	Cleanup Level[1]	20BET-SS-C5	20BET-SS-C10	20BET-SS-D4	20BET-SS-D10	20BET-Sub-01	20BET-Sub-02	20BET-Sub-20	20BET-Sub-03
SW8260C (VOC)	Toluene	6.7	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	0.0190 JL*	<0.0890 J*	<0.0640 J*
	Total Xylenes	1.5	**5.00 JL***	**6.40 JL***	**2.80 JL***	**2.30 JL***	<0.0700 J*	0.0630 JL*	0.120 JL*	0.0670 JL*
	trans-1,2-Dichloroethene	1.3	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	trans-1,3-Dichloropropene	0.018	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	Trichloroethene	0.011	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
	Trichlorofluoromethane	41	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	Vinyl acetate	1.1	<0.130 J*	<0.260 J*	<0.270 J*	<0.250 J*	<0.0700 J*	<0.0710 J*	<0.0890 J*	<0.0640 J*
	Vinyl chloride	0.0008	**<0.130 J***	**<0.260 J***	**<0.270 J***	**<0.250 J***	**<0.0700 J***	**<0.0710 J***	**<0.0890 J***	**<0.0640 J***
SW8270D-SIM (PAH)	Acenaphthene	37	<0.0580 J*	0.0410 JL*	<0.0550 J*	<0.0580 J*	<0.0620 J*	<0.0570 J*	<0.0660 J*	<0.0550 J*
	Acenaphthylene	18	<0.0580 J*	<0.120 J*	<0.0550 J*	<0.0580 J*	<0.0620 J*	<0.0570 J*	<0.0660 J*	<0.0550 J*
	Anthracene	390	<0.0580 J*	<0.120 J*	<0.0550 J*	<0.0580 J*	<0.0620 J*	<0.0570 J*	<0.0660 J*	<0.0550 J*
	Benzo(a)anthracene	0.7	<0.0580 J*	<0.120 J*	<0.0550 J*	<0.0580 J*	<0.0620 J*	<0.0570 J*	<0.0660 J*	<0.0550 J*
	Benzo(a)pyrene	1.9	<0.0580 J*	<0.120 J*	<0.0550 J*	<0.0580 J*	<0.0620 J*	<0.0570 J*	<0.0660 J*	<0.0550 J*
	Benzo(b)fluoranthene	20	<0.0580 J*	<0.120 J*	<0.0550 J*	<0.0580 J*	<0.0620 J*	<0.0570 J*	<0.0660 J*	<0.0550 J*
	Benzo(g,h,i)perylene	15,000	<0.0580 J*	<0.120 J*	<0.0550 J*	<0.0580 J*	<0.0620 J*	<0.0570 J*	<0.0660 J*	<0.0550 J*
	Benzo(k)fluoranthene	190	<0.0580 J*	<0.120 J*	<0.0550 J*	<0.0580 J*	<0.0620 J*	<0.0570 J*	<0.0660 J*	<0.0550 J*
	Chrysene	600	<0.0580 J*	<0.120 J*	<0.0550 J*	<0.0580 J*	<0.0620 J*	<0.0570 J*	<0.0660 J*	<0.0550 J*
	Dibenzo(a,h)anthracene	6.3	<0.0580 J*	<0.120 J*	<0.0550 J*	<0.0580 J*	<0.0620 J*	<0.0570 J*	<0.0660 J*	<0.0550 J*
	Fluoranthene	590	<0.0580 J*	<0.120 J*	<0.0550 J*	<0.0580 J*	<0.0620 J*	<0.0570 J*	<0.0660 J*	<0.0550 J*
	Fluorene	36	0.0910 JL*	0.0710 JL*	0.0730 JL*	0.0700 JL*	<0.0620 J*	<0.0570 J*	<0.0660 J*	<0.0550 J*
	Indeno(1,2,3-cd)pyrene	65	<0.0580 J*	<0.120 J*	<0.0550 J*	<0.0580 J*	<0.0620 J*	<0.0570 J*	<0.0660 J*	<0.0550 J*
	Naphthalene	0.038	**0.890 JL***	**1.10 JL***	**0.990 JL***	**0.990 JL***	**<0.0620 J***	**0.0430 JL***	**0.0440 JL***	**0.0400 JL***
	Phenanthrene	39	0.0180 JL*	<0.120 J*	0.0180 JL*	0.0180 JL*	0.0120 JL*	0.00920 JL*	0.0100 JL*	0.0110 JL*
	Pyrene	87	<0.0580 J*	<0.120 J*	<0.0550 J*	<0.0580 J*	<0.0620 J*	<0.0570 J*	<0.0660 J*	<0.0550 J*

NOTES:
Results were obtained from Eurofins TestAmerica Laboratories, Inc. work order 320-63955-1.

1 DEC Soil-Cleanup Levels from 18 AAC 75.341 Table B1. Method Two - Migration to Groundwater and Table B2. Method Two - Under 40 Inch Zone - Migration to Groundwater

< Analyte not detected; listed as less than the RL unless otherwise flagged due to quality-control failures.

J* Estimated concentration due to quality control failures. Flag applied by Shannon & Wilson, Inc.

JL* Estimated concentration, biased low due to quality control failures. Flag applied by Shannon & Wilson, Inc.

<Bold RL concentration exceeds regulatory limit.

Bold Detected concentration exceeds regulatory limit.

DEC = Alaska Department of Conservation; Dup = field duplicate; mg/kg = milligrams per kilogram; PAHs = polycyclic aromatic hydrocarbons; RL = reporting Limit; VOCs = volatile organic compounds.

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

Project Area

Project Location

0 1,000 2,000 3,000

Feet

N

Bethel Airport AFFF Release Site
Bethel, Alaska

SITE VICINITY

April 2021

104507-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 1

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 400 800

Feet

LEGEND

Project Area

N

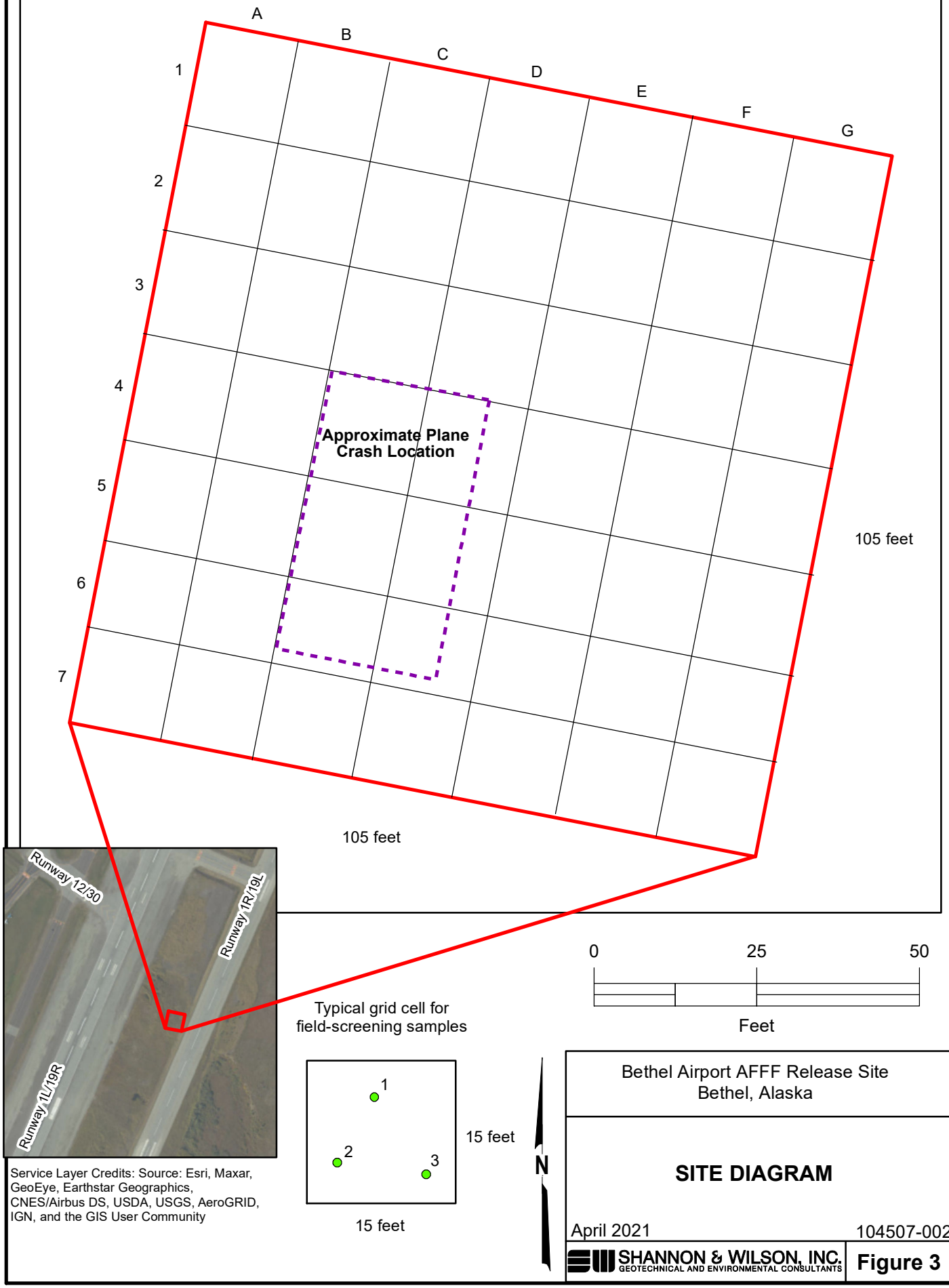
Bethel Airport AFFF Release Site
Bethel, Alaska

PROJECT AREA

April 2021 104507-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 2



Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Bethel Airport AFFF Release Site
Bethel, Alaska

SITE DIAGRAM

April 2021

104507-002

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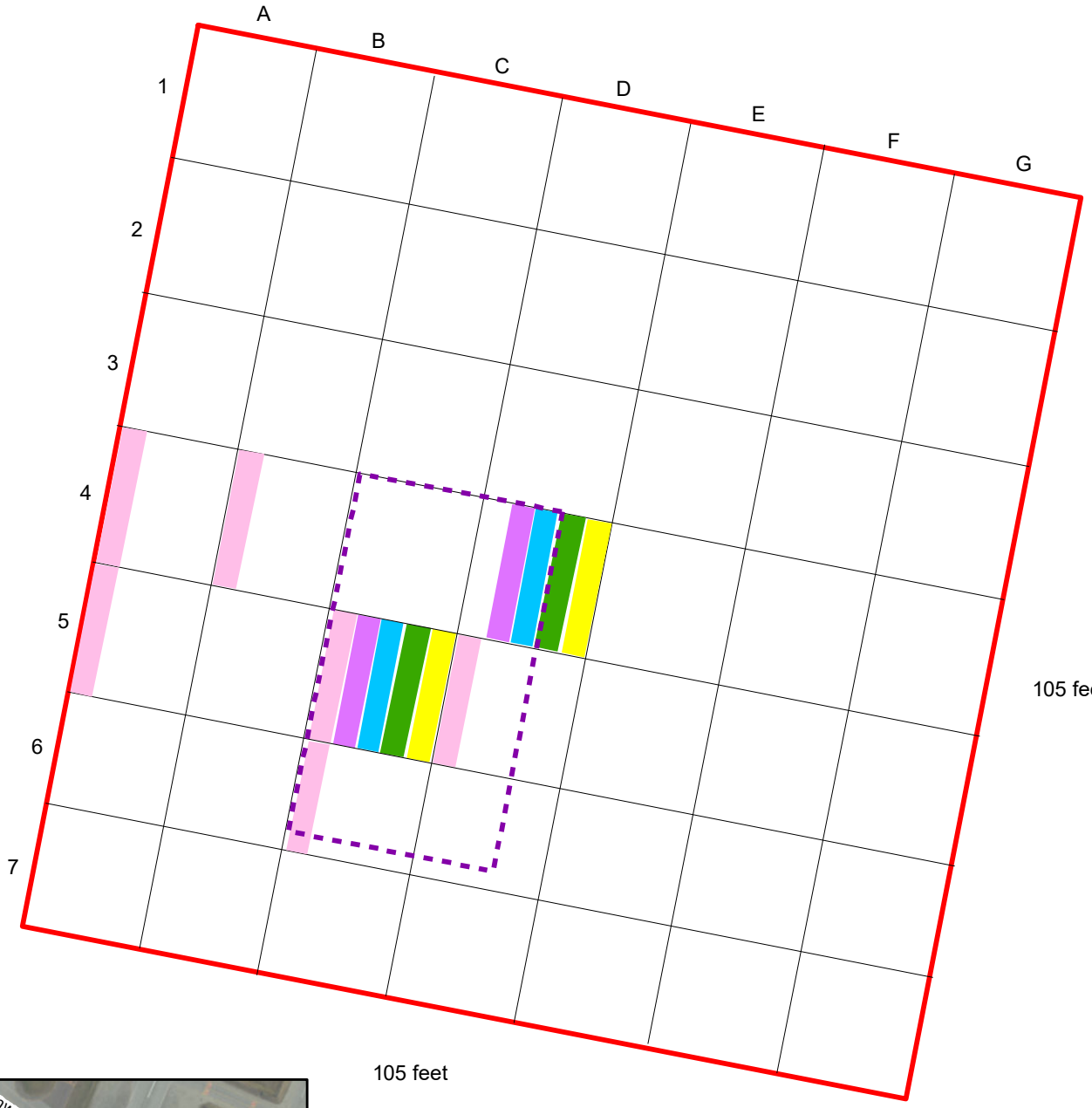
Figure 3



Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- PFAS exceedance for grid cell
- GRO exceedance for grid cell
- DRO exceedance for grid cell
- VOC exceedance for grid cell
- PAH exceedance for grid cell
- Approximate Plane Crash Location

0 25 50

Feet

N

Bethel Airport AFFF Release Site
Bethel, Alaska

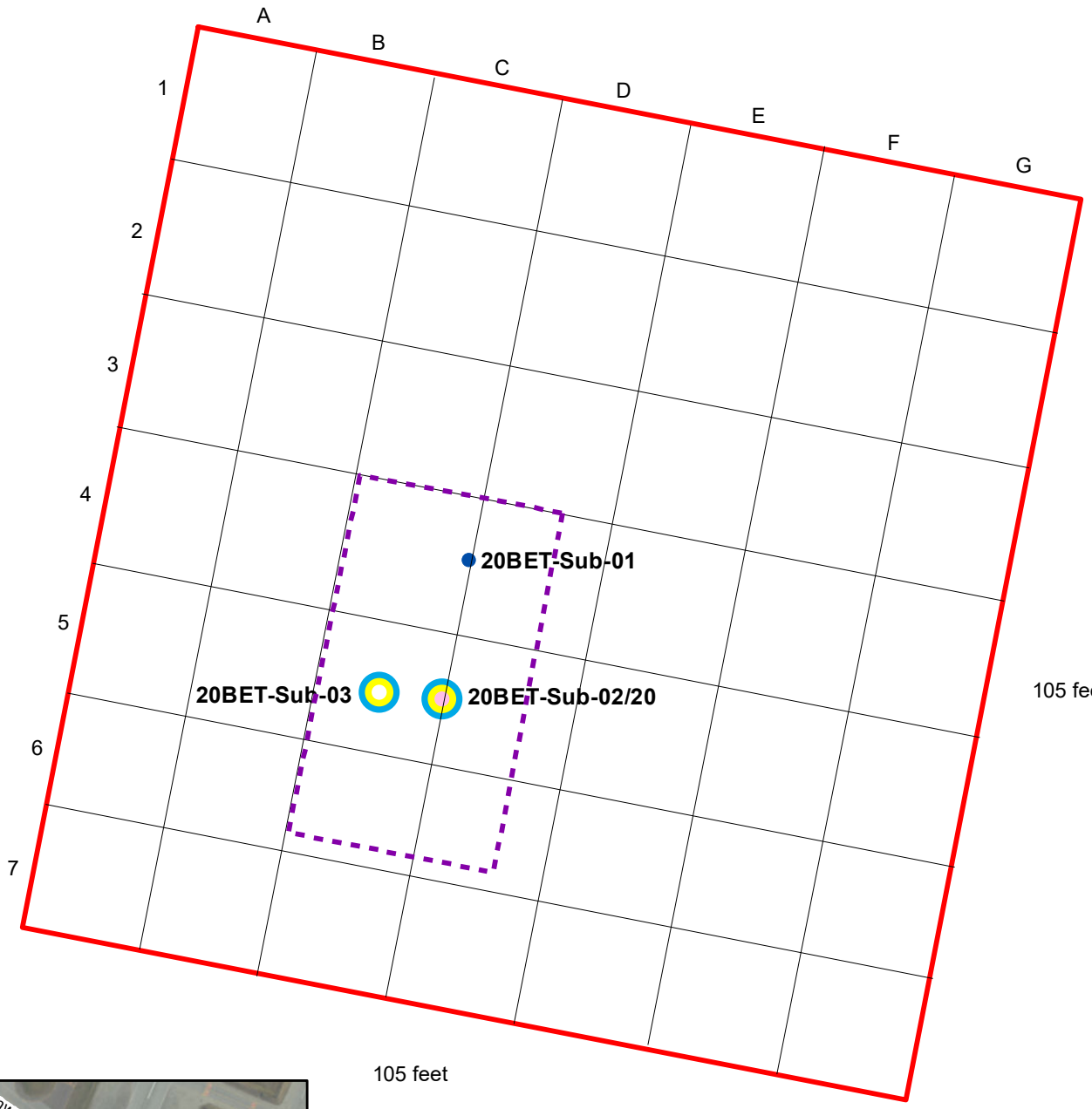
SURFACE SOIL SAMPLE EXCEEDANCES

April 2021

104507-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 4



Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- No Exceedances
- PFAS Exceedance
- PAH Exceedance
- DRO Exceedance
- Approximate Plane Crash Location

0 25 50

Feet

N

Bethel Airport AFFF Release Site
Bethel, Alaska

SUBSURFACE SOIL SAMPLE EXCEEDANCES

April 2021

104507-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 5

APPENDIX A: FIELD FORMS

Appendix A

Field Forms

FIELD ACTIVITIES DAILY LOG

Date 8/18/2020
Sheet 1 of 1
Project No. 104507

Project Name: BET AFFF Release Site
Field activity subject: Site Characterization
Description of daily activities and events:

07:15 met Tim to escort us @ Fire station
07:30 arrived on site and performed the following:
- set up grid
- dig field screening holes to expose soil
- field screened 147 holes
- dug 3 additional spots in crash site
15:15 left site

Visitors on site: Tim Bee, escort

Changes from plans/specifications and other special orders and important decisions:
N/A

Weather conditions: sunny, ~70°F

Important telephone calls: N/A

Personnel on site: APW, VTY

Signature:

Date: 8/18/20

FIELD ACTIVITIES DAILY LOG

Date 8/19/20
Sheet 1 of 1
Project No. 104507

Project Name: #BET AFFF Release Site
Field activity subject: Site Characterization
Description of daily activities and events:

7:20 met with escort @ Fire station
7:30 arrived on site and sampled
11:30 left site; paperwork and shipping prep

Visitors on site: N/A

Changes from plans/specifications and other special orders and important decisions:
N/A

Weather conditions: sunny (70°F)

Important telephone calls: N/A

Personnel on site: APW, VTY

Signature:

Date: 8/19/20

FIELD SCREENING LOG (soil samples)

Project Number: 104507 Project Name: BET AFFF Release Site

Date: 8/18/20

Sampler: APW, VTY Calibration time, result: 8/17/20 - 6:30, 0.0 ambient air, 100% isobut. PID number: 592-927726

FS Sample Number	Sample Time	PID Reading	Depth (ft)	FS Sample Location	Soil Description/Notes
A1-1	9:00	0.2	1	see field diagram	brown to grey silty sand with organics
A1-2	9:05	0.1			
A1-3	9:10	0.2			
A2-1	9:15	0.2			
A2-2	9:17	0.0			
A2-3	9:19	0.1			
A3-1	9:21	0.0			
A3-2	9:23	0.4			
A3-3	9:25	0.5			
A4-1	9:27	0.6			
A4-2	9:29	0.7			
A4-3	9:31	0.8			
A5-1	9:33	0.5			
A5-2	9:35	0.5			
A5-3	9:37	0.6			
A6-1	9:39	0.6			
A6-2	9:41	0.4			
A6-3	9:43	0.7			
A7-1	9:45	0.3			
A7-2	9:47	0.7			
A7-3	9:50	0.7			
B1-1	10:30	0.8			
B1-2	1032	0.7			
B1-3	1034	0.7			
B2-1	1036	0.5			
B2-2	1038	0.6			
B2-3	1040	0.7			
B3-1	1042	0.8			
B3-2	1044	0.2			
B3-3	1046	0.5			
B4-1	1048	1.2			
B4-2	1050	1.0			
B4-3	1052	1.0			
B5-1	1054	1.0			

FIELD SCREENING LOG (soil samples)

Project Number: 104507 Project Name: BET AFFF Release Site

Date: 8/18/20

Sampler: APW, VTY Calibration time, result: PID number:

FS Sample Number	Sample Time	PID Reading	Depth (ft)	FS Sample Location	Soil Description/Notes
B5-2	1056	0.9	1	see field diagram.	Brown to grey silty sand with organics
B5-3	1058	0.9			
B6-1	1100	1.0			
B6-2	1102	1.1			
B6-3	1104	1.1			
B7-1	1106	0.7			
B7-2	11:08	0.8			
B7-3	11:10	1.0			
C1-1	11:30	0.7			
C1-2	1131	0.4			
C1-3	1132	0.5			
C2-1	1133	0.4			
C2-2	1134	0.6			
C2-3	1135	0.8			
C3-1	1136	0.5			
C3-2	1137	0.2			
C3-3	1138	0.3			
C4-1	1139	0.6			
C4-2	1140	0.4			
C4-3	1141	12.0			
C5-1	1142	602.2			
C5-2	1143	146.0			
C5-3	1144	74.3			
C6-1	1145	5.9			
C6-2	1146	3.5			
C6-3	1147	2.9			
C7-1	1148	2.5			
C7-2	1149	2.2			
C7-3	11:50	2.0			
D1-1	12:00	0.9			
D1-2	1210	0.8			
D1-3	1212	1.1			
D2-1	1213	1.2			
D2-2	1214	1.0			

FIELD SCREENING LOG (soil samples)

Project Number: 104507 Project Name: BET AFFF Release Site

Date: 8/18/20

Sampler: APW, UTY Calibration time, result: PID number:

FS Sample Number	Sample Time	PID Reading	Depth (ft)	FS Sample Location	Soil Description/Notes
D2-3	1215	0.9	1	see field diagram	Brown to grey silty sand with organics
D3-1	1216	1.1			
D3-2	1217	0.9			
D3-3	1218	0.7			
D4-1	1219	2.0			
D4-2	1220	754.3			
D4-3	1221	95.0			
D5-1	1222	40.1			
D5-2	1223	6.8			
D5-3	1224	3.8			
D6-1	1225	2.7			
D6-2	1226	2.5			
D6-3	1227	2.1			
D7-1	1228	2.2			
D7-2	1229	2.1			
D7-3	12:30	2.1			
E1-1	1240	1.2			
E1-2	1250	1.1			
E1-3	1251	1.1			
E2-1	1252	1.4			
E2-2	1253	1.2			
E2-3	1254	1.3			
E3-1	1255	1.2			
E3-2	1256	1.4			
E3-3	1257	1.3			
E4-1	1258	1.2			
E4-2	1259	1.0			
E4-3	1300	1.2			
E5-1	1301	0.8			
E5-2	1302	1.1			
E5-3	1303	0.9			
E6-1	1304	0.9			
E6-2	1305	1.1			
E6-3	1306	1.0			

FIELD SCREENING LOG (soil samples)

Project Number: 104507 Project Name: BET AFFF Release Site

Date: 8/18/20

Sampler: APW, VTY Calibration time, result: PID number:

FS Sample Number	Sample Time	PID Reading	Depth (ft)	FS Sample Location	Soil Description/Notes
E7-1	1307	1.2	1	see field diagram	Brown to grey silty sand with organics
E7-2	1308	1.2			
E7-3	1309	0.9			
F1-1	1310	1.2			
F1-2	1310	1.4			
F1-3	1311	1.5			
F2-1	1312	1.1			
F2-2	1313	1.1			
F2-3	1314	1.3			
F3-1	1315	1.1			
F3-2	1316	0.9			
F3-3	1317	0.9			
F4-1	1318	1.5			
F4-2	1319	1.4			
F4-3	1318	1.3			
F5-1	1319	1.4			
F5-2	1320	1.4			
F5-3	1321	1.5			
F6-1	1322	1.5			
F6-2	1323	1.2			
F6-3	1324	1.2			
F7-1	1325	1.6			
F7-2	1326	1.1			
F7-3	1329	1.2			
G1-1	1330	1.0			
G1-2	1331	1.1			
G1-3	1332	1.1			
G2-1	1333	0.8			
G2-2	1334	1.0			
G2-3	1335	1.1			
G3-1	1336	0.9			
G3-2	1337	0.8			
G3-3	1337	0.7			
G4-1	1338	1.6			

FIELD SCREENING LOG (soil samples)

Project Number: 104507 Project Name: BET AFFF Release Site

Date: 8/18/20

Sampler: APW, VTY Calibration time, result: PID number:

FS Sample Number	Sample Time	PID Reading	Depth (ft)	FS Sample Location	Soil Description/Notes
G4-2	1339	1.6	1	see field diagram	Brown to grey silty sand with organics
G4-3	1340	0.8			
~~G5~~G5-1	1341	1.4			
G5-2	1342	0.8			
G5-3	1343	1.2			
G6-1	1355	1.1			
G6-2	1356	0.8			
G6-3	1357	0.8			
G7-1	1358	0.9			
G7-2	1359	0.9			
G7-3	1400	0.5			

SHANNON & WILSON, INC.

SAMPLE COLLECTION LOG

Project Number: 104507 Location: Bethel Airport AFFF Release Site Page 1 of 3

Date: 8/19/2020

Sampler: APW / VTY

Sample Number	Location	Sample Time	Depth Interval (ft) top	Depth Interval (ft) bottom	Matrix Type	Sampling Method	Sample Type	PID Reading	Analyses
20BET-SS-A1	A1	755	0.5'	1.0'	SS	G	ES		PFAS
20BET-SS-A2	A2	757							
20BET-SS-A3	A3	759							
20BET-SS-A4	A4	801							
20BET-SS-A5	A5	803							
20BET-SS-A6	A6	805							
20BET-SS-A7	A7	807							
20BET-SS-A10	A5	7:53					FD		
20BET-SS-B1	B1	8:12					ES		
20BET-SS-B2	B2	8:14							
20BET-SS-B3	B3	8:16							
20BET-SS-B4	B4	8:18							
20BET-SS-B5	B5	8:20							
20BET-SS-B6	B6	8:22							
20BET-SS-B7	B7	8:24							
20BET-SS-C1	C1	8:35							
20BET-SS-C2	C2	8:37							
20BET-SS-C3	C3	8:39							
20BET-SS-C4	C4	8:41							
20BET-SS-C5	C5	8:43					ES + MS/MSD		PFAS, DRO, RRO, GRO, VOCs, PAHs
20BET-SS-C6	C6	8:45					ES		PFAS
20BET-SS-C7	C7	8:47					ES		PFAS
20BET-SS-C10	C5	8:33					FD		PFAS, DRO, RRO, GRO, VOCs, PAHs
20BET-SS-D1	D1	9:05					ES		PFAS
20BET-SS-D2	D2	9:07							
20BET-SS-D3	D3	9:09							

Matrix Type		Sampling Method		Sample Type	
AR	Air	B	Bailer/Coliwas	ES	Environmental sample
GW	Groundwater	D	Drill cuttings	ER	Equipment rinsate
PR	Product	G	Grab sampling	FB	Field blank
SB	Subsurf. soil	H	Hand auger	FD	Field duplicate
SE	Sediment	L	Tube liner	FM	Field measurement
SG	Sludge	P	Pump (liquid)	FR	Field replicate
SS	Surface soil	SS	Split spoon	MD	Matrix spike duplicate
SW	Surface water	T	Shelby tube	MS	Matrix spike duplicate
WR	Water	V	Vacuum (gas)	TB	Trip blank
		W	Wipe sampling		

SHANNON & WILSON, INC.

SAMPLE COLLECTION LOG

Project Number: 104507 Location: Bethel Airport AFFF Release Site

Date: 8/19/2020

Sampler: APW / VTY

Sample Number	Location	Sample Time	Depth Interval (ft) top	Depth Interval (ft) bottom	Matrix Type	Sampling Method	Sample Type	PID Reading	Analyses
20BET-SS-D4	D4	9:11	0.5'	1.0'	SS	G	ES		PFAS, DRO, RRO, GRO, VOCs, PAHs
20BET-SS-D5	D5	9:13							PFAS
20BET-SS-D6	D6	9:15							
20BET-SS-D7	D7	9:17							
20BET-SS-D10	D4	9:01					FD		PFAS, DRO, RRO, GRO, VOCs, PAHs
20BET-SS-E1	E1	9:25					ES		PFAS
20BET-SS-E2	E2	9:27							
20BET-SS-E3	E3	9:29							
20BET-SS-E4	E4	9:31							
20BET-SS-E5	E5	9:33							
20BET-SS-E6	E6	9:35							
20BET-SS-E7	E7	9:37							
20BET-SS-F1	F1	9:40							
20BET-SS-F2	F2	9:42							
20BET-SS-F3	F3	9:44							
20BET-SS-F4	F4	9:46							
20BET-SS-F5	F5	9:48							
20BET-SS-F6	F6	9:50							
20BET-SS-F7	F7	9:52							
20BET-SS-F10	~~F10~~ F1	9:30					FD		
20BET-SS-G1	G1	10:00					ES		
20BET-SS-G2	G2	10:02							
20BET-SS-G3	G3	10:04							
20BET-SS-G4	G4	10:06							
20BET-SS-G5	G5	10:08							
20BET-SS-G6	G6	10:10							

Matrix Type

AR	Air
GW	Groundwater
PR	Product
SB	Subsurf. soil
SE	Sediment
SG	Sludge
SS	Surface soil
SW	Surface water
WR	Water

Sampling Method

B	Bailer/Coliwas
D	Drill cuttings
G	Grab sampling
H	Hand auger
L	Tube liner
P	Pump (liquid)
SS	Split spoon
T	Shelby tube
V	Vacuum (gas)
W	Wipe sampling

Sample Type

ES	Environmental sample
ER	Equipment rinsate
FB	Field blank
FD	Field duplicate
FM	Field measurement
FR	Field replicate
MD	Matrix spike duplicate
MS	Matrix spike duplicate
TB	Trip blank

SHANNON & WILSON, INC.

SAMPLE COLLECTION LOG

Project Number: 104507 Location: Bethel Airport AFFF Release Site

Date: 8/19/2020

Sampler: APW / VTY

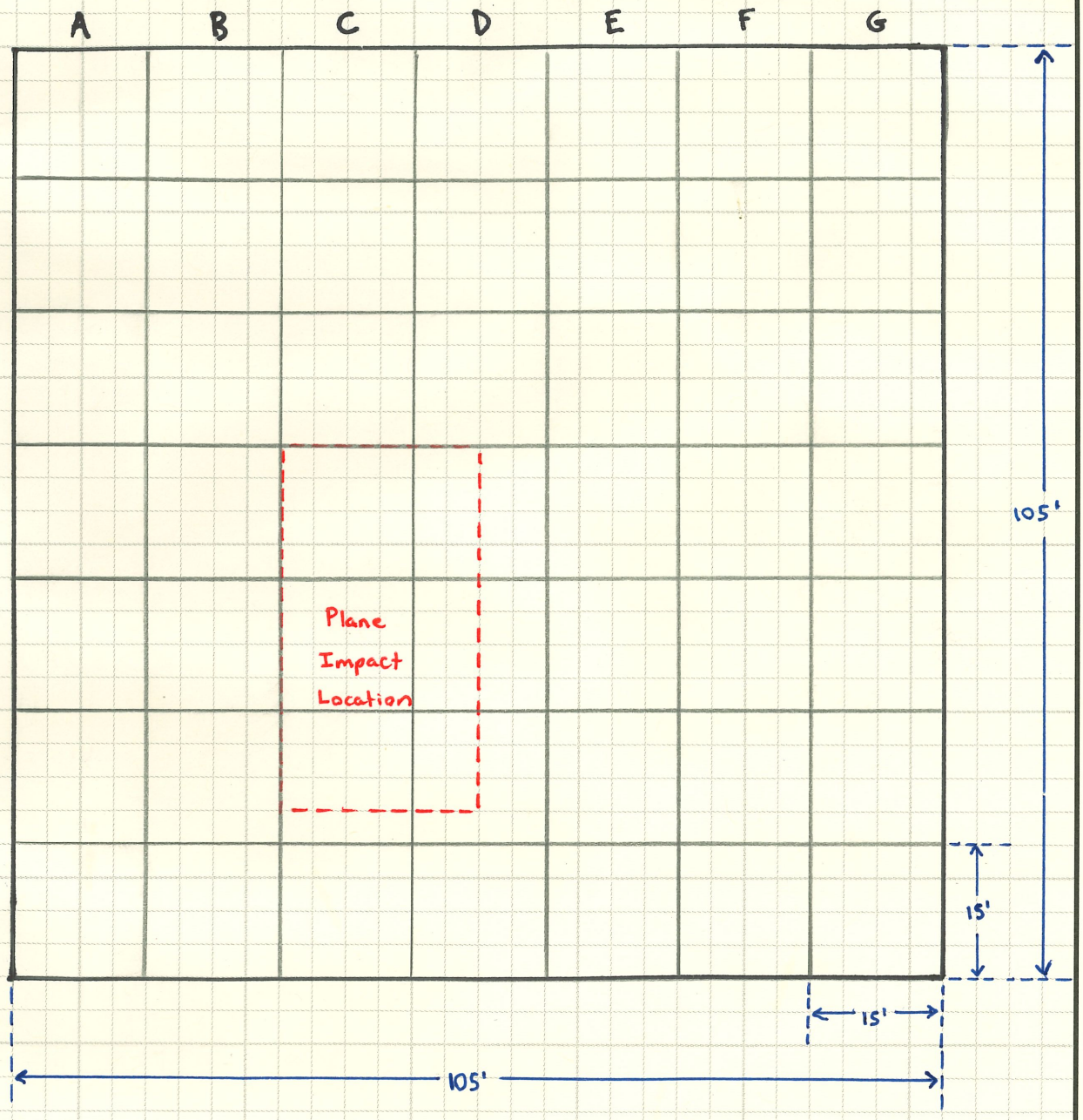
Sample Number	Location	Sample Time	Depth Interval (ft) top	Depth Interval (ft) bottom	Matrix Type	Sampling Method	Sample Type	PID Reading	Analyses
20BET-SS-G7	G7	10:12	0.5'	1.0'	SS	G	ES		PFAS
20BET-SS-G10	G3	9:54	0.5'	1.0'	SS	G	FD		PFAS
20BET-Sub-01	C4 / D4	10:50	2.0'	2.5'	SB	G	ES		PFAS, DRO, RRO, GRO, VOCs, PAHs
20BET-Sub-02	C5/D5	10:55	↓	↓	↓	↓	ES +MS/MSD		↓
20BET-Sub-20	C5/D5	10:45					FD		
20BET-Sub-03	C5	11:00	↓	↓	↓	↓	ES		↓
Field Blank		11:10	N/A	N/A	WR	G	FB		PFAS

Matrix Type		Sampling Method		Sample Type	
AR	Air	B	Bailer/Coliwas	ES	Environmental sample
GW	Groundwater	D	Drill cuttings	ER	Equipment rinsate
PR	Product	G	Grab sampling	FB	Field blank
SB	Subsurf. soil	H	Hand auger	FD	Field duplicate
SE	Sediment	L	Tube liner	FM	Field measurement
SG	Sludge	P	Pump (liquid)	FR	Field replicate
SS	Surface soil	SS	Split spoon	MD	Matrix spike duplicate
SW	Surface water	T	Shelby tube	MS	Matrix spike duplicate
WR	Water	V	Vacuum (gas)	TB	Trip blank
		W	Wipe sampling		

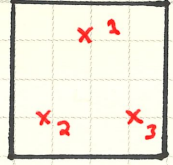
SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

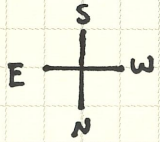
JOB NAME Bethel Airport
SUBJECT Field-screening and Sampling
BY APW CHK'D

JOB NO. 104507
DATE 8/18/2020
SHEET 1 of 1



Typical Grid Cell





APPENDIX B: FIELD STAFF RESUMES

Appendix B

Field Staff Resumes

ADAM WYBORNY, EIT
ENVIRONMENTAL ENGINEERING STAFF

Year Joined S&W: 04/27/2015
Years of Experience: 6
Current Firm: 5

Education:
BS, Ecological Engineering, Oregon State University, Corvallis, OR 2012

Registrations/Certifications:
Engineer in Training (EIT) – NCEES 17-939-73
Environmental Professional – (ASTM E1527 13)
Hazardous Waste Operations & Emergency Response (HAZWOPER) - (OSHA 29 CFR 1910.120)
Hazardous Materials or Dangerous Goods for Transport - (49 CFR 172H and IATA DGR1.5)
State of Alaska Qualified Sampler - (18 AAC 75, 18 AAC 78)
State of Alaska Qualified Environmental Professional - (18 AAC 75, 18 AAC 78)
Based on his education and work experience, Adam meets the requirements of a Qualified Environmental Professional, as defined by 18 Alaska Administrative Code (AAC) 75.333.

Memberships:
American Society of Civil Engineers (ASCE)

Professional Summary:
Adam is an environmental professional with experience in site characterization, contaminated site remediation, environmental sampling, water treatment technologies, and data analysis. He has conducted site investigations and spill response efforts throughout interior Alaska and the North Slope Borough (NSB). Adam has been involved in projects for the Alaska Department of Environmental Conservation (ADEC), Alaska Department of Transportation & Public Facilities (ADOT&PF), the NSB, the United States Army Corps of Engineers (USACE), and private clients. Adam regularly coordinates with interdisciplinary Shannon & Wilson (S&W) personnel and state regulatory bodies to design and implement treatment and/or remediation solutions which comply with state environmental standards

Project Experience:

Military Projects

100155: Alaska Testlab, ATL Eielson Field Screening Projects | Eielson AFB, AK. **Environmental Professional**.
:EIE405 Steam Utilidor Extension to the South Loop. S&W was requested to provide environmental services during the construction of a Steam-Water Utilidor Extension from the base power plant to the South Loop of Eielson Air Force Base. Perfluoroalkyl substances (PFAS), hydrocarbon, and coal ash contamination is known to exist within large portions of the alignment and excavated soil required different handling and disposal procedures. Adam serves as S&W's primary field operative and point of contact for the project. Adam's field responsibilities include field-screening and sampling soil during excavation activities, delineating and sampling stockpile sites, coordinating soil segregation based on observed contamination, and collection of water samples for hazard assessment. All soil sampling performed during active excavation or within stockpile footprints is done via Incremental Sampling Methodology (ISM) and includes PFAS analysis. Adam's other responsibilities include analyzing laboratory data, providing soil disposal recommendations to the USACE, and performing Level II data reviews to evaluate usability and meet project data-quality objectives. **May 2018 - 2020/ongoing.**

:EIE384 D/B F-35A AGE Facility and Fill Stand. S&W was requested to provide environmental services during the excavation phase of the F-35A Aerospace Ground Equipment (AGE) Facility and Fill Stand project. Large portions of the project site occupied areas of known perfluoroalkyl substances (PFAS) and hydrocarbon contamination.

Adam served as S&W's primary field operative and point of contact for the project. Adam's responsibilities included field-screening soil during excavation activities, delineating and sampling stockpile sites, coordinating soil segregation based on observed contamination, collection of excavation-extent analytical samples, analyzing laboratory data, providing soil disposal recommendations to the client, performing Level II data reviews, and authoring a report evaluating whether project data-quality objectives were met. **August 2018 – March 2020.**

:EIE406 Repair Arctic Utilidors. S&W was requested to provide environmental services during the earthwork phase of the EIE406 utilidor repair project. The existing utilidors at Eielson's South Loop were exposed so that repairs could be made, and the housed utilities could be connected to the new utilidor being constructed as part of the EIE405 project. Adam's responsibilities included field screening excavated soil, guiding the segregation of soil with observed petroleum, oil, and/or lubricant (POL) contamination, collection of waste characterization samples from the onsite stockpiles, analyzing laboratory data, performing Level II data reviews to evaluate usability and meet project data-quality objectives, and providing soil disposal recommendations to the client**. August 2018 – December 2019.**

:EIE393/394 Building 1335 4-Bay Weather Shelter Renovation. S&W was requested to provide environmental services during an effort to renovate and upgrade the existing 4-bay and 8-bay weather shelters on the South Loop of Eielson Air Force Base. Adam was onsite periodically to field-screen soil excavated from the perimeter of the weather shelters during the installation of new utility lines**. September 2018 – May 2019.**

:EIE338 Replace JP-8 Pre-Filter System. S&W was requested to provide environmental services during the earthwork phase of the JP-8 pre-filter replacement project at the Quarry Rd tank farm on Eielson Air Force Base. Adam's responsibilities include field-screening and sampling excavated soil, delineating and sampling stockpile footprints using incremental sampling methodology (ISM), guiding the segregation of soil with observed petroleum, oil, and/or lubricant (POL) contamination, performing Level II laboratory data reviews, and providing soil disposal recommendations to the client**.** Adam will be responsible for evaluating compliance with project data quality objectives at the conclusion of sampling activities. **April 2020/ongoing.**

100146: Alcan Builders, EIE389 Satellite Dining Facility | Eielson AFB, AK. **Environmental Professional**. S&W was contracted to provide environmental and geotechnical services during the earthwork phase of construction of the new satellite dining facility on the South Loop of Eielson Air Force Base. Adam delineated and performed the pre-liner sampling of the long-term stockpile for the project using incremental sampling methodology (ISM). Adam provided additional support such as field-screening soil during excavation and collecting confirmation samples from several onsite excavations. **June 2019 – July 2019.**

103263: Bristol Engineering Services Company, LLC, EIE388 F-35 R-11 Fuel Truck Shelter | Eielson AFB, AK. **Environmental Professional**. S&W was contracted to provide environmental services during the construction of a new fuel truck shelter and supporting subsurface infrastructure on the South Loop of Eielson Air Force Base. Adam acted as the S&W project manager, primary point of contact, and lead field representative. Adam was onsite during excavation to field-screen soil and collect excavation extent samples. **April 2019 – December 2019.**

103480: Jaffa Construction Inc., Jaffa EIE CHPP Environmental Services | Eielson AFB, AK. **Environmental Professional**. S&W was contracted to provide environmental services during upgrade and maintenance activities at the Eielson Air Force Base Industrial Road coal fire power plant. Adam assisted with onsite sample collection from wastewater generated during boiler maintenance activities. **August 2019.**

31120078: Coffman Engineers, FTQW 15-1031 B1348 | Eielson AFB, AK. **Environmental Professional**. S&W was contracted to characterize the soil conditions around building 1348 in preparation for the installation of a new water line. The grounds of building 1348 are an ADEC contaminated site with known solvent contamination. PFAS was also suspected to be present in soil at the site. Adam's responsibilities included screening and sampling soil extracted from several borings distributed along the proposed path of the water line. **May 2018.**

31102478: Enterprise Engineering, Inc., Eielson AFB Air National Guard Tanker Row | Eielson AFB, AK. **Environmental Professional**. S&W was contracted to advance soil borings for geotechnical and chemical analysis at the Air National Guard tanker aprons on Eielson Air Force Base. Adam was onsite during drilling operations to field-screen and sample soil extracted from the designated boring locations. **February 2017.**

31102488: U.S. Air Force/RIM-HDR JV, EIE382 F35 Weather Shelter #2 | Eielson AFB, AK. **Environmental Professional** S&W was contracted to advance exploratory geotechnical and environmental borings at the proposed construction site of Weather Shelter #2. Adam was onsite to field-screen and sample soil extracted from the designated boring locations. Adam also reviewed the analytical data and assisted with authoring the environmental summary report. **Summer 2017.**

31120042: Doyon Utilities, LLC., Doyon Utilities CERCLA Investigation | Fort Wainwright, AK. **Environmental Professional**. S&W was contracted to perform a site investigation to determine environmental concerns relating to future development. Monitoring wells were installed on the site to facilitate groundwater sampling. Adam aided with monitoring well development, groundwater sampling, IDW management, and site surveying. **October 2017.**

100589: Doyon Utilities, LLC, DU Water Tank – Construction Phase Services | Fort Wainwright, AK. **Environmental Professional**. S&W was contracted to provide environmental services during the construction of a bulk water storage facility and connecting piping infrastructure. The facility was constructed in an area of known coal ash contamination, with possible POL contamination. Part of the waterline corridor passed through a historical dump site. Adam aided with field-screening the surface area of the site prior to excavation, field-screening and guiding soil segregation during active excavation, collection of excavation extent samples, and stockpile waste characterization samples. Adam also reviewed the laboratory data to evaluate usability and meet project data-quality objectives. **August 2018 – May 2019.**

100004: Aleut, FTW Building 3025 | Fort Wainwright, AK. **Environmental Professional**. S&W was contracted to provide environmental services in support of facility upgrades to building 3025 on Fort Wainwright. Adam assisted with field-screening soil during the excavation of utility trenches along the building. Excavation extent sampling was performed once the limits of excavation were reached. ***May 2019*.**

31120038: Aaron Plumbing & Heating, Doyon well 3559 Video | Fairbanks, AK. **Environmental Professional**. S&W was contracted to provide an assessment of the condition of well 3559 and recommend rehabilitation options. Adam was onsite before and after well rehabilitation activities to perform a well inspection and produce video footage of the total length of the well column. Adam then authored the letter report summarizing S&W's findings. **August 2017 – November 2017.**

103762: UMIAQ Environmental, LLC, NARL Landfarm | Utqiagvik, AK. **Environmental Professional**. S&W was contracted to provide onsite QEP services for the remediation of a former bulk fuel storage site. Adam worked with UMIAQ personnel to oversee the excavation of POL contaminated soil and the construction of several landfarm cells. Over the span of several weeks, Adam oversaw daily operations in the landfarm cells including soil aeration, fertilization, and application of heat. Adam performed daily monitoring of the landfarmed soil for moisture content, temperature, nitrogen and phosphorous content, and hydrocarbon concentrations. Adam also performed limited site characterization activities to identify areas of contamination not addressed by the initial corrective action. **July 2019 – August 2019.**

103805: UIC, Kaktovik QEP Services | Kaktovik, AK. **Environmental Professional**. S&W was contracted to provide QEP services during the removal of contaminated material from the site of a former Air Force hanger in Kaktovik, AK. Adam field-screened soil and collected analytical samples during the excavation and containment of soil with known PCB contamination. Adam was onsite to observe the contaminated soil as it was loaded into

supersacks. Adam then oversaw the transfer of roughly 2,000 supersacks and stockpiled metal/concrete debris from the project site to an offshore lightering barge. On one occasion, Adam responded to a release when several supersacks ruptured during transport. Once the site was cleared, Adam field-screened the former staging areas to determine if contamination had spread to the ground surface. **August 2019.**

North Slope Borough (NSB) Projects

31111765: North Slope Borough Public Works, NSB Barrow Shop #2 ULSD Release | Barrow, AK.
Environmental Professional. S&W was contracted to respond to an ultra-low sulfur diesel (ULSD) release in an industrial yard. The scope of the project involved treating contaminated water along with the removal and containment of contaminated soil. Adam was onsite to guide the excavation of contaminated soil and oversee its containment in supersacks. Adam field-screened the excavation to identify hotspots, collected excavation extent analytical samples, collected waste characterization samples from containerized soil, and collected pre-treatment water samples from contaminated snowmelt and stormwater runoff recovered from the project site. Finally, Adam was responsible for reviewing the laboratory deliverables and drafting the environmental summary report. **2015.**

31111800: North Slope Borough Public Works, Wainwright Power Plant ULSD Release | Wainwright, AK.
Environmental Professional S&W was contracted to respond to an ultra-low sulfur diesel (ULSD) release that occurred beneath the Village of Wainwright's power plant. Adam worked with responders to erect an onsite enclosure to house a holding tank and granular activated carbon (GAC) treatment system. Adam then assisted with transferring impacted snow and water into the holding tank. The contained material was melted, and free product was recovered. The impacted water was treated onsite. Adam collected pre- and post-treatment water samples and confirmation soil samples from the release site. **Winter 2015.**

31111815: North Slope Borough, Wainwright TTLA Site Remediation | Wainwright, AK.**Environmental Professional**. S&W was contracted to respond to an ultra-low sulfur diesel (ULSD) release that occurred at the tank truck loading area (TTLA) in the Village of Wainwright's tank farm. Adam worked with spill response professionals to dewater the TTLA, treat the contaminated water using a portable granular activated carbon (GAC) water filtration system, excavate contaminated soil, and contain the contaminated soil in supersacks. Adam performed a limited site characterization including field-screening and collection of soil and water characterization samples. **2016.**

31111814: North Slope Borough Public Works, Kaktovik Tank Farm ULSD Release | Kaktovik, AK.
Environmental Professional. S&W was contracted to respond to an ultra-low sulfur diesel (ULSD) release that occurred within the secondary containment basin of the Kaktovik tank farm. Adam aided with the development of a remediation plan, which included designing a robust portable granular activated carbon (GAC) water treatment system and soil-washing solution. Adam remained onsite for several weeks guiding the soil-washing effort and operating the water-treatment system used to treat the recirculated rinse water. Adam periodically performed a total petroleum hydrocarbon (TPH) field analysis on water samples to verify the continued effectiveness of the GAC water treatment system. Following the soil-washing effort, Adam performed a limited site characterization to assess the effectiveness of the corrective action. Finally, Adam was responsible to reviewing the laboratory deliverables and co-authoring the environmental summary report. **May 2016 – September 2017.**

31111810: North Slope Borough Public Works, NSB Barrow Shop #2 Waste Disposal | Barrow, AK.
Environmental Professional. S&W was contracted to author and implement a waste disposal plan for containerized soil generated from several ultra-low sulfur diesel (ULSD) release sites. Adam co-authored the waste disposal plan, which involved using the containerized soil as a building material when constructing the exterior berms of a new landfill cell in Utqiagvik. Adam coordinated with the ADEC's Solid Waste Division to gain

approval of the disposal plan. Finally, Adam observed and documented the transportation process for all supersacks to their final disposal location at the Utqiagvik landfill. **Year(s) you worked on the project.**

31111846: North Slope Borough Public Works, Kaktovik Tank 70 Site Characterization | Kaktovik, AK. **Environmental Professional**. S&W was contracted to gather supplemental information following and initial response to an ultra-low sulfur diesel (ULSD) release that occurred at an NSB Public Works fuel dispenser. Adam arrived onsite to collect a sample of the fuel remaining in the tank while field-screening the surrounding area and collecting analytical soil samples from the expected flow path. **February 2017.**

105034: North Slope Borough, Kaktovik Transformer Release | Kaktovik, AK. **Environmental Professional**. S&W was contracted to respond to a release of transformer oil that occurred at a leaking transformer located immediately west of the Kaktovik tank farm. Adam assisted with initial containment of the leak, conducting a limited site characterization, and authoring the corrective action work plan. Adam oversaw the excavation and containment of contaminated soil and collected confirmation samples from the excavation. Analytical results show contamination remaining onsite where buried utilities made excavation impractical. Future corrective action is planned for 2020. **September 2017 – 2020/ongoing.**

Village Work

100022: Alaska Department of Environmental Conservation, Kaltag Landfarm | Kaltag, AK. **Environmental Professional**. S&W was contracted by the ADEC and the village of Kaltag to oversee the remediation to diesel contaminated soil excavated from a release site at the local school. The soil was placed in a landfarm that is tilled and sampled annually. Adam assisted with field-screening and sampling the soil contained in the landfarm following a tilling event. **October 2015.**

31120024: Yukon Koyukuk School District, Huslia Soil Assessment | Huslia, AK. **Environmental Professional**. S&W was contracted to respond to an ultra-low sulfur diesel (ULSD) release that occurred at the Huslia elementary school above-ground storage tank (AST). Adam worked with the school district's general contractor to guide the excavation of contaminated soil. During excavation activities, and unknown underground storage tank (UST) was encountered. Adam determined that a comingled fuel release was present and guided the excavation of the UST. The contaminated soil and UST were taken to a landfarm cell that had been constructed at the Huslia landfill. Following excavation activities, Adam field-screened and sampled the limits of the excavation and documented the placement of a separation layer and backfill. **October 2018.**

31120065: Guess & Rudd, Kiana Site Characterization | Kiana, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31120066: Rampart Village Council, Rampart Environmental Assessment | Rampart Village, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

State of Alaska Projects

102809: Alaska Department of Environmental Conservation, Well Water Sampling, DOT & PF Northway Airport Lease Lot | Northway, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

102896: Alaska Department of Transportation & Public Facilities, Yakutat DOT&PF PFAS | Yaktuat, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

103570: Alaska Department of Environmental Conservation, ADOT Peger Road 2019 | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31111729: Northern Region Supply Office, NR DOT&PF Class V Injection Well | Various Locations, AK. **Environmental Engineering Staff**. Assisted with soil boring description and analytical soil sample collection at the Cantwell site. Collected water samples from temporary well points. Aided with the collection of sludge samples from the DOT highway maintenance station sump and septic tank. Conducted an extensive review of the laboratory analytical data. **2016-2020/ongoing.**

31111822: Alaska Department of Environmental Conservation, Hales Tesoro Site Remediation | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **2015-2018/ongoing.**

31111843: Alaska Department of Environmental Conservation, 2017 Six Mile Richardson Hwy Monitoring | North Pole, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31120056: Alaska Department of Environmental Conservation, Miller Salvage, Inc. Property | Fairbanks, AK. **Environmental Professional**. Participated in the site characterization which involved groundwater sampling from temporary well points. Reviewed and analyzed laboratory analytical data. **2017-2019.**

Fairbanks North Star Borough (FNSB) Projects

102189: Fairbanks North Star Borough, FNSB Solid Waste Facility FY20 Enviro Consulting Services | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **2016 – 2020/ongoing.**

102920: City of North Pole, North Pole 8th Ave Fire-well Pump House | North Pole, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

103119: Fairbanks North Star Borough, North Pole Ice Rink Fuel Spill Cleanup | North Pole, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

104041: Fairbanks North Star Borough, Marika Road Warehouse | Fairbanks, AK **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

State-Wide Per- and Poly-Fluoroalkyl Substances (PFAS) Projects

31111735: City of Fairbanks Engineering, Regional Fire Training Center | Fairbanks, AK. **Environmental Professional**. S&W was contracted by the city of Fairbanks to delineate the extent of a per- and polyfluoroalkyl substances (PFAS) groundwater plume originating from the Regional Fire Training Center (RFTC). Adam routinely assists with residential and monitoring well sampling, laboratory data review, reporting results to private well owners, and drafting corrective action plans. **2016 - 2020/ongoing.**

102519: Fairbanks International Airport (FAI), Fairbanks International DOT&PF PFAS | Fairbanks, AK. **Environmental Professional**. In 2017 PFAS was detected in monitoring wells and surface-water bodies at and near the FAI, and there was concern that adjacent neighborhoods were affected. Adam was involved with residential well sampling, laboratory data review, and reporting results to private well owners. Adam has also been involved with planning and implementing corrective actions at one of the FAI source areas for PFAS contamination. These corrective actions involved the treatment of several hundred thousand gallons of contaminated water and the installation of controls to prevent future accumulation. ***November 2017 - 2020/ongoing*.**

***Phase 10: FAI Plume Stop Pilot Study, Fairbanks, AK*. Environmental Engineering Staff.** S&W worked with Regenesis and the FAI to conduct a pilot study aimed at determining the effectiveness of PlumeStop as an in-situ groundwater remediation solution within the FAI per- and polyfluoroalkyl substances (PFAS) groundwater plume. During this study, Adam has been responsible for acquiring permits and maintaining compliance with regulatory agencies including the EPA, ADEC, and FAA. Adam prepared and attained EPA permits to install monitoring wells and injection wells at the project site and then supervised their installation.

101543: Alaska Department of Administration, Division of Risk Management, Gustavus Airport PFAS | Gustavus Airport. **Environmental Professional**. In 2018, PFAS was detected in groundwater at the Gustavus airport. S&W was asked to assess residential impacts in accordance with our Statewide contract for PFAS response. S&W's experience and adaptive approach allowed for the delineation of the extent of private well impacts within three months. Adam regularly assists with drinking water-supply well sampling and analysis, data review and reporting, and treatment option assessment. Adam aids in the sampling and data review processes to provide drinking-water analytical results in a timely manner, without affecting the quality of deliverables. Adam is currently aiding with the development of point-of-entry treatment systems for affected properties. **August 2018 - 2020/ongoing.**

102599: Alaska Department of Transportation & Public Facilities, Gustavus DOT&PF PFAS | Gustavus, AK. **Environmental Professional**. Shannon & Wilson is contracted with the Alaska DOT & PF to perform PFAS sampling and associated work in support of corrective actions being carried out at the Gustavus PFAS groundwater plume. Adam's role in the project involves residential well sampling, site surveys, and aiding in the design of point of entry (POE) treatment systems. Adam works with Shannon & Wilson's subcontractor to design modular treatment system to provide potable water to the affected residents of Gustavus. ***January 2019 - 2020/ongoing*.**

102581: Alaska Department of Transportation & Public Facilities, Dillingham DOT&PF PFAS | Dillingham, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

102786: Alaska Department of Administration, Division of Risk Management, Dillingham Alternate Water | Dillingham, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

102582: Alaska Department of Transportation & Public Facilities, King Salmon DOT&PF PFAS | King Salmon, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

103039: Alaska Department of Environmental Conservation, Bloom Enterprises PFAS | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

Flint Hills Resources Alaska (FHRA) Projects

104582: Flint Hills Resources Alaska, LLC, FHRA NPT On-Site Services | North Pole, AK. **Environmental Professional**. S&W has maintained a long-term contract to provide environmental compliance services to FHRA to help meet state regulatory requirements. Adam's onsite duties have included collecting routine samples from the two onsite granular activated carbon (GAC) water treatment systems, collecting quarterly groundwater samples from the onsite monitoring well and recovery well networks, and collecting quarterly groundwater elevation data. Adam is also responsible for reviewing laboratory deliverables, maintaining an online database of historical sample results, and assisting with data consolidation and reporting. **May 2015 – 2020/ongoing.**

104583: Flint Hills Resources Alaska, LLC, FHRA NPT Off-Site Services | North Pole, AK. **Environmental Professional**. S&W has maintained a long-term contract to provide environmental compliance services to FHRA to help meet state regulatory requirements. Adam's off-site duties have included collecting quarterly groundwater samples from a robust monitoring well network, overseeing the installation and decommissioning of said monitoring wells, and participating in private well search operations. Adam is also responsible for reviewing laboratory deliverables from residential point-of-entry (POE) water treatment systems, maintaining an online database of historical sample results, and assisting with data consolidation and reporting. **May 2015 – 2020/ongoing.**

31120011: Flint Hills Resources AK, LLC., 2017 Residential Services | North Pole, AK. **Environmental Professional**. S&W has maintained a long-term contract to provide environmental compliance services to FHRA to help meet state regulatory requirements. Adam has been involved with an ongoing residential drinking-water assessment of private wells within the known sulfolane plume. Adam participated in quarterly sampling events at private residences. Adam was also responsible for reviewing laboratory deliverables and aiding in data reduction and reporting. **May 2015 - 2017.**

31111844: Flint Hills Resources AK, LLC, FHRA NPT 2017 Interim Recovery Well Rehabilitation | North Pole, AK. **Environmental Professional**. S&W has maintained a long-term contract to provide environmental compliance services to FHRA to help meet state regulatory requirements. Adam has been involved with efforts to maintain the recovery well network feeding the onsite groundwater treatment facilities. Rehabilitation of theses recovery wells meant boosting water yields by removing fouling and blockages from the well screen. This was accomplished by acidifying the water column, deploying a Hydro-Pulse throughout the length of the well screen, and conducting pumping tests. **2016 - 2017.**

31102483: Stantec Consulting, Flint Hills NP Water Distribution | North Pole, AK **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

Petro Star, Inc. Projects

105016: Petro Star, Inc., North Pole Tank Farm Permitting | Fairbanks, AK. **Environmental Professional**. S&W was contracted to perform a geotechnical design for a proposed bulk fuel storage facility and acquire the necessary permits. Adam worked with Petro Star and Fairbanks North Star Borough (FNSB) personnel to draft a floodplain permit application and supporting documentation. Adam referenced Federal Emergency Response Agency (FEMA) materials when making determinations about how to comply with all necessary regulations. **March 2020 – April 2020.**

100417: Petro Star, Inc., Petro Star USACE Chena Lakes Spill | North Pole, AK. **Environmental Professional**. S&W was contracted to implement corrective action at a heating oil release site outside the USACE building at Chena Lakes. The contaminated soil was to be excavated directly into rock trucks and brought to OIT for thermal

remediation. Adam was onsite to guide excavation activities by field-screening the limits of excavation and identifying hotspots. Adam collected confirmation soil samples at the conclusion of excavation activities, reviewed the laboratory data, and authored the environmental summary report. **June 2018 – July 2018.**

102542: Petro Star, Inc., Petro Star TPI Environmental Services | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

102564: Petro Star, Inc., Petro Star Sourdough Van Horn Environmental Services | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**
31111551: Petro Star Inc., Petro Star Refinery Spill | North Pole, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31111811: Petro Star Inc., Tank Farm Installation and Rehabilitation | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

Miscellaneous Projects for Private Clients

101939: Ben Lomond, Inc., Ben Lomond HOT Closures | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

102794: Alyeska Pipeline Service Company, Alyeska Nordale PFAS | Fairbanks, AK **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

102808: Colaska, Walsky Properties - Site Summary | North Pole, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

103568: Ryan Johnson, Black Diamond Spill | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

103729: Krausz Companies, Inc., BMES 2019 Drilling | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

103755: Denali Borough, FY20 Denali Borough Landfill - Enviro Services | Denali Borough, AK**. Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

103777: Gavora, Inc., Gavora 2019 Indoor Air Monitoring | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31102422: Utility Services of Alaska, Water Line Extension FBX to NP | Fairbanks to North Pole, AK. **Environmental Professional**. Project team tasks for the proposed water system included research and data

collection, planning and preliminary route evaluations, geotechnical risk analysis, site and subsurface explorations, laboratory testing, geologic hazard assessments, environmental site assessments, wetland and contaminated sites studies, environmental permitting and agency consultations, pipe permeation studies, project plan field reviews, cost estimations, and geotechnical design and construction recommendations. Adam assisted with Draft and Final reporting and writing permitting documents. **Year(s) you worked on the project.**

31111726: Young's Chevron Service, Former Young's Chevron Service | Fairbanks, AK. **Environmental Professional**. Reviewed the analytical laboratory data from S&W sampling efforts. Tabulated the data and created summary tables for the environmental site assessment report. **2015-2016.**

31111736: Golden Valley Electric Assoc., HCCP Well Design and Construction | Healy, AK. **Environmental Professional** Conducted step tests to measure the water production from Well #2 and oversaw the 24-hour pumping test. Deployed dataloggers in the wells and regularly downloaded the hydrologic data. Consulted with project managers from both Shannon & Wilson and GVEA. Monitored the drawdown rate and collected water samples for GVEA personnel. **2015.**

31111777: World Wide Movers Inc., WWM UST and UIC Closures | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31111785: UAF Facilities Services, UAF Physical Plant Source-Area | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31111790: Fairbanks Natural Gas, FNG Stockpile Sampling | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31111809: CEM leasing Inc., Interior Texaco | Delta Junction, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31111818: Williams Energy Services, Healy Creek Former Tank Farm | Healy, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31111832: Tim Woster, 1066 ELIZ RD Environmental Services | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31111837: College Utilities, GHU well Inspection Video | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31111850: Gavora, Inc., Shoppers Forum Mall Annex | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31120001: Utility Services of Alaska, FAI East Ramp Contaminated Soil | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31120005: Microcom, Microcom Office Building | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31120006: PDC Inc., GVEA North Pole Fuel Storage | North Pole, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31120013: Utility Services of Alaska, Chena Marina Waterline Extension | Fairbanks, AK. **Environmental Professional**. This project included Agency coordination and preparation and submittal of permits from a waterline expansion. Adam was responsible conducting a cultural resources assessment and acquiring a *General Waterway/Waterbody Permit* from the AK department of Fish and Game and a Fairbanks North Star Borough, Department of Community Planning *Floodplain Permit.* **Year(s) you worked on the project.**

31120030: Denali Borough, DB Landfill 2017-2018 Environmental Services | Denali Borough, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31120045: C & R Pipe and Steel, Inc., C&R Pipe Fuel Release | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31120047: Krausz Company, Inc., 2017 BMES Services | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

3112005: Peraton Inc., 11.3 Meter Antenna | Fairbanks, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

31120094: Roger Burggraf, Grant Mine Closure | Ester Dome, AK. **Environmental Professional**. Brief project write-up (short paragraph). Be specific regarding your services and include a project overview. **Year(s) you worked on the project.**

References:

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VESELINA YAKIMOVA
GEOLOGIST

Education:

BS, Earth Science (emphasis in Geology), University of Glasgow - 2015
Master of Science, Geosciences (emphasis in Structural Geology), University of Alaska Fairbanks - 2019

Registration / Certification:

CPR, First Aid, AED - (American Red Cross)
Hazardous Waste Operations & Emergency Response (HAZWOPER)
State of Alaska Qualified Sampler - (18 AAC 75, 18 AAC 78)

Based on her education and work experience, Veselina meets the requirements of a Qualified Environmental Professional, as defined by 18 Alaska Administrative Code (AAC) 75.333.

Professional Summary:

Veselina joined Shannon & Wilson (S&W) in January of 2020 following the completion of her master's degree in Geosciences. Since joining S&W, Veselina immediately became engaged in the DOT&PF Statewide Statewide Per- and Polyfluoroalkyl substances (PFAS) Environmental Services term contract. She has gained experience with coordinating subsurface explorations, door to door well searches, residential well sampling, field screening and sampling, data review and management, public relations, drafting Work Plans, and reporting.

Relevant Project Experience:

Alaska Department of Transportation & Public Facilities (DOT & PF), Gustavus Airport PFAS | Gustavus, AK (2020)

Field Geologist. Shannon & Wilson is the term contractor for the DOT&PF PFAS response in the remote community of Gustavus. Planning began within one day of project notification; less than two weeks after receiving notice to proceed S&W staff traveled to Gustavus to participate in a public meeting and identify drinking-water wells. Veselina was present for the September 2020 site visit and site characterization activities. Her responsibilities included scheduling sampling events with residents, sampling private wells and monitoring wells and shipping analytical samples for analysis.

DOT&PF, Nome DOT&PF PFAS | Nome, Alaska (2020-ongoing)

Field Geologist. Under the DOT&PF statewide PFAS environmental and engineering services contract, S&W initial site characterization activities for PFAS near the Nome Airport in Nome, Alaska. The scope of services included water supply well search and sampling, pre-investigation activities to include utility locates and permitting, soil characterization activities, groundwater characterization activities, laboratory analysis activities, and reporting. Veselina was responsible for collecting surface water and associated sediment samples, collecting surface soil samples, residential well searches, and residential well sampling.

DOT & PF, DOT & PF Statewide PFAS) | Various Locations, Alaska (2020)

Field Geologist. This project consists of PFAS private well sampling and other services near state-operated airports under the DOT&PF statewide PFAS environmental and engineering services contract. Veselina reviewed analytical data, prepared comprehensive data tables and results letters for private-well owners, and assisted in authoring the analytical section of annual reports.

DOT & PF/Alaska Department of Administration, Division of Risk Management, Fairbanks International Airport (FAI) PFAS | Fairbanks, Alaska (2020)

Field Geologist. In 2017 PFAS was detected in monitoring wells and surface-water bodies at and near the FAI, and there was concern that adjacent neighborhoods were affected. FAI retained S&W with an expedited contract to initiate a well search and sampling effort to determine the extent of groundwater contamination and its impact on residential water-supply wells throughout those neighborhoods. Other tasks included corrective action at the FAI fire-training pit, and a collaborative study of PlumeStop®, a remedial technology based on the injection of colloidal GAC to treat PFAS-contaminated groundwater. Veselina was responsible for collection of monitoring well samples at the FAI, data review, and assisting with reporting.

City of Fairbanks, City of Fairbanks Regional Fire Training Center (RFTC) | Fairbanks, AK (2020)

Field Geologist. This project consists of PFAS private well sampling and other services near the Fairbanks Regional Fire Training Center, under the City of Fairbanks Regional Fire Training Center Burn Pit Site Investigation services contract. Veselina collected private-water well and monitoring well samples for PFAS analysis. Her duties also included reviewing the analytical data and creating comprehensive data tables.

Flint Hills Resource Alaska, NPT 2020 Onsite Services | North Pole, Alaska (2020)

Field Geologist. Shannon & Wilson is responsible for onsite monitoring services for sulfolane plume associated with former FHRA North Pole Refinery. Veselina's duties included sampling monitoring wells for sulfolane, GRO, DRO, and BTEX analysis. She also reviewed the analytical data and prepared comprehensive data tables.

APPENDIX C: LABORATORY REPORT AND LDRC

Appendix C

Laboratory Report 320-63955-1 and LDRC

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

Laboratory Job ID: 320-63955-1
Client Project/Site: BET AFFF Site
Revision: 1

For:
Shannon & Wilson, Inc
2355 Hill Rd.
Fairbanks, Alaska 99709-5244

Attn: Ashley Jaramillo

Authorized for release by:
9/28/2020 12:49:54 PM

David Alltucker, Project Manager I
(916)374-4383
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Table of Contents

Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate recovery exceeds control limits

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate recovery exceeds control limits

GC Semi VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
B	Compound was found in the blank and sample.
H	Sample was prepped or analyzed beyond the specified holding time
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate recovery exceeds control limits

LCMS

Qualifier	Qualifier Description
*5	Isotope dilution analyte is outside acceptance limits.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
B	Compound was found in the blank and sample.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
G	The reported quantitation limit has been raised due to an exhibited elevated noise or matrix interference
I	Value is EMPC (estimated maximum possible concentration).
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 320-63955-1

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

Job Narrative
320-63955-1

Receipt
The samples were received on 8/25/2020 9:50 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 4.8º C and 7.8º C.

Receipt Exceptions
1 of 2 coolers was received out of temp. The cooler temp was 7.8c. Temp blank was provided. Ice received in ziploc bags that were separated by a thick layer of bubble wrap. The following sample listed were out of temp:
20BET-SS-C5 (320-63955-20), 2 of 3 containers were out of temp. 4 oz soil jar and 4 oz soil jar with MeOH.
20BET-SS-C10 (320-63955-23), 2 of 3 containers were out of temp. 4 oz soil jar and 4 oz soil jar with MeOH.
20BET-SS-D4 (320-63955-27), 2 of 3 containers were out of temp. 4 oz soil jar and 4 oz soil jar with MeOH.
20BET-SS-D10 (320-63955-31), 2 of 3 containers were out of temp. 4 oz soil jar and 4 oz soil jar with MeOH.
20BET-SS-E1 (320-63955-32), 20BET-SS-E2 (320-63955-33), 20BET-SS-E3 (320-63955-34), 20BET-SS-E4 (320-63955-35), 20BET-SS-E5 (320-63955-36), 20BET-SS-E6 (320-63955-37), 20BET-SS-E7 (320-63955-38), 20BET-SS-F1 (320-63955-39), 20BET-SS-F2 (320-63955-40), 20BET-SS-F3 (320-63955-41), 20BET-SS-F4 (320-63955-42), 20BET-SS-F5 (320-63955-43), 20BET-SS-F6 (320-63955-44), 20BET-SS-F7 (320-63955-45), 20BET-SS-F10 (320-63955-46), 20BET-SS-G1 (320-63955-47), 20BET-SS-G2 (320-63955-48), 20BET-SS-G3 (320-63955-49), 20BET-SS-G4 (320-63955-50), 20BET-SS-G5 (320-63955-51), 20BET-SS-G6 (320-63955-52), 20BET-SS-G7 (320-63955-53), 20BET-SS-G10 (320-63955-54), 20BET-Sub-01 (320-63955-55), 20BET-Sub-02 (320-63955-56), 20BET-Sub-02 (320-63955-56[MS]), 20BET-Sub-02 (320-63955-56[MSD]), 20BET-Sub-20 (320-63955-57), 20BET-Sub-03 (320-63955-58) and Trip Blank (320-63955-60), all containers belong to samples were all out of temp including MS/MSD for sample 56.

GC/MS VOA
Method 8260C: The continuing calibration verification (CCV) associated with batch 320-408442 recovered above the upper control limit for Bromomethane, Chloroethane and Trichlorofluoromethane. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated sample is impacted: (CCV 320-408442/3).

Method 8260C: The following samples were diluted to bring the concentration of target analytes within the calibration range: 20BET-SS-C5 (320-63955-20), 20BET-SS-C10 (320-63955-23), 20BET-SS-D4 (320-63955-27) and 20BET-SS-D10 (320-63955-31). Elevated reporting limits (RLs) are provided.

Method 8260C: Internal standard (ISTD) response for TBA-d9 for the following sample was outside acceptance criteria: 20BET-SS-D4 (320-63955-27). This ISTD does not correspond to any of the requested target compounds; therefore, the data have been reported.

Method AK101: Surrogate recovery for the following samples were outside the upper control limit: 20BET-Sub-01 (320-63955-55) and Trip Blank (320-63955-60). This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Method AK101: Surrogate recovery for Trifluorotoluene (TFT) in the following samples 20BET-Sub-20 (320-63955-57), was outside control limits. Several tests were run and it was found that the pre-spiked TFT in the sample jars was high, therefore samples with high TFT are reported. 20BET-Sub-20 (320-63955-57)

Method AK101: The surrogate recovery for Trifluorotoluene in the following sample 20BET-SS-C5 (320-63955-20), 20BET-SS-C10 (320-63955-23), 20BET-SS-D4 (320-63955-27), 20BET-SS-D10 (320-63955-31), 20BET-Sub-02 (320-63955-56) and 20BET-Sub-03 (320-63955-58) is outside of QC limit of 60-120%. However, per the method the QC limits are 50-150% for samples therefore data are reported. 20BET-SS-C5 (320-63955-20), 20BET-SS-C10 (320-63955-23), 20BET-SS-D4 (320-63955-27), 20BET-SS-D10 (320-63955-31), 20BET-Sub-02 (320-63955-56) and 20BET-Sub-03 (320-63955-58)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS Semi VOA
Methods 8270C SIM, 8270D SIM: The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision for preparation batch 320-405646 and 320-408031 and analytical batch 320-408409 was outside control limits. Sample matrix interference and

Job ID: 320-63955-1 (Continued)

Laboratory: Eurofins TestAmerica, Sacramento (Continued)

non-homogeneity is suspected.

Methods 8270C SIM, 8270D SIM: The response for the internal standard Perylene-d12 was outside of acceptance limits for the following sample: (320-63852-A-1-Y MSD). The sample shows evidence of matrix interference.

Method 8270D SIM: The following samples required a dilution due to the nature of the sample matrix: 20BET-SS-C5 (320-63955-20), 20BET-SS-D4 (320-63955-27), 20BET-SS-D10 (320-63955-31), 20BET-Sub-02 (320-63955-56), 20BET-Sub-20 (320-63955-57) and 20BET-Sub-03 (320-63955-58). Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

Method 8270D SIM: The following samples were diluted due to the nature of the sample matrix: 20BET-SS-C5 (320-63955-20), 20BET-SS-D4 (320-63955-27), 20BET-SS-D10 (320-63955-31), 20BET-Sub-01 (320-63955-55), 20BET-Sub-02 (320-63955-56), 20BET-Sub-20 (320-63955-57) and 20BET-Sub-03 (320-63955-58). Elevated reporting limits (RLs) are provided.

Method 8270D SIM: The following sample was diluted due to the nature of the sample matrix: 20BET-SS-C10 (320-63955-23). Elevated reporting limits (RLs) are provided.

Method 8270D SIM: Surrogate 2-Fluorobiphenyl (Surr), 2-methylnaphthalene-d10, and Nitrobenzene-d5 recovery for the following sample was outside control limits: 20BET-SS-C10 (320-63955-23). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA

Method AK102 & 103: The method blank for preparation batch 320-410567 and analytical batch 320-412344 contained DRO (nC10-<nC25) above the method detection limit. This target analyte concentration was less than half the reporting limit (1/2RL); therefore, re-extraction and re-analysis of samples was not performed.

Method AK102 & 103: The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 320-408389 and analytical batch 320-410385 recovered outside control limits for the following analytes: DRO (nC10-<nC25) The associated sample(s) was re-prepared outside holding time. Both sets of data have been reported.

Method AK102 & 103: Due to the high concentration of DRO (nC10-<nC25) and RRO (nC25-nC36), the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 320-408389 and analytical batch 320-410385 could not be evaluated for accuracy and precision.

Method AK102 & 103: The following samples were diluted due to abundance of target analytes: 20BET-SS-C5 (320-63955-20), 20BET-SS-C10 (320-63955-23), 20BET-SS-D4 (320-63955-27) and 20BET-SS-D10 (320-63955-31). As such, surrogate recoveries are below the calibration range or are not reported, and elevated reporting limits (RLs) are provided.

Method AK102 & 103: The following samples were diluted to bring the concentration of target analytes within the calibration range: 20BET-Sub-01 (320-63955-55), 20BET-Sub-02 (320-63955-56), 20BET-Sub-20 (320-63955-57), 20BET-Sub-03 (320-63955-58), (320-63955-B-58-C MS) and (320-63955-B-58-D MSD). Elevated reporting limits (RLs) are provided.

Method AK102 & 103: The following samples contained a hydrocarbon pattern in the diesel range; however, the elution pattern was earlier than the typical diesel fuel pattern used by the laboratory for quantitative purposes: 20BET-SS-C5 (320-63955-20), 20BET-SS-C10 (320-63955-23), 20BET-SS-D4 (320-63955-27), 20BET-SS-D10 (320-63955-31), 20BET-Sub-02 (320-63955-56), 20BET-Sub-20 (320-63955-57) and 20BET-Sub-03 (320-63955-58).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

LCMS

Method EPA 537(Mod): The first level standard from the initial calibration curve is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5amu; therefore, detection of the analyte serves as verification that the assigned mass is within +/- 0.5amu of the true value, which meets the DoD/DOE QSM tune criterion.

Job ID: 320-63955-1 (Continued)

Laboratory: Eurofins TestAmerica, Sacramento (Continued)

Method EPA 537(Mod): The method blank for preparation batch 320-407018 contained Perfluorooctanesulfonic acid (PFOS) above the reporting limit (RL). None of the samples associated with this method blank contained the target compound above the RL; therefore, re-extraction and/or re-analysis of samples were not performed.

Method EPA 537(Mod): The wide scale industrial use of PFAS compounds in everyday products makes these compounds ubiquitous. As such, laboratories must work tirelessly to minimize the impact of this upon the analytical support for PFAS determination. The laboratory uses single use supplies whenever possible and has an extensive cleaning procedure for extraction equipment that is re-used. However, despite these procedural controls laboratory artifacts are not an uncommon occurrence. Unfortunately, this was the situation with your samples in question. In these circumstances, positives in method blank (MB) >1/2 RL for PFOS, the laboratory did re-extract and re-analyze your samples. The same or similar results for PFOS were detected which did confirm that the initially reported result for PFOS was due to laboratory artifact. Please review these results against your data quality objectives (DQO) and primary compounds of concern for the site for significance. Eurofins TestAmerica continues to evaluate its processes to reduce/eliminate PFOS in future sample sets. We do apologize for any inconvenience this may have caused. Both sets of data are reported. 20BET-SS-A2 (320-63955-2), 20BET-SS-A3 (320-63955-3), 20BET-SS-A4 (320-63955-4), 20BET-SS-A5 (320-63955-5), 20BET-SS-A6 (320-63955-6), 20BET-SS-A7 (320-63955-7), 20BET-SS-A10 (320-63955-8), 20BET-SS-B1 (320-63955-9), 20BET-SS-B2 (320-63955-10), 20BET-SS-B3 (320-63955-11), 20BET-SS-B4 (320-63955-12), 20BET-SS-B5 (320-63955-13), 20BET-SS-B6 (320-63955-14), 20BET-SS-B7 (320-63955-15), 20BET-SS-C1 (320-63955-16), 20BET-SS-C2 (320-63955-17), 20BET-SS-C3 (320-63955-18), 20BET-SS-C4 (320-63955-19), 20BET-SS-C5 (320-63955-20), 20BET-SS-C5 (320-63955-20[MS]), 20BET-SS-C5 (320-63955-20[MSD]), (MB 320-407012/1-A) and (MB 320-408023/1-A)

Method EPA 537(Mod): The method blank for preparation batch 320-407012 contained Perfluorooctanesulfonic acid (PFOS) above the reporting limit (RL). None of the samples associated with this method blank contained the target compound; therefore, re-extraction of samples was not performed.

Method EPA 537(Mod): The wide scale industrial use of PFAS compounds in everyday products makes these compounds ubiquitous. As such, laboratories must work tirelessly to minimize the impact of this upon the analytical support for PFAS determination. The laboratory uses single use supplies whenever possible and has an extensive cleaning procedure for extraction equipment that is re-used. However, despite these procedural controls laboratory artifacts are not an uncommon occurrence. Unfortunately, this was the situation with your samples in question 20BET-SS-G4 (320-63955-50), 20BET-SS-G5 (320-63955-51), 20BET-SS-G6 (320-63955-52), 20BET-SS-G10 (320-63955-54) and (MB 320-407018/1-A). In these circumstances (positives in method blank (MB) >1/2 RL for Pefluorooctane sulfonic acid PFOS), the laboratory did re-extract and re-analyze your samples. The same or similar results for PFBA were detected which did confirm that the initially reported result for PFBA was due to laboratory artifact. Please review these results against your data quality objectives (DQO) and primary compounds of concern for the site for significance. Eurofins TestAmerica continues to evaluate its processes to reduce/eliminate PFBA in future sample sets. We do apologize for any inconvenience this may have caused. Both sets of data are reported.

Method EPA 537(Mod): The matrix spike (MS) recoveries for preparation batch 320-408367 and analytical batch 320-409188 were outside control limits for Perfluoroheptanoic acid (PFHpA). Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method EPA 537(Mod): The matrix spike / matrix spike duplicate (MS/MSD) precision for preparation batch 320-408367 and analytical batch 320-409188 was outside control limits for Perfluorotetradecanoic acid (PFTeDA). Sample matrix interference and/or non-homogeneity are suspected.

Method EPA 537(Mod): The matrix spike (MS) recovery for preparation batch 320-408368 and analytical batch 320-409209 was outside control limits for F-53B Major. Sample non-homogeneity is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method EPA 537(Mod): Due to the high concentration of Perfluorohexanoic acid (PFHxA), the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 320-408368 and analytical batch 320-409209 could not be evaluated for accuracy. The associated laboratory control sample (LCS) met acceptance criteria.

Method EPA 537(Mod): The matrix spike (MS) recoveries for preparation batch 320-409241 and analytical batch 320-409777 were outside control limits for several analytes. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Job ID: 320-63955-1 (Continued)

Laboratory: Eurofins TestAmerica, Sacramento (Continued)

Method EPA 537(Mod): The matrix spike/matrix spike duplicate (MS/MSD) precision for preparation batch 320-409241 and analytical batch 320-409777 were outside control limits for several analytes. Sample matrix interference and/or non-homogeneity is suspected.

Method EPA 537(Mod): Due to the high concentration of Perfluorohexanoic acid (PFHxA), the matrix spike/ matrix spike duplicate (MS/MSD) for preparation batch 320-407012 and analytical batch 320-407930 could not be evaluated for accuracy. The associated laboratory control sample (LCS) met acceptance criteria.

Method EPA 537(Mod): Due to the high concentration of Perfluorohexanoic acid (PFHxA), the matrix spike(MS) for preparation batch 320-409241 and analytical batch 320-410249 could not be evaluated for accuracy. The associated laboratory control sample (LCS) met acceptance criteria.

Method EPA 537(Mod): The "I" qualifier means the transition mass ratio for the indicated analyte was outside of the established ratio limits. The qualitative identification of the analyte(s) has/have some degree of uncertainty. However, analyst judgment was used to positively identify the analyte. 20BET-SS-F10 (320-63955-46), 20BET-SS-G2 (320-63955-48), 20BET-SS-G3 (320-63955-49), 20BET-SS-G4 (320-63955-50), 20BET-SS-G7 (320-63955-53), 20BET-SS-G10 (320-63955-54), 20BET-Sub-02 (320-63955-56) and 20BET-Sub-03 (320-63955-58)

Method EPA 537(Mod): The d3-NMeFOSAA Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: 20BET-SS-A2 (320-63955-2), 20BET-SS-A4 (320-63955-4), 20BET-SS-A5 (320-63955-5), 20BET-SS-A10 (320-63955-8), (LCS 320-407012/2-A) and (MB 320-407012/1-A). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s).

Method EPA 537(Mod): Isotope Dilution Analyte (IDA) recovery 13C4 PFOS is above the method recommended limit for the following samples: 20BET-SS-A4 (320-63955-4), 20BET-SS-A5 (320-63955-5), 20BET-SS-B3 (320-63955-11), 20BET-SS-B4 (320-63955-12) and 20BET-SS-B5 (320-63955-13). . Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method EPA 537(Mod): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for several analytes of the following sample: 20BET-SS-C3 (320-63955-18). This sample was re-extracted with improve IDA recovery. Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method EPA 537(Mod): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for 13C2 PFDoA of the following sample: 20BET-SS-C4 (320-63955-19). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method EPA 537(Mod): Several Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for the following samples: 20BET-SS-C5 (320-63955-20), 20BET-SS-C5 (320-63955-20[MS]) and 20BET-SS-C5 (320-63955-20[MSD]), 20BET-Sub-02 (320-63955-56), 20BET-Sub-02 (320-63955-56[MS]) 20BET-Sub-02 (320-63955-56[MSD]), and 20BET-Sub-03 (320-63955-58). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method EPA 537(Mod): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for 13C4 PFHpA in the following sample: 20BET-SS-D3 (320-63955-26). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method EPA 537(Mod): The Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit for d5-NEtFOSAA: (320-63955-A-41-D MSD). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample.

Method EPA 537(Mod): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for 13C2 PFUnA and 18O2 PFHxS in the following sample: 20BET-Sub-02 (320-63955-56[MSD]). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method EPA 537(Mod): The Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit for d5-NEtFOSAA and d3-NMeFOSAA: 20BET-Sub-20 (320-63955-57). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples.

Job ID: 320-63955-1 (Continued)

Laboratory: Eurofins TestAmerica, Sacramento (Continued)

Method EPA 537(Mod): Internal standard (ISTD) response for 13C2 PFOA for the following samples were outside acceptance criteria: 20BET-SS-A4 (320-63955-4) and 20BET-SS-B3 (320-63955-11). The ISTD is not used to quantitate the target analytes; therefore there is no impact on the data. The samples were re-analyzed with concurring results.

Method EPA 537(Mod): Results for samples 20BET-SS-A5 (320-63955-5), 20BET-SS-A10 (320-63955-8), 20BET-SS-B4 (320-63955-12), 20BET-SS-B5 (320-63955-13), 20BET-SS-C5 (320-63955-20), 20BET-SS-C5 (320-63955-20[MS]), 20BET-SS-C5 (320-63955-20[MSD]) 20BET-SS-C6 (320-63955-21), 20BET-SS-C10 (320-63955-23), 20BET-SS-D5 (320-63955-28), (320-63955-A-21-E MS), (320-63955-A-21-F MSD), 20BET-Sub-01 (320-63955-55), 20BET-Sub-02 (320-63955-56), 20BET-Sub-02 (320-63955-56[MS]), 20BET-Sub-02 (320-63955-56[MSD]), 20BET-Sub-20 (320-63955-57) and 20BET-Sub-03 (320-63955-58) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits.

Method EPA 537(Mod): The following sample exhibited matrix interferences for Perfluorohexanesulfonic acid (PFHxS) causing elevation of the reporting limit (RL): 20BET-Sub-20 (320-63955-57) . The RL for the affected analyte has been raised to be equal to the matrix, and a "G" qualifier applied.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method AK102: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with method AK102_103 solids in preparation batch 320-410567.

Method AK102: The following samples were re-prepared outside of preparation holding time due to low percent recovery in the laboratory control sample and laboratory control sample duplicate: 20BET-SS-C5 (320-63955-20), 20BET-SS-C10 (320-63955-23), 20BET-SS-D4 (320-63955-27), 20BET-SS-D10 (320-63955-31), 20BET-Sub-01 (320-63955-55), 20BET-Sub-02 (320-63955-56), 20BET-Sub-20 (320-63955-57) and 20BET-Sub-03 (320-63955-58). These samples are associated with method AK102_103 solids in preparation batch 320-410567.

Method SHAKE: The following sample is gray after final volume: 20BET-SS-B7 (320-63955-15).

Method SHAKE: The following sample was yellow after extraction/final volume: 20BET-SS-D5 (320-63955-28).

Method SHAKE: The following samples were observed to be gray after extraction/final volume: 20BET-SS-A5 (320-63955-5) and 20BET-SS-B7 (320-63955-15).

Method SHAKE: The following samples were gray after extraction:20BET-SS-D4 (320-63955-27) and 20BET-SS-D5 (320-63955-28).

Method SHAKE: The following sample was gray after extraction: 20BET-SS-E6 (320-63955-37).

Method SHAKE: The following samples are observed to be yellow after final voluming: 20BET-SS-F6 (320-63955-44), 20BET-SS-F7 (320-63955-45) and 20BET-SS-G2 (320-63955-48)

Method SHAKE: The following samples are observed to be yellow after final voluming: 20BET-SS-G6 (320-63955-52), 20BET-SS-G7 (320-63955-53), 20BET-Sub-01 (320-63955-55), 20BET-Sub-02 (320-63955-56), 20BET-Sub-02 (320-63955-56[MS]), 20BET-Sub-02 (320-63955-56[MSD]), 20BET-Sub-20 (320-63955-57) and 20BET-Sub-03 (320-63955-58)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Client Sample ID: 20BET-SS-A1 — Lab Sample ID: 320-63955-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	2.8		0.21	0.044	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.9		0.21	0.030	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.39		0.21	0.090	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.076	J	0.21	0.038	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-A2 — Lab Sample ID: 320-63955-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	8.3		0.21	0.045	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.4		0.21	0.031	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.26		0.21	0.092	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.043	J	0.21	0.038	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.3	B	0.53	0.21	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	0.49	J B	0.56	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-A3 — Lab Sample ID: 320-63955-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	11		0.24	0.050	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.8		0.24	0.035	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.67		0.24	0.10	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.32		0.24	0.043	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.090	J	0.24	0.026	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.064	J	0.24	0.037	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.6	B	0.60	0.24	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	1.3	B	0.57	0.23	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-A4 — Lab Sample ID: 320-63955-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	19		0.22	0.047	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.8		0.22	0.033	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1.2		0.22	0.097	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.28		0.22	0.040	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.33		0.22	0.025	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.15	J	0.22	0.040	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.3	B	0.56	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	1.9	B	0.54	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-A5 — Lab Sample ID: 320-63955-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	3.1		0.21	0.030	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1.2		0.21	0.089	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.31		0.21	0.037	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.26		0.21	0.023	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.067	J	0.21	0.037	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.9	B	0.52	0.21	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	24		0.41	0.087	ug/Kg	2	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	1.9	B	0.55	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Client Sample ID: 20BET-SS-A6 — Lab Sample ID: 320-63955-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	10		0.21	0.043	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.1		0.21	0.030	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1.1		0.21	0.089	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.16	J	0.21	0.037	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.15	J	0.21	0.023	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.6	B	0.52	0.21	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	0.79	B	0.55	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-A7 — Lab Sample ID: 320-63955-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	14		0.25	0.052	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.8		0.25	0.036	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1.1		0.25	0.11	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.14	J	0.25	0.045	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.048	J	0.25	0.027	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.091	J	0.25	0.038	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.40	J B	0.62	0.25	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	0.41	J B	0.60	0.24	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-A10 — Lab Sample ID: 320-63955-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	2.9		0.22	0.032	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.96		0.22	0.095	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.19	J	0.22	0.024	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.055	J	0.22	0.040	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.7	B	0.55	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	25		0.44	0.093	ug/Kg	2	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA) - DL	0.23	J	0.44	0.079	ug/Kg	2	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	3.0	B	1.1	0.44	ug/Kg	2	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-B1 — Lab Sample ID: 320-63955-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	1.5		0.21	0.044	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.59		0.21	0.030	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.23		0.21	0.090	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.47	J B	0.52	0.21	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	0.31	J B	0.51	0.20	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-B2 — Lab Sample ID: 320-63955-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	3.1		0.21	0.044	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.73		0.21	0.031	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.54		0.21	0.091	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.13	J	0.21	0.038	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.11	J	0.21	0.023	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.98	B	0.53	0.21	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 20BET-SS-B2 (Continued) — Lab Sample ID: 320-63955-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS) - RE	0.82	B	0.49	0.20	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-B3 — Lab Sample ID: 320-63955-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	15		0.21	0.044	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.5		0.21	0.030	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1.1		0.21	0.090	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.28		0.21	0.038	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.36		0.21	0.023	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.065	J	0.21	0.038	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.085	J	0.21	0.070	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.2	B	0.53	0.21	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	2.0	B	0.53	0.21	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-B4 — Lab Sample ID: 320-63955-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	1.7		0.21	0.091	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.35		0.21	0.023	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	47		1.1	0.22	ug/Kg	5	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	9.1		1.1	0.15	ug/Kg	5	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA) - DL	0.31	J	1.1	0.19	ug/Kg	5	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	2.8	B	2.7	1.1	ug/Kg	5	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	3.0	B	2.8	1.1	ug/Kg	5	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-B5 — Lab Sample ID: 320-63955-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	1.4		0.22	0.095	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.31		0.22	0.024	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.3	B	0.55	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	35		1.1	0.23	ug/Kg	5	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	3.5		1.1	0.16	ug/Kg	5	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA) - DL	0.37	J	1.1	0.20	ug/Kg	5	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	2.2	J B	2.7	1.1	ug/Kg	5	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-B6 — Lab Sample ID: 320-63955-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	2.0		0.20	0.042	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.65		0.20	0.029	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.37		0.20	0.085	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.047	J	0.20	0.036	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.35	J B	0.50	0.20	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	0.56	B	0.51	0.20	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 20BET-SS-B7 — Lab Sample ID: 320-63955-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	20		0.34	0.070	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.4		0.34	0.049	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1.4		0.34	0.14	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.80		0.34	0.060	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.34	J B	0.84	0.34	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	0.50	J B	0.89	0.36	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-C1 — Lab Sample ID: 320-63955-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	1.6		0.20	0.042	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.38		0.20	0.029	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.23		0.20	0.085	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.36	J B	0.50	0.20	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	0.68	B	0.53	0.21	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-C2 — Lab Sample ID: 320-63955-17

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	9.0		0.20	0.043	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.3		0.20	0.029	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.45		0.20	0.087	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.085	J	0.20	0.037	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.10	J	0.20	0.022	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.61	B	0.51	0.20	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	0.71	B	0.52	0.21	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-C3 — Lab Sample ID: 320-63955-18

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	16		0.21	0.043	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.2		0.21	0.030	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1.2		0.21	0.089	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.090	J	0.21	0.023	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.77	B	0.52	0.21	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA) - RE	0.22		0.22	0.039	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	1.6	B	0.54	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-C4 — Lab Sample ID: 320-63955-19

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	20		0.21	0.043	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.0		0.21	0.030	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.93		0.21	0.088	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.50		0.21	0.037	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.28		0.21	0.023	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.053	J	0.21	0.037	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.3	B	0.51	0.21	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	2.1	B	0.55	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 20BET-SS-C5 — Lab Sample ID: 320-63955-20

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	6400		130	9.1	ug/Kg	2	☼	8260C	Total/NA
1,3,5-Trimethylbenzene	8600		130	9.1	ug/Kg	2	☼	8260C	Total/NA
2-Butanone (MEK)	130	J	260	68	ug/Kg	2	☼	8260C	Total/NA
Isopropylbenzene	130		130	9.1	ug/Kg	2	☼	8260C	Total/NA
m-Xylene & p-Xylene	710		130	13	ug/Kg	2	☼	8260C	Total/NA
N-Propylbenzene	62	J	130	12	ug/Kg	2	☼	8260C	Total/NA
o-Xylene	4300		130	14	ug/Kg	2	☼	8260C	Total/NA
p-Isopropyltoluene	3600		130	4.2	ug/Kg	2	☼	8260C	Total/NA
sec-Butylbenzene	4500		130	6.2	ug/Kg	2	☼	8260C	Total/NA
tert-Butylbenzene	130		130	11	ug/Kg	2	☼	8260C	Total/NA
Xylenes, Total	5000		130	14	ug/Kg	2	☼	8260C	Total/NA
C6-C10 AK	420		13	2.6	mg/Kg	2	☼	AK101	Total/NA
Fluorene	91		58	7.4	ug/Kg	10	☼	8270D SIM	Total/NA
Naphthalene	890		58	7.7	ug/Kg	10	☼	8270D SIM	Total/NA
Phenanthrene	18	J	58	8.3	ug/Kg	10	☼	8270D SIM	Total/NA
DRO (nC10-<nC25)	10000	*	230	58	mg/Kg	100	☼	AK102 & 103	Total/NA
DRO (nC10-<nC25) - RE	9600	H B	230	58	mg/Kg	100	☼	AK102 & 103	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.2		0.22	0.032	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1.5		0.22	0.096	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.12	J	0.22	0.040	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.10	J	0.22	0.024	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.0	B	0.56	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	28		2.2	0.47	ug/Kg	10	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-C6 — Lab Sample ID: 320-63955-21

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	20	B	2.3	0.48	ug/Kg	10	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	8.3	F1	2.3	0.33	ug/Kg	10	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1.9	J	2.3	0.99	ug/Kg	10	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.95	J	2.3	0.42	ug/Kg	10	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.31	J	2.3	0.25	ug/Kg	10	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-C7 — Lab Sample ID: 320-63955-22

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	3.0	B	0.22	0.046	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.86		0.22	0.032	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.24		0.22	0.095	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.049	J	0.22	0.040	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.78	B	0.55	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-C10 — Lab Sample ID: 320-63955-23

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	8900		260	18	ug/Kg	4	☼	8260C	Total/NA
1,3,5-Trimethylbenzene	12000		260	18	ug/Kg	4	☼	8260C	Total/NA
2-Butanone (MEK)	160	J	510	130	ug/Kg	4	☼	8260C	Total/NA
Isopropylbenzene	170	J	260	18	ug/Kg	4	☼	8260C	Total/NA
m-Xylene & p-Xylene	880		260	26	ug/Kg	4	☼	8260C	Total/NA
N-Propylbenzene	110	J	260	24	ug/Kg	4	☼	8260C	Total/NA
o-Xylene	5500		260	27	ug/Kg	4	☼	8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 20BET-SS-C10 (Continued) — Lab Sample ID: 320-63955-23

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
p-Isopropyltoluene	4800		260	8.2	ug/Kg	4	☼	8260C	Total/NA
sec-Butylbenzene	6300		260	12	ug/Kg	4	☼	8260C	Total/NA
tert-Butylbenzene	190	J	260	21	ug/Kg	4	☼	8260C	Total/NA
Xylenes, Total	6400		260	27	ug/Kg	4	☼	8260C	Total/NA
C6-C10 AK	650		26	5.1	mg/Kg	4	☼	AK101	Total/NA
Acenaphthene	41	J	120	15	ug/Kg	20	☼	8270D SIM	Total/NA
Fluorene	71	J	120	15	ug/Kg	20	☼	8270D SIM	Total/NA
Naphthalene	1100		120	16	ug/Kg	20	☼	8270D SIM	Total/NA
DRO (nC10-<nC25)	10000	*	240	59	mg/Kg	100	☼	AK102 & 103	Total/NA
DRO (nC10-<nC25) - RE	9500	H B	230	57	mg/Kg	100	☼	AK102 & 103	Total/NA
Perfluorohexanoic acid (PFHxA)	27	B	1.1	0.24	ug/Kg	5	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.5		1.1	0.17	ug/Kg	5	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1.8		1.1	0.49	ug/Kg	5	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.0	J B	2.8	1.1	ug/Kg	5	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-D1 — Lab Sample ID: 320-63955-24

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	2.8	B	0.22	0.046	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.63		0.22	0.032	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.26		0.22	0.094	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.066	J	0.22	0.039	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.026	J	0.22	0.024	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.44	J B	0.54	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-D2 — Lab Sample ID: 320-63955-25

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	17	B	0.21	0.044	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.2		0.21	0.030	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.82		0.21	0.089	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.13	J	0.21	0.037	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.095	J	0.21	0.023	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.037	J	0.21	0.037	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.5	B	0.52	0.21	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-D3 — Lab Sample ID: 320-63955-26

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	17	B	0.22	0.047	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.7		0.22	0.032	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1.2		0.22	0.096	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.34		0.22	0.040	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.49		0.22	0.025	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.057	J	0.22	0.040	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.10	J	0.22	0.075	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.8	B	0.56	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-D4 — Lab Sample ID: 320-63955-27

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	6400		270	19	ug/Kg	4	☼	8260C	Total/NA
1,3,5-Trimethylbenzene	12000		270	19	ug/Kg	4	☼	8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 20BET-SS-D4 (Continued) — Lab Sample ID: 320-63955-27

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2-Butanone (MEK)	170	J	530	140	ug/Kg	4	☼	8260C	Total/NA
Isopropylbenzene	110	J	270	19	ug/Kg	4	☼	8260C	Total/NA
m-Xylene & p-Xylene	170	J	270	27	ug/Kg	4	☼	8260C	Total/NA
N-Propylbenzene	150	J	270	25	ug/Kg	4	☼	8260C	Total/NA
o-Xylene	2600		270	28	ug/Kg	4	☼	8260C	Total/NA
p-Isopropyltoluene	4400		270	8.5	ug/Kg	4	☼	8260C	Total/NA
sec-Butylbenzene	5400		270	13	ug/Kg	4	☼	8260C	Total/NA
tert-Butylbenzene	170	J	270	22	ug/Kg	4	☼	8260C	Total/NA
Xylenes, Total	2800		270	28	ug/Kg	4	☼	8260C	Total/NA
C6-C10 AK	420		27	5.3	mg/Kg	4	☼	AK101	Total/NA
Fluorene	73		55	7.0	ug/Kg	10	☼	8270D SIM	Total/NA
Naphthalene	990		55	7.3	ug/Kg	10	☼	8270D SIM	Total/NA
Phenanthrene	18	J	55	7.9	ug/Kg	10	☼	8270D SIM	Total/NA
DRO (nC10-<nC25)	9900	*	230	57	mg/Kg	100	☼	AK102 & 103	Total/NA
DRO (nC10-<nC25) - RE	10000	H B	230	58	mg/Kg	100	☼	AK102 & 103	Total/NA
Perfluorohexanoic acid (PFHxA)	21	B	0.24	0.049	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.3		0.24	0.034	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1.2		0.24	0.10	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.11	J	0.24	0.042	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.24		0.24	0.026	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.063	J	0.24	0.036	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.7	B	0.59	0.24	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-D5 — Lab Sample ID: 320-63955-28

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	120	B	1.4	0.29	ug/Kg	5	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	18		1.4	0.20	ug/Kg	5	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1.9		1.4	0.60	ug/Kg	5	☼	EPA 537(Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.35	J	1.4	0.22	ug/Kg	5	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.6	J B	3.5	1.4	ug/Kg	5	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-D6 — Lab Sample ID: 320-63955-29

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	4.4	B	0.22	0.045	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.67		0.22	0.031	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.36		0.22	0.093	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.25	J B	0.54	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-D7 — Lab Sample ID: 320-63955-30

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	4.3	B	0.22	0.046	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.91		0.22	0.032	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.36		0.22	0.094	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.3	B	0.55	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-D10 — Lab Sample ID: 320-63955-31

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	7000		250	18	ug/Kg	4	☼	8260C	Total/NA
1,3,5-Trimethylbenzene	11000		250	18	ug/Kg	4	☼	8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 20BET-SS-D10 (Continued) — Lab Sample ID: 320-63955-31

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2-Butanone (MEK)	140	J	510	130	ug/Kg	4	☼	8260C	Total/NA
Isopropylbenzene	130	J	250	18	ug/Kg	4	☼	8260C	Total/NA
m-Xylene & p-Xylene	140	J	250	25	ug/Kg	4	☼	8260C	Total/NA
N-Propylbenzene	160	J	250	24	ug/Kg	4	☼	8260C	Total/NA
o-Xylene	2200		250	26	ug/Kg	4	☼	8260C	Total/NA
p-Isopropyltoluene	3800		250	8.1	ug/Kg	4	☼	8260C	Total/NA
sec-Butylbenzene	5200		250	12	ug/Kg	4	☼	8260C	Total/NA
tert-Butylbenzene	140	J	250	21	ug/Kg	4	☼	8260C	Total/NA
Xylenes, Total	2300		250	26	ug/Kg	4	☼	8260C	Total/NA
C6-C10 AK	400		25	5.1	mg/Kg	4	☼	AK101	Total/NA
Fluorene	70		58	7.4	ug/Kg	10	☼	8270D SIM	Total/NA
Naphthalene	990		58	7.7	ug/Kg	10	☼	8270D SIM	Total/NA
Phenanthrene	18	J	58	8.3	ug/Kg	10	☼	8270D SIM	Total/NA
DRO (nC10-<nC25)	9000	*	230	57	mg/Kg	100	☼	AK102 & 103	Total/NA
DRO (nC10-<nC25) - RE	8900	H B	230	57	mg/Kg	100	☼	AK102 & 103	Total/NA
Perfluorohexanoic acid (PFHxA)	20		0.23	0.049	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.4		0.23	0.033	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1.3		0.23	0.099	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.11	J	0.23	0.042	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.27		0.23	0.025	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.8		0.58	0.23	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-E1 — Lab Sample ID: 320-63955-32

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	2.7		0.21	0.045	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.33		0.21	0.031	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.16	J	0.21	0.091	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.37	J	0.53	0.21	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-E2 — Lab Sample ID: 320-63955-33

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	7.4		0.22	0.045	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.62		0.22	0.031	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.42		0.22	0.093	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.039	J	0.22	0.024	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.41	J	0.54	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-E3 — Lab Sample ID: 320-63955-34

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	14		0.22	0.045	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.8		0.22	0.031	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.57		0.22	0.093	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.14	J	0.22	0.039	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.14	J	0.22	0.024	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.78		0.54	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-E4 — Lab Sample ID: 320-63955-35

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	8.7		0.21	0.045	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 20BET-SS-E4 (Continued) — Lab Sample ID: 320-63955-35

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	1.1		0.21	0.031	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.66		0.21	0.091	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.046	J	0.21	0.023	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.061	J	0.21	0.033	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.41	J	0.53	0.21	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-E5 — Lab Sample ID: 320-63955-36

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	2.6		0.21	0.045	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.2		0.21	0.031	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.43		0.21	0.092	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.081	J	0.21	0.038	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.034	J	0.21	0.024	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.055	J I	0.21	0.033	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-E6 — Lab Sample ID: 320-63955-37

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	5.1		0.24	0.050	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.91		0.24	0.035	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.49		0.24	0.10	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.079	J	0.24	0.043	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.051	J	0.24	0.037	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-E7 — Lab Sample ID: 320-63955-38

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	2.6		0.22	0.046	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.73		0.22	0.032	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.20	J	0.22	0.094	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.27	J	0.55	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-F1 — Lab Sample ID: 320-63955-39

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	4.4		0.22	0.047	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.81		0.22	0.032	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.17	J	0.22	0.095	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.33	J	0.55	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-F2 — Lab Sample ID: 320-63955-40

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	2.6		0.22	0.046	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.65		0.22	0.032	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.29		0.22	0.094	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.052	J	0.22	0.039	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.26	J	0.55	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-F3 — Lab Sample ID: 320-63955-41

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	5.0		0.22	0.046	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 20BET-SS-F3 (Continued) — Lab Sample ID: 320-63955-41

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	1.4		0.22	0.032	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.51		0.22	0.094	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.071	J	0.22	0.039	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.026	J	0.22	0.024	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.79	B	0.55	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-F4 — Lab Sample ID: 320-63955-42

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	3.1		0.21	0.044	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.49		0.21	0.030	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.36		0.21	0.090	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.36	J B	0.52	0.21	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-F5 — Lab Sample ID: 320-63955-43

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	2.5		0.21	0.045	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.50		0.21	0.031	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.29		0.21	0.092	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.46	J B	0.53	0.21	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-F6 — Lab Sample ID: 320-63955-44

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	7.1		0.23	0.048	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.0		0.23	0.033	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.23		0.23	0.099	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.056	J	0.23	0.041	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.048	J	0.23	0.036	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-F7 — Lab Sample ID: 320-63955-45

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	30		0.35	0.074	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	7.2		0.35	0.051	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.44		0.35	0.15	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.095	J	0.35	0.063	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-F10 — Lab Sample ID: 320-63955-46

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	4.4		0.21	0.045	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.74		0.21	0.031	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.17	J	0.21	0.092	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.057	J I	0.21	0.033	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.44	J B	0.53	0.21	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-G1 — Lab Sample ID: 320-63955-47

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	1.9		0.24	0.050	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.75		0.24	0.034	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.13	J	0.24	0.10	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 20BET-SS-G1 (Continued) — Lab Sample ID: 320-63955-47

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorononanoic acid (PFNA)	0.095	J	0.24	0.043	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.087	J	0.24	0.026	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.046	J	0.24	0.037	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.67	B	0.59	0.24	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-G2 — Lab Sample ID: 320-63955-48

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	6.2		0.23	0.048	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.8		0.23	0.033	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.19	J	0.23	0.098	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.045	J	0.23	0.041	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.091	J I	0.23	0.035	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.33	J B	0.57	0.23	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-G3 — Lab Sample ID: 320-63955-49

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	1.6		0.21	0.045	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.60		0.21	0.031	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.17	J	0.21	0.092	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.11	J	0.21	0.039	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.060	J I	0.21	0.033	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-G4 — Lab Sample ID: 320-63955-50

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	3.5		0.23	0.048	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.79		0.23	0.033	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.45		0.23	0.099	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.098	J I	0.23	0.036	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.46	J	0.57	0.23	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-G5 — Lab Sample ID: 320-63955-51

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	1.8		0.21	0.045	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.35		0.21	0.031	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.19	J	0.21	0.091	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.25	J	0.53	0.21	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-G6 — Lab Sample ID: 320-63955-52

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	5.0		0.23	0.048	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.1		0.23	0.033	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.36		0.23	0.098	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.24		0.23	0.041	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.034	J	0.23	0.025	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-G7 — Lab Sample ID: 320-63955-53

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	7.5		0.36	0.076	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 20BET-SS-G7 (Continued) — Lab Sample ID: 320-63955-53

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	3.7		0.36	0.053	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.12	J I	0.36	0.065	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.095	J	0.36	0.056	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-SS-G10 — Lab Sample ID: 320-63955-54

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	1.7		0.22	0.045	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.56		0.22	0.031	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.15	J	0.22	0.093	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.048	J	0.22	0.039	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.047	J I	0.22	0.033	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.52	J	0.54	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-Sub-01 — Lab Sample ID: 320-63955-55

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2-Butanone (MEK)	170		140	36	ug/Kg	1	☼	8260C	Total/NA
Acetone	110	J	700	70	ug/Kg	1	☼	8260C	Total/NA
Phenanthrene	12	J	62	8.9	ug/Kg	10	☼	8270D SIM	Total/NA
DRO (nC10-<nC25)	31	*	12	3.0	mg/Kg	5	☼	AK102 & 103	Total/NA
RRO (nC25-nC36)	200		120	23	mg/Kg	5	☼	AK102 & 103	Total/NA
DRO (nC10-<nC25) - RE	34	H B	12	3.1	mg/Kg	5	☼	AK102 & 103	Total/NA
RRO (nC25-nC36) - RE	210	H	120	23	mg/Kg	5	☼	AK102 & 103	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.2		0.24	0.035	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.10	J	0.24	0.10	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.96		0.61	0.24	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	38		2.4	0.51	ug/Kg	10	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-Sub-02 — Lab Sample ID: 320-63955-56

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	17	J	71	5.0	ug/Kg	1	☼	8260C	Total/NA
1,3,5-Trimethylbenzene	220		71	5.0	ug/Kg	1	☼	8260C	Total/NA
2-Butanone (MEK)	170		140	37	ug/Kg	1	☼	8260C	Total/NA
m-Xylene & p-Xylene	17	J	71	7.1	ug/Kg	1	☼	8260C	Total/NA
o-Xylene	46	J	71	7.4	ug/Kg	1	☼	8260C	Total/NA
sec-Butylbenzene	10	J	71	3.4	ug/Kg	1	☼	8260C	Total/NA
Toluene	19	J	71	6.4	ug/Kg	1	☼	8260C	Total/NA
Xylenes, Total	63	J	71	7.4	ug/Kg	1	☼	8260C	Total/NA
C6-C10 AK	11		7.1	1.4	mg/Kg	1	☼	AK101	Total/NA
Naphthalene	43	J	57	7.6	ug/Kg	10	☼	8270D SIM	Total/NA
Phenanthrene	9.2	J	57	8.2	ug/Kg	10	☼	8270D SIM	Total/NA
DRO (nC10-<nC25)	290	*	12	3.1	mg/Kg	5	☼	AK102 & 103	Total/NA
RRO (nC25-nC36)	180		120	23	mg/Kg	5	☼	AK102 & 103	Total/NA
DRO (nC10-<nC25) - RE	470	H B	12	3.1	mg/Kg	5	☼	AK102 & 103	Total/NA
RRO (nC25-nC36) - RE	270	H	120	23	mg/Kg	5	☼	AK102 & 103	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.93		0.25	0.036	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.24	J	0.25	0.11	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.047	J	0.25	0.044	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.085	J	0.25	0.027	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.038	J	0.25	0.031	ug/Kg	1	☼	EPA 537(Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 20BET-Sub-02 (Continued) — Lab Sample ID: 320-63955-56

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.65	I F1	0.25	0.038	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.39	J F2	0.62	0.25	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	43		2.5	0.52	ug/Kg	10	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-Sub-20 — Lab Sample ID: 320-63955-57

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,3,5-Trimethylbenzene	410		89	6.2	ug/Kg	1	☼	8260C	Total/NA
2-Butanone (MEK)	250		180	46	ug/Kg	1	☼	8260C	Total/NA
Acetone	89	J	890	89	ug/Kg	1	☼	8260C	Total/NA
o-Xylene	120		89	9.2	ug/Kg	1	☼	8260C	Total/NA
sec-Butylbenzene	17	J	89	4.2	ug/Kg	1	☼	8260C	Total/NA
Xylenes, Total	120		89	9.2	ug/Kg	1	☼	8260C	Total/NA
C6-C10 AK	10		8.9	1.8	mg/Kg	1	☼	AK101	Total/NA
Naphthalene	44	J	66	8.8	ug/Kg	10	☼	8270D SIM	Total/NA
Phenanthrene	10	J	66	9.5	ug/Kg	10	☼	8270D SIM	Total/NA
DRO (nC10-<nC25)	380	*	14	3.6	mg/Kg	5	☼	AK102 & 103	Total/NA
RRO (nC25-nC36)	290		140	27	mg/Kg	5	☼	AK102 & 103	Total/NA
DRO (nC10-<nC25) - RE	380	H B	14	3.6	mg/Kg	5	☼	AK102 & 103	Total/NA
RRO (nC25-nC36) - RE	300	H	140	27	mg/Kg	5	☼	AK102 & 103	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.4		0.28	0.041	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.48		0.28	0.12	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.10	J	0.28	0.051	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.16	J	0.28	0.031	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.1		0.71	0.28	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	45		2.8	0.60	ug/Kg	10	☼	EPA 537(Mod)	Total/NA

Client Sample ID: 20BET-Sub-03 — Lab Sample ID: 320-63955-58

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	26	J	64	4.5	ug/Kg	1	☼	8260C	Total/NA
1,3,5-Trimethylbenzene	75		64	4.5	ug/Kg	1	☼	8260C	Total/NA
2-Butanone (MEK)	160		130	33	ug/Kg	1	☼	8260C	Total/NA
Acetone	130	J	640	64	ug/Kg	1	☼	8260C	Total/NA
o-Xylene	67		64	6.7	ug/Kg	1	☼	8260C	Total/NA
p-Isopropyltoluene	12	J	64	2.0	ug/Kg	1	☼	8260C	Total/NA
Xylenes, Total	67		64	6.7	ug/Kg	1	☼	8260C	Total/NA
C6-C10 AK	3.2	J	6.4	1.3	mg/Kg	1	☼	AK101	Total/NA
Naphthalene	40	J	55	7.4	ug/Kg	10	☼	8270D SIM	Total/NA
Phenanthrene	11	J	55	7.9	ug/Kg	10	☼	8270D SIM	Total/NA
DRO (nC10-<nC25)	270	*	12	3.0	mg/Kg	5	☼	AK102 & 103	Total/NA
RRO (nC25-nC36)	280		120	23	mg/Kg	5	☼	AK102 & 103	Total/NA
DRO (nC10-<nC25) - RE	310	H B	12	3.0	mg/Kg	5	☼	AK102 & 103	Total/NA
RRO (nC25-nC36) - RE	380	H	120	23	mg/Kg	5	☼	AK102 & 103	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.6		0.22	0.032	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.64		0.22	0.096	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.11	J	0.22	0.040	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.097	J	0.22	0.025	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.91	I	0.22	0.035	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.3		0.56	0.22	ug/Kg	1	☼	EPA 537(Mod)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	44		2.2	0.47	ug/Kg	10	☼	EPA 537(Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Client Sample ID: Field Blank — Lab Sample ID: 320-63955-59

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.35	J B	1.7	0.15	ng/L	1		EPA 537(Mod)	Total/NA

Client Sample ID: Trip Blank — Lab Sample ID: 320-63955-60

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2-Butanone (MEK)	130		100	26	ug/Kg	1		8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 20BET-SS-A1

Date Collected: 08/19/20 07:55
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-1
Matrix: Solid
Percent Solids: 88.0

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**2.8**		0.21	0.044	ug/Kg	☼	08/26/20 21:33	08/29/20 08:36	1
Perfluoroheptanoic acid (PFHpA)	**1.9**		0.21	0.030	ug/Kg	☼	08/26/20 21:33	08/29/20 08:36	1
Perfluorooctanoic acid (PFOA)	**0.39**		0.21	0.090	ug/Kg	☼	08/26/20 21:33	08/29/20 08:36	1
Perfluorononanoic acid (PFNA)	**0.076**	**J**	0.21	0.038	ug/Kg	☼	08/26/20 21:33	08/29/20 08:36	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 08:36	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	08/26/20 21:33	08/29/20 08:36	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.070	ug/Kg	☼	08/26/20 21:33	08/29/20 08:36	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	08/26/20 21:33	08/29/20 08:36	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	08/26/20 21:33	08/29/20 08:36	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	08/26/20 21:33	08/29/20 08:36	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.033	ug/Kg	☼	08/26/20 21:33	08/29/20 08:36	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.53	0.21	ug/Kg	☼	08/26/20 21:33	08/29/20 08:36	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	08/26/20 21:33	08/29/20 08:36	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	08/26/20 21:33	08/29/20 08:36	1
F-53B Major	ND		0.21	0.028	ug/Kg	☼	08/26/20 21:33	08/29/20 08:36	1
HFPO-DA (GenX)	ND		0.26	0.12	ug/Kg	☼	08/26/20 21:33	08/29/20 08:36	1
F-53B Minor	ND		0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 08:36	1
DONA	ND		0.21	0.019	ug/Kg	☼	08/26/20 21:33	08/29/20 08:36	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*90*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:36*	*1*
13C2 PFDA	*88*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:36*	*1*
13C4 PFOS	*92*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:36*	*1*
d3-NMeFOSAA	*81*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:36*	*1*
d5-NEtFOSAA	*95*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:36*	*1*
13C3 HFPO-DA	*74*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:36*	*1*
18O2 PFHxS	*94*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:36*	*1*
13C3 PFBS	*86*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:36*	*1*
13C2 PFDoA	*91*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:36*	*1*
13C2 PFTeDA	*89*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:36*	*1*
13C5 PFNA	*97*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:36*	*1*
13C4 PFOA	*84*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:36*	*1*
13C2 PFUnA	*93*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:36*	*1*
13C4 PFHpA	*98*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:36*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**12.0**		0.1	0.1	%			08/27/20 11:52	1
Percent Solids	**88.0**		0.1	0.1	%			08/27/20 11:52	1

Client Sample ID: 20BET-SS-A2

Date Collected: 08/19/20 07:57
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-2
Matrix: Solid
Percent Solids: 88.1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**8.3**		0.21	0.045	ug/Kg	☼	08/26/20 21:33	08/29/20 08:45	1
Perfluoroheptanoic acid (PFHpA)	**2.4**		0.21	0.031	ug/Kg	☼	08/26/20 21:33	08/29/20 08:45	1
Perfluorooctanoic acid (PFOA)	**0.26**		0.21	0.092	ug/Kg	☼	08/26/20 21:33	08/29/20 08:45	1

Client Sample ID: 20BET-SS-A2

Date Collected: 08/19/20 07:57
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-2

Matrix: Solid
Percent Solids: 88.1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	**0.043**	**J**	0.21	0.038	ug/Kg	☼	08/26/20 21:33	08/29/20 08:45	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 08:45	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	08/26/20 21:33	08/29/20 08:45	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	08/26/20 21:33	08/29/20 08:45	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	08/26/20 21:33	08/29/20 08:45	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.058	ug/Kg	☼	08/26/20 21:33	08/29/20 08:45	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.027	ug/Kg	☼	08/26/20 21:33	08/29/20 08:45	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.033	ug/Kg	☼	08/26/20 21:33	08/29/20 08:45	1
Perfluorooctanesulfonic acid (PFOS)	**1.3**	**B**	0.53	0.21	ug/Kg	☼	08/26/20 21:33	08/29/20 08:45	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.42	ug/Kg	☼	08/26/20 21:33	08/29/20 08:45	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	08/26/20 21:33	08/29/20 08:45	1
F-53B Major	ND		0.21	0.029	ug/Kg	☼	08/26/20 21:33	08/29/20 08:45	1
HFPO-DA (GenX)	ND		0.27	0.12	ug/Kg	☼	08/26/20 21:33	08/29/20 08:45	1
F-53B Minor	ND		0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 08:45	1
DONA	ND		0.21	0.019	ug/Kg	☼	08/26/20 21:33	08/29/20 08:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*95*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:45*	*1*
13C2 PFDA	*94*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:45*	*1*
13C4 PFOS	*109*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:45*	*1*
d3-NMeFOSAA	*41*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 08:45*	*1*
d5-NEtFOSAA	*50*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:45*	*1*
13C3 HFPO-DA	*85*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:45*	*1*
18O2 PFHxS	*109*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:45*	*1*
13C3 PFBS	*97*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:45*	*1*
13C2 PFDoA	*105*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:45*	*1*
13C2 PFTeDA	*95*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:45*	*1*
13C5 PFNA	*106*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:45*	*1*
13C4 PFOA	*88*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:45*	*1*
13C2 PFUnA	*106*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:45*	*1*
13C4 PFHpA	*112*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:45*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**0.49**	**J B**	0.56	0.22	ug/Kg	☼	08/31/20 05:54	09/02/20 14:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*113*		*50 - 150*	*08/31/20 05:54*	*09/02/20 14:10*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**11.9**		0.1	0.1	%			08/27/20 11:52	1
Percent Solids	**88.1**		0.1	0.1	%			08/27/20 11:52	1

Client Sample ID: 20BET-SS-A3

Date Collected: 08/19/20 07:59
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-3

Matrix: Solid
Percent Solids: 82.1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**11**		0.24	0.050	ug/Kg	☼	08/26/20 21:33	08/29/20 10:50	1
Perfluoroheptanoic acid (PFHpA)	**1.8**		0.24	0.035	ug/Kg	☼	08/26/20 21:33	08/29/20 10:50	1
Perfluorooctanoic acid (PFOA)	**0.67**		0.24	0.10	ug/Kg	☼	08/26/20 21:33	08/29/20 10:50	1
Perfluorononanoic acid (PFNA)	**0.32**		0.24	0.043	ug/Kg	☼	08/26/20 21:33	08/29/20 10:50	1
Perfluorodecanoic acid (PFDA)	**0.090**	**J**	0.24	0.026	ug/Kg	☼	08/26/20 21:33	08/29/20 10:50	1
Perfluoroundecanoic acid (PFUnA)	ND		0.24	0.043	ug/Kg	☼	08/26/20 21:33	08/29/20 10:50	1
Perfluorododecanoic acid (PFDoA)	ND		0.24	0.080	ug/Kg	☼	08/26/20 21:33	08/29/20 10:50	1
Perfluorotridecanoic acid (PFTriA)	ND		0.24	0.061	ug/Kg	☼	08/26/20 21:33	08/29/20 10:50	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.24	0.065	ug/Kg	☼	08/26/20 21:33	08/29/20 10:50	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.24	0.030	ug/Kg	☼	08/26/20 21:33	08/29/20 10:50	1
Perfluorohexanesulfonic acid (PFHxS)	**0.064**	**J**	0.24	0.037	ug/Kg	☼	08/26/20 21:33	08/29/20 10:50	1
Perfluorooctanesulfonic acid (PFOS)	**1.6**	**B**	0.60	0.24	ug/Kg	☼	08/26/20 21:33	08/29/20 10:50	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.4	0.47	ug/Kg	☼	08/26/20 21:33	08/29/20 10:50	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.4	0.44	ug/Kg	☼	08/26/20 21:33	08/29/20 10:50	1
F-53B Major	ND		0.24	0.032	ug/Kg	☼	08/26/20 21:33	08/29/20 10:50	1
HFPO-DA (GenX)	ND		0.30	0.13	ug/Kg	☼	08/26/20 21:33	08/29/20 10:50	1
F-53B Minor	ND		0.24	0.026	ug/Kg	☼	08/26/20 21:33	08/29/20 10:50	1
DONA	ND		0.24	0.022	ug/Kg	☼	08/26/20 21:33	08/29/20 10:50	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*94*		*50 - 150*	*08/26/20 21:33*	*08/29/20 10:50*	*1*
13C2 PFDA	*91*		*50 - 150*	*08/26/20 21:33*	*08/29/20 10:50*	*1*
13C4 PFOS	*103*		*50 - 150*	*08/26/20 21:33*	*08/29/20 10:50*	*1*
d3-NMeFOSAA	*53*		*50 - 150*	*08/26/20 21:33*	*08/29/20 10:50*	*1*
d5-NEtFOSAA	*59*		*50 - 150*	*08/26/20 21:33*	*08/29/20 10:50*	*1*
13C3 HFPO-DA	*82*		*50 - 150*	*08/26/20 21:33*	*08/29/20 10:50*	*1*
18O2 PFHxS	*104*		*50 - 150*	*08/26/20 21:33*	*08/29/20 10:50*	*1*
13C3 PFBS	*94*		*50 - 150*	*08/26/20 21:33*	*08/29/20 10:50*	*1*
13C2 PFDoA	*97*		*50 - 150*	*08/26/20 21:33*	*08/29/20 10:50*	*1*
13C2 PFTeDA	*93*		*50 - 150*	*08/26/20 21:33*	*08/29/20 10:50*	*1*
13C5 PFNA	*104*		*50 - 150*	*08/26/20 21:33*	*08/29/20 10:50*	*1*
13C4 PFOA	*90*		*50 - 150*	*08/26/20 21:33*	*08/29/20 10:50*	*1*
13C2 PFUnA	*101*		*50 - 150*	*08/26/20 21:33*	*08/29/20 10:50*	*1*
13C4 PFHpA	*103*		*50 - 150*	*08/26/20 21:33*	*08/29/20 10:50*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**1.3**	**B**	0.57	0.23	ug/Kg	☼	08/31/20 05:54	09/02/20 14:20	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*68*		*50 - 150*	*08/31/20 05:54*	*09/02/20 14:20*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**17.9**		0.1	0.1	%			08/27/20 11:52	1
Percent Solids	**82.1**		0.1	0.1	%			08/27/20 11:52	1

Client Sample ID: 20BET-SS-A4

Date Collected: 08/19/20 08:01
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-4

Matrix: Solid
Percent Solids: 88.1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**19**		0.22	0.047	ug/Kg	☼	08/26/20 21:33	08/29/20 09:04	1
Perfluoroheptanoic acid (PFHpA)	**1.8**		0.22	0.033	ug/Kg	☼	08/26/20 21:33	08/29/20 09:04	1
Perfluorooctanoic acid (PFOA)	**1.2**		0.22	0.097	ug/Kg	☼	08/26/20 21:33	08/29/20 09:04	1
Perfluorononanoic acid (PFNA)	**0.28**		0.22	0.040	ug/Kg	☼	08/26/20 21:33	08/29/20 09:04	1
Perfluorodecanoic acid (PFDA)	**0.33**		0.22	0.025	ug/Kg	☼	08/26/20 21:33	08/29/20 09:04	1
Perfluoroundecanoic acid (PFUnA)	**0.15**	**J**	0.22	0.040	ug/Kg	☼	08/26/20 21:33	08/29/20 09:04	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.075	ug/Kg	☼	08/26/20 21:33	08/29/20 09:04	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.057	ug/Kg	☼	08/26/20 21:33	08/29/20 09:04	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.061	ug/Kg	☼	08/26/20 21:33	08/29/20 09:04	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.028	ug/Kg	☼	08/26/20 21:33	08/29/20 09:04	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.035	ug/Kg	☼	08/26/20 21:33	08/29/20 09:04	1
Perfluorooctanesulfonic acid (PFOS)	**3.3**	**B**	0.56	0.22	ug/Kg	☼	08/26/20 21:33	08/29/20 09:04	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.44	ug/Kg	☼	08/26/20 21:33	08/29/20 09:04	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.42	ug/Kg	☼	08/26/20 21:33	08/29/20 09:04	1
F-53B Major	ND		0.22	0.030	ug/Kg	☼	08/26/20 21:33	08/29/20 09:04	1
HFPO-DA (GenX)	ND		0.28	0.12	ug/Kg	☼	08/26/20 21:33	08/29/20 09:04	1
F-53B Minor	ND		0.22	0.025	ug/Kg	☼	08/26/20 21:33	08/29/20 09:04	1
DONA	ND		0.22	0.020	ug/Kg	☼	08/26/20 21:33	08/29/20 09:04	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*120*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:04*	*1*
13C2 PFDA	*123*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:04*	*1*
13C4 PFOS	*131*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:04*	*1*
d3-NMeFOSAA	*33*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 09:04*	*1*
d5-NEtFOSAA	*41*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 09:04*	*1*
13C3 HFPO-DA	*105*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:04*	*1*
18O2 PFHxS	*140*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:04*	*1*
13C3 PFBS	*121*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:04*	*1*
13C2 PFDoA	*137*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:04*	*1*
13C2 PFTeDA	*127*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:04*	*1*
13C5 PFNA	*140*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:04*	*1*
13C4 PFOA	*85*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:04*	*1*
13C2 PFUnA	*134*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:04*	*1*
13C4 PFHpA	*142*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:04*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**1.9**	**B**	0.54	0.22	ug/Kg	☼	08/31/20 05:54	09/02/20 14:29	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*209*	**5*	*50 - 150*	*08/31/20 05:54*	*09/02/20 14:29*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**11.9**		0.1	0.1	%			08/27/20 11:52	1
Percent Solids	**88.1**		0.1	0.1	%			08/27/20 11:52	1

Client Sample ID: 20BET-SS-A5

Date Collected: 08/19/20 08:03
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-5

Matrix: Solid
Percent Solids: 88.2

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**3.1**		0.21	0.030	ug/Kg	☼	08/26/20 21:33	08/29/20 09:13	1
Perfluorooctanoic acid (PFOA)	**1.2**		0.21	0.089	ug/Kg	☼	08/26/20 21:33	08/29/20 09:13	1
Perfluorononanoic acid (PFNA)	**0.31**		0.21	0.037	ug/Kg	☼	08/26/20 21:33	08/29/20 09:13	1
Perfluorodecanoic acid (PFDA)	**0.26**		0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 09:13	1
Perfluoroundecanoic acid (PFUnA)	**0.067**	**J**	0.21	0.037	ug/Kg	☼	08/26/20 21:33	08/29/20 09:13	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.069	ug/Kg	☼	08/26/20 21:33	08/29/20 09:13	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.053	ug/Kg	☼	08/26/20 21:33	08/29/20 09:13	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.056	ug/Kg	☼	08/26/20 21:33	08/29/20 09:13	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	08/26/20 21:33	08/29/20 09:13	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.032	ug/Kg	☼	08/26/20 21:33	08/29/20 09:13	1
Perfluorooctanesulfonic acid (PFOS)	**3.9**	**B**	0.52	0.21	ug/Kg	☼	08/26/20 21:33	08/29/20 09:13	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.40	ug/Kg	☼	08/26/20 21:33	08/29/20 09:13	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.38	ug/Kg	☼	08/26/20 21:33	08/29/20 09:13	1
F-53B Major	ND		0.21	0.028	ug/Kg	☼	08/26/20 21:33	08/29/20 09:13	1
HFPO-DA (GenX)	ND		0.26	0.11	ug/Kg	☼	08/26/20 21:33	08/29/20 09:13	1
F-53B Minor	ND		0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 09:13	1
DONA	ND		0.21	0.019	ug/Kg	☼	08/26/20 21:33	08/29/20 09:13	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDA	*110*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:13*	*1*
13C4 PFOS	*121*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:13*	*1*
d3-NMeFOSAA	*5*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 09:13*	*1*
d5-NEtFOSAA	*6*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 09:13*	*1*
13C3 HFPO-DA	*104*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:13*	*1*
18O2 PFHxS	*128*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:13*	*1*
13C3 PFBS	*114*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:13*	*1*
13C2 PFDoA	*118*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:13*	*1*
13C2 PFTeDA	*107*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:13*	*1*
13C5 PFNA	*131*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:13*	*1*
13C4 PFOA	*85*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:13*	*1*
13C2 PFUnA	*124*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:13*	*1*
13C4 PFHpA	*127*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:13*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**24**		0.41	0.087	ug/Kg	☼	08/26/20 21:33	08/30/20 03:11	2

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*106*		*50 - 150*	*08/26/20 21:33*	*08/30/20 03:11*	*2*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**1.9**	**B**	0.55	0.22	ug/Kg	☼	08/31/20 05:54	09/02/20 14:38	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*156*	**5*	*50 - 150*	*08/31/20 05:54*	*09/02/20 14:38*	*1*

Client Sample ID: 20BET-SS-A5

Lab Sample ID: 320-63955-5
Date Collected: 08/19/20 08:03
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 88.2

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**11.8**		0.1	0.1	%			08/27/20 11:52	1
Percent Solids	**88.2**		0.1	0.1	%			08/27/20 11:52	1

Client Sample ID: 20BET-SS-A6

Lab Sample ID: 320-63955-6
Date Collected: 08/19/20 08:05
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 88.7

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**10**		0.21	0.043	ug/Kg	☼	08/26/20 21:33	08/29/20 09:23	1
Perfluoroheptanoic acid (PFHpA)	**1.1**		0.21	0.030	ug/Kg	☼	08/26/20 21:33	08/29/20 09:23	1
Perfluorooctanoic acid (PFOA)	**1.1**		0.21	0.089	ug/Kg	☼	08/26/20 21:33	08/29/20 09:23	1
Perfluorononanoic acid (PFNA)	**0.16**	**J**	0.21	0.037	ug/Kg	☼	08/26/20 21:33	08/29/20 09:23	1
Perfluorodecanoic acid (PFDA)	**0.15**	**J**	0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 09:23	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.037	ug/Kg	☼	08/26/20 21:33	08/29/20 09:23	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.069	ug/Kg	☼	08/26/20 21:33	08/29/20 09:23	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.053	ug/Kg	☼	08/26/20 21:33	08/29/20 09:23	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.056	ug/Kg	☼	08/26/20 21:33	08/29/20 09:23	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	08/26/20 21:33	08/29/20 09:23	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.032	ug/Kg	☼	08/26/20 21:33	08/29/20 09:23	1
Perfluorooctanesulfonic acid (PFOS)	**1.6**	**B**	0.52	0.21	ug/Kg	☼	08/26/20 21:33	08/29/20 09:23	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.40	ug/Kg	☼	08/26/20 21:33	08/29/20 09:23	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.38	ug/Kg	☼	08/26/20 21:33	08/29/20 09:23	1
F-53B Major	ND		0.21	0.028	ug/Kg	☼	08/26/20 21:33	08/29/20 09:23	1
HFPO-DA (GenX)	ND		0.26	0.11	ug/Kg	☼	08/26/20 21:33	08/29/20 09:23	1
F-53B Minor	ND		0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 09:23	1
DONA	ND		0.21	0.019	ug/Kg	☼	08/26/20 21:33	08/29/20 09:23	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*118*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:23*	*1*
13C2 PFDA	*118*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:23*	*1*
13C4 PFOS	*137*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:23*	*1*
d3-NMeFOSAA	*62*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:23*	*1*
d5-NEtFOSAA	*73*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:23*	*1*
13C3 HFPO-DA	*106*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:23*	*1*
18O2 PFHxS	*136*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:23*	*1*
13C3 PFBS	*122*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:23*	*1*
13C2 PFDoA	*130*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:23*	*1*
13C2 PFTeDA	*125*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:23*	*1*
13C5 PFNA	*139*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:23*	*1*
13C4 PFOA	*92*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:23*	*1*
13C2 PFUnA	*132*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:23*	*1*
13C4 PFHpA	*137*		*50 - 150*	*08/26/20 21:33*	*08/29/20 09:23*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**0.79**	**B**	0.55	0.22	ug/Kg	☼	08/31/20 05:54	09/02/20 14:48	1

Client Sample ID: 20BET-SS-A6

Lab Sample ID: 320-63955-6

Date Collected: 08/19/20 08:05
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 88.7

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	138		50 - 150	08/31/20 05:54	09/02/20 14:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	11.3		0.1	0.1	%			08/27/20 11:52	1
Percent Solids	88.7		0.1	0.1	%			08/27/20 11:52	1

Client Sample ID: 20BET-SS-A7

Lab Sample ID: 320-63955-7

Date Collected: 08/19/20 08:07
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 76.6

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	14		0.25	0.052	ug/Kg	☼	08/26/20 21:33	08/29/20 09:32	1
Perfluoroheptanoic acid (PFHpA)	3.8		0.25	0.036	ug/Kg	☼	08/26/20 21:33	08/29/20 09:32	1
Perfluorooctanoic acid (PFOA)	1.1		0.25	0.11	ug/Kg	☼	08/26/20 21:33	08/29/20 09:32	1
Perfluorononanoic acid (PFNA)	0.14	J	0.25	0.045	ug/Kg	☼	08/26/20 21:33	08/29/20 09:32	1
Perfluorodecanoic acid (PFDA)	0.048	J	0.25	0.027	ug/Kg	☼	08/26/20 21:33	08/29/20 09:32	1
Perfluoroundecanoic acid (PFUnA)	ND		0.25	0.045	ug/Kg	☼	08/26/20 21:33	08/29/20 09:32	1
Perfluorododecanoic acid (PFDoA)	ND		0.25	0.083	ug/Kg	☼	08/26/20 21:33	08/29/20 09:32	1
Perfluorotridecanoic acid (PFTriA)	ND		0.25	0.063	ug/Kg	☼	08/26/20 21:33	08/29/20 09:32	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.25	0.067	ug/Kg	☼	08/26/20 21:33	08/29/20 09:32	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.25	0.031	ug/Kg	☼	08/26/20 21:33	08/29/20 09:32	1
Perfluorohexanesulfonic acid (PFHxS)	0.091	J	0.25	0.038	ug/Kg	☼	08/26/20 21:33	08/29/20 09:32	1
Perfluorooctanesulfonic acid (PFOS)	0.40	J B	0.62	0.25	ug/Kg	☼	08/26/20 21:33	08/29/20 09:32	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.5	0.48	ug/Kg	☼	08/26/20 21:33	08/29/20 09:32	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.5	0.46	ug/Kg	☼	08/26/20 21:33	08/29/20 09:32	1
F-53B Major	ND		0.25	0.033	ug/Kg	☼	08/26/20 21:33	08/29/20 09:32	1
HFPO-DA (GenX)	ND		0.31	0.14	ug/Kg	☼	08/26/20 21:33	08/29/20 09:32	1
F-53B Minor	ND		0.25	0.027	ug/Kg	☼	08/26/20 21:33	08/29/20 09:32	1
DONA	ND		0.25	0.022	ug/Kg	☼	08/26/20 21:33	08/29/20 09:32	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	87		50 - 150	08/26/20 21:33	08/29/20 09:32	1
13C2 PFDA	92		50 - 150	08/26/20 21:33	08/29/20 09:32	1
13C4 PFOS	115		50 - 150	08/26/20 21:33	08/29/20 09:32	1
d3-NMeFOSAA	69		50 - 150	08/26/20 21:33	08/29/20 09:32	1
d5-NEtFOSAA	85		50 - 150	08/26/20 21:33	08/29/20 09:32	1
13C3 HFPO-DA	77		50 - 150	08/26/20 21:33	08/29/20 09:32	1
18O2 PFHxS	109		50 - 150	08/26/20 21:33	08/29/20 09:32	1
13C3 PFBS	99		50 - 150	08/26/20 21:33	08/29/20 09:32	1
13C2 PFDoA	102		50 - 150	08/26/20 21:33	08/29/20 09:32	1
13C2 PFTeDA	100		50 - 150	08/26/20 21:33	08/29/20 09:32	1
13C5 PFNA	97		50 - 150	08/26/20 21:33	08/29/20 09:32	1
13C4 PFOA	78		50 - 150	08/26/20 21:33	08/29/20 09:32	1
13C2 PFUnA	102		50 - 150	08/26/20 21:33	08/29/20 09:32	1
13C4 PFHpA	100		50 - 150	08/26/20 21:33	08/29/20 09:32	1

Client Sample ID: 20BET-SS-A7

Lab Sample ID: 320-63955-7
Date Collected: 08/19/20 08:07
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 76.6

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**0.41**	**J B**	0.60	0.24	ug/Kg	☼	08/31/20 05:54	09/02/20 14:57	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*102*		*50 - 150*	*08/31/20 05:54*	*09/02/20 14:57*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**23.4**		0.1	0.1	%			08/27/20 11:52	1
Percent Solids	**76.6**		0.1	0.1	%			08/27/20 11:52	1

Client Sample ID: 20BET-SS-A10

Lab Sample ID: 320-63955-8
Date Collected: 08/19/20 07:53
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 86.9

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**2.9**		0.22	0.032	ug/Kg	☼	08/26/20 21:33	08/29/20 11:37	1
Perfluorooctanoic acid (PFOA)	**0.96**		0.22	0.095	ug/Kg	☼	08/26/20 21:33	08/29/20 11:37	1
Perfluorodecanoic acid (PFDA)	**0.19**	**J**	0.22	0.024	ug/Kg	☼	08/26/20 21:33	08/29/20 11:37	1
Perfluoroundecanoic acid (PFUnA)	**0.055**	**J**	0.22	0.040	ug/Kg	☼	08/26/20 21:33	08/29/20 11:37	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.074	ug/Kg	☼	08/26/20 21:33	08/29/20 11:37	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.056	ug/Kg	☼	08/26/20 21:33	08/29/20 11:37	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.060	ug/Kg	☼	08/26/20 21:33	08/29/20 11:37	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.028	ug/Kg	☼	08/26/20 21:33	08/29/20 11:37	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.034	ug/Kg	☼	08/26/20 21:33	08/29/20 11:37	1
Perfluorooctanesulfonic acid (PFOS)	**2.7**	**B**	0.55	0.22	ug/Kg	☼	08/26/20 21:33	08/29/20 11:37	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	08/26/20 21:33	08/29/20 11:37	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	08/26/20 21:33	08/29/20 11:37	1
F-53B Major	ND		0.22	0.030	ug/Kg	☼	08/26/20 21:33	08/29/20 11:37	1
HFPO-DA (GenX)	ND		0.28	0.12	ug/Kg	☼	08/26/20 21:33	08/29/20 11:37	1
F-53B Minor	ND		0.22	0.024	ug/Kg	☼	08/26/20 21:33	08/29/20 11:37	1
DONA	ND		0.22	0.020	ug/Kg	☼	08/26/20 21:33	08/29/20 11:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDA	*112*		*50 - 150*	*08/26/20 21:33*	*08/29/20 11:37*	*1*
13C4 PFOS	*141*		*50 - 150*	*08/26/20 21:33*	*08/29/20 11:37*	*1*
d3-NMeFOSAA	*46*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 11:37*	*1*
d5-NEtFOSAA	*50*		*50 - 150*	*08/26/20 21:33*	*08/29/20 11:37*	*1*
13C3 HFPO-DA	*115*		*50 - 150*	*08/26/20 21:33*	*08/29/20 11:37*	*1*
18O2 PFHxS	*145*		*50 - 150*	*08/26/20 21:33*	*08/29/20 11:37*	*1*
13C3 PFBS	*132*		*50 - 150*	*08/26/20 21:33*	*08/29/20 11:37*	*1*
13C2 PFDoA	*142*		*50 - 150*	*08/26/20 21:33*	*08/29/20 11:37*	*1*
13C2 PFTeDA	*127*		*50 - 150*	*08/26/20 21:33*	*08/29/20 11:37*	*1*
13C4 PFOA	*90*		*50 - 150*	*08/26/20 21:33*	*08/29/20 11:37*	*1*
13C2 PFUnA	*139*		*50 - 150*	*08/26/20 21:33*	*08/29/20 11:37*	*1*
13C4 PFHpA	*147*		*50 - 150*	*08/26/20 21:33*	*08/29/20 11:37*	*1*

Client Sample ID: 20BET-SS-A10

Lab Sample ID: 320-63955-8
Date Collected: 08/19/20 07:53
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 86.9

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	25		0.44	0.093	ug/Kg	☼	08/26/20 21:33	08/30/20 03:21	2
Perfluorononanoic acid (PFNA)	0.23	J	0.44	0.079	ug/Kg	☼	08/26/20 21:33	08/30/20 03:21	2

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*118*		*50 - 150*	*08/26/20 21:33*	*08/30/20 03:21*	*2*
13C5 PFNA	*125*		*50 - 150*	*08/26/20 21:33*	*08/30/20 03:21*	*2*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	3.0	B	1.1	0.44	ug/Kg	☼	08/31/20 05:54	09/02/20 17:55	2

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*89*		*50 - 150*	*08/31/20 05:54*	*09/02/20 17:55*	*2*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	13.1		0.1	0.1	%			08/27/20 11:52	1
Percent Solids	86.9		0.1	0.1	%			08/27/20 11:52	1

Client Sample ID: 20BET-SS-B1

Lab Sample ID: 320-63955-9
Date Collected: 08/19/20 08:12
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 92.4

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	1.5		0.21	0.044	ug/Kg	☼	08/26/20 21:33	08/29/20 12:05	1
Perfluoroheptanoic acid (PFHpA)	0.59		0.21	0.030	ug/Kg	☼	08/26/20 21:33	08/29/20 12:05	1
Perfluorooctanoic acid (PFOA)	0.23		0.21	0.090	ug/Kg	☼	08/26/20 21:33	08/29/20 12:05	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	08/26/20 21:33	08/29/20 12:05	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 12:05	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	08/26/20 21:33	08/29/20 12:05	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.070	ug/Kg	☼	08/26/20 21:33	08/29/20 12:05	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.053	ug/Kg	☼	08/26/20 21:33	08/29/20 12:05	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.056	ug/Kg	☼	08/26/20 21:33	08/29/20 12:05	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	08/26/20 21:33	08/29/20 12:05	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.032	ug/Kg	☼	08/26/20 21:33	08/29/20 12:05	1
Perfluorooctanesulfonic acid (PFOS)	0.47	J B	0.52	0.21	ug/Kg	☼	08/26/20 21:33	08/29/20 12:05	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	08/26/20 21:33	08/29/20 12:05	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	08/26/20 21:33	08/29/20 12:05	1
F-53B Major	ND		0.21	0.028	ug/Kg	☼	08/26/20 21:33	08/29/20 12:05	1
HFPO-DA (GenX)	ND		0.26	0.11	ug/Kg	☼	08/26/20 21:33	08/29/20 12:05	1
F-53B Minor	ND		0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 12:05	1
DONA	ND		0.21	0.019	ug/Kg	☼	08/26/20 21:33	08/29/20 12:05	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*100*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:05*	*1*
13C2 PFDA	*93*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:05*	*1*
13C4 PFOS	*92*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:05*	*1*
d3-NMeFOSAA	*80*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:05*	*1*
d5-NEtFOSAA	*77*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:05*	*1*

Client Sample ID: 20BET-SS-B1

Lab Sample ID: 320-63955-9
Date Collected: 08/19/20 08:12
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 92.4

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*85*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:05*	*1*
18O2 PFHxS	*100*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:05*	*1*
13C3 PFBS	*92*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:05*	*1*
13C2 PFDoA	*92*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:05*	*1*
13C2 PFTeDA	*96*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:05*	*1*
13C5 PFNA	*105*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:05*	*1*
13C4 PFOA	*89*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:05*	*1*
13C2 PFUnA	*90*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:05*	*1*
13C4 PFHpA	*101*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:05*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**0.31**	**J B**	0.51	0.20	ug/Kg	☼	08/31/20 05:54	09/02/20 15:06	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*92*		*50 - 150*	*08/31/20 05:54*	*09/02/20 15:06*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**7.6**		0.1	0.1	%			08/27/20 11:52	1
Percent Solids	**92.4**		0.1	0.1	%			08/27/20 11:52	1

Client Sample ID: 20BET-SS-B2

Lab Sample ID: 320-63955-10
Date Collected: 08/19/20 08:14
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 93.0

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**3.1**		0.21	0.044	ug/Kg	☼	08/26/20 21:33	08/29/20 12:14	1
Perfluoroheptanoic acid (PFHpA)	**0.73**		0.21	0.031	ug/Kg	☼	08/26/20 21:33	08/29/20 12:14	1
Perfluorooctanoic acid (PFOA)	**0.54**		0.21	0.091	ug/Kg	☼	08/26/20 21:33	08/29/20 12:14	1
Perfluorononanoic acid (PFNA)	**0.13**	**J**	0.21	0.038	ug/Kg	☼	08/26/20 21:33	08/29/20 12:14	1
Perfluorodecanoic acid (PFDA)	**0.11**	**J**	0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 12:14	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	08/26/20 21:33	08/29/20 12:14	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	08/26/20 21:33	08/29/20 12:14	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	08/26/20 21:33	08/29/20 12:14	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	08/26/20 21:33	08/29/20 12:14	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	08/26/20 21:33	08/29/20 12:14	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.033	ug/Kg	☼	08/26/20 21:33	08/29/20 12:14	1
Perfluorooctanesulfonic acid (PFOS)	**0.98**	**B**	0.53	0.21	ug/Kg	☼	08/26/20 21:33	08/29/20 12:14	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	08/26/20 21:33	08/29/20 12:14	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	08/26/20 21:33	08/29/20 12:14	1
F-53B Major	ND		0.21	0.029	ug/Kg	☼	08/26/20 21:33	08/29/20 12:14	1
HFPO-DA (GenX)	ND		0.26	0.12	ug/Kg	☼	08/26/20 21:33	08/29/20 12:14	1
F-53B Minor	ND		0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 12:14	1
DONA	ND		0.21	0.019	ug/Kg	☼	08/26/20 21:33	08/29/20 12:14	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*103*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:14*	*1*

Client Sample ID: 20BET-SS-B2

Lab Sample ID: 320-63955-10
Date Collected: 08/19/20 08:14
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 93.0

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	98		50 - 150	08/26/20 21:33	08/29/20 12:14	1
13C4 PFOS	99		50 - 150	08/26/20 21:33	08/29/20 12:14	1
d3-NMeFOSAA	62		50 - 150	08/26/20 21:33	08/29/20 12:14	1
d5-NEtFOSAA	64		50 - 150	08/26/20 21:33	08/29/20 12:14	1
13C3 HFPO-DA	85		50 - 150	08/26/20 21:33	08/29/20 12:14	1
18O2 PFHxS	98		50 - 150	08/26/20 21:33	08/29/20 12:14	1
13C3 PFBS	91		50 - 150	08/26/20 21:33	08/29/20 12:14	1
13C2 PFDoA	100		50 - 150	08/26/20 21:33	08/29/20 12:14	1
13C2 PFTeDA	104		50 - 150	08/26/20 21:33	08/29/20 12:14	1
13C5 PFNA	106		50 - 150	08/26/20 21:33	08/29/20 12:14	1
13C4 PFOA	92		50 - 150	08/26/20 21:33	08/29/20 12:14	1
13C2 PFUnA	103		50 - 150	08/26/20 21:33	08/29/20 12:14	1
13C4 PFHpA	104		50 - 150	08/26/20 21:33	08/29/20 12:14	1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.82	B	0.49	0.20	ug/Kg	☼	08/31/20 05:54	09/02/20 15:34	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	94		50 - 150	08/31/20 05:54	09/02/20 15:34	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	7.0		0.1	0.1	%			08/27/20 11:52	1
Percent Solids	93.0		0.1	0.1	%			08/27/20 11:52	1

Client Sample ID: 20BET-SS-B3

Lab Sample ID: 320-63955-11
Date Collected: 08/19/20 08:16
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 91.6

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	15		0.21	0.044	ug/Kg	☼	08/26/20 21:33	08/29/20 12:23	1
Perfluoroheptanoic acid (PFHpA)	1.5		0.21	0.030	ug/Kg	☼	08/26/20 21:33	08/29/20 12:23	1
Perfluorooctanoic acid (PFOA)	1.1		0.21	0.090	ug/Kg	☼	08/26/20 21:33	08/29/20 12:23	1
Perfluorononanoic acid (PFNA)	0.28		0.21	0.038	ug/Kg	☼	08/26/20 21:33	08/29/20 12:23	1
Perfluorodecanoic acid (PFDA)	0.36		0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 12:23	1
Perfluoroundecanoic acid (PFUnA)	0.065	J	0.21	0.038	ug/Kg	☼	08/26/20 21:33	08/29/20 12:23	1
Perfluorododecanoic acid (PFDoA)	0.085	J	0.21	0.070	ug/Kg	☼	08/26/20 21:33	08/29/20 12:23	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	08/26/20 21:33	08/29/20 12:23	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	08/26/20 21:33	08/29/20 12:23	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	08/26/20 21:33	08/29/20 12:23	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.033	ug/Kg	☼	08/26/20 21:33	08/29/20 12:23	1
Perfluorooctanesulfonic acid (PFOS)	2.2	B	0.53	0.21	ug/Kg	☼	08/26/20 21:33	08/29/20 12:23	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	08/26/20 21:33	08/29/20 12:23	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	08/26/20 21:33	08/29/20 12:23	1
F-53B Major	ND		0.21	0.028	ug/Kg	☼	08/26/20 21:33	08/29/20 12:23	1

Client Sample ID: 20BET-SS-B3

Date Collected: 08/19/20 08:16
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-11

Matrix: Solid
Percent Solids: 91.6

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA (GenX)	ND		0.26	0.12	ug/Kg	☼	08/26/20 21:33	08/29/20 12:23	1
F-53B Minor	ND		0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 12:23	1
DONA	ND		0.21	0.019	ug/Kg	☼	08/26/20 21:33	08/29/20 12:23	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*143*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:23*	*1*
13C2 PFDA	*109*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:23*	*1*
13C4 PFOS	*132*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:23*	*1*
d3-NMeFOSAA	*80*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:23*	*1*
d5-NEtFOSAA	*89*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:23*	*1*
13C3 HFPO-DA	*120*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:23*	*1*
18O2 PFHxS	*143*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:23*	*1*
13C3 PFBS	*134*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:23*	*1*
13C2 PFDoA	*129*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:23*	*1*
13C2 PFTeDA	*138*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:23*	*1*
13C5 PFNA	*150*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:23*	*1*
13C4 PFOA	*86*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:23*	*1*
13C2 PFUnA	*133*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:23*	*1*
13C4 PFHpA	*145*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:23*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**2.0**	**B**	0.53	0.21	ug/Kg	☼	08/31/20 05:54	09/02/20 15:44	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*177*	*5*	*50 - 150*	*08/31/20 05:54*	*09/02/20 15:44*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**8.4**		0.1	0.1	%			08/27/20 11:52	1
Percent Solids	**91.6**		0.1	0.1	%			08/27/20 11:52	1

Client Sample ID: 20BET-SS-B4

Date Collected: 08/19/20 08:18
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-12

Matrix: Solid
Percent Solids: 87.9

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**1.7**		0.21	0.091	ug/Kg	☼	08/26/20 21:33	08/29/20 12:33	1
Perfluorodecanoic acid (PFDA)	**0.35**		0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 12:33	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.027	ug/Kg	☼	08/26/20 21:33	08/29/20 12:33	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	08/26/20 21:33	08/29/20 12:33	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	08/26/20 21:33	08/29/20 12:33	1
F-53B Major	ND		0.21	0.029	ug/Kg	☼	08/26/20 21:33	08/29/20 12:33	1
HFPO-DA (GenX)	ND		0.27	0.12	ug/Kg	☼	08/26/20 21:33	08/29/20 12:33	1
F-53B Minor	ND		0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 12:33	1
DONA	ND		0.21	0.019	ug/Kg	☼	08/26/20 21:33	08/29/20 12:33	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDA	*80*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:33*	*1*

Client Sample ID: 20BET-SS-B4

Date Collected: 08/19/20 08:18
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-12
Matrix: Solid
Percent Solids: 87.9

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	163	*5	50 - 150	08/26/20 21:33	08/29/20 12:33	1
d3-NMeFOSAA	78		50 - 150	08/26/20 21:33	08/29/20 12:33	1
d5-NEtFOSAA	98		50 - 150	08/26/20 21:33	08/29/20 12:33	1
13C3 HFPO-DA	136		50 - 150	08/26/20 21:33	08/29/20 12:33	1
13C3 PFBS	150		50 - 150	08/26/20 21:33	08/29/20 12:33	1
13C4 PFOA	83		50 - 150	08/26/20 21:33	08/29/20 12:33	1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**47**		1.1	0.22	ug/Kg	☼	08/26/20 21:33	08/30/20 03:30	5
Perfluoroheptanoic acid (PFHpA)	**9.1**		1.1	0.15	ug/Kg	☼	08/26/20 21:33	08/30/20 03:30	5
Perfluorononanoic acid (PFNA)	**0.31**	**J**	1.1	0.19	ug/Kg	☼	08/26/20 21:33	08/30/20 03:30	5
Perfluoroundecanoic acid (PFUnA)	ND		1.1	0.19	ug/Kg	☼	08/26/20 21:33	08/30/20 03:30	5
Perfluorododecanoic acid (PFDoA)	ND		1.1	0.36	ug/Kg	☼	08/26/20 21:33	08/30/20 03:30	5
Perfluorotridecanoic acid (PFTriA)	ND		1.1	0.27	ug/Kg	☼	08/26/20 21:33	08/30/20 03:30	5
Perfluorotetradecanoic acid (PFTeA)	ND		1.1	0.29	ug/Kg	☼	08/26/20 21:33	08/30/20 03:30	5
Perfluorohexanesulfonic acid (PFHxS)	ND		1.1	0.16	ug/Kg	☼	08/26/20 21:33	08/30/20 03:30	5
Perfluorooctanesulfonic acid (PFOS)	**2.8**	**B**	2.7	1.1	ug/Kg	☼	08/26/20 21:33	08/30/20 03:30	5

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	107		50 - 150	08/26/20 21:33	08/30/20 03:30	5
13C4 PFOS	107		50 - 150	08/26/20 21:33	08/30/20 03:30	5
18O2 PFHxS	109		50 - 150	08/26/20 21:33	08/30/20 03:30	5
13C2 PFDoA	103		50 - 150	08/26/20 21:33	08/30/20 03:30	5
13C2 PFTeDA	102		50 - 150	08/26/20 21:33	08/30/20 03:30	5
13C5 PFNA	110		50 - 150	08/26/20 21:33	08/30/20 03:30	5
13C2 PFUnA	104		50 - 150	08/26/20 21:33	08/30/20 03:30	5
13C4 PFHpA	112		50 - 150	08/26/20 21:33	08/30/20 03:30	5

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**3.0**	**B**	2.8	1.1	ug/Kg	☼	08/31/20 05:54	09/02/20 17:36	5

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	85		50 - 150	08/31/20 05:54	09/02/20 17:36	5

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**12.1**		0.1	0.1	%			08/27/20 11:52	1
Percent Solids	**87.9**		0.1	0.1	%			08/27/20 11:52	1

Client Sample ID: 20BET-SS-B5

Date Collected: 08/19/20 08:20
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-13
Matrix: Solid
Percent Solids: 86.6

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**1.4**		0.22	0.095	ug/Kg	☼	08/26/20 21:33	08/29/20 12:42	1
Perfluorodecanoic acid (PFDA)	**0.31**		0.22	0.024	ug/Kg	☼	08/26/20 21:33	08/29/20 12:42	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.057	ug/Kg	☼	08/26/20 21:33	08/29/20 12:42	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.028	ug/Kg	☼	08/26/20 21:33	08/29/20 12:42	1

Client Sample ID: 20BET-SS-B5

Date Collected: 08/19/20 08:20
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-13

Matrix: Solid
Percent Solids: 86.6

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**2.3**	**B**	0.55	0.22	ug/Kg	☼	08/26/20 21:33	08/29/20 12:42	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	08/26/20 21:33	08/29/20 12:42	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	08/26/20 21:33	08/29/20 12:42	1
F-53B Major	ND		0.22	0.030	ug/Kg	☼	08/26/20 21:33	08/29/20 12:42	1
HFPO-DA (GenX)	ND		0.28	0.12	ug/Kg	☼	08/26/20 21:33	08/29/20 12:42	1
F-53B Minor	ND		0.22	0.024	ug/Kg	☼	08/26/20 21:33	08/29/20 12:42	1
DONA	ND		0.22	0.020	ug/Kg	☼	08/26/20 21:33	08/29/20 12:42	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDA	*119*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:42*	*1*
13C4 PFOS	*157*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 12:42*	*1*
d3-NMeFOSAA	*85*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:42*	*1*
d5-NEtFOSAA	*101*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:42*	*1*
13C3 HFPO-DA	*130*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:42*	*1*
13C3 PFBS	*144*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:42*	*1*
13C4 PFOA	*83*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:42*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**35**		1.1	0.23	ug/Kg	☼	08/26/20 21:33	08/30/20 03:39	5
Perfluoroheptanoic acid (PFHpA)	**3.5**		1.1	0.16	ug/Kg	☼	08/26/20 21:33	08/30/20 03:39	5
Perfluorononanoic acid (PFNA)	**0.37**	**J**	1.1	0.20	ug/Kg	☼	08/26/20 21:33	08/30/20 03:39	5
Perfluoroundecanoic acid (PFUnA)	ND		1.1	0.20	ug/Kg	☼	08/26/20 21:33	08/30/20 03:39	5
Perfluorododecanoic acid (PFDoA)	ND		1.1	0.37	ug/Kg	☼	08/26/20 21:33	08/30/20 03:39	5
Perfluorotetradecanoic acid (PFTeA)	ND		1.1	0.30	ug/Kg	☼	08/26/20 21:33	08/30/20 03:39	5
Perfluorohexanesulfonic acid (PFHxS)	ND		1.1	0.17	ug/Kg	☼	08/26/20 21:33	08/30/20 03:39	5

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*110*		*50 - 150*	*08/26/20 21:33*	*08/30/20 03:39*	*5*
18O2 PFHxS	*107*		*50 - 150*	*08/26/20 21:33*	*08/30/20 03:39*	*5*
13C2 PFDoA	*103*		*50 - 150*	*08/26/20 21:33*	*08/30/20 03:39*	*5*
13C2 PFTeDA	*105*		*50 - 150*	*08/26/20 21:33*	*08/30/20 03:39*	*5*
13C5 PFNA	*104*		*50 - 150*	*08/26/20 21:33*	*08/30/20 03:39*	*5*
13C2 PFUnA	*107*		*50 - 150*	*08/26/20 21:33*	*08/30/20 03:39*	*5*
13C4 PFHpA	*109*		*50 - 150*	*08/26/20 21:33*	*08/30/20 03:39*	*5*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**2.2**	**J B**	2.7	1.1	ug/Kg	☼	08/31/20 05:54	09/02/20 17:46	5

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*95*		*50 - 150*	*08/31/20 05:54*	*09/02/20 17:46*	*5*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**13.4**		0.1	0.1	%			08/27/20 11:52	1
Percent Solids	**86.6**		0.1	0.1	%			08/27/20 11:52	1

Client Sample ID: 20BET-SS-B6

Date Collected: 08/19/20 08:22
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-14

Matrix: Solid
Percent Solids: 92.5

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**2.0**		0.20	0.042	ug/Kg	☼	08/26/20 21:33	08/29/20 12:51	1
Perfluoroheptanoic acid (PFHpA)	**0.65**		0.20	0.029	ug/Kg	☼	08/26/20 21:33	08/29/20 12:51	1
Perfluorooctanoic acid (PFOA)	**0.37**		0.20	0.085	ug/Kg	☼	08/26/20 21:33	08/29/20 12:51	1
Perfluorononanoic acid (PFNA)	**0.047**	**J**	0.20	0.036	ug/Kg	☼	08/26/20 21:33	08/29/20 12:51	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg	☼	08/26/20 21:33	08/29/20 12:51	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg	☼	08/26/20 21:33	08/29/20 12:51	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.066	ug/Kg	☼	08/26/20 21:33	08/29/20 12:51	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg	☼	08/26/20 21:33	08/29/20 12:51	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg	☼	08/26/20 21:33	08/29/20 12:51	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg	☼	08/26/20 21:33	08/29/20 12:51	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg	☼	08/26/20 21:33	08/29/20 12:51	1
Perfluorooctanesulfonic acid (PFOS)	**0.35**	**J B**	0.50	0.20	ug/Kg	☼	08/26/20 21:33	08/29/20 12:51	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg	☼	08/26/20 21:33	08/29/20 12:51	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg	☼	08/26/20 21:33	08/29/20 12:51	1
F-53B Major	ND		0.20	0.027	ug/Kg	☼	08/26/20 21:33	08/29/20 12:51	1
HFPO-DA (GenX)	ND		0.25	0.11	ug/Kg	☼	08/26/20 21:33	08/29/20 12:51	1
F-53B Minor	ND		0.20	0.022	ug/Kg	☼	08/26/20 21:33	08/29/20 12:51	1
DONA	ND		0.20	0.018	ug/Kg	☼	08/26/20 21:33	08/29/20 12:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*105*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:51*	*1*
13C2 PFDA	*103*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:51*	*1*
13C4 PFOS	*102*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:51*	*1*
d3-NMeFOSAA	*76*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:51*	*1*
d5-NEtFOSAA	*74*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:51*	*1*
13C3 HFPO-DA	*88*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:51*	*1*
18O2 PFHxS	*107*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:51*	*1*
13C3 PFBS	*98*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:51*	*1*
13C2 PFDoA	*101*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:51*	*1*
13C2 PFTeDA	*102*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:51*	*1*
13C5 PFNA	*109*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:51*	*1*
13C4 PFOA	*92*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:51*	*1*
13C2 PFUnA	*102*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:51*	*1*
13C4 PFHpA	*106*		*50 - 150*	*08/26/20 21:33*	*08/29/20 12:51*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**0.56**	**B**	0.51	0.20	ug/Kg	☼	08/31/20 05:54	09/02/20 15:53	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*75*		*50 - 150*	*08/31/20 05:54*	*09/02/20 15:53*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**7.5**		0.1	0.1	%			08/27/20 11:52	1
Percent Solids	**92.5**		0.1	0.1	%			08/27/20 11:52	1

Client Sample ID: 20BET-SS-B7

Date Collected: 08/19/20 08:24
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-15

Matrix: Solid
Percent Solids: 55.4

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**20**		0.34	0.070	ug/Kg	☼	08/26/20 21:33	08/29/20 13:01	1
Perfluoroheptanoic acid (PFHpA)	**6.4**		0.34	0.049	ug/Kg	☼	08/26/20 21:33	08/29/20 13:01	1
Perfluorooctanoic acid (PFOA)	**1.4**		0.34	0.14	ug/Kg	☼	08/26/20 21:33	08/29/20 13:01	1
Perfluorononanoic acid (PFNA)	**0.80**		0.34	0.060	ug/Kg	☼	08/26/20 21:33	08/29/20 13:01	1
Perfluorodecanoic acid (PFDA)	ND		0.34	0.037	ug/Kg	☼	08/26/20 21:33	08/29/20 13:01	1
Perfluoroundecanoic acid (PFUnA)	ND		0.34	0.060	ug/Kg	☼	08/26/20 21:33	08/29/20 13:01	1
Perfluorododecanoic acid (PFDoA)	ND		0.34	0.11	ug/Kg	☼	08/26/20 21:33	08/29/20 13:01	1
Perfluorotridecanoic acid (PFTriA)	ND		0.34	0.085	ug/Kg	☼	08/26/20 21:33	08/29/20 13:01	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.34	0.090	ug/Kg	☼	08/26/20 21:33	08/29/20 13:01	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.34	0.042	ug/Kg	☼	08/26/20 21:33	08/29/20 13:01	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.34	0.052	ug/Kg	☼	08/26/20 21:33	08/29/20 13:01	1
Perfluorooctanesulfonic acid (PFOS)	**0.34**	**J B**	0.84	0.34	ug/Kg	☼	08/26/20 21:33	08/29/20 13:01	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		3.4	0.65	ug/Kg	☼	08/26/20 21:33	08/29/20 13:01	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		3.4	0.62	ug/Kg	☼	08/26/20 21:33	08/29/20 13:01	1
F-53B Major	ND		0.34	0.045	ug/Kg	☼	08/26/20 21:33	08/29/20 13:01	1
HFPO-DA (GenX)	ND		0.42	0.18	ug/Kg	☼	08/26/20 21:33	08/29/20 13:01	1
F-53B Minor	ND		0.34	0.037	ug/Kg	☼	08/26/20 21:33	08/29/20 13:01	1
DONA	ND		0.34	0.030	ug/Kg	☼	08/26/20 21:33	08/29/20 13:01	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*104*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:01*	*1*
13C2 PFDA	*93*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:01*	*1*
13C4 PFOS	*127*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:01*	*1*
d3-NMeFOSAA	*77*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:01*	*1*
d5-NEtFOSAA	*92*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:01*	*1*
13C3 HFPO-DA	*92*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:01*	*1*
18O2 PFHxS	*131*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:01*	*1*
13C3 PFBS	*114*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:01*	*1*
13C2 PFDoA	*95*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:01*	*1*
13C2 PFTeDA	*71*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:01*	*1*
13C5 PFNA	*110*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:01*	*1*
13C4 PFOA	*84*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:01*	*1*
13C2 PFUnA	*91*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:01*	*1*
13C4 PFHpA	*104*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:01*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**0.50**	**J B**	0.89	0.36	ug/Kg	☼	08/31/20 05:54	09/02/20 16:03	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*115*		*50 - 150*	*08/31/20 05:54*	*09/02/20 16:03*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**44.6**		0.1	0.1	%			08/27/20 11:52	1
Percent Solids	**55.4**		0.1	0.1	%			08/27/20 11:52	1

Client Sample ID: 20BET-SS-C1

Date Collected: 08/19/20 08:35
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-16

Matrix: Solid
Percent Solids: 92.6

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**1.6**		0.20	0.042	ug/Kg	☼	08/26/20 21:33	08/29/20 13:10	1
Perfluoroheptanoic acid (PFHpA)	**0.38**		0.20	0.029	ug/Kg	☼	08/26/20 21:33	08/29/20 13:10	1
Perfluorooctanoic acid (PFOA)	**0.23**		0.20	0.085	ug/Kg	☼	08/26/20 21:33	08/29/20 13:10	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg	☼	08/26/20 21:33	08/29/20 13:10	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg	☼	08/26/20 21:33	08/29/20 13:10	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg	☼	08/26/20 21:33	08/29/20 13:10	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.066	ug/Kg	☼	08/26/20 21:33	08/29/20 13:10	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg	☼	08/26/20 21:33	08/29/20 13:10	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg	☼	08/26/20 21:33	08/29/20 13:10	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg	☼	08/26/20 21:33	08/29/20 13:10	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg	☼	08/26/20 21:33	08/29/20 13:10	1
Perfluorooctanesulfonic acid (PFOS)	**0.36**	**J B**	0.50	0.20	ug/Kg	☼	08/26/20 21:33	08/29/20 13:10	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg	☼	08/26/20 21:33	08/29/20 13:10	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg	☼	08/26/20 21:33	08/29/20 13:10	1
F-53B Major	ND		0.20	0.027	ug/Kg	☼	08/26/20 21:33	08/29/20 13:10	1
HFPO-DA (GenX)	ND		0.25	0.11	ug/Kg	☼	08/26/20 21:33	08/29/20 13:10	1
F-53B Minor	ND		0.20	0.022	ug/Kg	☼	08/26/20 21:33	08/29/20 13:10	1
DONA	ND		0.20	0.018	ug/Kg	☼	08/26/20 21:33	08/29/20 13:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*101*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:10*	*1*
13C2 PFDA	*102*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:10*	*1*
13C4 PFOS	*93*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:10*	*1*
d3-NMeFOSAA	*86*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:10*	*1*
d5-NEtFOSAA	*89*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:10*	*1*
13C3 HFPO-DA	*87*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:10*	*1*
18O2 PFHxS	*92*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:10*	*1*
13C3 PFBS	*87*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:10*	*1*
13C2 PFDoA	*106*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:10*	*1*
13C2 PFTeDA	*92*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:10*	*1*
13C5 PFNA	*110*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:10*	*1*
13C4 PFOA	*89*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:10*	*1*
13C2 PFUnA	*105*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:10*	*1*
13C4 PFHpA	*98*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:10*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**0.68**	**B**	0.53	0.21	ug/Kg	☼	08/31/20 05:54	09/02/20 16:12	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*64*		*50 - 150*	*08/31/20 05:54*	*09/02/20 16:12*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**7.4**		0.1	0.1	%			08/27/20 11:52	1
Percent Solids	**92.6**		0.1	0.1	%			08/27/20 11:52	1

Client Sample ID: 20BET-SS-C2

Date Collected: 08/19/20 08:37
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-17

Matrix: Solid
Percent Solids: 90.4

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**9.0**		0.20	0.043	ug/Kg	☼	08/26/20 21:33	08/29/20 13:19	1
Perfluoroheptanoic acid (PFHpA)	**1.3**		0.20	0.029	ug/Kg	☼	08/26/20 21:33	08/29/20 13:19	1
Perfluorooctanoic acid (PFOA)	**0.45**		0.20	0.087	ug/Kg	☼	08/26/20 21:33	08/29/20 13:19	1
Perfluorononanoic acid (PFNA)	**0.085**	**J**	0.20	0.037	ug/Kg	☼	08/26/20 21:33	08/29/20 13:19	1
Perfluorodecanoic acid (PFDA)	**0.10**	**J**	0.20	0.022	ug/Kg	☼	08/26/20 21:33	08/29/20 13:19	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.037	ug/Kg	☼	08/26/20 21:33	08/29/20 13:19	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.068	ug/Kg	☼	08/26/20 21:33	08/29/20 13:19	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.052	ug/Kg	☼	08/26/20 21:33	08/29/20 13:19	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.055	ug/Kg	☼	08/26/20 21:33	08/29/20 13:19	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg	☼	08/26/20 21:33	08/29/20 13:19	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg	☼	08/26/20 21:33	08/29/20 13:19	1
Perfluorooctanesulfonic acid (PFOS)	**0.61**	**B**	0.51	0.20	ug/Kg	☼	08/26/20 21:33	08/29/20 13:19	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.40	ug/Kg	☼	08/26/20 21:33	08/29/20 13:19	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.38	ug/Kg	☼	08/26/20 21:33	08/29/20 13:19	1
F-53B Major	ND		0.20	0.027	ug/Kg	☼	08/26/20 21:33	08/29/20 13:19	1
HFPO-DA (GenX)	ND		0.25	0.11	ug/Kg	☼	08/26/20 21:33	08/29/20 13:19	1
F-53B Minor	ND		0.20	0.022	ug/Kg	☼	08/26/20 21:33	08/29/20 13:19	1
DONA	ND		0.20	0.018	ug/Kg	☼	08/26/20 21:33	08/29/20 13:19	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*127*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:19*	*1*
13C2 PFDA	*69*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:19*	*1*
13C4 PFOS	*116*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:19*	*1*
d3-NMeFOSAA	*119*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:19*	*1*
d5-NEtFOSAA	*130*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:19*	*1*
13C3 HFPO-DA	*104*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:19*	*1*
18O2 PFHxS	*121*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:19*	*1*
13C3 PFBS	*112*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:19*	*1*
13C2 PFDoA	*130*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:19*	*1*
13C2 PFTeDA	*128*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:19*	*1*
13C5 PFNA	*134*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:19*	*1*
13C4 PFOA	*87*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:19*	*1*
13C2 PFUnA	*135*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:19*	*1*
13C4 PFHpA	*128*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:19*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**0.71**	**B**	0.52	0.21	ug/Kg	☼	08/31/20 05:54	09/02/20 16:21	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*100*		*50 - 150*	*08/31/20 05:54*	*09/02/20 16:21*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**9.6**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**90.4**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-C3

Date Collected: 08/19/20 08:39
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-18

Matrix: Solid
Percent Solids: 88.0

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**16**		0.21	0.043	ug/Kg	☼	08/26/20 21:33	08/29/20 13:29	1
Perfluoroheptanoic acid (PFHpA)	**2.2**		0.21	0.030	ug/Kg	☼	08/26/20 21:33	08/29/20 13:29	1
Perfluorooctanoic acid (PFOA)	**1.2**		0.21	0.089	ug/Kg	☼	08/26/20 21:33	08/29/20 13:29	1
Perfluorodecanoic acid (PFDA)	**0.090**	**J**	0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 13:29	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.053	ug/Kg	☼	08/26/20 21:33	08/29/20 13:29	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	08/26/20 21:33	08/29/20 13:29	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.032	ug/Kg	☼	08/26/20 21:33	08/29/20 13:29	1
Perfluorooctanesulfonic acid (PFOS)	**0.77**	**B**	0.52	0.21	ug/Kg	☼	08/26/20 21:33	08/29/20 13:29	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.40	ug/Kg	☼	08/26/20 21:33	08/29/20 13:29	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.38	ug/Kg	☼	08/26/20 21:33	08/29/20 13:29	1
F-53B Major	ND		0.21	0.028	ug/Kg	☼	08/26/20 21:33	08/29/20 13:29	1
HFPO-DA (GenX)	ND		0.26	0.11	ug/Kg	☼	08/26/20 21:33	08/29/20 13:29	1
F-53B Minor	ND		0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 13:29	1
DONA	ND		0.21	0.019	ug/Kg	☼	08/26/20 21:33	08/29/20 13:29	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*144*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:29*	*1*
13C2 PFDA	*62*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:29*	*1*
13C4 PFOS	*167*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 13:29*	*1*
d3-NMeFOSAA	*132*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:29*	*1*
d5-NEtFOSAA	*154*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 13:29*	*1*
13C3 HFPO-DA	*128*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:29*	*1*
18O2 PFHxS	*166*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 13:29*	*1*
13C3 PFBS	*146*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:29*	*1*
13C4 PFOA	*88*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:29*	*1*
13C4 PFHpA	*170*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 13:29*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	**0.22**		0.22	0.039	ug/Kg	☼	08/31/20 05:54	09/02/20 16:31	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.039	ug/Kg	☼	08/31/20 05:54	09/02/20 16:31	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.073	ug/Kg	☼	08/31/20 05:54	09/02/20 16:31	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.059	ug/Kg	☼	08/31/20 05:54	09/02/20 16:31	1
Perfluorooctanesulfonic acid (PFOS)	**1.6**	**B**	0.54	0.22	ug/Kg	☼	08/31/20 05:54	09/02/20 16:31	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*126*		*50 - 150*	*08/31/20 05:54*	*09/02/20 16:31*	*1*
13C2 PFDoA	*96*		*50 - 150*	*08/31/20 05:54*	*09/02/20 16:31*	*1*
13C2 PFTeDA	*92*		*50 - 150*	*08/31/20 05:54*	*09/02/20 16:31*	*1*
13C5 PFNA	*139*		*50 - 150*	*08/31/20 05:54*	*09/02/20 16:31*	*1*
13C2 PFUnA	*110*		*50 - 150*	*08/31/20 05:54*	*09/02/20 16:31*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**12.0**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**88.0**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-C4

Date Collected: 08/19/20 08:41
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-19

Matrix: Solid
Percent Solids: 88.5

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**20**		0.21	0.043	ug/Kg	☼	08/26/20 21:33	08/29/20 13:57	1
Perfluoroheptanoic acid (PFHpA)	**6.0**		0.21	0.030	ug/Kg	☼	08/26/20 21:33	08/29/20 13:57	1
Perfluorooctanoic acid (PFOA)	**0.93**		0.21	0.088	ug/Kg	☼	08/26/20 21:33	08/29/20 13:57	1
Perfluorononanoic acid (PFNA)	**0.50**		0.21	0.037	ug/Kg	☼	08/26/20 21:33	08/29/20 13:57	1
Perfluorodecanoic acid (PFDA)	**0.28**		0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 13:57	1
Perfluoroundecanoic acid (PFUnA)	**0.053**	**J**	0.21	0.037	ug/Kg	☼	08/26/20 21:33	08/29/20 13:57	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.069	ug/Kg	☼	08/26/20 21:33	08/29/20 13:57	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.052	ug/Kg	☼	08/26/20 21:33	08/29/20 13:57	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.055	ug/Kg	☼	08/26/20 21:33	08/29/20 13:57	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	08/26/20 21:33	08/29/20 13:57	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.032	ug/Kg	☼	08/26/20 21:33	08/29/20 13:57	1
Perfluorooctanesulfonic acid (PFOS)	**1.3**	**B**	0.51	0.21	ug/Kg	☼	08/26/20 21:33	08/29/20 13:57	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.40	ug/Kg	☼	08/26/20 21:33	08/29/20 13:57	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.38	ug/Kg	☼	08/26/20 21:33	08/29/20 13:57	1
F-53B Major	ND		0.21	0.028	ug/Kg	☼	08/26/20 21:33	08/29/20 13:57	1
HFPO-DA (GenX)	ND		0.26	0.11	ug/Kg	☼	08/26/20 21:33	08/29/20 13:57	1
F-53B Minor	ND		0.21	0.023	ug/Kg	☼	08/26/20 21:33	08/29/20 13:57	1
DONA	ND		0.21	0.018	ug/Kg	☼	08/26/20 21:33	08/29/20 13:57	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*136*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:57*	*1*
13C2 PFDA	*126*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:57*	*1*
13C4 PFOS	*139*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:57*	*1*
d3-NMeFOSAA	*107*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:57*	*1*
d5-NEtFOSAA	*129*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:57*	*1*
13C3 HFPO-DA	*120*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:57*	*1*
18O2 PFHxS	*144*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:57*	*1*
13C3 PFBS	*130*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:57*	*1*
13C2 PFDoA	*151*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 13:57*	*1*
13C2 PFTeDA	*131*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:57*	*1*
13C5 PFNA	*148*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:57*	*1*
13C4 PFOA	*89*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:57*	*1*
13C2 PFUnA	*141*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:57*	*1*
13C4 PFHpA	*150*		*50 - 150*	*08/26/20 21:33*	*08/29/20 13:57*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**2.1**	**B**	0.55	0.22	ug/Kg	☼	08/31/20 05:54	09/02/20 16:40	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*90*		*50 - 150*	*08/31/20 05:54*	*09/02/20 16:40*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**11.5**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**88.5**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-C5
Date Collected: 08/19/20 08:43
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-20
Matrix: Solid
Percent Solids: 84.9

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		130	15	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,1,1-Trichloroethane	ND		130	9.6	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,1,2,2-Tetrachloroethane	ND		130	8.3	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,1,2-Trichloroethane	ND		130	8.8	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,1-Dichloroethane	ND		130	7.0	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,1-Dichloroethene	ND		130	12	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,1-Dichloropropene	ND		130	11	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,2,3-Trichlorobenzene	ND		130	16	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,2,3-Trichloropropane	ND		130	12	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,2,4-Trichlorobenzene	ND		130	8.8	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,2,4-Trimethylbenzene	**6400**		130	9.1	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,2-Dibromo-3-Chloropropane	ND		260	16	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,2-Dibromoethane (EDB)	ND		130	14	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,2-Dichlorobenzene	ND		130	5.7	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,2-Dichloroethane	ND		130	12	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,2-Dichloropropane	ND		130	12	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,3,5-Trimethylbenzene	**8600**		130	9.1	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,3-Dichlorobenzene	ND		130	8.6	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,3-Dichloropropane	ND		130	6.0	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
1,4-Dichlorobenzene	ND		130	5.7	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
2,2-Dichloropropane	ND		130	11	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
2-Butanone (MEK)	**130**	**J**	260	68	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
2-Chlorotoluene	ND		130	9.4	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
4-Chlorotoluene	ND		130	7.3	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
4-Methyl-2-pentanone (MIBK)	ND		260	8.1	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Acetone	ND		1300	130	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Benzene	ND		130	8.6	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Bromobenzene	ND		130	15	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Bromochloromethane	ND		130	19	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Bromodichloromethane	ND		130	13	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Bromoform	ND		130	29	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Bromomethane	ND		260	31	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Carbon disulfide	ND		260	9.1	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Carbon tetrachloride	ND		130	9.1	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Chlorobenzene	ND		130	11	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Chloroethane	ND		130	17	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Chloroform	ND		130	6.8	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Chloromethane	ND		130	6.5	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
cis-1,2-Dichloroethene	ND		130	21	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
cis-1,3-Dichloropropene	ND		130	11	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Dibromochloromethane	ND		130	8.6	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Dibromomethane	ND		130	17	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Dichlorodifluoromethane	ND		130	24	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Ethylbenzene	ND		130	17	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Hexachlorobutadiene	ND		130	13	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Isopropylbenzene	**130**		130	9.1	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Methylene Chloride	ND		130	14	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
m-Xylene & p-Xylene	**710**		130	13	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Naphthalene	ND		130	4.7	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2

Client Sample ID: 20BET-SS-C5

Date Collected: 08/19/20 08:43
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-20

Matrix: Solid
Percent Solids: 84.9

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
n-Butylbenzene	ND		130	8.1	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
N-Propylbenzene	**62**	**J**	130	12	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
o-Xylene	**4300**		130	14	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
p-Isopropyltoluene	**3600**		130	4.2	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
sec-Butylbenzene	**4500**		130	6.2	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Styrene	ND		130	2.9	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
tert-Butylbenzene	**130**		130	11	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Tetrachloroethene	ND		130	11	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Toluene	ND		130	12	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
trans-1,2-Dichloroethene	ND		130	16	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
trans-1,3-Dichloropropene	ND		130	7.3	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Trichloroethene	ND		130	14	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Trichlorofluoromethane	ND		130	31	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Vinyl acetate	ND		130	20	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Vinyl chloride	ND		130	11	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2
Xylenes, Total	**5000**		130	14	ug/Kg	☼	08/25/20 18:14	09/01/20 18:10	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*52 - 126*	*08/25/20 18:14*	*09/01/20 18:10*	*2*
4-Bromofluorobenzene (Surr)	*103*		*67 - 135*	*08/25/20 18:14*	*09/01/20 18:10*	*2*
Dibromofluoromethane (Surr)	*87*		*61 - 123*	*08/25/20 18:14*	*09/01/20 18:10*	*2*
Toluene-d8 (Surr)	*102*		*65 - 131*	*08/25/20 18:14*	*09/01/20 18:10*	*2*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C10 AK	**420**		13	2.6	mg/Kg	☼	08/25/20 18:14	09/01/20 18:10	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*60 - 120*	*08/25/20 18:14*	*09/01/20 18:10*	*2*
Trifluorotoluene (Surr)	*138*	*X*	*60 - 120*	*08/25/20 18:14*	*09/01/20 18:10*	*2*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		58	7.3	ug/Kg	☼	08/31/20 07:48	09/01/20 21:58	10
Acenaphthylene	ND		58	7.6	ug/Kg	☼	08/31/20 07:48	09/01/20 21:58	10
Anthracene	ND		58	7.7	ug/Kg	☼	08/31/20 07:48	09/01/20 21:58	10
Benzo[a]anthracene	ND		58	8.2	ug/Kg	☼	08/31/20 07:48	09/01/20 21:58	10
Benzo[a]pyrene	ND		58	8.1	ug/Kg	☼	08/31/20 07:48	09/01/20 21:58	10
Benzo[b]fluoranthene	ND		58	8.9	ug/Kg	☼	08/31/20 07:48	09/01/20 21:58	10
Benzo[g,h,i]perylene	ND		58	8.3	ug/Kg	☼	08/31/20 07:48	09/01/20 21:58	10
Benzo[k]fluoranthene	ND		58	8.3	ug/Kg	☼	08/31/20 07:48	09/01/20 21:58	10
Chrysene	ND		58	8.3	ug/Kg	☼	08/31/20 07:48	09/01/20 21:58	10
Dibenz(a,h)anthracene	ND		58	8.9	ug/Kg	☼	08/31/20 07:48	09/01/20 21:58	10
Fluoranthene	ND		58	9.3	ug/Kg	☼	08/31/20 07:48	09/01/20 21:58	10
Fluorene	**91**		58	7.4	ug/Kg	☼	08/31/20 07:48	09/01/20 21:58	10
Indeno[1,2,3-cd]pyrene	ND		58	8.9	ug/Kg	☼	08/31/20 07:48	09/01/20 21:58	10
Naphthalene	**890**		58	7.7	ug/Kg	☼	08/31/20 07:48	09/01/20 21:58	10
Phenanthrene	**18**	**J**	58	8.3	ug/Kg	☼	08/31/20 07:48	09/01/20 21:58	10
Pyrene	ND		58	8.7	ug/Kg	☼	08/31/20 07:48	09/01/20 21:58	10

Client Sample ID: 20BET-SS-C5
Date Collected: 08/19/20 08:43
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-20
Matrix: Solid
Percent Solids: 84.9

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5	0	X	49 - 114	08/31/20 07:48	09/01/20 21:58	10
Terphenyl-d14	89		53 - 121	08/31/20 07:48	09/01/20 21:58	10
2-Fluorobiphenyl (Surr)	177	X	43 - 109	08/31/20 07:48	09/01/20 21:58	10
2-methylnaphthalene-d10	0	X	50 - 150	08/31/20 07:48	09/01/20 21:58	10
Fluoranthene-d10 (Surr)	87		50 - 150	08/31/20 07:48	09/01/20 21:58	10

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**10000**	*	230	58	mg/Kg	☼	09/01/20 07:19	09/10/20 05:11	100
RRO (nC25-nC36)	ND		2300	440	mg/Kg	☼	09/01/20 07:19	09/10/20 05:11	100

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	85		60 - 120	09/01/20 07:19	09/10/20 05:11	100
n-Triacontane-d62	102		60 - 120	09/01/20 07:19	09/10/20 05:11	100

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**9600**	H B	230	58	mg/Kg	☼	09/09/20 09:17	09/14/20 18:10	100
RRO (nC25-nC36)	ND	H	2300	440	mg/Kg	☼	09/09/20 09:17	09/14/20 18:10	100

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	101		60 - 120	09/09/20 09:17	09/14/20 18:10	100
n-Triacontane-d62	104		60 - 120	09/09/20 09:17	09/14/20 18:10	100

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**2.2**		0.22	0.032	ug/Kg	☼	08/26/20 21:33	08/29/20 14:06	1
Perfluorooctanoic acid (PFOA)	**1.5**		0.22	0.096	ug/Kg	☼	08/26/20 21:33	08/29/20 14:06	1
Perfluorononanoic acid (PFNA)	**0.12**	J	0.22	0.040	ug/Kg	☼	08/26/20 21:33	08/29/20 14:06	1
Perfluorodecanoic acid (PFDA)	**0.10**	J	0.22	0.024	ug/Kg	☼	08/26/20 21:33	08/29/20 14:06	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.040	ug/Kg	☼	08/26/20 21:33	08/29/20 14:06	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.074	ug/Kg	☼	08/26/20 21:33	08/29/20 14:06	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.057	ug/Kg	☼	08/26/20 21:33	08/29/20 14:06	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.060	ug/Kg	☼	08/26/20 21:33	08/29/20 14:06	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.028	ug/Kg	☼	08/26/20 21:33	08/29/20 14:06	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.034	ug/Kg	☼	08/26/20 21:33	08/29/20 14:06	1
Perfluorooctanesulfonic acid (PFOS)	**1.0**	B	0.56	0.22	ug/Kg	☼	08/26/20 21:33	08/29/20 14:06	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	08/26/20 21:33	08/29/20 14:06	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	08/26/20 21:33	08/29/20 14:06	1
F-53B Major	ND		0.22	0.030	ug/Kg	☼	08/26/20 21:33	08/29/20 14:06	1
HFPO-DA (GenX)	ND		0.28	0.12	ug/Kg	☼	08/26/20 21:33	08/29/20 14:06	1
F-53B Minor	ND		0.22	0.024	ug/Kg	☼	08/26/20 21:33	08/29/20 14:06	1
DONA	ND		0.22	0.020	ug/Kg	☼	08/26/20 21:33	08/29/20 14:06	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	50		50 - 150	08/26/20 21:33	08/29/20 14:06	1
13C4 PFOS	178	*5	50 - 150	08/26/20 21:33	08/29/20 14:06	1
d3-NMeFOSAA	143		50 - 150	08/26/20 21:33	08/29/20 14:06	1
d5-NEtFOSAA	177	*5	50 - 150	08/26/20 21:33	08/29/20 14:06	1
13C3 HFPO-DA	148		50 - 150	08/26/20 21:33	08/29/20 14:06	1

Client Sample ID: 20BET-SS-C5

Lab Sample ID: 320-63955-20

Date Collected: 08/19/20 08:43
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 84.9

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*181*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 14:06*	*1*
13C3 PFBS	*165*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 14:06*	*1*
13C2 PFDoA	*189*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 14:06*	*1*
13C2 PFTeDA	*173*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 14:06*	*1*
13C5 PFNA	*172*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 14:06*	*1*
13C4 PFOA	*85*		*50 - 150*	*08/26/20 21:33*	*08/29/20 14:06*	*1*
13C2 PFUnA	*188*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 14:06*	*1*
13C4 PFHpA	*186*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 14:06*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**28**		2.2	0.47	ug/Kg	☼	08/26/20 21:33	08/30/20 03:49	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*104*		*50 - 150*	*08/26/20 21:33*	*08/30/20 03:49*	*10*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	ND		5.8	2.3	ug/Kg	☼	08/31/20 05:54	09/02/20 17:08	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*85*		*50 - 150*	*08/31/20 05:54*	*09/02/20 17:08*	*10*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**15.1**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**84.9**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-C6

Lab Sample ID: 320-63955-21

Date Collected: 08/19/20 08:45
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 86.3

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**20**	**B**	2.3	0.48	ug/Kg	☼	09/01/20 00:42	09/03/20 03:16	10
Perfluoroheptanoic acid (PFHpA)	**8.3**	**F1**	2.3	0.33	ug/Kg	☼	09/01/20 00:42	09/03/20 03:16	10
Perfluorooctanoic acid (PFOA)	**1.9**	**J**	2.3	0.99	ug/Kg	☼	09/01/20 00:42	09/03/20 03:16	10
Perfluorononanoic acid (PFNA)	**0.95**	**J**	2.3	0.42	ug/Kg	☼	09/01/20 00:42	09/03/20 03:16	10
Perfluorodecanoic acid (PFDA)	**0.31**	**J**	2.3	0.25	ug/Kg	☼	09/01/20 00:42	09/03/20 03:16	10
Perfluoroundecanoic acid (PFUnA)	ND		2.3	0.42	ug/Kg	☼	09/01/20 00:42	09/03/20 03:16	10
Perfluorododecanoic acid (PFDoA)	ND		2.3	0.77	ug/Kg	☼	09/01/20 00:42	09/03/20 03:16	10
Perfluorotridecanoic acid (PFTriA)	ND		2.3	0.59	ug/Kg	☼	09/01/20 00:42	09/03/20 03:16	10
Perfluorotetradecanoic acid (PFTeA)	ND	F2	2.3	0.62	ug/Kg	☼	09/01/20 00:42	09/03/20 03:16	10
Perfluorobutanesulfonic acid (PFBS)	ND		2.3	0.29	ug/Kg	☼	09/01/20 00:42	09/03/20 03:16	10
Perfluorohexanesulfonic acid (PFHxS)	ND		2.3	0.36	ug/Kg	☼	09/01/20 00:42	09/03/20 03:16	10
Perfluorooctanesulfonic acid (PFOS)	ND		5.8	2.3	ug/Kg	☼	09/01/20 00:42	09/03/20 03:16	10
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		23	4.5	ug/Kg	☼	09/01/20 00:42	09/03/20 03:16	10
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		23	4.3	ug/Kg	☼	09/01/20 00:42	09/03/20 03:16	10
F-53B Major	ND		2.3	0.31	ug/Kg	☼	09/01/20 00:42	09/03/20 03:16	10
HFPO-DA (GenX)	ND		2.9	1.3	ug/Kg	☼	09/01/20 00:42	09/03/20 03:16	10
F-53B Minor	ND		2.3	0.25	ug/Kg	☼	09/01/20 00:42	09/03/20 03:16	10

Client Sample ID: 20BET-SS-C6

Date Collected: 08/19/20 08:45
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-21

Matrix: Solid
Percent Solids: 86.3

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DONA	ND		2.3	0.21	ug/Kg	☼	09/01/20 00:42	09/03/20 03:16	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*84*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:16*	*10*
13C2 PFDA	*87*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:16*	*10*
13C4 PFOS	*85*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:16*	*10*
d3-NMeFOSAA	*81*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:16*	*10*
d5-NEtFOSAA	*80*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:16*	*10*
13C3 HFPO-DA	*70*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:16*	*10*
18O2 PFHxS	*83*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:16*	*10*
13C3 PFBS	*83*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:16*	*10*
13C2 PFDoA	*84*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:16*	*10*
13C2 PFTeDA	*85*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:16*	*10*
13C5 PFNA	*89*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:16*	*10*
13C4 PFOA	*84*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:16*	*10*
13C2 PFUnA	*89*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:16*	*10*
13C4 PFHpA	*87*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:16*	*10*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**13.7**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**86.3**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-C7

Date Collected: 08/19/20 08:47
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-22

Matrix: Solid
Percent Solids: 90.3

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**3.0**	**B**	0.22	0.046	ug/Kg	☼	09/01/20 00:42	09/03/20 01:52	1
Perfluoroheptanoic acid (PFHpA)	**0.86**		0.22	0.032	ug/Kg	☼	09/01/20 00:42	09/03/20 01:52	1
Perfluorooctanoic acid (PFOA)	**0.24**		0.22	0.095	ug/Kg	☼	09/01/20 00:42	09/03/20 01:52	1
Perfluorononanoic acid (PFNA)	**0.049**	**J**	0.22	0.040	ug/Kg	☼	09/01/20 00:42	09/03/20 01:52	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.024	ug/Kg	☼	09/01/20 00:42	09/03/20 01:52	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.040	ug/Kg	☼	09/01/20 00:42	09/03/20 01:52	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.074	ug/Kg	☼	09/01/20 00:42	09/03/20 01:52	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.056	ug/Kg	☼	09/01/20 00:42	09/03/20 01:52	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.060	ug/Kg	☼	09/01/20 00:42	09/03/20 01:52	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.028	ug/Kg	☼	09/01/20 00:42	09/03/20 01:52	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.034	ug/Kg	☼	09/01/20 00:42	09/03/20 01:52	1
Perfluorooctanesulfonic acid (PFOS)	**0.78**	**B**	0.55	0.22	ug/Kg	☼	09/01/20 00:42	09/03/20 01:52	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	09/01/20 00:42	09/03/20 01:52	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	09/01/20 00:42	09/03/20 01:52	1
F-53B Major	ND		0.22	0.030	ug/Kg	☼	09/01/20 00:42	09/03/20 01:52	1
HFPO-DA (GenX)	ND		0.28	0.12	ug/Kg	☼	09/01/20 00:42	09/03/20 01:52	1
F-53B Minor	ND		0.22	0.024	ug/Kg	☼	09/01/20 00:42	09/03/20 01:52	1
DONA	ND		0.22	0.020	ug/Kg	☼	09/01/20 00:42	09/03/20 01:52	1

Client Sample ID: 20BET-SS-C7

Lab Sample ID: 320-63955-22

Date Collected: 08/19/20 08:47
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 90.3

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*84*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:52*	*1*
13C2 PFDA	*88*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:52*	*1*
13C4 PFOS	*84*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:52*	*1*
d3-NMeFOSAA	*68*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:52*	*1*
d5-NEtFOSAA	*72*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:52*	*1*
13C3 HFPO-DA	*72*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:52*	*1*
18O2 PFHxS	*82*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:52*	*1*
13C3 PFBS	*79*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:52*	*1*
13C2 PFDoA	*81*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:52*	*1*
13C2 PFTeDA	*86*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:52*	*1*
13C5 PFNA	*91*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:52*	*1*
13C4 PFOA	*85*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:52*	*1*
13C2 PFUnA	*82*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:52*	*1*
13C4 PFHpA	*89*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:52*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**9.7**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**90.3**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-C10

Lab Sample ID: 320-63955-23

Date Collected: 08/19/20 08:33
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 84.5

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		260	30	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,1,1-Trichloroethane	ND		260	19	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,1,2,2-Tetrachloroethane	ND		260	16	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,1,2-Trichloroethane	ND		260	17	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,1-Dichloroethane	ND		260	14	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,1-Dichloroethene	ND		260	24	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,1-Dichloropropene	ND		260	22	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,2,3-Trichlorobenzene	ND		260	32	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,2,3-Trichloropropane	ND		260	24	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,2,4-Trichlorobenzene	ND		260	17	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,2,4-Trimethylbenzene	**8900**		260	18	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,2-Dibromo-3-Chloropropane	ND		510	32	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,2-Dibromoethane (EDB)	ND		260	28	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,2-Dichlorobenzene	ND		260	11	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,2-Dichloroethane	ND		260	24	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,2-Dichloropropane	ND		260	24	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,3,5-Trimethylbenzene	**12000**		260	18	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,3-Dichlorobenzene	ND		260	17	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,3-Dichloropropane	ND		260	12	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
1,4-Dichlorobenzene	ND		260	11	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
2,2-Dichloropropane	ND		260	22	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
2-Butanone (MEK)	**160**	**J**	510	130	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
2-Chlorotoluene	ND		260	18	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
4-Chlorotoluene	ND		260	14	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
4-Methyl-2-pentanone (MIBK)	ND		510	16	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4

Client Sample ID: 20BET-SS-C10
Date Collected: 08/19/20 08:33
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-23
Matrix: Solid
Percent Solids: 84.5

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		2600	260	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Benzene	ND		260	17	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Bromobenzene	ND		260	29	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Bromochloromethane	ND		260	37	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Bromodichloromethane	ND		260	26	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Bromoform	ND		260	56	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Bromomethane	ND		510	61	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Carbon disulfide	ND		510	18	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Carbon tetrachloride	ND		260	18	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Chlorobenzene	ND		260	22	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Chloroethane	ND		260	34	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Chloroform	ND		260	13	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Chloromethane	ND		260	13	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
cis-1,2-Dichloroethene	ND		260	42	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
cis-1,3-Dichloropropene	ND		260	21	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Dibromochloromethane	ND		260	17	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Dibromomethane	ND		260	33	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Dichlorodifluoromethane	ND		260	48	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Ethylbenzene	ND		260	34	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Hexachlorobutadiene	ND		260	26	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Isopropylbenzene	**170**	**J**	260	18	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Methylene Chloride	ND		260	28	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
m-Xylene & p-Xylene	**880**		260	26	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Naphthalene	ND		260	9.2	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
n-Butylbenzene	ND		260	16	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
N-Propylbenzene	**110**	**J**	260	24	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
o-Xylene	**5500**		260	27	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
p-Isopropyltoluene	**4800**		260	8.2	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
sec-Butylbenzene	**6300**		260	12	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Styrene	ND		260	5.6	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
tert-Butylbenzene	**190**	**J**	260	21	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Tetrachloroethene	ND		260	21	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Toluene	ND		260	23	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
trans-1,2-Dichloroethene	ND		260	32	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
trans-1,3-Dichloropropene	ND		260	14	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Trichloroethene	ND		260	28	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Trichlorofluoromethane	ND		260	61	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Vinyl acetate	ND		260	40	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Vinyl chloride	ND		260	22	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4
Xylenes, Total	**6400**		260	27	ug/Kg	☼	08/25/20 18:14	09/01/20 18:33	4

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*52 - 126*	*08/25/20 18:14*	*09/01/20 18:33*	*4*
4-Bromofluorobenzene (Surr)	*107*		*67 - 135*	*08/25/20 18:14*	*09/01/20 18:33*	*4*
Dibromofluoromethane (Surr)	*90*		*61 - 123*	*08/25/20 18:14*	*09/01/20 18:33*	*4*
Toluene-d8 (Surr)	*101*		*65 - 131*	*08/25/20 18:14*	*09/01/20 18:33*	*4*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C10 AK	**650**		26	5.1	mg/Kg	☼	08/25/20 18:14	09/01/20 18:33	4

Client Sample ID: 20BET-SS-C10

Date Collected: 08/19/20 08:33
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-23

Matrix: Solid
Percent Solids: 84.5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		60 - 120	08/25/20 18:14	09/01/20 18:33	4
Trifluorotoluene (Surr)	145	X	60 - 120	08/25/20 18:14	09/01/20 18:33	4

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**41**	**J**	120	15	ug/Kg	☼	08/31/20 07:48	09/04/20 17:05	20
Acenaphthylene	ND		120	15	ug/Kg	☼	08/31/20 07:48	09/04/20 17:05	20
Anthracene	ND		120	16	ug/Kg	☼	08/31/20 07:48	09/04/20 17:05	20
Benzo[a]anthracene	ND		120	17	ug/Kg	☼	08/31/20 07:48	09/04/20 17:05	20
Benzo[a]pyrene	ND		120	16	ug/Kg	☼	08/31/20 07:48	09/04/20 17:05	20
Benzo[b]fluoranthene	ND		120	18	ug/Kg	☼	08/31/20 07:48	09/04/20 17:05	20
Benzo[g,h,i]perylene	ND		120	17	ug/Kg	☼	08/31/20 07:48	09/04/20 17:05	20
Benzo[k]fluoranthene	ND		120	17	ug/Kg	☼	08/31/20 07:48	09/04/20 17:05	20
Chrysene	ND		120	17	ug/Kg	☼	08/31/20 07:48	09/04/20 17:05	20
Dibenz(a,h)anthracene	ND		120	18	ug/Kg	☼	08/31/20 07:48	09/04/20 17:05	20
Fluoranthene	ND		120	19	ug/Kg	☼	08/31/20 07:48	09/04/20 17:05	20
Fluorene	**71**	**J**	120	15	ug/Kg	☼	08/31/20 07:48	09/04/20 17:05	20
Indeno[1,2,3-cd]pyrene	ND		120	18	ug/Kg	☼	08/31/20 07:48	09/04/20 17:05	20
Naphthalene	**1100**		120	16	ug/Kg	☼	08/31/20 07:48	09/04/20 17:05	20
Phenanthrene	ND		120	17	ug/Kg	☼	08/31/20 07:48	09/04/20 17:05	20
Pyrene	ND		120	18	ug/Kg	☼	08/31/20 07:48	09/04/20 17:05	20

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5	0	X	49 - 114	08/31/20 07:48	09/04/20 17:05	20
Terphenyl-d14	84		53 - 121	08/31/20 07:48	09/04/20 17:05	20
2-Fluorobiphenyl (Surr)	150	X	43 - 109	08/31/20 07:48	09/04/20 17:05	20
2-methylnaphthalene-d10	0	X	50 - 150	08/31/20 07:48	09/04/20 17:05	20
Fluoranthene-d10 (Surr)	83		50 - 150	08/31/20 07:48	09/04/20 17:05	20

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**10000**	*****	240	59	mg/Kg	☼	09/01/20 07:19	09/10/20 05:40	100
RRO (nC25-nC36)	ND		2400	440	mg/Kg	☼	09/01/20 07:19	09/10/20 05:40	100

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	82		60 - 120	09/01/20 07:19	09/10/20 05:40	100
n-Triacontane-d62	98		60 - 120	09/01/20 07:19	09/10/20 05:40	100

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**9500**	**H B**	230	57	mg/Kg	☼	09/09/20 09:17	09/14/20 18:41	100
RRO (nC25-nC36)	ND	H	2300	430	mg/Kg	☼	09/09/20 09:17	09/14/20 18:41	100

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	94		60 - 120	09/09/20 09:17	09/14/20 18:41	100
n-Triacontane-d62	94		60 - 120	09/09/20 09:17	09/14/20 18:41	100

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**27**	**B**	1.1	0.24	ug/Kg	☼	09/01/20 00:42	09/03/20 03:44	5
Perfluoroheptanoic acid (PFHpA)	**2.5**		1.1	0.17	ug/Kg	☼	09/01/20 00:42	09/03/20 03:44	5
Perfluorooctanoic acid (PFOA)	**1.8**		1.1	0.49	ug/Kg	☼	09/01/20 00:42	09/03/20 03:44	5

Client Sample ID: 20BET-SS-C10

Lab Sample ID: 320-63955-23

Date Collected: 08/19/20 08:33
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 84.5

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	ND		1.1	0.21	ug/Kg	☼	09/01/20 00:42	09/03/20 03:44	5
Perfluorodecanoic acid (PFDA)	ND		1.1	0.13	ug/Kg	☼	09/01/20 00:42	09/03/20 03:44	5
Perfluoroundecanoic acid (PFUnA)	ND		1.1	0.21	ug/Kg	☼	09/01/20 00:42	09/03/20 03:44	5
Perfluorododecanoic acid (PFDoA)	ND		1.1	0.38	ug/Kg	☼	09/01/20 00:42	09/03/20 03:44	5
Perfluorotridecanoic acid (PFTriA)	ND		1.1	0.29	ug/Kg	☼	09/01/20 00:42	09/03/20 03:44	5
Perfluorotetradecanoic acid (PFTeA)	ND		1.1	0.31	ug/Kg	☼	09/01/20 00:42	09/03/20 03:44	5
Perfluorobutanesulfonic acid (PFBS)	ND		1.1	0.14	ug/Kg	☼	09/01/20 00:42	09/03/20 03:44	5
Perfluorohexanesulfonic acid (PFHxS)	ND		1.1	0.18	ug/Kg	☼	09/01/20 00:42	09/03/20 03:44	5
Perfluorooctanesulfonic acid (PFOS)	**2.0**	**J B**	2.8	1.1	ug/Kg	☼	09/01/20 00:42	09/03/20 03:44	5
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		11	2.2	ug/Kg	☼	09/01/20 00:42	09/03/20 03:44	5
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		11	2.1	ug/Kg	☼	09/01/20 00:42	09/03/20 03:44	5
F-53B Major	ND		1.1	0.15	ug/Kg	☼	09/01/20 00:42	09/03/20 03:44	5
HFPO-DA (GenX)	ND		1.4	0.63	ug/Kg	☼	09/01/20 00:42	09/03/20 03:44	5
F-53B Minor	ND		1.1	0.13	ug/Kg	☼	09/01/20 00:42	09/03/20 03:44	5
DONA	ND		1.1	0.10	ug/Kg	☼	09/01/20 00:42	09/03/20 03:44	5

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*104*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:44*	*5*
13C2 PFDA	*63*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:44*	*5*
13C4 PFOS	*89*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:44*	*5*
d3-NMeFOSAA	*77*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:44*	*5*
d5-NEtFOSAA	*86*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:44*	*5*
13C3 HFPO-DA	*85*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:44*	*5*
18O2 PFHxS	*102*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:44*	*5*
13C3 PFBS	*105*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:44*	*5*
13C2 PFDoA	*86*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:44*	*5*
13C2 PFTeDA	*84*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:44*	*5*
13C5 PFNA	*105*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:44*	*5*
13C4 PFOA	*78*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:44*	*5*
13C2 PFUnA	*90*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:44*	*5*
13C4 PFHpA	*106*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:44*	*5*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**15.5**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**84.5**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-D1

Lab Sample ID: 320-63955-24

Date Collected: 08/19/20 09:05
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 90.3

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**2.8**	**B**	0.22	0.046	ug/Kg	☼	09/01/20 00:42	09/03/20 02:01	1
Perfluoroheptanoic acid (PFHpA)	**0.63**		0.22	0.032	ug/Kg	☼	09/01/20 00:42	09/03/20 02:01	1
Perfluorooctanoic acid (PFOA)	**0.26**		0.22	0.094	ug/Kg	☼	09/01/20 00:42	09/03/20 02:01	1
Perfluorononanoic acid (PFNA)	**0.066**	**J**	0.22	0.039	ug/Kg	☼	09/01/20 00:42	09/03/20 02:01	1
Perfluorodecanoic acid (PFDA)	**0.026**	**J**	0.22	0.024	ug/Kg	☼	09/01/20 00:42	09/03/20 02:01	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.039	ug/Kg	☼	09/01/20 00:42	09/03/20 02:01	1

Client Sample ID: 20BET-SS-D1

Lab Sample ID: 320-63955-24

Date Collected: 08/19/20 09:05
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 90.3

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.073	ug/Kg	☼	09/01/20 00:42	09/03/20 02:01	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.056	ug/Kg	☼	09/01/20 00:42	09/03/20 02:01	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.059	ug/Kg	☼	09/01/20 00:42	09/03/20 02:01	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.027	ug/Kg	☼	09/01/20 00:42	09/03/20 02:01	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.034	ug/Kg	☼	09/01/20 00:42	09/03/20 02:01	1
Perfluorooctanesulfonic acid (PFOS)	**0.44**	**J B**	0.54	0.22	ug/Kg	☼	09/01/20 00:42	09/03/20 02:01	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	09/01/20 00:42	09/03/20 02:01	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.40	ug/Kg	☼	09/01/20 00:42	09/03/20 02:01	1
F-53B Major	ND		0.22	0.029	ug/Kg	☼	09/01/20 00:42	09/03/20 02:01	1
HFPO-DA (GenX)	ND		0.27	0.12	ug/Kg	☼	09/01/20 00:42	09/03/20 02:01	1
F-53B Minor	ND		0.22	0.024	ug/Kg	☼	09/01/20 00:42	09/03/20 02:01	1
DONA	ND		0.22	0.020	ug/Kg	☼	09/01/20 00:42	09/03/20 02:01	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*97*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:01*	*1*
13C2 PFDA	*99*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:01*	*1*
13C4 PFOS	*94*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:01*	*1*
d3-NMeFOSAA	*89*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:01*	*1*
d5-NEtFOSAA	*96*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:01*	*1*
13C3 HFPO-DA	*80*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:01*	*1*
18O2 PFHxS	*91*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:01*	*1*
13C3 PFBS	*88*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:01*	*1*
13C2 PFDoA	*93*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:01*	*1*
13C2 PFTeDA	*97*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:01*	*1*
13C5 PFNA	*105*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:01*	*1*
13C4 PFOA	*84*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:01*	*1*
13C2 PFUnA	*100*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:01*	*1*
13C4 PFHpA	*101*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:01*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**9.7**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**90.3**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-D2

Lab Sample ID: 320-63955-25

Date Collected: 08/19/20 09:07
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 91.1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**17**	**B**	0.21	0.044	ug/Kg	☼	09/01/20 00:42	09/03/20 02:10	1
Perfluoroheptanoic acid (PFHpA)	**1.2**		0.21	0.030	ug/Kg	☼	09/01/20 00:42	09/03/20 02:10	1
Perfluorooctanoic acid (PFOA)	**0.82**		0.21	0.089	ug/Kg	☼	09/01/20 00:42	09/03/20 02:10	1
Perfluorononanoic acid (PFNA)	**0.13**	**J**	0.21	0.037	ug/Kg	☼	09/01/20 00:42	09/03/20 02:10	1
Perfluorodecanoic acid (PFDA)	**0.095**	**J**	0.21	0.023	ug/Kg	☼	09/01/20 00:42	09/03/20 02:10	1
Perfluoroundecanoic acid (PFUnA)	**0.037**	**J**	0.21	0.037	ug/Kg	☼	09/01/20 00:42	09/03/20 02:10	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.070	ug/Kg	☼	09/01/20 00:42	09/03/20 02:10	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.053	ug/Kg	☼	09/01/20 00:42	09/03/20 02:10	1

Client Sample ID: 20BET-SS-D2

Date Collected: 08/19/20 09:07
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-25

Matrix: Solid
Percent Solids: 91.1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.056	ug/Kg	☼	09/01/20 00:42	09/03/20 02:10	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	09/01/20 00:42	09/03/20 02:10	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.032	ug/Kg	☼	09/01/20 00:42	09/03/20 02:10	1
Perfluorooctanesulfonic acid (PFOS)	**1.5**	**B**	0.52	0.21	ug/Kg	☼	09/01/20 00:42	09/03/20 02:10	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.40	ug/Kg	☼	09/01/20 00:42	09/03/20 02:10	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.38	ug/Kg	☼	09/01/20 00:42	09/03/20 02:10	1
F-53B Major	ND		0.21	0.028	ug/Kg	☼	09/01/20 00:42	09/03/20 02:10	1
HFPO-DA (GenX)	ND		0.26	0.11	ug/Kg	☼	09/01/20 00:42	09/03/20 02:10	1
F-53B Minor	ND		0.21	0.023	ug/Kg	☼	09/01/20 00:42	09/03/20 02:10	1
DONA	ND		0.21	0.019	ug/Kg	☼	09/01/20 00:42	09/03/20 02:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*129*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:10*	*1*
13C2 PFDA	*122*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:10*	*1*
13C4 PFOS	*128*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:10*	*1*
d3-NMeFOSAA	*62*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:10*	*1*
d5-NEtFOSAA	*62*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:10*	*1*
13C3 HFPO-DA	*112*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:10*	*1*
18O2 PFHxS	*129*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:10*	*1*
13C3 PFBS	*124*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:10*	*1*
13C2 PFDoA	*119*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:10*	*1*
13C2 PFTeDA	*115*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:10*	*1*
13C5 PFNA	*135*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:10*	*1*
13C4 PFOA	*81*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:10*	*1*
13C2 PFUnA	*127*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:10*	*1*
13C4 PFHpA	*146*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:10*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**8.9**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**91.1**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-D3

Date Collected: 08/19/20 09:09
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-26

Matrix: Solid
Percent Solids: 89.1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**17**	**B**	0.22	0.047	ug/Kg	☼	09/01/20 00:42	09/03/20 02:20	1
Perfluoroheptanoic acid (PFHpA)	**1.7**		0.22	0.032	ug/Kg	☼	09/01/20 00:42	09/03/20 02:20	1
Perfluorooctanoic acid (PFOA)	**1.2**		0.22	0.096	ug/Kg	☼	09/01/20 00:42	09/03/20 02:20	1
Perfluorononanoic acid (PFNA)	**0.34**		0.22	0.040	ug/Kg	☼	09/01/20 00:42	09/03/20 02:20	1
Perfluorodecanoic acid (PFDA)	**0.49**		0.22	0.025	ug/Kg	☼	09/01/20 00:42	09/03/20 02:20	1
Perfluoroundecanoic acid (PFUnA)	**0.057**	**J**	0.22	0.040	ug/Kg	☼	09/01/20 00:42	09/03/20 02:20	1
Perfluorododecanoic acid (PFDoA)	**0.10**	**J**	0.22	0.075	ug/Kg	☼	09/01/20 00:42	09/03/20 02:20	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.057	ug/Kg	☼	09/01/20 00:42	09/03/20 02:20	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.060	ug/Kg	☼	09/01/20 00:42	09/03/20 02:20	1

Client Sample ID: 20BET-SS-D3

Lab Sample ID: 320-63955-26
Date Collected: 08/19/20 09:09
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 89.1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.028	ug/Kg	☼	09/01/20 00:42	09/03/20 02:20	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.035	ug/Kg	☼	09/01/20 00:42	09/03/20 02:20	1
Perfluorooctanesulfonic acid (PFOS)	**2.8**	**B**	0.56	0.22	ug/Kg	☼	09/01/20 00:42	09/03/20 02:20	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.44	ug/Kg	☼	09/01/20 00:42	09/03/20 02:20	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	09/01/20 00:42	09/03/20 02:20	1
F-53B Major	ND		0.22	0.030	ug/Kg	☼	09/01/20 00:42	09/03/20 02:20	1
HFPO-DA (GenX)	ND		0.28	0.12	ug/Kg	☼	09/01/20 00:42	09/03/20 02:20	1
F-53B Minor	ND		0.22	0.025	ug/Kg	☼	09/01/20 00:42	09/03/20 02:20	1
DONA	ND		0.22	0.020	ug/Kg	☼	09/01/20 00:42	09/03/20 02:20	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*120*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:20*	*1*
13C2 PFDA	*123*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:20*	*1*
13C4 PFOS	*136*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:20*	*1*
d3-NMeFOSAA	*91*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:20*	*1*
d5-NEtFOSAA	*104*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:20*	*1*
13C3 HFPO-DA	*117*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:20*	*1*
18O2 PFHxS	*140*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:20*	*1*
13C3 PFBS	*136*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:20*	*1*
13C2 PFDoA	*149*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:20*	*1*
13C2 PFTeDA	*144*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:20*	*1*
13C5 PFNA	*137*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:20*	*1*
13C4 PFOA	*85*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:20*	*1*
13C2 PFUnA	*145*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:20*	*1*
13C4 PFHpA	*159*	**5*	*50 - 150*	*09/01/20 00:42*	*09/03/20 02:20*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**10.9**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**89.1**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-D4

Lab Sample ID: 320-63955-27
Date Collected: 08/19/20 09:11
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 85.1

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		270	31	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
1,1,1-Trichloroethane	ND		270	20	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
1,1,2,2-Tetrachloroethane	ND		270	17	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
1,1,2-Trichloroethane	ND		270	18	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
1,1-Dichloroethane	ND		270	14	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
1,1-Dichloroethene	ND		270	25	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
1,1-Dichloropropene	ND		270	23	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
1,2,3-Trichlorobenzene	ND		270	33	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
1,2,3-Trichloropropane	ND		270	25	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
1,2,4-Trichlorobenzene	ND		270	18	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
1,2,4-Trimethylbenzene	**6400**		270	19	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
1,2-Dibromo-3-Chloropropane	ND		530	34	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4

Client Sample ID: 20BET-SS-D4
Date Collected: 08/19/20 09:11
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-27
Matrix: Solid
Percent Solids: 85.1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		270	29	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
1,2-Dichlorobenzene	ND		270	12	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
1,2-Dichloroethane	ND		270	25	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
1,2-Dichloropropane	ND		270	25	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
1,3,5-Trimethylbenzene	**12000**		270	19	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
1,3-Dichlorobenzene	ND		270	18	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
1,3-Dichloropropane	ND		270	12	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
1,4-Dichlorobenzene	ND		270	12	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
2,2-Dichloropropane	ND		270	23	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
2-Butanone (MEK)	**170**	**J**	530	140	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
2-Chlorotoluene	ND		270	19	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
4-Chlorotoluene	ND		270	15	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
4-Methyl-2-pentanone (MIBK)	ND		530	17	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Acetone	ND		2700	270	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Benzene	ND		270	18	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Bromobenzene	ND		270	30	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Bromochloromethane	ND		270	39	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Bromodichloromethane	ND		270	27	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Bromoform	ND		270	59	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Bromomethane	ND		530	64	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Carbon disulfide	ND		530	19	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Carbon tetrachloride	ND		270	19	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Chlorobenzene	ND		270	23	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Chloroethane	ND		270	35	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Chloroform	ND		270	14	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Chloromethane	ND		270	13	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
cis-1,2-Dichloroethene	ND		270	44	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
cis-1,3-Dichloropropene	ND		270	22	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Dibromochloromethane	ND		270	18	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Dibromomethane	ND		270	35	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Dichlorodifluoromethane	ND		270	50	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Ethylbenzene	ND		270	35	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Hexachlorobutadiene	ND		270	27	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Isopropylbenzene	**110**	**J**	270	19	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Methylene Chloride	ND		270	29	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
m-Xylene & p-Xylene	**170**	**J**	270	27	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Naphthalene	ND		270	9.6	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
n-Butylbenzene	ND		270	17	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
N-Propylbenzene	**150**	**J**	270	25	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
o-Xylene	**2600**		270	28	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
p-Isopropyltoluene	**4400**		270	8.5	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
sec-Butylbenzene	**5400**		270	13	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Styrene	ND		270	5.9	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
tert-Butylbenzene	**170**	**J**	270	22	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Tetrachloroethene	ND		270	22	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Toluene	ND		270	24	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
trans-1,2-Dichloroethene	ND		270	33	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
trans-1,3-Dichloropropene	ND		270	15	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Trichloroethene	ND		270	29	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4

Client Sample ID: 20BET-SS-D4

Date Collected: 08/19/20 09:11
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-27

Matrix: Solid
Percent Solids: 85.1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichlorofluoromethane	ND		270	64	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Vinyl acetate	ND		270	42	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Vinyl chloride	ND		270	23	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4
Xylenes, Total	**2800**		270	28	ug/Kg	☼	08/25/20 18:14	09/01/20 18:55	4

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*52 - 126*	*08/25/20 18:14*	*09/01/20 18:55*	*4*
4-Bromofluorobenzene (Surr)	*103*		*67 - 135*	*08/25/20 18:14*	*09/01/20 18:55*	*4*
Dibromofluoromethane (Surr)	*90*		*61 - 123*	*08/25/20 18:14*	*09/01/20 18:55*	*4*
Toluene-d8 (Surr)	*100*		*65 - 131*	*08/25/20 18:14*	*09/01/20 18:55*	*4*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C10 AK	**420**		27	5.3	mg/Kg	☼	08/25/20 18:14	09/01/20 18:55	4

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*60 - 120*	*08/25/20 18:14*	*09/01/20 18:55*	*4*
Trifluorotoluene (Surr)	*145*	*X*	*60 - 120*	*08/25/20 18:14*	*09/01/20 18:55*	*4*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		55	6.9	ug/Kg	☼	08/31/20 07:48	09/01/20 22:57	10
Acenaphthylene	ND		55	7.2	ug/Kg	☼	08/31/20 07:48	09/01/20 22:57	10
Anthracene	ND		55	7.3	ug/Kg	☼	08/31/20 07:48	09/01/20 22:57	10
Benzo[a]anthracene	ND		55	7.7	ug/Kg	☼	08/31/20 07:48	09/01/20 22:57	10
Benzo[a]pyrene	ND		55	7.6	ug/Kg	☼	08/31/20 07:48	09/01/20 22:57	10
Benzo[b]fluoranthene	ND		55	8.4	ug/Kg	☼	08/31/20 07:48	09/01/20 22:57	10
Benzo[g,h,i]perylene	ND		55	7.9	ug/Kg	☼	08/31/20 07:48	09/01/20 22:57	10
Benzo[k]fluoranthene	ND		55	7.9	ug/Kg	☼	08/31/20 07:48	09/01/20 22:57	10
Chrysene	ND		55	7.9	ug/Kg	☼	08/31/20 07:48	09/01/20 22:57	10
Dibenz(a,h)anthracene	ND		55	8.4	ug/Kg	☼	08/31/20 07:48	09/01/20 22:57	10
Fluoranthene	ND		55	8.8	ug/Kg	☼	08/31/20 07:48	09/01/20 22:57	10
Fluorene	**73**		55	7.0	ug/Kg	☼	08/31/20 07:48	09/01/20 22:57	10
Indeno[1,2,3-cd]pyrene	ND		55	8.4	ug/Kg	☼	08/31/20 07:48	09/01/20 22:57	10
Naphthalene	**990**		55	7.3	ug/Kg	☼	08/31/20 07:48	09/01/20 22:57	10
Phenanthrene	**18**	**J**	55	7.9	ug/Kg	☼	08/31/20 07:48	09/01/20 22:57	10
Pyrene	ND		55	8.2	ug/Kg	☼	08/31/20 07:48	09/01/20 22:57	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*0*	*X*	*49 - 114*	*08/31/20 07:48*	*09/01/20 22:57*	*10*
Terphenyl-d14	*87*		*53 - 121*	*08/31/20 07:48*	*09/01/20 22:57*	*10*
2-Fluorobiphenyl (Surr)	*110*	*X*	*43 - 109*	*08/31/20 07:48*	*09/01/20 22:57*	*10*
2-methylnaphthalene-d10	*0*	*X*	*50 - 150*	*08/31/20 07:48*	*09/01/20 22:57*	*10*
Fluoranthene-d10 (Surr)	*88*		*50 - 150*	*08/31/20 07:48*	*09/01/20 22:57*	*10*

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**9900**	*	230	57	mg/Kg	☼	09/01/20 07:19	09/10/20 06:09	100
RRO (nC25-nC36)	ND		2300	430	mg/Kg	☼	09/01/20 07:19	09/10/20 06:09	100

Client Sample ID: 20BET-SS-D4

Date Collected: 08/19/20 09:11
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-27

Matrix: Solid
Percent Solids: 85.1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*80*		*60 - 120*	*09/01/20 07:19*	*09/10/20 06:09*	*100*
n-Triacontane-d62	*100*		*60 - 120*	*09/01/20 07:19*	*09/10/20 06:09*	*100*

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**10000**	**H B**	230	58	mg/Kg	☼	09/09/20 09:17	09/14/20 19:11	100
RRO (nC25-nC36)	ND	H	2300	440	mg/Kg	☼	09/09/20 09:17	09/14/20 19:11	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*130*	*X*	*60 - 120*	*09/09/20 09:17*	*09/14/20 19:11*	*100*
n-Triacontane-d62	*86*		*60 - 120*	*09/09/20 09:17*	*09/14/20 19:11*	*100*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**21**	**B**	0.24	0.049	ug/Kg	☼	09/01/20 00:42	09/03/20 02:29	1
Perfluoroheptanoic acid (PFHpA)	**2.3**		0.24	0.034	ug/Kg	☼	09/01/20 00:42	09/03/20 02:29	1
Perfluorooctanoic acid (PFOA)	**1.2**		0.24	0.10	ug/Kg	☼	09/01/20 00:42	09/03/20 02:29	1
Perfluorononanoic acid (PFNA)	**0.11**	**J**	0.24	0.042	ug/Kg	☼	09/01/20 00:42	09/03/20 02:29	1
Perfluorodecanoic acid (PFDA)	**0.24**		0.24	0.026	ug/Kg	☼	09/01/20 00:42	09/03/20 02:29	1
Perfluoroundecanoic acid (PFUnA)	ND		0.24	0.042	ug/Kg	☼	09/01/20 00:42	09/03/20 02:29	1
Perfluorododecanoic acid (PFDoA)	ND		0.24	0.079	ug/Kg	☼	09/01/20 00:42	09/03/20 02:29	1
Perfluorotridecanoic acid (PFTriA)	ND		0.24	0.060	ug/Kg	☼	09/01/20 00:42	09/03/20 02:29	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.24	0.063	ug/Kg	☼	09/01/20 00:42	09/03/20 02:29	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.24	0.029	ug/Kg	☼	09/01/20 00:42	09/03/20 02:29	1
Perfluorohexanesulfonic acid (PFHxS)	**0.063**	**J**	0.24	0.036	ug/Kg	☼	09/01/20 00:42	09/03/20 02:29	1
Perfluorooctanesulfonic acid (PFOS)	**1.7**	**B**	0.59	0.24	ug/Kg	☼	09/01/20 00:42	09/03/20 02:29	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.4	0.46	ug/Kg	☼	09/01/20 00:42	09/03/20 02:29	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.4	0.43	ug/Kg	☼	09/01/20 00:42	09/03/20 02:29	1
F-53B Major	ND		0.24	0.032	ug/Kg	☼	09/01/20 00:42	09/03/20 02:29	1
HFPO-DA (GenX)	ND		0.29	0.13	ug/Kg	☼	09/01/20 00:42	09/03/20 02:29	1
F-53B Minor	ND		0.24	0.026	ug/Kg	☼	09/01/20 00:42	09/03/20 02:29	1
DONA	ND		0.24	0.021	ug/Kg	☼	09/01/20 00:42	09/03/20 02:29	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*107*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:29*	*1*
13C2 PFDA	*54*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:29*	*1*
13C4 PFOS	*126*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:29*	*1*
d3-NMeFOSAA	*85*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:29*	*1*
d5-NEtFOSAA	*101*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:29*	*1*
13C3 HFPO-DA	*100*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:29*	*1*
18O2 PFHxS	*121*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:29*	*1*
13C3 PFBS	*112*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:29*	*1*
13C2 PFDoA	*128*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:29*	*1*
13C2 PFTeDA	*123*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:29*	*1*
13C5 PFNA	*123*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:29*	*1*
13C4 PFOA	*80*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:29*	*1*
13C2 PFUnA	*129*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:29*	*1*
13C4 PFHpA	*126*		*50 - 150*	*09/01/20 00:42*	*09/03/20 02:29*	*1*

Client Sample ID: 20BET-SS-D4

Lab Sample ID: 320-63955-27
Date Collected: 08/19/20 09:11
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 85.1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**14.9**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**85.1**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-D5

Lab Sample ID: 320-63955-28
Date Collected: 08/19/20 09:13
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 69.8

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**120**	**B**	1.4	0.29	ug/Kg	☼	09/01/20 00:42	09/03/20 03:53	5
Perfluoroheptanoic acid (PFHpA)	**18**		1.4	0.20	ug/Kg	☼	09/01/20 00:42	09/03/20 03:53	5
Perfluorooctanoic acid (PFOA)	**1.9**		1.4	0.60	ug/Kg	☼	09/01/20 00:42	09/03/20 03:53	5
Perfluorononanoic acid (PFNA)	ND		1.4	0.25	ug/Kg	☼	09/01/20 00:42	09/03/20 03:53	5
Perfluorodecanoic acid (PFDA)	ND		1.4	0.15	ug/Kg	☼	09/01/20 00:42	09/03/20 03:53	5
Perfluoroundecanoic acid (PFUnA)	ND		1.4	0.25	ug/Kg	☼	09/01/20 00:42	09/03/20 03:53	5
Perfluorododecanoic acid (PFDoA)	ND		1.4	0.47	ug/Kg	☼	09/01/20 00:42	09/03/20 03:53	5
Perfluorotridecanoic acid (PFTriA)	ND		1.4	0.36	ug/Kg	☼	09/01/20 00:42	09/03/20 03:53	5
Perfluorotetradecanoic acid (PFTeA)	ND		1.4	0.38	ug/Kg	☼	09/01/20 00:42	09/03/20 03:53	5
Perfluorobutanesulfonic acid (PFBS)	ND		1.4	0.17	ug/Kg	☼	09/01/20 00:42	09/03/20 03:53	5
Perfluorohexanesulfonic acid (PFHxS)	**0.35**	**J**	1.4	0.22	ug/Kg	☼	09/01/20 00:42	09/03/20 03:53	5
Perfluorooctanesulfonic acid (PFOS)	**1.6**	**J B**	3.5	1.4	ug/Kg	☼	09/01/20 00:42	09/03/20 03:53	5
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		14	2.7	ug/Kg	☼	09/01/20 00:42	09/03/20 03:53	5
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		14	2.6	ug/Kg	☼	09/01/20 00:42	09/03/20 03:53	5
F-53B Major	ND		1.4	0.19	ug/Kg	☼	09/01/20 00:42	09/03/20 03:53	5
HFPO-DA (GenX)	ND		1.7	0.77	ug/Kg	☼	09/01/20 00:42	09/03/20 03:53	5
F-53B Minor	ND		1.4	0.15	ug/Kg	☼	09/01/20 00:42	09/03/20 03:53	5
DONA	ND		1.4	0.13	ug/Kg	☼	09/01/20 00:42	09/03/20 03:53	5

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*105*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:53*	*5*
13C2 PFDA	*99*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:53*	*5*
13C4 PFOS	*103*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:53*	*5*
d3-NMeFOSAA	*112*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:53*	*5*
d5-NEtFOSAA	*120*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:53*	*5*
13C3 HFPO-DA	*87*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:53*	*5*
18O2 PFHxS	*109*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:53*	*5*
13C3 PFBS	*110*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:53*	*5*
13C2 PFDoA	*109*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:53*	*5*
13C2 PFTeDA	*108*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:53*	*5*
13C5 PFNA	*112*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:53*	*5*
13C4 PFOA	*83*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:53*	*5*
13C2 PFUnA	*109*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:53*	*5*
13C4 PFHpA	*111*		*50 - 150*	*09/01/20 00:42*	*09/03/20 03:53*	*5*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**30.2**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**69.8**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-D6

Lab Sample ID: 320-63955-29

Date Collected: 08/19/20 09:15
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 87.7

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**4.4**	**B**	0.22	0.045	ug/Kg	☼	09/01/20 00:46	09/03/20 02:38	1
Perfluoroheptanoic acid (PFHpA)	**0.67**		0.22	0.031	ug/Kg	☼	09/01/20 00:46	09/03/20 02:38	1
Perfluorooctanoic acid (PFOA)	**0.36**		0.22	0.093	ug/Kg	☼	09/01/20 00:46	09/03/20 02:38	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.039	ug/Kg	☼	09/01/20 00:46	09/03/20 02:38	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.024	ug/Kg	☼	09/01/20 00:46	09/03/20 02:38	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.039	ug/Kg	☼	09/01/20 00:46	09/03/20 02:38	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.072	ug/Kg	☼	09/01/20 00:46	09/03/20 02:38	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.055	ug/Kg	☼	09/01/20 00:46	09/03/20 02:38	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.058	ug/Kg	☼	09/01/20 00:46	09/03/20 02:38	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.027	ug/Kg	☼	09/01/20 00:46	09/03/20 02:38	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.033	ug/Kg	☼	09/01/20 00:46	09/03/20 02:38	1
Perfluorooctanesulfonic acid (PFOS)	**0.25**	**J B**	0.54	0.22	ug/Kg	☼	09/01/20 00:46	09/03/20 02:38	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.42	ug/Kg	☼	09/01/20 00:46	09/03/20 02:38	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.40	ug/Kg	☼	09/01/20 00:46	09/03/20 02:38	1
F-53B Major	ND		0.22	0.029	ug/Kg	☼	09/01/20 00:46	09/03/20 02:38	1
HFPO-DA (GenX)	ND		0.27	0.12	ug/Kg	☼	09/01/20 00:46	09/03/20 02:38	1
F-53B Minor	ND		0.22	0.024	ug/Kg	☼	09/01/20 00:46	09/03/20 02:38	1
DONA	ND		0.22	0.019	ug/Kg	☼	09/01/20 00:46	09/03/20 02:38	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*87*		*50 - 150*	*09/01/20 00:46*	*09/03/20 02:38*	*1*
13C2 PFDA	*90*		*50 - 150*	*09/01/20 00:46*	*09/03/20 02:38*	*1*
13C4 PFOS	*81*		*50 - 150*	*09/01/20 00:46*	*09/03/20 02:38*	*1*
d3-NMeFOSAA	*85*		*50 - 150*	*09/01/20 00:46*	*09/03/20 02:38*	*1*
d5-NEtFOSAA	*82*		*50 - 150*	*09/01/20 00:46*	*09/03/20 02:38*	*1*
13C3 HFPO-DA	*72*		*50 - 150*	*09/01/20 00:46*	*09/03/20 02:38*	*1*
18O2 PFHxS	*79*		*50 - 150*	*09/01/20 00:46*	*09/03/20 02:38*	*1*
13C3 PFBS	*75*		*50 - 150*	*09/01/20 00:46*	*09/03/20 02:38*	*1*
13C2 PFDoA	*92*		*50 - 150*	*09/01/20 00:46*	*09/03/20 02:38*	*1*
13C2 PFTeDA	*92*		*50 - 150*	*09/01/20 00:46*	*09/03/20 02:38*	*1*
13C5 PFNA	*92*		*50 - 150*	*09/01/20 00:46*	*09/03/20 02:38*	*1*
13C4 PFOA	*81*		*50 - 150*	*09/01/20 00:46*	*09/03/20 02:38*	*1*
13C2 PFUnA	*88*		*50 - 150*	*09/01/20 00:46*	*09/03/20 02:38*	*1*
13C4 PFHpA	*88*		*50 - 150*	*09/01/20 00:46*	*09/03/20 02:38*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**12.3**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**87.7**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-D7

Lab Sample ID: 320-63955-30

Date Collected: 08/19/20 09:17
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 90.7

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**4.3**	**B**	0.22	0.046	ug/Kg	☼	09/01/20 00:46	09/03/20 03:06	1
Perfluoroheptanoic acid (PFHpA)	**0.91**		0.22	0.032	ug/Kg	☼	09/01/20 00:46	09/03/20 03:06	1
Perfluorooctanoic acid (PFOA)	**0.36**		0.22	0.094	ug/Kg	☼	09/01/20 00:46	09/03/20 03:06	1

Client Sample ID: 20BET-SS-D7

Lab Sample ID: 320-63955-30
Date Collected: 08/19/20 09:17
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 90.7

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	ND		0.22	0.039	ug/Kg	☼	09/01/20 00:46	09/03/20 03:06	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.024	ug/Kg	☼	09/01/20 00:46	09/03/20 03:06	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.039	ug/Kg	☼	09/01/20 00:46	09/03/20 03:06	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.073	ug/Kg	☼	09/01/20 00:46	09/03/20 03:06	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.056	ug/Kg	☼	09/01/20 00:46	09/03/20 03:06	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.059	ug/Kg	☼	09/01/20 00:46	09/03/20 03:06	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.027	ug/Kg	☼	09/01/20 00:46	09/03/20 03:06	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.034	ug/Kg	☼	09/01/20 00:46	09/03/20 03:06	1
Perfluorooctanesulfonic acid (PFOS)	**1.3**	**B**	0.55	0.22	ug/Kg	☼	09/01/20 00:46	09/03/20 03:06	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	09/01/20 00:46	09/03/20 03:06	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.40	ug/Kg	☼	09/01/20 00:46	09/03/20 03:06	1
F-53B Major	ND		0.22	0.029	ug/Kg	☼	09/01/20 00:46	09/03/20 03:06	1
HFPO-DA (GenX)	ND		0.27	0.12	ug/Kg	☼	09/01/20 00:46	09/03/20 03:06	1
F-53B Minor	ND		0.22	0.024	ug/Kg	☼	09/01/20 00:46	09/03/20 03:06	1
DONA	ND		0.22	0.020	ug/Kg	☼	09/01/20 00:46	09/03/20 03:06	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*80*		*50 - 150*	*09/01/20 00:46*	*09/03/20 03:06*	*1*
13C2 PFDA	*86*		*50 - 150*	*09/01/20 00:46*	*09/03/20 03:06*	*1*
13C4 PFOS	*88*		*50 - 150*	*09/01/20 00:46*	*09/03/20 03:06*	*1*
d3-NMeFOSAA	*60*		*50 - 150*	*09/01/20 00:46*	*09/03/20 03:06*	*1*
d5-NEtFOSAA	*70*		*50 - 150*	*09/01/20 00:46*	*09/03/20 03:06*	*1*
13C3 HFPO-DA	*72*		*50 - 150*	*09/01/20 00:46*	*09/03/20 03:06*	*1*
18O2 PFHxS	*89*		*50 - 150*	*09/01/20 00:46*	*09/03/20 03:06*	*1*
13C3 PFBS	*83*		*50 - 150*	*09/01/20 00:46*	*09/03/20 03:06*	*1*
13C2 PFDoA	*88*		*50 - 150*	*09/01/20 00:46*	*09/03/20 03:06*	*1*
13C2 PFTeDA	*91*		*50 - 150*	*09/01/20 00:46*	*09/03/20 03:06*	*1*
13C5 PFNA	*91*		*50 - 150*	*09/01/20 00:46*	*09/03/20 03:06*	*1*
13C4 PFOA	*81*		*50 - 150*	*09/01/20 00:46*	*09/03/20 03:06*	*1*
13C2 PFUnA	*85*		*50 - 150*	*09/01/20 00:46*	*09/03/20 03:06*	*1*
13C4 PFHpA	*92*		*50 - 150*	*09/01/20 00:46*	*09/03/20 03:06*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**9.3**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**90.7**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-D10

Lab Sample ID: 320-63955-31
Date Collected: 08/19/20 09:01
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 86.4

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		250	30	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
1,1,1-Trichloroethane	ND		250	19	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
1,1,2,2-Tetrachloroethane	ND		250	16	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
1,1,2-Trichloroethane	ND		250	17	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
1,1-Dichloroethane	ND		250	14	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
1,1-Dichloroethene	ND		250	24	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4

Client Sample ID: 20BET-SS-D10
Date Collected: 08/19/20 09:01
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-31
Matrix: Solid
Percent Solids: 86.4

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloropropene	ND		250	22	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
1,2,3-Trichlorobenzene	ND		250	32	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
1,2,3-Trichloropropane	ND		250	24	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
1,2,4-Trichlorobenzene	ND		250	17	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
1,2,4-Trimethylbenzene	**7000**		250	18	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
1,2-Dibromo-3-Chloropropane	ND		510	32	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
1,2-Dibromoethane (EDB)	ND		250	27	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
1,2-Dichlorobenzene	ND		250	11	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
1,2-Dichloroethane	ND		250	24	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
1,2-Dichloropropane	ND		250	24	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
1,3,5-Trimethylbenzene	**11000**		250	18	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
1,3-Dichlorobenzene	ND		250	17	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
1,3-Dichloropropane	ND		250	12	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
1,4-Dichlorobenzene	ND		250	11	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
2,2-Dichloropropane	ND		250	22	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
2-Butanone (MEK)	**140**	**J**	510	130	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
2-Chlorotoluene	ND		250	18	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
4-Chlorotoluene	ND		250	14	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
4-Methyl-2-pentanone (MIBK)	ND		510	16	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Acetone	ND		2500	250	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Benzene	ND		250	17	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Bromobenzene	ND		250	28	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Bromochloromethane	ND		250	37	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Bromodichloromethane	ND		250	25	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Bromoform	ND		250	56	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Bromomethane	ND		510	61	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Carbon disulfide	ND		510	18	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Carbon tetrachloride	ND		250	18	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Chlorobenzene	ND		250	22	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Chloroethane	ND		250	34	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Chloroform	ND		250	13	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Chloromethane	ND		250	13	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
cis-1,2-Dichloroethene	ND		250	42	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
cis-1,3-Dichloropropene	ND		250	21	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Dibromochloromethane	ND		250	17	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Dibromomethane	ND		250	33	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Dichlorodifluoromethane	ND		250	48	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Ethylbenzene	ND		250	34	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Hexachlorobutadiene	ND		250	26	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Isopropylbenzene	**130**	**J**	250	18	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Methylene Chloride	ND		250	27	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
m-Xylene & p-Xylene	**140**	**J**	250	25	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Naphthalene	ND		250	9.2	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
n-Butylbenzene	ND		250	16	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
N-Propylbenzene	**160**	**J**	250	24	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
o-Xylene	**2200**		250	26	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
p-Isopropyltoluene	**3800**		250	8.1	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
sec-Butylbenzene	**5200**		250	12	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Styrene	ND		250	5.6	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4

Client Sample ID: 20BET-SS-D10

Date Collected: 08/19/20 09:01
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-31

Matrix: Solid
Percent Solids: 86.4

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	**140**	**J**	250	21	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Tetrachloroethene	ND		250	21	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Toluene	ND		250	23	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
trans-1,2-Dichloroethene	ND		250	32	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
trans-1,3-Dichloropropene	ND		250	14	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Trichloroethene	ND		250	28	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Trichlorofluoromethane	ND		250	61	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Vinyl acetate	ND		250	40	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Vinyl chloride	ND		250	22	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4
Xylenes, Total	**2300**		250	26	ug/Kg	☼	08/25/20 18:14	09/01/20 19:18	4

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*52 - 126*	*08/25/20 18:14*	*09/01/20 19:18*	*4*
4-Bromofluorobenzene (Surr)	*104*		*67 - 135*	*08/25/20 18:14*	*09/01/20 19:18*	*4*
Dibromofluoromethane (Surr)	*87*		*61 - 123*	*08/25/20 18:14*	*09/01/20 19:18*	*4*
Toluene-d8 (Surr)	*105*		*65 - 131*	*08/25/20 18:14*	*09/01/20 19:18*	*4*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C10 AK	**400**		25	5.1	mg/Kg	☼	08/25/20 18:14	09/01/20 19:18	4

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*60 - 120*	*08/25/20 18:14*	*09/01/20 19:18*	*4*
Trifluorotoluene (Surr)	*125*	*X*	*60 - 120*	*08/25/20 18:14*	*09/01/20 19:18*	*4*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		58	7.2	ug/Kg	☼	08/31/20 07:48	09/01/20 23:26	10
Acenaphthylene	ND		58	7.6	ug/Kg	☼	08/31/20 07:48	09/01/20 23:26	10
Anthracene	ND		58	7.7	ug/Kg	☼	08/31/20 07:48	09/01/20 23:26	10
Benzo[a]anthracene	ND		58	8.2	ug/Kg	☼	08/31/20 07:48	09/01/20 23:26	10
Benzo[a]pyrene	ND		58	8.1	ug/Kg	☼	08/31/20 07:48	09/01/20 23:26	10
Benzo[b]fluoranthene	ND		58	8.9	ug/Kg	☼	08/31/20 07:48	09/01/20 23:26	10
Benzo[g,h,i]perylene	ND		58	8.3	ug/Kg	☼	08/31/20 07:48	09/01/20 23:26	10
Benzo[k]fluoranthene	ND		58	8.3	ug/Kg	☼	08/31/20 07:48	09/01/20 23:26	10
Chrysene	ND		58	8.3	ug/Kg	☼	08/31/20 07:48	09/01/20 23:26	10
Dibenz(a,h)anthracene	ND		58	8.9	ug/Kg	☼	08/31/20 07:48	09/01/20 23:26	10
Fluoranthene	ND		58	9.3	ug/Kg	☼	08/31/20 07:48	09/01/20 23:26	10
Fluorene	**70**		58	7.4	ug/Kg	☼	08/31/20 07:48	09/01/20 23:26	10
Indeno[1,2,3-cd]pyrene	ND		58	8.9	ug/Kg	☼	08/31/20 07:48	09/01/20 23:26	10
Naphthalene	**990**		58	7.7	ug/Kg	☼	08/31/20 07:48	09/01/20 23:26	10
Phenanthrene	**18**	**J**	58	8.3	ug/Kg	☼	08/31/20 07:48	09/01/20 23:26	10
Pyrene	ND		58	8.6	ug/Kg	☼	08/31/20 07:48	09/01/20 23:26	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*0*	*X*	*49 - 114*	*08/31/20 07:48*	*09/01/20 23:26*	*10*
Terphenyl-d14	*90*		*53 - 121*	*08/31/20 07:48*	*09/01/20 23:26*	*10*
2-Fluorobiphenyl (Surr)	*107*		*43 - 109*	*08/31/20 07:48*	*09/01/20 23:26*	*10*
2-methylnaphthalene-d10	*0*	*X*	*50 - 150*	*08/31/20 07:48*	*09/01/20 23:26*	*10*
Fluoranthene-d10 (Surr)	*89*		*50 - 150*	*08/31/20 07:48*	*09/01/20 23:26*	*10*

Client Sample ID: 20BET-SS-D10

Date Collected: 08/19/20 09:01
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-31

Matrix: Solid
Percent Solids: 86.4

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**9000**	*	230	57	mg/Kg	☼	09/01/20 07:19	09/11/20 17:47	100
RRO (nC25-nC36)	ND		2300	430	mg/Kg	☼	09/01/20 07:19	09/11/20 17:47	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*64*		*60 - 120*	*09/01/20 07:19*	*09/11/20 17:47*	*100*
n-Triacontane-d62	*88*		*60 - 120*	*09/01/20 07:19*	*09/11/20 17:47*	*100*

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**8900**	H B	230	57	mg/Kg	☼	09/09/20 09:17	09/14/20 19:41	100
RRO (nC25-nC36)	ND	H	2300	430	mg/Kg	☼	09/09/20 09:17	09/14/20 19:41	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*110*		*60 - 120*	*09/09/20 09:17*	*09/14/20 19:41*	*100*
n-Triacontane-d62	*101*		*60 - 120*	*09/09/20 09:17*	*09/14/20 19:41*	*100*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**20**		0.23	0.049	ug/Kg	☼	09/01/20 00:44	09/03/20 05:08	1
Perfluoroheptanoic acid (PFHpA)	**2.4**		0.23	0.033	ug/Kg	☼	09/01/20 00:44	09/03/20 05:08	1
Perfluorooctanoic acid (PFOA)	**1.3**		0.23	0.099	ug/Kg	☼	09/01/20 00:44	09/03/20 05:08	1
Perfluorononanoic acid (PFNA)	**0.11**	J	0.23	0.042	ug/Kg	☼	09/01/20 00:44	09/03/20 05:08	1
Perfluorodecanoic acid (PFDA)	**0.27**		0.23	0.025	ug/Kg	☼	09/01/20 00:44	09/03/20 05:08	1
Perfluoroundecanoic acid (PFUnA)	ND		0.23	0.042	ug/Kg	☼	09/01/20 00:44	09/03/20 05:08	1
Perfluorododecanoic acid (PFDoA)	ND		0.23	0.077	ug/Kg	☼	09/01/20 00:44	09/03/20 05:08	1
Perfluorotridecanoic acid (PFTriA)	ND		0.23	0.059	ug/Kg	☼	09/01/20 00:44	09/03/20 05:08	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.23	0.062	ug/Kg	☼	09/01/20 00:44	09/03/20 05:08	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.23	0.029	ug/Kg	☼	09/01/20 00:44	09/03/20 05:08	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.23	0.036	ug/Kg	☼	09/01/20 00:44	09/03/20 05:08	1
Perfluorooctanesulfonic acid (PFOS)	**1.8**		0.58	0.23	ug/Kg	☼	09/01/20 00:44	09/03/20 05:08	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.3	0.45	ug/Kg	☼	09/01/20 00:44	09/03/20 05:08	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.3	0.43	ug/Kg	☼	09/01/20 00:44	09/03/20 05:08	1
F-53B Major	ND	F1	0.23	0.031	ug/Kg	☼	09/01/20 00:44	09/03/20 05:08	1
HFPO-DA (GenX)	ND		0.29	0.13	ug/Kg	☼	09/01/20 00:44	09/03/20 05:08	1
F-53B Minor	ND		0.23	0.025	ug/Kg	☼	09/01/20 00:44	09/03/20 05:08	1
DONA	ND		0.23	0.021	ug/Kg	☼	09/01/20 00:44	09/03/20 05:08	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*126*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:08*	*1*
13C2 PFDA	*58*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:08*	*1*
13C4 PFOS	*135*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:08*	*1*
d3-NMeFOSAA	*91*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:08*	*1*
d5-NEtFOSAA	*116*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:08*	*1*
13C3 HFPO-DA	*115*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:08*	*1*
18O2 PFHxS	*137*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:08*	*1*
13C3 PFBS	*132*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:08*	*1*
13C2 PFDoA	*143*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:08*	*1*
13C2 PFTeDA	*143*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:08*	*1*
13C5 PFNA	*135*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:08*	*1*

Client Sample ID: 20BET-SS-D10

Lab Sample ID: 320-63955-31

Date Collected: 08/19/20 09:01
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 86.4

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	84		50 - 150	09/01/20 00:44	09/03/20 05:08	1
13C2 PFUnA	145		50 - 150	09/01/20 00:44	09/03/20 05:08	1
13C4 PFHpA	148		50 - 150	09/01/20 00:44	09/03/20 05:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**13.6**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**86.4**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-E1

Lab Sample ID: 320-63955-32

Date Collected: 08/19/20 09:25
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 93.9

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**2.7**		0.21	0.045	ug/Kg	☼	09/01/20 00:44	09/03/20 05:36	1
Perfluoroheptanoic acid (PFHpA)	**0.33**		0.21	0.031	ug/Kg	☼	09/01/20 00:44	09/03/20 05:36	1
Perfluorooctanoic acid (PFOA)	**0.16**	**J**	0.21	0.091	ug/Kg	☼	09/01/20 00:44	09/03/20 05:36	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	09/01/20 00:44	09/03/20 05:36	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	09/01/20 00:44	09/03/20 05:36	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	09/01/20 00:44	09/03/20 05:36	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	09/01/20 00:44	09/03/20 05:36	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	09/01/20 00:44	09/03/20 05:36	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	09/01/20 00:44	09/03/20 05:36	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.027	ug/Kg	☼	09/01/20 00:44	09/03/20 05:36	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.033	ug/Kg	☼	09/01/20 00:44	09/03/20 05:36	1
Perfluorooctanesulfonic acid (PFOS)	**0.37**	**J**	0.53	0.21	ug/Kg	☼	09/01/20 00:44	09/03/20 05:36	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	09/01/20 00:44	09/03/20 05:36	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	09/01/20 00:44	09/03/20 05:36	1
F-53B Major	ND		0.21	0.029	ug/Kg	☼	09/01/20 00:44	09/03/20 05:36	1
HFPO-DA (GenX)	ND		0.27	0.12	ug/Kg	☼	09/01/20 00:44	09/03/20 05:36	1
F-53B Minor	ND		0.21	0.023	ug/Kg	☼	09/01/20 00:44	09/03/20 05:36	1
DONA	ND		0.21	0.019	ug/Kg	☼	09/01/20 00:44	09/03/20 05:36	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	88		50 - 150	09/01/20 00:44	09/03/20 05:36	1
13C2 PFDA	91		50 - 150	09/01/20 00:44	09/03/20 05:36	1
13C4 PFOS	83		50 - 150	09/01/20 00:44	09/03/20 05:36	1
d3-NMeFOSAA	78		50 - 150	09/01/20 00:44	09/03/20 05:36	1
d5-NEtFOSAA	76		50 - 150	09/01/20 00:44	09/03/20 05:36	1
13C3 HFPO-DA	76		50 - 150	09/01/20 00:44	09/03/20 05:36	1
18O2 PFHxS	82		50 - 150	09/01/20 00:44	09/03/20 05:36	1
13C3 PFBS	84		50 - 150	09/01/20 00:44	09/03/20 05:36	1
13C2 PFDoA	86		50 - 150	09/01/20 00:44	09/03/20 05:36	1
13C2 PFTeDA	93		50 - 150	09/01/20 00:44	09/03/20 05:36	1
13C5 PFNA	94		50 - 150	09/01/20 00:44	09/03/20 05:36	1
13C4 PFOA	83		50 - 150	09/01/20 00:44	09/03/20 05:36	1
13C2 PFUnA	87		50 - 150	09/01/20 00:44	09/03/20 05:36	1
13C4 PFHpA	91		50 - 150	09/01/20 00:44	09/03/20 05:36	1

Client Sample ID: 20BET-SS-E1

Lab Sample ID: 320-63955-32
Date Collected: 08/19/20 09:25
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 93.9

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**6.1**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**93.9**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-E2

Lab Sample ID: 320-63955-33
Date Collected: 08/19/20 09:27
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 91.4

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**7.4**		0.22	0.045	ug/Kg	☼	09/01/20 00:44	09/03/20 05:45	1
Perfluoroheptanoic acid (PFHpA)	**0.62**		0.22	0.031	ug/Kg	☼	09/01/20 00:44	09/03/20 05:45	1
Perfluorooctanoic acid (PFOA)	**0.42**		0.22	0.093	ug/Kg	☼	09/01/20 00:44	09/03/20 05:45	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.039	ug/Kg	☼	09/01/20 00:44	09/03/20 05:45	1
Perfluorodecanoic acid (PFDA)	**0.039**	**J**	0.22	0.024	ug/Kg	☼	09/01/20 00:44	09/03/20 05:45	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.039	ug/Kg	☼	09/01/20 00:44	09/03/20 05:45	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.072	ug/Kg	☼	09/01/20 00:44	09/03/20 05:45	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.055	ug/Kg	☼	09/01/20 00:44	09/03/20 05:45	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.058	ug/Kg	☼	09/01/20 00:44	09/03/20 05:45	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.027	ug/Kg	☼	09/01/20 00:44	09/03/20 05:45	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.033	ug/Kg	☼	09/01/20 00:44	09/03/20 05:45	1
Perfluorooctanesulfonic acid (PFOS)	**0.41**	**J**	0.54	0.22	ug/Kg	☼	09/01/20 00:44	09/03/20 05:45	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.42	ug/Kg	☼	09/01/20 00:44	09/03/20 05:45	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.40	ug/Kg	☼	09/01/20 00:44	09/03/20 05:45	1
F-53B Major	ND		0.22	0.029	ug/Kg	☼	09/01/20 00:44	09/03/20 05:45	1
HFPO-DA (GenX)	ND		0.27	0.12	ug/Kg	☼	09/01/20 00:44	09/03/20 05:45	1
F-53B Minor	ND		0.22	0.024	ug/Kg	☼	09/01/20 00:44	09/03/20 05:45	1
DONA	ND		0.22	0.019	ug/Kg	☼	09/01/20 00:44	09/03/20 05:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*123*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:45*	*1*
13C2 PFDA	*120*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:45*	*1*
13C4 PFOS	*121*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:45*	*1*
d3-NMeFOSAA	*100*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:45*	*1*
d5-NEtFOSAA	*98*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:45*	*1*
13C3 HFPO-DA	*105*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:45*	*1*
18O2 PFHxS	*124*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:45*	*1*
13C3 PFBS	*118*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:45*	*1*
13C2 PFDoA	*118*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:45*	*1*
13C2 PFTeDA	*121*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:45*	*1*
13C5 PFNA	*131*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:45*	*1*
13C4 PFOA	*84*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:45*	*1*
13C2 PFUnA	*117*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:45*	*1*
13C4 PFHpA	*127*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:45*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**8.6**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**91.4**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-E3

Lab Sample ID: 320-63955-34
Date Collected: 08/19/20 09:29
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 92.6

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**14**		0.22	0.045	ug/Kg	☼	09/01/20 00:44	09/03/20 05:55	1
Perfluoroheptanoic acid (PFHpA)	**1.8**		0.22	0.031	ug/Kg	☼	09/01/20 00:44	09/03/20 05:55	1
Perfluorooctanoic acid (PFOA)	**0.57**		0.22	0.093	ug/Kg	☼	09/01/20 00:44	09/03/20 05:55	1
Perfluorononanoic acid (PFNA)	**0.14**	**J**	0.22	0.039	ug/Kg	☼	09/01/20 00:44	09/03/20 05:55	1
Perfluorodecanoic acid (PFDA)	**0.14**	**J**	0.22	0.024	ug/Kg	☼	09/01/20 00:44	09/03/20 05:55	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.039	ug/Kg	☼	09/01/20 00:44	09/03/20 05:55	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.072	ug/Kg	☼	09/01/20 00:44	09/03/20 05:55	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.055	ug/Kg	☼	09/01/20 00:44	09/03/20 05:55	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.058	ug/Kg	☼	09/01/20 00:44	09/03/20 05:55	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.027	ug/Kg	☼	09/01/20 00:44	09/03/20 05:55	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.033	ug/Kg	☼	09/01/20 00:44	09/03/20 05:55	1
Perfluorooctanesulfonic acid (PFOS)	**0.78**		0.54	0.22	ug/Kg	☼	09/01/20 00:44	09/03/20 05:55	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.42	ug/Kg	☼	09/01/20 00:44	09/03/20 05:55	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.40	ug/Kg	☼	09/01/20 00:44	09/03/20 05:55	1
F-53B Major	ND		0.22	0.029	ug/Kg	☼	09/01/20 00:44	09/03/20 05:55	1
HFPO-DA (GenX)	ND		0.27	0.12	ug/Kg	☼	09/01/20 00:44	09/03/20 05:55	1
F-53B Minor	ND		0.22	0.024	ug/Kg	☼	09/01/20 00:44	09/03/20 05:55	1
DONA	ND		0.22	0.019	ug/Kg	☼	09/01/20 00:44	09/03/20 05:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*124*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:55*	*1*
13C2 PFDA	*123*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:55*	*1*
13C4 PFOS	*114*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:55*	*1*
d3-NMeFOSAA	*117*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:55*	*1*
d5-NEtFOSAA	*141*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:55*	*1*
13C3 HFPO-DA	*106*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:55*	*1*
18O2 PFHxS	*124*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:55*	*1*
13C3 PFBS	*122*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:55*	*1*
13C2 PFDoA	*133*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:55*	*1*
13C2 PFTeDA	*134*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:55*	*1*
13C5 PFNA	*127*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:55*	*1*
13C4 PFOA	*81*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:55*	*1*
13C2 PFUnA	*133*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:55*	*1*
13C4 PFHpA	*135*		*50 - 150*	*09/01/20 00:44*	*09/03/20 05:55*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**7.4**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**92.6**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-E4

Lab Sample ID: 320-63955-35
Date Collected: 08/19/20 09:31
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 90.0

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**8.7**		0.21	0.045	ug/Kg	☼	09/01/20 00:44	09/03/20 06:23	1
Perfluoroheptanoic acid (PFHpA)	**1.1**		0.21	0.031	ug/Kg	☼	09/01/20 00:44	09/03/20 06:23	1
Perfluorooctanoic acid (PFOA)	**0.66**		0.21	0.091	ug/Kg	☼	09/01/20 00:44	09/03/20 06:23	1

Client Sample ID: 20BET-SS-E4

Lab Sample ID: 320-63955-35
Date Collected: 08/19/20 09:31
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 90.0

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	09/01/20 00:44	09/03/20 06:23	1
Perfluorodecanoic acid (PFDA)	**0.046**	**J**	0.21	0.023	ug/Kg	☼	09/01/20 00:44	09/03/20 06:23	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	09/01/20 00:44	09/03/20 06:23	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	09/01/20 00:44	09/03/20 06:23	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	09/01/20 00:44	09/03/20 06:23	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	09/01/20 00:44	09/03/20 06:23	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	09/01/20 00:44	09/03/20 06:23	1
Perfluorohexanesulfonic acid (PFHxS)	**0.061**	**J**	0.21	0.033	ug/Kg	☼	09/01/20 00:44	09/03/20 06:23	1
Perfluorooctanesulfonic acid (PFOS)	**0.41**	**J**	0.53	0.21	ug/Kg	☼	09/01/20 00:44	09/03/20 06:23	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	09/01/20 00:44	09/03/20 06:23	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	09/01/20 00:44	09/03/20 06:23	1
F-53B Major	ND		0.21	0.029	ug/Kg	☼	09/01/20 00:44	09/03/20 06:23	1
HFPO-DA (GenX)	ND		0.26	0.12	ug/Kg	☼	09/01/20 00:44	09/03/20 06:23	1
F-53B Minor	ND		0.21	0.023	ug/Kg	☼	09/01/20 00:44	09/03/20 06:23	1
DONA	ND		0.21	0.019	ug/Kg	☼	09/01/20 00:44	09/03/20 06:23	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*102*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:23*	*1*
13C2 PFDA	*106*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:23*	*1*
13C4 PFOS	*105*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:23*	*1*
d3-NMeFOSAA	*92*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:23*	*1*
d5-NEtFOSAA	*96*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:23*	*1*
13C3 HFPO-DA	*88*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:23*	*1*
18O2 PFHxS	*103*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:23*	*1*
13C3 PFBS	*97*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:23*	*1*
13C2 PFDoA	*107*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:23*	*1*
13C2 PFTeDA	*103*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:23*	*1*
13C5 PFNA	*112*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:23*	*1*
13C4 PFOA	*86*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:23*	*1*
13C2 PFUnA	*104*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:23*	*1*
13C4 PFHpA	*110*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:23*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**10**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**90.0**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-E5

Lab Sample ID: 320-63955-36
Date Collected: 08/19/20 09:33
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 92.8

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**2.6**		0.21	0.045	ug/Kg	☼	09/01/20 00:44	09/03/20 06:32	1
Perfluoroheptanoic acid (PFHpA)	**1.2**		0.21	0.031	ug/Kg	☼	09/01/20 00:44	09/03/20 06:32	1
Perfluorooctanoic acid (PFOA)	**0.43**		0.21	0.092	ug/Kg	☼	09/01/20 00:44	09/03/20 06:32	1
Perfluorononanoic acid (PFNA)	**0.081**	**J**	0.21	0.038	ug/Kg	☼	09/01/20 00:44	09/03/20 06:32	1
Perfluorodecanoic acid (PFDA)	**0.034**	**J**	0.21	0.024	ug/Kg	☼	09/01/20 00:44	09/03/20 06:32	1

Client Sample ID: 20BET-SS-E5

Date Collected: 08/19/20 09:33
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-36
Matrix: Solid
Percent Solids: 92.8

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	09/01/20 00:44	09/03/20 06:32	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.072	ug/Kg	☼	09/01/20 00:44	09/03/20 06:32	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.055	ug/Kg	☼	09/01/20 00:44	09/03/20 06:32	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.058	ug/Kg	☼	09/01/20 00:44	09/03/20 06:32	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.027	ug/Kg	☼	09/01/20 00:44	09/03/20 06:32	1
Perfluorohexanesulfonic acid (PFHxS)	**0.055**	**J I**	0.21	0.033	ug/Kg	☼	09/01/20 00:44	09/03/20 06:32	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.53	0.21	ug/Kg	☼	09/01/20 00:44	09/03/20 06:32	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.42	ug/Kg	☼	09/01/20 00:44	09/03/20 06:32	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.40	ug/Kg	☼	09/01/20 00:44	09/03/20 06:32	1
F-53B Major	ND		0.21	0.029	ug/Kg	☼	09/01/20 00:44	09/03/20 06:32	1
HFPO-DA (GenX)	ND		0.27	0.12	ug/Kg	☼	09/01/20 00:44	09/03/20 06:32	1
F-53B Minor	ND		0.21	0.024	ug/Kg	☼	09/01/20 00:44	09/03/20 06:32	1
DONA	ND		0.21	0.019	ug/Kg	☼	09/01/20 00:44	09/03/20 06:32	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*82*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:32*	*1*
13C2 PFDA	*88*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:32*	*1*
13C4 PFOS	*82*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:32*	*1*
d3-NMeFOSAA	*91*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:32*	*1*
d5-NEtFOSAA	*82*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:32*	*1*
13C3 HFPO-DA	*72*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:32*	*1*
18O2 PFHxS	*81*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:32*	*1*
13C3 PFBS	*78*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:32*	*1*
13C2 PFDoA	*86*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:32*	*1*
13C2 PFTeDA	*91*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:32*	*1*
13C5 PFNA	*89*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:32*	*1*
13C4 PFOA	*81*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:32*	*1*
13C2 PFUnA	*90*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:32*	*1*
13C4 PFHpA	*88*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:32*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**7.2**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**92.8**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-E6

Date Collected: 08/19/20 09:35
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-37
Matrix: Solid
Percent Solids: 83.6

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**5.1**		0.24	0.050	ug/Kg	☼	09/01/20 00:44	09/03/20 06:41	1
Perfluoroheptanoic acid (PFHpA)	**0.91**		0.24	0.035	ug/Kg	☼	09/01/20 00:44	09/03/20 06:41	1
Perfluorooctanoic acid (PFOA)	**0.49**		0.24	0.10	ug/Kg	☼	09/01/20 00:44	09/03/20 06:41	1
Perfluorononanoic acid (PFNA)	**0.079**	**J**	0.24	0.043	ug/Kg	☼	09/01/20 00:44	09/03/20 06:41	1
Perfluorodecanoic acid (PFDA)	ND		0.24	0.026	ug/Kg	☼	09/01/20 00:44	09/03/20 06:41	1
Perfluoroundecanoic acid (PFUnA)	ND		0.24	0.043	ug/Kg	☼	09/01/20 00:44	09/03/20 06:41	1
Perfluorododecanoic acid (PFDoA)	ND		0.24	0.080	ug/Kg	☼	09/01/20 00:44	09/03/20 06:41	1
Perfluorotridecanoic acid (PFTriA)	ND		0.24	0.061	ug/Kg	☼	09/01/20 00:44	09/03/20 06:41	1

Client Sample ID: 20BET-SS-E6

Date Collected: 08/19/20 09:35
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-37

Matrix: Solid
Percent Solids: 83.6

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotetradecanoic acid (PFTeA)	ND		0.24	0.064	ug/Kg	☼	09/01/20 00:44	09/03/20 06:41	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.24	0.030	ug/Kg	☼	09/01/20 00:44	09/03/20 06:41	1
Perfluorohexanesulfonic acid (PFHxS)	**0.051**	**J**	0.24	0.037	ug/Kg	☼	09/01/20 00:44	09/03/20 06:41	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.60	0.24	ug/Kg	☼	09/01/20 00:44	09/03/20 06:41	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.4	0.47	ug/Kg	☼	09/01/20 00:44	09/03/20 06:41	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.4	0.44	ug/Kg	☼	09/01/20 00:44	09/03/20 06:41	1
F-53B Major	ND		0.24	0.032	ug/Kg	☼	09/01/20 00:44	09/03/20 06:41	1
HFPO-DA (GenX)	ND		0.30	0.13	ug/Kg	☼	09/01/20 00:44	09/03/20 06:41	1
F-53B Minor	ND		0.24	0.026	ug/Kg	☼	09/01/20 00:44	09/03/20 06:41	1
DONA	ND		0.24	0.021	ug/Kg	☼	09/01/20 00:44	09/03/20 06:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*99*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:41*	*1*
13C2 PFDA	*101*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:41*	*1*
13C4 PFOS	*129*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:41*	*1*
d3-NMeFOSAA	*82*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:41*	*1*
d5-NEtFOSAA	*89*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:41*	*1*
13C3 HFPO-DA	*87*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:41*	*1*
18O2 PFHxS	*127*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:41*	*1*
13C3 PFBS	*115*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:41*	*1*
13C2 PFDoA	*106*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:41*	*1*
13C2 PFTeDA	*101*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:41*	*1*
13C5 PFNA	*111*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:41*	*1*
13C4 PFOA	*82*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:41*	*1*
13C2 PFUnA	*103*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:41*	*1*
13C4 PFHpA	*120*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:41*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**16.4**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**83.6**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-E7

Date Collected: 08/19/20 09:37
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-38

Matrix: Solid
Percent Solids: 90.3

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**2.6**		0.22	0.046	ug/Kg	☼	09/01/20 00:44	09/03/20 06:51	1
Perfluoroheptanoic acid (PFHpA)	**0.73**		0.22	0.032	ug/Kg	☼	09/01/20 00:44	09/03/20 06:51	1
Perfluorooctanoic acid (PFOA)	**0.20**	**J**	0.22	0.094	ug/Kg	☼	09/01/20 00:44	09/03/20 06:51	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.039	ug/Kg	☼	09/01/20 00:44	09/03/20 06:51	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.024	ug/Kg	☼	09/01/20 00:44	09/03/20 06:51	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.039	ug/Kg	☼	09/01/20 00:44	09/03/20 06:51	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.073	ug/Kg	☼	09/01/20 00:44	09/03/20 06:51	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.056	ug/Kg	☼	09/01/20 00:44	09/03/20 06:51	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.059	ug/Kg	☼	09/01/20 00:44	09/03/20 06:51	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.027	ug/Kg	☼	09/01/20 00:44	09/03/20 06:51	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.034	ug/Kg	☼	09/01/20 00:44	09/03/20 06:51	1

Client Sample ID: 20BET-SS-E7

Lab Sample ID: 320-63955-38
Date Collected: 08/19/20 09:37
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 90.3

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**0.27**	**J**	0.55	0.22	ug/Kg	☼	09/01/20 00:44	09/03/20 06:51	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	09/01/20 00:44	09/03/20 06:51	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	09/01/20 00:44	09/03/20 06:51	1
F-53B Major	ND		0.22	0.030	ug/Kg	☼	09/01/20 00:44	09/03/20 06:51	1
HFPO-DA (GenX)	ND		0.27	0.12	ug/Kg	☼	09/01/20 00:44	09/03/20 06:51	1
F-53B Minor	ND		0.22	0.024	ug/Kg	☼	09/01/20 00:44	09/03/20 06:51	1
DONA	ND		0.22	0.020	ug/Kg	☼	09/01/20 00:44	09/03/20 06:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*91*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:51*	*1*
13C2 PFDA	*96*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:51*	*1*
13C4 PFOS	*90*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:51*	*1*
d3-NMeFOSAA	*80*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:51*	*1*
d5-NEtFOSAA	*77*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:51*	*1*
13C3 HFPO-DA	*78*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:51*	*1*
18O2 PFHxS	*91*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:51*	*1*
13C3 PFBS	*85*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:51*	*1*
13C2 PFDoA	*90*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:51*	*1*
13C2 PFTeDA	*79*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:51*	*1*
13C5 PFNA	*102*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:51*	*1*
13C4 PFOA	*87*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:51*	*1*
13C2 PFUnA	*97*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:51*	*1*
13C4 PFHpA	*94*		*50 - 150*	*09/01/20 00:44*	*09/03/20 06:51*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**9.7**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**90.3**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-F1

Lab Sample ID: 320-63955-39
Date Collected: 08/19/20 09:40
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 89.9

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**4.4**		0.22	0.047	ug/Kg	☼	09/01/20 00:44	09/03/20 07:00	1
Perfluoroheptanoic acid (PFHpA)	**0.81**		0.22	0.032	ug/Kg	☼	09/01/20 00:44	09/03/20 07:00	1
Perfluorooctanoic acid (PFOA)	**0.17**	**J**	0.22	0.095	ug/Kg	☼	09/01/20 00:44	09/03/20 07:00	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.040	ug/Kg	☼	09/01/20 00:44	09/03/20 07:00	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.024	ug/Kg	☼	09/01/20 00:44	09/03/20 07:00	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.040	ug/Kg	☼	09/01/20 00:44	09/03/20 07:00	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.074	ug/Kg	☼	09/01/20 00:44	09/03/20 07:00	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.057	ug/Kg	☼	09/01/20 00:44	09/03/20 07:00	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.060	ug/Kg	☼	09/01/20 00:44	09/03/20 07:00	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.028	ug/Kg	☼	09/01/20 00:44	09/03/20 07:00	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.034	ug/Kg	☼	09/01/20 00:44	09/03/20 07:00	1
Perfluorooctanesulfonic acid (PFOS)	**0.33**	**J**	0.55	0.22	ug/Kg	☼	09/01/20 00:44	09/03/20 07:00	1

Client Sample ID: 20BET-SS-F1

Lab Sample ID: 320-63955-39
Date Collected: 08/19/20 09:40
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 89.9

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	09/01/20 00:44	09/03/20 07:00	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	09/01/20 00:44	09/03/20 07:00	1
F-53B Major	ND		0.22	0.030	ug/Kg	☼	09/01/20 00:44	09/03/20 07:00	1
HFPO-DA (GenX)	ND		0.28	0.12	ug/Kg	☼	09/01/20 00:44	09/03/20 07:00	1
F-53B Minor	ND		0.22	0.024	ug/Kg	☼	09/01/20 00:44	09/03/20 07:00	1
DONA	ND		0.22	0.020	ug/Kg	☼	09/01/20 00:44	09/03/20 07:00	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*92*		*50 - 150*	*09/01/20 00:44*	*09/03/20 07:00*	*1*
13C2 PFDA	*94*		*50 - 150*	*09/01/20 00:44*	*09/03/20 07:00*	*1*
13C4 PFOS	*88*		*50 - 150*	*09/01/20 00:44*	*09/03/20 07:00*	*1*
d3-NMeFOSAA	*69*		*50 - 150*	*09/01/20 00:44*	*09/03/20 07:00*	*1*
d5-NEtFOSAA	*76*		*50 - 150*	*09/01/20 00:44*	*09/03/20 07:00*	*1*
13C3 HFPO-DA	*79*		*50 - 150*	*09/01/20 00:44*	*09/03/20 07:00*	*1*
18O2 PFHxS	*94*		*50 - 150*	*09/01/20 00:44*	*09/03/20 07:00*	*1*
13C3 PFBS	*85*		*50 - 150*	*09/01/20 00:44*	*09/03/20 07:00*	*1*
13C2 PFDoA	*98*		*50 - 150*	*09/01/20 00:44*	*09/03/20 07:00*	*1*
13C2 PFTeDA	*97*		*50 - 150*	*09/01/20 00:44*	*09/03/20 07:00*	*1*
13C5 PFNA	*100*		*50 - 150*	*09/01/20 00:44*	*09/03/20 07:00*	*1*
13C4 PFOA	*85*		*50 - 150*	*09/01/20 00:44*	*09/03/20 07:00*	*1*
13C2 PFUnA	*94*		*50 - 150*	*09/01/20 00:44*	*09/03/20 07:00*	*1*
13C4 PFHpA	*96*		*50 - 150*	*09/01/20 00:44*	*09/03/20 07:00*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**10.1**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**89.9**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-F2

Lab Sample ID: 320-63955-40
Date Collected: 08/19/20 09:42
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 90.7

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**2.6**		0.22	0.046	ug/Kg	☼	09/01/20 00:45	09/03/20 07:10	1
Perfluoroheptanoic acid (PFHpA)	**0.65**		0.22	0.032	ug/Kg	☼	09/01/20 00:45	09/03/20 07:10	1
Perfluorooctanoic acid (PFOA)	**0.29**		0.22	0.094	ug/Kg	☼	09/01/20 00:45	09/03/20 07:10	1
Perfluorononanoic acid (PFNA)	**0.052**	**J**	0.22	0.039	ug/Kg	☼	09/01/20 00:45	09/03/20 07:10	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.024	ug/Kg	☼	09/01/20 00:45	09/03/20 07:10	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.039	ug/Kg	☼	09/01/20 00:45	09/03/20 07:10	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.073	ug/Kg	☼	09/01/20 00:45	09/03/20 07:10	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.056	ug/Kg	☼	09/01/20 00:45	09/03/20 07:10	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.059	ug/Kg	☼	09/01/20 00:45	09/03/20 07:10	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.027	ug/Kg	☼	09/01/20 00:45	09/03/20 07:10	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.034	ug/Kg	☼	09/01/20 00:45	09/03/20 07:10	1
Perfluorooctanesulfonic acid (PFOS)	**0.26**	**J**	0.55	0.22	ug/Kg	☼	09/01/20 00:45	09/03/20 07:10	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	09/01/20 00:45	09/03/20 07:10	1

Client Sample ID: 20BET-SS-F2

Lab Sample ID: 320-63955-40
Date Collected: 08/19/20 09:42
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 90.7

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.40	ug/Kg	☼	09/01/20 00:45	09/03/20 07:10	1
F-53B Major	ND		0.22	0.030	ug/Kg	☼	09/01/20 00:45	09/03/20 07:10	1
HFPO-DA (GenX)	ND		0.27	0.12	ug/Kg	☼	09/01/20 00:45	09/03/20 07:10	1
F-53B Minor	ND		0.22	0.024	ug/Kg	☼	09/01/20 00:45	09/03/20 07:10	1
DONA	ND		0.22	0.020	ug/Kg	☼	09/01/20 00:45	09/03/20 07:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*89*		*50 - 150*	*09/01/20 00:45*	*09/03/20 07:10*	*1*
13C2 PFDA	*90*		*50 - 150*	*09/01/20 00:45*	*09/03/20 07:10*	*1*
13C4 PFOS	*89*		*50 - 150*	*09/01/20 00:45*	*09/03/20 07:10*	*1*
d3-NMeFOSAA	*83*		*50 - 150*	*09/01/20 00:45*	*09/03/20 07:10*	*1*
d5-NEtFOSAA	*86*		*50 - 150*	*09/01/20 00:45*	*09/03/20 07:10*	*1*
13C3 HFPO-DA	*77*		*50 - 150*	*09/01/20 00:45*	*09/03/20 07:10*	*1*
18O2 PFHxS	*89*		*50 - 150*	*09/01/20 00:45*	*09/03/20 07:10*	*1*
13C3 PFBS	*81*		*50 - 150*	*09/01/20 00:45*	*09/03/20 07:10*	*1*
13C2 PFDoA	*93*		*50 - 150*	*09/01/20 00:45*	*09/03/20 07:10*	*1*
13C2 PFTeDA	*88*		*50 - 150*	*09/01/20 00:45*	*09/03/20 07:10*	*1*
13C5 PFNA	*100*		*50 - 150*	*09/01/20 00:45*	*09/03/20 07:10*	*1*
13C4 PFOA	*84*		*50 - 150*	*09/01/20 00:45*	*09/03/20 07:10*	*1*
13C2 PFUnA	*87*		*50 - 150*	*09/01/20 00:45*	*09/03/20 07:10*	*1*
13C4 PFHpA	*97*		*50 - 150*	*09/01/20 00:45*	*09/03/20 07:10*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**9.3**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**90.7**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-F3

Lab Sample ID: 320-63955-41
Date Collected: 08/19/20 09:44
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 91.3

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**5.0**		0.22	0.046	ug/Kg	☼	09/02/20 20:34	09/04/20 12:13	1
Perfluoroheptanoic acid (PFHpA)	**1.4**		0.22	0.032	ug/Kg	☼	09/02/20 20:34	09/04/20 12:13	1
Perfluorooctanoic acid (PFOA)	**0.51**		0.22	0.094	ug/Kg	☼	09/02/20 20:34	09/04/20 12:13	1
Perfluorononanoic acid (PFNA)	**0.071**	**J**	0.22	0.039	ug/Kg	☼	09/02/20 20:34	09/04/20 12:13	1
Perfluorodecanoic acid (PFDA)	**0.026**	**J**	0.22	0.024	ug/Kg	☼	09/02/20 20:34	09/04/20 12:13	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.039	ug/Kg	☼	09/02/20 20:34	09/04/20 12:13	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.073	ug/Kg	☼	09/02/20 20:34	09/04/20 12:13	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.056	ug/Kg	☼	09/02/20 20:34	09/04/20 12:13	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.059	ug/Kg	☼	09/02/20 20:34	09/04/20 12:13	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.027	ug/Kg	☼	09/02/20 20:34	09/04/20 12:13	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.034	ug/Kg	☼	09/02/20 20:34	09/04/20 12:13	1
Perfluorooctanesulfonic acid (PFOS)	**0.79**	**B**	0.55	0.22	ug/Kg	☼	09/02/20 20:34	09/04/20 12:13	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	09/02/20 20:34	09/04/20 12:13	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	09/02/20 20:34	09/04/20 12:13	1
F-53B Major	ND		0.22	0.030	ug/Kg	☼	09/02/20 20:34	09/04/20 12:13	1

Client Sample ID: 20BET-SS-F3

Lab Sample ID: 320-63955-41
Date Collected: 08/19/20 09:44
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 91.3

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA (GenX)	ND		0.27	0.12	ug/Kg	☼	09/02/20 20:34	09/04/20 12:13	1
F-53B Minor	ND		0.22	0.024	ug/Kg	☼	09/02/20 20:34	09/04/20 12:13	1
DONA	ND		0.22	0.020	ug/Kg	☼	09/02/20 20:34	09/04/20 12:13	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*90*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:13*	*1*
13C2 PFDA	*90*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:13*	*1*
13C4 PFOS	*81*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:13*	*1*
d3-NMeFOSAA	*65*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:13*	*1*
d5-NEtFOSAA	*60*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:13*	*1*
13C3 HFPO-DA	*78*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:13*	*1*
18O2 PFHxS	*87*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:13*	*1*
13C3 PFBS	*87*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:13*	*1*
13C2 PFDoA	*80*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:13*	*1*
13C2 PFTeDA	*74*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:13*	*1*
13C5 PFNA	*95*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:13*	*1*
13C4 PFOA	*79*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:13*	*1*
13C2 PFUnA	*83*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:13*	*1*
13C4 PFHpA	*89*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:13*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**8.7**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**91.3**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-F4

Lab Sample ID: 320-63955-42
Date Collected: 08/19/20 09:46
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 91.1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**3.1**		0.21	0.044	ug/Kg	☼	09/02/20 20:34	09/04/20 12:42	1
Perfluoroheptanoic acid (PFHpA)	**0.49**		0.21	0.030	ug/Kg	☼	09/02/20 20:34	09/04/20 12:42	1
Perfluorooctanoic acid (PFOA)	**0.36**		0.21	0.090	ug/Kg	☼	09/02/20 20:34	09/04/20 12:42	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	09/02/20 20:34	09/04/20 12:42	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	09/02/20 20:34	09/04/20 12:42	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	09/02/20 20:34	09/04/20 12:42	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.070	ug/Kg	☼	09/02/20 20:34	09/04/20 12:42	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.053	ug/Kg	☼	09/02/20 20:34	09/04/20 12:42	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.056	ug/Kg	☼	09/02/20 20:34	09/04/20 12:42	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	09/02/20 20:34	09/04/20 12:42	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.032	ug/Kg	☼	09/02/20 20:34	09/04/20 12:42	1
Perfluorooctanesulfonic acid (PFOS)	**0.36**	**J B**	0.52	0.21	ug/Kg	☼	09/02/20 20:34	09/04/20 12:42	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	09/02/20 20:34	09/04/20 12:42	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	09/02/20 20:34	09/04/20 12:42	1
F-53B Major	ND		0.21	0.028	ug/Kg	☼	09/02/20 20:34	09/04/20 12:42	1
HFPO-DA (GenX)	ND		0.26	0.12	ug/Kg	☼	09/02/20 20:34	09/04/20 12:42	1
F-53B Minor	ND		0.21	0.023	ug/Kg	☼	09/02/20 20:34	09/04/20 12:42	1
DONA	ND		0.21	0.019	ug/Kg	☼	09/02/20 20:34	09/04/20 12:42	1

Client Sample ID: 20BET-SS-F4

Lab Sample ID: 320-63955-42

Date Collected: 08/19/20 09:46

Matrix: Solid

Date Received: 08/25/20 09:50

Percent Solids: 91.1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*86*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:42*	*1*
13C2 PFDA	*83*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:42*	*1*
13C4 PFOS	*80*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:42*	*1*
d3-NMeFOSAA	*79*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:42*	*1*
d5-NEtFOSAA	*70*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:42*	*1*
13C3 HFPO-DA	*72*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:42*	*1*
18O2 PFHxS	*87*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:42*	*1*
13C3 PFBS	*85*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:42*	*1*
13C2 PFDoA	*78*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:42*	*1*
13C2 PFTeDA	*68*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:42*	*1*
13C5 PFNA	*89*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:42*	*1*
13C4 PFOA	*75*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:42*	*1*
13C2 PFUnA	*81*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:42*	*1*
13C4 PFHpA	*85*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:42*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**8.9**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**91.1**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-F5

Lab Sample ID: 320-63955-43

Date Collected: 08/19/20 09:48

Matrix: Solid

Date Received: 08/25/20 09:50

Percent Solids: 87.1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**2.5**		0.21	0.045	ug/Kg	☼	09/02/20 20:34	09/04/20 12:51	1
Perfluoroheptanoic acid (PFHpA)	**0.50**		0.21	0.031	ug/Kg	☼	09/02/20 20:34	09/04/20 12:51	1
Perfluorooctanoic acid (PFOA)	**0.29**		0.21	0.092	ug/Kg	☼	09/02/20 20:34	09/04/20 12:51	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	09/02/20 20:34	09/04/20 12:51	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	09/02/20 20:34	09/04/20 12:51	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	09/02/20 20:34	09/04/20 12:51	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	09/02/20 20:34	09/04/20 12:51	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	09/02/20 20:34	09/04/20 12:51	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	09/02/20 20:34	09/04/20 12:51	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.027	ug/Kg	☼	09/02/20 20:34	09/04/20 12:51	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.033	ug/Kg	☼	09/02/20 20:34	09/04/20 12:51	1
Perfluorooctanesulfonic acid (PFOS)	**0.46**	**J B**	0.53	0.21	ug/Kg	☼	09/02/20 20:34	09/04/20 12:51	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.42	ug/Kg	☼	09/02/20 20:34	09/04/20 12:51	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	09/02/20 20:34	09/04/20 12:51	1
F-53B Major	ND		0.21	0.029	ug/Kg	☼	09/02/20 20:34	09/04/20 12:51	1
HFPO-DA (GenX)	ND		0.27	0.12	ug/Kg	☼	09/02/20 20:34	09/04/20 12:51	1
F-53B Minor	ND		0.21	0.023	ug/Kg	☼	09/02/20 20:34	09/04/20 12:51	1
DONA	ND		0.21	0.019	ug/Kg	☼	09/02/20 20:34	09/04/20 12:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*85*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:51*	*1*
13C2 PFDA	*87*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:51*	*1*
13C4 PFOS	*77*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:51*	*1*
d3-NMeFOSAA	*77*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:51*	*1*

Client Sample ID: 20BET-SS-F5

Lab Sample ID: 320-63955-43

Date Collected: 08/19/20 09:48

Matrix: Solid

Date Received: 08/25/20 09:50

Percent Solids: 87.1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
d5-NEtFOSAA	*70*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:51*	*1*
13C3 HFPO-DA	*75*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:51*	*1*
18O2 PFHxS	*86*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:51*	*1*
13C3 PFBS	*80*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:51*	*1*
13C2 PFDoA	*82*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:51*	*1*
13C2 PFTeDA	*78*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:51*	*1*
13C5 PFNA	*93*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:51*	*1*
13C4 PFOA	*79*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:51*	*1*
13C2 PFUnA	*85*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:51*	*1*
13C4 PFHpA	*84*		*50 - 150*	*09/02/20 20:34*	*09/04/20 12:51*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**12.9**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**87.1**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-F6

Lab Sample ID: 320-63955-44

Date Collected: 08/19/20 09:50

Matrix: Solid

Date Received: 08/25/20 09:50

Percent Solids: 82.6

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**7.1**		0.23	0.048	ug/Kg	☼	08/27/20 04:46	09/01/20 17:55	1
Perfluoroheptanoic acid (PFHpA)	**2.0**		0.23	0.033	ug/Kg	☼	08/27/20 04:46	09/01/20 17:55	1
Perfluorooctanoic acid (PFOA)	**0.23**		0.23	0.099	ug/Kg	☼	08/27/20 04:46	09/01/20 17:55	1
Perfluorononanoic acid (PFNA)	**0.056**	**J**	0.23	0.041	ug/Kg	☼	08/27/20 04:46	09/01/20 17:55	1
Perfluorodecanoic acid (PFDA)	ND		0.23	0.025	ug/Kg	☼	08/27/20 04:46	09/01/20 17:55	1
Perfluoroundecanoic acid (PFUnA)	ND		0.23	0.041	ug/Kg	☼	08/27/20 04:46	09/01/20 17:55	1
Perfluorododecanoic acid (PFDoA)	ND		0.23	0.077	ug/Kg	☼	08/27/20 04:46	09/01/20 17:55	1
Perfluorotridecanoic acid (PFTriA)	ND		0.23	0.058	ug/Kg	☼	08/27/20 04:46	09/01/20 17:55	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.23	0.062	ug/Kg	☼	08/27/20 04:46	09/01/20 17:55	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.23	0.029	ug/Kg	☼	08/27/20 04:46	09/01/20 17:55	1
Perfluorohexanesulfonic acid (PFHxS)	**0.048**	**J**	0.23	0.036	ug/Kg	☼	08/27/20 04:46	09/01/20 17:55	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.57	0.23	ug/Kg	☼	08/27/20 04:46	09/01/20 17:55	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.3	0.45	ug/Kg	☼	08/27/20 04:46	09/01/20 17:55	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.3	0.42	ug/Kg	☼	08/27/20 04:46	09/01/20 17:55	1
F-53B Major	ND		0.23	0.031	ug/Kg	☼	08/27/20 04:46	09/01/20 17:55	1
HFPO-DA (GenX)	ND		0.29	0.13	ug/Kg	☼	08/27/20 04:46	09/01/20 17:55	1
F-53B Minor	ND		0.23	0.025	ug/Kg	☼	08/27/20 04:46	09/01/20 17:55	1
DONA	ND		0.23	0.021	ug/Kg	☼	08/27/20 04:46	09/01/20 17:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*76*		*50 - 150*	*08/27/20 04:46*	*09/01/20 17:55*	*1*
13C2 PFDA	*77*		*50 - 150*	*08/27/20 04:46*	*09/01/20 17:55*	*1*
13C4 PFOS	*78*		*50 - 150*	*08/27/20 04:46*	*09/01/20 17:55*	*1*
d3-NMeFOSAA	*54*		*50 - 150*	*08/27/20 04:46*	*09/01/20 17:55*	*1*
d5-NEtFOSAA	*52*		*50 - 150*	*08/27/20 04:46*	*09/01/20 17:55*	*1*
13C3 HFPO-DA	*70*		*50 - 150*	*08/27/20 04:46*	*09/01/20 17:55*	*1*
18O2 PFHxS	*87*		*50 - 150*	*08/27/20 04:46*	*09/01/20 17:55*	*1*

Client Sample ID: 20BET-SS-F6

Lab Sample ID: 320-63955-44
Date Collected: 08/19/20 09:50
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 82.6

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 PFBS	*74*		*50 - 150*	*08/27/20 04:46*	*09/01/20 17:55*	*1*
13C2 PFDoA	*62*		*50 - 150*	*08/27/20 04:46*	*09/01/20 17:55*	*1*
13C2 PFTeDA	*54*		*50 - 150*	*08/27/20 04:46*	*09/01/20 17:55*	*1*
13C5 PFNA	*87*		*50 - 150*	*08/27/20 04:46*	*09/01/20 17:55*	*1*
13C4 PFOA	*81*		*50 - 150*	*08/27/20 04:46*	*09/01/20 17:55*	*1*
13C2 PFUnA	*73*		*50 - 150*	*08/27/20 04:46*	*09/01/20 17:55*	*1*
13C4 PFHpA	*85*		*50 - 150*	*08/27/20 04:46*	*09/01/20 17:55*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**17.4**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**82.6**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-F7

Lab Sample ID: 320-63955-45
Date Collected: 08/19/20 09:52
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 54.0

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**30**		0.35	0.074	ug/Kg	☼	08/27/20 04:46	09/01/20 18:04	1
Perfluoroheptanoic acid (PFHpA)	**7.2**		0.35	0.051	ug/Kg	☼	08/27/20 04:46	09/01/20 18:04	1
Perfluorooctanoic acid (PFOA)	**0.44**		0.35	0.15	ug/Kg	☼	08/27/20 04:46	09/01/20 18:04	1
Perfluorononanoic acid (PFNA)	**0.095**	**J**	0.35	0.063	ug/Kg	☼	08/27/20 04:46	09/01/20 18:04	1
Perfluorodecanoic acid (PFDA)	ND		0.35	0.039	ug/Kg	☼	08/27/20 04:46	09/01/20 18:04	1
Perfluoroundecanoic acid (PFUnA)	ND		0.35	0.063	ug/Kg	☼	08/27/20 04:46	09/01/20 18:04	1
Perfluorododecanoic acid (PFDoA)	ND		0.35	0.12	ug/Kg	☼	08/27/20 04:46	09/01/20 18:04	1
Perfluorotridecanoic acid (PFTriA)	ND		0.35	0.090	ug/Kg	☼	08/27/20 04:46	09/01/20 18:04	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.35	0.095	ug/Kg	☼	08/27/20 04:46	09/01/20 18:04	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.35	0.044	ug/Kg	☼	08/27/20 04:46	09/01/20 18:04	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.35	0.055	ug/Kg	☼	08/27/20 04:46	09/01/20 18:04	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.88	0.35	ug/Kg	☼	08/27/20 04:46	09/01/20 18:04	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		3.5	0.69	ug/Kg	☼	08/27/20 04:46	09/01/20 18:04	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		3.5	0.65	ug/Kg	☼	08/27/20 04:46	09/01/20 18:04	1
F-53B Major	ND		0.35	0.048	ug/Kg	☼	08/27/20 04:46	09/01/20 18:04	1
HFPO-DA (GenX)	ND		0.44	0.19	ug/Kg	☼	08/27/20 04:46	09/01/20 18:04	1
F-53B Minor	ND		0.35	0.039	ug/Kg	☼	08/27/20 04:46	09/01/20 18:04	1
DONA	ND		0.35	0.032	ug/Kg	☼	08/27/20 04:46	09/01/20 18:04	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*85*		*50 - 150*	*08/27/20 04:46*	*09/01/20 18:04*	*1*
13C2 PFDA	*77*		*50 - 150*	*08/27/20 04:46*	*09/01/20 18:04*	*1*
13C4 PFOS	*90*		*50 - 150*	*08/27/20 04:46*	*09/01/20 18:04*	*1*
d3-NMeFOSAA	*67*		*50 - 150*	*08/27/20 04:46*	*09/01/20 18:04*	*1*
d5-NEtFOSAA	*57*		*50 - 150*	*08/27/20 04:46*	*09/01/20 18:04*	*1*
13C3 HFPO-DA	*76*		*50 - 150*	*08/27/20 04:46*	*09/01/20 18:04*	*1*
18O2 PFHxS	*106*		*50 - 150*	*08/27/20 04:46*	*09/01/20 18:04*	*1*
13C3 PFBS	*86*		*50 - 150*	*08/27/20 04:46*	*09/01/20 18:04*	*1*
13C2 PFDoA	*63*		*50 - 150*	*08/27/20 04:46*	*09/01/20 18:04*	*1*
13C2 PFTeDA	*60*		*50 - 150*	*08/27/20 04:46*	*09/01/20 18:04*	*1*

Client Sample ID: 20BET-SS-F7

Lab Sample ID: 320-63955-45
Date Collected: 08/19/20 09:52
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 54.0

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	90		50 - 150	08/27/20 04:46	09/01/20 18:04	1
13C4 PFOA	76		50 - 150	08/27/20 04:46	09/01/20 18:04	1
13C2 PFUnA	69		50 - 150	08/27/20 04:46	09/01/20 18:04	1
13C4 PFHpA	85		50 - 150	08/27/20 04:46	09/01/20 18:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**46.0**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**54.0**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-F10

Lab Sample ID: 320-63955-46
Date Collected: 08/19/20 09:30
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 91.2

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**4.4**		0.21	0.045	ug/Kg	☼	09/02/20 20:34	09/04/20 13:01	1
Perfluoroheptanoic acid (PFHpA)	**0.74**		0.21	0.031	ug/Kg	☼	09/02/20 20:34	09/04/20 13:01	1
Perfluorooctanoic acid (PFOA)	**0.17**	**J**	0.21	0.092	ug/Kg	☼	09/02/20 20:34	09/04/20 13:01	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	09/02/20 20:34	09/04/20 13:01	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	09/02/20 20:34	09/04/20 13:01	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	09/02/20 20:34	09/04/20 13:01	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	09/02/20 20:34	09/04/20 13:01	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	09/02/20 20:34	09/04/20 13:01	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.058	ug/Kg	☼	09/02/20 20:34	09/04/20 13:01	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.027	ug/Kg	☼	09/02/20 20:34	09/04/20 13:01	1
Perfluorohexanesulfonic acid (PFHxS)	**0.057**	**J I**	0.21	0.033	ug/Kg	☼	09/02/20 20:34	09/04/20 13:01	1
Perfluorooctanesulfonic acid (PFOS)	**0.44**	**J B**	0.53	0.21	ug/Kg	☼	09/02/20 20:34	09/04/20 13:01	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.42	ug/Kg	☼	09/02/20 20:34	09/04/20 13:01	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	09/02/20 20:34	09/04/20 13:01	1
F-53B Major	ND		0.21	0.029	ug/Kg	☼	09/02/20 20:34	09/04/20 13:01	1
HFPO-DA (GenX)	ND		0.27	0.12	ug/Kg	☼	09/02/20 20:34	09/04/20 13:01	1
F-53B Minor	ND		0.21	0.023	ug/Kg	☼	09/02/20 20:34	09/04/20 13:01	1
DONA	ND		0.21	0.019	ug/Kg	☼	09/02/20 20:34	09/04/20 13:01	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	88		50 - 150	09/02/20 20:34	09/04/20 13:01	1
13C2 PFDA	90		50 - 150	09/02/20 20:34	09/04/20 13:01	1
13C4 PFOS	84		50 - 150	09/02/20 20:34	09/04/20 13:01	1
d3-NMeFOSAA	64		50 - 150	09/02/20 20:34	09/04/20 13:01	1
d5-NEtFOSAA	61		50 - 150	09/02/20 20:34	09/04/20 13:01	1
13C3 HFPO-DA	77		50 - 150	09/02/20 20:34	09/04/20 13:01	1
18O2 PFHxS	93		50 - 150	09/02/20 20:34	09/04/20 13:01	1
13C3 PFBS	82		50 - 150	09/02/20 20:34	09/04/20 13:01	1
13C2 PFDoA	78		50 - 150	09/02/20 20:34	09/04/20 13:01	1
13C2 PFTeDA	70		50 - 150	09/02/20 20:34	09/04/20 13:01	1
13C5 PFNA	92		50 - 150	09/02/20 20:34	09/04/20 13:01	1
13C4 PFOA	84		50 - 150	09/02/20 20:34	09/04/20 13:01	1

Client Sample ID: 20BET-SS-F10

Lab Sample ID: 320-63955-46

Date Collected: 08/19/20 09:30
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 91.2

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFUnA	76		50 - 150	09/02/20 20:34	09/04/20 13:01	1
13C4 PFHpA	92		50 - 150	09/02/20 20:34	09/04/20 13:01	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**8.8**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**91.2**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-G1

Lab Sample ID: 320-63955-47

Date Collected: 08/19/20 10:00
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 82.9

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**1.9**		0.24	0.050	ug/Kg	☼	09/02/20 20:34	09/04/20 13:10	1
Perfluoroheptanoic acid (PFHpA)	**0.75**		0.24	0.034	ug/Kg	☼	09/02/20 20:34	09/04/20 13:10	1
Perfluorooctanoic acid (PFOA)	**0.13**	**J**	0.24	0.10	ug/Kg	☼	09/02/20 20:34	09/04/20 13:10	1
Perfluorononanoic acid (PFNA)	**0.095**	**J**	0.24	0.043	ug/Kg	☼	09/02/20 20:34	09/04/20 13:10	1
Perfluorodecanoic acid (PFDA)	**0.087**	**J**	0.24	0.026	ug/Kg	☼	09/02/20 20:34	09/04/20 13:10	1
Perfluoroundecanoic acid (PFUnA)	ND		0.24	0.043	ug/Kg	☼	09/02/20 20:34	09/04/20 13:10	1
Perfluorododecanoic acid (PFDoA)	ND		0.24	0.079	ug/Kg	☼	09/02/20 20:34	09/04/20 13:10	1
Perfluorotridecanoic acid (PFTriA)	ND		0.24	0.060	ug/Kg	☼	09/02/20 20:34	09/04/20 13:10	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.24	0.064	ug/Kg	☼	09/02/20 20:34	09/04/20 13:10	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.24	0.030	ug/Kg	☼	09/02/20 20:34	09/04/20 13:10	1
Perfluorohexanesulfonic acid (PFHxS)	**0.046**	**J**	0.24	0.037	ug/Kg	☼	09/02/20 20:34	09/04/20 13:10	1
Perfluorooctanesulfonic acid (PFOS)	**0.67**	**B**	0.59	0.24	ug/Kg	☼	09/02/20 20:34	09/04/20 13:10	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.4	0.46	ug/Kg	☼	09/02/20 20:34	09/04/20 13:10	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.4	0.44	ug/Kg	☼	09/02/20 20:34	09/04/20 13:10	1
F-53B Major	ND		0.24	0.032	ug/Kg	☼	09/02/20 20:34	09/04/20 13:10	1
HFPO-DA (GenX)	ND		0.30	0.13	ug/Kg	☼	09/02/20 20:34	09/04/20 13:10	1
F-53B Minor	ND		0.24	0.026	ug/Kg	☼	09/02/20 20:34	09/04/20 13:10	1
DONA	ND		0.24	0.021	ug/Kg	☼	09/02/20 20:34	09/04/20 13:10	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	85		50 - 150	09/02/20 20:34	09/04/20 13:10	1
13C2 PFDA	92		50 - 150	09/02/20 20:34	09/04/20 13:10	1
13C4 PFOS	77		50 - 150	09/02/20 20:34	09/04/20 13:10	1
d3-NMeFOSAA	63		50 - 150	09/02/20 20:34	09/04/20 13:10	1
d5-NEtFOSAA	62		50 - 150	09/02/20 20:34	09/04/20 13:10	1
13C3 HFPO-DA	74		50 - 150	09/02/20 20:34	09/04/20 13:10	1
18O2 PFHxS	84		50 - 150	09/02/20 20:34	09/04/20 13:10	1
13C3 PFBS	80		50 - 150	09/02/20 20:34	09/04/20 13:10	1
13C2 PFDoA	82		50 - 150	09/02/20 20:34	09/04/20 13:10	1
13C2 PFTeDA	73		50 - 150	09/02/20 20:34	09/04/20 13:10	1
13C5 PFNA	83		50 - 150	09/02/20 20:34	09/04/20 13:10	1
13C4 PFOA	83		50 - 150	09/02/20 20:34	09/04/20 13:10	1
13C2 PFUnA	79		50 - 150	09/02/20 20:34	09/04/20 13:10	1
13C4 PFHpA	83		50 - 150	09/02/20 20:34	09/04/20 13:10	1

Client Sample ID: 20BET-SS-G1

Lab Sample ID: 320-63955-47
Date Collected: 08/19/20 10:00
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 82.9

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**17.1**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**82.9**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-G2

Lab Sample ID: 320-63955-48
Date Collected: 08/19/20 10:02
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 85.0

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**6.2**		0.23	0.048	ug/Kg	☼	09/02/20 20:34	09/04/20 13:38	1
Perfluoroheptanoic acid (PFHpA)	**2.8**		0.23	0.033	ug/Kg	☼	09/02/20 20:34	09/04/20 13:38	1
Perfluorooctanoic acid (PFOA)	**0.19**	**J**	0.23	0.098	ug/Kg	☼	09/02/20 20:34	09/04/20 13:38	1
Perfluorononanoic acid (PFNA)	**0.045**	**J**	0.23	0.041	ug/Kg	☼	09/02/20 20:34	09/04/20 13:38	1
Perfluorodecanoic acid (PFDA)	ND		0.23	0.025	ug/Kg	☼	09/02/20 20:34	09/04/20 13:38	1
Perfluoroundecanoic acid (PFUnA)	ND		0.23	0.041	ug/Kg	☼	09/02/20 20:34	09/04/20 13:38	1
Perfluorododecanoic acid (PFDoA)	ND		0.23	0.077	ug/Kg	☼	09/02/20 20:34	09/04/20 13:38	1
Perfluorotridecanoic acid (PFTriA)	ND		0.23	0.058	ug/Kg	☼	09/02/20 20:34	09/04/20 13:38	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.23	0.062	ug/Kg	☼	09/02/20 20:34	09/04/20 13:38	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.23	0.029	ug/Kg	☼	09/02/20 20:34	09/04/20 13:38	1
Perfluorohexanesulfonic acid (PFHxS)	**0.091**	**J I**	0.23	0.035	ug/Kg	☼	09/02/20 20:34	09/04/20 13:38	1
Perfluorooctanesulfonic acid (PFOS)	**0.33**	**J B**	0.57	0.23	ug/Kg	☼	09/02/20 20:34	09/04/20 13:38	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.3	0.45	ug/Kg	☼	09/02/20 20:34	09/04/20 13:38	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.3	0.42	ug/Kg	☼	09/02/20 20:34	09/04/20 13:38	1
F-53B Major	ND		0.23	0.031	ug/Kg	☼	09/02/20 20:34	09/04/20 13:38	1
HFPO-DA (GenX)	ND		0.29	0.13	ug/Kg	☼	09/02/20 20:34	09/04/20 13:38	1
F-53B Minor	ND		0.23	0.025	ug/Kg	☼	09/02/20 20:34	09/04/20 13:38	1
DONA	ND		0.23	0.021	ug/Kg	☼	09/02/20 20:34	09/04/20 13:38	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*83*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:38*	*1*
13C2 PFDA	*88*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:38*	*1*
13C4 PFOS	*78*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:38*	*1*
d3-NMeFOSAA	*66*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:38*	*1*
d5-NEtFOSAA	*65*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:38*	*1*
13C3 HFPO-DA	*76*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:38*	*1*
18O2 PFHxS	*97*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:38*	*1*
13C3 PFBS	*88*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:38*	*1*
13C2 PFDoA	*75*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:38*	*1*
13C2 PFTeDA	*76*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:38*	*1*
13C5 PFNA	*81*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:38*	*1*
13C4 PFOA	*76*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:38*	*1*
13C2 PFUnA	*82*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:38*	*1*
13C4 PFHpA	*92*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:38*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**15.0**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**85.0**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-G3

Lab Sample ID: 320-63955-49
Date Collected: 08/19/20 10:04
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 89.6

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**1.6**		0.21	0.045	ug/Kg	☼	09/02/20 20:34	09/04/20 13:48	1
Perfluoroheptanoic acid (PFHpA)	**0.60**		0.21	0.031	ug/Kg	☼	09/02/20 20:34	09/04/20 13:48	1
Perfluorooctanoic acid (PFOA)	**0.17**	**J**	0.21	0.092	ug/Kg	☼	09/02/20 20:34	09/04/20 13:48	1
Perfluorononanoic acid (PFNA)	**0.11**	**J**	0.21	0.039	ug/Kg	☼	09/02/20 20:34	09/04/20 13:48	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.024	ug/Kg	☼	09/02/20 20:34	09/04/20 13:48	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.039	ug/Kg	☼	09/02/20 20:34	09/04/20 13:48	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.072	ug/Kg	☼	09/02/20 20:34	09/04/20 13:48	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.055	ug/Kg	☼	09/02/20 20:34	09/04/20 13:48	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.058	ug/Kg	☼	09/02/20 20:34	09/04/20 13:48	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.027	ug/Kg	☼	09/02/20 20:34	09/04/20 13:48	1
Perfluorohexanesulfonic acid (PFHxS)	**0.060**	**J I**	0.21	0.033	ug/Kg	☼	09/02/20 20:34	09/04/20 13:48	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.54	0.21	ug/Kg	☼	09/02/20 20:34	09/04/20 13:48	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.42	ug/Kg	☼	09/02/20 20:34	09/04/20 13:48	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.40	ug/Kg	☼	09/02/20 20:34	09/04/20 13:48	1
F-53B Major	ND		0.21	0.029	ug/Kg	☼	09/02/20 20:34	09/04/20 13:48	1
HFPO-DA (GenX)	ND		0.27	0.12	ug/Kg	☼	09/02/20 20:34	09/04/20 13:48	1
F-53B Minor	ND		0.21	0.024	ug/Kg	☼	09/02/20 20:34	09/04/20 13:48	1
DONA	ND		0.21	0.019	ug/Kg	☼	09/02/20 20:34	09/04/20 13:48	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*92*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:48*	*1*
13C2 PFDA	*91*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:48*	*1*
13C4 PFOS	*86*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:48*	*1*
d3-NMeFOSAA	*77*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:48*	*1*
d5-NEtFOSAA	*74*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:48*	*1*
13C3 HFPO-DA	*78*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:48*	*1*
18O2 PFHxS	*91*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:48*	*1*
13C3 PFBS	*86*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:48*	*1*
13C2 PFDoA	*83*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:48*	*1*
13C2 PFTeDA	*80*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:48*	*1*
13C5 PFNA	*96*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:48*	*1*
13C4 PFOA	*84*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:48*	*1*
13C2 PFUnA	*83*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:48*	*1*
13C4 PFHpA	*92*		*50 - 150*	*09/02/20 20:34*	*09/04/20 13:48*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**10.4**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**89.6**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-G4

Lab Sample ID: 320-63955-50
Date Collected: 08/19/20 10:06
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 85.1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**3.5**		0.23	0.048	ug/Kg	☼	09/02/20 20:39	09/04/20 15:59	1
Perfluoroheptanoic acid (PFHpA)	**0.79**		0.23	0.033	ug/Kg	☼	09/02/20 20:39	09/04/20 15:59	1
Perfluorooctanoic acid (PFOA)	**0.45**		0.23	0.099	ug/Kg	☼	09/02/20 20:39	09/04/20 15:59	1

Client Sample ID: 20BET-SS-G4

Lab Sample ID: 320-63955-50

Date Collected: 08/19/20 10:06
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 85.1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	ND		0.23	0.041	ug/Kg	☼	09/02/20 20:39	09/04/20 15:59	1
Perfluorodecanoic acid (PFDA)	ND		0.23	0.025	ug/Kg	☼	09/02/20 20:39	09/04/20 15:59	1
Perfluoroundecanoic acid (PFUnA)	ND		0.23	0.041	ug/Kg	☼	09/02/20 20:39	09/04/20 15:59	1
Perfluorododecanoic acid (PFDoA)	ND		0.23	0.077	ug/Kg	☼	09/02/20 20:39	09/04/20 15:59	1
Perfluorotridecanoic acid (PFTriA)	ND		0.23	0.059	ug/Kg	☼	09/02/20 20:39	09/04/20 15:59	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.23	0.062	ug/Kg	☼	09/02/20 20:39	09/04/20 15:59	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.23	0.029	ug/Kg	☼	09/02/20 20:39	09/04/20 15:59	1
Perfluorohexanesulfonic acid (PFHxS)	**0.098**	**J I**	0.23	0.036	ug/Kg	☼	09/02/20 20:39	09/04/20 15:59	1
Perfluorooctanesulfonic acid (PFOS)	**0.46**	**J**	0.57	0.23	ug/Kg	☼	09/02/20 20:39	09/04/20 15:59	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.3	0.45	ug/Kg	☼	09/02/20 20:39	09/04/20 15:59	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.3	0.42	ug/Kg	☼	09/02/20 20:39	09/04/20 15:59	1
F-53B Major	ND		0.23	0.031	ug/Kg	☼	09/02/20 20:39	09/04/20 15:59	1
HFPO-DA (GenX)	ND		0.29	0.13	ug/Kg	☼	09/02/20 20:39	09/04/20 15:59	1
F-53B Minor	ND		0.23	0.025	ug/Kg	☼	09/02/20 20:39	09/04/20 15:59	1
DONA	ND		0.23	0.021	ug/Kg	☼	09/02/20 20:39	09/04/20 15:59	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*82*		*50 - 150*	*09/02/20 20:39*	*09/04/20 15:59*	*1*
13C2 PFDA	*85*		*50 - 150*	*09/02/20 20:39*	*09/04/20 15:59*	*1*
13C4 PFOS	*77*		*50 - 150*	*09/02/20 20:39*	*09/04/20 15:59*	*1*
d3-NMeFOSAA	*68*		*50 - 150*	*09/02/20 20:39*	*09/04/20 15:59*	*1*
d5-NEtFOSAA	*69*		*50 - 150*	*09/02/20 20:39*	*09/04/20 15:59*	*1*
13C3 HFPO-DA	*73*		*50 - 150*	*09/02/20 20:39*	*09/04/20 15:59*	*1*
18O2 PFHxS	*83*		*50 - 150*	*09/02/20 20:39*	*09/04/20 15:59*	*1*
13C3 PFBS	*83*		*50 - 150*	*09/02/20 20:39*	*09/04/20 15:59*	*1*
13C2 PFDoA	*81*		*50 - 150*	*09/02/20 20:39*	*09/04/20 15:59*	*1*
13C2 PFTeDA	*77*		*50 - 150*	*09/02/20 20:39*	*09/04/20 15:59*	*1*
13C5 PFNA	*91*		*50 - 150*	*09/02/20 20:39*	*09/04/20 15:59*	*1*
13C4 PFOA	*72*		*50 - 150*	*09/02/20 20:39*	*09/04/20 15:59*	*1*
13C2 PFUnA	*85*		*50 - 150*	*09/02/20 20:39*	*09/04/20 15:59*	*1*
13C4 PFHpA	*83*		*50 - 150*	*09/02/20 20:39*	*09/04/20 15:59*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**14.9**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**85.1**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-G5

Lab Sample ID: 320-63955-51

Date Collected: 08/19/20 10:08
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 90.3

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**1.8**		0.21	0.045	ug/Kg	☼	09/02/20 20:39	09/04/20 16:08	1
Perfluoroheptanoic acid (PFHpA)	**0.35**		0.21	0.031	ug/Kg	☼	09/02/20 20:39	09/04/20 16:08	1
Perfluorooctanoic acid (PFOA)	**0.19**	**J**	0.21	0.091	ug/Kg	☼	09/02/20 20:39	09/04/20 16:08	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	09/02/20 20:39	09/04/20 16:08	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	09/02/20 20:39	09/04/20 16:08	1

Client Sample ID: 20BET-SS-G5

Lab Sample ID: 320-63955-51

Date Collected: 08/19/20 10:08

Matrix: Solid

Date Received: 08/25/20 09:50

Percent Solids: 90.3

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	09/02/20 20:39	09/04/20 16:08	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	09/02/20 20:39	09/04/20 16:08	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	09/02/20 20:39	09/04/20 16:08	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	09/02/20 20:39	09/04/20 16:08	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.027	ug/Kg	☼	09/02/20 20:39	09/04/20 16:08	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.033	ug/Kg	☼	09/02/20 20:39	09/04/20 16:08	1
Perfluorooctanesulfonic acid (PFOS)	**0.25**	**J**	0.53	0.21	ug/Kg	☼	09/02/20 20:39	09/04/20 16:08	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	09/02/20 20:39	09/04/20 16:08	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	09/02/20 20:39	09/04/20 16:08	1
F-53B Major	ND		0.21	0.029	ug/Kg	☼	09/02/20 20:39	09/04/20 16:08	1
HFPO-DA (GenX)	ND		0.27	0.12	ug/Kg	☼	09/02/20 20:39	09/04/20 16:08	1
F-53B Minor	ND		0.21	0.023	ug/Kg	☼	09/02/20 20:39	09/04/20 16:08	1
DONA	ND		0.21	0.019	ug/Kg	☼	09/02/20 20:39	09/04/20 16:08	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*76*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:08*	*1*
13C2 PFDA	*71*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:08*	*1*
13C4 PFOS	*69*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:08*	*1*
d3-NMeFOSAA	*69*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:08*	*1*
d5-NEtFOSAA	*70*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:08*	*1*
13C3 HFPO-DA	*65*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:08*	*1*
18O2 PFHxS	*74*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:08*	*1*
13C3 PFBS	*72*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:08*	*1*
13C2 PFDoA	*67*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:08*	*1*
13C2 PFTeDA	*67*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:08*	*1*
13C5 PFNA	*72*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:08*	*1*
13C4 PFOA	*67*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:08*	*1*
13C2 PFUnA	*70*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:08*	*1*
13C4 PFHpA	*73*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:08*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**9.7**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**90.3**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-G6

Lab Sample ID: 320-63955-52

Date Collected: 08/19/20 10:10

Matrix: Solid

Date Received: 08/25/20 09:50

Percent Solids: 83.1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**5.0**		0.23	0.048	ug/Kg	☼	09/02/20 20:39	09/04/20 16:18	1
Perfluoroheptanoic acid (PFHpA)	**2.1**		0.23	0.033	ug/Kg	☼	09/02/20 20:39	09/04/20 16:18	1
Perfluorooctanoic acid (PFOA)	**0.36**		0.23	0.098	ug/Kg	☼	09/02/20 20:39	09/04/20 16:18	1
Perfluorononanoic acid (PFNA)	**0.24**		0.23	0.041	ug/Kg	☼	09/02/20 20:39	09/04/20 16:18	1
Perfluorodecanoic acid (PFDA)	**0.034**	**J**	0.23	0.025	ug/Kg	☼	09/02/20 20:39	09/04/20 16:18	1
Perfluoroundecanoic acid (PFUnA)	ND		0.23	0.041	ug/Kg	☼	09/02/20 20:39	09/04/20 16:18	1
Perfluorododecanoic acid (PFDoA)	ND		0.23	0.076	ug/Kg	☼	09/02/20 20:39	09/04/20 16:18	1
Perfluorotridecanoic acid (PFTriA)	ND		0.23	0.058	ug/Kg	☼	09/02/20 20:39	09/04/20 16:18	1

Client Sample ID: 20BET-SS-G6

Lab Sample ID: 320-63955-52
Date Collected: 08/19/20 10:10
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 83.1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotetradecanoic acid (PFTeA)	ND		0.23	0.061	ug/Kg	☼	09/02/20 20:39	09/04/20 16:18	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.23	0.028	ug/Kg	☼	09/02/20 20:39	09/04/20 16:18	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.23	0.035	ug/Kg	☼	09/02/20 20:39	09/04/20 16:18	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.57	0.23	ug/Kg	☼	09/02/20 20:39	09/04/20 16:18	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.3	0.44	ug/Kg	☼	09/02/20 20:39	09/04/20 16:18	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.3	0.42	ug/Kg	☼	09/02/20 20:39	09/04/20 16:18	1
F-53B Major	ND		0.23	0.031	ug/Kg	☼	09/02/20 20:39	09/04/20 16:18	1
HFPO-DA (GenX)	ND		0.28	0.13	ug/Kg	☼	09/02/20 20:39	09/04/20 16:18	1
F-53B Minor	ND		0.23	0.025	ug/Kg	☼	09/02/20 20:39	09/04/20 16:18	1
DONA	ND		0.23	0.020	ug/Kg	☼	09/02/20 20:39	09/04/20 16:18	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*67*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:18*	*1*
13C2 PFDA	*78*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:18*	*1*
13C4 PFOS	*75*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:18*	*1*
d3-NMeFOSAA	*59*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:18*	*1*
d5-NEtFOSAA	*63*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:18*	*1*
13C3 HFPO-DA	*62*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:18*	*1*
18O2 PFHxS	*81*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:18*	*1*
13C3 PFBS	*68*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:18*	*1*
13C2 PFDoA	*73*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:18*	*1*
13C2 PFTeDA	*69*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:18*	*1*
13C5 PFNA	*73*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:18*	*1*
13C4 PFOA	*73*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:18*	*1*
13C2 PFUnA	*70*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:18*	*1*
13C4 PFHpA	*72*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:18*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**16.9**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**83.1**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-G7

Lab Sample ID: 320-63955-53
Date Collected: 08/19/20 10:12
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 51.8

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**7.5**		0.36	0.076	ug/Kg	☼	08/27/20 04:46	09/01/20 19:38	1
Perfluoroheptanoic acid (PFHpA)	**3.7**		0.36	0.053	ug/Kg	☼	08/27/20 04:46	09/01/20 19:38	1
Perfluorooctanoic acid (PFOA)	ND		0.36	0.16	ug/Kg	☼	08/27/20 04:46	09/01/20 19:38	1
Perfluorononanoic acid (PFNA)	**0.12**	**J I**	0.36	0.065	ug/Kg	☼	08/27/20 04:46	09/01/20 19:38	1
Perfluorodecanoic acid (PFDA)	ND		0.36	0.040	ug/Kg	☼	08/27/20 04:46	09/01/20 19:38	1
Perfluoroundecanoic acid (PFUnA)	ND		0.36	0.065	ug/Kg	☼	08/27/20 04:46	09/01/20 19:38	1
Perfluorododecanoic acid (PFDoA)	ND		0.36	0.12	ug/Kg	☼	08/27/20 04:46	09/01/20 19:38	1
Perfluorotridecanoic acid (PFTriA)	ND		0.36	0.093	ug/Kg	☼	08/27/20 04:46	09/01/20 19:38	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.36	0.098	ug/Kg	☼	08/27/20 04:46	09/01/20 19:38	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.36	0.045	ug/Kg	☼	08/27/20 04:46	09/01/20 19:38	1
Perfluorohexanesulfonic acid (PFHxS)	**0.095**	**J**	0.36	0.056	ug/Kg	☼	08/27/20 04:46	09/01/20 19:38	1

Client Sample ID: 20BET-SS-G7

Lab Sample ID: 320-63955-53
Date Collected: 08/19/20 10:12
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 51.8

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	ND		0.91	0.36	ug/Kg	☼	08/27/20 04:46	09/01/20 19:38	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		3.6	0.71	ug/Kg	☼	08/27/20 04:46	09/01/20 19:38	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		3.6	0.67	ug/Kg	☼	08/27/20 04:46	09/01/20 19:38	1
F-53B Major	ND		0.36	0.049	ug/Kg	☼	08/27/20 04:46	09/01/20 19:38	1
HFPO-DA (GenX)	ND		0.45	0.20	ug/Kg	☼	08/27/20 04:46	09/01/20 19:38	1
F-53B Minor	ND		0.36	0.040	ug/Kg	☼	08/27/20 04:46	09/01/20 19:38	1
DONA	ND		0.36	0.033	ug/Kg	☼	08/27/20 04:46	09/01/20 19:38	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*100*		*50 - 150*	*08/27/20 04:46*	*09/01/20 19:38*	*1*
13C2 PFDA	*85*		*50 - 150*	*08/27/20 04:46*	*09/01/20 19:38*	*1*
13C4 PFOS	*94*		*50 - 150*	*08/27/20 04:46*	*09/01/20 19:38*	*1*
d3-NMeFOSAA	*66*		*50 - 150*	*08/27/20 04:46*	*09/01/20 19:38*	*1*
d5-NEtFOSAA	*55*		*50 - 150*	*08/27/20 04:46*	*09/01/20 19:38*	*1*
13C3 HFPO-DA	*87*		*50 - 150*	*08/27/20 04:46*	*09/01/20 19:38*	*1*
18O2 PFHxS	*118*		*50 - 150*	*08/27/20 04:46*	*09/01/20 19:38*	*1*
13C3 PFBS	*108*		*50 - 150*	*08/27/20 04:46*	*09/01/20 19:38*	*1*
13C2 PFDoA	*67*		*50 - 150*	*08/27/20 04:46*	*09/01/20 19:38*	*1*
13C2 PFTeDA	*65*		*50 - 150*	*08/27/20 04:46*	*09/01/20 19:38*	*1*
13C5 PFNA	*88*		*50 - 150*	*08/27/20 04:46*	*09/01/20 19:38*	*1*
13C4 PFOA	*82*		*50 - 150*	*08/27/20 04:46*	*09/01/20 19:38*	*1*
13C2 PFUnA	*71*		*50 - 150*	*08/27/20 04:46*	*09/01/20 19:38*	*1*
13C4 PFHpA	*97*		*50 - 150*	*08/27/20 04:46*	*09/01/20 19:38*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**48.2**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**51.8**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-SS-G10

Lab Sample ID: 320-63955-54
Date Collected: 08/19/20 09:54
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 90.6

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**1.7**		0.22	0.045	ug/Kg	☼	09/02/20 20:39	09/04/20 16:27	1
Perfluoroheptanoic acid (PFHpA)	**0.56**		0.22	0.031	ug/Kg	☼	09/02/20 20:39	09/04/20 16:27	1
Perfluorooctanoic acid (PFOA)	**0.15**	**J**	0.22	0.093	ug/Kg	☼	09/02/20 20:39	09/04/20 16:27	1
Perfluorononanoic acid (PFNA)	**0.048**	**J**	0.22	0.039	ug/Kg	☼	09/02/20 20:39	09/04/20 16:27	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.024	ug/Kg	☼	09/02/20 20:39	09/04/20 16:27	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.039	ug/Kg	☼	09/02/20 20:39	09/04/20 16:27	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.072	ug/Kg	☼	09/02/20 20:39	09/04/20 16:27	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.055	ug/Kg	☼	09/02/20 20:39	09/04/20 16:27	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.058	ug/Kg	☼	09/02/20 20:39	09/04/20 16:27	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.027	ug/Kg	☼	09/02/20 20:39	09/04/20 16:27	1
Perfluorohexanesulfonic acid (PFHxS)	**0.047**	**J I**	0.22	0.033	ug/Kg	☼	09/02/20 20:39	09/04/20 16:27	1
Perfluorooctanesulfonic acid (PFOS)	**0.52**	**J**	0.54	0.22	ug/Kg	☼	09/02/20 20:39	09/04/20 16:27	1

Client Sample ID: 20BET-SS-G10

Lab Sample ID: 320-63955-54
Date Collected: 08/19/20 09:54
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 90.6

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.42	ug/Kg	☼	09/02/20 20:39	09/04/20 16:27	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.40	ug/Kg	☼	09/02/20 20:39	09/04/20 16:27	1
F-53B Major	ND		0.22	0.029	ug/Kg	☼	09/02/20 20:39	09/04/20 16:27	1
HFPO-DA (GenX)	ND		0.27	0.12	ug/Kg	☼	09/02/20 20:39	09/04/20 16:27	1
F-53B Minor	ND		0.22	0.024	ug/Kg	☼	09/02/20 20:39	09/04/20 16:27	1
DONA	ND		0.22	0.019	ug/Kg	☼	09/02/20 20:39	09/04/20 16:27	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*80*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:27*	*1*
13C2 PFDA	*86*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:27*	*1*
13C4 PFOS	*77*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:27*	*1*
d3-NMeFOSAA	*64*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:27*	*1*
d5-NEtFOSAA	*66*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:27*	*1*
13C3 HFPO-DA	*70*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:27*	*1*
18O2 PFHxS	*84*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:27*	*1*
13C3 PFBS	*77*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:27*	*1*
13C2 PFDoA	*80*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:27*	*1*
13C2 PFTeDA	*71*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:27*	*1*
13C5 PFNA	*86*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:27*	*1*
13C4 PFOA	*72*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:27*	*1*
13C2 PFUnA	*84*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:27*	*1*
13C4 PFHpA	*81*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:27*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**9.4**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**90.6**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-Sub-01

Lab Sample ID: 320-63955-55
Date Collected: 08/19/20 10:50
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 80.3

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		70	8.3	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
1,1,1-Trichloroethane	ND		70	5.2	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
1,1,2,2-Tetrachloroethane	ND		70	4.5	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
1,1,2-Trichloroethane	ND		70	4.8	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
1,1-Dichloroethane	ND		70	3.8	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
1,1-Dichloroethene	ND		70	6.6	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
1,1-Dichloropropene	ND		70	6.0	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
1,2,3-Trichlorobenzene	ND		70	8.7	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
1,2,3-Trichloropropane	ND		70	6.6	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
1,2,4-Trichlorobenzene	ND		70	4.8	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
1,2,4-Trimethylbenzene	ND		70	4.9	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
1,2-Dibromo-3-Chloropropane	ND		140	8.8	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
1,2-Dibromoethane (EDB)	ND		70	7.6	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
1,2-Dichlorobenzene	ND		70	3.1	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
1,2-Dichloroethane	ND		70	6.6	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1

Client Sample ID: 20BET-Sub-01
Date Collected: 08/19/20 10:50
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-55
Matrix: Solid
Percent Solids: 80.3

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloropropane	ND		70	6.6	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
1,3,5-Trimethylbenzene	ND		70	4.9	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
1,3-Dichlorobenzene	ND		70	4.6	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
1,3-Dichloropropane	ND		70	3.2	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
1,4-Dichlorobenzene	ND		70	3.1	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
2,2-Dichloropropane	ND		70	6.0	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
2-Butanone (MEK)	**170**		140	36	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
2-Chlorotoluene	ND		70	5.0	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
4-Chlorotoluene	ND		70	3.9	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
4-Methyl-2-pentanone (MIBK)	ND		140	4.3	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Acetone	**110**	**J**	700	70	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Benzene	ND		70	4.6	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Bromobenzene	ND		70	7.8	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Bromochloromethane	ND		70	10	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Bromodichloromethane	ND		70	7.0	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Bromoform	ND		70	15	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Bromomethane	ND		140	17	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Carbon disulfide	ND		140	4.9	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Carbon tetrachloride	ND		70	4.9	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Chlorobenzene	ND		70	6.2	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Chloroethane	ND		70	9.2	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Chloroform	ND		70	3.6	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Chloromethane	ND		70	3.5	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
cis-1,2-Dichloroethene	ND		70	11	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
cis-1,3-Dichloropropene	ND		70	5.7	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Dibromochloromethane	ND		70	4.6	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Dibromomethane	ND		70	9.1	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Dichlorodifluoromethane	ND		70	13	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Ethylbenzene	ND		70	9.2	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Hexachlorobutadiene	ND		70	7.1	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Isopropylbenzene	ND		70	4.9	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Methylene Chloride	ND		70	7.6	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
m-Xylene & p-Xylene	ND		70	7.0	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Naphthalene	ND		70	2.5	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
n-Butylbenzene	ND		70	4.3	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
N-Propylbenzene	ND		70	6.6	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
o-Xylene	ND		70	7.3	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
p-Isopropyltoluene	ND		70	2.2	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
sec-Butylbenzene	ND		70	3.4	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Styrene	ND		70	1.5	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
tert-Butylbenzene	ND		70	5.7	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Tetrachloroethene	ND		70	5.9	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Toluene	ND		70	6.3	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
trans-1,2-Dichloroethene	ND		70	8.7	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
trans-1,3-Dichloropropene	ND		70	3.9	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Trichloroethene	ND		70	7.7	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Trichlorofluoromethane	ND		70	17	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Vinyl acetate	ND		70	11	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1
Vinyl chloride	ND		70	6.0	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1

Client Sample ID: 20BET-Sub-01

Date Collected: 08/19/20 10:50
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-55

Matrix: Solid
Percent Solids: 80.3

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Xylenes, Total	ND		70	7.3	ug/Kg	☼	08/25/20 18:14	09/01/20 16:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*52 - 126*	*08/25/20 18:14*	*09/01/20 16:16*	*1*
4-Bromofluorobenzene (Surr)	*93*		*67 - 135*	*08/25/20 18:14*	*09/01/20 16:16*	*1*
Dibromofluoromethane (Surr)	*89*		*61 - 123*	*08/25/20 18:14*	*09/01/20 16:16*	*1*
Toluene-d8 (Surr)	*110*		*65 - 131*	*08/25/20 18:14*	*09/01/20 16:16*	*1*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C10 AK	ND		7.0	1.4	mg/Kg	☼	08/25/20 18:14	09/01/20 16:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*88*		*60 - 120*	*08/25/20 18:14*	*09/01/20 16:16*	*1*
Trifluorotoluene (Surr)	*158*	*X*	*60 - 120*	*08/25/20 18:14*	*09/01/20 16:16*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		62	7.8	ug/Kg	☼	08/31/20 07:48	09/01/20 23:56	10
Acenaphthylene	ND		62	8.1	ug/Kg	☼	08/31/20 07:48	09/01/20 23:56	10
Anthracene	ND		62	8.2	ug/Kg	☼	08/31/20 07:48	09/01/20 23:56	10
Benzo[a]anthracene	ND		62	8.7	ug/Kg	☼	08/31/20 07:48	09/01/20 23:56	10
Benzo[a]pyrene	ND		62	8.6	ug/Kg	☼	08/31/20 07:48	09/01/20 23:56	10
Benzo[b]fluoranthene	ND		62	9.5	ug/Kg	☼	08/31/20 07:48	09/01/20 23:56	10
Benzo[g,h,i]perylene	ND		62	8.9	ug/Kg	☼	08/31/20 07:48	09/01/20 23:56	10
Benzo[k]fluoranthene	ND		62	8.9	ug/Kg	☼	08/31/20 07:48	09/01/20 23:56	10
Chrysene	ND		62	8.9	ug/Kg	☼	08/31/20 07:48	09/01/20 23:56	10
Dibenz(a,h)anthracene	ND		62	9.5	ug/Kg	☼	08/31/20 07:48	09/01/20 23:56	10
Fluoranthene	ND		62	10	ug/Kg	☼	08/31/20 07:48	09/01/20 23:56	10
Fluorene	ND		62	7.9	ug/Kg	☼	08/31/20 07:48	09/01/20 23:56	10
Indeno[1,2,3-cd]pyrene	ND		62	9.5	ug/Kg	☼	08/31/20 07:48	09/01/20 23:56	10
Naphthalene	ND		62	8.2	ug/Kg	☼	08/31/20 07:48	09/01/20 23:56	10
Phenanthrene	**12**	**J**	62	8.9	ug/Kg	☼	08/31/20 07:48	09/01/20 23:56	10
Pyrene	ND		62	9.2	ug/Kg	☼	08/31/20 07:48	09/01/20 23:56	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*92*		*49 - 114*	*08/31/20 07:48*	*09/01/20 23:56*	*10*
Terphenyl-d14	*83*		*53 - 121*	*08/31/20 07:48*	*09/01/20 23:56*	*10*
2-Fluorobiphenyl (Surr)	*70*		*43 - 109*	*08/31/20 07:48*	*09/01/20 23:56*	*10*
2-methylnaphthalene-d10	*84*		*50 - 150*	*08/31/20 07:48*	*09/01/20 23:56*	*10*
Fluoranthene-d10 (Surr)	*82*		*50 - 150*	*08/31/20 07:48*	*09/01/20 23:56*	*10*

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**31**	*****	12	3.0	mg/Kg	☼	09/01/20 07:19	09/09/20 04:18	5
RRO (nC25-nC36)	**200**		120	23	mg/Kg	☼	09/01/20 07:19	09/09/20 04:18	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*65*		*60 - 120*	*09/01/20 07:19*	*09/09/20 04:18*	*5*
n-Triacontane-d62	*85*		*60 - 120*	*09/01/20 07:19*	*09/09/20 04:18*	*5*

Client Sample ID: 20BET-Sub-01

Date Collected: 08/19/20 10:50
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-55

Matrix: Solid
Percent Solids: 80.3

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**34**	**H B**	12	3.1	mg/Kg	☼	09/09/20 09:17	09/14/20 20:12	5
RRO (nC25-nC36)	**210**	**H**	120	23	mg/Kg	☼	09/09/20 09:17	09/14/20 20:12	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*91*		*60 - 120*	*09/09/20 09:17*	*09/14/20 20:12*	*5*
n-Triacontane-d62	*90*		*60 - 120*	*09/09/20 09:17*	*09/14/20 20:12*	*5*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**2.2**		0.24	0.035	ug/Kg	☼	09/02/20 20:39	09/04/20 16:37	1
Perfluorooctanoic acid (PFOA)	**0.10**	**J**	0.24	0.10	ug/Kg	☼	09/02/20 20:39	09/04/20 16:37	1
Perfluorononanoic acid (PFNA)	ND		0.24	0.044	ug/Kg	☼	09/02/20 20:39	09/04/20 16:37	1
Perfluorodecanoic acid (PFDA)	ND		0.24	0.027	ug/Kg	☼	09/02/20 20:39	09/04/20 16:37	1
Perfluoroundecanoic acid (PFUnA)	ND		0.24	0.044	ug/Kg	☼	09/02/20 20:39	09/04/20 16:37	1
Perfluorododecanoic acid (PFDoA)	ND		0.24	0.081	ug/Kg	☼	09/02/20 20:39	09/04/20 16:37	1
Perfluorotridecanoic acid (PFTriA)	ND		0.24	0.062	ug/Kg	☼	09/02/20 20:39	09/04/20 16:37	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.24	0.065	ug/Kg	☼	09/02/20 20:39	09/04/20 16:37	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.24	0.030	ug/Kg	☼	09/02/20 20:39	09/04/20 16:37	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.24	0.038	ug/Kg	☼	09/02/20 20:39	09/04/20 16:37	1
Perfluorooctanesulfonic acid (PFOS)	**0.96**		0.61	0.24	ug/Kg	☼	09/02/20 20:39	09/04/20 16:37	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.4	0.47	ug/Kg	☼	09/02/20 20:39	09/04/20 16:37	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.4	0.45	ug/Kg	☼	09/02/20 20:39	09/04/20 16:37	1
F-53B Major	ND		0.24	0.033	ug/Kg	☼	09/02/20 20:39	09/04/20 16:37	1
HFPO-DA (GenX)	ND		0.30	0.13	ug/Kg	☼	09/02/20 20:39	09/04/20 16:37	1
F-53B Minor	ND		0.24	0.027	ug/Kg	☼	09/02/20 20:39	09/04/20 16:37	1
DONA	ND		0.24	0.022	ug/Kg	☼	09/02/20 20:39	09/04/20 16:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDA	*135*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:37*	*1*
13C4 PFOS	*140*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:37*	*1*
d3-NMeFOSAA	*97*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:37*	*1*
d5-NEtFOSAA	*95*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:37*	*1*
13C3 HFPO-DA	*122*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:37*	*1*
18O2 PFHxS	*146*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:37*	*1*
13C3 PFBS	*136*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:37*	*1*
13C2 PFDoA	*133*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:37*	*1*
13C2 PFTeDA	*127*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:37*	*1*
13C5 PFNA	*149*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:37*	*1*
13C4 PFOA	*73*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:37*	*1*
13C2 PFUnA	*141*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:37*	*1*
13C4 PFHpA	*138*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:37*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**38**		2.4	0.51	ug/Kg	☼	09/02/20 20:39	09/08/20 10:06	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*89*		*50 - 150*	*09/02/20 20:39*	*09/08/20 10:06*	*10*

Client Sample ID: 20BET-Sub-01

Lab Sample ID: 320-63955-55
Date Collected: 08/19/20 10:50
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 80.3

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**19.7**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**80.3**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-Sub-02

Lab Sample ID: 320-63955-56
Date Collected: 08/19/20 10:55
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 79.8

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		71	8.4	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,1,1-Trichloroethane	ND		71	5.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,1,2,2-Tetrachloroethane	ND		71	4.6	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,1,2-Trichloroethane	ND		71	4.8	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,1-Dichloroethane	ND		71	3.9	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,1-Dichloroethene	ND		71	6.7	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,1-Dichloropropene	ND		71	6.1	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,2,3-Trichlorobenzene	ND		71	8.8	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,2,3-Trichloropropane	ND		71	6.7	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,2,4-Trichlorobenzene	ND		71	4.8	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,2,4-Trimethylbenzene	**17**	**J**	71	5.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,2-Dibromo-3-Chloropropane	ND		140	9.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,2-Dibromoethane (EDB)	ND		71	7.7	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,2-Dichlorobenzene	ND		71	3.1	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,2-Dichloroethane	ND		71	6.7	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,2-Dichloropropane	ND		71	6.7	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,3,5-Trimethylbenzene	**220**		71	5.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,3-Dichlorobenzene	ND		71	4.7	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,3-Dichloropropane	ND		71	3.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
1,4-Dichlorobenzene	ND		71	3.1	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
2,2-Dichloropropane	ND		71	6.1	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
2-Butanone (MEK)	**170**		140	37	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
2-Chlorotoluene	ND		71	5.1	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
4-Chlorotoluene	ND		71	4.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
4-Methyl-2-pentanone (MIBK)	ND		140	4.4	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Acetone	ND		710	71	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Benzene	ND		71	4.7	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Bromobenzene	ND		71	8.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Bromochloromethane	ND		71	10	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Bromodichloromethane	ND		71	7.1	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Bromoform	ND		71	16	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Bromomethane	ND		140	17	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Carbon disulfide	ND		140	5.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Carbon tetrachloride	ND		71	5.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Chlorobenzene	ND		71	6.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Chloroethane	ND		71	9.4	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Chloroform	ND		71	3.7	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Chloromethane	ND		71	3.6	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
cis-1,2-Dichloroethene	ND		71	12	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
cis-1,3-Dichloropropene	ND		71	5.8	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Dibromochloromethane	ND		71	4.7	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1

Client Sample ID: 20BET-Sub-02
Date Collected: 08/19/20 10:55
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-56
Matrix: Solid
Percent Solids: 79.8

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibromomethane	ND		71	9.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Dichlorodifluoromethane	ND		71	13	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Ethylbenzene	ND		71	9.4	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Hexachlorobutadiene	ND		71	7.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Isopropylbenzene	ND		71	5.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Methylene Chloride	ND		71	7.7	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
m-Xylene & p-Xylene	**17**	**J**	71	7.1	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Naphthalene	ND		71	2.6	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
n-Butylbenzene	ND		71	4.4	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
N-Propylbenzene	ND		71	6.7	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
o-Xylene	**46**	**J**	71	7.4	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
p-Isopropyltoluene	ND		71	2.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
sec-Butylbenzene	**10**	**J**	71	3.4	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Styrene	ND		71	1.6	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
tert-Butylbenzene	ND		71	5.8	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Tetrachloroethene	ND		71	6.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Toluene	**19**	**J**	71	6.4	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
trans-1,2-Dichloroethene	ND		71	8.8	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
trans-1,3-Dichloropropene	ND		71	4.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Trichloroethene	ND		71	7.8	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Trichlorofluoromethane	ND		71	17	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Vinyl acetate	ND		71	11	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Vinyl chloride	ND		71	6.1	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1
Xylenes, Total	**63**	**J**	71	7.4	ug/Kg	☼	08/25/20 18:14	09/01/20 17:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*52 - 126*	*08/25/20 18:14*	*09/01/20 17:02*	*1*
4-Bromofluorobenzene (Surr)	*100*		*67 - 135*	*08/25/20 18:14*	*09/01/20 17:02*	*1*
Dibromofluoromethane (Surr)	*103*		*61 - 123*	*08/25/20 18:14*	*09/01/20 17:02*	*1*
Toluene-d8 (Surr)	*118*		*65 - 131*	*08/25/20 18:14*	*09/01/20 17:02*	*1*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C10 AK	**11**		7.1	1.4	mg/Kg	☼	08/25/20 18:14	09/01/20 17:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*60 - 120*	*08/25/20 18:14*	*09/01/20 17:02*	*1*
Trifluorotoluene (Surr)	*148*	*X*	*60 - 120*	*08/25/20 18:14*	*09/01/20 17:02*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		57	7.2	ug/Kg	☼	08/31/20 07:48	09/02/20 00:25	10
Acenaphthylene	ND		57	7.5	ug/Kg	☼	08/31/20 07:48	09/02/20 00:25	10
Anthracene	ND		57	7.6	ug/Kg	☼	08/31/20 07:48	09/02/20 00:25	10
Benzo[a]anthracene	ND		57	8.1	ug/Kg	☼	08/31/20 07:48	09/02/20 00:25	10
Benzo[a]pyrene	ND		57	8.0	ug/Kg	☼	08/31/20 07:48	09/02/20 00:25	10
Benzo[b]fluoranthene	ND		57	8.8	ug/Kg	☼	08/31/20 07:48	09/02/20 00:25	10
Benzo[g,h,i]perylene	ND		57	8.2	ug/Kg	☼	08/31/20 07:48	09/02/20 00:25	10
Benzo[k]fluoranthene	ND		57	8.2	ug/Kg	☼	08/31/20 07:48	09/02/20 00:25	10
Chrysene	ND		57	8.2	ug/Kg	☼	08/31/20 07:48	09/02/20 00:25	10

Client Sample ID: 20BET-Sub-02

Date Collected: 08/19/20 10:55
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-56

Matrix: Solid
Percent Solids: 79.8

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		57	8.8	ug/Kg	☼	08/31/20 07:48	09/02/20 00:25	10
Fluoranthene	ND		57	9.2	ug/Kg	☼	08/31/20 07:48	09/02/20 00:25	10
Fluorene	ND		57	7.3	ug/Kg	☼	08/31/20 07:48	09/02/20 00:25	10
Indeno[1,2,3-cd]pyrene	ND		57	8.8	ug/Kg	☼	08/31/20 07:48	09/02/20 00:25	10
Naphthalene	**43**	**J**	57	7.6	ug/Kg	☼	08/31/20 07:48	09/02/20 00:25	10
Phenanthrene	**9.2**	**J**	57	8.2	ug/Kg	☼	08/31/20 07:48	09/02/20 00:25	10
Pyrene	ND		57	8.6	ug/Kg	☼	08/31/20 07:48	09/02/20 00:25	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*0*	*X*	*49 - 114*	*08/31/20 07:48*	*09/02/20 00:25*	*10*
Terphenyl-d14	*78*		*53 - 121*	*08/31/20 07:48*	*09/02/20 00:25*	*10*
2-Fluorobiphenyl (Surr)	*74*		*43 - 109*	*08/31/20 07:48*	*09/02/20 00:25*	*10*
2-methylnaphthalene-d10	*93*		*50 - 150*	*08/31/20 07:48*	*09/02/20 00:25*	*10*
Fluoranthene-d10 (Surr)	*79*		*50 - 150*	*08/31/20 07:48*	*09/02/20 00:25*	*10*

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**290**	*****	12	3.1	mg/Kg	☼	09/01/20 07:19	09/09/20 04:46	5
RRO (nC25-nC36)	**180**		120	23	mg/Kg	☼	09/01/20 07:19	09/09/20 04:46	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*60*		*60 - 120*	*09/01/20 07:19*	*09/09/20 04:46*	*5*
n-Triacontane-d62	*78*		*60 - 120*	*09/01/20 07:19*	*09/09/20 04:46*	*5*

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**470**	**H B**	12	3.1	mg/Kg	☼	09/09/20 09:17	09/14/20 20:42	5
RRO (nC25-nC36)	**270**	**H**	120	23	mg/Kg	☼	09/09/20 09:17	09/14/20 20:42	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*95*		*60 - 120*	*09/09/20 09:17*	*09/14/20 20:42*	*5*
n-Triacontane-d62	*95*		*60 - 120*	*09/09/20 09:17*	*09/14/20 20:42*	*5*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.93**		0.25	0.036	ug/Kg	☼	09/02/20 20:39	09/04/20 16:46	1
Perfluorooctanoic acid (PFOA)	**0.24**	**J**	0.25	0.11	ug/Kg	☼	09/02/20 20:39	09/04/20 16:46	1
Perfluorononanoic acid (PFNA)	**0.047**	**J**	0.25	0.044	ug/Kg	☼	09/02/20 20:39	09/04/20 16:46	1
Perfluorodecanoic acid (PFDA)	**0.085**	**J**	0.25	0.027	ug/Kg	☼	09/02/20 20:39	09/04/20 16:46	1
Perfluoroundecanoic acid (PFUnA)	ND	F1	0.25	0.044	ug/Kg	☼	09/02/20 20:39	09/04/20 16:46	1
Perfluorododecanoic acid (PFDoA)	ND		0.25	0.083	ug/Kg	☼	09/02/20 20:39	09/04/20 16:46	1
Perfluorotridecanoic acid (PFTriA)	ND		0.25	0.063	ug/Kg	☼	09/02/20 20:39	09/04/20 16:46	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.25	0.067	ug/Kg	☼	09/02/20 20:39	09/04/20 16:46	1
Perfluorobutanesulfonic acid (PFBS)	**0.038**	**J**	0.25	0.031	ug/Kg	☼	09/02/20 20:39	09/04/20 16:46	1
Perfluorohexanesulfonic acid (PFHxS)	**0.65**	**I F1**	0.25	0.038	ug/Kg	☼	09/02/20 20:39	09/04/20 16:46	1
Perfluorooctanesulfonic acid (PFOS)	**0.39**	**J F2**	0.62	0.25	ug/Kg	☼	09/02/20 20:39	09/04/20 16:46	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.5	0.48	ug/Kg	☼	09/02/20 20:39	09/04/20 16:46	1

Client Sample ID: 20BET-Sub-02

Lab Sample ID: 320-63955-56

Date Collected: 08/19/20 10:55
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 79.8

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.5	0.46	ug/Kg	☼	09/02/20 20:39	09/04/20 16:46	1
F-53B Major	ND	F1 F2	0.25	0.033	ug/Kg	☼	09/02/20 20:39	09/04/20 16:46	1
HFPO-DA (GenX)	ND		0.31	0.14	ug/Kg	☼	09/02/20 20:39	09/04/20 16:46	1
F-53B Minor	ND	F2	0.25	0.027	ug/Kg	☼	09/02/20 20:39	09/04/20 16:46	1
DONA	ND	F2	0.25	0.022	ug/Kg	☼	09/02/20 20:39	09/04/20 16:46	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDA	*171*	*5	*50 - 150*	*09/02/20 20:39*	*09/04/20 16:46*	*1*
13C4 PFOS	*176*	*5	*50 - 150*	*09/02/20 20:39*	*09/04/20 16:46*	*1*
d3-NMeFOSAA	*134*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:46*	*1*
d5-NEtFOSAA	*128*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:46*	*1*
13C3 HFPO-DA	*164*	*5	*50 - 150*	*09/02/20 20:39*	*09/04/20 16:46*	*1*
18O2 PFHxS	*206*	*5	*50 - 150*	*09/02/20 20:39*	*09/04/20 16:46*	*1*
13C3 PFBS	*177*	*5	*50 - 150*	*09/02/20 20:39*	*09/04/20 16:46*	*1*
13C2 PFDoA	*152*	*5	*50 - 150*	*09/02/20 20:39*	*09/04/20 16:46*	*1*
13C2 PFTeDA	*133*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:46*	*1*
13C5 PFNA	*181*	*5	*50 - 150*	*09/02/20 20:39*	*09/04/20 16:46*	*1*
13C4 PFOA	*68*		*50 - 150*	*09/02/20 20:39*	*09/04/20 16:46*	*1*
13C2 PFUnA	*177*	*5	*50 - 150*	*09/02/20 20:39*	*09/04/20 16:46*	*1*
13C4 PFHpA	*182*	*5	*50 - 150*	*09/02/20 20:39*	*09/04/20 16:46*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**43**		2.5	0.52	ug/Kg	☼	09/02/20 20:39	09/08/20 10:15	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*113*		*50 - 150*	*09/02/20 20:39*	*09/08/20 10:15*	*10*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**20.2**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**79.8**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-Sub-20

Lab Sample ID: 320-63955-57

Date Collected: 08/19/20 10:45
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 69.3

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		89	10	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
1,1,1-Trichloroethane	ND		89	6.6	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
1,1,2,2-Tetrachloroethane	ND		89	5.7	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
1,1,2-Trichloroethane	ND		89	6.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
1,1-Dichloroethane	ND		89	4.8	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
1,1-Dichloroethene	ND		89	8.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
1,1-Dichloropropene	ND		89	7.6	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
1,2,3-Trichlorobenzene	ND		89	11	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
1,2,3-Trichloropropane	ND		89	8.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
1,2,4-Trichlorobenzene	ND		89	6.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
1,2,4-Trimethylbenzene	ND		89	6.2	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
1,2-Dibromo-3-Chloropropane	ND		180	11	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1

Client Sample ID: 20BET-Sub-20
Date Collected: 08/19/20 10:45
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-57
Matrix: Solid
Percent Solids: 69.3

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		89	9.6	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
1,2-Dichlorobenzene	ND		89	3.9	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
1,2-Dichloroethane	ND		89	8.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
1,2-Dichloropropane	ND		89	8.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
1,3,5-Trimethylbenzene	**410**		89	6.2	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
1,3-Dichlorobenzene	ND		89	5.8	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
1,3-Dichloropropane	ND		89	4.1	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
1,4-Dichlorobenzene	ND		89	3.9	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
2,2-Dichloropropane	ND		89	7.6	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
2-Butanone (MEK)	**250**		180	46	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
2-Chlorotoluene	ND		89	6.4	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
4-Chlorotoluene	ND		89	5.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
4-Methyl-2-pentanone (MIBK)	ND		180	5.5	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Acetone	**89**	**J**	890	89	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Benzene	ND		89	5.8	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Bromobenzene	ND		89	9.9	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Bromochloromethane	ND		89	13	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Bromodichloromethane	ND		89	8.9	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Bromoform	ND		89	19	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Bromomethane	ND		180	21	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Carbon disulfide	ND		180	6.2	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Carbon tetrachloride	ND		89	6.2	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Chlorobenzene	ND		89	7.8	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Chloroethane	ND		89	12	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Chloroform	ND		89	4.6	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Chloromethane	ND		89	4.4	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
cis-1,2-Dichloroethene	ND		89	15	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
cis-1,3-Dichloropropene	ND		89	7.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Dibromochloromethane	ND		89	5.8	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Dibromomethane	ND		89	12	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Dichlorodifluoromethane	ND		89	17	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Ethylbenzene	ND		89	12	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Hexachlorobutadiene	ND		89	9.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Isopropylbenzene	ND		89	6.2	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Methylene Chloride	ND		89	9.6	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
m-Xylene & p-Xylene	ND		89	8.9	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Naphthalene	ND		89	3.2	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
n-Butylbenzene	ND		89	5.5	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
N-Propylbenzene	ND		89	8.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
o-Xylene	**120**		89	9.2	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
p-Isopropyltoluene	ND		89	2.8	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
sec-Butylbenzene	**17**	**J**	89	4.2	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Styrene	ND		89	1.9	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
tert-Butylbenzene	ND		89	7.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Tetrachloroethene	ND		89	7.4	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Toluene	ND		89	8.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
trans-1,2-Dichloroethene	ND		89	11	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
trans-1,3-Dichloropropene	ND		89	5.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Trichloroethene	ND		89	9.7	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1

Client Sample ID: 20BET-Sub-20

Date Collected: 08/19/20 10:45
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-57

Matrix: Solid
Percent Solids: 69.3

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichlorofluoromethane	ND		89	21	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Vinyl acetate	ND		89	14	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Vinyl chloride	ND		89	7.6	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1
Xylenes, Total	**120**		89	9.2	ug/Kg	☼	08/25/20 18:14	09/01/20 17:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*52 - 126*	*08/25/20 18:14*	*09/01/20 17:25*	*1*
4-Bromofluorobenzene (Surr)	*104*		*67 - 135*	*08/25/20 18:14*	*09/01/20 17:25*	*1*
Dibromofluoromethane (Surr)	*91*		*61 - 123*	*08/25/20 18:14*	*09/01/20 17:25*	*1*
Toluene-d8 (Surr)	*112*		*65 - 131*	*08/25/20 18:14*	*09/01/20 17:25*	*1*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C10 AK	**10**		8.9	1.8	mg/Kg	☼	08/25/20 18:14	09/01/20 17:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*60 - 120*	*08/25/20 18:14*	*09/01/20 17:25*	*1*
Trifluorotoluene (Surr)	*163*	*X*	*60 - 120*	*08/25/20 18:14*	*09/01/20 17:25*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		66	8.3	ug/Kg	☼	08/31/20 07:48	09/02/20 00:54	10
Acenaphthylene	ND		66	8.7	ug/Kg	☼	08/31/20 07:48	09/02/20 00:54	10
Anthracene	ND		66	8.8	ug/Kg	☼	08/31/20 07:48	09/02/20 00:54	10
Benzo[a]anthracene	ND		66	9.4	ug/Kg	☼	08/31/20 07:48	09/02/20 00:54	10
Benzo[a]pyrene	ND		66	9.2	ug/Kg	☼	08/31/20 07:48	09/02/20 00:54	10
Benzo[b]fluoranthene	ND		66	10	ug/Kg	☼	08/31/20 07:48	09/02/20 00:54	10
Benzo[g,h,i]perylene	ND		66	9.5	ug/Kg	☼	08/31/20 07:48	09/02/20 00:54	10
Benzo[k]fluoranthene	ND		66	9.5	ug/Kg	☼	08/31/20 07:48	09/02/20 00:54	10
Chrysene	ND		66	9.5	ug/Kg	☼	08/31/20 07:48	09/02/20 00:54	10
Dibenz(a,h)anthracene	ND		66	10	ug/Kg	☼	08/31/20 07:48	09/02/20 00:54	10
Fluoranthene	ND		66	11	ug/Kg	☼	08/31/20 07:48	09/02/20 00:54	10
Fluorene	ND		66	8.4	ug/Kg	☼	08/31/20 07:48	09/02/20 00:54	10
Indeno[1,2,3-cd]pyrene	ND		66	10	ug/Kg	☼	08/31/20 07:48	09/02/20 00:54	10
Naphthalene	**44**	**J**	66	8.8	ug/Kg	☼	08/31/20 07:48	09/02/20 00:54	10
Phenanthrene	**10**	**J**	66	9.5	ug/Kg	☼	08/31/20 07:48	09/02/20 00:54	10
Pyrene	ND		66	9.9	ug/Kg	☼	08/31/20 07:48	09/02/20 00:54	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*0*	*X*	*49 - 114*	*08/31/20 07:48*	*09/02/20 00:54*	*10*
Terphenyl-d14	*80*		*53 - 121*	*08/31/20 07:48*	*09/02/20 00:54*	*10*
2-Fluorobiphenyl (Surr)	*76*		*43 - 109*	*08/31/20 07:48*	*09/02/20 00:54*	*10*
2-methylnaphthalene-d10	*150*		*50 - 150*	*08/31/20 07:48*	*09/02/20 00:54*	*10*
Fluoranthene-d10 (Surr)	*81*		*50 - 150*	*08/31/20 07:48*	*09/02/20 00:54*	*10*

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**380**	*	14	3.6	mg/Kg	☼	09/01/20 07:19	09/09/20 05:15	5
RRO (nC25-nC36)	**290**		140	27	mg/Kg	☼	09/01/20 07:19	09/09/20 05:15	5

Client Sample ID: 20BET-Sub-20
Date Collected: 08/19/20 10:45
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-57
Matrix: Solid
Percent Solids: 69.3

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*65*		*60 - 120*	*09/01/20 07:19*	*09/09/20 05:15*	*5*
n-Triacontane-d62	*84*		*60 - 120*	*09/01/20 07:19*	*09/09/20 05:15*	*5*

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**380**	**H B**	14	3.6	mg/Kg	☼	09/09/20 09:17	09/14/20 21:13	5
RRO (nC25-nC36)	**300**	**H**	140	27	mg/Kg	☼	09/09/20 09:17	09/14/20 21:13	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*86*		*60 - 120*	*09/09/20 09:17*	*09/14/20 21:13*	*5*
n-Triacontane-d62	*85*		*60 - 120*	*09/09/20 09:17*	*09/14/20 21:13*	*5*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**1.4**		0.28	0.041	ug/Kg	☼	09/02/20 20:39	09/04/20 17:33	1
Perfluorooctanoic acid (PFOA)	**0.48**		0.28	0.12	ug/Kg	☼	09/02/20 20:39	09/04/20 17:33	1
Perfluorononanoic acid (PFNA)	**0.10**	**J**	0.28	0.051	ug/Kg	☼	09/02/20 20:39	09/04/20 17:33	1
Perfluorodecanoic acid (PFDA)	**0.16**	**J**	0.28	0.031	ug/Kg	☼	09/02/20 20:39	09/04/20 17:33	1
Perfluoroundecanoic acid (PFUnA)	ND		0.28	0.051	ug/Kg	☼	09/02/20 20:39	09/04/20 17:33	1
Perfluorododecanoic acid (PFDoA)	ND		0.28	0.095	ug/Kg	☼	09/02/20 20:39	09/04/20 17:33	1
Perfluorotridecanoic acid (PFTriA)	ND		0.28	0.072	ug/Kg	☼	09/02/20 20:39	09/04/20 17:33	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.28	0.077	ug/Kg	☼	09/02/20 20:39	09/04/20 17:33	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.28	0.035	ug/Kg	☼	09/02/20 20:39	09/04/20 17:33	1
Perfluorohexanesulfonic acid (PFHxS)	ND	G	0.85	0.85	ug/Kg	☼	09/02/20 20:39	09/04/20 17:33	1
Perfluorooctanesulfonic acid (PFOS)	**3.1**		0.71	0.28	ug/Kg	☼	09/02/20 20:39	09/04/20 17:33	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.8	0.55	ug/Kg	☼	09/02/20 20:39	09/04/20 17:33	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.8	0.52	ug/Kg	☼	09/02/20 20:39	09/04/20 17:33	1
F-53B Major	ND		0.28	0.038	ug/Kg	☼	09/02/20 20:39	09/04/20 17:33	1
HFPO-DA (GenX)	ND		0.35	0.16	ug/Kg	☼	09/02/20 20:39	09/04/20 17:33	1
F-53B Minor	ND		0.28	0.031	ug/Kg	☼	09/02/20 20:39	09/04/20 17:33	1
DONA	ND		0.28	0.026	ug/Kg	☼	09/02/20 20:39	09/04/20 17:33	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDA	*96*		*50 - 150*	*09/02/20 20:39*	*09/04/20 17:33*	*1*
13C4 PFOS	*97*		*50 - 150*	*09/02/20 20:39*	*09/04/20 17:33*	*1*
d3-NMeFOSAA	*32*	**5*	*50 - 150*	*09/02/20 20:39*	*09/04/20 17:33*	*1*
d5-NEtFOSAA	*33*	**5*	*50 - 150*	*09/02/20 20:39*	*09/04/20 17:33*	*1*
13C3 HFPO-DA	*87*		*50 - 150*	*09/02/20 20:39*	*09/04/20 17:33*	*1*
18O2 PFHxS	*108*		*50 - 150*	*09/02/20 20:39*	*09/04/20 17:33*	*1*
13C3 PFBS	*98*		*50 - 150*	*09/02/20 20:39*	*09/04/20 17:33*	*1*
13C2 PFDoA	*89*		*50 - 150*	*09/02/20 20:39*	*09/04/20 17:33*	*1*
13C2 PFTeDA	*81*		*50 - 150*	*09/02/20 20:39*	*09/04/20 17:33*	*1*
13C5 PFNA	*104*		*50 - 150*	*09/02/20 20:39*	*09/04/20 17:33*	*1*
13C4 PFOA	*60*		*50 - 150*	*09/02/20 20:39*	*09/04/20 17:33*	*1*
13C2 PFUnA	*96*		*50 - 150*	*09/02/20 20:39*	*09/04/20 17:33*	*1*
13C4 PFHpA	*100*		*50 - 150*	*09/02/20 20:39*	*09/04/20 17:33*	*1*

Client Sample ID: 20BET-Sub-20

Lab Sample ID: 320-63955-57
Date Collected: 08/19/20 10:45
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 69.3

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**45**		2.8	0.60	ug/Kg	☼	09/02/20 20:39	09/08/20 10:43	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*77*		*50 - 150*	*09/02/20 20:39*	*09/08/20 10:43*	*10*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**30.7**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**69.3**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: 20BET-Sub-03

Lab Sample ID: 320-63955-58
Date Collected: 08/19/20 11:00
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 82.9

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		64	7.6	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,1,1-Trichloroethane	ND		64	4.7	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,1,2,2-Tetrachloroethane	ND		64	4.1	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,1,2-Trichloroethane	ND		64	4.4	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,1-Dichloroethane	ND		64	3.5	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,1-Dichloroethene	ND		64	6.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,1-Dichloropropene	ND		64	5.5	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,2,3-Trichlorobenzene	ND		64	7.9	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,2,3-Trichloropropane	ND		64	6.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,2,4-Trichlorobenzene	ND		64	4.4	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,2,4-Trimethylbenzene	**26**	**J**	64	4.5	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,2-Dibromo-3-Chloropropane	ND		130	8.1	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,2-Dibromoethane (EDB)	ND		64	6.9	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,2-Dichlorobenzene	ND		64	2.8	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,2-Dichloroethane	ND		64	6.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,2-Dichloropropane	ND		64	6.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,3,5-Trimethylbenzene	**75**		64	4.5	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,3-Dichlorobenzene	ND		64	4.2	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,3-Dichloropropane	ND		64	2.9	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
1,4-Dichlorobenzene	ND		64	2.8	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
2,2-Dichloropropane	ND		64	5.5	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
2-Butanone (MEK)	**160**		130	33	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
2-Chlorotoluene	ND		64	4.6	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
4-Chlorotoluene	ND		64	3.6	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
4-Methyl-2-pentanone (MIBK)	ND		130	4.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Acetone	**130**	**J**	640	64	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Benzene	ND		64	4.2	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Bromobenzene	ND		64	7.2	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Bromochloromethane	ND		64	9.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Bromodichloromethane	ND		64	6.4	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Bromoform	ND		64	14	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Bromomethane	ND		130	15	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Carbon disulfide	ND		130	4.5	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Carbon tetrachloride	ND		64	4.5	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Chlorobenzene	ND		64	5.6	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1

Client Sample ID: 20BET-Sub-03

Date Collected: 08/19/20 11:00
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-58

Matrix: Solid
Percent Solids: 82.9

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		64	8.5	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Chloroform	ND		64	3.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Chloromethane	ND		64	3.2	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
cis-1,2-Dichloroethene	ND		64	11	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
cis-1,3-Dichloropropene	ND		64	5.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Dibromochloromethane	ND		64	4.2	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Dibromomethane	ND		64	8.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Dichlorodifluoromethane	ND		64	12	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Ethylbenzene	ND		64	8.5	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Hexachlorobutadiene	ND		64	6.5	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Isopropylbenzene	ND		64	4.5	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Methylene Chloride	ND		64	6.9	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
m-Xylene & p-Xylene	ND		64	6.4	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Naphthalene	ND		64	2.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
n-Butylbenzene	ND		64	4.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
N-Propylbenzene	ND		64	6.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
o-Xylene	**67**		64	6.7	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
p-Isopropyltoluene	**12**	**J**	64	2.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
sec-Butylbenzene	ND		64	3.1	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Styrene	ND		64	1.4	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
tert-Butylbenzene	ND		64	5.3	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Tetrachloroethene	ND		64	5.4	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Toluene	ND		64	5.8	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
trans-1,2-Dichloroethene	ND		64	7.9	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
trans-1,3-Dichloropropene	ND		64	3.6	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Trichloroethene	ND		64	7.0	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Trichlorofluoromethane	ND		64	15	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Vinyl acetate	ND		64	10	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Vinyl chloride	ND		64	5.5	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1
Xylenes, Total	**67**		64	6.7	ug/Kg	☼	08/25/20 18:14	09/01/20 17:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*52 - 126*	*08/25/20 18:14*	*09/01/20 17:47*	*1*
4-Bromofluorobenzene (Surr)	*103*		*67 - 135*	*08/25/20 18:14*	*09/01/20 17:47*	*1*
Dibromofluoromethane (Surr)	*84*		*61 - 123*	*08/25/20 18:14*	*09/01/20 17:47*	*1*
Toluene-d8 (Surr)	*103*		*65 - 131*	*08/25/20 18:14*	*09/01/20 17:47*	*1*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C10 AK	**3.2**	**J**	6.4	1.3	mg/Kg	☼	08/25/20 18:14	09/01/20 17:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*60 - 120*	*08/25/20 18:14*	*09/01/20 17:47*	*1*
Trifluorotoluene (Surr)	*146*	*X*	*60 - 120*	*08/25/20 18:14*	*09/01/20 17:47*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		55	6.9	ug/Kg	☼	08/31/20 07:48	09/02/20 01:24	10
Acenaphthylene	ND		55	7.3	ug/Kg	☼	08/31/20 07:48	09/02/20 01:24	10
Anthracene	ND		55	7.4	ug/Kg	☼	08/31/20 07:48	09/02/20 01:24	10

Client Sample ID: 20BET-Sub-03

Date Collected: 08/19/20 11:00
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-58

Matrix: Solid
Percent Solids: 82.9

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	ND		55	7.8	ug/Kg	☼	08/31/20 07:48	09/02/20 01:24	10
Benzo[a]pyrene	ND		55	7.7	ug/Kg	☼	08/31/20 07:48	09/02/20 01:24	10
Benzo[b]fluoranthene	ND		55	8.5	ug/Kg	☼	08/31/20 07:48	09/02/20 01:24	10
Benzo[g,h,i]perylene	ND		55	7.9	ug/Kg	☼	08/31/20 07:48	09/02/20 01:24	10
Benzo[k]fluoranthene	ND		55	7.9	ug/Kg	☼	08/31/20 07:48	09/02/20 01:24	10
Chrysene	ND		55	7.9	ug/Kg	☼	08/31/20 07:48	09/02/20 01:24	10
Dibenz(a,h)anthracene	ND		55	8.5	ug/Kg	☼	08/31/20 07:48	09/02/20 01:24	10
Fluoranthene	ND		55	8.9	ug/Kg	☼	08/31/20 07:48	09/02/20 01:24	10
Fluorene	ND		55	7.1	ug/Kg	☼	08/31/20 07:48	09/02/20 01:24	10
Indeno[1,2,3-cd]pyrene	ND		55	8.5	ug/Kg	☼	08/31/20 07:48	09/02/20 01:24	10
Naphthalene	**40**	**J**	55	7.4	ug/Kg	☼	08/31/20 07:48	09/02/20 01:24	10
Phenanthrene	**11**	**J**	55	7.9	ug/Kg	☼	08/31/20 07:48	09/02/20 01:24	10
Pyrene	ND		55	8.3	ug/Kg	☼	08/31/20 07:48	09/02/20 01:24	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*0*	*X*	*49 - 114*	*08/31/20 07:48*	*09/02/20 01:24*	*10*
Terphenyl-d14	*82*		*53 - 121*	*08/31/20 07:48*	*09/02/20 01:24*	*10*
2-Fluorobiphenyl (Surr)	*78*		*43 - 109*	*08/31/20 07:48*	*09/02/20 01:24*	*10*
2-methylnaphthalene-d10	*133*		*50 - 150*	*08/31/20 07:48*	*09/02/20 01:24*	*10*
Fluoranthene-d10 (Surr)	*83*		*50 - 150*	*08/31/20 07:48*	*09/02/20 01:24*	*10*

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**270**	*****	12	3.0	mg/Kg	☼	09/01/20 07:19	09/09/20 05:44	5
RRO (nC25-nC36)	**280**		120	23	mg/Kg	☼	09/01/20 07:19	09/09/20 05:44	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*64*		*60 - 120*	*09/01/20 07:19*	*09/09/20 05:44*	*5*
n-Triacontane-d62	*82*		*60 - 120*	*09/01/20 07:19*	*09/09/20 05:44*	*5*

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**310**	**H B**	12	3.0	mg/Kg	☼	09/09/20 09:17	09/14/20 21:43	5
RRO (nC25-nC36)	**380**	**H**	120	23	mg/Kg	☼	09/09/20 09:17	09/14/20 21:43	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*87*		*60 - 120*	*09/09/20 09:17*	*09/14/20 21:43*	*5*
n-Triacontane-d62	*95*		*60 - 120*	*09/09/20 09:17*	*09/14/20 21:43*	*5*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**2.6**		0.22	0.032	ug/Kg	☼	09/02/20 20:39	09/04/20 17:43	1
Perfluorooctanoic acid (PFOA)	**0.64**		0.22	0.096	ug/Kg	☼	09/02/20 20:39	09/04/20 17:43	1
Perfluorononanoic acid (PFNA)	**0.11**	**J**	0.22	0.040	ug/Kg	☼	09/02/20 20:39	09/04/20 17:43	1
Perfluorodecanoic acid (PFDA)	**0.097**	**J**	0.22	0.025	ug/Kg	☼	09/02/20 20:39	09/04/20 17:43	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.040	ug/Kg	☼	09/02/20 20:39	09/04/20 17:43	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.075	ug/Kg	☼	09/02/20 20:39	09/04/20 17:43	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.057	ug/Kg	☼	09/02/20 20:39	09/04/20 17:43	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.060	ug/Kg	☼	09/02/20 20:39	09/04/20 17:43	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.028	ug/Kg	☼	09/02/20 20:39	09/04/20 17:43	1

Client Sample ID: 20BET-Sub-03

Lab Sample ID: 320-63955-58
Date Collected: 08/19/20 11:00
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 82.9

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	**0.91**	**I**	0.22	0.035	ug/Kg	☼	09/02/20 20:39	09/04/20 17:43	1
Perfluorooctanesulfonic acid (PFOS)	**1.3**		0.56	0.22	ug/Kg	☼	09/02/20 20:39	09/04/20 17:43	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	09/02/20 20:39	09/04/20 17:43	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	09/02/20 20:39	09/04/20 17:43	1
F-53B Major	ND		0.22	0.030	ug/Kg	☼	09/02/20 20:39	09/04/20 17:43	1
HFPO-DA (GenX)	ND		0.28	0.12	ug/Kg	☼	09/02/20 20:39	09/04/20 17:43	1
F-53B Minor	ND		0.22	0.025	ug/Kg	☼	09/02/20 20:39	09/04/20 17:43	1
DONA	ND		0.22	0.020	ug/Kg	☼	09/02/20 20:39	09/04/20 17:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDA	*81*		*50 - 150*	*09/02/20 20:39*	*09/04/20 17:43*	*1*
13C4 PFOS	*164*	**5*	*50 - 150*	*09/02/20 20:39*	*09/04/20 17:43*	*1*
d3-NMeFOSAA	*89*		*50 - 150*	*09/02/20 20:39*	*09/04/20 17:43*	*1*
d5-NEtFOSAA	*94*		*50 - 150*	*09/02/20 20:39*	*09/04/20 17:43*	*1*
13C3 HFPO-DA	*152*	**5*	*50 - 150*	*09/02/20 20:39*	*09/04/20 17:43*	*1*
18O2 PFHxS	*185*	**5*	*50 - 150*	*09/02/20 20:39*	*09/04/20 17:43*	*1*
13C3 PFBS	*174*	**5*	*50 - 150*	*09/02/20 20:39*	*09/04/20 17:43*	*1*
13C2 PFDoA	*145*		*50 - 150*	*09/02/20 20:39*	*09/04/20 17:43*	*1*
13C2 PFTeDA	*131*		*50 - 150*	*09/02/20 20:39*	*09/04/20 17:43*	*1*
13C5 PFNA	*154*	**5*	*50 - 150*	*09/02/20 20:39*	*09/04/20 17:43*	*1*
13C4 PFOA	*78*		*50 - 150*	*09/02/20 20:39*	*09/04/20 17:43*	*1*
13C2 PFUnA	*150*		*50 - 150*	*09/02/20 20:39*	*09/04/20 17:43*	*1*
13C4 PFHpA	*176*	**5*	*50 - 150*	*09/02/20 20:39*	*09/04/20 17:43*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**44**		2.2	0.47	ug/Kg	☼	09/02/20 20:39	09/08/20 10:53	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*103*		*50 - 150*	*09/02/20 20:39*	*09/08/20 10:53*	*10*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**17.1**		0.1	0.1	%			08/27/20 13:55	1
Percent Solids	**82.9**		0.1	0.1	%			08/27/20 13:55	1

Client Sample ID: Field Blank

Lab Sample ID: 320-63955-59
Date Collected: 08/19/20 11:10
Matrix: Water
Date Received: 08/25/20 09:50

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		1.7	0.50	ng/L		08/27/20 04:51	08/27/20 16:46	1
Perfluoroheptanoic acid (PFHpA)	ND		1.7	0.22	ng/L		08/27/20 04:51	08/27/20 16:46	1
Perfluorooctanoic acid (PFOA)	ND		1.7	0.74	ng/L		08/27/20 04:51	08/27/20 16:46	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.23	ng/L		08/27/20 04:51	08/27/20 16:46	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.27	ng/L		08/27/20 04:51	08/27/20 16:46	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.95	ng/L		08/27/20 04:51	08/27/20 16:46	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.48	ng/L		08/27/20 04:51	08/27/20 16:46	1

Client Sample ID: Field Blank

Lab Sample ID: 320-63955-59

Date Collected: 08/19/20 11:10

Matrix: Water

Date Received: 08/25/20 09:50

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		08/27/20 04:51	08/27/20 16:46	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.25	ng/L		08/27/20 04:51	08/27/20 16:46	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.7	0.17	ng/L		08/27/20 04:51	08/27/20 16:46	1
Perfluorohexanesulfonic acid (PFHxS)	**0.35**	**J B**	1.7	0.15	ng/L		08/27/20 04:51	08/27/20 16:46	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.7	0.47	ng/L		08/27/20 04:51	08/27/20 16:46	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		17	1.6	ng/L		08/27/20 04:51	08/27/20 16:46	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		17	2.7	ng/L		08/27/20 04:51	08/27/20 16:46	1
HFPO-DA (GenX)	ND		3.5	1.3	ng/L		08/27/20 04:51	08/27/20 16:46	1
DONA	ND		1.7	0.16	ng/L		08/27/20 04:51	08/27/20 16:46	1
F-53B Major	ND		1.7	0.21	ng/L		08/27/20 04:51	08/27/20 16:46	1
F-53B Minor	ND		1.7	0.28	ng/L		08/27/20 04:51	08/27/20 16:46	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*89*		*50 - 150*	*08/27/20 04:51*	*08/27/20 16:46*	*1*
13C2 PFDA	*92*		*50 - 150*	*08/27/20 04:51*	*08/27/20 16:46*	*1*
d5-NEtFOSAA	*91*		*50 - 150*	*08/27/20 04:51*	*08/27/20 16:46*	*1*
13C3 HFPO-DA	*85*		*50 - 150*	*08/27/20 04:51*	*08/27/20 16:46*	*1*
18O2 PFHxS	*88*		*50 - 150*	*08/27/20 04:51*	*08/27/20 16:46*	*1*
13C3 PFBS	*91*		*50 - 150*	*08/27/20 04:51*	*08/27/20 16:46*	*1*
13C2 PFDoA	*94*		*50 - 150*	*08/27/20 04:51*	*08/27/20 16:46*	*1*
13C2 PFTeDA	*74*		*50 - 150*	*08/27/20 04:51*	*08/27/20 16:46*	*1*
13C5 PFNA	*99*		*50 - 150*	*08/27/20 04:51*	*08/27/20 16:46*	*1*
13C4 PFOA	*89*		*50 - 150*	*08/27/20 04:51*	*08/27/20 16:46*	*1*
13C2 PFUnA	*99*		*50 - 150*	*08/27/20 04:51*	*08/27/20 16:46*	*1*
13C4 PFHpA	*91*		*50 - 150*	*08/27/20 04:51*	*08/27/20 16:46*	*1*

Client Sample ID: Trip Blank

Lab Sample ID: 320-63955-60

Date Collected: 08/19/20 08:30

Matrix: Solid

Date Received: 08/25/20 09:50

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		50	5.9	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
1,1,1-Trichloroethane	ND		50	3.7	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
1,1,2,2-Tetrachloroethane	ND		50	3.2	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
1,1,2-Trichloroethane	ND		50	3.4	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
1,1-Dichloroethane	ND		50	2.7	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
1,1-Dichloroethene	ND		50	4.7	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
1,1-Dichloropropene	ND		50	4.3	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
1,2,3-Trichlorobenzene	ND		50	6.2	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
1,2,3-Trichloropropane	ND		50	4.7	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
1,2,4-Trichlorobenzene	ND		50	3.4	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
1,2,4-Trimethylbenzene	ND		50	3.5	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
1,2-Dibromo-3-Chloropropane	ND		100	6.3	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
1,2-Dibromoethane (EDB)	ND		50	5.4	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
1,2-Dichlorobenzene	ND		50	2.2	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
1,2-Dichloroethane	ND		50	4.7	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
1,2-Dichloropropane	ND		50	4.7	ug/Kg		08/25/20 18:14	09/01/20 13:16	1

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Client Sample ID: Trip Blank

Date Collected: 08/19/20 08:30
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-60

Matrix: Solid

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3,5-Trimethylbenzene	ND		50	3.5	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
1,3-Dichlorobenzene	ND		50	3.3	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
1,3-Dichloropropane	ND		50	2.3	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
1,4-Dichlorobenzene	ND		50	2.2	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
2,2-Dichloropropane	ND		50	4.3	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
2-Butanone (MEK)	**130**		100	26	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
2-Chlorotoluene	ND		50	3.6	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
4-Chlorotoluene	ND		50	2.8	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
4-Methyl-2-pentanone (MIBK)	ND		100	3.1	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Acetone	ND		500	50	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Benzene	ND		50	3.3	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Bromobenzene	ND		50	5.6	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Bromochloromethane	ND		50	7.3	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Bromodichloromethane	ND		50	5.0	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Bromoform	ND		50	11	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Bromomethane	ND		100	12	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Carbon disulfide	ND		100	3.5	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Carbon tetrachloride	ND		50	3.5	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Chlorobenzene	ND		50	4.4	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Chloroethane	ND		50	6.6	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Chloroform	ND		50	2.6	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Chloromethane	ND		50	2.5	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
cis-1,2-Dichloroethene	ND		50	8.2	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
cis-1,3-Dichloropropene	ND		50	4.1	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Dibromochloromethane	ND		50	3.3	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Dibromomethane	ND		50	6.5	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Dichlorodifluoromethane	ND		50	9.4	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Ethylbenzene	ND		50	6.6	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Hexachlorobutadiene	ND		50	5.1	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Isopropylbenzene	ND		50	3.5	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Methylene Chloride	ND		50	5.4	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
m-Xylene & p-Xylene	ND		50	5.0	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Naphthalene	ND		50	1.8	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
n-Butylbenzene	ND		50	3.1	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
N-Propylbenzene	ND		50	4.7	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
o-Xylene	ND		50	5.2	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
p-Isopropyltoluene	ND		50	1.6	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
sec-Butylbenzene	ND		50	2.4	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Styrene	ND		50	1.1	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
tert-Butylbenzene	ND		50	4.1	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Tetrachloroethene	ND		50	4.2	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Toluene	ND		50	4.5	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
trans-1,2-Dichloroethene	ND		50	6.2	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
trans-1,3-Dichloropropene	ND		50	2.8	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Trichloroethene	ND		50	5.5	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Trichlorofluoromethane	ND		50	12	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Vinyl acetate	ND		50	7.8	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Vinyl chloride	ND		50	4.3	ug/Kg		08/25/20 18:14	09/01/20 13:16	1
Xylenes, Total	ND		50	5.2	ug/Kg		08/25/20 18:14	09/01/20 13:16	1

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Client Sample ID: Trip Blank

Lab Sample ID: 320-63955-60

Date Collected: 08/19/20 08:30

Matrix: Solid

Date Received: 08/25/20 09:50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*52 - 126*	*08/25/20 18:14*	*09/01/20 13:16*	*1*
4-Bromofluorobenzene (Surr)	*99*		*67 - 135*	*08/25/20 18:14*	*09/01/20 13:16*	*1*
Dibromofluoromethane (Surr)	*88*		*61 - 123*	*08/25/20 18:14*	*09/01/20 13:16*	*1*
Toluene-d8 (Surr)	*99*		*65 - 131*	*08/25/20 18:14*	*09/01/20 13:16*	*1*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C10 AK	ND		5.0	1.0	mg/Kg		08/25/20 18:14	09/01/20 13:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*60 - 120*	*08/25/20 18:14*	*09/01/20 13:16*	*1*
Trifluorotoluene (Surr)	*162*	*X*	*60 - 120*	*08/25/20 18:14*	*09/01/20 13:16*	*1*

Surrogate Summary

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(52-126)	(67-135)	(61-123)	(65-131)
320-63955-20	20BET-SS-C5	81	103	87	102
320-63955-23	20BET-SS-C10	84	107	90	101
320-63955-27	20BET-SS-D4	83	103	90	100
320-63955-31	20BET-SS-D10	84	104	87	105
320-63955-55	20BET-Sub-01	86	93	89	110
320-63955-56	20BET-Sub-02	90	100	103	118
320-63955-57	20BET-Sub-20	89	104	91	112
320-63955-58	20BET-Sub-03	84	103	84	103
320-63955-60	Trip Blank	83	99	88	99
LCS 320-406586/2-A	Lab Control Sample	95	111	95	95
LCSD 320-406586/3-A	Lab Control Sample Dup	92	105	91	94
MB 320-406586/1-A	Method Blank	94	102	92	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		BFB	TFT
Lab Sample ID	Client Sample ID	(60-120)	(60-120)
320-63955-20	20BET-SS-C5	96	138 X
320-63955-23	20BET-SS-C10	101	145 X
320-63955-27	20BET-SS-D4	96	145 X
320-63955-31	20BET-SS-D10	97	125 X
320-63955-55	20BET-Sub-01	88	158 X
320-63955-56	20BET-Sub-02	94	148 X
320-63955-57	20BET-Sub-20	97	163 X
320-63955-58	20BET-Sub-03	96	146 X
320-63955-60	Trip Blank	93	162 X
LCS 320-406586/4-A	Lab Control Sample	97	97
LCSD 320-406586/5-A	Lab Control Sample Dup	99	111
MB 320-406586/1-A	Method Blank	96	111

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
TFT = Trifluorotoluene (Surr)

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)				
		NBZ	TPHL	FBP	2MN	FLN10
Lab Sample ID	Client Sample ID	(49-114)	(53-121)	(43-109)	(50-150)	(50-150)
320-63955-20	20BET-SS-C5	0 X	89	177 X	0 X	87
320-63955-23	20BET-SS-C10	0 X	84	150 X	0 X	83
320-63955-27	20BET-SS-D4	0 X	87	110 X	0 X	88

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)				
Lab Sample ID	Client Sample ID	NBZ (49-114)	TPHL (53-121)	FBP (43-109)	2MN (50-150)	FLN10 (50-150)
320-63955-31	20BET-SS-D10	0 X	90	107	0 X	89
320-63955-55	20BET-Sub-01	92	83	70	84	82
320-63955-56	20BET-Sub-02	0 X	78	74	93	79
320-63955-57	20BET-Sub-20	0 X	80	76	150	81
320-63955-58	20BET-Sub-03	0 X	82	78	133	83
LCS 320-408031/2-A	Lab Control Sample	85	90	80	84	87
MB 320-408031/1-A	Method Blank	89	94	83	88	90

Surrogate Legend

NBZ = Nitrobenzene-d5
TPHL = Terphenyl-d14
FBP = 2-Fluorobiphenyl (Surr)
2MN = 2-methylnaphthalene-d10
FLN10 = Fluoranthene-d10 (Surr)

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	OTPH (60-120)	NTC (60-120)
320-63955-20	20BET-SS-C5	85	102
320-63955-20 - RE	20BET-SS-C5	101	104
320-63955-23	20BET-SS-C10	82	98
320-63955-23 - RE	20BET-SS-C10	94	94
320-63955-27	20BET-SS-D4	80	100
320-63955-27 - RE	20BET-SS-D4	130 X	86
320-63955-31	20BET-SS-D10	64	88
320-63955-31 - RE	20BET-SS-D10	110	101
320-63955-55	20BET-Sub-01	65	85
320-63955-55 - RE	20BET-Sub-01	91	90
320-63955-56	20BET-Sub-02	60	78
320-63955-56 - RE	20BET-Sub-02	95	95
320-63955-57	20BET-Sub-20	65	84
320-63955-57 - RE	20BET-Sub-20	86	85
320-63955-58	20BET-Sub-03	64	82
320-63955-58 - RE	20BET-Sub-03	87	95
320-63955-58 MS	20BET-Sub-03	70	86
320-63955-58 MSD	20BET-Sub-03	72	86
LCS 320-408389/2-A	Lab Control Sample	74	82
LCS 320-410567/2-A	Lab Control Sample	107	96
LCSD 320-408389/3-A	Lab Control Sample Dup	69	77
LCSD 320-410567/3-A	Lab Control Sample Dup	99	87
MB 320-408389/1-A	Method Blank	69	82
MB 320-410567/1-A	Method Blank	120	114

Surrogate Legend

OTPH = o-Terphenyl (Surr)
NTC = n-Triacontane-d62

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Matrix: Solid

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFHxA (50-150)	PFDA (50-150)	PFOS (50-150)	d3NMFOSAA (50-150)	d5NEFOSAA (50-150)	HFPODA (50-150)	PFHxS (50-150)	C3PFBS (50-150)
320-63955-1	20BET-SS-A1	90	88	92	81	95	74	94	86
320-63955-2	20BET-SS-A2	95	94	109	41 *5	50	85	109	97
320-63955-2 - RE	20BET-SS-A2			113					
320-63955-3	20BET-SS-A3	94	91	103	53	59	82	104	94
320-63955-3 - RE	20BET-SS-A3			68					
320-63955-4	20BET-SS-A4	120	123	131	33 *5	41 *5	105	140	121
320-63955-4 - RE	20BET-SS-A4			209 *5					
320-63955-5	20BET-SS-A5		110	121	5 *5	6 *5	104	128	114
320-63955-5 - DL	20BET-SS-A5	106							
320-63955-5 - RE	20BET-SS-A5			156 *5					
320-63955-6	20BET-SS-A6	118	118	137	62	73	106	136	122
320-63955-6 - RE	20BET-SS-A6			138					
320-63955-7	20BET-SS-A7	87	92	115	69	85	77	109	99
320-63955-7 - RE	20BET-SS-A7			102					
320-63955-8	20BET-SS-A10		112	141	46 *5	50	115	145	132
320-63955-8 - DL	20BET-SS-A10	118							
320-63955-8 - RE	20BET-SS-A10			89					
320-63955-9	20BET-SS-B1	100	93	92	80	77	85	100	92
320-63955-9 - RE	20BET-SS-B1			92					
320-63955-10	20BET-SS-B2	103	98	99	62	64	85	98	91
320-63955-10 - RE	20BET-SS-B2			94					
320-63955-11	20BET-SS-B3	143	109	132	80	89	120	143	134
320-63955-11 - RE	20BET-SS-B3			177 *5					
320-63955-12	20BET-SS-B4		80	163 *5	78	98	136		150
320-63955-12 - DL	20BET-SS-B4	107		107				109	
320-63955-12 - RE	20BET-SS-B4			85					
320-63955-13	20BET-SS-B5		119	157 *5	85	101	130		144
320-63955-13 - DL	20BET-SS-B5	110						107	
320-63955-13 - RE	20BET-SS-B5			95					
320-63955-14	20BET-SS-B6	105	103	102	76	74	88	107	98
320-63955-14 - RE	20BET-SS-B6			75					
320-63955-15	20BET-SS-B7	104	93	127	77	92	92	131	114
320-63955-15 - RE	20BET-SS-B7			115					
320-63955-16	20BET-SS-C1	101	102	93	86	89	87	92	87
320-63955-16 - RE	20BET-SS-C1			64					
320-63955-17	20BET-SS-C2	127	69	116	119	130	104	121	112
320-63955-17 - RE	20BET-SS-C2			100					
320-63955-18	20BET-SS-C3	144	62	167 *5	132	154 *5	128	166 *5	146
320-63955-18 - RE	20BET-SS-C3			126					
320-63955-19	20BET-SS-C4	136	126	139	107	129	120	144	130
320-63955-19 - RE	20BET-SS-C4			90					
320-63955-20	20BET-SS-C5		50	178 *5	143	177 *5	148	181 *5	165 *5
320-63955-20 - DL	20BET-SS-C5	104							
320-63955-20 - RE	20BET-SS-C5			85					
320-63955-20 MS	20BET-SS-C5		45 *5	150	102	122	128	165 *5	145
320-63955-20 MS - DL	20BET-SS-C5	101							
320-63955-20 MS - RE	20BET-SS-C5			88					
320-63955-20 MSD	20BET-SS-C5		48 *5	172 *5	124	149	144	184 *5	168 *5
320-63955-20 MSD - DL	20BET-SS-C5	102							

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Matrix: Solid

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFHxA (50-150)	PFDA (50-150)	PFOS (50-150)	d3NMFOS (50-150)	d5NEFOS (50-150)	HFPODA (50-150)	PFHxS (50-150)	C3PFBS (50-150)
320-63955-20 MSD - RE	20BET-SS-C5			77					
320-63955-21	20BET-SS-C6	84	87	85	81	80	70	83	83
320-63955-21 MS	20BET-SS-C6	86	91	83	81	81	71	80	82
320-63955-21 MSD	20BET-SS-C6	75	73	71	69	71	63	67	71
320-63955-22	20BET-SS-C7	84	88	84	68	72	72	82	79
320-63955-23	20BET-SS-C10	104	63	89	77	86	85	102	105
320-63955-24	20BET-SS-D1	97	99	94	89	96	80	91	88
320-63955-25	20BET-SS-D2	129	122	128	62	62	112	129	124
320-63955-26	20BET-SS-D3	120	123	136	91	104	117	140	136
320-63955-27	20BET-SS-D4	107	54	126	85	101	100	121	112
320-63955-28	20BET-SS-D5	105	99	103	112	120	87	109	110
320-63955-29	20BET-SS-D6	87	90	81	85	82	72	79	75
320-63955-30	20BET-SS-D7	80	86	88	60	70	72	89	83
320-63955-31	20BET-SS-D10	126	58	135	91	116	115	137	132
320-63955-31 MS	20BET-SS-D10	122	60	137	97	113	117	145	131
320-63955-31 MSD	20BET-SS-D10	120	57	130	95	108	112	135	122
320-63955-32	20BET-SS-E1	88	91	83	78	76	76	82	84
320-63955-33	20BET-SS-E2	123	120	121	100	98	105	124	118
320-63955-34	20BET-SS-E3	124	123	114	117	141	106	124	122
320-63955-35	20BET-SS-E4	102	106	105	92	96	88	103	97
320-63955-36	20BET-SS-E5	82	88	82	91	82	72	81	78
320-63955-37	20BET-SS-E6	99	101	129	82	89	87	127	115
320-63955-38	20BET-SS-E7	91	96	90	80	77	78	91	85
320-63955-39	20BET-SS-F1	92	94	88	69	76	79	94	85
320-63955-40	20BET-SS-F2	89	90	89	83	86	77	89	81
320-63955-41	20BET-SS-F3	90	90	81	65	60	78	87	87
320-63955-41 MS	20BET-SS-F3	89	90	84	71	65	77	88	86
320-63955-41 MSD	20BET-SS-F3	87	81	77	55	47 *5	72	86	83
320-63955-42	20BET-SS-F4	86	83	80	79	70	72	87	85
320-63955-43	20BET-SS-F5	85	87	77	77	70	75	86	80
320-63955-44	20BET-SS-F6	76	77	78	54	52	70	87	74
320-63955-45	20BET-SS-F7	85	77	90	67	57	76	106	86
320-63955-46	20BET-SS-F10	88	90	84	64	61	77	93	82
320-63955-47	20BET-SS-G1	85	92	77	63	62	74	84	80
320-63955-48	20BET-SS-G2	83	88	78	66	65	76	97	88
320-63955-49	20BET-SS-G3	92	91	86	77	74	78	91	86
320-63955-50	20BET-SS-G4	82	85	77	68	69	73	83	83
320-63955-51	20BET-SS-G5	76	71	69	69	70	65	74	72
320-63955-52	20BET-SS-G6	67	78	75	59	63	62	81	68
320-63955-53	20BET-SS-G7	100	85	94	66	55	87	118	108
320-63955-54	20BET-SS-G10	80	86	77	64	66	70	84	77
320-63955-55	20BET-Sub-01		135	140	97	95	122	146	136
320-63955-55 - DL	20BET-Sub-01	89							
320-63955-56	20BET-Sub-02		171 *5	176 *5	134	128	164 *5	206 *5	177 *5
320-63955-56 - DL	20BET-Sub-02	113							
320-63955-56 MS	20BET-Sub-02		147	152 *5	131	131	147	191 *5	166 *5
320-63955-56 MS - DL	20BET-Sub-02	118							
320-63955-56 MSD	20BET-Sub-02		140	145	120	118	130	158 *5	141
320-63955-56 MSD - DL	20BET-Sub-02	103							
320-63955-57	20BET-Sub-20		96	97	32 *5	33 *5	87	108	98

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Job ID: 320-63955-1
Project/Site: BET AFFF Site

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Matrix: Solid
Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFHxA (50-150)	PFDA (50-150)	PFOS (50-150)	d3NMFOS (50-150)	d5NEFOS (50-150)	HFPODA (50-150)	PFHxS (50-150)	C3PFBS (50-150)
320-63955-57 - DL	20BET-Sub-20	77							
320-63955-58	20BET-Sub-03		81	164 *5	89	94	152 *5	185 *5	174 *5
320-63955-58 - DL	20BET-Sub-03	103							
LCS 320-407012/2-A	Lab Control Sample	88	87	94	39 *5	42 *5	83	95	88
LCS 320-407018/2-A	Lab Control Sample	96	94	89	80	80	90	97	94
LCS 320-408023/2-A	Lab Control Sample			115					
LCS 320-408367/2-A	Lab Control Sample	81	90	93	76	80	79	89	89
LCS 320-408368/2-A	Lab Control Sample	82	91	84	75	74	73	88	83
LCS 320-409240/2-A	Lab Control Sample	80	75	74	68	66	71	78	79
LCS 320-409241/2-A	Lab Control Sample	79	77	79	73	70	73	84	81
MB 320-407012/1-A	Method Blank	90	90	93	43 *5	46 *5	84	96	89
MB 320-407018/1-A	Method Blank	86	80	81	55	55	81	87	84
MB 320-408023/1-A	Method Blank			99					
MB 320-408367/1-A	Method Blank	83	86	84	75	82	77	87	85
MB 320-408368/1-A	Method Blank	81	85	87	80	79	73	86	85
MB 320-409240/1-A	Method Blank	78	86	79	76	73	72	80	82
MB 320-409241/1-A	Method Blank	78	81	78	70	70	73	83	84

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFDoA (50-150)	PFTDA (50-150)	PFNA (50-150)	PFOA (50-150)	PFUnA (50-150)	C4PFHA (50-150)		
320-63955-1	20BET-SS-A1	91	89	97	84	93	98		
320-63955-2	20BET-SS-A2	105	95	106	88	106	112		
320-63955-2 - RE	20BET-SS-A2								
320-63955-3	20BET-SS-A3	97	93	104	90	101	103		
320-63955-3 - RE	20BET-SS-A3								
320-63955-4	20BET-SS-A4	137	127	140	85	134	142		
320-63955-4 - RE	20BET-SS-A4								
320-63955-5	20BET-SS-A5	118	107	131	85	124	127		
320-63955-5 - DL	20BET-SS-A5								
320-63955-5 - RE	20BET-SS-A5								
320-63955-6	20BET-SS-A6	130	125	139	92	132	137		
320-63955-6 - RE	20BET-SS-A6								
320-63955-7	20BET-SS-A7	102	100	97	78	102	100		
320-63955-7 - RE	20BET-SS-A7								
320-63955-8	20BET-SS-A10	142	127		90	139	147		
320-63955-8 - DL	20BET-SS-A10			125					
320-63955-8 - RE	20BET-SS-A10								
320-63955-9	20BET-SS-B1	92	96	105	89	90	101		
320-63955-9 - RE	20BET-SS-B1								
320-63955-10	20BET-SS-B2	100	104	106	92	103	104		
320-63955-10 - RE	20BET-SS-B2								
320-63955-11	20BET-SS-B3	129	138	150	86	133	145		
320-63955-11 - RE	20BET-SS-B3								
320-63955-12	20BET-SS-B4				83				
320-63955-12 - DL	20BET-SS-B4	103	102	110		104	112		
320-63955-12 - RE	20BET-SS-B4								
320-63955-13	20BET-SS-B5				83				
320-63955-13 - DL	20BET-SS-B5	103	105	104		107	109		
320-63955-13 - RE	20BET-SS-B5								
320-63955-14	20BET-SS-B6	101	102	109	92	102	106		

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Matrix: Solid

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFDoA (50-150)	PFTDA (50-150)	PFNA (50-150)	PFOA (50-150)	PFUnA (50-150)	C4PFHA (50-150)		
320-63955-14 - RE	20BET-SS-B6								
320-63955-15	20BET-SS-B7	95	71	110	84	91	104		
320-63955-15 - RE	20BET-SS-B7								
320-63955-16	20BET-SS-C1	106	92	110	89	105	98		
320-63955-16 - RE	20BET-SS-C1								
320-63955-17	20BET-SS-C2	130	128	134	87	135	128		
320-63955-17 - RE	20BET-SS-C2								
320-63955-18	20BET-SS-C3				88		170 *5		
320-63955-18 - RE	20BET-SS-C3	96	92	139		110			
320-63955-19	20BET-SS-C4	151 *5	131	148	89	141	150		
320-63955-19 - RE	20BET-SS-C4								
320-63955-20	20BET-SS-C5	189 *5	173 *5	172 *5	85	188 *5	186 *5		
320-63955-20 - DL	20BET-SS-C5								
320-63955-20 - RE	20BET-SS-C5								
320-63955-20 MS	20BET-SS-C5	157 *5	150	158 *5	84	160 *5	170 *5		
320-63955-20 MS - DL	20BET-SS-C5								
320-63955-20 MS - RE	20BET-SS-C5								
320-63955-20 MSD	20BET-SS-C5	163 *5	165 *5	174 *5	90	177 *5	181 *5		
320-63955-20 MSD - DL	20BET-SS-C5								
320-63955-20 MSD - RE	20BET-SS-C5								
320-63955-21	20BET-SS-C6	84	85	89	84	89	87		
320-63955-21 MS	20BET-SS-C6	85	84	88	84	84	84		
320-63955-21 MSD	20BET-SS-C6	69	69	77	72	70	76		
320-63955-22	20BET-SS-C7	81	86	91	85	82	89		
320-63955-23	20BET-SS-C10	86	84	105	78	90	106		
320-63955-24	20BET-SS-D1	93	97	105	84	100	101		
320-63955-25	20BET-SS-D2	119	115	135	81	127	146		
320-63955-26	20BET-SS-D3	149	144	137	85	145	159 *5		
320-63955-27	20BET-SS-D4	128	123	123	80	129	126		
320-63955-28	20BET-SS-D5	109	108	112	83	109	111		
320-63955-29	20BET-SS-D6	92	92	92	81	88	88		
320-63955-30	20BET-SS-D7	88	91	91	81	85	92		
320-63955-31	20BET-SS-D10	143	143	135	84	145	148		
320-63955-31 MS	20BET-SS-D10	147	148	142	87	149	148		
320-63955-31 MSD	20BET-SS-D10	131	132	130	82	137	141		
320-63955-32	20BET-SS-E1	86	93	94	83	87	91		
320-63955-33	20BET-SS-E2	118	121	131	84	117	127		
320-63955-34	20BET-SS-E3	133	134	127	81	133	135		
320-63955-35	20BET-SS-E4	107	103	112	86	104	110		
320-63955-36	20BET-SS-E5	86	91	89	81	90	88		
320-63955-37	20BET-SS-E6	106	101	111	82	103	120		
320-63955-38	20BET-SS-E7	90	79	102	87	97	94		
320-63955-39	20BET-SS-F1	98	97	100	85	94	96		
320-63955-40	20BET-SS-F2	93	88	100	84	87	97		
320-63955-41	20BET-SS-F3	80	74	95	79	83	89		
320-63955-41 MS	20BET-SS-F3	77	76	93	75	86	88		
320-63955-41 MSD	20BET-SS-F3	76	72	90	77	83	84		
320-63955-42	20BET-SS-F4	78	68	89	75	81	85		
320-63955-43	20BET-SS-F5	82	78	93	79	85	84		
320-63955-44	20BET-SS-F6	62	54	87	81	73	85		

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Matrix: Solid

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFDoA (50-150)	PFTDA (50-150)	PFNA (50-150)	PFOA (50-150)	PFUnA (50-150)	C4PFHA (50-150)		
320-63955-45	20BET-SS-F7	63	60	90	76	69	85		
320-63955-46	20BET-SS-F10	78	70	92	84	76	92		
320-63955-47	20BET-SS-G1	82	73	83	83	79	83		
320-63955-48	20BET-SS-G2	75	76	81	76	82	92		
320-63955-49	20BET-SS-G3	83	80	96	84	83	92		
320-63955-50	20BET-SS-G4	81	77	91	72	85	83		
320-63955-51	20BET-SS-G5	67	67	72	67	70	73		
320-63955-52	20BET-SS-G6	73	69	73	73	70	72		
320-63955-53	20BET-SS-G7	67	65	88	82	71	97		
320-63955-54	20BET-SS-G10	80	71	86	72	84	81		
320-63955-55	20BET-Sub-01	133	127	149	73	141	138		
320-63955-55 - DL	20BET-Sub-01								
320-63955-56	20BET-Sub-02	152 *5	133	181 *5	68	177 *5	182 *5		
320-63955-56 - DL	20BET-Sub-02								
320-63955-56 MS	20BET-Sub-02	150	139	163 *5	70	150	170 *5		
320-63955-56 MS - DL	20BET-Sub-02								
320-63955-56 MSD	20BET-Sub-02	148	135	145	71	156 *5	147		
320-63955-56 MSD - DL	20BET-Sub-02								
320-63955-57	20BET-Sub-20	89	81	104	60	96	100		
320-63955-57 - DL	20BET-Sub-20								
320-63955-58	20BET-Sub-03	145	131	154 *5	78	150	176 *5		
320-63955-58 - DL	20BET-Sub-03								
LCS 320-407012/2-A	Lab Control Sample	91	93	93	91	88	92		
LCS 320-407018/2-A	Lab Control Sample	93	107	101	93	95	93		
LCS 320-408023/2-A	Lab Control Sample								
LCS 320-408367/2-A	Lab Control Sample	90	87	89	88	86	86		
LCS 320-408368/2-A	Lab Control Sample	90	82	90	83	80	86		
LCS 320-409240/2-A	Lab Control Sample	70	72	83	77	75	77		
LCS 320-409241/2-A	Lab Control Sample	76	80	84	80	76	80		
MB 320-407012/1-A	Method Blank	93	87	94	93	91	92		
MB 320-407018/1-A	Method Blank	83	87	90	85	83	81		
MB 320-408023/1-A	Method Blank								
MB 320-408367/1-A	Method Blank	79	85	87	83	82	85		
MB 320-408368/1-A	Method Blank	79	80	87	83	84	83		
MB 320-409240/1-A	Method Blank	74	75	85	82	79	80		
MB 320-409241/1-A	Method Blank	76	79	83	79	77	79		

Surrogate Legend

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA
PFOS = 13C4 PFOS
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA
HFPODA = 13C3 HFPO-DA
PFHxS = 18O2 PFHxS
C3PFBS = 13C3 PFBS
PFDoA = 13C2 PFDoA
PFTDA = 13C2 PFTeDA
PFNA = 13C5 PFNA
PFOA = 13C4 PFOA

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

PFUnA = 13C2 PFUnA
C4PFHA = 13C4 PFHpA

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFHxA (50-150)	PFDA (50-150)	d5NEFOS (50-150)	HFPODA (50-150)	PFHxS (50-150)	C3PFBS (50-150)	PFDoA (50-150)	PFTDA (50-150)
320-63955-59	Field Blank	89	92	91	85	88	91	94	74
LCS 320-407019/2-A	Lab Control Sample	84	85	89	81	84	86	78	74
MB 320-407019/1-A	Method Blank	94	95	97	88	96	95	106	79

		Percent Isotope Dilution Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	PFNA (50-150)	PFOA (50-150)	PFUnA (50-150)	C4PFHA (50-150)
320-63955-59	Field Blank	99	89	99	91
LCS 320-407019/2-A	Lab Control Sample	91	80	94	84
MB 320-407019/1-A	Method Blank	100	91	97	96

Surrogate Legend

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA
d5NEFOS = d5-NEtFOSAA
HFPODA = 13C3 HFPO-DA
PFHxS = 18O2 PFHxS
C3PFBS = 13C3 PFBS
PFDoA = 13C2 PFDoA
PFTDA = 13C2 PFTeDA
PFNA = 13C5 PFNA
PFOA = 13C4 PFOA
PFUnA = 13C2 PFUnA
C4PFHA = 13C4 PFHpA

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 320-406586/1-A
Matrix: Solid
Analysis Batch: 410964

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 406586

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		50	5.9	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,1,1-Trichloroethane	ND		50	3.7	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,1,2,2-Tetrachloroethane	ND		50	3.2	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,1,2-Trichloroethane	ND		50	3.4	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,1-Dichloroethane	ND		50	2.7	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,1-Dichloroethene	ND		50	4.7	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,1-Dichloropropene	ND		50	4.3	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,2,3-Trichlorobenzene	ND		50	6.2	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,2,3-Trichloropropane	ND		50	4.7	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,2,4-Trichlorobenzene	ND		50	3.4	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,2,4-Trimethylbenzene	ND		50	3.5	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,2-Dibromo-3-Chloropropane	ND		100	6.3	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,2-Dibromoethane (EDB)	ND		50	5.4	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,2-Dichlorobenzene	ND		50	2.2	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,2-Dichloroethane	ND		50	4.7	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,2-Dichloropropane	ND		50	4.7	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,3,5-Trimethylbenzene	ND		50	3.5	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,3-Dichlorobenzene	ND		50	3.3	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,3-Dichloropropane	ND		50	2.3	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
1,4-Dichlorobenzene	ND		50	2.2	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
2,2-Dichloropropane	ND		50	4.3	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
2-Butanone (MEK)	ND		100	26	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
2-Chlorotoluene	ND		50	3.6	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
4-Chlorotoluene	ND		50	2.8	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
4-Methyl-2-pentanone (MIBK)	ND		100	3.1	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Acetone	ND		500	50	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Benzene	ND		50	3.3	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Bromobenzene	ND		50	5.6	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Bromochloromethane	ND		50	7.3	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Bromodichloromethane	ND		50	5.0	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Bromoform	ND		50	11	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Bromomethane	ND		100	12	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Carbon disulfide	ND		100	3.5	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Carbon tetrachloride	ND		50	3.5	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Chlorobenzene	ND		50	4.4	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Chloroethane	ND		50	6.6	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Chloroform	ND		50	2.6	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Chloromethane	ND		50	2.5	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
cis-1,2-Dichloroethene	ND		50	8.2	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
cis-1,3-Dichloropropene	ND		50	4.1	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Dibromochloromethane	ND		50	3.3	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Dibromomethane	ND		50	6.5	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Dichlorodifluoromethane	ND		50	9.4	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Ethylbenzene	ND		50	6.6	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Hexachlorobutadiene	ND		50	5.1	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Isopropylbenzene	ND		50	3.5	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Methylene Chloride	ND		50	5.4	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
m-Xylene & p-Xylene	ND		50	5.0	ug/Kg		08/25/20 18:14	09/10/20 12:34	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 320-406586/1-A
Matrix: Solid
Analysis Batch: 410964

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 406586

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		50	1.8	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
n-Butylbenzene	ND		50	3.1	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
N-Propylbenzene	ND		50	4.7	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
o-Xylene	ND		50	5.2	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
p-Isopropyltoluene	ND		50	1.6	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
sec-Butylbenzene	ND		50	2.4	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Styrene	ND		50	1.1	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
tert-Butylbenzene	ND		50	4.1	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Tetrachloroethene	ND		50	4.2	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Toluene	ND		50	4.5	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
trans-1,2-Dichloroethene	ND		50	6.2	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
trans-1,3-Dichloropropene	ND		50	2.8	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Trichloroethene	ND		50	5.5	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Trichlorofluoromethane	ND		50	12	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Vinyl acetate	ND		50	7.8	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Vinyl chloride	ND		50	4.3	ug/Kg		08/25/20 18:14	09/10/20 12:34	1
Xylenes, Total	ND		50	5.2	ug/Kg		08/25/20 18:14	09/10/20 12:34	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*52 - 126*	*08/25/20 18:14*	*09/10/20 12:34*	*1*
4-Bromofluorobenzene (Surr)	*102*		*67 - 135*	*08/25/20 18:14*	*09/10/20 12:34*	*1*
Dibromofluoromethane (Surr)	*92*		*61 - 123*	*08/25/20 18:14*	*09/10/20 12:34*	*1*
Toluene-d8 (Surr)	*91*		*65 - 131*	*08/25/20 18:14*	*09/10/20 12:34*	*1*

Lab Sample ID: LCS 320-406586/2-A
Matrix: Solid
Analysis Batch: 410964

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 406586

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1,2-Tetrachloroethane	1000	966		ug/Kg		97	72 - 120
1,1,1-Trichloroethane	1000	939		ug/Kg		94	67 - 120
1,1,2,2-Tetrachloroethane	1000	976		ug/Kg		98	54 - 131
1,1,2-Trichloroethane	1000	991		ug/Kg		99	74 - 120
1,1-Dichloroethane	1000	945		ug/Kg		95	70 - 120
1,1-Dichloroethene	1000	994		ug/Kg		99	59 - 120
1,1-Dichloropropene	1000	994		ug/Kg		99	71 - 126
1,2,3-Trichlorobenzene	1000	994		ug/Kg		99	35 - 169
1,2,3-Trichloropropane	1000	988		ug/Kg		99	62 - 120
1,2,4-Trichlorobenzene	1000	979		ug/Kg		98	53 - 141
1,2,4-Trimethylbenzene	1000	1060		ug/Kg		106	78 - 120
1,2-Dibromo-3-Chloropropane	1000	884		ug/Kg		88	46 - 120
1,2-Dibromoethane (EDB)	1000	1040		ug/Kg		104	74 - 120
1,2-Dichlorobenzene	1000	999		ug/Kg		100	74 - 120
1,2-Dichloroethane	1000	977		ug/Kg		98	62 - 122
1,2-Dichloropropane	1000	997		ug/Kg		100	77 - 120
1,3,5-Trimethylbenzene	1000	1060		ug/Kg		106	80 - 121
1,3-Dichlorobenzene	1000	1040		ug/Kg		104	78 - 120
1,3-Dichloropropane	1000	1050		ug/Kg		105	76 - 120

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 320-406586/2-A
Matrix: Solid
Analysis Batch: 410964

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 406586

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dichlorobenzene	1000	1020		ug/Kg		102	75 - 120
2,2-Dichloropropane	1000	876		ug/Kg		88	50 - 120
2-Butanone (MEK)	1000	973		ug/Kg		97	41 - 121
2-Chlorotoluene	1000	1060		ug/Kg		106	77 - 122
4-Chlorotoluene	1000	1070		ug/Kg		107	79 - 124
4-Methyl-2-pentanone (MIBK)	1000	922		ug/Kg		92	56 - 120
Acetone	1000	736		ug/Kg		74	17 - 154
Benzene	1000	1010		ug/Kg		101	76 - 120
Bromobenzene	1000	1060		ug/Kg		106	77 - 120
Bromochloromethane	1000	908		ug/Kg		91	71 - 120
Bromodichloromethane	1000	982		ug/Kg		98	69 - 120
Bromoform	1000	982		ug/Kg		98	59 - 120
Bromomethane	1000	971		ug/Kg		97	14 - 120
Carbon disulfide	1000	959		ug/Kg		96	42 - 120
Carbon tetrachloride	1000	941		ug/Kg		94	61 - 125
Chlorobenzene	1000	1020		ug/Kg		102	78 - 120
Chloroethane	1000	1010		ug/Kg		101	11 - 120
Chloroform	1000	981		ug/Kg		98	67 - 120
Chloromethane	1000	750		ug/Kg		75	45 - 120
cis-1,2-Dichloroethene	1000	955		ug/Kg		96	73 - 120
cis-1,3-Dichloropropene	1000	997		ug/Kg		100	74 - 124
Dibromochloromethane	1000	974		ug/Kg		97	69 - 120
Dibromomethane	1000	962		ug/Kg		96	70 - 120
Dichlorodifluoromethane	1000	792		ug/Kg		79	11 - 120
Ethylbenzene	1000	1030		ug/Kg		103	80 - 122
Hexachlorobutadiene	1000	1060		ug/Kg		106	61 - 136
Isopropylbenzene	1000	1020		ug/Kg		102	80 - 122
Methylene Chloride	1000	952		ug/Kg		95	62 - 120
m-Xylene & p-Xylene	1000	1030		ug/Kg		103	80 - 123
Naphthalene	1000	908		ug/Kg		91	50 - 138
n-Butylbenzene	1000	1070		ug/Kg		107	76 - 127
N-Propylbenzene	1000	1090		ug/Kg		109	80 - 121
o-Xylene	1000	1010		ug/Kg		101	80 - 120
p-Isopropyltoluene	1000	1060		ug/Kg		106	80 - 122
sec-Butylbenzene	1000	1090		ug/Kg		109	80 - 121
Styrene	1000	999		ug/Kg		100	79 - 120
tert-Butylbenzene	1000	1070		ug/Kg		107	80 - 122
Tetrachloroethene	1000	1060		ug/Kg		106	78 - 121
Toluene	1000	989		ug/Kg		99	78 - 125
trans-1,2-Dichloroethene	1000	919		ug/Kg		92	67 - 120
trans-1,3-Dichloropropene	1000	997		ug/Kg		100	70 - 127
Trichloroethene	1000	1040		ug/Kg		104	68 - 120
Trichlorofluoromethane	1000	1100		ug/Kg		110	12 - 144
Vinyl acetate	1000	946		ug/Kg		95	47 - 120
Vinyl chloride	1000	835		ug/Kg		83	53 - 120
Xylenes, Total	2000	2040		ug/Kg		102	70 - 130

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 320-406586/2-A
Matrix: Solid
Analysis Batch: 410964

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 406586

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	95		52 - 126
4-Bromofluorobenzene (Surr)	111		67 - 135
Dibromofluoromethane (Surr)	95		61 - 123
Toluene-d8 (Surr)	95		65 - 131

Lab Sample ID: LCSD 320-406586/3-A
Matrix: Solid
Analysis Batch: 410964

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 406586

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1,2-Tetrachloroethane			1000	940		ug/Kg		94	72 - 120	3	25
1,1,1-Trichloroethane			1000	948		ug/Kg		95	67 - 120	1	30
1,1,2,2-Tetrachloroethane			1000	973		ug/Kg		97	54 - 131	0	34
1,1,2-Trichloroethane			1000	988		ug/Kg		99	74 - 120	0	26
1,1-Dichloroethane			1000	963		ug/Kg		96	70 - 120	2	26
1,1-Dichloroethene			1000	986		ug/Kg		99	59 - 120	1	30
1,1-Dichloropropene			1000	1000		ug/Kg		100	71 - 126	1	27
1,2,3-Trichlorobenzene			1000	984		ug/Kg		98	35 - 169	1	65
1,2,3-Trichloropropane			1000	976		ug/Kg		98	62 - 120	1	30
1,2,4-Trichlorobenzene			1000	981		ug/Kg		98	53 - 141	0	42
1,2,4-Trimethylbenzene			1000	1060		ug/Kg		106	78 - 120	1	25
1,2-Dibromo-3-Chloropropane			1000	882		ug/Kg		88	46 - 120	0	46
1,2-Dibromoethane (EDB)			1000	1030		ug/Kg		103	74 - 120	0	25
1,2-Dichlorobenzene			1000	992		ug/Kg		99	74 - 120	1	25
1,2-Dichloroethane			1000	991		ug/Kg		99	62 - 122	1	33
1,2-Dichloropropane			1000	1020		ug/Kg		102	77 - 120	3	25
1,3,5-Trimethylbenzene			1000	1050		ug/Kg		105	80 - 121	1	25
1,3-Dichlorobenzene			1000	1030		ug/Kg		103	78 - 120	0	25
1,3-Dichloropropane			1000	1070		ug/Kg		107	76 - 120	2	25
1,4-Dichlorobenzene			1000	1010		ug/Kg		101	75 - 120	1	25
2,2-Dichloropropane			1000	835		ug/Kg		84	50 - 120	5	35
2-Butanone (MEK)			1000	928		ug/Kg		93	41 - 121	5	47
2-Chlorotoluene			1000	1050		ug/Kg		105	77 - 122	1	25
4-Chlorotoluene			1000	1070		ug/Kg		107	79 - 124	1	25
4-Methyl-2-pentanone (MIBK)			1000	949		ug/Kg		95	56 - 120	3	33
Acetone			1000	723		ug/Kg		72	17 - 154	2	77
Benzene			1000	1020		ug/Kg		102	76 - 120	1	25
Bromobenzene			1000	1050		ug/Kg		105	77 - 120	0	25
Bromochloromethane			1000	907		ug/Kg		91	71 - 120	0	25
Bromodichloromethane			1000	990		ug/Kg		99	69 - 120	1	29
Bromoform			1000	969		ug/Kg		97	59 - 120	1	25
Bromomethane			1000	985		ug/Kg		98	14 - 120	1	67
Carbon disulfide			1000	936		ug/Kg		94	42 - 120	2	44
Carbon tetrachloride			1000	937		ug/Kg		94	61 - 125	0	34
Chlorobenzene			1000	1000		ug/Kg		100	78 - 120	2	25
Chloroethane			1000	1070		ug/Kg		107	11 - 120	6	91
Chloroform			1000	972		ug/Kg		97	67 - 120	1	29
Chloromethane			1000	780		ug/Kg		78	45 - 120	4	43

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 320-406586/3-A
Matrix: Solid
Analysis Batch: 410964

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 406586

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	1000	965		ug/Kg		97	73 - 120	1	25
cis-1,3-Dichloropropene	1000	1020		ug/Kg		102	74 - 124	3	26
Dibromochloromethane	1000	985		ug/Kg		99	69 - 120	1	25
Dibromomethane	1000	981		ug/Kg		98	70 - 120	2	26
Dichlorodifluoromethane	1000	785		ug/Kg		78	11 - 120	1	75
Ethylbenzene	1000	1020		ug/Kg		102	80 - 122	1	25
Hexachlorobutadiene	1000	1030		ug/Kg		103	61 - 136	2	35
Isopropylbenzene	1000	989		ug/Kg		99	80 - 122	3	25
Methylene Chloride	1000	951		ug/Kg		95	62 - 120	0	28
m-Xylene & p-Xylene	1000	1030		ug/Kg		103	80 - 123	0	25
Naphthalene	1000	910		ug/Kg		91	50 - 138	0	48
n-Butylbenzene	1000	1040		ug/Kg		104	76 - 127	2	28
N-Propylbenzene	1000	1080		ug/Kg		108	80 - 121	1	25
o-Xylene	1000	992		ug/Kg		99	80 - 120	1	25
p-Isopropyltoluene	1000	1030		ug/Kg		103	80 - 122	3	25
sec-Butylbenzene	1000	1070		ug/Kg		107	80 - 121	2	25
Styrene	1000	1000		ug/Kg		100	79 - 120	0	25
tert-Butylbenzene	1000	1060		ug/Kg		106	80 - 122	1	25
Tetrachloroethene	1000	1070		ug/Kg		107	78 - 121	1	25
Toluene	1000	1010		ug/Kg		101	78 - 125	2	25
trans-1,2-Dichloroethene	1000	928		ug/Kg		93	67 - 120	1	25
trans-1,3-Dichloropropene	1000	1010		ug/Kg		101	70 - 127	1	31
Trichloroethene	1000	1050		ug/Kg		105	68 - 120	1	25
Trichlorofluoromethane	1000	1110		ug/Kg		111	12 - 144	1	107
Vinyl acetate	1000	957		ug/Kg		96	47 - 120	1	38
Vinyl chloride	1000	845		ug/Kg		84	53 - 120	1	34
Xylenes, Total	2000	2020		ug/Kg		101	70 - 130	1	15

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*52 - 126*
4-Bromofluorobenzene (Surr)	*105*		*67 - 135*
Dibromofluoromethane (Surr)	*91*		*61 - 123*
Toluene-d8 (Surr)	*94*		*65 - 131*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Lab Sample ID: MB 320-406586/1-A
Matrix: Solid
Analysis Batch: 411306

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 406586

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C10 AK	ND		5.0	1.0	mg/Kg		08/25/20 18:14	08/26/20 12:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*60 - 120*	*08/25/20 18:14*	*08/26/20 12:38*	*1*
Trifluorotoluene (Surr)	*111*		*60 - 120*	*08/25/20 18:14*	*08/26/20 12:38*	*1*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS) (Continued)

Lab Sample ID: LCS 320-406586/4-A
Matrix: Solid
Analysis Batch: 411306

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 406586

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
C6-C10 AK			50.0	51.9		mg/Kg		104	60 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*97*		*60 - 120*
Trifluorotoluene (Surr)	*97*		*60 - 120*

Lab Sample ID: LCSD 320-406586/5-A
Matrix: Solid
Analysis Batch: 411306

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 406586

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
C6-C10 AK			50.0	51.1		mg/Kg		102	60 - 120	2	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*99*		*60 - 120*
Trifluorotoluene (Surr)	*111*		*60 - 120*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 320-408031/1-A
Matrix: Solid
Analysis Batch: 408410

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 408031

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		5.0	0.63	ug/Kg		08/31/20 07:48	09/01/20 10:02	1
Acenaphthylene	ND		5.0	0.66	ug/Kg		08/31/20 07:48	09/01/20 10:02	1
Anthracene	ND		5.0	0.67	ug/Kg		08/31/20 07:48	09/01/20 10:02	1
Benzo[a]anthracene	ND		5.0	0.71	ug/Kg		08/31/20 07:48	09/01/20 10:02	1
Benzo[a]pyrene	ND		5.0	0.70	ug/Kg		08/31/20 07:48	09/01/20 10:02	1
Benzo[b]fluoranthene	ND		5.0	0.77	ug/Kg		08/31/20 07:48	09/01/20 10:02	1
Benzo[g,h,i]perylene	ND		5.0	0.72	ug/Kg		08/31/20 07:48	09/01/20 10:02	1
Benzo[k]fluoranthene	ND		5.0	0.72	ug/Kg		08/31/20 07:48	09/01/20 10:02	1
Chrysene	ND		5.0	0.72	ug/Kg		08/31/20 07:48	09/01/20 10:02	1
Dibenz(a,h)anthracene	ND		5.0	0.77	ug/Kg		08/31/20 07:48	09/01/20 10:02	1
Fluoranthene	ND		5.0	0.81	ug/Kg		08/31/20 07:48	09/01/20 10:02	1
Fluorene	ND		5.0	0.64	ug/Kg		08/31/20 07:48	09/01/20 10:02	1
Indeno[1,2,3-cd]pyrene	ND		5.0	0.77	ug/Kg		08/31/20 07:48	09/01/20 10:02	1
Naphthalene	ND		5.0	0.67	ug/Kg		08/31/20 07:48	09/01/20 10:02	1
Phenanthrene	ND		5.0	0.72	ug/Kg		08/31/20 07:48	09/01/20 10:02	1
Pyrene	ND		5.0	0.75	ug/Kg		08/31/20 07:48	09/01/20 10:02	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*89*		*49 - 114*	*08/31/20 07:48*	*09/01/20 10:02*	*1*
Terphenyl-d14	*94*		*53 - 121*	*08/31/20 07:48*	*09/01/20 10:02*	*1*
2-Fluorobiphenyl (Surr)	*83*		*43 - 109*	*08/31/20 07:48*	*09/01/20 10:02*	*1*
2-methylnaphthalene-d10	*88*		*50 - 150*	*08/31/20 07:48*	*09/01/20 10:02*	*1*
Fluoranthene-d10 (Surr)	*90*		*50 - 150*	*08/31/20 07:48*	*09/01/20 10:02*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 320-408031/2-A
Matrix: Solid
Analysis Batch: 408410

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 408031

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene	25.0	19.0		ug/Kg		76	54 - 97
Acenaphthylene	25.0	18.5		ug/Kg		74	52 - 99
Anthracene	25.0	18.9		ug/Kg		75	52 - 102
Benzo[a]anthracene	25.0	20.8		ug/Kg		83	55 - 109
Benzo[a]pyrene	25.0	19.7		ug/Kg		79	54 - 110
Benzo[b]fluoranthene	25.0	20.9		ug/Kg		84	52 - 112
Benzo[g,h,i]perylene	25.0	21.7		ug/Kg		87	51 - 119
Benzo[k]fluoranthene	25.0	20.2		ug/Kg		81	56 - 106
Chrysene	25.0	20.5		ug/Kg		82	54 - 110
Dibenz(a,h)anthracene	25.0	19.5		ug/Kg		78	55 - 119
Fluoranthene	25.0	19.9		ug/Kg		80	53 - 110
Fluorene	25.0	19.6		ug/Kg		78	53 - 100
Indeno[1,2,3-cd]pyrene	25.0	19.6		ug/Kg		78	52 - 120
Naphthalene	25.0	19.6		ug/Kg		78	55 - 100
Phenanthrene	25.0	18.8		ug/Kg		75	54 - 98
Pyrene	25.0	20.3		ug/Kg		81	53 - 108

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Nitrobenzene-d5	*85*		*49 - 114*
Terphenyl-d14	*90*		*53 - 121*
2-Fluorobiphenyl (Surr)	*80*		*43 - 109*
2-methylnaphthalene-d10	*84*		*50 - 150*
Fluoranthene-d10 (Surr)	*87*		*50 - 150*

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Lab Sample ID: MB 320-408389/1-A
Matrix: Solid
Analysis Batch: 410385

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 408389

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	ND		2.0	0.50	mg/Kg		09/01/20 07:19	09/09/20 01:55	1
RRO (nC25-nC36)	ND		20	3.8	mg/Kg		09/01/20 07:19	09/09/20 01:55	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*69*		*60 - 120*	*09/01/20 07:19*	*09/09/20 01:55*	*1*
n-Triacontane-d62	*82*		*60 - 120*	*09/01/20 07:19*	*09/09/20 01:55*	*1*

Lab Sample ID: LCS 320-408389/2-A
Matrix: Solid
Analysis Batch: 410385

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 408389

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
DRO (nC10-<nC25)	10.0	7.08	*	mg/Kg		71	75 - 125
RRO (nC25-nC36)	30.0	24.8		mg/Kg		83	60 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl (Surr)	*74*		*60 - 120*

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC) (Continued)

Lab Sample ID: LCS 320-408389/2-A
Matrix: Solid
Analysis Batch: 410385

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 408389

Surrogate	LCS %Recovery	LCS Qualifier	Limits
n-Triacontane-d62	82		60 - 120

Lab Sample ID: LCSD 320-408389/3-A
Matrix: Solid
Analysis Batch: 410385

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 408389

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
DRO (nC10-<nC25)			10.0	6.79	*	mg/Kg		68	75 - 125	4	20
RRO (nC25-nC36)			30.0	24.1		mg/Kg		80	60 - 120	3	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
o-Terphenyl (Surr)	69		60 - 120
n-Triacontane-d62	77		60 - 120

Lab Sample ID: 320-63955-58 MS
Matrix: Solid
Analysis Batch: 410385

Client Sample ID: 20BET-Sub-03
Prep Type: Total/NA
Prep Batch: 408389

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
DRO (nC10-<nC25)	270	*	12.0	347	4	mg/Kg	☼	678	60 - 140		
RRO (nC25-nC36)	280		36.0	299	4	mg/Kg	☼	60	60 - 120		

Surrogate	MS %Recovery	MS Qualifier	Limits
o-Terphenyl (Surr)	70		60 - 120
n-Triacontane-d62	86		60 - 120

Lab Sample ID: 320-63955-58 MSD
Matrix: Solid
Analysis Batch: 410385

Client Sample ID: 20BET-Sub-03
Prep Type: Total/NA
Prep Batch: 408389

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
DRO (nC10-<nC25)	270	*	12.0	406	4	mg/Kg	☼	1172	60 - 140	16	50
RRO (nC25-nC36)	280		36.0	264	4	mg/Kg	☼	-39	60 - 120	13	20

Surrogate	MSD %Recovery	MSD Qualifier	Limits
o-Terphenyl (Surr)	72		60 - 120
n-Triacontane-d62	86		60 - 120

Lab Sample ID: MB 320-410567/1-A
Matrix: Solid
Analysis Batch: 412344

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 410567

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	0.621	J	2.0	0.50	mg/Kg		09/09/20 09:17	09/14/20 16:39	1
RRO (nC25-nC36)	ND		20	3.8	mg/Kg		09/09/20 09:17	09/14/20 16:39	1

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC) (Continued)

Lab Sample ID: MB 320-410567/1-A
Matrix: Solid
Analysis Batch: 412344

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 410567

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	120		60 - 120	09/09/20 09:17	09/14/20 16:39	1
n-Triacontane-d62	114		60 - 120	09/09/20 09:17	09/14/20 16:39	1

Lab Sample ID: LCS 320-410567/2-A
Matrix: Solid
Analysis Batch: 412344

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 410567

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
DRO (nC10-<nC25)			10.0	10.3		mg/Kg		103	75 - 125		
RRO (nC25-nC36)			30.0	29.1		mg/Kg		97	60 - 120		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
o-Terphenyl (Surr)	107		60 - 120
n-Triacontane-d62	96		60 - 120

Lab Sample ID: LCSD 320-410567/3-A
Matrix: Solid
Analysis Batch: 412344

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 410567

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
DRO (nC10-<nC25)			10.0	9.88		mg/Kg		99	75 - 125	4	20
RRO (nC25-nC36)			30.0	28.7		mg/Kg		96	60 - 120	1	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
o-Terphenyl (Surr)	99		60 - 120
n-Triacontane-d62	87		60 - 120

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15

Lab Sample ID: MB 320-407012/1-A
Matrix: Solid
Analysis Batch: 407776

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 407012

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.042	ug/Kg		08/26/20 21:33	08/29/20 08:17	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg		08/26/20 21:33	08/29/20 08:17	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.086	ug/Kg		08/26/20 21:33	08/29/20 08:17	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg		08/26/20 21:33	08/29/20 08:17	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg		08/26/20 21:33	08/29/20 08:17	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg		08/26/20 21:33	08/29/20 08:17	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg		08/26/20 21:33	08/29/20 08:17	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg		08/26/20 21:33	08/29/20 08:17	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg		08/26/20 21:33	08/29/20 08:17	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg		08/26/20 21:33	08/29/20 08:17	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg		08/26/20 21:33	08/29/20 08:17	1
Perfluorooctanesulfonic acid (PFOS)	0.448	J	0.50	0.20	ug/Kg		08/26/20 21:33	08/29/20 08:17	1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: MB 320-407012/1-A
Matrix: Solid
Analysis Batch: 407776

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 407012

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg		08/26/20 21:33	08/29/20 08:17	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg		08/26/20 21:33	08/29/20 08:17	1
F-53B Major	ND		0.20	0.027	ug/Kg		08/26/20 21:33	08/29/20 08:17	1
HFPO-DA (GenX)	ND		0.25	0.11	ug/Kg		08/26/20 21:33	08/29/20 08:17	1
F-53B Minor	ND		0.20	0.022	ug/Kg		08/26/20 21:33	08/29/20 08:17	1
DONA	ND		0.20	0.018	ug/Kg		08/26/20 21:33	08/29/20 08:17	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*93*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:17*	*1*
d3-NMeFOSAA	*43*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 08:17*	*1*
13C2 PFHxA	*90*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:17*	*1*
13C2 PFDA	*90*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:17*	*1*
d5-NEtFOSAA	*46*	**5*	*50 - 150*	*08/26/20 21:33*	*08/29/20 08:17*	*1*
13C3 HFPO-DA	*84*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:17*	*1*
18O2 PFHxS	*96*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:17*	*1*
13C3 PFBS	*89*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:17*	*1*
13C2 PFDoA	*93*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:17*	*1*
13C2 PFTeDA	*87*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:17*	*1*
13C5 PFNA	*94*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:17*	*1*
13C4 PFOA	*93*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:17*	*1*
13C2 PFUnA	*91*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:17*	*1*
13C4 PFHpA	*92*		*50 - 150*	*08/26/20 21:33*	*08/29/20 08:17*	*1*

Lab Sample ID: LCS 320-407012/2-A
Matrix: Solid
Analysis Batch: 407776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 407012

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	2.00	1.98		ug/Kg		99	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	1.97		ug/Kg		98	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	1.83		ug/Kg		91	72 - 132
Perfluorononanoic acid (PFNA)	2.00	1.89		ug/Kg		95	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	2.01		ug/Kg		100	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	2.00		ug/Kg		100	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	1.89		ug/Kg		94	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	2.00		ug/Kg		100	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	1.80		ug/Kg		90	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	1.83		ug/Kg		104	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.59		ug/Kg		87	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	2.56		ug/Kg		138	68 - 141
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	1.82	J	ug/Kg		91	72 - 132

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: LCS 320-407012/2-A
Matrix: Solid
Analysis Batch: 407776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 407012

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	1.63	J	ug/Kg		81	72 - 132
F-53B Major	1.86	1.78		ug/Kg		96	74 - 134
HFPO-DA (GenX)	2.00	2.01		ug/Kg		100	53 - 158
F-53B Minor	1.88	1.75		ug/Kg		93	66 - 136
DONA	1.88	1.71		ug/Kg		91	79 - 139

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFOS	*94*		*50 - 150*
d3-NMeFOSAA	*39*	**5*	*50 - 150*
13C2 PFHxA	*88*		*50 - 150*
13C2 PFDA	*87*		*50 - 150*
d5-NEtFOSAA	*42*	**5*	*50 - 150*
13C3 HFPO-DA	*83*		*50 - 150*
18O2 PFHxS	*95*		*50 - 150*
13C3 PFBS	*88*		*50 - 150*
13C2 PFDoA	*91*		*50 - 150*
13C2 PFTeDA	*93*		*50 - 150*
13C5 PFNA	*93*		*50 - 150*
13C4 PFOA	*91*		*50 - 150*
13C2 PFUnA	*88*		*50 - 150*
13C4 PFHpA	*92*		*50 - 150*

Lab Sample ID: 320-63955-20 MS
Matrix: Solid
Analysis Batch: 407776

Client Sample ID: 20BET-SS-C5
Prep Type: Total/NA
Prep Batch: 407012

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid (PFHpA)	2.2		2.22	4.47		ug/Kg	☼	103	71 - 131
Perfluorooctanoic acid (PFOA)	1.5		2.22	3.57		ug/Kg	☼	92	72 - 132
Perfluorononanoic acid (PFNA)	0.12	J	2.22	2.08		ug/Kg	☼	88	73 - 133
Perfluorodecanoic acid (PFDA)	0.10	J	2.22	2.50		ug/Kg	☼	108	72 - 132
Perfluoroundecanoic acid (PFUnA)	ND		2.22	2.36		ug/Kg	☼	106	66 - 126
Perfluorododecanoic acid (PFDoA)	ND		2.22	2.05		ug/Kg	☼	92	71 - 131
Perfluorotridecanoic acid (PFTriA)	ND		2.22	2.10		ug/Kg	☼	95	71 - 131
Perfluorotetradecanoic acid (PFTeA)	ND		2.22	2.05		ug/Kg	☼	93	67 - 127
Perfluorobutanesulfonic acid (PFBS)	ND		1.96	1.95		ug/Kg	☼	99	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	ND		2.02	2.31		ug/Kg	☼	114	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.0	B	2.06	3.23		ug/Kg	☼	108	68 - 141
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.22	2.31		ug/Kg	☼	104	72 - 132
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.22	2.31		ug/Kg	☼	104	72 - 132
F-53B Major	ND		2.07	2.62		ug/Kg	☼	127	74 - 134

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: 320-63955-20 MS
Matrix: Solid
Analysis Batch: 407776

Client Sample ID: 20BET-SS-C5
Prep Type: Total/NA
Prep Batch: 407012

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
HFPO-DA (GenX)	ND		2.22	2.45		ug/Kg	☼	110	53 - 158
F-53B Minor	ND		2.09	2.25		ug/Kg	☼	108	66 - 136
DONA	ND		2.09	2.07		ug/Kg	☼	99	79 - 139

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C2 PFDA	*45*	**5*	*50 - 150*
13C4 PFOS	*150*		*50 - 150*
d3-NMeFOSAA	*102*		*50 - 150*
d5-NEtFOSAA	*122*		*50 - 150*
13C3 HFPO-DA	*128*		*50 - 150*
18O2 PFHxS	*165*	**5*	*50 - 150*
13C3 PFBS	*145*		*50 - 150*
13C2 PFDoA	*157*	**5*	*50 - 150*
13C2 PFTeDA	*150*		*50 - 150*
13C5 PFNA	*158*	**5*	*50 - 150*
13C4 PFOA	*84*		*50 - 150*
13C2 PFUnA	*160*	**5*	*50 - 150*
13C4 PFHpA	*170*	**5*	*50 - 150*

Lab Sample ID: 320-63955-20 MSD
Matrix: Solid
Analysis Batch: 407776

Client Sample ID: 20BET-SS-C5
Prep Type: Total/NA
Prep Batch: 407012

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid (PFHpA)	2.2		2.23	4.41		ug/Kg	☼	99	71 - 131	1	30
Perfluorooctanoic acid (PFOA)	1.5		2.23	3.20		ug/Kg	☼	75	72 - 132	11	30
Perfluorononanoic acid (PFNA)	0.12	J	2.23	2.15		ug/Kg	☼	91	73 - 133	3	30
Perfluorodecanoic acid (PFDA)	0.10	J	2.23	2.63		ug/Kg	☼	113	72 - 132	5	30
Perfluoroundecanoic acid (PFUnA)	ND		2.23	2.50		ug/Kg	☼	112	66 - 126	6	30
Perfluorododecanoic acid (PFDoA)	ND		2.23	2.20		ug/Kg	☼	99	71 - 131	7	30
Perfluorotridecanoic acid (PFTriA)	ND		2.23	2.21		ug/Kg	☼	99	71 - 131	5	30
Perfluorotetradecanoic acid (PFTeA)	ND		2.23	1.92		ug/Kg	☼	86	67 - 127	7	30
Perfluorobutanesulfonic acid (PFBS)	ND		1.97	1.91		ug/Kg	☼	97	69 - 129	2	30
Perfluorohexanesulfonic acid (PFHxS)	ND		2.03	2.33		ug/Kg	☼	115	62 - 122	1	30
Perfluorooctanesulfonic acid (PFOS)	1.0	B	2.07	3.30		ug/Kg	☼	111	68 - 141	2	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.23	2.11	J	ug/Kg	☼	95	72 - 132	9	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.23	2.04	J	ug/Kg	☼	91	72 - 132	12	30
F-53B Major	ND		2.08	2.62		ug/Kg	☼	126	74 - 134	0	30
HFPO-DA (GenX)	ND		2.23	2.18		ug/Kg	☼	98	53 - 158	11	30
F-53B Minor	ND		2.10	2.21		ug/Kg	☼	105	66 - 136	2	30
DONA	ND		2.10	1.91		ug/Kg	☼	91	79 - 139	8	30

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C2 PFDA	48	*5	50 - 150
13C4 PFOS	172	*5	50 - 150
d3-NMeFOSAA	124		50 - 150
d5-NEtFOSAA	149		50 - 150
13C3 HFPO-DA	144		50 - 150
18O2 PFHxS	184	*5	50 - 150
13C3 PFBS	168	*5	50 - 150
13C2 PFDoA	163	*5	50 - 150
13C2 PFTeDA	165	*5	50 - 150
13C5 PFNA	174	*5	50 - 150
13C4 PFOA	90		50 - 150
13C2 PFUnA	177	*5	50 - 150
13C4 PFHpA	181	*5	50 - 150

Lab Sample ID: MB 320-407018/1-A
Matrix: Solid
Analysis Batch: 408542

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 407018

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.042	ug/Kg		08/27/20 04:46	09/01/20 17:08	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg		08/27/20 04:46	09/01/20 17:08	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.086	ug/Kg		08/27/20 04:46	09/01/20 17:08	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg		08/27/20 04:46	09/01/20 17:08	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg		08/27/20 04:46	09/01/20 17:08	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg		08/27/20 04:46	09/01/20 17:08	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg		08/27/20 04:46	09/01/20 17:08	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg		08/27/20 04:46	09/01/20 17:08	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg		08/27/20 04:46	09/01/20 17:08	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg		08/27/20 04:46	09/01/20 17:08	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg		08/27/20 04:46	09/01/20 17:08	1
Perfluorooctanesulfonic acid (PFOS)	1.17		0.50	0.20	ug/Kg		08/27/20 04:46	09/01/20 17:08	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg		08/27/20 04:46	09/01/20 17:08	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg		08/27/20 04:46	09/01/20 17:08	1
F-53B Major	ND		0.20	0.027	ug/Kg		08/27/20 04:46	09/01/20 17:08	1
HFPO-DA (GenX)	ND		0.25	0.11	ug/Kg		08/27/20 04:46	09/01/20 17:08	1
F-53B Minor	ND		0.20	0.022	ug/Kg		08/27/20 04:46	09/01/20 17:08	1
DONA	ND		0.20	0.018	ug/Kg		08/27/20 04:46	09/01/20 17:08	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	81		50 - 150	08/27/20 04:46	09/01/20 17:08	1
d3-NMeFOSAA	55		50 - 150	08/27/20 04:46	09/01/20 17:08	1
13C2 PFHxA	86		50 - 150	08/27/20 04:46	09/01/20 17:08	1
13C2 PFDA	80		50 - 150	08/27/20 04:46	09/01/20 17:08	1
d5-NEtFOSAA	55		50 - 150	08/27/20 04:46	09/01/20 17:08	1
13C3 HFPO-DA	81		50 - 150	08/27/20 04:46	09/01/20 17:08	1
18O2 PFHxS	87		50 - 150	08/27/20 04:46	09/01/20 17:08	1
13C3 PFBS	84		50 - 150	08/27/20 04:46	09/01/20 17:08	1
13C2 PFDoA	83		50 - 150	08/27/20 04:46	09/01/20 17:08	1
13C2 PFTeDA	87		50 - 150	08/27/20 04:46	09/01/20 17:08	1
13C5 PFNA	90		50 - 150	08/27/20 04:46	09/01/20 17:08	1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: MB 320-407018/1-A
Matrix: Solid
Analysis Batch: 408542

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 407018

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	85		50 - 150	08/27/20 04:46	09/01/20 17:08	1
13C2 PFUnA	83		50 - 150	08/27/20 04:46	09/01/20 17:08	1
13C4 PFHpA	81		50 - 150	08/27/20 04:46	09/01/20 17:08	1

Lab Sample ID: LCS 320-407018/2-A
Matrix: Solid
Analysis Batch: 408542

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 407018

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	2.00	1.94		ug/Kg		97	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	2.18		ug/Kg		109	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	1.99		ug/Kg		100	72 - 132
Perfluorononanoic acid (PFNA)	2.00	1.98		ug/Kg		99	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	2.11		ug/Kg		106	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	1.99		ug/Kg		100	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	1.91		ug/Kg		96	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	1.91		ug/Kg		96	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	1.87		ug/Kg		93	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	1.82		ug/Kg		103	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.64		ug/Kg		90	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	2.43		ug/Kg		131	68 - 141
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	1.95	J	ug/Kg		98	72 - 132
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	1.86	J	ug/Kg		93	72 - 132
F-53B Major	1.86	1.97		ug/Kg		106	74 - 134
HFPO-DA (GenX)	2.00	1.98		ug/Kg		99	53 - 158
F-53B Minor	1.88	1.93		ug/Kg		102	66 - 136
DONA	1.88	1.99		ug/Kg		106	79 - 139

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFOS	89		50 - 150
d3-NMeFOSAA	80		50 - 150
13C2 PFHxA	96		50 - 150
13C2 PFDA	94		50 - 150
d5-NEtFOSAA	80		50 - 150
13C3 HFPO-DA	90		50 - 150
18O2 PFHxS	97		50 - 150
13C3 PFBS	94		50 - 150
13C2 PFDoA	93		50 - 150
13C2 PFTeDA	107		50 - 150
13C5 PFNA	101		50 - 150
13C4 PFOA	93		50 - 150
13C2 PFUnA	95		50 - 150

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: LCS 320-407018/2-A
Matrix: Solid
Analysis Batch: 408542

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 407018

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFHpA	93		50 - 150

Lab Sample ID: MB 320-407019/1-A
Matrix: Water
Analysis Batch: 407272

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 407019

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.58	ng/L		08/27/20 04:51	08/27/20 14:28	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.25	ng/L		08/27/20 04:51	08/27/20 14:28	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.85	ng/L		08/27/20 04:51	08/27/20 14:28	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.27	ng/L		08/27/20 04:51	08/27/20 14:28	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		08/27/20 04:51	08/27/20 14:28	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		08/27/20 04:51	08/27/20 14:28	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		08/27/20 04:51	08/27/20 14:28	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	1.3	ng/L		08/27/20 04:51	08/27/20 14:28	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.29	ng/L		08/27/20 04:51	08/27/20 14:28	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.20	ng/L		08/27/20 04:51	08/27/20 14:28	1
Perfluorohexanesulfonic acid (PFHxS)	0.405	J	2.0	0.17	ng/L		08/27/20 04:51	08/27/20 14:28	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.54	ng/L		08/27/20 04:51	08/27/20 14:28	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		20	3.1	ng/L		08/27/20 04:51	08/27/20 14:28	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		20	1.9	ng/L		08/27/20 04:51	08/27/20 14:28	1
F-53B Major	ND		2.0	0.24	ng/L		08/27/20 04:51	08/27/20 14:28	1
HFPO-DA (GenX)	ND		4.0	1.5	ng/L		08/27/20 04:51	08/27/20 14:28	1
F-53B Minor	ND		2.0	0.32	ng/L		08/27/20 04:51	08/27/20 14:28	1
DONA	ND		2.0	0.18	ng/L		08/27/20 04:51	08/27/20 14:28	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	94		50 - 150	08/27/20 04:51	08/27/20 14:28	1
13C2 PFDA	95		50 - 150	08/27/20 04:51	08/27/20 14:28	1
d5-NEtFOSAA	97		50 - 150	08/27/20 04:51	08/27/20 14:28	1
13C3 HFPO-DA	88		50 - 150	08/27/20 04:51	08/27/20 14:28	1
18O2 PFHxS	96		50 - 150	08/27/20 04:51	08/27/20 14:28	1
13C3 PFBS	95		50 - 150	08/27/20 04:51	08/27/20 14:28	1
13C2 PFDoA	106		50 - 150	08/27/20 04:51	08/27/20 14:28	1
13C2 PFTeDA	79		50 - 150	08/27/20 04:51	08/27/20 14:28	1
13C5 PFNA	100		50 - 150	08/27/20 04:51	08/27/20 14:28	1
13C4 PFOA	91		50 - 150	08/27/20 04:51	08/27/20 14:28	1
13C2 PFUnA	97		50 - 150	08/27/20 04:51	08/27/20 14:28	1
13C4 PFHpA	96		50 - 150	08/27/20 04:51	08/27/20 14:28	1

Lab Sample ID: LCS 320-407019/2-A
Matrix: Water
Analysis Batch: 407272

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 407019

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	40.0	40.3		ng/L		101	73 - 133
Perfluoroheptanoic acid (PFHpA)	40.0	39.4		ng/L		98	72 - 132
Perfluorooctanoic acid (PFOA)	40.0	39.3		ng/L		98	70 - 130

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: LCS 320-407019/2-A
Matrix: Water
Analysis Batch: 407272

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 407019

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorononanoic acid (PFNA)	40.0	37.9		ng/L		95	75 - 135
Perfluorodecanoic acid (PFDA)	40.0	41.6		ng/L		104	76 - 136
Perfluoroundecanoic acid (PFUnA)	40.0	36.2		ng/L		91	68 - 128
Perfluorododecanoic acid (PFDoA)	40.0	43.6		ng/L		109	71 - 131
Perfluorotridecanoic acid (PFTriA)	40.0	44.5		ng/L		111	71 - 131
Perfluorotetradecanoic acid (PFTeA)	40.0	40.1		ng/L		100	70 - 130
Perfluorobutanesulfonic acid (PFBS)	35.4	34.9		ng/L		99	67 - 127
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.4		ng/L		97	59 - 119
Perfluorooctanesulfonic acid (PFOS)	37.1	38.6		ng/L		104	70 - 130
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	40.0	38.3		ng/L		96	76 - 136
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	40.0	39.4		ng/L		98	76 - 136
F-53B Major	37.3	36.2		ng/L		97	75 - 135
HFPO-DA (GenX)	40.0	41.9		ng/L		105	51 - 173
F-53B Minor	37.7	35.9		ng/L		95	54 - 114
DONA	37.7	36.3		ng/L		96	79 - 139

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*84*		*50 - 150*
13C2 PFDA	*85*		*50 - 150*
d5-NEtFOSAA	*89*		*50 - 150*
13C3 HFPO-DA	*81*		*50 - 150*
18O2 PFHxS	*84*		*50 - 150*
13C3 PFBS	*86*		*50 - 150*
13C2 PFDoA	*78*		*50 - 150*
13C2 PFTeDA	*74*		*50 - 150*
13C5 PFNA	*91*		*50 - 150*
13C4 PFOA	*80*		*50 - 150*
13C2 PFUnA	*94*		*50 - 150*
13C4 PFHpA	*84*		*50 - 150*

Lab Sample ID: MB 320-408023/1-A
Matrix: Solid
Analysis Batch: 408962

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 408023

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.550		0.50	0.20	ug/Kg		08/31/20 05:54	09/02/20 13:42	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*99*		*50 - 150*	*08/31/20 05:54*	*09/02/20 13:42*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: LCS 320-408023/2-A
Matrix: Solid
Analysis Batch: 408962

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 408023

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Perfluorooctanesulfonic acid (PFOS)			1.86	2.48		ug/Kg		133	68 - 141		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFOS	*115*		*50 - 150*

Lab Sample ID: MB 320-408367/1-A
Matrix: Solid
Analysis Batch: 409188

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 408367

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.0615	J	0.20	0.042	ug/Kg		09/01/20 00:42	09/03/20 01:33	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg		09/01/20 00:42	09/03/20 01:33	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.086	ug/Kg		09/01/20 00:42	09/03/20 01:33	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg		09/01/20 00:42	09/03/20 01:33	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg		09/01/20 00:42	09/03/20 01:33	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg		09/01/20 00:42	09/03/20 01:33	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg		09/01/20 00:42	09/03/20 01:33	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg		09/01/20 00:42	09/03/20 01:33	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg		09/01/20 00:42	09/03/20 01:33	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg		09/01/20 00:42	09/03/20 01:33	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg		09/01/20 00:42	09/03/20 01:33	1
Perfluorooctanesulfonic acid (PFOS)	0.216	J	0.50	0.20	ug/Kg		09/01/20 00:42	09/03/20 01:33	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg		09/01/20 00:42	09/03/20 01:33	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg		09/01/20 00:42	09/03/20 01:33	1
F-53B Major	ND		0.20	0.027	ug/Kg		09/01/20 00:42	09/03/20 01:33	1
HFPO-DA (GenX)	ND		0.25	0.11	ug/Kg		09/01/20 00:42	09/03/20 01:33	1
F-53B Minor	ND		0.20	0.022	ug/Kg		09/01/20 00:42	09/03/20 01:33	1
DONA	ND		0.20	0.018	ug/Kg		09/01/20 00:42	09/03/20 01:33	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*84*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:33*	*1*
d3-NMeFOSAA	*75*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:33*	*1*
13C2 PFHxA	*83*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:33*	*1*
13C2 PFDA	*86*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:33*	*1*
d5-NEtFOSAA	*82*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:33*	*1*
13C3 HFPO-DA	*77*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:33*	*1*
18O2 PFHxS	*87*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:33*	*1*
13C3 PFBS	*85*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:33*	*1*
13C2 PFDoA	*79*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:33*	*1*
13C2 PFTeDA	*85*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:33*	*1*
13C5 PFNA	*87*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:33*	*1*
13C4 PFOA	*83*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:33*	*1*
13C2 PFUnA	*82*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:33*	*1*
13C4 PFHpA	*85*		*50 - 150*	*09/01/20 00:42*	*09/03/20 01:33*	*1*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: LCS 320-408367/2-A
Matrix: Solid
Analysis Batch: 409188

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 408367

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	2.00	2.05		ug/Kg		103	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	2.10		ug/Kg		105	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	1.97		ug/Kg		98	72 - 132
Perfluorononanoic acid (PFNA)	2.00	2.04		ug/Kg		102	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	2.06		ug/Kg		103	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	2.15		ug/Kg		107	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	1.89		ug/Kg		95	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	2.08		ug/Kg		104	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	2.00		ug/Kg		100	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	1.82		ug/Kg		103	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.73		ug/Kg		95	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	2.06		ug/Kg		111	68 - 141
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	2.17		ug/Kg		109	72 - 132
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	1.88	J	ug/Kg		94	72 - 132
F-53B Major	1.86	1.86		ug/Kg		100	74 - 134
HFPO-DA (GenX)	2.00	1.98		ug/Kg		99	53 - 158
F-53B Minor	1.88	1.92		ug/Kg		102	66 - 136
DONA	1.88	1.89		ug/Kg		101	79 - 139

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFOS	*93*		*50 - 150*
d3-NMeFOSAA	*76*		*50 - 150*
13C2 PFHxA	*81*		*50 - 150*
13C2 PFDA	*90*		*50 - 150*
d5-NEtFOSAA	*80*		*50 - 150*
13C3 HFPO-DA	*79*		*50 - 150*
18O2 PFHxS	*89*		*50 - 150*
13C3 PFBS	*89*		*50 - 150*
13C2 PFDoA	*90*		*50 - 150*
13C2 PFTeDA	*87*		*50 - 150*
13C5 PFNA	*89*		*50 - 150*
13C4 PFOA	*88*		*50 - 150*
13C2 PFUnA	*86*		*50 - 150*
13C4 PFHpA	*86*		*50 - 150*

Lab Sample ID: 320-63955-21 MS
Matrix: Solid
Analysis Batch: 409188

Client Sample ID: 20BET-SS-C6
Prep Type: Total/NA
Prep Batch: 408367

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	20	B	2.32	21.8	4	ug/Kg	☼	71	71 - 131
Perfluoroheptanoic acid (PFHpA)	8.3	F1	2.32	11.5	F1	ug/Kg	☼	136	71 - 131

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: 320-63955-21 MS
Matrix: Solid
Analysis Batch: 409188

Client Sample ID: 20BET-SS-C6
Prep Type: Total/NA
Prep Batch: 408367

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanoic acid (PFOA)	1.9	J	2.32	4.04		ug/Kg	☼	94	72 - 132
Perfluorononanoic acid (PFNA)	0.95	J	2.32	3.32		ug/Kg	☼	102	73 - 133
Perfluorodecanoic acid (PFDA)	0.31	J	2.32	2.63		ug/Kg	☼	100	72 - 132
Perfluoroundecanoic acid (PFUnA)	ND		2.32	2.49		ug/Kg	☼	107	66 - 126
Perfluorododecanoic acid (PFDoA)	ND		2.32	2.38		ug/Kg	☼	103	71 - 131
Perfluorotridecanoic acid (PFTriA)	ND		2.32	2.25	J	ug/Kg	☼	97	71 - 131
Perfluorotetradecanoic acid (PFTeA)	ND	F2	2.32	2.28	J	ug/Kg	☼	98	67 - 127
Perfluorobutanesulfonic acid (PFBS)	ND		2.05	2.02	J	ug/Kg	☼	99	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	ND		2.11	2.17	J	ug/Kg	☼	103	62 - 122
Perfluorooctanesulfonic acid (PFOS)	ND		2.15	3.27	J	ug/Kg	☼	NC	68 - 141
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.32	ND		ug/Kg	☼	NC	72 - 132
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.32	ND		ug/Kg	☼	NC	72 - 132
F-53B Major	ND		2.16	2.61		ug/Kg	☼	121	74 - 134
HFPO-DA (GenX)	ND		2.32	2.38	J	ug/Kg	☼	103	53 - 158
F-53B Minor	ND		2.18	2.01	J	ug/Kg	☼	92	66 - 136
DONA	ND		2.18	2.32		ug/Kg	☼	106	79 - 139

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C4 PFOS	*83*		*50 - 150*
d3-NMeFOSAA	*81*		*50 - 150*
13C2 PFHxA	*86*		*50 - 150*
13C2 PFDA	*91*		*50 - 150*
d5-NEtFOSAA	*81*		*50 - 150*
13C3 HFPO-DA	*71*		*50 - 150*
18O2 PFHxS	*80*		*50 - 150*
13C3 PFBS	*82*		*50 - 150*
13C2 PFDoA	*85*		*50 - 150*
13C2 PFTeDA	*84*		*50 - 150*
13C5 PFNA	*88*		*50 - 150*
13C4 PFOA	*84*		*50 - 150*
13C2 PFUnA	*84*		*50 - 150*
13C4 PFHpA	*84*		*50 - 150*

Lab Sample ID: 320-63955-21 MSD
Matrix: Solid
Analysis Batch: 409188

Client Sample ID: 20BET-SS-C6
Prep Type: Total/NA
Prep Batch: 408367

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	20	B	2.19	21.5	4	ug/Kg	☼	64	71 - 131	1	30
Perfluoroheptanoic acid (PFHpA)	8.3	F1	2.19	9.90		ug/Kg	☼	72	71 - 131	15	30
Perfluorooctanoic acid (PFOA)	1.9	J	2.19	3.90		ug/Kg	☼	93	72 - 132	4	30
Perfluorononanoic acid (PFNA)	0.95	J	2.19	2.81		ug/Kg	☼	85	73 - 133	17	30

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: 320-63955-21 MSD
Matrix: Solid
Analysis Batch: 409188

Client Sample ID: 20BET-SS-C6
Prep Type: Total/NA
Prep Batch: 408367

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorodecanoic acid (PFDA)	0.31	J	2.19	2.66		ug/Kg	☼	107	72 - 132	1	30
Perfluoroundecanoic acid (PFUnA)	ND		2.19	2.43		ug/Kg	☼	111	66 - 126	2	30
Perfluorododecanoic acid (PFDoA)	ND		2.19	2.12	J	ug/Kg	☼	97	71 - 131	12	30
Perfluorotridecanoic acid (PFTriA)	ND		2.19	2.21		ug/Kg	☼	101	71 - 131	2	30
Perfluorotetradecanoic acid (PFTeA)	ND	F2	2.19	1.67	J F2	ug/Kg	☼	76	67 - 127	31	30
Perfluorobutanesulfonic acid (PFBS)	ND		1.94	1.94	J	ug/Kg	☼	100	69 - 129	4	30
Perfluorohexanesulfonic acid (PFHxS)	ND		2.00	2.03	J	ug/Kg	☼	102	62 - 122	7	30
Perfluorooctanesulfonic acid (PFOS)	ND		2.04	2.84	J	ug/Kg	☼	NC	68 - 141	14	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.19	ND		ug/Kg	☼	NC	72 - 132	NC	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.19	ND		ug/Kg	☼	NC	72 - 132	NC	30
F-53B Major	ND		2.05	2.30		ug/Kg	☼	113	74 - 134	13	30
HFPO-DA (GenX)	ND		2.19	2.29	J	ug/Kg	☼	104	53 - 158	4	30
F-53B Minor	ND		2.07	2.02	J	ug/Kg	☼	97	66 - 136	0	30
DONA	ND		2.07	2.22		ug/Kg	☼	107	79 - 139	4	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C4 PFOS	*71*		*50 - 150*
d3-NMeFOSAA	*69*		*50 - 150*
13C2 PFHxA	*75*		*50 - 150*
13C2 PFDA	*73*		*50 - 150*
d5-NEtFOSAA	*71*		*50 - 150*
13C3 HFPO-DA	*63*		*50 - 150*
18O2 PFHxS	*67*		*50 - 150*
13C3 PFBS	*71*		*50 - 150*
13C2 PFDoA	*69*		*50 - 150*
13C2 PFTeDA	*69*		*50 - 150*
13C5 PFNA	*77*		*50 - 150*
13C4 PFOA	*72*		*50 - 150*
13C2 PFUnA	*70*		*50 - 150*
13C4 PFHpA	*76*		*50 - 150*

Lab Sample ID: MB 320-408368/1-A
Matrix: Solid
Analysis Batch: 409209

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 408368

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.042	ug/Kg		09/01/20 00:44	09/03/20 04:49	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg		09/01/20 00:44	09/03/20 04:49	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.086	ug/Kg		09/01/20 00:44	09/03/20 04:49	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg		09/01/20 00:44	09/03/20 04:49	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg		09/01/20 00:44	09/03/20 04:49	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg		09/01/20 00:44	09/03/20 04:49	1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: MB 320-408368/1-A
Matrix: Solid
Analysis Batch: 409209

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 408368

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg		09/01/20 00:44	09/03/20 04:49	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg		09/01/20 00:44	09/03/20 04:49	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg		09/01/20 00:44	09/03/20 04:49	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg		09/01/20 00:44	09/03/20 04:49	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg		09/01/20 00:44	09/03/20 04:49	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.50	0.20	ug/Kg		09/01/20 00:44	09/03/20 04:49	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg		09/01/20 00:44	09/03/20 04:49	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg		09/01/20 00:44	09/03/20 04:49	1
F-53B Major	ND		0.20	0.027	ug/Kg		09/01/20 00:44	09/03/20 04:49	1
HFPO-DA (GenX)	ND		0.25	0.11	ug/Kg		09/01/20 00:44	09/03/20 04:49	1
F-53B Minor	ND		0.20	0.022	ug/Kg		09/01/20 00:44	09/03/20 04:49	1
DONA	ND		0.20	0.018	ug/Kg		09/01/20 00:44	09/03/20 04:49	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*87*		*50 - 150*	*09/01/20 00:44*	*09/03/20 04:49*	*1*
d3-NMeFOSAA	*80*		*50 - 150*	*09/01/20 00:44*	*09/03/20 04:49*	*1*
13C2 PFHxA	*81*		*50 - 150*	*09/01/20 00:44*	*09/03/20 04:49*	*1*
13C2 PFDA	*85*		*50 - 150*	*09/01/20 00:44*	*09/03/20 04:49*	*1*
d5-NEtFOSAA	*79*		*50 - 150*	*09/01/20 00:44*	*09/03/20 04:49*	*1*
13C3 HFPO-DA	*73*		*50 - 150*	*09/01/20 00:44*	*09/03/20 04:49*	*1*
18O2 PFHxS	*86*		*50 - 150*	*09/01/20 00:44*	*09/03/20 04:49*	*1*
13C3 PFBS	*85*		*50 - 150*	*09/01/20 00:44*	*09/03/20 04:49*	*1*
13C2 PFDoA	*79*		*50 - 150*	*09/01/20 00:44*	*09/03/20 04:49*	*1*
13C2 PFTeDA	*80*		*50 - 150*	*09/01/20 00:44*	*09/03/20 04:49*	*1*
13C5 PFNA	*87*		*50 - 150*	*09/01/20 00:44*	*09/03/20 04:49*	*1*
13C4 PFOA	*83*		*50 - 150*	*09/01/20 00:44*	*09/03/20 04:49*	*1*
13C2 PFUnA	*84*		*50 - 150*	*09/01/20 00:44*	*09/03/20 04:49*	*1*
13C4 PFHpA	*83*		*50 - 150*	*09/01/20 00:44*	*09/03/20 04:49*	*1*

Lab Sample ID: LCS 320-408368/2-A
Matrix: Solid
Analysis Batch: 409209

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 408368

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	2.00	1.95		ug/Kg		97	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	1.96		ug/Kg		98	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	1.95		ug/Kg		97	72 - 132
Perfluorononanoic acid (PFNA)	2.00	1.89		ug/Kg		94	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	2.09		ug/Kg		105	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	2.16		ug/Kg		108	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	1.86		ug/Kg		93	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	2.02		ug/Kg		101	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	1.92		ug/Kg		96	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	1.91		ug/Kg		108	69 - 129

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: LCS 320-408368/2-A
Matrix: Solid
Analysis Batch: 409209

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 408368

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.69		ug/Kg		93	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	2.25		ug/Kg		121	68 - 141
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	2.10		ug/Kg		105	72 - 132
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	1.96	J	ug/Kg		98	72 - 132
F-53B Major	1.86	2.02		ug/Kg		108	74 - 134
HFPO-DA (GenX)	2.00	2.04		ug/Kg		102	53 - 158
F-53B Minor	1.88	1.92		ug/Kg		102	66 - 136
DONA	1.88	1.94		ug/Kg		103	79 - 139

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFOS	*84*		*50 - 150*
d3-NMeFOSAA	*75*		*50 - 150*
13C2 PFHxA	*82*		*50 - 150*
13C2 PFDA	*91*		*50 - 150*
d5-NEtFOSAA	*74*		*50 - 150*
13C3 HFPO-DA	*73*		*50 - 150*
18O2 PFHxS	*88*		*50 - 150*
13C3 PFBS	*83*		*50 - 150*
13C2 PFDoA	*90*		*50 - 150*
13C2 PFTeDA	*82*		*50 - 150*
13C5 PFNA	*90*		*50 - 150*
13C4 PFOA	*83*		*50 - 150*
13C2 PFUnA	*80*		*50 - 150*
13C4 PFHpA	*86*		*50 - 150*

Lab Sample ID: 320-63955-31 MS
Matrix: Solid
Analysis Batch: 409209

Client Sample ID: 20BET-SS-D10
Prep Type: Total/NA
Prep Batch: 408368

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	20		2.25	21.7	4	ug/Kg	☼	56	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.4		2.25	4.47		ug/Kg	☼	90	71 - 131
Perfluorooctanoic acid (PFOA)	1.3		2.25	3.11		ug/Kg	☼	80	72 - 132
Perfluorononanoic acid (PFNA)	0.11	J	2.25	2.19		ug/Kg	☼	92	73 - 133
Perfluorodecanoic acid (PFDA)	0.27		2.25	2.71		ug/Kg	☼	109	72 - 132
Perfluoroundecanoic acid (PFUnA)	ND		2.25	2.49		ug/Kg	☼	111	66 - 126
Perfluorododecanoic acid (PFDoA)	ND		2.25	2.19		ug/Kg	☼	97	71 - 131
Perfluorotridecanoic acid (PFTriA)	ND		2.25	2.21		ug/Kg	☼	98	71 - 131
Perfluorotetradecanoic acid (PFTeA)	ND		2.25	2.12		ug/Kg	☼	94	67 - 127
Perfluorobutanesulfonic acid (PFBS)	ND		1.99	2.12		ug/Kg	☼	107	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	ND		2.04	2.37		ug/Kg	☼	116	62 - 122

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: 320-63955-31 MS
Matrix: Solid
Analysis Batch: 409209

Client Sample ID: 20BET-SS-D10
Prep Type: Total/NA
Prep Batch: 408368

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	1.8		2.09	3.79		ug/Kg	☼	97	68 - 141
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.25	2.36		ug/Kg	☼	105	72 - 132
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.25	2.25		ug/Kg	☼	100	72 - 132
F-53B Major	ND	F1	2.09	2.86	F1	ug/Kg	☼	137	74 - 134
HFPO-DA (GenX)	ND		2.25	2.29		ug/Kg	☼	102	53 - 158
F-53B Minor	ND		2.12	2.33		ug/Kg	☼	110	66 - 136
DONA	ND		2.12	2.10		ug/Kg	☼	99	79 - 139

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C4 PFOS	*137*		*50 - 150*
d3-NMeFOSAA	*97*		*50 - 150*
13C2 PFHxA	*122*		*50 - 150*
13C2 PFDA	*60*		*50 - 150*
d5-NEtFOSAA	*113*		*50 - 150*
13C3 HFPO-DA	*117*		*50 - 150*
18O2 PFHxS	*145*		*50 - 150*
13C3 PFBS	*131*		*50 - 150*
13C2 PFDoA	*147*		*50 - 150*
13C2 PFTeDA	*148*		*50 - 150*
13C5 PFNA	*142*		*50 - 150*
13C4 PFOA	*87*		*50 - 150*
13C2 PFUnA	*149*		*50 - 150*
13C4 PFHpA	*148*		*50 - 150*

Lab Sample ID: 320-63955-31 MSD
Matrix: Solid
Analysis Batch: 409209

Client Sample ID: 20BET-SS-D10
Prep Type: Total/NA
Prep Batch: 408368

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	20		2.23	19.0	4	ug/Kg	☼	-64	71 - 131	13	30
Perfluoroheptanoic acid (PFHpA)	2.4		2.23	4.56		ug/Kg	☼	95	71 - 131	2	30
Perfluorooctanoic acid (PFOA)	1.3		2.23	3.11		ug/Kg	☼	81	72 - 132	0	30
Perfluorononanoic acid (PFNA)	0.11	J	2.23	2.25		ug/Kg	☼	96	73 - 133	3	30
Perfluorodecanoic acid (PFDA)	0.27		2.23	2.62		ug/Kg	☼	105	72 - 132	3	30
Perfluoroundecanoic acid (PFUnA)	ND		2.23	2.62		ug/Kg	☼	117	66 - 126	5	30
Perfluorododecanoic acid (PFDoA)	ND		2.23	2.19		ug/Kg	☼	98	71 - 131	0	30
Perfluorotridecanoic acid (PFTriA)	ND		2.23	2.20		ug/Kg	☼	99	71 - 131	0	30
Perfluorotetradecanoic acid (PFTeA)	ND		2.23	2.15		ug/Kg	☼	96	67 - 127	1	30
Perfluorobutanesulfonic acid (PFBS)	ND		1.97	2.03		ug/Kg	☼	103	69 - 129	4	30
Perfluorohexanesulfonic acid (PFHxS)	ND		2.03	2.40		ug/Kg	☼	118	62 - 122	1	30
Perfluorooctanesulfonic acid (PFOS)	1.8		2.07	3.41		ug/Kg	☼	79	68 - 141	11	30

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: 320-63955-31 MSD
Matrix: Solid
Analysis Batch: 409209

Client Sample ID: 20BET-SS-D10
Prep Type: Total/NA
Prep Batch: 408368

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.23	2.34		ug/Kg	☼	105	72 - 132	1	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.23	2.29		ug/Kg	☼	102	72 - 132	2	30
F-53B Major	ND	F1	2.08	2.58		ug/Kg	☼	124	74 - 134	10	30
HFPO-DA (GenX)	ND		2.23	2.14		ug/Kg	☼	96	53 - 158	7	30
F-53B Minor	ND		2.10	2.26		ug/Kg	☼	108	66 - 136	3	30
DONA	ND		2.10	2.18		ug/Kg	☼	104	79 - 139	4	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C4 PFOS	*130*		*50 - 150*
d3-NMeFOSAA	*95*		*50 - 150*
13C2 PFHxA	*120*		*50 - 150*
13C2 PFDA	*57*		*50 - 150*
d5-NEtFOSAA	*108*		*50 - 150*
13C3 HFPO-DA	*112*		*50 - 150*
18O2 PFHxS	*135*		*50 - 150*
13C3 PFBS	*122*		*50 - 150*
13C2 PFDoA	*131*		*50 - 150*
13C2 PFTeDA	*132*		*50 - 150*
13C5 PFNA	*130*		*50 - 150*
13C4 PFOA	*82*		*50 - 150*
13C2 PFUnA	*137*		*50 - 150*
13C4 PFHpA	*141*		*50 - 150*

Lab Sample ID: MB 320-409240/1-A
Matrix: Solid
Analysis Batch: 409774

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 409240

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.042	ug/Kg		09/02/20 20:34	09/04/20 11:55	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg		09/02/20 20:34	09/04/20 11:55	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.086	ug/Kg		09/02/20 20:34	09/04/20 11:55	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg		09/02/20 20:34	09/04/20 11:55	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg		09/02/20 20:34	09/04/20 11:55	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg		09/02/20 20:34	09/04/20 11:55	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg		09/02/20 20:34	09/04/20 11:55	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg		09/02/20 20:34	09/04/20 11:55	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg		09/02/20 20:34	09/04/20 11:55	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg		09/02/20 20:34	09/04/20 11:55	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg		09/02/20 20:34	09/04/20 11:55	1
Perfluorooctanesulfonic acid (PFOS)	0.238	J	0.50	0.20	ug/Kg		09/02/20 20:34	09/04/20 11:55	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg		09/02/20 20:34	09/04/20 11:55	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg		09/02/20 20:34	09/04/20 11:55	1
F-53B Major	ND		0.20	0.027	ug/Kg		09/02/20 20:34	09/04/20 11:55	1
HFPO-DA (GenX)	ND		0.25	0.11	ug/Kg		09/02/20 20:34	09/04/20 11:55	1
F-53B Minor	ND		0.20	0.022	ug/Kg		09/02/20 20:34	09/04/20 11:55	1
DONA	ND		0.20	0.018	ug/Kg		09/02/20 20:34	09/04/20 11:55	1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	79		50 - 150	09/02/20 20:34	09/04/20 11:55	1
d3-NMeFOSAA	76		50 - 150	09/02/20 20:34	09/04/20 11:55	1
13C2 PFHxA	78		50 - 150	09/02/20 20:34	09/04/20 11:55	1
13C2 PFDA	86		50 - 150	09/02/20 20:34	09/04/20 11:55	1
d5-NEtFOSAA	73		50 - 150	09/02/20 20:34	09/04/20 11:55	1
13C3 HFPO-DA	72		50 - 150	09/02/20 20:34	09/04/20 11:55	1
18O2 PFHxS	80		50 - 150	09/02/20 20:34	09/04/20 11:55	1
13C3 PFBS	82		50 - 150	09/02/20 20:34	09/04/20 11:55	1
13C2 PFDoA	74		50 - 150	09/02/20 20:34	09/04/20 11:55	1
13C2 PFTeDA	75		50 - 150	09/02/20 20:34	09/04/20 11:55	1
13C5 PFNA	85		50 - 150	09/02/20 20:34	09/04/20 11:55	1
13C4 PFOA	82		50 - 150	09/02/20 20:34	09/04/20 11:55	1
13C2 PFUnA	79		50 - 150	09/02/20 20:34	09/04/20 11:55	1
13C4 PFHpA	80		50 - 150	09/02/20 20:34	09/04/20 11:55	1

Lab Sample ID: LCS 320-409240/2-A
Matrix: Solid
Analysis Batch: 409774

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 409240

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	2.00	2.00		ug/Kg		100	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	2.13		ug/Kg		107	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	2.03		ug/Kg		101	72 - 132
Perfluorononanoic acid (PFNA)	2.00	2.06		ug/Kg		103	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	2.23		ug/Kg		111	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	2.14		ug/Kg		107	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	2.01		ug/Kg		100	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	1.95		ug/Kg		97	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	1.90		ug/Kg		95	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	1.79		ug/Kg		101	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.84		ug/Kg		101	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	2.43		ug/Kg		131	68 - 141
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	2.05		ug/Kg		102	72 - 132
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	2.03		ug/Kg		102	72 - 132
F-53B Major	1.86	1.92		ug/Kg		103	74 - 134
HFPO-DA (GenX)	2.00	1.96		ug/Kg		98	53 - 158
F-53B Minor	1.88	1.86		ug/Kg		99	66 - 136
DONA	1.88	1.99		ug/Kg		106	79 - 139

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFOS	74		50 - 150
d3-NMeFOSAA	68		50 - 150
13C2 PFHxA	80		50 - 150
13C2 PFDA	75		50 - 150
d5-NEtFOSAA	66		50 - 150

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: LCS 320-409240/2-A
Matrix: Solid
Analysis Batch: 409774

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 409240

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C3 HFPO-DA	71		50 - 150
18O2 PFHxS	78		50 - 150
13C3 PFBS	79		50 - 150
13C2 PFDoA	70		50 - 150
13C2 PFTeDA	72		50 - 150
13C5 PFNA	83		50 - 150
13C4 PFOA	77		50 - 150
13C2 PFUnA	75		50 - 150
13C4 PFHpA	77		50 - 150

Lab Sample ID: 320-63955-41 MS
Matrix: Solid
Analysis Batch: 409774

Client Sample ID: 20BET-SS-F3
Prep Type: Total/NA
Prep Batch: 409240

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	5.0		2.03	7.65		ug/Kg	☼	128	71 - 131
Perfluoroheptanoic acid (PFHpA)	1.4		2.03	3.69		ug/Kg	☼	112	71 - 131
Perfluorooctanoic acid (PFOA)	0.51		2.03	2.54		ug/Kg	☼	100	72 - 132
Perfluorononanoic acid (PFNA)	0.071	J	2.03	2.16		ug/Kg	☼	103	73 - 133
Perfluorodecanoic acid (PFDA)	0.026	J	2.03	2.21		ug/Kg	☼	108	72 - 132
Perfluoroundecanoic acid (PFUnA)	ND		2.03	2.29		ug/Kg	☼	113	66 - 126
Perfluorododecanoic acid (PFDoA)	ND		2.03	2.08		ug/Kg	☼	102	71 - 131
Perfluorotridecanoic acid (PFTriA)	ND		2.03	1.91		ug/Kg	☼	94	71 - 131
Perfluorotetradecanoic acid (PFTeA)	ND		2.03	1.87		ug/Kg	☼	92	67 - 127
Perfluorobutanesulfonic acid (PFBS)	ND		1.80	1.94		ug/Kg	☼	108	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	ND		1.85	1.99		ug/Kg	☼	107	62 - 122
Perfluorooctanesulfonic acid (PFOS)	0.79	B	1.89	2.54		ug/Kg	☼	93	68 - 141
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.03	2.21		ug/Kg	☼	109	72 - 132
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.03	2.17		ug/Kg	☼	106	72 - 132
F-53B Major	ND		1.90	2.01		ug/Kg	☼	106	74 - 134
HFPO-DA (GenX)	ND		2.03	2.10		ug/Kg	☼	103	53 - 158
F-53B Minor	ND		1.92	1.99		ug/Kg	☼	104	66 - 136
DONA	ND		1.92	1.98		ug/Kg	☼	103	79 - 139

Isotope Dilution	MS %Recovery	MS Qualifier	Limits
13C4 PFOS	84		50 - 150
d3-NMeFOSAA	71		50 - 150
13C2 PFHxA	89		50 - 150
13C2 PFDA	90		50 - 150
d5-NEtFOSAA	65		50 - 150
13C3 HFPO-DA	77		50 - 150
18O2 PFHxS	88		50 - 150

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: 320-63955-41 MS
Matrix: Solid
Analysis Batch: 409774

Client Sample ID: 20BET-SS-F3
Prep Type: Total/NA
Prep Batch: 409240

Isotope Dilution	MS %Recovery	MS Qualifier	Limits
13C3 PFBS	86		50 - 150
13C2 PFDoA	77		50 - 150
13C2 PFTeDA	76		50 - 150
13C5 PFNA	93		50 - 150
13C4 PFOA	75		50 - 150
13C2 PFUnA	86		50 - 150
13C4 PFHpA	88		50 - 150

Lab Sample ID: 320-63955-41 MSD
Matrix: Solid
Analysis Batch: 409774

Client Sample ID: 20BET-SS-F3
Prep Type: Total/NA
Prep Batch: 409240

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	5.0		2.16	7.65		ug/Kg	☼	120	71 - 131	0	30
Perfluoroheptanoic acid (PFHpA)	1.4		2.16	3.94		ug/Kg	☼	117	71 - 131	7	30
Perfluorooctanoic acid (PFOA)	0.51		2.16	2.51		ug/Kg	☼	92	72 - 132	1	30
Perfluorononanoic acid (PFNA)	0.071	J	2.16	2.39		ug/Kg	☼	107	73 - 133	10	30
Perfluorodecanoic acid (PFDA)	0.026	J	2.16	2.57		ug/Kg	☼	118	72 - 132	15	30
Perfluoroundecanoic acid (PFUnA)	ND		2.16	2.39		ug/Kg	☼	110	66 - 126	4	30
Perfluorododecanoic acid (PFDoA)	ND		2.16	2.01		ug/Kg	☼	93	71 - 131	4	30
Perfluorotridecanoic acid (PFTriA)	ND		2.16	2.05		ug/Kg	☼	95	71 - 131	7	30
Perfluorotetradecanoic acid (PFTeA)	ND		2.16	2.20		ug/Kg	☼	102	67 - 127	16	30
Perfluorobutanesulfonic acid (PFBS)	ND		1.91	2.11		ug/Kg	☼	110	69 - 129	9	30
Perfluorohexanesulfonic acid (PFHxS)	ND		1.97	2.01		ug/Kg	☼	102	62 - 122	1	30
Perfluorooctanesulfonic acid (PFOS)	0.79	B	2.01	2.99		ug/Kg	☼	109	68 - 141	16	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.16	2.41		ug/Kg	☼	112	72 - 132	9	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.16	2.37		ug/Kg	☼	110	72 - 132	9	30
F-53B Major	ND		2.02	2.28		ug/Kg	☼	113	74 - 134	12	30
HFPO-DA (GenX)	ND		2.16	2.26		ug/Kg	☼	105	53 - 158	7	30
F-53B Minor	ND		2.04	2.25		ug/Kg	☼	110	66 - 136	12	30
DONA	ND		2.04	2.15		ug/Kg	☼	105	79 - 139	8	30

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C4 PFOS	77		50 - 150
d3-NMeFOSAA	55		50 - 150
13C2 PFHxA	87		50 - 150
13C2 PFDA	81		50 - 150
d5-NEtFOSAA	47	*5	50 - 150
13C3 HFPO-DA	72		50 - 150
18O2 PFHxS	86		50 - 150
13C3 PFBS	83		50 - 150
13C2 PFDoA	76		50 - 150

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: 320-63955-41 MSD
Matrix: Solid
Analysis Batch: 409774

Client Sample ID: 20BET-SS-F3
Prep Type: Total/NA
Prep Batch: 409240

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C2 PFTeDA	72		50 - 150
13C5 PFNA	90		50 - 150
13C4 PFOA	77		50 - 150
13C2 PFUnA	83		50 - 150
13C4 PFHpA	84		50 - 150

Lab Sample ID: MB 320-409241/1-A
Matrix: Solid
Analysis Batch: 409777

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 409241

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.042	ug/Kg		09/02/20 20:39	09/04/20 15:40	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg		09/02/20 20:39	09/04/20 15:40	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.086	ug/Kg		09/02/20 20:39	09/04/20 15:40	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg		09/02/20 20:39	09/04/20 15:40	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg		09/02/20 20:39	09/04/20 15:40	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg		09/02/20 20:39	09/04/20 15:40	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg		09/02/20 20:39	09/04/20 15:40	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg		09/02/20 20:39	09/04/20 15:40	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg		09/02/20 20:39	09/04/20 15:40	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg		09/02/20 20:39	09/04/20 15:40	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg		09/02/20 20:39	09/04/20 15:40	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.50	0.20	ug/Kg		09/02/20 20:39	09/04/20 15:40	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg		09/02/20 20:39	09/04/20 15:40	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg		09/02/20 20:39	09/04/20 15:40	1
F-53B Major	ND		0.20	0.027	ug/Kg		09/02/20 20:39	09/04/20 15:40	1
HFPO-DA (GenX)	ND		0.25	0.11	ug/Kg		09/02/20 20:39	09/04/20 15:40	1
F-53B Minor	ND		0.20	0.022	ug/Kg		09/02/20 20:39	09/04/20 15:40	1
DONA	ND		0.20	0.018	ug/Kg		09/02/20 20:39	09/04/20 15:40	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	78		50 - 150	09/02/20 20:39	09/04/20 15:40	1
d3-NMeFOSAA	70		50 - 150	09/02/20 20:39	09/04/20 15:40	1
13C2 PFHxA	78		50 - 150	09/02/20 20:39	09/04/20 15:40	1
13C2 PFDA	81		50 - 150	09/02/20 20:39	09/04/20 15:40	1
d5-NEtFOSAA	70		50 - 150	09/02/20 20:39	09/04/20 15:40	1
13C3 HFPO-DA	73		50 - 150	09/02/20 20:39	09/04/20 15:40	1
18O2 PFHxS	83		50 - 150	09/02/20 20:39	09/04/20 15:40	1
13C3 PFBS	84		50 - 150	09/02/20 20:39	09/04/20 15:40	1
13C2 PFDoA	76		50 - 150	09/02/20 20:39	09/04/20 15:40	1
13C2 PFTeDA	79		50 - 150	09/02/20 20:39	09/04/20 15:40	1
13C5 PFNA	83		50 - 150	09/02/20 20:39	09/04/20 15:40	1
13C4 PFOA	79		50 - 150	09/02/20 20:39	09/04/20 15:40	1
13C2 PFUnA	77		50 - 150	09/02/20 20:39	09/04/20 15:40	1
13C4 PFHpA	79		50 - 150	09/02/20 20:39	09/04/20 15:40	1

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: LCS 320-409241/2-A
Matrix: Solid
Analysis Batch: 409777

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 409241

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	2.00	2.07		ug/Kg		103	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	2.23		ug/Kg		111	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	2.12		ug/Kg		106	72 - 132
Perfluorononanoic acid (PFNA)	2.00	2.09		ug/Kg		104	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	2.35		ug/Kg		117	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	2.29		ug/Kg		114	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	1.93		ug/Kg		96	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	1.87		ug/Kg		94	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	2.04		ug/Kg		102	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	1.90		ug/Kg		107	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.83		ug/Kg		101	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	2.15		ug/Kg		116	68 - 141
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	2.06		ug/Kg		103	72 - 132
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	1.97	J	ug/Kg		98	72 - 132
F-53B Major	1.86	1.85		ug/Kg		99	74 - 134
HFPO-DA (GenX)	2.00	1.95		ug/Kg		97	53 - 158
F-53B Minor	1.88	1.86		ug/Kg		98	66 - 136
DONA	1.88	2.03		ug/Kg		108	79 - 139

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFOS	*79*		*50 - 150*
d3-NMeFOSAA	*73*		*50 - 150*
13C2 PFHxA	*79*		*50 - 150*
13C2 PFDA	*77*		*50 - 150*
d5-NEtFOSAA	*70*		*50 - 150*
13C3 HFPO-DA	*73*		*50 - 150*
18O2 PFHxS	*84*		*50 - 150*
13C3 PFBS	*81*		*50 - 150*
13C2 PFDoA	*76*		*50 - 150*
13C2 PFTeDA	*80*		*50 - 150*
13C5 PFNA	*84*		*50 - 150*
13C4 PFOA	*80*		*50 - 150*
13C2 PFUnA	*76*		*50 - 150*
13C4 PFHpA	*80*		*50 - 150*

Lab Sample ID: 320-63955-56 MS
Matrix: Solid
Analysis Batch: 409777

Client Sample ID: 20BET-Sub-02
Prep Type: Total/NA
Prep Batch: 409241

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid (PFHpA)	0.93		2.51	4.07		ug/Kg	☼	125	71 - 131
Perfluorooctanoic acid (PFOA)	0.24	J	2.51	3.02		ug/Kg	☼	111	72 - 132

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: 320-63955-56 MS
Matrix: Solid
Analysis Batch: 409777

Client Sample ID: 20BET-Sub-02
Prep Type: Total/NA
Prep Batch: 409241

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorononanoic acid (PFNA)	0.047	J	2.51	2.87		ug/Kg	☼	113	73 - 133
Perfluorodecanoic acid (PFDA)	0.085	J	2.51	3.11		ug/Kg	☼	121	72 - 132
Perfluoroundecanoic acid (PFUnA)	ND	F1	2.51	4.02	F1	ug/Kg	☼	160	66 - 126
Perfluorododecanoic acid (PFDoA)	ND		2.51	2.65		ug/Kg	☼	106	71 - 131
Perfluorotridecanoic acid (PFTriA)	ND		2.51	2.21		ug/Kg	☼	88	71 - 131
Perfluorotetradecanoic acid (PFTeA)	ND		2.51	2.47		ug/Kg	☼	99	67 - 127
Perfluorobutanesulfonic acid (PFBS)	0.038	J	2.22	2.45		ug/Kg	☼	109	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	0.65	I F1	2.28	3.12		ug/Kg	☼	108	62 - 122
Perfluorooctanesulfonic acid (PFOS)	0.39	J F2	2.33	3.49		ug/Kg	☼	133	68 - 141
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.51	2.83		ug/Kg	☼	113	72 - 132
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.51	2.82		ug/Kg	☼	112	72 - 132
F-53B Major	ND	F1 F2	2.34	3.16	F1	ug/Kg	☼	135	74 - 134
HFPO-DA (GenX)	ND		2.51	2.81		ug/Kg	☼	112	53 - 158
F-53B Minor	ND	F2	2.36	3.09		ug/Kg	☼	131	66 - 136
DONA	ND	F2	2.36	2.63		ug/Kg	☼	112	79 - 139

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C2 PFDA	*147*		*50 - 150*
13C4 PFOS	*152*	*5*	*50 - 150*
d3-NMeFOSAA	*131*		*50 - 150*
d5-NEtFOSAA	*131*		*50 - 150*
13C3 HFPO-DA	*147*		*50 - 150*
18O2 PFHxS	*191*	*5*	*50 - 150*
13C3 PFBS	*166*	*5*	*50 - 150*
13C2 PFDoA	*150*		*50 - 150*
13C2 PFTeDA	*139*		*50 - 150*
13C5 PFNA	*163*	*5*	*50 - 150*
13C4 PFOA	*70*		*50 - 150*
13C2 PFUnA	*150*		*50 - 150*
13C4 PFHpA	*170*	*5*	*50 - 150*

Lab Sample ID: 320-63955-56 MSD
Matrix: Solid
Analysis Batch: 409777

Client Sample ID: 20BET-Sub-02
Prep Type: Total/NA
Prep Batch: 409241

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid (PFHpA)	0.93		2.35	3.73		ug/Kg	☼	119	71 - 131	9	30
Perfluorooctanoic acid (PFOA)	0.24	J	2.35	3.07		ug/Kg	☼	120	72 - 132	1	30
Perfluorononanoic acid (PFNA)	0.047	J	2.35	2.77		ug/Kg	☼	116	73 - 133	4	30
Perfluorodecanoic acid (PFDA)	0.085	J	2.35	2.68		ug/Kg	☼	110	72 - 132	15	30
Perfluoroundecanoic acid (PFUnA)	ND	F1	2.35	3.12	F1	ug/Kg	☼	133	66 - 126	25	30

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: 320-63955-56 MSD
Matrix: Solid
Analysis Batch: 409777

Client Sample ID: 20BET-Sub-02
Prep Type: Total/NA
Prep Batch: 409241

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorododecanoic acid (PFDoA)	ND		2.35	2.24		ug/Kg	☼	95	71 - 131	17	30
Perfluorotridecanoic acid (PFTriA)	ND		2.35	2.14		ug/Kg	☼	91	71 - 131	3	30
Perfluorotetradecanoic acid (PFTeA)	ND		2.35	2.44		ug/Kg	☼	104	67 - 127	1	30
Perfluorobutanesulfonic acid (PFBS)	0.038	J	2.08	2.23		ug/Kg	☼	105	69 - 129	9	30
Perfluorohexanesulfonic acid (PFHxS)	0.65	I F1	2.14	3.75	F1	ug/Kg	☼	145	62 - 122	18	30
Perfluorooctanesulfonic acid (PFOS)	0.39	J F2	2.18	2.67		ug/Kg	☼	105	68 - 141	27	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.35	2.56		ug/Kg	☼	109	72 - 132	10	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.35	2.59		ug/Kg	☼	110	72 - 132	8	30
F-53B Major	ND	F1 F2	2.19	2.62		ug/Kg	☼	120	74 - 134	19	30
HFPO-DA (GenX)	ND		2.35	2.56		ug/Kg	☼	109	53 - 158	9	30
F-53B Minor	ND	F2	2.21	2.62		ug/Kg	☼	118	66 - 136	16	30
DONA	ND	F2	2.21	2.29		ug/Kg	☼	103	79 - 139	14	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C2 PFDA	*140*		*50 - 150*
13C4 PFOS	*145*		*50 - 150*
d3-NMeFOSAA	*120*		*50 - 150*
d5-NEtFOSAA	*118*		*50 - 150*
13C3 HFPO-DA	*130*		*50 - 150*
18O2 PFHxS	*158*	*5	*50 - 150*
13C3 PFBS	*141*		*50 - 150*
13C2 PFDoA	*148*		*50 - 150*
13C2 PFTeDA	*135*		*50 - 150*
13C5 PFNA	*145*		*50 - 150*
13C4 PFOA	*71*		*50 - 150*
13C2 PFUnA	*156*	*5	*50 - 150*
13C4 PFHpA	*147*		*50 - 150*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - DL

Lab Sample ID: 320-63955-20 MS
Matrix: Solid
Analysis Batch: 407930

Client Sample ID: 20BET-SS-C5
Prep Type: Total/NA
Prep Batch: 407012

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA) - DL	28		2.22	29.3	4	ug/Kg	☼	43	71 - 131

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C2 PFHxA - DL	*101*		*50 - 150*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Lab Sample ID: 320-63955-20 MSD
Matrix: Solid
Analysis Batch: 407930

Client Sample ID: 20BET-SS-C5
Prep Type: Total/NA
Prep Batch: 407012

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA) - DL	28		2.23	34.5	4	ug/Kg	☼	278	71 - 131	16	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C2 PFHxA - DL	*102*		*50 - 150*

Lab Sample ID: 320-63955-56 MS
Matrix: Solid
Analysis Batch: 410249

Client Sample ID: 20BET-Sub-02
Prep Type: Total/NA
Prep Batch: 409241

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA) - DL	43		2.51	47.6	4	ug/Kg	☼	190	71 - 131

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C2 PFHxA - DL	*118*		*50 - 150*

Lab Sample ID: 320-63955-56 MSD
Matrix: Solid
Analysis Batch: 410249

Client Sample ID: 20BET-Sub-02
Prep Type: Total/NA
Prep Batch: 409241

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA) - DL	43		2.35	41.0	4	ug/Kg	☼	-81	71 - 131	15	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C2 PFHxA - DL	*103*		*50 - 150*

Method: EPA 537(Mod) - PFAS for QSM 5.1, Table B-15 - RE

Lab Sample ID: 320-63955-20 MS
Matrix: Solid
Analysis Batch: 408962

Client Sample ID: 20BET-SS-C5
Prep Type: Total/NA
Prep Batch: 408023

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS) - RE	ND		2.15	4.47	J	ug/Kg	☼	NC	68 - 141

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C4 PFOS - RE	*88*		*50 - 150*

Lab Sample ID: 320-63955-20 MSD
Matrix: Solid
Analysis Batch: 408962

Client Sample ID: 20BET-SS-C5
Prep Type: Total/NA
Prep Batch: 408023

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS) - RE	ND		2.00	4.29	J	ug/Kg	☼	NC	68 - 141	4	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C4 PFOS - RE	*77*		*50 - 150*

Method: D 2216 - Percent Moisture

Lab Sample ID: 320-63955-20 DU
Matrix: Solid
Analysis Batch: 407277

Client Sample ID: 20BET-SS-C5
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Percent Moisture	15.1			14.9		%				1	20
Percent Solids	84.9			85.1		%				0.2	20

Lab Sample ID: 320-63955-36 DU
Matrix: Solid
Analysis Batch: 407278

Client Sample ID: 20BET-SS-E5
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Percent Moisture	7.2			6.7		%				7	20
Percent Solids	92.8			93.3		%				0.5	20

Lab Sample ID: 320-63955-56 DU
Matrix: Solid
Analysis Batch: 407279

Client Sample ID: 20BET-Sub-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Percent Moisture	20.2			23.4		%				15	20
Percent Solids	79.8			76.6		%				4	20

GC/MS VOA

Prep Batch: 406586

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-20	20BET-SS-C5	Total/NA	Solid	5035	
320-63955-23	20BET-SS-C10	Total/NA	Solid	5035	
320-63955-27	20BET-SS-D4	Total/NA	Solid	5035	
320-63955-31	20BET-SS-D10	Total/NA	Solid	5035	
320-63955-55	20BET-Sub-01	Total/NA	Solid	5035	
320-63955-56	20BET-Sub-02	Total/NA	Solid	5035	
320-63955-57	20BET-Sub-20	Total/NA	Solid	5035	
320-63955-58	20BET-Sub-03	Total/NA	Solid	5035	
320-63955-60	Trip Blank	Total/NA	Solid	5035	
MB 320-406586/1-A	Method Blank	Total/NA	Solid	5035	
LCS 320-406586/2-A	Lab Control Sample	Total/NA	Solid	5035	
LCS 320-406586/4-A	Lab Control Sample	Total/NA	Solid	5035	
LCSD 320-406586/3-A	Lab Control Sample Dup	Total/NA	Solid	5035	
LCSD 320-406586/5-A	Lab Control Sample Dup	Total/NA	Solid	5035	

Analysis Batch: 408441

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-20	20BET-SS-C5	Total/NA	Solid	AK101	406586
320-63955-23	20BET-SS-C10	Total/NA	Solid	AK101	406586
320-63955-27	20BET-SS-D4	Total/NA	Solid	AK101	406586
320-63955-31	20BET-SS-D10	Total/NA	Solid	AK101	406586
320-63955-55	20BET-Sub-01	Total/NA	Solid	AK101	406586
320-63955-56	20BET-Sub-02	Total/NA	Solid	AK101	406586
320-63955-57	20BET-Sub-20	Total/NA	Solid	AK101	406586
320-63955-58	20BET-Sub-03	Total/NA	Solid	AK101	406586
320-63955-60	Trip Blank	Total/NA	Solid	AK101	406586

Analysis Batch: 408442

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-20	20BET-SS-C5	Total/NA	Solid	8260C	406586
320-63955-23	20BET-SS-C10	Total/NA	Solid	8260C	406586
320-63955-27	20BET-SS-D4	Total/NA	Solid	8260C	406586
320-63955-31	20BET-SS-D10	Total/NA	Solid	8260C	406586
320-63955-55	20BET-Sub-01	Total/NA	Solid	8260C	406586
320-63955-56	20BET-Sub-02	Total/NA	Solid	8260C	406586
320-63955-57	20BET-Sub-20	Total/NA	Solid	8260C	406586
320-63955-58	20BET-Sub-03	Total/NA	Solid	8260C	406586
320-63955-60	Trip Blank	Total/NA	Solid	8260C	406586

Analysis Batch: 410964

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-406586/1-A	Method Blank	Total/NA	Solid	8260C	406586
LCS 320-406586/2-A	Lab Control Sample	Total/NA	Solid	8260C	406586
LCSD 320-406586/3-A	Lab Control Sample Dup	Total/NA	Solid	8260C	406586

Analysis Batch: 411306

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-406586/1-A	Method Blank	Total/NA	Solid	AK101	406586
LCS 320-406586/4-A	Lab Control Sample	Total/NA	Solid	AK101	406586
LCSD 320-406586/5-A	Lab Control Sample Dup	Total/NA	Solid	AK101	406586

GC/MS Semi VOA

Prep Batch: 408031

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-20	20BET-SS-C5	Total/NA	Solid	3546	
320-63955-23	20BET-SS-C10	Total/NA	Solid	3546	
320-63955-27	20BET-SS-D4	Total/NA	Solid	3546	
320-63955-31	20BET-SS-D10	Total/NA	Solid	3546	
320-63955-55	20BET-Sub-01	Total/NA	Solid	3546	
320-63955-56	20BET-Sub-02	Total/NA	Solid	3546	
320-63955-57	20BET-Sub-20	Total/NA	Solid	3546	
320-63955-58	20BET-Sub-03	Total/NA	Solid	3546	
MB 320-408031/1-A	Method Blank	Total/NA	Solid	3546	
LCS 320-408031/2-A	Lab Control Sample	Total/NA	Solid	3546	

Analysis Batch: 408410

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-408031/1-A	Method Blank	Total/NA	Solid	8270D SIM	408031
LCS 320-408031/2-A	Lab Control Sample	Total/NA	Solid	8270D SIM	408031

Analysis Batch: 408593

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-20	20BET-SS-C5	Total/NA	Solid	8270D SIM	408031
320-63955-27	20BET-SS-D4	Total/NA	Solid	8270D SIM	408031
320-63955-31	20BET-SS-D10	Total/NA	Solid	8270D SIM	408031
320-63955-55	20BET-Sub-01	Total/NA	Solid	8270D SIM	408031
320-63955-56	20BET-Sub-02	Total/NA	Solid	8270D SIM	408031
320-63955-57	20BET-Sub-20	Total/NA	Solid	8270D SIM	408031
320-63955-58	20BET-Sub-03	Total/NA	Solid	8270D SIM	408031

Analysis Batch: 409812

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-23	20BET-SS-C10	Total/NA	Solid	8270D SIM	408031

GC Semi VOA

Prep Batch: 408389

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-20	20BET-SS-C5	Total/NA	Solid	AK102	
320-63955-23	20BET-SS-C10	Total/NA	Solid	AK102	
320-63955-27	20BET-SS-D4	Total/NA	Solid	AK102	
320-63955-31	20BET-SS-D10	Total/NA	Solid	AK102	
320-63955-55	20BET-Sub-01	Total/NA	Solid	AK102	
320-63955-56	20BET-Sub-02	Total/NA	Solid	AK102	
320-63955-57	20BET-Sub-20	Total/NA	Solid	AK102	
320-63955-58	20BET-Sub-03	Total/NA	Solid	AK102	
MB 320-408389/1-A	Method Blank	Total/NA	Solid	AK102	
LCS 320-408389/2-A	Lab Control Sample	Total/NA	Solid	AK102	
LCSD 320-408389/3-A	Lab Control Sample Dup	Total/NA	Solid	AK102	
320-63955-58 MS	20BET-Sub-03	Total/NA	Solid	AK102	
320-63955-58 MSD	20BET-Sub-03	Total/NA	Solid	AK102	

Analysis Batch: 410385

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-55	20BET-Sub-01	Total/NA	Solid	AK102 & 103	408389

GC Semi VOA (Continued)

Analysis Batch: 410385 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-56	20BET-Sub-02	Total/NA	Solid	AK102 & 103	408389
320-63955-57	20BET-Sub-20	Total/NA	Solid	AK102 & 103	408389
320-63955-58	20BET-Sub-03	Total/NA	Solid	AK102 & 103	408389
MB 320-408389/1-A	Method Blank	Total/NA	Solid	AK102 & 103	408389
LCS 320-408389/2-A	Lab Control Sample	Total/NA	Solid	AK102 & 103	408389
LCSD 320-408389/3-A	Lab Control Sample Dup	Total/NA	Solid	AK102 & 103	408389
320-63955-58 MS	20BET-Sub-03	Total/NA	Solid	AK102 & 103	408389
320-63955-58 MSD	20BET-Sub-03	Total/NA	Solid	AK102 & 103	408389

Prep Batch: 410567

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-20 - RE	20BET-SS-C5	Total/NA	Solid	AK102	
320-63955-23 - RE	20BET-SS-C10	Total/NA	Solid	AK102	
320-63955-27 - RE	20BET-SS-D4	Total/NA	Solid	AK102	
320-63955-31 - RE	20BET-SS-D10	Total/NA	Solid	AK102	
320-63955-55 - RE	20BET-Sub-01	Total/NA	Solid	AK102	
320-63955-56 - RE	20BET-Sub-02	Total/NA	Solid	AK102	
320-63955-57 - RE	20BET-Sub-20	Total/NA	Solid	AK102	
320-63955-58 - RE	20BET-Sub-03	Total/NA	Solid	AK102	
MB 320-410567/1-A	Method Blank	Total/NA	Solid	AK102	
LCS 320-410567/2-A	Lab Control Sample	Total/NA	Solid	AK102	
LCSD 320-410567/3-A	Lab Control Sample Dup	Total/NA	Solid	AK102	

Analysis Batch: 410717

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-20	20BET-SS-C5	Total/NA	Solid	AK102 & 103	408389
320-63955-23	20BET-SS-C10	Total/NA	Solid	AK102 & 103	408389
320-63955-27	20BET-SS-D4	Total/NA	Solid	AK102 & 103	408389

Analysis Batch: 411398

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-31	20BET-SS-D10	Total/NA	Solid	AK102 & 103	408389

Analysis Batch: 412344

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-20 - RE	20BET-SS-C5	Total/NA	Solid	AK102 & 103	410567
320-63955-23 - RE	20BET-SS-C10	Total/NA	Solid	AK102 & 103	410567
320-63955-27 - RE	20BET-SS-D4	Total/NA	Solid	AK102 & 103	410567
320-63955-31 - RE	20BET-SS-D10	Total/NA	Solid	AK102 & 103	410567
320-63955-55 - RE	20BET-Sub-01	Total/NA	Solid	AK102 & 103	410567
320-63955-56 - RE	20BET-Sub-02	Total/NA	Solid	AK102 & 103	410567
320-63955-57 - RE	20BET-Sub-20	Total/NA	Solid	AK102 & 103	410567
320-63955-58 - RE	20BET-Sub-03	Total/NA	Solid	AK102 & 103	410567
MB 320-410567/1-A	Method Blank	Total/NA	Solid	AK102 & 103	410567
LCS 320-410567/2-A	Lab Control Sample	Total/NA	Solid	AK102 & 103	410567
LCSD 320-410567/3-A	Lab Control Sample Dup	Total/NA	Solid	AK102 & 103	410567

LCMS

Prep Batch: 407012

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-1	20BET-SS-A1	Total/NA	Solid	SHAKE	
320-63955-2	20BET-SS-A2	Total/NA	Solid	SHAKE	
320-63955-3	20BET-SS-A3	Total/NA	Solid	SHAKE	
320-63955-4	20BET-SS-A4	Total/NA	Solid	SHAKE	
320-63955-5	20BET-SS-A5	Total/NA	Solid	SHAKE	
320-63955-5 - DL	20BET-SS-A5	Total/NA	Solid	SHAKE	
320-63955-6	20BET-SS-A6	Total/NA	Solid	SHAKE	
320-63955-7	20BET-SS-A7	Total/NA	Solid	SHAKE	
320-63955-8 - DL	20BET-SS-A10	Total/NA	Solid	SHAKE	
320-63955-8	20BET-SS-A10	Total/NA	Solid	SHAKE	
320-63955-9	20BET-SS-B1	Total/NA	Solid	SHAKE	
320-63955-10	20BET-SS-B2	Total/NA	Solid	SHAKE	
320-63955-11	20BET-SS-B3	Total/NA	Solid	SHAKE	
320-63955-12	20BET-SS-B4	Total/NA	Solid	SHAKE	
320-63955-12 - DL	20BET-SS-B4	Total/NA	Solid	SHAKE	
320-63955-13 - DL	20BET-SS-B5	Total/NA	Solid	SHAKE	
320-63955-13	20BET-SS-B5	Total/NA	Solid	SHAKE	
320-63955-14	20BET-SS-B6	Total/NA	Solid	SHAKE	
320-63955-15	20BET-SS-B7	Total/NA	Solid	SHAKE	
320-63955-16	20BET-SS-C1	Total/NA	Solid	SHAKE	
320-63955-17	20BET-SS-C2	Total/NA	Solid	SHAKE	
320-63955-18	20BET-SS-C3	Total/NA	Solid	SHAKE	
320-63955-19	20BET-SS-C4	Total/NA	Solid	SHAKE	
320-63955-20 - DL	20BET-SS-C5	Total/NA	Solid	SHAKE	
320-63955-20	20BET-SS-C5	Total/NA	Solid	SHAKE	
MB 320-407012/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-407012/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-63955-20 MS	20BET-SS-C5	Total/NA	Solid	SHAKE	
320-63955-20 MS - DL	20BET-SS-C5	Total/NA	Solid	SHAKE	
320-63955-20 MSD	20BET-SS-C5	Total/NA	Solid	SHAKE	
320-63955-20 MSD - DL	20BET-SS-C5	Total/NA	Solid	SHAKE	

Prep Batch: 407018

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-44	20BET-SS-F6	Total/NA	Solid	SHAKE	
320-63955-45	20BET-SS-F7	Total/NA	Solid	SHAKE	
320-63955-53	20BET-SS-G7	Total/NA	Solid	SHAKE	
MB 320-407018/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-407018/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	

Prep Batch: 407019

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-59	Field Blank	Total/NA	Water	3535	
MB 320-407019/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-407019/2-A	Lab Control Sample	Total/NA	Water	3535	

Analysis Batch: 407272

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-59	Field Blank	Total/NA	Water	EPA 537(Mod)	407019
MB 320-407019/1-A	Method Blank	Total/NA	Water	EPA 537(Mod)	407019
LCS 320-407019/2-A	Lab Control Sample	Total/NA	Water	EPA 537(Mod)	407019

LCMS

Analysis Batch: 407776

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-1	20BET-SS-A1	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-2	20BET-SS-A2	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-3	20BET-SS-A3	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-4	20BET-SS-A4	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-5	20BET-SS-A5	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-6	20BET-SS-A6	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-7	20BET-SS-A7	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-8	20BET-SS-A10	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-9	20BET-SS-B1	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-10	20BET-SS-B2	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-11	20BET-SS-B3	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-12	20BET-SS-B4	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-13	20BET-SS-B5	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-14	20BET-SS-B6	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-15	20BET-SS-B7	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-16	20BET-SS-C1	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-17	20BET-SS-C2	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-18	20BET-SS-C3	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-19	20BET-SS-C4	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-20	20BET-SS-C5	Total/NA	Solid	EPA 537(Mod)	407012
MB 320-407012/1-A	Method Blank	Total/NA	Solid	EPA 537(Mod)	407012
LCS 320-407012/2-A	Lab Control Sample	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-20 MS	20BET-SS-C5	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-20 MSD	20BET-SS-C5	Total/NA	Solid	EPA 537(Mod)	407012

Analysis Batch: 407930

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-5 - DL	20BET-SS-A5	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-8 - DL	20BET-SS-A10	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-12 - DL	20BET-SS-B4	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-13 - DL	20BET-SS-B5	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-20 - DL	20BET-SS-C5	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-20 MS - DL	20BET-SS-C5	Total/NA	Solid	EPA 537(Mod)	407012
320-63955-20 MSD - DL	20BET-SS-C5	Total/NA	Solid	EPA 537(Mod)	407012

Prep Batch: 408023

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-2 - RE	20BET-SS-A2	Total/NA	Solid	SHAKE	
320-63955-3 - RE	20BET-SS-A3	Total/NA	Solid	SHAKE	
320-63955-4 - RE	20BET-SS-A4	Total/NA	Solid	SHAKE	
320-63955-5 - RE	20BET-SS-A5	Total/NA	Solid	SHAKE	
320-63955-6 - RE	20BET-SS-A6	Total/NA	Solid	SHAKE	
320-63955-7 - RE	20BET-SS-A7	Total/NA	Solid	SHAKE	
320-63955-8 - RE	20BET-SS-A10	Total/NA	Solid	SHAKE	
320-63955-9 - RE	20BET-SS-B1	Total/NA	Solid	SHAKE	
320-63955-10 - RE	20BET-SS-B2	Total/NA	Solid	SHAKE	
320-63955-11 - RE	20BET-SS-B3	Total/NA	Solid	SHAKE	
320-63955-12 - RE	20BET-SS-B4	Total/NA	Solid	SHAKE	
320-63955-13 - RE	20BET-SS-B5	Total/NA	Solid	SHAKE	
320-63955-14 - RE	20BET-SS-B6	Total/NA	Solid	SHAKE	
320-63955-15 - RE	20BET-SS-B7	Total/NA	Solid	SHAKE	

LCMS (Continued)

Prep Batch: 408023 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-16 - RE	20BET-SS-C1	Total/NA	Solid	SHAKE	
320-63955-17 - RE	20BET-SS-C2	Total/NA	Solid	SHAKE	
320-63955-18 - RE	20BET-SS-C3	Total/NA	Solid	SHAKE	
320-63955-19 - RE	20BET-SS-C4	Total/NA	Solid	SHAKE	
320-63955-20 - RE	20BET-SS-C5	Total/NA	Solid	SHAKE	
MB 320-408023/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-408023/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-63955-20 MS - RE	20BET-SS-C5	Total/NA	Solid	SHAKE	
320-63955-20 MSD - RE	20BET-SS-C5	Total/NA	Solid	SHAKE	

Prep Batch: 408367

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-21	20BET-SS-C6	Total/NA	Solid	SHAKE	
320-63955-22	20BET-SS-C7	Total/NA	Solid	SHAKE	
320-63955-23	20BET-SS-C10	Total/NA	Solid	SHAKE	
320-63955-24	20BET-SS-D1	Total/NA	Solid	SHAKE	
320-63955-25	20BET-SS-D2	Total/NA	Solid	SHAKE	
320-63955-26	20BET-SS-D3	Total/NA	Solid	SHAKE	
320-63955-27	20BET-SS-D4	Total/NA	Solid	SHAKE	
320-63955-28	20BET-SS-D5	Total/NA	Solid	SHAKE	
320-63955-29	20BET-SS-D6	Total/NA	Solid	SHAKE	
320-63955-30	20BET-SS-D7	Total/NA	Solid	SHAKE	
MB 320-408367/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-408367/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-63955-21 MS	20BET-SS-C6	Total/NA	Solid	SHAKE	
320-63955-21 MSD	20BET-SS-C6	Total/NA	Solid	SHAKE	

Prep Batch: 408368

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-31	20BET-SS-D10	Total/NA	Solid	SHAKE	
320-63955-32	20BET-SS-E1	Total/NA	Solid	SHAKE	
320-63955-33	20BET-SS-E2	Total/NA	Solid	SHAKE	
320-63955-34	20BET-SS-E3	Total/NA	Solid	SHAKE	
320-63955-35	20BET-SS-E4	Total/NA	Solid	SHAKE	
320-63955-36	20BET-SS-E5	Total/NA	Solid	SHAKE	
320-63955-37	20BET-SS-E6	Total/NA	Solid	SHAKE	
320-63955-38	20BET-SS-E7	Total/NA	Solid	SHAKE	
320-63955-39	20BET-SS-F1	Total/NA	Solid	SHAKE	
320-63955-40	20BET-SS-F2	Total/NA	Solid	SHAKE	
MB 320-408368/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-408368/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-63955-31 MS	20BET-SS-D10	Total/NA	Solid	SHAKE	
320-63955-31 MSD	20BET-SS-D10	Total/NA	Solid	SHAKE	

Analysis Batch: 408542

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-44	20BET-SS-F6	Total/NA	Solid	EPA 537(Mod)	407018
320-63955-45	20BET-SS-F7	Total/NA	Solid	EPA 537(Mod)	407018
320-63955-53	20BET-SS-G7	Total/NA	Solid	EPA 537(Mod)	407018
MB 320-407018/1-A	Method Blank	Total/NA	Solid	EPA 537(Mod)	407018
LCS 320-407018/2-A	Lab Control Sample	Total/NA	Solid	EPA 537(Mod)	407018

LCMS

Analysis Batch: 408962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-2 - RE	20BET-SS-A2	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-3 - RE	20BET-SS-A3	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-4 - RE	20BET-SS-A4	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-5 - RE	20BET-SS-A5	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-6 - RE	20BET-SS-A6	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-7 - RE	20BET-SS-A7	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-8 - RE	20BET-SS-A10	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-9 - RE	20BET-SS-B1	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-10 - RE	20BET-SS-B2	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-11 - RE	20BET-SS-B3	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-12 - RE	20BET-SS-B4	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-13 - RE	20BET-SS-B5	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-14 - RE	20BET-SS-B6	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-15 - RE	20BET-SS-B7	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-16 - RE	20BET-SS-C1	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-17 - RE	20BET-SS-C2	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-18 - RE	20BET-SS-C3	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-19 - RE	20BET-SS-C4	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-20 - RE	20BET-SS-C5	Total/NA	Solid	EPA 537(Mod)	408023
MB 320-408023/1-A	Method Blank	Total/NA	Solid	EPA 537(Mod)	408023
LCS 320-408023/2-A	Lab Control Sample	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-20 MS - RE	20BET-SS-C5	Total/NA	Solid	EPA 537(Mod)	408023
320-63955-20 MSD - RE	20BET-SS-C5	Total/NA	Solid	EPA 537(Mod)	408023

Analysis Batch: 409188

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-21	20BET-SS-C6	Total/NA	Solid	EPA 537(Mod)	408367
320-63955-22	20BET-SS-C7	Total/NA	Solid	EPA 537(Mod)	408367
320-63955-23	20BET-SS-C10	Total/NA	Solid	EPA 537(Mod)	408367
320-63955-24	20BET-SS-D1	Total/NA	Solid	EPA 537(Mod)	408367
320-63955-25	20BET-SS-D2	Total/NA	Solid	EPA 537(Mod)	408367
320-63955-26	20BET-SS-D3	Total/NA	Solid	EPA 537(Mod)	408367
320-63955-27	20BET-SS-D4	Total/NA	Solid	EPA 537(Mod)	408367
320-63955-28	20BET-SS-D5	Total/NA	Solid	EPA 537(Mod)	408367
320-63955-29	20BET-SS-D6	Total/NA	Solid	EPA 537(Mod)	408367
320-63955-30	20BET-SS-D7	Total/NA	Solid	EPA 537(Mod)	408367
MB 320-408367/1-A	Method Blank	Total/NA	Solid	EPA 537(Mod)	408367
LCS 320-408367/2-A	Lab Control Sample	Total/NA	Solid	EPA 537(Mod)	408367
320-63955-21 MS	20BET-SS-C6	Total/NA	Solid	EPA 537(Mod)	408367
320-63955-21 MSD	20BET-SS-C6	Total/NA	Solid	EPA 537(Mod)	408367

Analysis Batch: 409209

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-31	20BET-SS-D10	Total/NA	Solid	EPA 537(Mod)	408368
320-63955-32	20BET-SS-E1	Total/NA	Solid	EPA 537(Mod)	408368
320-63955-33	20BET-SS-E2	Total/NA	Solid	EPA 537(Mod)	408368
320-63955-34	20BET-SS-E3	Total/NA	Solid	EPA 537(Mod)	408368
320-63955-35	20BET-SS-E4	Total/NA	Solid	EPA 537(Mod)	408368
320-63955-36	20BET-SS-E5	Total/NA	Solid	EPA 537(Mod)	408368
320-63955-37	20BET-SS-E6	Total/NA	Solid	EPA 537(Mod)	408368
320-63955-38	20BET-SS-E7	Total/NA	Solid	EPA 537(Mod)	408368

LCMS (Continued)

Analysis Batch: 409209 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-39	20BET-SS-F1	Total/NA	Solid	EPA 537(Mod)	408368
320-63955-40	20BET-SS-F2	Total/NA	Solid	EPA 537(Mod)	408368
MB 320-408368/1-A	Method Blank	Total/NA	Solid	EPA 537(Mod)	408368
LCS 320-408368/2-A	Lab Control Sample	Total/NA	Solid	EPA 537(Mod)	408368
320-63955-31 MS	20BET-SS-D10	Total/NA	Solid	EPA 537(Mod)	408368
320-63955-31 MSD	20BET-SS-D10	Total/NA	Solid	EPA 537(Mod)	408368

Prep Batch: 409240

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-41	20BET-SS-F3	Total/NA	Solid	SHAKE	
320-63955-42	20BET-SS-F4	Total/NA	Solid	SHAKE	
320-63955-43	20BET-SS-F5	Total/NA	Solid	SHAKE	
320-63955-46	20BET-SS-F10	Total/NA	Solid	SHAKE	
320-63955-47	20BET-SS-G1	Total/NA	Solid	SHAKE	
320-63955-48	20BET-SS-G2	Total/NA	Solid	SHAKE	
320-63955-49	20BET-SS-G3	Total/NA	Solid	SHAKE	
MB 320-409240/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-409240/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-63955-41 MS	20BET-SS-F3	Total/NA	Solid	SHAKE	
320-63955-41 MSD	20BET-SS-F3	Total/NA	Solid	SHAKE	

Prep Batch: 409241

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-50	20BET-SS-G4	Total/NA	Solid	SHAKE	
320-63955-51	20BET-SS-G5	Total/NA	Solid	SHAKE	
320-63955-52	20BET-SS-G6	Total/NA	Solid	SHAKE	
320-63955-54	20BET-SS-G10	Total/NA	Solid	SHAKE	
320-63955-55	20BET-Sub-01	Total/NA	Solid	SHAKE	
320-63955-55 - DL	20BET-Sub-01	Total/NA	Solid	SHAKE	
320-63955-56	20BET-Sub-02	Total/NA	Solid	SHAKE	
320-63955-56 - DL	20BET-Sub-02	Total/NA	Solid	SHAKE	
320-63955-57	20BET-Sub-20	Total/NA	Solid	SHAKE	
320-63955-57 - DL	20BET-Sub-20	Total/NA	Solid	SHAKE	
320-63955-58	20BET-Sub-03	Total/NA	Solid	SHAKE	
320-63955-58 - DL	20BET-Sub-03	Total/NA	Solid	SHAKE	
MB 320-409241/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-409241/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-63955-56 MS - DL	20BET-Sub-02	Total/NA	Solid	SHAKE	
320-63955-56 MS	20BET-Sub-02	Total/NA	Solid	SHAKE	
320-63955-56 MSD - DL	20BET-Sub-02	Total/NA	Solid	SHAKE	
320-63955-56 MSD	20BET-Sub-02	Total/NA	Solid	SHAKE	

Analysis Batch: 409774

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-41	20BET-SS-F3	Total/NA	Solid	EPA 537(Mod)	409240
320-63955-42	20BET-SS-F4	Total/NA	Solid	EPA 537(Mod)	409240
320-63955-43	20BET-SS-F5	Total/NA	Solid	EPA 537(Mod)	409240
320-63955-46	20BET-SS-F10	Total/NA	Solid	EPA 537(Mod)	409240
320-63955-47	20BET-SS-G1	Total/NA	Solid	EPA 537(Mod)	409240
320-63955-48	20BET-SS-G2	Total/NA	Solid	EPA 537(Mod)	409240
320-63955-49	20BET-SS-G3	Total/NA	Solid	EPA 537(Mod)	409240

LCMS (Continued)

Analysis Batch: 409774 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-409240/1-A	Method Blank	Total/NA	Solid	EPA 537(Mod)	409240
LCS 320-409240/2-A	Lab Control Sample	Total/NA	Solid	EPA 537(Mod)	409240
320-63955-41 MS	20BET-SS-F3	Total/NA	Solid	EPA 537(Mod)	409240
320-63955-41 MSD	20BET-SS-F3	Total/NA	Solid	EPA 537(Mod)	409240

Analysis Batch: 409777

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-50	20BET-SS-G4	Total/NA	Solid	EPA 537(Mod)	409241
320-63955-51	20BET-SS-G5	Total/NA	Solid	EPA 537(Mod)	409241
320-63955-52	20BET-SS-G6	Total/NA	Solid	EPA 537(Mod)	409241
320-63955-54	20BET-SS-G10	Total/NA	Solid	EPA 537(Mod)	409241
320-63955-55	20BET-Sub-01	Total/NA	Solid	EPA 537(Mod)	409241
320-63955-56	20BET-Sub-02	Total/NA	Solid	EPA 537(Mod)	409241
320-63955-57	20BET-Sub-20	Total/NA	Solid	EPA 537(Mod)	409241
320-63955-58	20BET-Sub-03	Total/NA	Solid	EPA 537(Mod)	409241
MB 320-409241/1-A	Method Blank	Total/NA	Solid	EPA 537(Mod)	409241
LCS 320-409241/2-A	Lab Control Sample	Total/NA	Solid	EPA 537(Mod)	409241
320-63955-56 MS	20BET-Sub-02	Total/NA	Solid	EPA 537(Mod)	409241
320-63955-56 MSD	20BET-Sub-02	Total/NA	Solid	EPA 537(Mod)	409241

Analysis Batch: 410249

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-55 - DL	20BET-Sub-01	Total/NA	Solid	EPA 537(Mod)	409241
320-63955-56 - DL	20BET-Sub-02	Total/NA	Solid	EPA 537(Mod)	409241
320-63955-57 - DL	20BET-Sub-20	Total/NA	Solid	EPA 537(Mod)	409241
320-63955-58 - DL	20BET-Sub-03	Total/NA	Solid	EPA 537(Mod)	409241
320-63955-56 MS - DL	20BET-Sub-02	Total/NA	Solid	EPA 537(Mod)	409241
320-63955-56 MSD - DL	20BET-Sub-02	Total/NA	Solid	EPA 537(Mod)	409241

General Chemistry

Analysis Batch: 407148

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-1	20BET-SS-A1	Total/NA	Solid	D 2216	
320-63955-2	20BET-SS-A2	Total/NA	Solid	D 2216	
320-63955-3	20BET-SS-A3	Total/NA	Solid	D 2216	
320-63955-4	20BET-SS-A4	Total/NA	Solid	D 2216	
320-63955-5	20BET-SS-A5	Total/NA	Solid	D 2216	
320-63955-6	20BET-SS-A6	Total/NA	Solid	D 2216	
320-63955-7	20BET-SS-A7	Total/NA	Solid	D 2216	
320-63955-8	20BET-SS-A10	Total/NA	Solid	D 2216	
320-63955-9	20BET-SS-B1	Total/NA	Solid	D 2216	
320-63955-10	20BET-SS-B2	Total/NA	Solid	D 2216	
320-63955-11	20BET-SS-B3	Total/NA	Solid	D 2216	
320-63955-12	20BET-SS-B4	Total/NA	Solid	D 2216	
320-63955-13	20BET-SS-B5	Total/NA	Solid	D 2216	
320-63955-14	20BET-SS-B6	Total/NA	Solid	D 2216	
320-63955-15	20BET-SS-B7	Total/NA	Solid	D 2216	
320-63955-16	20BET-SS-C1	Total/NA	Solid	D 2216	

General Chemistry

Analysis Batch: 407277

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-17	20BET-SS-C2	Total/NA	Solid	D 2216	
320-63955-18	20BET-SS-C3	Total/NA	Solid	D 2216	
320-63955-19	20BET-SS-C4	Total/NA	Solid	D 2216	
320-63955-20	20BET-SS-C5	Total/NA	Solid	D 2216	
320-63955-21	20BET-SS-C6	Total/NA	Solid	D 2216	
320-63955-22	20BET-SS-C7	Total/NA	Solid	D 2216	
320-63955-23	20BET-SS-C10	Total/NA	Solid	D 2216	
320-63955-24	20BET-SS-D1	Total/NA	Solid	D 2216	
320-63955-25	20BET-SS-D2	Total/NA	Solid	D 2216	
320-63955-26	20BET-SS-D3	Total/NA	Solid	D 2216	
320-63955-27	20BET-SS-D4	Total/NA	Solid	D 2216	
320-63955-28	20BET-SS-D5	Total/NA	Solid	D 2216	
320-63955-29	20BET-SS-D6	Total/NA	Solid	D 2216	
320-63955-30	20BET-SS-D7	Total/NA	Solid	D 2216	
320-63955-31	20BET-SS-D10	Total/NA	Solid	D 2216	
320-63955-32	20BET-SS-E1	Total/NA	Solid	D 2216	
320-63955-33	20BET-SS-E2	Total/NA	Solid	D 2216	
320-63955-34	20BET-SS-E3	Total/NA	Solid	D 2216	
320-63955-35	20BET-SS-E4	Total/NA	Solid	D 2216	
320-63955-20 DU	20BET-SS-C5	Total/NA	Solid	D 2216	

Analysis Batch: 407278

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-36	20BET-SS-E5	Total/NA	Solid	D 2216	
320-63955-37	20BET-SS-E6	Total/NA	Solid	D 2216	
320-63955-38	20BET-SS-E7	Total/NA	Solid	D 2216	
320-63955-39	20BET-SS-F1	Total/NA	Solid	D 2216	
320-63955-40	20BET-SS-F2	Total/NA	Solid	D 2216	
320-63955-41	20BET-SS-F3	Total/NA	Solid	D 2216	
320-63955-42	20BET-SS-F4	Total/NA	Solid	D 2216	
320-63955-43	20BET-SS-F5	Total/NA	Solid	D 2216	
320-63955-44	20BET-SS-F6	Total/NA	Solid	D 2216	
320-63955-45	20BET-SS-F7	Total/NA	Solid	D 2216	
320-63955-46	20BET-SS-F10	Total/NA	Solid	D 2216	
320-63955-47	20BET-SS-G1	Total/NA	Solid	D 2216	
320-63955-48	20BET-SS-G2	Total/NA	Solid	D 2216	
320-63955-49	20BET-SS-G3	Total/NA	Solid	D 2216	
320-63955-36 DU	20BET-SS-E5	Total/NA	Solid	D 2216	

Analysis Batch: 407279

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-63955-50	20BET-SS-G4	Total/NA	Solid	D 2216	
320-63955-51	20BET-SS-G5	Total/NA	Solid	D 2216	
320-63955-52	20BET-SS-G6	Total/NA	Solid	D 2216	
320-63955-53	20BET-SS-G7	Total/NA	Solid	D 2216	
320-63955-54	20BET-SS-G10	Total/NA	Solid	D 2216	
320-63955-55	20BET-Sub-01	Total/NA	Solid	D 2216	
320-63955-56	20BET-Sub-02	Total/NA	Solid	D 2216	
320-63955-57	20BET-Sub-20	Total/NA	Solid	D 2216	
320-63955-58	20BET-Sub-03	Total/NA	Solid	D 2216	
320-63955-56 DU	20BET-Sub-02	Total/NA	Solid	D 2216	

Client Sample ID: 20BET-SS-A1
Date Collected: 08/19/20 07:55
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407148	08/27/20 11:52	TCS	TAL SAC

Client Sample ID: 20BET-SS-A1
Date Collected: 08/19/20 07:55
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-1
Matrix: Solid
Percent Solids: 88.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.40 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 08:36	S1M	TAL SAC

Client Sample ID: 20BET-SS-A2
Date Collected: 08/19/20 07:57
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407148	08/27/20 11:52	TCS	TAL SAC

Client Sample ID: 20BET-SS-A2
Date Collected: 08/19/20 07:57
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-2
Matrix: Solid
Percent Solids: 88.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.33 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 08:45	S1M	TAL SAC
Total/NA	Prep	SHAKE	RE		5.11 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	1			408962	09/02/20 14:10	D1R	TAL SAC

Client Sample ID: 20BET-SS-A3
Date Collected: 08/19/20 07:59
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407148	08/27/20 11:52	TCS	TAL SAC

Client Sample ID: 20BET-SS-A3
Date Collected: 08/19/20 07:59
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-3
Matrix: Solid
Percent Solids: 82.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.08 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 10:50	S1M	TAL SAC
Total/NA	Prep	SHAKE	RE		5.36 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	1			408962	09/02/20 14:20	D1R	TAL SAC

Client Sample ID: 20BET-SS-A4
Date Collected: 08/19/20 08:01
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407148	08/27/20 11:52	TCS	TAL SAC

Client Sample ID: 20BET-SS-A4
Date Collected: 08/19/20 08:01
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-4
Matrix: Solid
Percent Solids: 88.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.05 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 09:04	S1M	TAL SAC
Total/NA	Prep	SHAKE	RE		5.25 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	1			408962	09/02/20 14:29	D1R	TAL SAC

Client Sample ID: 20BET-SS-A5
Date Collected: 08/19/20 08:03
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-5
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407148	08/27/20 11:52	TCS	TAL SAC

Client Sample ID: 20BET-SS-A5
Date Collected: 08/19/20 08:03
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-5
Matrix: Solid
Percent Solids: 88.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.48 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 09:13	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		5.48 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	DL	2			407930	08/30/20 03:11	S1M	TAL SAC
Total/NA	Prep	SHAKE	RE		5.15 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	1			408962	09/02/20 14:38	D1R	TAL SAC

Client Sample ID: 20BET-SS-A6
Date Collected: 08/19/20 08:05
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-6
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407148	08/27/20 11:52	TCS	TAL SAC

Client Sample ID: 20BET-SS-A6
Date Collected: 08/19/20 08:05
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-6
Matrix: Solid
Percent Solids: 88.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.46 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 09:23	S1M	TAL SAC

Client Sample ID: 20BET-SS-A6
Lab Sample ID: 320-63955-6
Date Collected: 08/19/20 08:05
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 88.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE	RE		5.13 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	1			408962	09/02/20 14:48	D1R	TAL SAC

Client Sample ID: 20BET-SS-A7
Lab Sample ID: 320-63955-7
Date Collected: 08/19/20 08:07
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407148	08/27/20 11:52	TCS	TAL SAC

Client Sample ID: 20BET-SS-A7
Lab Sample ID: 320-63955-7
Date Collected: 08/19/20 08:07
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 76.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.27 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 09:32	S1M	TAL SAC
Total/NA	Prep	SHAKE	RE		5.42 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	1			408962	09/02/20 14:57	D1R	TAL SAC

Client Sample ID: 20BET-SS-A10
Lab Sample ID: 320-63955-8
Date Collected: 08/19/20 07:53
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407148	08/27/20 11:52	TCS	TAL SAC

Client Sample ID: 20BET-SS-A10
Lab Sample ID: 320-63955-8
Date Collected: 08/19/20 07:53
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 86.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.22 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 11:37	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		5.22 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	DL	2			407930	08/30/20 03:21	S1M	TAL SAC
Total/NA	Prep	SHAKE	RE		5.25 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	2			408962	09/02/20 17:55	D1R	TAL SAC

Client Sample ID: 20BET-SS-B1
Lab Sample ID: 320-63955-9
Date Collected: 08/19/20 08:12
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407148	08/27/20 11:52	TCS	TAL SAC

Client Sample ID: 20BET-SS-B1

Lab Sample ID: 320-63955-9

Date Collected: 08/19/20 08:12

Matrix: Solid

Date Received: 08/25/20 09:50

Percent Solids: 92.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.18 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 12:05	S1M	TAL SAC
Total/NA	Prep	SHAKE	RE		5.32 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	1			408962	09/02/20 15:06	D1R	TAL SAC

Client Sample ID: 20BET-SS-B2

Lab Sample ID: 320-63955-10

Date Collected: 08/19/20 08:14

Matrix: Solid

Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407148	08/27/20 11:52	TCS	TAL SAC

Client Sample ID: 20BET-SS-B2

Lab Sample ID: 320-63955-10

Date Collected: 08/19/20 08:14

Matrix: Solid

Date Received: 08/25/20 09:50

Percent Solids: 93.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.08 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 12:14	S1M	TAL SAC
Total/NA	Prep	SHAKE	RE		5.46 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	1			408962	09/02/20 15:34	D1R	TAL SAC

Client Sample ID: 20BET-SS-B3

Lab Sample ID: 320-63955-11

Date Collected: 08/19/20 08:16

Matrix: Solid

Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407148	08/27/20 11:52	TCS	TAL SAC

Client Sample ID: 20BET-SS-B3

Lab Sample ID: 320-63955-11

Date Collected: 08/19/20 08:16

Matrix: Solid

Date Received: 08/25/20 09:50

Percent Solids: 91.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.19 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 12:23	S1M	TAL SAC
Total/NA	Prep	SHAKE	RE		5.14 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	1			408962	09/02/20 15:44	D1R	TAL SAC

Client Sample ID: 20BET-SS-B4

Lab Sample ID: 320-63955-12

Date Collected: 08/19/20 08:18

Matrix: Solid

Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407148	08/27/20 11:52	TCS	TAL SAC

Client Sample ID: 20BET-SS-B4
Lab Sample ID: 320-63955-12
Date Collected: 08/19/20 08:18
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 87.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.36 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 12:33	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		5.36 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	DL	5			407930	08/30/20 03:30	S1M	TAL SAC
Total/NA	Prep	SHAKE	RE		5.06 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	5			408962	09/02/20 17:36	D1R	TAL SAC

Client Sample ID: 20BET-SS-B5
Lab Sample ID: 320-63955-13
Date Collected: 08/19/20 08:20
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407148	08/27/20 11:52	TCS	TAL SAC

Client Sample ID: 20BET-SS-B5
Lab Sample ID: 320-63955-13
Date Collected: 08/19/20 08:20
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 86.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.21 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 12:42	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		5.21 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	DL	5			407930	08/30/20 03:39	S1M	TAL SAC
Total/NA	Prep	SHAKE	RE		5.29 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	5			408962	09/02/20 17:46	D1R	TAL SAC

Client Sample ID: 20BET-SS-B6
Lab Sample ID: 320-63955-14
Date Collected: 08/19/20 08:22
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407148	08/27/20 11:52	TCS	TAL SAC

Client Sample ID: 20BET-SS-B6
Lab Sample ID: 320-63955-14
Date Collected: 08/19/20 08:22
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 92.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.45 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 12:51	S1M	TAL SAC
Total/NA	Prep	SHAKE	RE		5.34 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	1			408962	09/02/20 15:53	D1R	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Client Sample ID: 20BET-SS-B7
Date Collected: 08/19/20 08:24
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-15
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407148	08/27/20 11:52	TCS	TAL SAC

Client Sample ID: 20BET-SS-B7
Date Collected: 08/19/20 08:24
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-15
Matrix: Solid
Percent Solids: 55.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.39 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 13:01	S1M	TAL SAC
Total/NA	Prep	SHAKE	RE		5.08 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	1			408962	09/02/20 16:03	D1R	TAL SAC

Client Sample ID: 20BET-SS-C1
Date Collected: 08/19/20 08:35
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-16
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407148	08/27/20 11:52	TCS	TAL SAC

Client Sample ID: 20BET-SS-C1
Date Collected: 08/19/20 08:35
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-16
Matrix: Solid
Percent Solids: 92.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.44 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 13:10	S1M	TAL SAC
Total/NA	Prep	SHAKE	RE		5.13 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	1			408962	09/02/20 16:12	D1R	TAL SAC

Client Sample ID: 20BET-SS-C2
Date Collected: 08/19/20 08:37
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-17
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-C2
Date Collected: 08/19/20 08:37
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-17
Matrix: Solid
Percent Solids: 90.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.45 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 13:19	S1M	TAL SAC
Total/NA	Prep	SHAKE	RE		5.30 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	1			408962	09/02/20 16:21	D1R	TAL SAC

Client Sample ID: 20BET-SS-C3
Lab Sample ID: 320-63955-18
Date Collected: 08/19/20 08:39
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-C3
Lab Sample ID: 320-63955-18
Date Collected: 08/19/20 08:39
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 88.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.49 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 13:29	S1M	TAL SAC
Total/NA	Prep	SHAKE	RE		5.22 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	1			408962	09/02/20 16:31	D1R	TAL SAC

Client Sample ID: 20BET-SS-C4
Lab Sample ID: 320-63955-19
Date Collected: 08/19/20 08:41
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-C4
Lab Sample ID: 320-63955-19
Date Collected: 08/19/20 08:41
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 88.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.50 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 13:57	S1M	TAL SAC
Total/NA	Prep	SHAKE	RE		5.17 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	1			408962	09/02/20 16:40	D1R	TAL SAC

Client Sample ID: 20BET-SS-C5
Lab Sample ID: 320-63955-20
Date Collected: 08/19/20 08:43
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-C5
Lab Sample ID: 320-63955-20
Date Collected: 08/19/20 08:43
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 84.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			26.237 g	25 mL	406586	08/25/20 18:14	SO1	TAL SAC
Total/NA	Analysis	8260C		2	1 mL	50 mL	408442	09/01/20 18:10	AP1	TAL SAC
Total/NA	Prep	5035			26.237 g	25 mL	406586	08/25/20 18:14	SO1	TAL SAC
Total/NA	Analysis	AK101		2	1 mL	50 mL	408441	09/01/20 18:10	AP1	TAL SAC

Client Sample ID: 20BET-SS-C5
Date Collected: 08/19/20 08:43
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-20
Matrix: Solid
Percent Solids: 84.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			10.21 g	1 mL	408031	08/31/20 07:48	MBG	TAL SAC
Total/NA	Analysis	8270D SIM		10			408593	09/01/20 21:58	Y1S	TAL SAC
Total/NA	Prep	AK102	RE		30.26 g	3 mL	410567	09/09/20 09:17	MBG	TAL SAC
Total/NA	Analysis	AK102 & 103	RE	100			412344	09/14/20 18:10	VMN	TAL SAC
Total/NA	Prep	AK102			30.44 g	3 mL	408389	09/01/20 07:19	MBG	TAL SAC
Total/NA	Analysis	AK102 & 103		100			410717	09/10/20 05:11	K1D	TAL SAC
Total/NA	Prep	SHAKE			5.30 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407776	08/29/20 14:06	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		5.30 g	10 mL	407012	08/26/20 21:33	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	DL	10			407930	08/30/20 03:49	S1M	TAL SAC
Total/NA	Prep	SHAKE	RE		5.10 g	10.00 mL	408023	08/31/20 05:54	MTN	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	RE	10			408962	09/02/20 17:08	D1R	TAL SAC

Client Sample ID: 20BET-SS-C6
Date Collected: 08/19/20 08:45
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-21
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-C6
Date Collected: 08/19/20 08:45
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-21
Matrix: Solid
Percent Solids: 86.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.02 g	10.00 mL	408367	09/01/20 00:42	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		10			409188	09/03/20 03:16	MNV	TAL SAC

Client Sample ID: 20BET-SS-C7
Date Collected: 08/19/20 08:47
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-22
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-C7
Date Collected: 08/19/20 08:47
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-22
Matrix: Solid
Percent Solids: 90.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.01 g	10.00 mL	408367	09/01/20 00:42	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409188	09/03/20 01:52	MNV	TAL SAC

Client Sample ID: 20BET-SS-C10
Lab Sample ID: 320-63955-23
Date Collected: 08/19/20 08:33
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-C10
Lab Sample ID: 320-63955-23
Date Collected: 08/19/20 08:33
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 84.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			27.005 g	25 mL	406586	08/25/20 18:14	SO1	TAL SAC
Total/NA	Analysis	8260C		4	1 mL	50 mL	408442	09/01/20 18:33	AP1	TAL SAC
Total/NA	Prep	5035			27.005 g	25 mL	406586	08/25/20 18:14	SO1	TAL SAC
Total/NA	Analysis	AK101		4	1 mL	50 mL	408441	09/01/20 18:33	AP1	TAL SAC
Total/NA	Prep	3546			10.11 g	1 mL	408031	08/31/20 07:48	MBG	TAL SAC
Total/NA	Analysis	8270D SIM		20			409812	09/04/20 17:05	AA	TAL SAC
Total/NA	Prep	AK102	RE		30.92 g	3 mL	410567	09/09/20 09:17	MBG	TAL SAC
Total/NA	Analysis	AK102 & 103	RE	100			412344	09/14/20 18:41	VMN	TAL SAC
Total/NA	Prep	AK102			30.07 g	3 mL	408389	09/01/20 07:19	MBG	TAL SAC
Total/NA	Analysis	AK102 & 103		100			410717	09/10/20 05:40	K1D	TAL SAC
Total/NA	Prep	SHAKE			5.19 g	10.00 mL	408367	09/01/20 00:42	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		5			409188	09/03/20 03:44	MNV	TAL SAC

Client Sample ID: 20BET-SS-D1
Lab Sample ID: 320-63955-24
Date Collected: 08/19/20 09:05
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-D1
Lab Sample ID: 320-63955-24
Date Collected: 08/19/20 09:05
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 90.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.08 g	10.00 mL	408367	09/01/20 00:42	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409188	09/03/20 02:01	MNV	TAL SAC

Client Sample ID: 20BET-SS-D2
Lab Sample ID: 320-63955-25
Date Collected: 08/19/20 09:07
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-D2
Lab Sample ID: 320-63955-25
Date Collected: 08/19/20 09:07
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 91.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.29 g	10.00 mL	408367	09/01/20 00:42	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409188	09/03/20 02:10	MNV	TAL SAC

Client Sample ID: 20BET-SS-D3
Lab Sample ID: 320-63955-26
Date Collected: 08/19/20 09:09
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-D3
Lab Sample ID: 320-63955-26
Date Collected: 08/19/20 09:09
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 89.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.02 g	10.00 mL	408367	09/01/20 00:42	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409188	09/03/20 02:20	MNV	TAL SAC

Client Sample ID: 20BET-SS-D4
Lab Sample ID: 320-63955-27
Date Collected: 08/19/20 09:11
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-D4
Lab Sample ID: 320-63955-27
Date Collected: 08/19/20 09:11
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 85.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			25.363 g	25 mL	406586	08/25/20 18:14	SO1	TAL SAC
Total/NA	Analysis	8260C		4	1 mL	50 mL	408442	09/01/20 18:55	AP1	TAL SAC
Total/NA	Prep	5035			25.363 g	25 mL	406586	08/25/20 18:14	SO1	TAL SAC
Total/NA	Analysis	AK101		4	1 mL	50 mL	408441	09/01/20 18:55	AP1	TAL SAC
Total/NA	Prep	3546			10.77 g	1 mL	408031	08/31/20 07:48	MBG	TAL SAC
Total/NA	Analysis	8270D SIM		10			408593	09/01/20 22:57	Y1S	TAL SAC
Total/NA	Prep	AK102	RE		30.37 g	3 mL	410567	09/09/20 09:17	MBG	TAL SAC
Total/NA	Analysis	AK102 & 103	RE	100			412344	09/14/20 19:11	VMN	TAL SAC
Total/NA	Prep	AK102			30.98 g	3 mL	408389	09/01/20 07:19	MBG	TAL SAC
Total/NA	Analysis	AK102 & 103		100			410717	09/10/20 06:09	K1D	TAL SAC
Total/NA	Prep	SHAKE			5.00 g	10.00 mL	408367	09/01/20 00:42	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409188	09/03/20 02:29	MNV	TAL SAC

Client Sample ID: 20BET-SS-D5
Date Collected: 08/19/20 09:13
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-28
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-D5
Date Collected: 08/19/20 09:13
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-28
Matrix: Solid
Percent Solids: 69.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.14 g	10.00 mL	408367	09/01/20 00:42	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		5			409188	09/03/20 03:53	MNV	TAL SAC

Client Sample ID: 20BET-SS-D6
Date Collected: 08/19/20 09:15
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-29
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-D6
Date Collected: 08/19/20 09:15
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-29
Matrix: Solid
Percent Solids: 87.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.29 g	10.00 mL	408367	09/01/20 00:46	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409188	09/03/20 02:38	MNV	TAL SAC

Client Sample ID: 20BET-SS-D7
Date Collected: 08/19/20 09:17
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-30
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-D7
Date Collected: 08/19/20 09:17
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-30
Matrix: Solid
Percent Solids: 90.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.05 g	10.00 mL	408367	09/01/20 00:46	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409188	09/03/20 03:06	MNV	TAL SAC

Client Sample ID: 20BET-SS-D10
Date Collected: 08/19/20 09:01
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-31
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-D10

Lab Sample ID: 320-63955-31
Date Collected: 08/19/20 09:01
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 86.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			25.976 g	25 mL	406586	08/25/20 18:14	SO1	TAL SAC
Total/NA	Analysis	8260C		4	1 mL	50 mL	408442	09/01/20 19:18	AP1	TAL SAC
Total/NA	Prep	5035			25.976 g	25 mL	406586	08/25/20 18:14	SO1	TAL SAC
Total/NA	Analysis	AK101		4	1 mL	50 mL	408441	09/01/20 19:18	AP1	TAL SAC
Total/NA	Prep	3546			10.06 g	1 mL	408031	08/31/20 07:48	MBG	TAL SAC
Total/NA	Analysis	8270D SIM		10			408593	09/01/20 23:26	Y1S	TAL SAC
Total/NA	Prep	AK102	RE		30.35 g	3 mL	410567	09/09/20 09:17	MBG	TAL SAC
Total/NA	Analysis	AK102 & 103	RE	100			412344	09/14/20 19:41	VMN	TAL SAC
Total/NA	Prep	AK102			30.42 g	3 mL	408389	09/01/20 07:19	MBG	TAL SAC
Total/NA	Analysis	AK102 & 103		100			411398	09/11/20 17:47	K1D	TAL SAC
Total/NA	Prep	SHAKE			5.01 g	10.00 mL	408368	09/01/20 00:44	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409209	09/03/20 05:08	IK	TAL SAC

Client Sample ID: 20BET-SS-E1

Lab Sample ID: 320-63955-32
Date Collected: 08/19/20 09:25
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-E1

Lab Sample ID: 320-63955-32
Date Collected: 08/19/20 09:25
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 93.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.02 g	10.00 mL	408368	09/01/20 00:44	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409209	09/03/20 05:36	IK	TAL SAC

Client Sample ID: 20BET-SS-E2

Lab Sample ID: 320-63955-33
Date Collected: 08/19/20 09:27
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-E2

Lab Sample ID: 320-63955-33
Date Collected: 08/19/20 09:27
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 91.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.07 g	10.00 mL	408368	09/01/20 00:44	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409209	09/03/20 05:45	IK	TAL SAC

Client Sample ID: 20BET-SS-E3
Date Collected: 08/19/20 09:29
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-34
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-E3
Date Collected: 08/19/20 09:29
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-34
Matrix: Solid
Percent Solids: 92.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.00 g	10.00 mL	408368	09/01/20 00:44	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409209	09/03/20 05:55	IK	TAL SAC

Client Sample ID: 20BET-SS-E4
Date Collected: 08/19/20 09:31
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-35
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407277	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-E4
Date Collected: 08/19/20 09:31
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-35
Matrix: Solid
Percent Solids: 90.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.24 g	10.00 mL	408368	09/01/20 00:44	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409209	09/03/20 06:23	IK	TAL SAC

Client Sample ID: 20BET-SS-E5
Date Collected: 08/19/20 09:33
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-36
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407278	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-E5
Date Collected: 08/19/20 09:33
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-36
Matrix: Solid
Percent Solids: 92.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.04 g	10.00 mL	408368	09/01/20 00:44	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409209	09/03/20 06:32	IK	TAL SAC

Client Sample ID: 20BET-SS-E6
Date Collected: 08/19/20 09:35
Date Received: 08/25/20 09:50

Lab Sample ID: 320-63955-37
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407278	08/27/20 13:55	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Client Sample ID: 20BET-SS-E6
Lab Sample ID: 320-63955-37
Date Collected: 08/19/20 09:35
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 83.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.01 g	10.00 mL	408368	09/01/20 00:44	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409209	09/03/20 06:41	IK	TAL SAC

Client Sample ID: 20BET-SS-E7
Lab Sample ID: 320-63955-38
Date Collected: 08/19/20 09:37
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407278	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-E7
Lab Sample ID: 320-63955-38
Date Collected: 08/19/20 09:37
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 90.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.05 g	10.00 mL	408368	09/01/20 00:44	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409209	09/03/20 06:51	IK	TAL SAC

Client Sample ID: 20BET-SS-F1
Lab Sample ID: 320-63955-39
Date Collected: 08/19/20 09:40
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407278	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-F1
Lab Sample ID: 320-63955-39
Date Collected: 08/19/20 09:40
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 89.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.02 g	10.00 mL	408368	09/01/20 00:44	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409209	09/03/20 07:00	IK	TAL SAC

Client Sample ID: 20BET-SS-F2
Lab Sample ID: 320-63955-40
Date Collected: 08/19/20 09:42
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407278	08/27/20 13:55	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Client Sample ID: 20BET-SS-F2
Lab Sample ID: 320-63955-40
Date Collected: 08/19/20 09:42
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 90.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.04 g	10.00 mL	408368	09/01/20 00:45	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409209	09/03/20 07:10	IK	TAL SAC

Client Sample ID: 20BET-SS-F3
Lab Sample ID: 320-63955-41
Date Collected: 08/19/20 09:44
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407278	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-F3
Lab Sample ID: 320-63955-41
Date Collected: 08/19/20 09:44
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 91.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.00 g	10.00 mL	409240	09/02/20 20:34	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409774	09/04/20 12:13	YH	TAL SAC

Client Sample ID: 20BET-SS-F4
Lab Sample ID: 320-63955-42
Date Collected: 08/19/20 09:46
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407278	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-F4
Lab Sample ID: 320-63955-42
Date Collected: 08/19/20 09:46
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 91.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.25 g	10.00 mL	409240	09/02/20 20:34	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409774	09/04/20 12:42	YH	TAL SAC

Client Sample ID: 20BET-SS-F5
Lab Sample ID: 320-63955-43
Date Collected: 08/19/20 09:48
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407278	08/27/20 13:55	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Client Sample ID: 20BET-SS-F5
Lab Sample ID: 320-63955-43
Date Collected: 08/19/20 09:48
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 87.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.39 g	10.00 mL	409240	09/02/20 20:34	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409774	09/04/20 12:51	YH	TAL SAC

Client Sample ID: 20BET-SS-F6
Lab Sample ID: 320-63955-44
Date Collected: 08/19/20 09:50
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407278	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-F6
Lab Sample ID: 320-63955-44
Date Collected: 08/19/20 09:50
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 82.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.28 g	10.0 mL	407018	08/27/20 04:46	NSS	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			408542	09/01/20 17:55	A1C	TAL SAC

Client Sample ID: 20BET-SS-F7
Lab Sample ID: 320-63955-45
Date Collected: 08/19/20 09:52
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407278	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-F7
Lab Sample ID: 320-63955-45
Date Collected: 08/19/20 09:52
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 54.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.26 g	10.0 mL	407018	08/27/20 04:46	NSS	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			408542	09/01/20 18:04	A1C	TAL SAC

Client Sample ID: 20BET-SS-F10
Lab Sample ID: 320-63955-46
Date Collected: 08/19/20 09:30
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407278	08/27/20 13:55	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Client Sample ID: 20BET-SS-F10
Lab Sample ID: 320-63955-46
Date Collected: 08/19/20 09:30
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 91.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.14 g	10.00 mL	409240	09/02/20 20:34	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409774	09/04/20 13:01	YH	TAL SAC

Client Sample ID: 20BET-SS-G1
Lab Sample ID: 320-63955-47
Date Collected: 08/19/20 10:00
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407278	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-G1
Lab Sample ID: 320-63955-47
Date Collected: 08/19/20 10:00
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 82.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.09 g	10.00 mL	409240	09/02/20 20:34	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409774	09/04/20 13:10	YH	TAL SAC

Client Sample ID: 20BET-SS-G2
Lab Sample ID: 320-63955-48
Date Collected: 08/19/20 10:02
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407278	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-G2
Lab Sample ID: 320-63955-48
Date Collected: 08/19/20 10:02
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 85.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.14 g	10.00 mL	409240	09/02/20 20:34	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409774	09/04/20 13:38	YH	TAL SAC

Client Sample ID: 20BET-SS-G3
Lab Sample ID: 320-63955-49
Date Collected: 08/19/20 10:04
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407278	08/27/20 13:55	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Client Sample ID: 20BET-SS-G3
Lab Sample ID: 320-63955-49
Date Collected: 08/19/20 10:04
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 89.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.19 g	10.00 mL	409240	09/02/20 20:34	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409774	09/04/20 13:48	YH	TAL SAC

Client Sample ID: 20BET-SS-G4
Lab Sample ID: 320-63955-50
Date Collected: 08/19/20 10:06
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407279	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-G4
Lab Sample ID: 320-63955-50
Date Collected: 08/19/20 10:06
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 85.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.12 g	10.00 mL	409241	09/02/20 20:39	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409777	09/04/20 15:59	YH	TAL SAC

Client Sample ID: 20BET-SS-G5
Lab Sample ID: 320-63955-51
Date Collected: 08/19/20 10:08
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407279	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-G5
Lab Sample ID: 320-63955-51
Date Collected: 08/19/20 10:08
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 90.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.22 g	10.00 mL	409241	09/02/20 20:39	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409777	09/04/20 16:08	YH	TAL SAC

Client Sample ID: 20BET-SS-G6
Lab Sample ID: 320-63955-52
Date Collected: 08/19/20 10:10
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407279	08/27/20 13:55	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Client Sample ID: 20BET-SS-G6
Lab Sample ID: 320-63955-52
Date Collected: 08/19/20 10:10
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 83.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.29 g	10.00 mL	409241	09/02/20 20:39	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409777	09/04/20 16:18	YH	TAL SAC

Client Sample ID: 20BET-SS-G7
Lab Sample ID: 320-63955-53
Date Collected: 08/19/20 10:12
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407279	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-G7
Lab Sample ID: 320-63955-53
Date Collected: 08/19/20 10:12
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 51.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.31 g	10.0 mL	407018	08/27/20 04:46	NSS	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			408542	09/01/20 19:38	A1C	TAL SAC

Client Sample ID: 20BET-SS-G10
Lab Sample ID: 320-63955-54
Date Collected: 08/19/20 09:54
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407279	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-SS-G10
Lab Sample ID: 320-63955-54
Date Collected: 08/19/20 09:54
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 90.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.13 g	10.00 mL	409241	09/02/20 20:39	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409777	09/04/20 16:27	YH	TAL SAC

Client Sample ID: 20BET-Sub-01
Lab Sample ID: 320-63955-55
Date Collected: 08/19/20 10:50
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407279	08/27/20 13:55	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Client Sample ID: 20BET-Sub-01

Lab Sample ID: 320-63955-55

Date Collected: 08/19/20 10:50

Matrix: Solid

Date Received: 08/25/20 09:50

Percent Solids: 80.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			27.013 g	25 mL	406586	08/25/20 18:14	SO1	TAL SAC
Total/NA	Analysis	8260C		1	1 mL	50 mL	408442	09/01/20 16:16	AP1	TAL SAC
Total/NA	Prep	5035			27.013 g	25 mL	406586	08/25/20 18:14	SO1	TAL SAC
Total/NA	Analysis	AK101		1	1 mL	50 mL	408441	09/01/20 16:16	AP1	TAL SAC
Total/NA	Prep	3546			10.12 g	1 mL	408031	08/31/20 07:48	MBG	TAL SAC
Total/NA	Analysis	8270D SIM		10			408593	09/01/20 23:56	Y1S	TAL SAC
Total/NA	Prep	AK102	RE		30.23 g	3 mL	410567	09/09/20 09:17	MBG	TAL SAC
Total/NA	Analysis	AK102 & 103	RE	5			412344	09/14/20 20:12	VMN	TAL SAC
Total/NA	Prep	AK102			30.85 g	3 mL	408389	09/01/20 07:19	MBG	TAL SAC
Total/NA	Analysis	AK102 & 103		5			410385	09/09/20 04:18	K1D	TAL SAC
Total/NA	Prep	SHAKE			5.14 g	10.00 mL	409241	09/02/20 20:39	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409777	09/04/20 16:37	YH	TAL SAC
Total/NA	Prep	SHAKE	DL		5.14 g	10.00 mL	409241	09/02/20 20:39	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	DL	10			410249	09/08/20 10:06	JY1	TAL SAC

Client Sample ID: 20BET-Sub-02

Lab Sample ID: 320-63955-56

Date Collected: 08/19/20 10:55

Matrix: Solid

Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407279	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-Sub-02

Lab Sample ID: 320-63955-56

Date Collected: 08/19/20 10:55

Matrix: Solid

Date Received: 08/25/20 09:50

Percent Solids: 79.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			26.708 g	25 mL	406586	08/25/20 18:14	SO1	TAL SAC
Total/NA	Analysis	8260C		1	1 mL	50 mL	408442	09/01/20 17:02	AP1	TAL SAC
Total/NA	Prep	5035			26.708 g	25 mL	406586	08/25/20 18:14	SO1	TAL SAC
Total/NA	Analysis	AK101		1	1 mL	50 mL	408441	09/01/20 17:02	AP1	TAL SAC
Total/NA	Prep	3546			10.99 g	1 mL	408031	08/31/20 07:48	MBG	TAL SAC
Total/NA	Analysis	8270D SIM		10			408593	09/02/20 00:25	Y1S	TAL SAC
Total/NA	Prep	AK102	RE		30.40 g	3 mL	410567	09/09/20 09:17	MBG	TAL SAC
Total/NA	Analysis	AK102 & 103	RE	5			412344	09/14/20 20:42	VMN	TAL SAC
Total/NA	Prep	AK102			30.36 g	3 mL	408389	09/01/20 07:19	MBG	TAL SAC
Total/NA	Analysis	AK102 & 103		5			410385	09/09/20 04:46	K1D	TAL SAC
Total/NA	Prep	SHAKE			5.08 g	10.00 mL	409241	09/02/20 20:39	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409777	09/04/20 16:46	YH	TAL SAC
Total/NA	Prep	SHAKE	DL		5.08 g	10.00 mL	409241	09/02/20 20:39	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	DL	10			410249	09/08/20 10:15	JY1	TAL SAC

Client Sample ID: 20BET-Sub-20

Lab Sample ID: 320-63955-57

Date Collected: 08/19/20 10:45

Matrix: Solid

Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407279	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-Sub-20

Lab Sample ID: 320-63955-57

Date Collected: 08/19/20 10:45

Matrix: Solid

Date Received: 08/25/20 09:50

Percent Solids: 69.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			27.147 g	25 mL	406586	08/25/20 18:14	SO1	TAL SAC
Total/NA	Analysis	8260C		1	1 mL	50 mL	408442	09/01/20 17:25	AP1	TAL SAC
Total/NA	Prep	5035			27.147 g	25 mL	406586	08/25/20 18:14	SO1	TAL SAC
Total/NA	Analysis	AK101		1	1 mL	50 mL	408441	09/01/20 17:25	AP1	TAL SAC
Total/NA	Prep	3546			10.93 g	1 mL	408031	08/31/20 07:48	MBG	TAL SAC
Total/NA	Analysis	8270D SIM		10			408593	09/02/20 00:54	Y1S	TAL SAC
Total/NA	Prep	AK102	RE		30.21 g	3 mL	410567	09/09/20 09:17	MBG	TAL SAC
Total/NA	Analysis	AK102 & 103	RE	5			412344	09/14/20 21:13	VMN	TAL SAC
Total/NA	Prep	AK102			30.34 g	3 mL	408389	09/01/20 07:19	MBG	TAL SAC
Total/NA	Analysis	AK102 & 103		5			410385	09/09/20 05:15	K1D	TAL SAC
Total/NA	Prep	SHAKE			5.09 g	10.00 mL	409241	09/02/20 20:39	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409777	09/04/20 17:33	YH	TAL SAC
Total/NA	Prep	SHAKE	DL		5.09 g	10.00 mL	409241	09/02/20 20:39	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	DL	10			410249	09/08/20 10:43	JY1	TAL SAC

Client Sample ID: 20BET-Sub-03

Lab Sample ID: 320-63955-58

Date Collected: 08/19/20 11:00

Matrix: Solid

Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			407279	08/27/20 13:55	TCS	TAL SAC

Client Sample ID: 20BET-Sub-03

Lab Sample ID: 320-63955-58

Date Collected: 08/19/20 11:00

Matrix: Solid

Date Received: 08/25/20 09:50

Percent Solids: 82.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			28.065 g	25 mL	406586	08/25/20 18:14	SO1	TAL SAC
Total/NA	Analysis	8260C		1	1 mL	50 mL	408442	09/01/20 17:47	AP1	TAL SAC
Total/NA	Prep	5035			28.065 g	25 mL	406586	08/25/20 18:14	SO1	TAL SAC
Total/NA	Analysis	AK101		1	1 mL	50 mL	408441	09/01/20 17:47	AP1	TAL SAC
Total/NA	Prep	3546			10.94 g	1 mL	408031	08/31/20 07:48	MBG	TAL SAC
Total/NA	Analysis	8270D SIM		10			408593	09/02/20 01:24	Y1S	TAL SAC
Total/NA	Prep	AK102	RE		30.11 g	3 mL	410567	09/09/20 09:17	MBG	TAL SAC
Total/NA	Analysis	AK102 & 103	RE	5			412344	09/14/20 21:43	VMN	TAL SAC
Total/NA	Prep	AK102			30.29 g	3 mL	408389	09/01/20 07:19	MBG	TAL SAC
Total/NA	Analysis	AK102 & 103		5			410385	09/09/20 05:44	K1D	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Client Sample ID: 20BET-Sub-03

Lab Sample ID: 320-63955-58
Date Collected: 08/19/20 11:00
Matrix: Solid
Date Received: 08/25/20 09:50
Percent Solids: 82.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.41 g	10.00 mL	409241	09/02/20 20:39	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			409777	09/04/20 17:43	YH	TAL SAC
Total/NA	Prep	SHAKE	DL		5.41 g	10.00 mL	409241	09/02/20 20:39	AP	TAL SAC
Total/NA	Analysis	EPA 537(Mod)	DL	10			410249	09/08/20 10:53	JY1	TAL SAC

Client Sample ID: Field Blank

Lab Sample ID: 320-63955-59
Date Collected: 08/19/20 11:10
Matrix: Water
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			288.2 mL	10.0 mL	407019	08/27/20 04:51	EG	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			407272	08/27/20 16:46	S1M	TAL SAC

Client Sample ID: Trip Blank

Lab Sample ID: 320-63955-60
Date Collected: 08/19/20 08:30
Matrix: Solid
Date Received: 08/25/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			25 g	25 mL	406586	08/25/20 18:14	SO1	TAL SAC
Total/NA	Analysis	8260C		1	1 mL	50 mL	408442	09/01/20 13:16	AP1	TAL SAC
Total/NA	Prep	5035			25 g	25 mL	406586	08/25/20 18:14	SO1	TAL SAC
Total/NA	Analysis	AK101		1	1 mL	50 mL	408441	09/01/20 13:16	AP1	TAL SAC

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Laboratory: Eurofins TestAmerica, Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	01-20-21

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
8260C	5035	Solid	1,1-Dichloropropene
8260C	5035	Solid	1,2-Dibromo-3-Chloropropane
8260C	5035	Solid	1,3-Dichloropropane
8260C	5035	Solid	2,2-Dichloropropane
8260C	5035	Solid	2-Chlorotoluene
8260C	5035	Solid	4-Chlorotoluene
8260C	5035	Solid	Bromochloromethane
8260C	5035	Solid	p-Isopropyltoluene
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids
EPA 537(Mod)	3535	Water	DONA
EPA 537(Mod)	3535	Water	F-53B Major
EPA 537(Mod)	3535	Water	F-53B Minor
EPA 537(Mod)	3535	Water	HFPO-DA (GenX)
EPA 537(Mod)	3535	Water	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)
EPA 537(Mod)	3535	Water	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)
EPA 537(Mod)	3535	Water	Perfluorobutanesulfonic acid (PFBS)
EPA 537(Mod)	3535	Water	Perfluorodecanoic acid (PFDA)
EPA 537(Mod)	3535	Water	Perfluorododecanoic acid (PFDoA)
EPA 537(Mod)	3535	Water	Perfluoroheptanoic acid (PFHpA)
EPA 537(Mod)	3535	Water	Perfluorohexanesulfonic acid (PFHxS)
EPA 537(Mod)	3535	Water	Perfluorohexanoic acid (PFHxA)
EPA 537(Mod)	3535	Water	Perfluorononanoic acid (PFNA)
EPA 537(Mod)	3535	Water	Perfluorooctanesulfonic acid (PFOS)
EPA 537(Mod)	3535	Water	Perfluorooctanoic acid (PFOA)
EPA 537(Mod)	3535	Water	Perfluorotetradecanoic acid (PFTeA)
EPA 537(Mod)	3535	Water	Perfluorotridecanoic acid (PFTriA)
EPA 537(Mod)	3535	Water	Perfluoroundecanoic acid (PFUnA)
EPA 537(Mod)	SHAKE	Solid	DONA
EPA 537(Mod)	SHAKE	Solid	F-53B Major
EPA 537(Mod)	SHAKE	Solid	F-53B Minor
EPA 537(Mod)	SHAKE	Solid	HFPO-DA (GenX)
EPA 537(Mod)	SHAKE	Solid	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)
EPA 537(Mod)	SHAKE	Solid	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)
EPA 537(Mod)	SHAKE	Solid	Perfluorobutanesulfonic acid (PFBS)
EPA 537(Mod)	SHAKE	Solid	Perfluorodecanoic acid (PFDA)
EPA 537(Mod)	SHAKE	Solid	Perfluorododecanoic acid (PFDoA)
EPA 537(Mod)	SHAKE	Solid	Perfluoroheptanoic acid (PFHpA)
EPA 537(Mod)	SHAKE	Solid	Perfluorohexanesulfonic acid (PFHxS)
EPA 537(Mod)	SHAKE	Solid	Perfluorohexanoic acid (PFHxA)
EPA 537(Mod)	SHAKE	Solid	Perfluorononanoic acid (PFNA)
EPA 537(Mod)	SHAKE	Solid	Perfluorooctanesulfonic acid (PFOS)

Laboratory: Eurofins TestAmerica, Sacramento (Continued)

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	01-20-21

EPA 537(Mod)	SHAKE	Solid	Perfluorooctanoic acid (PFOA)
EPA 537(Mod)	SHAKE	Solid	Perfluorotetradecanoic acid (PFTeA)
EPA 537(Mod)	SHAKE	Solid	Perfluorotridecanoic acid (PFTriA)
EPA 537(Mod)	SHAKE	Solid	Perfluoroundecanoic acid (PFUnA)

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL SAC
AK101	Alaska - Gasoline Range Organics (GC/MS)	ADEC	TAL SAC
8270D SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	TAL SAC
AK102 & 103	Alaska - Diesel Range Organics & Residual Range Organics (GC)	ADEC	TAL SAC
EPA 537(Mod)	PFAS for QSM 5.1, Table B-15	EPA	TAL SAC
D 2216	Percent Moisture	ASTM	TAL SAC
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC
3546	Microwave Extraction	SW846	TAL SAC
5035	Closed System Purge and Trap	SW846	TAL SAC
AK102	Alaska Extraction (Diesel Range Organic Compounds)	ADEC	TAL SAC
SHAKE	Shake Extraction with Ultrasonic Bath Extraction	SW846	TAL SAC

Protocol References:

ADEC = Alaska Department of Environmental Conservation
ASTM = ASTM International
EPA = US Environmental Protection Agency
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-63955-1	20BET-SS-A1	Solid	08/19/20 07:55	08/25/20 09:50	
320-63955-2	20BET-SS-A2	Solid	08/19/20 07:57	08/25/20 09:50	
320-63955-3	20BET-SS-A3	Solid	08/19/20 07:59	08/25/20 09:50	
320-63955-4	20BET-SS-A4	Solid	08/19/20 08:01	08/25/20 09:50	
320-63955-5	20BET-SS-A5	Solid	08/19/20 08:03	08/25/20 09:50	
320-63955-6	20BET-SS-A6	Solid	08/19/20 08:05	08/25/20 09:50	
320-63955-7	20BET-SS-A7	Solid	08/19/20 08:07	08/25/20 09:50	
320-63955-8	20BET-SS-A10	Solid	08/19/20 07:53	08/25/20 09:50	
320-63955-9	20BET-SS-B1	Solid	08/19/20 08:12	08/25/20 09:50	
320-63955-10	20BET-SS-B2	Solid	08/19/20 08:14	08/25/20 09:50	
320-63955-11	20BET-SS-B3	Solid	08/19/20 08:16	08/25/20 09:50	
320-63955-12	20BET-SS-B4	Solid	08/19/20 08:18	08/25/20 09:50	
320-63955-13	20BET-SS-B5	Solid	08/19/20 08:20	08/25/20 09:50	
320-63955-14	20BET-SS-B6	Solid	08/19/20 08:22	08/25/20 09:50	
320-63955-15	20BET-SS-B7	Solid	08/19/20 08:24	08/25/20 09:50	
320-63955-16	20BET-SS-C1	Solid	08/19/20 08:35	08/25/20 09:50	
320-63955-17	20BET-SS-C2	Solid	08/19/20 08:37	08/25/20 09:50	
320-63955-18	20BET-SS-C3	Solid	08/19/20 08:39	08/25/20 09:50	
320-63955-19	20BET-SS-C4	Solid	08/19/20 08:41	08/25/20 09:50	
320-63955-20	20BET-SS-C5	Solid	08/19/20 08:43	08/25/20 09:50	
320-63955-21	20BET-SS-C6	Solid	08/19/20 08:45	08/25/20 09:50	
320-63955-22	20BET-SS-C7	Solid	08/19/20 08:47	08/25/20 09:50	
320-63955-23	20BET-SS-C10	Solid	08/19/20 08:33	08/25/20 09:50	
320-63955-24	20BET-SS-D1	Solid	08/19/20 09:05	08/25/20 09:50	
320-63955-25	20BET-SS-D2	Solid	08/19/20 09:07	08/25/20 09:50	
320-63955-26	20BET-SS-D3	Solid	08/19/20 09:09	08/25/20 09:50	
320-63955-27	20BET-SS-D4	Solid	08/19/20 09:11	08/25/20 09:50	
320-63955-28	20BET-SS-D5	Solid	08/19/20 09:13	08/25/20 09:50	
320-63955-29	20BET-SS-D6	Solid	08/19/20 09:15	08/25/20 09:50	
320-63955-30	20BET-SS-D7	Solid	08/19/20 09:17	08/25/20 09:50	
320-63955-31	20BET-SS-D10	Solid	08/19/20 09:01	08/25/20 09:50	
320-63955-32	20BET-SS-E1	Solid	08/19/20 09:25	08/25/20 09:50	
320-63955-33	20BET-SS-E2	Solid	08/19/20 09:27	08/25/20 09:50	
320-63955-34	20BET-SS-E3	Solid	08/19/20 09:29	08/25/20 09:50	
320-63955-35	20BET-SS-E4	Solid	08/19/20 09:31	08/25/20 09:50	
320-63955-36	20BET-SS-E5	Solid	08/19/20 09:33	08/25/20 09:50	
320-63955-37	20BET-SS-E6	Solid	08/19/20 09:35	08/25/20 09:50	
320-63955-38	20BET-SS-E7	Solid	08/19/20 09:37	08/25/20 09:50	
320-63955-39	20BET-SS-F1	Solid	08/19/20 09:40	08/25/20 09:50	
320-63955-40	20BET-SS-F2	Solid	08/19/20 09:42	08/25/20 09:50	
320-63955-41	20BET-SS-F3	Solid	08/19/20 09:44	08/25/20 09:50	
320-63955-42	20BET-SS-F4	Solid	08/19/20 09:46	08/25/20 09:50	
320-63955-43	20BET-SS-F5	Solid	08/19/20 09:48	08/25/20 09:50	
320-63955-44	20BET-SS-F6	Solid	08/19/20 09:50	08/25/20 09:50	
320-63955-45	20BET-SS-F7	Solid	08/19/20 09:52	08/25/20 09:50	
320-63955-46	20BET-SS-F10	Solid	08/19/20 09:30	08/25/20 09:50	
320-63955-47	20BET-SS-G1	Solid	08/19/20 10:00	08/25/20 09:50	
320-63955-48	20BET-SS-G2	Solid	08/19/20 10:02	08/25/20 09:50	
320-63955-49	20BET-SS-G3	Solid	08/19/20 10:04	08/25/20 09:50	
320-63955-50	20BET-SS-G4	Solid	08/19/20 10:06	08/25/20 09:50	
320-63955-51	20BET-SS-G5	Solid	08/19/20 10:08	08/25/20 09:50	
320-63955-52	20BET-SS-G6	Solid	08/19/20 10:10	08/25/20 09:50	
320-63955-53	20BET-SS-G7	Solid	08/19/20 10:12	08/25/20 09:50	

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: BET AFFF Site

Job ID: 320-63955-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-63955-54	20BET-SS-G10	Solid	08/19/20 09:54	08/25/20 09:50	
320-63955-55	20BET-Sub-01	Solid	08/19/20 10:50	08/25/20 09:50	
320-63955-56	20BET-Sub-02	Solid	08/19/20 10:55	08/25/20 09:50	
320-63955-57	20BET-Sub-20	Solid	08/19/20 10:45	08/25/20 09:50	
320-63955-58	20BET-Sub-03	Solid	08/19/20 11:00	08/25/20 09:50	
320-63955-59	Field Blank	Water	08/19/20 11:10	08/25/20 09:50	
320-63955-60	Trip Blank	Solid	08/19/20 08:30	08/25/20 09:50	

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600
www.shannonwilson.com

CHAIN-OF-CUSTODY RECORD

Laboratory Test America
Attn:

Turn Around Time: [X] Normal [ ] Rush — Please Specify

Quote No:

J-Flags: [X] Yes [ ] No

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFAS (EPA 537 M)	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
20BET-SS-A1		7:55	8/19/20	x	1	Soil Grab Sample
20BET-SS-A2		7:57		x	1	
20BET-SS-A3		7:59		x	1	
20BET-SS-A4		8:01		x	1	
20BET-SS-A5		8:02		x	1	
20BET-SS-A6		8:05		x	1	
20BET-SS-A7		8:07		x	1	
20BET-SS-A10		7:53		x	1	
20BET-SS-B1		8:12		x	1	
20BET-SS-B2		8:14		x	1	

320-63955 Chain of Custody

Project Information	
Number:	104507
Name:	BET AFFF Site
Contact:	Ashley Jaramillo
Ongoing Project?	Yes [X] No [ ]
Sampler:	APW / VTY

Sample Receipt	
Total No. of Containers:	81
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Temp:	
Delivery Method:	AK Air Cargo

Notes:

Reliquished By: 1.	Reliquished By: 2.	Reliquished By: 3.
Signature: Time: 1500	Signature: Time: 1520	Signature: Time:
Printed Name: Date: 8/19/20	Printed Name: Date: 8/24/2020	Printed Name: Date:
Veselina Yakimova	Kim Preston	
Company: Shannon & Wilson	Company: ETA Sac	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 1400	Signature: Time: 9 TO	Signature: Time:
Printed Name: Date: 8/24/2020	Printed Name: Date: 8/25/20	Printed Name: Date:
Kim Preston	Sarah Thompson	
Company: ETA Sac	Company: ETA Sac	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

4.3 cw 4.8
7.3 cw 7.8

No. 411596

SHANNON & WILSON, INC.
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CHAIN-OF-CUSTODY RECORD

Page 2 of 7
Laboratory Test America
Attn:

Turn Around Time: ☒ Normal ☐ Rush
Please Specify

Quote No:

J-Flags: ☒ Yes ☐ No

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFAS (EPA 537 M)	VOCs (SW8260C)	GRO (AK101)	DRO (AK102)	RRO (AK103)	PAH (SW8270D SIM)		Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
20BET-SS-B3		8:16	8/19/20	x							1	Soil Grab Sample
20BET-SS-B4		8:18	↓	x							1	↓
20BET-SS-B5		8:20	↓	x							1	↓
20BET-SS-B6		8:22	↓	x							1	↓
20BET-SS-B7		8:24	↓	x							1	↓
20BET-SS-C1		8:35	↓	x							1	↓
20BET-SS-C2		8:37	↓	x							1	↓
20BET-SS-C3		8:39	↓	x							1	↓
20BET-SS-C4		8:41	↓	x							1	↓
* 20BET-SS-C5		8:43	↓	x	x	x	x	x	x		3	↓

Project Information	
Number:	104507
Name:	BET AFFF Site
Contact:	Ashley Jaramillo
Ongoing Project?	Yes ☒ No ☐
Sampler:	APW / VTY

Sample Receipt	
Total No. of Containers:	81
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Temp:	
Delivery Method:	AK Air Cargo

	Reliquished By: 1.	Reliquished By: 2.	Reliquished By: 3.
Signature:	[signature]	[signature]	
Time:	1500	1500	
Printed Name:	VESELINA YAKIMOVA	Kim Presley	
Date:	8/19/20	8/24/20	
Company:	Shannon & Wilson	EMA Sea	

	Received By: 1.	Received By: 2.	Received By: 3.
Signature:	[signature]	[signature]	
Time:	1400	950	
Printed Name:	Kim Presley	Sarah Thompson	
Date:	8/24/20	8/25/20	
Company:	EM Sea	ETA Sac	

Notes:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

* 2 of 3 Containers out of temp. 4oz Soil Jar Amber / Soil Jar clear SO 8/25/20 4.3 cw 4.8 7.3 cw 7.8

No. 411597

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600
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CHAIN-OF-CUSTODY RECORD

Laboratory Test America
Attn:

Turn Around Time: [X] Normal [ ] Rush — Please Specify

Quote No:

J-Flags: [X] Yes [ ] No

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFAS (EPA 537 M)	VOCs (SW8260C)	GRO (AK101)	DRO (AK102)	RRO (AK103)	PAH (SW8270D SIM)	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
20BET-SS-C6		8:45	8/19/20	X						1	Soil Grab Sample
20BET-SS-C7		8:47		X						1	
20BET-SS-C10		8:33		X	X	X	X	X	X	3	
20BET-SS-D1		9:05		X						1	
20BET-SS-D2		9:07		X						1	
20BET-SS-D3		9:09		X						1	
20BET-SS-D4		9:11		X	X	X	X	X	X	3	
20BET-SS-D5		9:13		X						1	
20BET-SS-D6		9:15		X						1	
20BET-SS-D7		9:17		X						1	

Project Information	
Number:	104507
Name:	BET AFFF Site
Contact:	Ashley Jaramillo
Ongoing Project?	Yes [X] No [ ]
Sampler:	APW / VTY

Sample Receipt	
Total No. of Containers:	81
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Temp:	
Delivery Method:	AK Air Cargo

Notes:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: BG	Signature: KMP	Signature:
Time: 1500	Time: 1500	Time:
Printed Name: VESELINA YAKIMOVA	Printed Name: Kim Presley	Printed Name:
Date: 8/19/20	Date: 8/24/20	Date:
Company: Shannon & Wilson	Company: ETA Sea	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature:	Signature:	Signature:
Time: 1400	Time: 910	Time:
Printed Name: Kim Presley	Printed Name: Sarah Thompson	Printed Name:
Date: 8/24/20	Date: 8/25/20	Date:
Company: ETA Sea	Company: ETA Sea	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

4.3 cw 4.8
7.3 cw 7.8

No. 411576

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CHAIN-OF-CUSTODY RECORD

Laboratory: Test America
Attn:

Turn Around Time:	
[X] Normal	[ ] Rush
Please Specify	

Quote No:

J-Flags: [X] Yes [ ] No

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFAS (EPA 537 M)	VOCs (SW 8260C)	GRO (AK 101)	DRO (AK 102)	RRO (AK 103)	PAHs (SW8270D SIM)		Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
20BET-SS-D10		9:01	8/19/20	X	X	X	X	X	X		3	Soil Grab Sample
20BET-SS-E1		9:25	↓	X							1	↓
20BET-SS-E2		9:27	↓	X							1	↓
20BET-SS-E3		9:29	↓	X							1	↓
20BET-SS-E4		9:31	↓	X							1	↓
20BET-SS-E5		9:33	↓	X							1	↓
20BET-SS-E6		9:35	↓	X							1	↓
20BET-SS-E7		9:37	↓	X							1	↓
20BET-SS-F1		9:40	↓	X							1	↓
20BET-SS-F2		9:42	↓	X							1	↓

Project Information	
Number:	104507
Name:	BET AFFF Site
Contact:	Ashley Jaramillo
Ongoing Project?	Yes [X] No [ ]
Sampler:	APW / VTY

Sample Receipt	
Total No. of Containers:	81
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Temp:	
Delivery Method:	AK Air Cargo

	Reliquished By: 1.	Reliquished By: 2.	Reliquished By: 3.
Signature:	[signature]	[signature]	
Time:	1500	1500	
Printed Name:	VESELINA YAKIMOVA	Kim Presley	
Date:	8/19/20	8/24/20	
Company:	Shannon & Wilson	ETA Sea	

	Received By: 1.	Received By: 2.	Received By: 3.
Signature:	[signature]	[signature]	
Time:	1900	950	
Printed Name:	Kim Presley	Sarah Thompson	
Date:	8/24/20	8/25/20	
Company:	ETA Sea	ETASea	

Notes:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

○ 4oz Soil dr Amber ID as 20BET-SS-, time/date good so 8/25/20 Cap had D10 4.3 cr 4.8 7.3 cr 7.8 !! 4oz plastic no ID but cap had D10 SS 8/25/20

No. 411577

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Laboratory Test America
Attn:

Turn Around Time: [X] Normal [ ] Rush — Please Specify

Quote No:

J-Flags: [X] Yes [ ] No

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFAS (EPA 537 M)	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
20BET-SS-F3		9:44	8/19/20	x	1	Soil Grab Sample
20BET-SS-F4		9:46		x	1	
20BET-SS-F5		9:48		x	1	
20BET-SS-F6		9:50		x	1	
20BET-SS-F7		9:52		x	1	
20BET-SS-F10		9:30		x	1	
20BET-SS-G1		10:00		x	1	
20BET-SS-G2		10:02		x	1	
20BET-SS-G3		10:04		x	1	
20BET-SS-G4		10:06		x	1	

Project Information	
Number:	104507
Name:	BET
Contact:	Ashley Jaramillo
Ongoing Project?	Yes [X] No [ ]
Sampler:	APW / VTY

Sample Receipt	
Total No. of Containers:	81
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Temp:	
Delivery Method:	Ak Air Cargo

Notes:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [signature] Time: 1500	Signature: [signature] Time: 1900	Signature: Time:
Printed Name: VESELINA YAKIMOVA Date: 8/19/20	Printed Name: Kim Presley Date: 8/24/20	Printed Name: Date:
Company: Shannon & Wilson	Company: ETA Sea	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: [signature] Time: 1400	Signature: [signature] Time: ~~1520~~ 0950 ET 8/25/20	Signature: Time:
Printed Name: Kim Presley Date: 8/24/20	Printed Name: Sarah Thompson Date: 8/25/20	Printed Name: Date:
Company: ETA Sea	Company: ETA Sea	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

4.3 cw 4.8
7.3 cw 7.8

No. 411589

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CHAIN-OF-CUSTODY RECORD

Page 6 of 7
Laboratory: Test America
Attn:

Turn Around Time: [X] Normal [ ] Rush
Please Specify

Quote No:

J-Flags: [X] Yes [ ] No

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFAS (EPA 537 M)	VOCs (SW 8260C)	GRO (AK 101)	DRO (AK 102)	RRO (AK 103)	PAHs (SW 8270D SIM)			Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
20BET-SS-G5		10:08	8/19/20	X								1	Soil Grab Sample
20BET-SS-G6		10:10	↓	X								1	↓
20BET-SS-G7		10:12	↓	X								1	↓
20BET-SS-G10		9:54	↓	X								1	↓
20BET-Sub-01		10:50	↓	X	X	X	X	X	X			3	↓
20BET-Sub-02		10:55	↓	X	X	X	X	X	X			3	↓
20BET-Sub-20		10:45	↓	X	X	X	X	X	X			3	↓
20BET-Sub-03		11:00	↓	X	X	X	X	X	X			3	↓
Field Blank		11:10	↓	X								2	DI water Field Blank
Trip Blank		8:30	↓	[struck out]	X	X						1	MeOH Trip Blank

Project Information	
Number:	104507
Name:	BET AFFF Site
Contact:	Ashley Jaramillo
Ongoing Project?	Yes [X] No [ ]
Sampler:	APW / VTY

Sample Receipt	
Total No. of Containers:	81
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Temp:	
Delivery Method:	AK Air Cargo

	Reliquished By: 1.	Reliquished By: 2.	Reliquished By: 3.
Signature:	[signature]	[signature]	
Time:	1500	1900	
Printed Name:	VESELINA YAKIMOVA	Kim Presley	
Date:	8/19/20	8/24/20	
Company:	Shannon & Wilson	ETA Sea	

	Received By: 1.	Received By: 2.	Received By: 3.
Signature:	[signature]	[signature]	
Time:	1400	950	
Printed Name:	Kim Presley	Sarah Thompson	
Date:	8/24/20	8/25/20	
Company:	ETA Sea	ETA Sea	

Notes:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

• All containers out of temp SO 8/25/20 4.3 cr 4.8
- 2 of 3 containers ID as 20 BET-Sub-1 missing 0(zero) after Sub- SO 8/25/20 7.3 cr 7.8
4oz Amber 4oz Plastic

No. 411590

CHAIN-OF-CUSTODY RECORD

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Attn:

Turn Around Time:	Quote No:
[X] Normal [ ] Rush	J-Flags: [X] Yes [ ] No
Please Specify	

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFAS (EPA 537 M)	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
20BET-SS-MS		8:43	8/19/20	x	1	MS sample - surface
20BET-SS-MSD		8:43	↓	x	1	MSD sample - surface
20BET-Sub-MS		10:55	↓	x	1	MS sample - subsurface
20BET-Sub-MSD		10:55	↓	x	1	MSD sample - subsurface

Project Information	
Number:	104507
Name:	BET AFFF site
Contact:	Ashley Jaramillo
Ongoing Project?	Yes [X] No [ ]
Sampler:	APW / VTY

Sample Receipt	
Total No. of Containers:	81
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Temp:	
Delivery Method:	AK Air Cargo

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [signature] Time: 1500	Signature: [signature] Time: 1500	Signature: Time:
Printed Name: VESELINA YAKIMOVA Date: 8/19/20	Printed Name: Kim Presley Date: 8/19/20	Printed Name: Date:
Company: Shannon & Wilson	Company: ETT Sea	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: [signature] Time: 1430	Signature: [signature] Time: 8/20/20	Signature: Time:
Printed Name: Kim Presley Date: 8/20/20	Printed Name: Sarah Thompson Date: 950	Printed Name: Date:
Company: ETT Sea	Company: ETT Sea	Company:

Notes:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

4.3 cw 4.8
7.3 cw 7.8

No. 411591

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-63955-1

Login Number: 63955
List Number: 1
Creator: Oropeza, Salvador

List Source: Eurofins TestAmerica, Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	1386203, 1386202
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	False	Refer to Job Narrative for details.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

Laboratory Data Review Checklist

Completed By:

Amber Masters/Ashley Jaramillo

Title:

Environmental Scientist/Senior Chemist

Date:

November 23, 2020

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

Eurofins TestAmerica Laboratories, Inc. (TestAmerica)

Laboratory Report Number:

320-63955-1 Rev 1

Laboratory Report Date:

September 28, 2020

CS Site Name:

ADOT & PF Bethel Airport Grant Aviation Plane Crash PFAS

ADEC File Number:

2407.38.030

Hazard Identification Number:

27139

Laboratory Report Date:

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   The requested analyses were conducted by Eurofins TestAmerica of West Sacramento, CA.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   Samples were not transferred to another network laboratory or sub-contracted to an alternate laboratory.

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☐ No☒ N/A☐ Comments:

   Sample receipt checklist refers to the case narrative for details regarding cooler temperatures and other discrepancies between the containers as they were received and the COC. See section 4.b. for further details.

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☒ No☐ N/A☐ Comments:

   c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

   Yes☒ No☐ N/A☐ Comments:

   Aside from those items noted in 3.a, above, samples arrive in good condition.

Laboratory Report Date:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes☒ No☐ N/A☐ Comments:

These items were documented in the case narrative section of the report, see Section 4.b. for more details.

e. Data quality or usability affected?

Comments:

See Section 4.b.

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☒ No☐ N/A☐ Comments:

The case narrative described method blank, MS/MSD, LCS/LCSD, and surrogate/IDA recovery discrepancies discussed in Section 6. The case narrative described additional discrepancies, which are discussed here.

One of two coolers was received out of temperature. The cooler temperature was 7.8 °C. A temperature blank was provided. Ice was received in ziploc bags that were separated by a thick layer of bubble wrap. The following samples for VOC, GRO, DRO, RRO, PAH, and PFAS analysis were listed out of temperature:

- *20BET-SS-C5*, 2 of 3 containers were out of temp. 4 oz soil jar and 4 oz soil jar with MeOH.
- *20BET-SS-C10*, 2 of 3 containers were out of temp. 4 oz soil jar and 4 oz soil jar with MeOH.
- *20BET-SS-D4*, 2 of 3 containers were out of temp. 4 oz soil jar and 4 oz soil jar with MeOH.
- *20BET-SS-D10*, 2 of 3 containers were out of temp. 4 oz soil jar and 4 oz soil jar with MeOH.
- *20BET-SS-E1, 20BET-SS-E2, 20BET-SS-E3, 20BET-SS-E4, 20BET-SS-E5, 20BET-SS-E6, 20BET-SS-E7, 20BET-SS-F1, 20BET-SS-F2, 20BET-SS-F3, 20BET-SS-F4, 20BET-SS-F5, 20BET-SS-F6, 20BET-SS-F7, 20BET-SS-F10, 20BET-SS-G1, 20BET-SS-G2, 20BET-SS-G3, 20BET-SS-G4, 20BET-SS-G5, 20BET-SS-G6, 20BET-SS-G7, 20BET-SS-G10, 20BET-Sub-01, 20BET-Sub-02, 20BET-Sub-20, and 20BET-Sub-03.*

PFAS analysis allows a range of 0- 10°C, therefore PFAS data quality and/or usability are not affected for samples analyzed for PFAS. Detected results for VOC, GRO, DRO, RRO, and PAH in the samples noted are considered estimates, low biased, and have been flagged JL*. Non-detected results for VOC, GRO, DRO, RRO, and PAH in the samples noted are considered estimates with no direction of bias and have been flagged J*.

Laboratory Report Date:

The VOC continuing calibration verification (CCV) associated with batch 320-408442 recovered above the upper control limit for Bromomethane, Chloroethane and Trichlorofluoromethane. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. Data quality and/or usability not affected.

The following VOC samples were diluted to bring the concentration of target analytes within the calibration range: *20BET-SS-C5, 20BET-SS-C10, 20BET-SS-D4 and 20BET-SS-D10*. Elevated reporting limits (RLs) are provided. Data quality and/or usability not affected.

VOC Internal standard (ISTD) response for TBA-d9 for the following sample was outside acceptance criteria: *20BET-SS-D4*. This ISTD does not correspond to any of the requested target compounds; therefore, the data have been reported. Data quality and/or usability not affected.

The following PAH samples were diluted due to the nature of the sample matrix: *20BET-SS-C5, 20BET-SS-D4, 20BET-SS-D10, 20BET-Sub-01, 20BET-Sub-02, 20BET-Sub-20 and 20BET-Sub-03.* Elevated RLs are provided. Data quality and/or usability not affected.

The following sample was diluted due to the nature of the sample matrix: *20BET-SS-C10*. Elevated RLs are provided. Data quality and/or usability not affected.

The following DRO/RRO samples were diluted to bring the concentration of target analytes within the calibration range: *20BET-Sub-01, 20BET-Sub-02, 20BET-Sub-20, and 20BET-Sub-03*. Elevated RLs are provided. Data quality and/or usability not affected.

The following DRO/RRO samples contained a hydrocarbon pattern in the diesel range; however, the elution pattern was earlier than the typical diesel fuel pattern used by the laboratory for quantitative purposes: *20BET-SS-C5, 20BET-SS-C10, 20BET-SS-D4, 20BET-SS-D10, 20BET-Sub-02, 20BET-Sub-20 and 20BET-Sub-03*. Data quality and/or usability not affected.

The PFAS first level standard from the initial calibration curve is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5amu; therefore, detection of the analyte serves as verification that the assigned mass is within +/- 0.5amu of the true value, which meets the DoD/DOE QSM tune criterion. Data quality and/or usability not affected.

The "I" qualifier on the following PFAS samples for the noted analytes means the transition mass ratio for those analytes was outside of the established ratio limits. The qualitative identification of the analytes has/have some degree of uncertainty. However, analyst judgment was used to positively identify the analyte. Consequently, the indicated PFAS analytes in the listed samples are considered estimates, with no direction of bias, and flagged J*.

- *PFHxS: 20BET-Sub-02, 20BET-SS-E5, 20BET-SS-F10, 20BET-SS-G2, 20BET-SS-G3, 20BET-SS-G4, 20BET-SS-G10, and 20BET-Sub-03*.
- *PFNA: 20BET-SS-G7*

Laboratory Report Date:

PFAS ISTD response for 13C2 PFOA for the following samples were outside acceptance criteria: *20BET-SS-A4 and 20BET-SS-B3*. The ISTD is not used to quantitate the target analytes; therefore, there is no impact on the data. The samples were re-analyzed with concurring results. Data quality and/or usability not affected.

PFAS results for samples *20BET-SS-A5, 20BET-SS-A10, 20BET-SS-B4, 20BET-SS-B5, 20BET-SS-C5, 20BET-SS-C5, 20BET-SS-C6, 20BET-SS-C10, 20BET-SS-D5, 20BET-Sub-01, 20BET-Sub-02, 20BET-Sub-02, 20BET-Sub-02, 20BET-Sub-20 and 20BET-Sub-03* were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits. Data quality and/or usability not affected.

The PFAS following sample exhibited matrix interferences for Perfluorohexanesulfonic acid (PFHxS) causing elevation of the RL: *20BET-Sub-20*. The RL for the affected analyte has been raised to be equal to the matrix, and a "G" qualifier applied by the laboratory. Data quality and/or usability not affected.

The wide scale industrial use of PFAS compounds in everyday products makes these compounds ubiquitous. As such, laboratories must work tirelessly to minimize the impact of this upon the analytical support for PFAS determination. The laboratory uses single use supplies whenever possible and has an extensive cleaning procedure for extraction equipment that is re-used. However, despite these procedural controls laboratory artifacts are not an uncommon occurrence. Unfortunately, this was the situation with your samples in question. In these circumstances, positives in method blank (MB) >1/2 RL for PFOS, the laboratory did re-extract and re-analyze your samples. The same or similar results for PFOS were detected which did confirm that the initially reported result for PFOS was due to laboratory artifact. Please review these results against your data quality objectives (DQO) and primary compounds of concern for the site for significance. Eurofins TestAmerica continues to evaluate its processes to reduce/eliminate PFOS in future sample sets. We do apologize for any inconvenience this may have caused. Both sets of data are reported. *20BET-SS-A2, 20BET-SS-A3, 20BET-SS-A4, 20BET-SS-A5, 20BET-SS-A6, 20BET-SS-A7, 20BET-SS-A10, 20BET-SS-B1, 20BET-SS-B2, 20BET-SS-B3, 20BET-SS-B4, 20BET-SS-B5, 20BET-SS-B6, 20BET-SS-B7, 20BET-SS-C1, 20BET-SS-C2, 20BET-SS-C3, 20BET-SS-C4, 20BET-SS-C5*. Results for the re-analyzed batch (320-408023) are included in the laboratory report, but do not appear in the analytical table. Only results from the original PFAS batch (320-407012) have been included in the analytical table. Additionally, other quality control issues related to the re-analyzed batch are not discussed in this checklist.

The following DRO samples were re-prepared outside of preparation holding time due to low percent recovery in the laboratory control sample and laboratory control sample duplicate: *20BET-SS-C5, 20BET-SS-C10, 20BET-SS-D4, 20BET-SS-D10, 20BET-Sub-01, 20BET-Sub-02, 20BET-Sub-20 and 20BET-Sub-03*. These samples are associated with method AK102_103 solids in preparation batch 320-410567. Results for this batch are included in the laboratory report, but do not appear in the analytical table. Only results from the in-hold DRO batch has been included in the analytical table. Additionally, other quality control issues related to the re-analyzed batch are not discussed in this checklist.

The following PFAS sample is gray after final volume: *20BET-SS-B7*.

Laboratory Report Date:

The following PFAS sample was yellow after extraction/final volume: *20BET-SS-D5*.

The following PFAS samples were observed to be gray after extraction/final volume: *20BET-SS-A5 and 20BET-SS-B7.*

The following PFAS samples were gray after extraction: *20BET-SS-D4 and 20BET-SS-D5*.

The following PFAS sample was gray after extraction: *20BET-SS-E6.*

The following PFAS samples are observed to be yellow after final voluming: *20BET-SS-F6, 20BET-SS-F7 and 20BET-SS-G2.*

The following PFAS samples are observed to be yellow after final voluming: *20BET-SS-G6, 20BET-SS-G7, 20BET-Sub-01, 20BET-Sub-02, 20BET-Sub-20 and 20BET-Sub-03.*

c. Were all corrective actions documented?

Yes☒ No☐ N/A☐ Comments:

Where required.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

See above.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

Holding times were met; however, DRO batch 320-410567 was re-analyzed outside of the method specified holding time. DRO results for batch 320-410567 are included in the laboratory report, but do not appear in the analytical table. Only results from the in-hold DRO batch has been included in the analytical table. Additionally, other quality control issues related to the re-analyzed batch are not discussed in this checklist. Data quality and/or usability not affected.

c. All soils reported on a dry weight basis?

Yes☒ No☐ N/A☐ Comments:

Laboratory Report Date:

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☐ No☒ N/A☐ Comments:

Analytical sensitivity was evaluated to verify that LOQs met the applicable DEC cleanup level for non-detect results, as appropriate. The following analytes in one or more project samples (as noted in the analytical table) did not meet the applicable DEC migration to groundwater level. These analytes may not be detected, if present, at the respective cleanup level.

- VOC: 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,1-dichloroethane, 1,2,3-trichlorobenzene, 1,2,3-trichloropropane, 1,2,4-trichlorobenzene, 1,2-dibromoethane, 1,2-dichloroethane, 1,2-dichloropropane, 1,4-dichlorobenzene, benzene, bromodichloromethane, bromoform, bromomethane, carbon tetrachloride, chloroform, cis-1,2-dichloroethene, cis-1,3-dichloropropene, dibromochloromethane, dibromomethane, ethylbenzene, hexachlorobutadiene, naphthalene, tetrachloroethene, trans-1,3-dichloropropene, trichloroethene, and vinyl chloride
- PAH: Naphthalene
- PFAS: PFOS

e. Data quality or usability affected?

See above.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☐ No☒ N/A☐ Comments:

PFAS analyte PFOS was detected in preparatory batch 320-407018 above the LOQ. PFOS was not detected in any project sample contained in this batch. Data quality and/or usability not affected. No other analytes were detected in method blank samples above the LOQ.

PFHxS was detected in the method blank associated with batch 320-407019 below the LOQ. PFHxS was not detected in any project sample within 10 times the concentration detected in the method sample. Data quality and/or usability not affected.

PFOS was detected within five times the concentration detected in the method blank sample in project *samples 20BET-SS-G2, 20BET-SS-F4, 20BET-SS-F10, 20BET-SS-F5, 20BET-SS-G1, and 20BET-SS-F3.* PFOS in these samples is considered not detected due to sample contamination identified in the method blank sample and have been flagged B*.

Laboratory Report Date:

PFOS was detected in the method blank associated with batch 320-407012 below the LOQ. PFOS was detected within five times the concentration detected in the method blank sample in project samples *20BET-SS-B7, 20BET-SS-B6, 20BET-SS-C1, 20BET-SS-A7, 20BET-SS-B1, 20BET-SS-C2, 20BET-SS-C3, 20BET-SS-B2, 20BET-SS-C5, 20BET-SS-A2, 20BET-SS-C4, 20BET-SS-A3, 20BET-SS-A6, 20BET-SS-B3, and 20BET-SS-B5*. PFOS in these samples is considered not detected due to sample contamination identified in the method blank sample and have been flagged B*. PFOS was detected greater than five times but less than ten times the concentration detected in the method blank samples in project sample *20BET-SS-A10, 20BET-SS-B4, 20BET-SS-A4, and 20BET-SS-A5*. PFOS in these samples is considered a biased high estimate and have been flagged JH*.

PFHxA and PFOS were detected in the method blank associated with batch 320-408367 below the LOQ. PFHxA was detected greater than 10 times the concentration detected in the method sample in associated project samples. Data quality and/or usability not affected. PFOS was detected within five times the concentration detected in the method blank sample in project *samples 20BET-SS-D6, 20BET-SS-D1, 20BET-SS-C7*. PFOS in these samples is considered not detected due to sample contamination identified in the method blank sample and have been flagged B*. PFOS was detected greater than five times but less than ten times the concentration detected in the method blank samples in project sample *20BET-SS-D7, 20BET-SS-D2, 20BET-SS-D5, 20BET-SS-D4, 20BET-SS-C10*. PFOS in these samples is considered a biased high estimate and have been flagged JH*.

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

See above.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

See above.

v. Data quality or usability affected?

Comments:

See above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☒ No☐ N/A☐ Comments:

LCS/LCSD samples were analyzed for VOC, GRO, DRO, and RRO analyses.

LCS samples were analyzed for PAH and PFAS analyses.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals and/or inorganics were not analyzed as part of this work order.

Laboratory Report Date:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☐ No☒ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

The LCS/LCSD recoveries for DRO analysis associated with preparatory batch 320-408389 were less than laboratory limits. Consequently, the DRO results in the following samples are considered low biased estimates and have been flagged JL*: *20BET-SS-C5, 20BET-SS-C10, 20BET-SS-D4, 20BET-SS-D10, 20BET-Sub-01, 20BET-Sub-02, 20BET-Sub-20, and 20BET-Sub-03.*

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

See above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

See above.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☒ N/A☐ Comments:

MS/MSD samples were analyzed for PFAS, DRO, and RRO analyses.

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals and/or inorganics were not analyzed as part of this work order.

Laboratory Report Date:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes☐ No☒ N/A☐ Comments:

See below.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes☐ No☒ N/A☐ Comments:

See below.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

The PFAS MS sample prepared from parent sample *20BET-SS-C6* exceeded the laboratory limits for PFHpA. The sample result was larger than the spiking concentration therefore flagging is not required. Data quality and/or usability not affected.

The PFAS MS and MSD samples prepared from parent sample *20BET-SS-C6* did not meet the laboratory limits for PFHxA. The sample result was larger than the spiking concentration therefore flagging is not required. Data quality and/or usability not affected.

The PFAS MS and MSD samples prepared from parent sample *20BET-SS-C6* exceeded the laboratory limits for NEtFOSAA, NMeFOSAA, and PFOS. These analytes were recovered high and not detected in the associated parent sample. Therefore, flagging is not required. Data quality and/or usability not affected.

The RPD for PFAS MS and MSD samples prepared from parent sample *20BET-SS-C6* exceeded the laboratory limits for PFTeA. This analyte was not detected in the parent sample; therefore the result is considered and estimate and has been flagged J*.

The PFAS MS sample prepared from parent sample *20BET-SS-D10* exceeded the laboratory limits for F-53B Major. This analyte was detected in the parent sample; therefore, the result is considered a biased high estimate and has been flagged JH*.

The PFAS MS and MSD samples prepared from parent sample *20BET-SS-D10* did not meet the laboratory limits for PFHxA. The sample result was larger than the spiking concentration therefore flagging is not required. Data quality and/or usability not affected.

The PFAS MS sample prepared from parent sample *20BET-Sub-02* exceeded the laboratory limits for F-53B Major. This analyte was detected in the parent sample; therefore, the result is considered a biased high estimate and has been flagged JH*.

Laboratory Report Date:

The PFAS MS and MSD samples prepared from parent sample *20BET-Sub-02* exceeded the laboratory limits for PFUnA. This analyte was detected in the parent sample; therefore, the result is considered a biased high estimate and has been flagged JH*.

The PFAS MS and/or MSD samples prepared from parent samples *20BET-Sub-02 and 20BET-SS-C5* did not meet the laboratory limits for PFHxA. The sample result was larger than the spiking concentration therefore flagging is not required. Data quality and/or usability not affected.

The PFAS MSD sample prepared from parent sample *20BET-SS-C5* did not meet the laboratory limits for PFHxA. The sample result was larger than the spiking concentration therefore flagging is not required. Data quality and/or usability not affected.

The PFAS MSD sample prepared from parent sample *20BET-Sub-02* exceeded the laboratory limits for PFHxS. This analyte was detected in the parent sample; therefore, the result is considered a biased high estimate and has been flagged JH*.

The DRO MS and MSD samples prepared from parent sample *20BET-Sub-03* exceeded the laboratory limits for DRO. The sample result was larger than the spiking concentration therefore flagging is not required. Data quality and/or usability not affected.

The RRO MS and MSD samples prepared from parent sample *20BET-Sub-03* did not meet the laboratory limits for RRO. The sample result was larger than the spiking concentration therefore flagging is not required. Data quality and/or usability not affected.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

See above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

See above.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☒ No☐ N/A☐ Comments:

Laboratory Report Date:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes☐ No☒ N/A☐ Comments:

The GRO surrogate trifluorotoluene was recovered above laboratory limits of 60-120% in the following samples: *20BET-SS-C10, 20BET-SS-C5, 20BET-SS-D10, 20BET-SS-D4, 20BET-Sub-02, and 20BET-Sub-03*. However, per the method the QC limits are 50-150%, trifluorotolune attained for these samples. Therefore, data quality and/or usability not affected.

The GRO surrogate trifluorotoluene was recovered above laboratory limits is sample *20BET-Sub-20*. The laboratory noted that several tests were run and it was determined that the pre-spiked trifluorotoluene in the sample jars was high, therefore the sample with high trifluorotoluene is reported. GRO was detected in the aforementioned sample, therefore the result is considered a biased high estimate and has been flagged JH*.

The GRO surrogate trifluorotoluene was recovered above laboratory limits in the following samples: *Trip Blank* and *20BET-Sub-01*. GRO was not detected in these samples, therefore, data quality and/or usability not affected.

The DRO surrogate o-Terphenyl was recovered below laboratory limits is sample *20BET-Sub-02*. DRO was detected in the aforementioned sample, therefore the result is considered a biased low estimate and has been flagged JL*.

Multiple PAH surrogates were recovered outside of laboratory limits in the following samples: *20BET-SS-C10, 20BET-SS-C5, 20BET-SS-D10, 20BET-SS-D4, 20BET-Sub-20, 20BET-Sub-02, and 20BET-Sub-03*. However, these samples were diluted due to the nature of the sample. Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information. Data quality and/or usability not affected.

PFAS IDAs d3-NMeFOSAA and d5-NEtFOSAAwere recovered below the laboratory control limits for the following samples: *20BET-SS-A10, 20BET-SS-A2, 20BET-SS-A4, 20BET-SS-A5, 20BET-Sub-20*. According to the laboratory, generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for these IDAs in theses sample. Data quality and/or usability not affected.

PFAS IDA 13C3 PFBS was recovered above laboratory limits in sample *20BET-SS-B4*. PFBS was not detected in this sample, therefore data quality and/or usability not affected.

PFAS IDA 13C2 PFDA was recovered below laboratory limits in sample *20BET-SS-C5*. PFDA was detected in the aforementioned sample therefore, considered an estimate and has been flagged J*.

PFAS IDA 13C4 PFHpA was recovered above laboratory limits in sample *20BET-SS-C4*. PFHpA was detected in the aforementioned sample therefore, considered an estimate and has been flagged J*.

Laboratory Report Date:

PFAS IDA 13C5 PFNA was recovered above laboratory limits in sample *20BET-SS-B3*. PFNA was detected in the aforementioned sample therefore, considered an estimate and has been flagged J*.

PFAS IDAs d3-NMeFOSAA and d5-NEtFOSAAwere recovered below the laboratory control limits for the following samples: *20BET-SS-A10, 20BET-SS-A2, 20BET-SS-A4, 20BET-SS-A5, 20BET-Sub-20*. According to the laboratory, generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for these IDAs in theses sample. Data quality and/or usability not affected.

The following PFAS IDAs in the noted samples were recovered above the laboratory control limit.

- 13C2 PFDoA: *20BET-SS-C4, 20BET-SS-C5, and 20BET-Sub-02*
- 13C2 PFTeDA: *20BET-SS-C5*
- 13C2 PFUnA: *20BET-SS-C5, 20BET-Sub-02, and 20BET-Sub-03*
- 13C3 HFPO-DA: *20BET-Sub-02 and 20BET-Sub-03*
- 13C3 PFBS: *20BET-SS-C5 and 20BET-Sub-03*
- 18O2 PFHxS: *20BET-SS-C3 and 20BET-SS-C5*
- 13C2 PFDA: *20BET-Sub-02*
- 13C3 PFBS: *20BET-Sub-02*
- 13C4 PFHpA: *20BET-SS-C3, 20BET-SS-C5, 20BET-SS-D3, 20BET-Sub-02, and 20BET-Sub-03*
- *13C4 PFOS: 20BET-SS-B4, 20BET-SS-B5, 20BET-SS-C3, 20BET-SS-C5, 20BET-Sub-02, and 20BET-Sub-03*
- 13C5 PFNA: *20BET-SS-C5, 20BET-Sub-02, and 20BET-Sub-03*
- 18O2 PFHxS: *20BET-Sub-02 and 20BET-Sub-03*
- d5-NEtFOSAA: *20BET-SS-C3 and 20BET-SS-C5*

According to the laboratory, quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries. Data quality and/or usability not affected.

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

See above.

iv. Data quality or usability affected?

Comments:

See above.

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☒ No☐ N/A☐ Comments:

Laboratory Report Date:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☒ No☐ N/A☐ Comments:

iii. All results less than LOQ and project specified objectives?

Yes☐ No☒ N/A☐ Comments:

VOC analyte 2-Butanone was detected above the LOQ in the trip blank sample. 2-Butanone was detected in the following samples within five times the concentration detected in the trip blank sample: *20BET-SS-C5, 20BET-SS-D10, 20BET-SS-C10, 20BET-SS-D4, 20BET-Sub-03, 20BET-Sub-01, 20BET-Sub-02, and 20BET-Sub-20*. 2-Butanone in these samples is considered not detected due to sample contamination identified in the trip blank sample and have been flagged B*.

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

See above.

v. Data quality or usability affected?

Comments:

See above.

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

The field duplicate pairs *20BET-SS-A5/20BET-SS-A10, 20BET-SS-C5/20BET-SS-C10, 20BET-SS-D4/20BET-SS-D10, 20BET-SS-F1/20BET-SS-F10, 20BET-SS-G3/G10,* and *20BET-Sub-02/20BET-Sub-20* were submitted with this work order.

Laboratory Report Date:

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☐ No☒ N/A☐ Comments:

All results for field duplicate sample pairs *20BET-SS-A5/20BET-SS-A10, 20BET-SS-D4/20BET-SS-D10, and 20BET-SS-F1/20BET-SS-F10* had comparable RPDs (RPD ≤ 50%), where calculable.

All results for field duplicate sample pairs *20BET-SS-C5/20BET-SS-C10* had comparable RPDs (RPD ≤ 50%), where calculable, except for N-propylbenzene and PFOS. Consequently, the results of the aforementioned analytes for the field duplicate pair are considered estimates and have been flagged J*.

All results for field duplicate sample pairs *20BET-SS-G3/G10* had comparable RPDs (RPD ≤ 50%), where calculable, except for PFNA. Consequently, the results of the aforementioned analyte for the field duplicate pair are considered estimates and have been flagged J*.

All results for field duplicate sample pairs *20BET-Sub-02/20BET-Sub-20* had comparable RPDs (RPD ≤ 50%), where calculable, except for 1,3,5-trimethylbenzene, o-xylene, PFNA, PFOS, PFOA, sec-butylbenzene, and total xylenes. Consequently, the results of the aforementioned analytes for the field duplicate pair are considered estimates and have been flagged J*.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

See above.

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

Decontamination or equipment blank were not required for this project.

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

Decontamination or equipment blank were not required for this project.

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

Decontamination or equipment blank were not required for this project.

Laboratory Report Date:

iii. Data quality or usability affected?

Comments:

The data quality and/or usability was not affected; see above.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes☒ No☐ N/A☐ Comments:

A field blank sample was also collected as a part of this project and is discussed below. PFHxS was detected in the field blank sample at a concentration below the LOQ. This detection is most likely due to laboratory contamination as indicated by a similar PFHxS concentration in the associated method blank sample. No flagging required, data quality and or usability not affected.

See Section 4.b. for additional flags applied to data.

Several results included in this work order required flagging due to multiple quality control discrepancies. Where multiple quality control discrepancies resulted in the application of the same flag, only one such flag will be applied to data. Where results are biased in one direction (e.g. JH*, JL*, or B) but another quality control discrepancy has no direction of bias (e.g. J*), the flag which provides direction of bias will be used over flags without bias assigned. Where results are biased high (e.g. JH* or B) as a result of once quality control failure and biased low (e.g. JL*) by a separate quality control failure, results will be qualified J* as the direction of bias resulting from two opposite biases is unknown.

APPENDIX D: QA/QC SUMMARY

Appendix D

QA/QC Summary

CONTENTS

Enclosures

- DOT&PF Statewide PFAS Data-Validation Program Plan

APPENDIX D: QA/QC SUMMARY

QA/QC procedures assist in producing data of acceptable quality and reliability. Enclosed is our DOT&PF Statewide PFAS Data-Validation Program Plan, which outlines our QA assessment of the data. We reviewed the analytical results for laboratory QC samples and conducted our own QA assessment for this project. We reviewed the chain of custody (COC) records and laboratory receipt forms to check that custody was not breached, sample-holding times were met, and the samples were kept chilled (between 0 degrees Celsius [°C] and 6 °C) during shipping. Our QA-review procedures allowed us to document the accuracy and precision of the analytical data, as well as check that the analyses were sufficiently sensitive to meet project-specific data quality objectives (DQOs).

Laboratory QC procedures included evaluating surrogate recovery, performing continuing calibration checks, and analyzing method blanks (MBs), laboratory control samples (LCS), and matrix spikes (MS) to assess accuracy and precision. LCS, LCS duplicate (LCSD), MS, MS duplicate (MSD), and surrogate recovery analyses were performed to evaluate the accuracy of the analytical process. Analytical precision was assessed by comparing the results of duplicate analyses performed on LCS/LCSD, MS/MSD, and duplicate-sample pairs.

QC procedures in the field included using single-use equipment to reduce the potential for sample cross-contamination. We used a new, clean pair of nitrile gloves when sampling at each monitoring well. The laboratory report contains a case narrative and forms documenting sample-receipt conditions.

Details regarding the results of our QA review are presented below. Refer to the Eurofins TestAmerica laboratory report and corresponding DEC LDRC (Appendix C and D, respectively) for additional information.

D.2 SAMPLE HANDLING

The sample coolers were shipped to Eurofins TestAmerica in West Sacramento, California for analysis using Alaska Air Cargo priority overnight service, also known as Goldstreak. Samples were shipped from Goldstreak in Bethel, Alaska. Samples were submitted promptly to the analytical laboratory after the sampling effort to allow enough time for shipping and the laboratory to analyze the samples within holding-time requirements of the analytical method.

Due to shipping issues, one of two coolers was received out of temperature. The cooler temperature was measured 7.8 °C. The following samples for VOC, GRO, DRO, RRO, PAH, and PFAS analysis were listed as received out of temperature:

- *20BET-SS-C5*, 2 of 3 containers were out of temperature, 4 oz soil jar and 4 oz soil jar with MeOH.
- *20BET-SS-C10*, 2 of 3 containers were out of temperature, 4 oz soil jar and 4 oz soil jar with MeOH.
- *20BET-SS-D4*, 2 of 3 containers were out of temperature, 4 oz soil jar and 4 oz soil jar with MeOH.
- *20BET-SS-D10*, 2 of 3 containers were out of temperature, 4 oz soil jar and 4 oz soil jar with MeOH.
- *20BET-SS-E1, 20BET-SS-E2, 20BET-SS-E3, 20BET-SS-E4, 20BET-SS-E5, 20BET-SS-E6, 20BET-SS-E7, 20BET-SS-F1, 20BET-SS-F2, 20BET-SS-F3, 20BET-SS-F4, 20BET-SS-F5, 20BET-SS-F6, 20BET-SS-F7, 20BET-SS-F10, 20BET-SS-G1, 20BET-SS-G2, 20BET-SS-G3, 20BET-SS-G4, 20BET-SS-G5, 20BET-SS-G6, 20BET-SS-G7, 20BET-SS-G10, 20BET-Sub-01, 20BET-Sub-02, 20BET-Sub-20,* and *20BET-Sub-03.*

PFAS analysis allows a range of 0- 10°C, therefore data quality and/or usability are not affected for samples analyzed for PFAS. Detected results for VOC, GRO, DRO, RRO, and PAH for the samples noted above are considered estimates, low biased, and have been flagged JL*. Non-detect results for VOC, GRO, DRO, RRO, and PAH for the samples noted above are considered estimates with no direction of bias and have been flagged J*.

D.3 ANALYTICAL SENSITIVITY

Analytical sensitivity was evaluated to verify that reporting limits (RLs) met the applicable DEC cleanup level for non-detect results, as appropriate. The following analytes in one or more project samples (as depicted in the analytical table) did not meet the applicable DEC migration to groundwater level. These analytes may not be detected, if present, at the respective cleanup level.

- VOCs: 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,1-dichloroethane, 1,2,3-trichlorobenzene, 1,2,3-trichloropropane, 1,2,4-trichlorobenzene, 1,2-dibromoethane, 1,2-dichloroethane, 1,2-dichloropropane, 1,4-dichlorobenzene, benzene, bromodichloromethane, bromoform, bromomethane, carbon tetrachloride, chloroform, cis-1,2-dichloroethene, cis-1,3-dichloropropene, dibromochloromethane, dibromomethane, ethylbenzene, hexachlorobutadiene, naphthalene, tetrachloroethene, trans-1,3-dichloropropene, trichloroethene, and vinyl chloride
- PAH: naphthalene
- PFAS: PFOS

To evaluate the potential for cross-contamination between volatile samples or introduction of contamination from an outside source, laboratory-supplied trip blanks were carried with the project samples in the coolers during sampling and shipping. VOC analyte 2-butanone was detected above the RL in the trip blank sample and within five times the concentration detected in the trip blank sample in the following samples: *20BET-SS-C5*, *20BET-SS-D10*, *20BET-SS-C10*, *20BET-SS-D4*, *20BET-Sub-03*, *20BET-Sub-01*, *20BET-Sub-02*, and *20BET-Sub-20*. The associated 2-butanone results for the listed samples are considered not detected due to sample contamination identified in the trip blank sample and have been flagged B*.

Laboratory MBs were also analyzed in association with samples collected for this project to check for contributions to the analytical results possibly attributable to laboratory-based contamination. The project samples are only affected by the MB detections if the analyte is detected in the project sample at a concentration less than ten times the concentration detected in the MB. The following analytes were detected in the MB samples and associated project samples:

- PFOS was detected within five times the concentration detected in the MB sample in project samples *20BET-SS-G2*, *20BET-SS-F4*, *20BET-SS-F10*, *20BET-SS-F5*, *20BET-SS-G1*, and *20BET-SS-F3*. PFOS in these samples is considered not detected due to sample contamination identified in the method blank sample and have been flagged B*.
- PFOS was detected below the RL in the MB associated with preparatory batch 320-407012. PFOS was detected within five times the concentration detected in the MB sample in project samples *20BET-SS-B7*, *20BET-SS-B6*, *20BET-SS-C1*, *20BET-SS-A7*, *20BET-SS-B1*, *20BET-SS-C2*, *20BET-SS-C3*, *20BET-SS-B2*, *20BET-SS-C5*, *20BET-SS-A2*, *20BET-SS-C4*, *20BET-SS-A3*, *20BET-SS-A6*, *20BET-SS-B3*, and *20BET-SS-B5*. PFOS in these samples is considered not detected due to sample contamination identified in the method blank sample and have been flagged B*. PFOS was detected greater than five times but less than ten times the concentration detected in the MB sample in project samples *20BET-SS-A10*, *20BET-SS-B4*, *20BET-SS-A4*, and *20BET-SS-A5*. PFOS in these samples is considered a biased high estimate and have been flagged JH*.
- PFHxA and PFOS were detected below the RL in the MB associated with preparatory batch 320-408367. PFHxA was detected greater than 10 times the concentration detected in the MB sample in associated project samples. Data quality and/or usability not affected. PFOS was detected within five times the concentration detected in the MB sample in project samples *20BET-SS-D6*, *20BET-SS-D1*, and *20BET-SS-C7*. PFOS in these samples is considered not detected due to sample contamination identified in the MB sample and have been flagged B*. PFOS was detected greater than five times but less than ten times the concentration detected in the MB sample in project samples *20BET-SS-D7*, *20BET-SS-D2*, *20BET-SS-D5*, *20BET-SS-D4*, and *20BET-SS-C10*. PFOS in these samples is considered a biased high estimate and have been flagged JH*.

Additional analytes were detected in method blank samples which did not result in qualification of results. Refer to the LDRCs for details.

One field blank was collected to assess the possibility of sample contamination from the site conditions. Project analytes were detected in the field blank sample but did not affect the data quality. Refer to the LDRCs for details.

D.4 ACCURACY

Accuracy refers to the ability to correctly determine the analyte concentration and is a comparison between the measured value and a known or expected value. Laboratory analytical accuracy may be assessed through the analyte recoveries from LCS/LCSD analyses and MS/MSD analyses, and the recovery of analyte surrogates (for organic analytes) added to project samples. The LCS/LCSDs are spikes of known analyte concentrations added to a clean matrix; the MS/MSDs are spikes of known analyte concentrations in a matrix similar to field samples.

The laboratories' LCS, LCSD, MS, MSD, and surrogate recoveries were within laboratory acceptance criteria, with the following exceptions:

- The LCS/LCSD recoveries for DRO analysis associated with preparatory batch 320-408389 were less than laboratory limits. DRO results in the following project samples are considered low biased estimates and have been flagged JL*: *20BET-SS-C5*, *20BET-SS-C10*, *20BET-SS-D4*, *20BET-SS-D10*, *20BET-Sub-01*, *20BET-Sub-02*, *20BET-Sub-20*, and *20BET-Sub-03*.
- The PFAS MS sample prepared from parent sample *20BET-SS-D10* exceeded the laboratory limits for F-53B Major. This analyte was detected in the parent sample; therefore, the result is considered a biased high estimate and has been flagged JH*.
- The PFAS MS sample prepared from parent sample *20BET-Sub-02* exceeded the laboratory limits for F-53B Major. This analyte was detected in the parent sample; therefore, the result is considered a biased high estimate and has been flagged JH*.
- The PFAS MS and MSD samples prepared from parent sample *20BET-Sub-02* exceeded the laboratory limits for PFUnA. This analyte was detected in the parent sample; therefore, the result is considered a biased high estimate and has been flagged JH*.
- The PFAS MSD sample prepared from parent sample *20BET-Sub-02* exceeded the laboratory limits for PFHxS. This analyte was detected in the parent sample; therefore, the result is considered a biased high estimate and has been flagged JH*.
- The GRO surrogate trifluorotoluene was recovered above laboratory limits for sample *20BET-Sub-20*. The laboratory noted that several tests were run and it was determined that the pre-spiked trifluorotoluene in the sample jars was high, therefore the sample with high trifluorotoluene is reported. GRO was detected in the aforementioned

sample, therefore the result is considered a biased high estimate and has been flagged JH*.

- The DRO surrogate o-terphenyl was recovered below laboratory limits for project sample *20BET-Sub-02*. DRO was detected in the aforementioned sample, therefore the result is considered a biased low estimate and has been flagged JL*.
- PFAS IDA 13C2 PFDA was recovered below laboratory limits in project sample *20BET-SS-C5*. PFDA was detected in the aforementioned sample therefore, considered an estimate and has been flagged J*.
- PFAS IDA 13C4 PFHpA was recovered above laboratory limits in project sample *20BET-SS-C4*. PFHpA was detected in the aforementioned sample therefore, considered an estimate and has been flagged J*.
- PFAS IDA 13C5 PFNA was recovered above laboratory limits in project sample *20BET-SS-B3*. PFNA was detected in the aforementioned sample therefore, considered an estimate and has been flagged J*.

Additional recovery failures were reported by the laboratory but did not affect the data quality. Refer to the LDRC for details.

D.5 PRECISION

We collected field-duplicate samples at a frequency of ten percent of the total number of samples to evaluate the precision of analytical measurements and reproducibility of our sampling technique. Six duplicate samples were collected; five from surface soil sample locations and one from the subsurface. The field-duplicate samples were submitted "blind" (i.e., the laboratory could not identify it as a duplicate) with a sample names of *20BET-SS-A5/20BET-SS-A10, 20BET-SS-C5/20BET-SS-C10, 20BET-SS-D4/20BET-SS-D10, 20BET-SS-F1/20BET-SS-F10, 20BET-SS-G3/G10,* and *20BET-Sub-02/20BET-Sub-20*. The duplicates were analyzed by the same test methods as the original sample. To evaluate the precision of the data, we calculated the relative percent difference (RPD; difference between the sample and its duplicate divided by the mean of the two). RPDs can be evaluated only if the results of the analyses for both the sample and its duplicate are reported above the DL.

The DQO for soil samples' RPD is 50 percent. Where concentrations were reported in both samples, we calculated the RPDs. The RPDs were within acceptance criteria, with the following exceptions:

- Results for field duplicate sample pair *20BET-SS-C5/20BET-SS-C10* had comparable RPDs (RPD ≤ 50%), where calculable, except for n-propylbenzene and PFOS. Consequently, the results of the aforementioned analytes for the field duplicate pair are considered estimates and have been flagged J*.

- Results for field duplicate sample pair *20BET-SS-G3/G10* had comparable RPDs (RPD ≤ 50%), where calculable, except for PFNA. Consequently, the results of the aforementioned analyte for the field duplicate pair are considered estimates and have been flagged J.
- Results for field duplicate sample pair *20BET-Sub-02/20BET-Sub-20* had comparable RPDs (RPD ≤ 50%), where calculable, except for 1,3,5-trimethylbenzene, o-xylene, PFNA, PFOS, PFOA, sec-butylbenzene, and total xylenes. Consequently, the results of the aforementioned analytes for the field duplicate pair are considered estimates and have been flagged J*.

Additional recovery failures were observed but did not affect the data quality. Refer to the LDRC for details.

Laboratory analytical precision can also be assessed by comparing the results of duplicate analyses performed on LCS/LCSD, MS/MSD, and laboratory-duplicate samples, and evaluating the associated RPDs. The laboratory LCS/LSCD, MS/MSD, and laboratory-duplicate sample RPDs were within laboratory acceptance criteria, with the following exceptions:

- The RPD for PFAS MS and MSD samples prepared from parent sample *20BET-SS-C6* exceeded the laboratory limits for PFTeA. This analyte was not detected in the parent sample; therefore, the non-detect RL is considered and estimate and has been flagged J*.

D.6 DATA QUALITY SUMMARY

By working in accordance with our proposed scope of services, we consider the samples we collected to be representative of site conditions at the locations and times they were obtained. The quality of the analytical data for this project does not appear to have been compromised, and those results affected by QC anomalies were qualified with appropriate flags. For more detail on individual analyte flags, see the attached LDRCs.

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FINAL

DATA-VALIDATION PROGRAM PLAN

DOT&PF Statewide PFAS

VARIOUS SITES, ALASKA

SHANNON & WILSON

June 2020

Shannon & Wilson No: 102219-002

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Submitted To: Alaska Department of Transportation & Public Facilities
2301 Peger Road
Fairbanks, Alaska 99709
Attn: Samantha Cummings

Subject: FINAL DATA-VALIDATION PROGRAM PLAN, DOT&PF STATEWIDE PFAS, VARIOUS SITES, ALASKA

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ACRONYMS

AAC	Alaska Administrative Code
CCV	continuing calibration verification
COC	chain-of-custody
°C	degrees Celsius
CSP	Contaminated Sites Program
DEC	Alaska Department of Environmental Conservation
DQO	data quality objective
DVPP	Data-Validation Program Plan
EB	equipment blank
EDD	electronic data deliverable
EPA	U.S. Environmental Protection Agency
FB	field blank
GRO	gasoline range organics
ICV	initial calibration verification
IDA	isotope dilution analyte
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LOD	limit of detection
LOQ	limit of quantitation
MB	method blank
mm	millimeter
MRL	method reporting limit
MS	matrix spike
MSD	matrix spike duplicate
%R	percent recovery
PFAS	per- and polyfluoroalkyl substances
PQL	practical quantitation limit
QAPP	quality assurance program plan
QA	quality assurance
QC	quality control
RPD	relative percent difference
SDG	sample delivery group
SGS	SGS North America, Inc.
SOP	standard operating procedure
SRF	sample receipt form
TB	trip blank
USACE	US Army Corps of Engineers
VOA	volatile organic analysis
VOC	volatile organic compound
WO	work order

Exhibit 1-1: Definition of Flags

Flag	Displayed as	Description
U	< [reporting limit]	The analyte was not detected; the result is listed as less than the reporting limit.
UJ	< [reporting limit] J*	The analyte was not detected; the listed reporting limit may not represent the true reporting limit due to sample-handling or laboratory quality-control (QC) failures (i.e., the listed reporting limit may be inaccurate or imprecise).
UB	< [LOQ or reported concentration] B*	The analyte is considered not detected due to sample-contamination identified in a blank; the result is listed as less than the limit of quantitation (LOQ) or the concentration originally reported in the sample (higher of the two values).
J	[Result] J – Flag applied by laboratory [Result] J* – Flag applied by reviewer	The result is an estimated quantity. The analyte was detected below the LOQ or was affected by QC failures.
JL	[Result] JL*	The result is an estimated quantity and may be biased low due to QC failures.
JH	[Result] JH*	The result is an estimated quantity and may be biased high due to QC failures.
JN	[Result] JN*	The analyte was tentatively identified, and the result is an estimated quantity.
R	R*	The results are unusable. The sample results are rejected due to severe QC deficiencies. The analyte may or may not be present in the sample.

NOTES:

* Flag applied by reviewer.

LOQ = limit of quantitation, QC = quality control

1 INTRODUCTION

This Data-Validation Program Plan (DVPP) was prepared to describe the procedures used by Shannon & Wilson staff for reviewing and qualifying analytical data in an objective and consistent manner.

This DVPP describes the process for qualifying analytical data based on quality assurance/quality control (QA/QC) review of Level II laboratory reports and electronic data deliverables (EDDs). This DVPP is intended to provide guidance for generally conducting what the U.S. Environmental Protection Agency (EPA) refers to as a Stage 2a Validation (EPA 2009). A more critical level of validation is beyond the scope of this DVPP, but the DVPP does present guidance for determining whether additional review should be conducted, based on information received from the laboratory. This DVPP also assesses the quality of the analytical data using PARCCS parameters (precision, accuracy, representativeness, comparability, completeness, and sensitivity).

This DVPP provides information about references used during the data-validation process and presents data qualifiers used to "flag" analytical data. The standard set of flags used to validate analytical data along with their definitions are presented in Exhibit 1-1. Methods for applying data qualifiers are referenced primarily from the following EPA guidance documents:

- EPA National Functional Guidelines for Organic Methods Data Review, January 2017 (EPA 2017b);
- EPA National Functional Guidelines for Inorganic Methods Data Review, January 2017 (EPA 2017a); and
- EPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537, November 2018 (EPA 2018a)

In some cases, the following US Army Corps of Engineers (USACE) guidance document is also referenced to formulate opinions when EPA guidance documents recommend exercising professional judgment:

- USACE Engineering Manual 200-1-10, Guidance for Evaluating Performance-Based Chemical Data, June 2005 (USACE 2005).

Additional references are listed in Section 12.0 and cited throughout the text.

In general, most data-review guidelines presented in this DVPP are drawn from federal guidance documents. However, in some cases federal guidance is not consistent, is outdated, or does not account for specific issues addressed in this DVPP; in these cases, the guidance presented in the DVPP is based on standard industry practice or site-specific

considerations, which are based on Shannon & Wilson chemists' years of professional experience and discussions with the Alaska Department of Environmental Conservation (DEC).

Most quality assurance program plans (QAPPs) specify data quality objectives (DQOs) for items such as laboratory control sample (LCS) recovery and target reporting limits. This document does not present such limits, but instead defers to internal laboratory control limits that are statistically derived, frequently updated, and within the requirements of the laboratory's national certification, and thus compliant with federal requirements.

2 LABORATORY CERTIFICATION AND DELIVERABLES

2.1 Laboratory Certification

The DEC Contaminated Sites Program (CSP) has an approval process for laboratories conducting analytical testing of various analytes; other DEC programs have their own laboratory certification programs. When using a new laboratory or analytical method, the DEC website is checked to verify that the laboratory analyzing project samples is certified as "approved." Laboratory certification is not required in cases where DEC does not list an analytical method. The websites do not appear to be updated frequently and laboratories may be certificated without being listed on the website. Certifications can be requested from the laboratory.

In cases where the original laboratory subcontracts analysis to a network or referral laboratory ("ref lab"), the referral laboratory shall also be verified for DEC approval, where applicable. This information may be found in the following websites listed in Exhibit 2-1, below:

Exhibit 2-1: Links to DEC-Approved Laboratories

DEC-Approval Authority	Website
Contaminated Sites Program	https://dec.alaska.gov/spar/csp/lab-approval/list-of-approved-labs
Drinking Water Program - Chemical Laboratories	https://dec.alaska.gov/eh/lab/chem-lab-cert-status.aspx
Drinking Water Program - Microbiological Laboratories	https://dec.alaska.gov/eh/lab/micro-lab-cert-status.aspx

2.2 Laboratory Deliverables

Laboratory Level II reports and EDDs are obtained directly from the laboratory via e-mail or laboratory data websites. The laboratory reports and EDDs are reviewed for completeness and revised reports are requested where there is missing or incorrect information.

Laboratory reports are provided in Adobe Acrobat (.pdf) format, while EDDs are provided in extensible markup language (.xml) format, or another similar format. It may be necessary to engage with the laboratory regarding a database compatible EDD format.

Laboratory reports and EDDs are grouped by the work order (WO) number assigned when the laboratory receives the sample delivery group (SDG). SDGs are determined by the samples and analyses listed on the chain-of-custody (COC) record.

3 CHAIN-OF-CUSTODY

Evidence of sample custody from the time of collection to the time of receipt by the laboratory is documented via the COC record. A COC contains the signatures of individuals collecting, shipping, and receiving each sample. The COC is reviewed to verify it is signed and dated by the sampler, the local receiving staff (unless shipped directly), and the laboratory's receiving staff. Carriers who are only involved in the transport of sealed coolers (e.g., Lynden Transport, Inc.) are not required to sign the COC. A sample is considered to be in custody if it is:

- in a person's actual possession;
- in view, after being in physical possession;
- sealed so no one can tamper with it, after having been in physical custody; or
- in a secured area, restricted to authorized personnel.

If the COC record is not complete and accurate (e.g., signatures missing, date/time discrepancies, lack of custody seals), professional judgment must be used as to whether to qualify the data. The reviewer should consider rejecting data and recollecting the samples, if possible, if it is suspected that custody was intentionally breached, and the samples may have been tampered with. If instead there is a simple omission or minor discrepancy, the data may be usable without qualification if the source of the omission or discrepancy is known and accounted for.

The COC also provides the requested analyses for each documented sample. COCs are reviewed to verify the correct analyses were requested, and that sample names match those on the sample-collection logs. Where discrepancies are noted, the laboratory will coordinate with the sampling team to confirm the correct sample names are used in reporting the results.

4 SAMPLE HANDLING, CONDITION, PRESERVATION, AND HOLDING TIMES

Evidence of sample condition is documented on the laboratory's sample receipt form (SRF) upon delivery. SRFs document QC non-conformance issues during sample handling, where such information exists. In some cases, samples are delivered to a local sample-receiving office prior to transport to the analytical laboratory; SRFs are completed at each location.

The following sections generally apply to soil and water. For sample-handling requirements for other media besides soil and water samples, reference to the individual EPA sampling and analysis methods and/or laboratory sampling guides will be made. In general, data qualification based on sample-handling failures is the same for other media as for soil and water samples; however, the sample-handling requirements may be different and must be assessed on a method-specific basis.

4.1 Acceptable Temperatures

SRFs are reviewed to verify samples are received within the acceptable temperature range. Temperature of the coolers and/or temperature blanks should be documented at each receiving location. Samples are considered to be within the acceptable temperature range if received between 0 degrees Celsius (°C) and 6 °C, where temperature preservation is required. This range is referenced in multiple guidance (e.g. EPA 2017a, 2017b, 2018b) noting that water samples received below this cutoff are acceptable in the absence of ice.

Data qualification based on temperatures outside the acceptable criteria may vary for different analyses and sample matrices. For example, PFAS analysis for samples exceeding 6 °C is unlikely to have the same reduction in concentration as a sample submitted for volatile organic compound (VOC) analysis. Another notable exception to the temperature range criteria is for samples that collected frozen (<-7 °C). These samples may be maintained frozen until sub-sampled and preserved, if allowed by the project work plan (DEC 2019a).

Exhibit 4-1 provides general guidelines for qualifying results for samples received outside the acceptable temperature range; however, the individual extraction or analytical methods should be consulted, and professional judgment used.

Exhibit 4-1: Sample-Temperature Actions

Matrix	Criteria	Action	
		Detected Analytes	Analytes Not Detected
Water	0 °C – 6 °C	No qualification	
	0 °C – 6 °C; ice in samples	J	UJ
	< 0 °C; no ice in samples	No qualification	
	< 0 °C; ice in samples	J	UJ
	> 6 °C	JL	UJ[1]
Soil	0 °C – 6 °C	No qualification	
	< 0 °C	No qualification[2]	
	> 6 °C	JL	UJ[1]
PFAS Impacted Soil and Water	0 °C – 10 °C[3]	No qualification	
	< 0 °C	No qualification[2]	
	> 10 °C	JL	UJ

NOTES:

1 Use professional judgment when qualifying sample results based on temperature exceedance, considering the volatility of the analyte. If temperatures are higher than 10 °C or are suspected to have been above 6 °C for an extended period (e.g., over 24 hours), reviewer should consider rejecting sample results for volatile analytes that were not detected.

2 Use professional judgment and refer to method-specific requirements for non-standard analyses and matrices.

3 Samples shall be protected from light and refrigerated at ≤ 6°C (but not frozen) from the time sample collection until receipt at the laboratory.

°C = degrees Celsius, PFAS = per- and polyfluoroalkyl substances

4.2 Sample Preservation

Some analyses require addition of sample preservatives in addition to maintaining the samples within the acceptable temperature range. Various guidance documents (EPA 2018b; USACE 2005) and individual EPA extraction methods list sample-preservation requirements for individual methods and matrices. SGS North America, Inc. (SGS) has condensed this information into one concise table including bottle type and volume requirements; this bottle guide table is included in Appendix A. The laboratory SRF documents whether samples were received with proper preservative and within relevant pH limits.

Not all data are affected the same way by failure to properly preserve samples, therefore, individual extraction or analytical methods should be consulted, and professional judgement used. For example:

- If the pH is outside method requirements for inorganic analytes in aqueous samples and the laboratory adjusts the pH immediately upon receipt at the laboratory within the method-specified holding time, allowing time for the sample to equilibrate prior to digestion, the sample results are not affected (EPA 2017a).

- In the case where one analyte is the degradation byproduct of another analyte, the degraded species may increase in a sample following storage with inadequate preservation (USACE 2005); the same may occur if holding times are exceeded (see Section 4.3, below).
- For metals speciation (e.g., Fe2+ vs. Fe3+), acidification can result in an increase in the reduced form and a decrease in the oxidized form. Professional judgment should be used for qualifying data for any samples with preservation issues.

In most cases where sample preservation is inadequate, sample results should be considered estimated and qualified using the criteria listed in Exhibit 4-2 below.

Exhibit 4-2: Preservation Actions

Criteria	Action	
	Detected Analytes	Analytes Not Detected
Adequate Preservation[1,2]	No qualification	
Inadequate Preservation[1,2]	JL	UJ

NOTES:

1 Per regulatory guidance and/or method specific or preservation requirements.

2 Use professional judgment and refer to method-specific requirements for non-standard analyses and matrices.

4.3 Holding Times

Samples are required to be extracted and/or analyzed within method-specific holding times. The holding time begins immediately following sample collection. Holding times are also presented on the SGS bottle guide included in Appendix A for standard analyses. Holding times are calculated on a per-day basis, except for short-holding-time analyses where the holding time is measured in hours (typically for analyses listed with a holding time of 72 hours or less).

Holding times are evaluated based on the matrix and method. Certain methods list a collection-to-analysis holding time (e.g., analysis of volatile organic compounds in soil, where extraction occurs in the field at the time of collection), while others list separate holding times for collection to extraction and for extraction to analysis.

In general, where holding times are exceeded, sample results shall be qualified using the criteria listed in Exhibit 4-3.

Exhibit 4-3: Holding-Time Actions

Analysis	Criteria	Action	
		Detected Analytes	Analytes Not Detected
PFAS	t ≤ HT	No qualification	
	t > HT	J	UJ
	t > 2x HT (gross exceedance)	J	R
All Others[1]	t ≤ HT	No qualification	
	HT < t ≤ 2 x HT (marginal exceedance)	JL	UJ
	t > 2x HT (gross exceedance)	JL	R

NOTES:

1 Use professional judgment and refer to method-specific requirements for non-standard analyses and matrices.

HT = method (technical) holding time; t = actual holding time

As with sample preservation, professional judgment must be used when qualifying data based on holding-time exceedance, as there can be situations where certain analytes are affected differently than others (such as in the case of analytes that are degradation products of one another). Also, preservation failures coupled with a marginal holding-time exceedance may warrant rejection of results for analytes that were not detected.

4.4 Sample Condition

Sample condition is documented on the laboratory's SRFs. Professional judgment should be used to determine if qualification of analytical results is necessary for cases where sample condition is compromised. Some common circumstances that may affect sample results are listed below:

1. **Broken Container**: Sometimes 1-L bottle lids crack upon tightening, but no liquid is lost. As long as the lid is replaced prior to sample shipment (may be replaced by the laboratory sample-receiving office), results are not considered affected. Most water analyses require at least one duplicate bottle to be filled. If only one of the bottles is broken and the analysis is performed with the intact bottle, no qualification is required other than noting the broken container on the data-review checklist (DEC 2019b). However, if the sample with the broken container was used for analysis, the analytes in question could oxidize, volatilize, degrade, or react, causing the concentration to at least be considered estimated ; professional judgment should be used to determine if the analyses are affected by the addition of air. Affected sample results shall be qualified using the criteria listed in Exhibit 4-4.

2. **Leaking methanol** (soil volatile organic analysis [VOA]): When collecting soil samples for volatile analysis, 25 mL of methanol is added to the sample container to perform the sample extraction and preserve the target analytes in the sample. If the methanol leaks out, it leads to a low bias in the calculated soil mass. The overall concentration of the analyte is determined by dividing the mass of the analyte by the mass of the soil, thus imparting a high bias to the sample result (see calculation below). The results for samples with leaking shall be qualified using the criteria listed in Exhibit 4-4. Professional judgment shall be used to determine if results should be rejected due to severely compromised sample integrity (e.g. complete loss of methanol, etc.)

$$Mass_{soil} = Mass_{total} - Mass_{MeOH} - Mass_{jar}$$

$$Concentration_{analyte} = Mass_{analyte}/Mass_{soil}$$

3. **Headspace in VOA vial**: For the analysis of gasoline range organics (GRO) and VOCs in water samples, the absence of headspace is necessary to prevent volatile analytes from partitioning out of the aqueous phase. As noted in the VOC method 5021A, "it is possible for the sample to generate some headspace during storage. This headspace will appear in the form of microbubbles and should not exceed 5-6 millimeters (mm)… Studies conducted by the EPA indicate that [bubbles not exceeding 6 mm in diameter] did not adversely affect volatiles data." This assessment is applied to the VOC analyses; bubbles larger than 6 mm in diameter are considered an unacceptable level of headspace. When unacceptable headspace is present, results shall be qualified using the criteria listed in Exhibit 4-4.

4. **Soil analysis reported using "wet weight"**: When collecting soil samples an additional jar is provided for the laboratory to determine the percent solids. In the absence of the additional percent-solids jar, the laboratory may report soil concentrations using the "wet weight." The overall concentration of the analyte is determined by dividing the mass of the analyte by the mass of the soil. In cases where a dry weight was not determined, the concentration may be reported using a wet weight. The results for samples reported using the wet weight shall be qualified using the criteria listed in Exhibit 4-4.

Other sample-condition anomalies than those listed above may occur. These anomalies should be addressed using available guidance, individual extraction or analytical methods, and the reviewer's professional judgement.

Exhibit 4-4: Sample Condition Actions

Criteria	Action	
	Detected Analytes	Analytes Not Detected
Broken Container	JL	UJ[1]
Leaking Methanol (soil VOA)	JH[2]	No qualification[3]
Headspace in VOA Vial ≤ 6 mm	JL	UJ
Headspace in VOA Vial > 6 mm	JL	R
Soil Analysis Reporting "Wet Weight"	JL	UJ

NOTES:

1 Use professional judgement and consider rejecting data depending on how much sample leaked or the volatility of the analyte.

2 Use professional judgement and consider rejecting data if the sample integrity has been severely compromised (e.g. complete loss of methanol, etc.)

3 Not detected analytes are not considered affected if there is sufficient methanol to run the analysis.

mm = millimeter; VOA = volatile organic analysis

5 ANALYTICAL SENSITIVITY

Analytical sensitivity refers to the amount of analyte necessary to produce a detector response that can be reliably detected or quantified (USACE 2005). Analytical sensitivity is evaluated by comparing the appropriate reporting limit (generally the limit of detection [LOD]) for not-detected results to the relevant cleanup level or action limit, where such standards exist. Where LODs are not available, limits of quantitation (LOQs), practical quantitation limits (PQLs), or method reporting limits (MRLs) may be used. It is important to note the LOQ, PQL and MRL are interchangeable terms and depends on the laboratory for which term is used in reporting the results. For the purposes of this DVPP, the LOQ is referenced.

In general, regulatory limits used to check analytical sensitivity are listed in Chapter 75 of Title 18 of the Alaska Administrative Code (18 AAC 75) for soil and water; analytes without regulatory limits are compared to the relevant, project-specific or analyte-specific action limit at the time of comparison.

In cases where the reporting limit (LOD, LOQ, PQL, etc.) exceeds the regulatory limit, a note will be added to the DEC data-review checklist (DEC 2019) and associated results tables noting the reporting limit is elevated. Reporting limits that exceed regulation limits should be identified using the following criteria listed in Exhibit 5-1.

Exhibit 5-1: Elevated Reporting Limit Actions

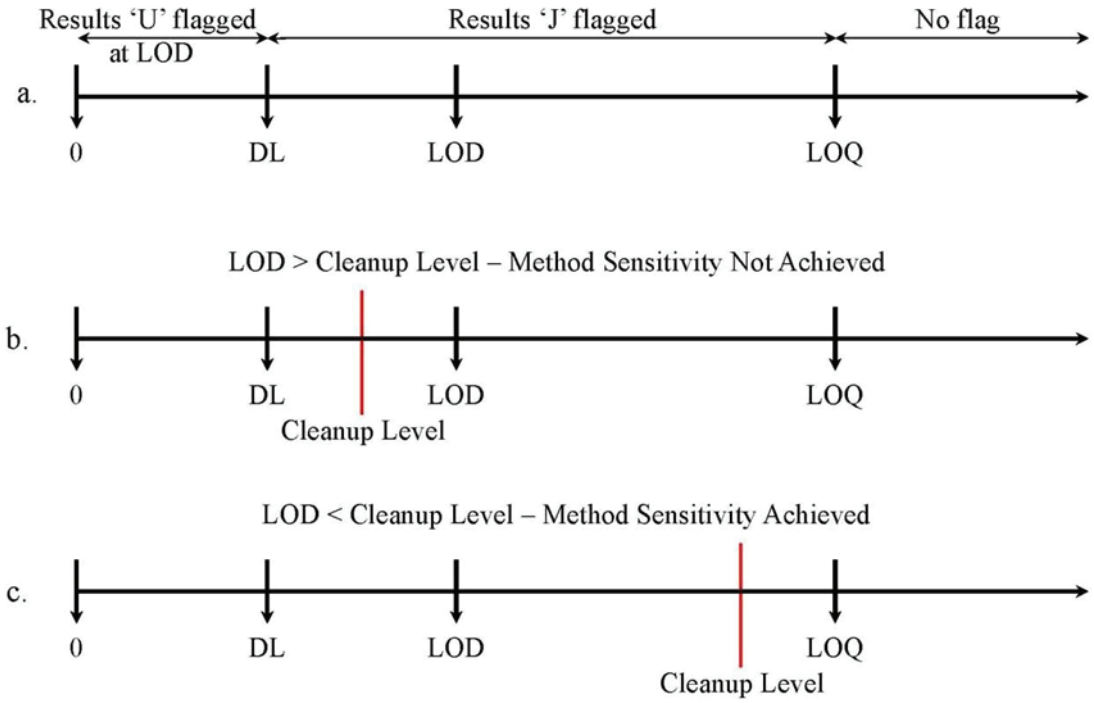
Criteria	Action
Reporting Limit[1] ≤ Cleanup Level / Action Level	No note
Reporting Limit[1] > Cleanup Level / Action Level	Note should be added to the Checklist and Results Tables

NOTES:

1 The reporting limit used for the analytical sensitivity comparison should be described in the DEC data-review checklist.

Exhibit 5-2 illustrates the relationship between the DL, LOD, and LOQ, with a summary of laboratory result flags applied to each range and an example of acceptable and unacceptable (elevated) reporting limits.

Exhibit 5-2: Relationship between DL, LOD, LOQ, and Corresponding Laboratory Result Flags and Cleanup Levels.



NOTES:

a. Results flagged "J" by laboratory where analyte is detected above the DL, but below the LOQ.

b. Unacceptable LOD-to-cleanup-level relationship.

c. Acceptable LOD-to-cleanup-level relationship.

Note that these are example scenarios; not all data are compared using the LOD, and therefore this figure does not apply to data received from all laboratories.

DL = detection limit; LOD = limit of detection; LOQ = limit of quantitation.

6 BLANK SAMPLES

Blank samples are analyzed to check for possible contributions to the analytical results from cross-contamination between samples, or from sample-contamination from an outside source. Typically, the following blank samples are reviewed in conjunction with project samples, where appropriate:

- method blanks;
- trip blanks (volatile analytes only);
- field blanks; and
- equipment blanks.

Each of these blanks check for sample-contamination issues at various steps between sample collection and analysis. Detections in one blank can cause related detections in other blank samples. For example, a detection in a method blank can cause detections in corresponding trip blanks or equipment blanks. Therefore, it is important to investigate blank detections to determine at what step sample-contamination was first introduced; data-qualification should proceed beginning at this level.

For the purposes of this DVPP (Level II data review), blank detection evaluation should proceed using the following hierarchy:

1. method blank;
2. trip blank;
3. field blank; and
4. equipment blank

Additional details regarding these types of blanks are provided in sections 6.1 through 6.4 below.

Additional blanks collected or analyzed by the lab for method-specific requirements should be evaluated on a case-by-case basis.

Data-qualification procedures are identical between blank types within a given matrix; however, the list of affected project samples vary. Exhibit 6-1 presents data-qualification criteria for samples affected by detections in a blank sample; these criteria are generally consistent with those presented in EM 200-1-10 (USACE 2005).

Exhibit 6-1: Actions for Blank Detections

Analysis	Concentration in blank (y)	Concentration in corresponding project sample (z)	Action
PFAS	DL < y < 2x LOQ	z = Not Detected	No qualification
		z < LOQ	UB at the LOQ
		LOQ ≤ z < 10y	UB at the detected result (z)
		z ≥ 10y	No qualification
	y ≥ 2x LOQ[2] (gross contamination)	z = Not Detected	No qualification
		z = Detect	R
All Others[1]	DL < y < 2x LOQ	z = Not detected	No qualification
		z < LOQ	UB at the LOQ
		LOQ ≤ z < 5y	UB at the detected result (z)
		5y ≤ z < 10y	JH
		10y ≤ z	No qualification
	y ≥ 2x LOQ[2] (gross contamination)	z = Not Detected	No qualification
		z = Detect	R

NOTES:

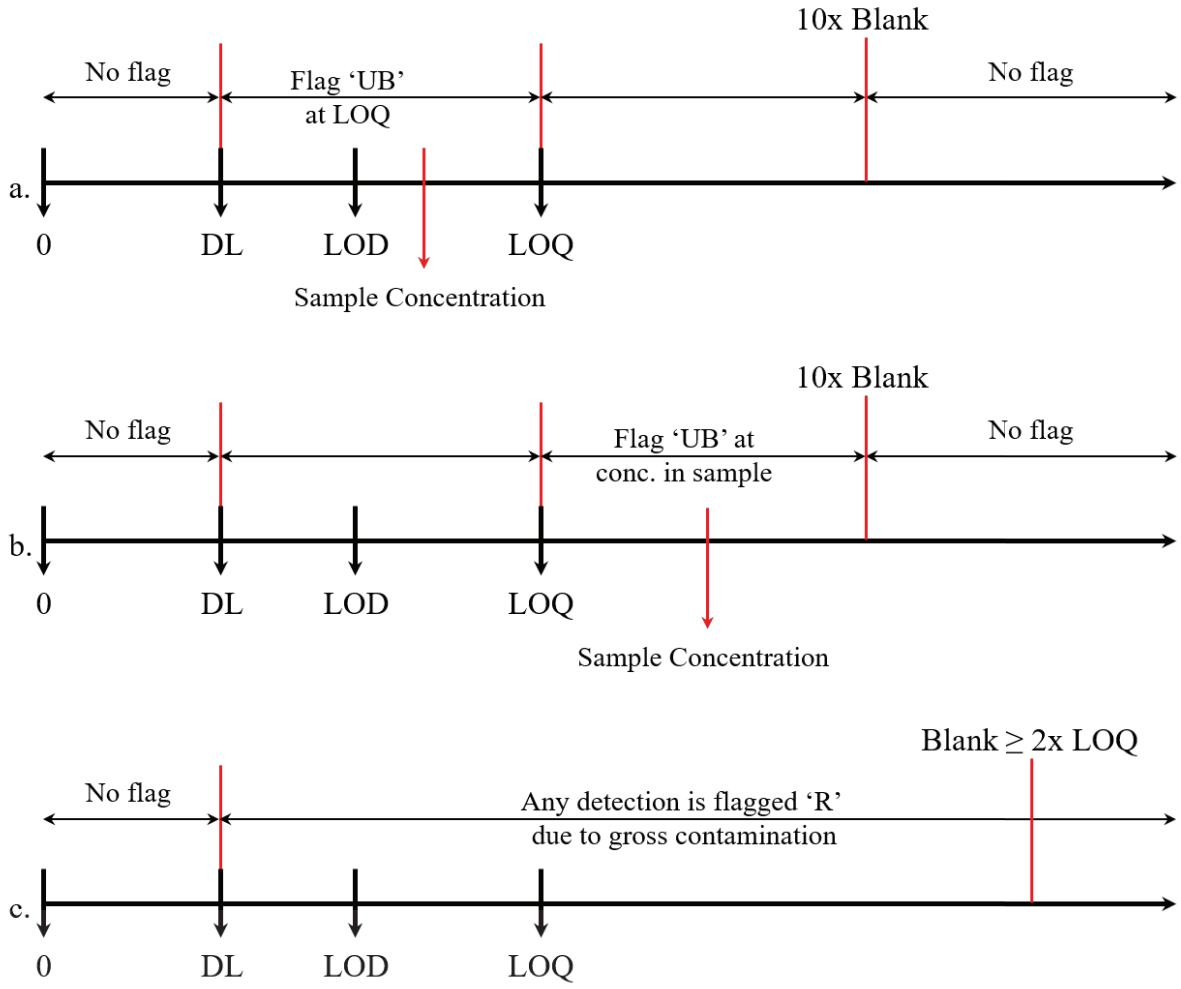
1 Use professional judgment and refer to method-specific requirements for non-standard analyses and matrices.

2 Use professional judgment to assess the reported LOQ. If elevated, reference a typical LOQ for a non-detect result.

DL = detection limit, LOQ = limit of quantitation (also known as PQL or MRL), y = concentration in blank, z = concentration in corresponding sample

Exhibits 6-2 and 6-3 presents a visual example of flagging criteria for a blank detection for PFAS and all other analyses, respectively.

Exhibit 6-2: Example Qualification Criteria for PFAS Blank Detections



NOTES:

Project-sample results would be qualified as follows:

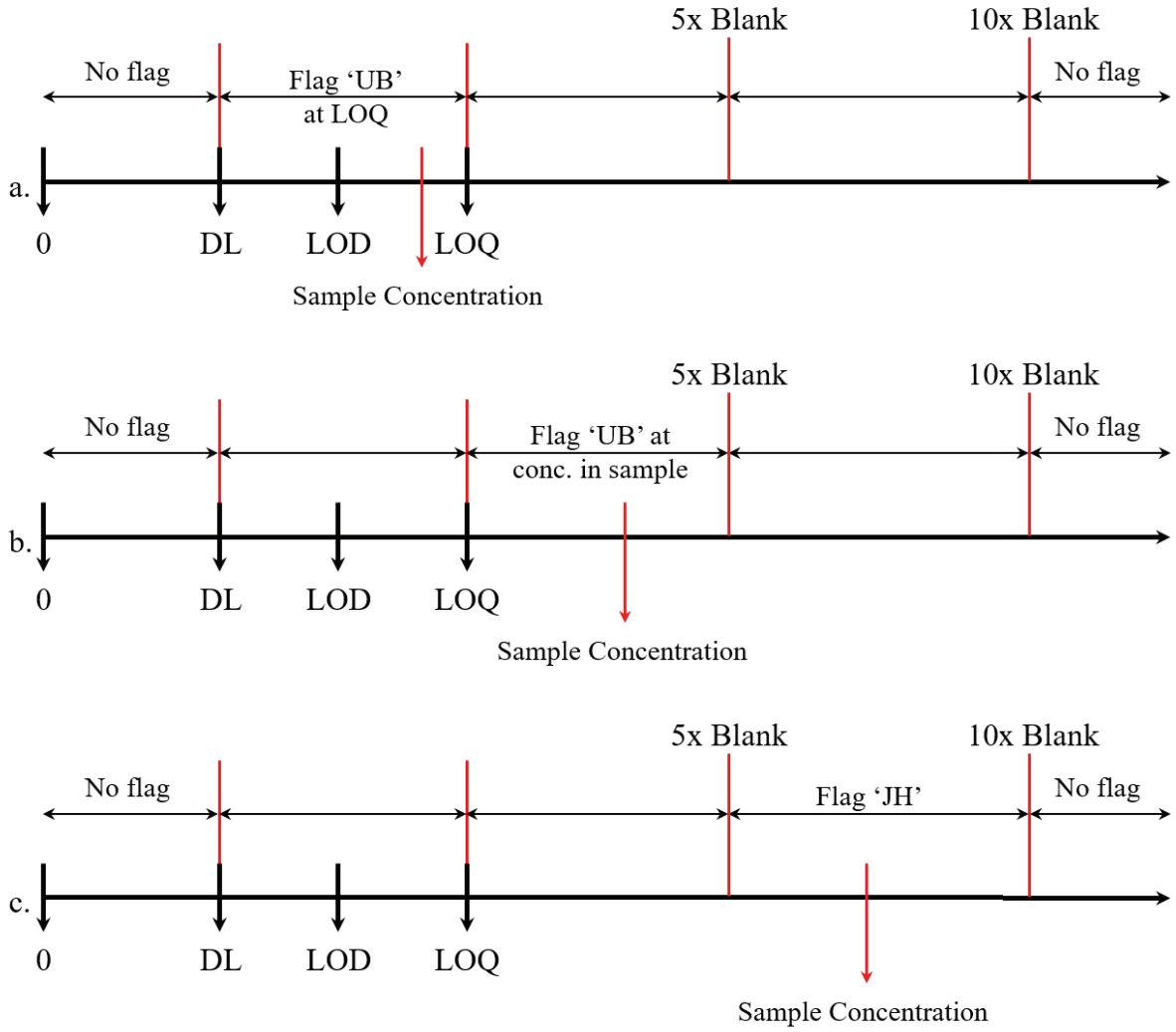
a) Flag 'UB' at the LOQ.

b) Flag 'UB' at the concentration detected in the sample.

c) Flag 'R' for any detection in the sample.

DL = detection limit; LOD = limit of detection; LOQ = limit of quantitation (also known as PQL or MRL).

Exhibit 6-3: Example Qualification Criteria for Non-PFAS Blank Detections



NOTES:

Project-sample results would be qualified as follows:

a) Flag 'UB' at the LOQ.

b) Flag 'UB' at the concentration detected in the sample.

c) Flag 'JH' at the concentration detected in the sample.

DL = detection limit; LOD = limit of detection; LOQ = limit of quantitation (also known as PQL or MRL).

6.1 Method Blanks

Method blank (MB) samples are prepared by the laboratory with every preparatory batch, at a minimum rate of one MB per 20 samples. MBs are samples of clean media (soil, water, etc.) that are subjected to the same procedures as project samples to extract a given analyte(s). MBs are evaluated to determine if the method of extraction, cleanup, or analysis introduces any contamination during the process.

The reviewer will check that MBs were prepared and analyzed by the laboratory at the required frequency, and that no analytes were reported in the MBs. If an analyte is reported in an MB, all samples in the corresponding preparatory batch should be evaluated for that analyte. Data qualifiers should be applied according to Exhibit 6-1, above.

6.2 Trip Blanks

Trip blank (TB) samples are prepared by the laboratory and one TB should always accompany each cooler containing samples for volatile analysis and stay with the samples. A TB is not required for semi-volatile or non-volatile analytes. TBs serve to check for cross-contamination or contamination from an outside source during sample collection, storage, transportation, and processing by the laboratory.

The reviewer will check that TBs were prepared, transported, and analyzed with any samples analyzed for VOCs, and that no analytes were reported in the TB. A minimum of one TB per cooler is required; the cooler containing the TB and samples for VOC analysis should be clearly identified on the COC. If an analyte is reported in a TB, all samples in the corresponding cooler should be evaluated for the detected analyte and, if necessary, qualified based on the criteria presented in Exhibit 6-1, above. If the sampler did not document which cooler contained the TB, and there is more than one cooler containing samples for VOC analysis, all VOC samples in the work order should be considered potentially affected.

6.3 Field Blanks

Field blank (FB) samples are collected in the field by sample personnel. The sampler opens a sample bottle in the same air space as the corresponding project sample and collects the field blank by filling the bottle with laboratory provided deionized water. The FB is used to assess for possible contamination from the sampling site. If an analyte is reported in the FB, the corresponding sample should be evaluated for the detected analytes and, if necessary, qualified based on the criteria presented in Exhibit 6-1, above.

6.4 Equipment Blanks

Equipment blank (EB) samples are collected in the field by the sampling personnel. The EB is used to determine if decontamination of reusable sampling equipment between sampling locations is sufficient. The reviewer will check that EBs were collected at the required frequency, and that no analytes were reported in the EBs. If an analyte is reported in an EB, all samples collected using the same sampling equipment on the same day will be evaluated (determined based on field sampling logs, and if necessary, qualify based on the criteria presented in Exhibit 6-1, above.

7 ACCURACY

Accuracy is evaluated at multiple levels throughout the analytical process, using a variety of techniques. It is assessed at the preparatory batch level using recovery information from LCS and laboratory control sample duplicates (LCSDs), matrix spike samples (MSs) and matrix spike duplicates (MSDs), and surrogates or isotope dilution analytes (IDAs). MS/MSD and surrogate or IDA recovery information are used to determine whether there is interference from the sample matrix that affects the accuracy of the reported results. The following sections discuss these QC samples in association with the preparatory batch. However, note that there are some analytical methods for inorganics that do not require a preparatory batch and the LCS, LCSD, MS, and MSD QC sample are assessed at the analytical-batch level. Accuracy is also assessed at the analytical-batch level using recovery information from initial calibration verification (ICV) and continuing calibration verification (CCV) samples, where information is available in the Level II data deliverable.

7.1 Laboratory Control Samples

LCSs (also referred to as blank spikes) are prepared by the laboratory with every preparatory batch, at a minimum of one LCS per 20 samples, where required. In some cases, analytical protocol requires the laboratory also analyze an LCSD to assess laboratory precision (see Section 8.1 for assessment of laboratory precision). LCSs and LCSDs are prepared using the same extraction method that is applied to the project samples using laboratory-grade, blank-matrix samples spiked with a known concentration of analyte(s). The laboratory reports a percent recovery (%R) of the spiked amount for each analyte added to the blank sample. The laboratory maintains acceptance limits for LCS/LCSD recovery; these limits are reported in the Level II laboratory report for comparison.

The reviewer will check that LCSs were reported at the required frequency, and that LCS/LCSD recoveries are within laboratory control limits. An LCS or LCSD recovery failure affects all corresponding samples in the same preparatory batch for the affected analyte(s). The following guidelines in Exhibit 7-1 will be used for qualifying sample results associated with LCS/LCSD-recovery failures.

Exhibit 7-1: Actions for LCS/LCSD and MS/MSD Recovery Failures

Analysis	LCS/LCSD or MS/MSD Results	Action	
		Detected Analytes	Analytes Not Detected
PFAS	%R < 10%	JL	R
	10% ≤ %R < LCL	JL	UJ
	%R > UCL[2]	JH	No qualification
All Others[1]	%R < Control Limits[2]	JL	UJ
	%R within Control Limits	No qualification	
	%R > Control Limits[2]	JH	No qualification

NOTES:

1 Use professional judgment and refer to method-specific requirements for non-standard analyses and matrices.

2 If LCS/LCSD recovery is grossly outside control limits (recoveries less than 10% or greater than 250%) the reviewer should use professional judgment when qualifying the data. The reviewer should consider rejecting results for analytes not detected where the recovery was below 10% (USACE 2005).

LCL = lower control limit, %R = percent recovery, UCL = upper control limit

7.2 Matrix Spike Samples

For certain methods, the laboratory analyzes an MS/MSD in addition to the LCS. MS/MSDs are prepared and analyzed on a preparatory batch basis and are analyzed with every 20 samples when used. They consist of project (native) samples spiked with a known concentration of analyte(s) and prepared using the same method that is applied to project samples to extract the analyte(s). The MS and MSD are used to determine the presence of matrix interferences and evaluate the analytical accuracy for a given method and matrix, expressed as a %R of the spiked amount added to the field sample.

The reviewer will check to make sure that MS/MSDs were analyzed at the frequency required by analytical methods or project-specific requirements. Some methods may require the analysis of an MS/MSD pair, but insufficient sample volume may prevent the laboratory from providing these QC samples. The laboratory's standard operating procedures (SOPs) may allow for an LCSD instead of an MS/MSD for these cases.

The reviewer will check that %R for each analyte is within laboratory control limits. If there is a recovery failure, only the field sample utilized for the MS/MSD (the parent sample) is typically considered affected; however, the reviewer should use professional judgment whether other samples in the same preparatory batch have sufficiently similar matrices to be considered affected as well. For example, if an MS/MSD recovery failure is reported for one of two field duplicate samples, it should be assumed there were similar matrix effects in the duplicate, and corresponding results should also be qualified.

Before MS/MSD recovery is evaluated, two important factors must be considered:

1. Verify that the field sample chosen for the MS/MSD is part of the project-sample set currently being reviewed. The laboratory may run samples from other projects in the same preparatory batch and it is possible that the original sample selected for the MS/MSD may not be from the work order reviewed. In this case, it cannot be confirmed that the parent sample matrix is similar to the matrix in the project samples and the recovery failures do not affect data quality for the project-sample set.
2. Verify that the spiking concentration is high relative to the native concentration of the analyte. In accordance with EM 200-1-10 (USACE 2005):

   If the native concentration of a target analyte is high relative to the spiking concentration, then this may contribute a significant uncertainty to the recovery calculations; the MS recovery may not be representative of actual method performance for the matrix. In the absence of other guidance, evaluate the MS recovery when the spiking concentration is at least two times greater than the native analyte concentration (USACE 2005).

If the above criteria are met, then results associated with the failures in the original project sample should be qualified using the criteria listed in Exhibit 7-1.

For metals analysis where MS/MSD recovery failures occur, different criteria are used. For metals analysis using most analytical methods, if a matrix spike recovery failure occurs and the sample concentration is greater than the spike concentration, the laboratory is required to conduct a post-digestion spike. A post-digestion spike is where the original sample is spiked at twice the native concentration so that recovery can be evaluated. In this case, refer to the data-qualification criteria in the spiked sample analysis section in the National Functional Guidelines for Inorganic Methods Data Review (EPA 2017a) under the relevant analytical technique.

7.3 Surrogates and Isotope Dilution Analytes

Surrogates are organic compounds that are similar to the analytes being evaluated by a given method (often a deuterated version of the one of the analytes). They are used to identify matrix interferences and inefficiencies in sample extraction for organic analyses. The surrogates are introduced into a field- or laboratory-QC sample prior to sample preparation and analysis. Accuracy is expressed as a %R of the spiked amount added to the sample.

Some methods require analysis using an isotope-dilution method, which uses IDAs instead of a surrogate, and corrects raw data of the associated analyte concentration based on the recovery of the IDA.

The reviewer will check that surrogates and/or IDAs were analyzed for each sample for each organic analysis (including laboratory QC samples), and that recoveries were reported within laboratory-control limits. If there is a reported recovery failure, it is considered to affect only the analytes associated with the surrogate/IDA (see Appendix B for a surrogate/IDA association list) for the corresponding project with the reported failure. However, there are a few special considerations when qualifying data based on surrogate-recovery failures:

1. Matrix interference: Recovery failures due to matrix interference (coelution of an interfering analyte or other matrix interactions) are considered to affect data quality, and results should be qualified as described in Exhibit 7-2. The laboratory typically documents in the case narrative whether a surrogate/IDA recovery failure was due to matrix interference.
2. Dilution: Recovery failures may be observed due to dilution of the surrogates and are not considered to affect the data (USACE 2005). The laboratory typically documents surrogate failures due to dilution in the case narrative. Refer to number 4 for IDA recovery failure assessments.
3. Surrogate/IDA recovery failures in laboratory QC samples: Surrogate/IDA failures in an LCS, LCSD, MS, or MSD are not considered to affect the project sample data as long as the recovery of individual analytes associated with that surrogate/IDA are within the laboratory control limits for the LCS/LCSD/MS/MSD sample. However, gross or systematic surrogate/IDA recovery failures should be considered along with all other QC information for the preparatory batch and the results evaluated according to professional judgment.
4. IDA recovery in project samples: As part of the analytical procedure for isotope-dilution methods, a given analyte concentration is corrected based on the recovery of the associated IDA. Therefore, recovery inefficiencies are somewhat self-correcting and one would expect less inaccuracy due to slight matrix effects. However, recovery outside the recovery limits may indicate there are significant matrix effects that the method is unable to adequately correct for. Results should be qualified as described in Exhibit 7-2.

Excluding the exceptions listed above, data affected by surrogate/IDA recovery failures should be qualified using the following criteria listed in Exhibit 7-2.

Exhibit 7-2: Actions for Surrogate or Isotope Dilution Analyte Recovery Failures

Type	Criteria	Action	
		Detected Analytes	Analytes Not Detected
IDA	%R < 10%	J	R
	10% ≤ %R < LCL	J	UJ
	%R < LCL (diluted sample)	Use professional judgement	N/A[1]
	%R > UCL	J	No qualification
	%R within range	No qualification	
Surrogate	%R < range	JL[2]	UJ[3]
	%R within range	No qualification	
	%R > range	JH[2]	No qualification

NOTES:

1 Non-detects should be reported from the undiluted analysis.

2 Use professional judgment when the bias is poorly defined. Only impart a bias to the qualified data if the bias is well defined (i.e., if there is more than one surrogate in the analysis, where recovery failures are in the same direction). Otherwise, it may be more conservative to simply qualify the results as estimated ('J'; USACE 2005).

3 Use professional judgment when evaluating gross recovery failures. The reviewer should consider rejecting the results where analytes are not detected if the associated surrogate recovery is below 20% (USACE 2005).

LCL = lower control limit, %R = percent recovery, UCL = upper control limit

7.4 Calibration Verification Samples

Calibration verification samples are not typically reported in the Level II data reports provided by the laboratory (aside from appearing in the EDD), and review of such samples is outside the scope of this DVPP. The laboratory may have requirements to re-calibrate the instrument if calibration verification fails or other corrective action. However, this is not always possible, and occasionally calibration verification failures occur and are reported in the case narrative of the Level II laboratory report. Calibration verification samples are described briefly below.

ICV samples are clean extraction solvent spiked with a known analyte concentration, using a different source than that of the primary calibration standards, and analyzed immediately following instrument calibration. Similarly, CCV samples are calibration standards that are analyzed at the beginning of each analytical batch and periodically throughout the run.

The laboratory evaluates ICV and CCV recovery information based on their internal acceptance criteria; in some cases, they also evaluate relative percent difference between CCVs to determine if drift is occurring. As stated above, calibration-level data review is beyond the scope of this DVPP and may be conducted as part of a Level IV data-validation, if calibration issues are identified in the case narrative. Professional judgment should dictate whether any samples in an analytical batch with unresolved CCV failures should be

considered preliminary pending further investigation. For these circumstances, contact the laboratory for more direction and ask the Senior Laboratory Analyst to provide justification for using the data and any bias resulting from these QC failures. Request that the laboratory report be revised to include the justification.

8 PRECISION

Precision refers to the repeatability of measurements (USACE 2005). Precision is evaluated using laboratory QA/QC and field-duplicate samples. The following sections describe the duplicate-sample information that is commonly used to assess precision. However, this is not an exhaustive list and the laboratory may occasionally analyze other duplicate samples that should also be considered. For most analyses, at least one laboratory QC-sample duplicate must be analyzed; this can include a LCSD, MSD, or a laboratory duplicate.

Each type of duplicate is evaluated in the same manner (LCS/LCSD, MS/MSD, laboratory duplicate and field duplicates). A relative percent difference (RPD) is calculated between the duplicate results for a given analyte using the following equation presented in Exhibit 8-1.

Exhibit 8-1: RPD Calculation

Equation	Variable and Definition	
$RPD = \frac{\lvert R_1 - R_2 \rvert}{(R_1 + R_2)/2} \times 100\%$	RPD	Relative Percent Difference
	R1	Primary Result
	R2	Duplicate Result

The resulting RPD is compared to laboratory control limits (for laboratory QC samples), or project or regulatory DQOs for field duplicates. For purposes of this DVPP, the DEC-recommended water-sample DQO of 30% and soil-sample DQO of 50% are used.

The guidelines presented in Exhibit 8-2 will be used for qualifying sample results associated with duplicate-sample RPD failures. The treatment of a failure is the same across types of duplicate samples, but the samples that are affected vary. Refer to the following sections for details.

Exhibit 8-2: Actions for Duplicate-Sample RPD Failures

Criteria	Action	
	Detected Analytes	Analytes Not Detected
RPD ≤ Control Limit or DQO	No qualification	
RPD > Control Limit or DQO	J	UJ

DQO = data quality objective, RPD = relative percent difference

8.1 Laboratory Control Sample Duplicates

Precision can be evaluated between LCS and LCSD results for a given analyte. The laboratory calculates the RPD using the equation presented in Exhibit 8-1 for each analyte. The reviewer will check that each RPD is within the laboratory control limits. RPD failures for specific analytes in the LCS/LCSD are considered to affect the precision of that analyte in each corresponding project sample in the same preparatory batch. Affected results should be flagged according to the criteria presented in Exhibit 8-2.

8.2 Matrix Spike Duplicates

Precision can be evaluated between the MS and the MSD results for a given analyte. The laboratory calculates the RPD for each analyte. The reviewer will check that each RPD is within the laboratory control limits. RPD failures for specific analytes in the MS/MSD are considered to affect the precision of that analyte in the parent sample spiked for the MS/MSD. Professional judgment should be used to determine whether additional samples should be qualified (based on similarity of sample matrix).

RPD failures should be considered to affect the data regardless of the concentration spiked, as long as the laboratory calculates the RPD based on the total analyte concentration quantified in the MS/MSD. If the laboratory calculates the RPD based only on what was recovered of the spike, it should be treated as for MS/MSD recovery, with failures only considered to affect data quality if the spiking concentration is at least double the native concentration of the analyte. Affected results should be flagged according to the criteria presented in Exhibit 8-2.

8.3 Laboratory Duplicates

For select analyses, or when insufficient volume is submitted for analysis of an MS and MSD, the laboratory may analyze a project sample twice (referred to as a laboratory duplicate). The laboratory calculates an RPD between the original result and the duplicate-sample result for each analyte. The reviewer will check that each RPD is within the laboratory control limits. As with MS/MSDs, laboratory duplicate RPD failures are considered to affect the precision of the affected analyte only in the parent sample used for the duplicate analysis. Affected results should be flagged according to the criteria presented in Exhibit 8-2.

8.4 Field-Duplicate Samples

Field-duplicate samples are duplicate samples collected from the same location and submitted to the laboratory performing the requested analysis. The duplicate sample will

have a "dummy" sample number and submitted to the laboratory as a regular sample (i.e., the duplicate is submitted "blind"). These field duplicates are used to determine the reproducibility of the sampling technique, as well as the subsequent laboratory analysis. Sample homogeneity is necessary to obtain acceptable values for the RPD and any heterogeneity should be noted during sampling.

For field-duplicate pairs, the reviewer will calculate an RPD using the equation presented in Exhibit 8-1. An RPD will only be calculated if both sample results are detected above the detection limit. The calculated RPD will be compared to the standard DQOs of 30% for water or 50% for soil. Field-duplicate RPD failures are considered to affect only the results of the duplicate pair; affected data will be qualified based on the criteria in Exhibit 8-2.

In the event that one of the results is above the LOQ but the other result is below the detection limit (not detected) and J-flag detections are reported for the project, the reviewer should use professional judgment and consider qualifying the detected and non-detect result as estimated even though an RPD cannot be calculated. This may be evidence of samples having been mislabeled (in the field or the laboratory), sample heterogeneity, or some other issue; further investigation may be warranted.

9 REPRESENTATIVENESS

Representativeness is defined in Chapter One of the EPA SW-846 Update V Revision 2 (EPA 2014) as the degree to which data accurately and precisely represents a characteristic of a population for a sampling point. Representativeness is dependent on proper execution of the approved sampling program, which is agreed upon by the DEC, DOT&PF, and Shannon & Wilson. To assess sample representativeness, sample-log sheets will be reviewed to ensure the samples were collected according to the approved sampling program and the results therefore represent the location and depth sampled. In addition, where possible, the analytical result for each sample will be compared to the historical results to check that the result is consistent with the broader data set for that location.

There are instances where sample collection procedures deviate from the sampling program and may affect the sample representativeness. Professional judgement is used to assess the data usability based on these deviations. Some of these infrequent instances are presented in Exhibit 9-1 along with qualifications to the data.

Exhibit 9-1: Actions for Deviations from Sampling Program

Sampling Type	Description of Deviation	Action	
		Detected Analytes	Analytes Not Detected
Monitoring Well/ Residential Sampling	Purging/stabilization criteria not met	J	UJ
Residential Sampling – Organic Analyses	Sample collected post treatment (especially for collection post carbon filter)	JL	UJ[1]
Residential Sampling – Inorganic Analyses	Sample collected post treatment (especially iron analyses collected post sediment filter)	JL	UJ

NOTES:

1 Use professional judgment. The reviewer should consider rejecting the results where organic analytes are not detected and samples were collected post carbon filter. At minimum, the non-detect results should be considered estimated and flagged 'UJ' to identify the sample collection discrepancy.

10 LABORATORY APPLIED FLAGS

The laboratory is required to qualify data that does not meet laboratory QC standards. The data qualifiers, flagging criteria, and flagging procedures are detailed in the laboratory's SOPs. The lab does not interpret the impact of an applied flag on the data, rather the flags are meant to draw the attention of the reviewer to an area where laboratory QC criteria is not met. When data is reviewed and validated, the information the laboratory reported is taken and evaluated to determine the effect of the QC deficiency on the data and apply appropriate flags as defined in this document.

In some cases, laboratory applied flags are not needed and may be removed for reporting. For example:

> When an MS and/or MSD sample has a %R failure, but the spiking concertation is not high relative to the native parent sample concentration, then the %R failure is not applicable. The flag the lab applies to the data is therefore not necessary and is removed the analytical reporting table.

In some cases, laboratory applied flags are overwritten by flags applied by Shannon & Wilson. For example:

> When a sample result exceeds the calibration range, the lab may flag the affected data with an 'E'. Calibration exceedances are flagged with a 'J' in the analytical reporting table overwriting the 'E' flag.

In either case listed above, laboratory applied flags are maintained in the laboratory report for reference.

See Exhibit 10-1 for common laboratory applied flags that are either overwritten by a S&W applied flag or are removed from the analytical reporting tables because they are deemed unnecessary after the data-validation process. The flags remain in the laboratory report for reference.

Exhibit 10-1: Actions for Common Laboratory Applied Flags

Laboratory Applied Flag[1]	Flag Description	Shannon & Wilson Applied Flag
I	Value is the estimated maximum possible concentration. Case Narrative flag description: The "I" qualifier means the transition mass ratio for the indicated analyte was outside of the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty. However, analyst judgement was used to positively identify the analyte.	J
E	Result exceeded calibration range.	J
B	Compound was found in the blank sample	See Exhibit 6-1 for flagging criteria
*	LCS or LCSD is outside acceptance limits.	See Exhibit 7-1 for flagging criteria
*	Isotope dilution analyte is outside acceptance limits	See Exhibit 7-2 for flagging criteria
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.	See Exhibit 7-2 for flagging criteria
F1	MS and/or MSD recovery is outside acceptance limits.	See Exhibit 7-2 for flagging criteria
F2	MS/MSD RPD exceeds control limits	See Exhibit 8-2 for flagging criteria

NOTES:

1 This is not meant to be a comprehensive list of flags applied by the laboratory, but rather a list of the most encountered laboratory flags that are often not applicable after data-validation. Labs do not always use identical flags for the same QC failure; therefore, this information will be extrapolated to address the specific flags used by each laboratory and applied to each data set on a case-by-case basis.

LCS = laboratory control sample, LCSD = laboratory control sample duplicate, MS = matrix spike, MSD = matrix spike duplicate, RPD = relative percent difference.

11 COMPARABILITY

Chapter One of the EPA SW-846 Update V Revision 2 (EPA 2014) defines comparability as the expression of the degree of confidence with which one data set can be compared to another. Per the EPA SW-846 Update V Revision 2, a measurement is considered to be valid if they are unqualified or qualified as estimated data during validation. The reviewer and data users should qualitatively assess the comparability between historical and current data sets and use caution in combining data sets if the quality of the data is uncertain. For example, current analytical methods may not be comparable to historical methods where the MRL was elevated.

12 COMPLETENESS

Chapter One of the EPA SW-846 Update V Revision 2 (EPA 2014) defines completeness as the measure of valid data collected compared to the amount planned. The SW-846 defines a valid datum as a measurement that is "unqualified or qualified as estimated [biased high, low, or no direction] during (data) validation." The overall data set from a sampling event will be evaluated to determine if the completeness goal of 85-percent useable data was achieved. Completeness is calculated by comparing the amount of useable (valid) data to the overall number of samples planned. A completeness value below 85- percent may be cause for collecting additional analytical samples.

13 DATA-VALIDATION PLAN UPDATES

This DVPP will be reviewed annually and updated as dictated by DOT&PF's schedule and funding.

14 REFERENCES

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APPENDIX A: SGS BOTTLE GUIDE

Appendix A

SGS Bottle Guide

SGS North America Inc. - Alaska Division

Sample Guide: Methods, Bottles, Preservatives & Hold Times

Parameter	Method	Matrix	Recommended Container/Size	Preservative	Holding Time *	Other Notes
1,4-Dioxane	SW 8270	water	2x250 ml amber glass	0-6° C	7 days	(Ref Lab)
1,4-Dioxane	EPA 522	DW	?	?	28 days	(Ref Lab)
1,4-Dioxane	SW 8260C SIM	water	3x40 ml VOA vials	HCl; 0-6° C	14 days	
1,4-Dioxane	SW 8260C SIM	soil	1x4 oz prewt'd amber (2nd 4 oz unpreserve % solids jar if no other analyses)	MeOH+BFB; 0-6° C	14 days	
Acidity as CaCO3	SM 2310B	water	1x250 ml HDPE	0-6° C	14 days	should be analyzed in the field
Acute Whole Effluent Toxicity (AWET)	*(depends on permit)*	water	1x2-8 gallon plastic (see permit)	0-6° C	**24 hrs**	(Ref Lab) need permit #/etc.
Alcohols: see Glycols or Alcohols						
Alkalinity as CaCO3 (Total or Full)	SM 2320B	water	1x250 ml HDPE	0-6° C	14 days	should be analyzed in the field
Ammonia	SM 4500-NH3-G modified	soil	1x4 oz glass	4° C	28 days	
Ammonia	SM 4500NH3-G	water	1x125 ml HDPE	H2SO4; 0-6° C	28 days	
Anion/Cation Balance	SM 1030E	water	1x60 ml Nalgene for NO2+NO3 1x250 ml HDPE for metals 1x500 ml HDPE for other analyses	H2SO4 HNO3 unpreserved	ASAP	field-filter for dissolved metals; other container unpreserved for alkalinity and anion analyses.
Asbestos	PCM or TEM	air	cartridge	none	n/s	(Ref Lab)
Asbestos	PLM or TEM	solids	any	none	n/s	(Ref Lab)
Asbestos	TEM	DW	2x1 L amber glass	0-6° C	48 hrs or ozonate	(Ref Lab) leave 20% headspace
Biochemical Oxygen Demand (BOD)	SM 5210B	water	1x1 L HDPE (depending on matrix)	0-6° C	**48 hrs**	
Bromate	EPA 300.1	water	125 ml HDPE (special order)	1.25 ml 5% EDA 0-6° C	28 days	(Ref Lab)
Bromide	EPA 300.0/SW 9056A	soil	1x4 oz glass	0-6° C	28 days	
Bromide	EPA 300.0/SW 9056A	water	1x60 ml Nalgene	0-6° C	28 days	
BTEX	SW 8021B/8260C	soil	1x4 oz prewt'd amber (2nd 4 oz unpreserve % solids jar if no other analyses)	MeOH+BFB; 0-6° C	28 days for AK101 (14 days for BTEX)	field-preservation required; use 50 g soil & 25 ml MeOH (can combo with GRO) TB required
BTEX	SW 8021B/8260C	water	3x40 ml amber VOA vials w/ septa	HCl; 0-6° C	14 days	(can combo with GRO) allow no headspace; TB required
CAN (Total Coliform, Arsenic, Nitrate)	SM 9223B, EPA 200.8, SM 4500NO3	DW	sterile 120 ml container for coli 1x120 mL Nalgene for metals 60 ml Nalgene for NO2+NO3	Na2S2O3 for coli; HNO3 for metals; H2SO4 for NOx; chill recommended	**30 hrs for coli**	
CAN (Total Coliform, Arsenic, Nitrate)	SM 9223B, EPA 200.8, SM 4500NO4	DW with PWSID	sterile 120 ml container for coli 1x120 mL Nalgene for metals 60 ml Nalgene for NO2+NO4	Na2S2O3 for coli; HNO3 for metals; H2SO4 for NOx; 2-6°C	**30 hrs for coli**	
Carbamates	EPA 531.1	DW	3x40 ml amber VOA vials w/ septa (special order)	Na2S2O3; Monochloroacetic Acid; 0-6° C	7 days	(Ref Lab)
Carbamates	EPA 531.1	DW with PWSID	3x40 ml amber VOA vials w/ septa (special order)	Na2S2O3; Monochloroacetic Acid; 2-6° C	7 days	(Ref Lab)
Chemical Oxygen Demand (COD)	EPA 410.4	water	1x125 ml HDPE	H2SO4; 0-6° C	28 days	
Chlorate	EPA 300.1	water	1x125 ml HDPE (special order)	1.25 ml 5% EDA 0-6° C	28 days	(Ref Lab)
Chloride	EPA 300.0/SW 9056A	soil	1x4 oz glass	0-6° C	28 days	
Chloride	EPA 300.0/SW 9056A	water	1x60 ml Nalgene	0-6° C	28 days	
Chlorite	EPA 300.1	water	1x125 ml HDPE (special order)	1.25 ml 5% EDA 0-6° C	14 days	(Ref Lab)
Chlorophyll a	SM 10200H	water	1x1 L amber glass (special order filters)	freeze filter ASAP	21 days	(Ref Lab) use 4.25 cm GF-B filter; field-filter & freeze
Chromium, Hexavalent	SM 3500Cr or SW 7196	water	1x125 ml HDPE	0-6° C	**24 hrs**	
Chromium, Hexavalent	SW 7196	soil	1x4 oz amber glass	0-6° C	28 days	(Ref Lab)
Chronic Whole Effluent Toxicity (CWET)	(depends on permit)	water	1x2-8 gallon plastic (see permit)	0-6° C	**24 hrs**	(Ref Lab) need permit specs
Coliform, Fecal (MF)	SM 9222D	water	sterile 120 ml container filled to 100 ml mark	Na2S203; 0-8° C	**8 hrs**	

Parameter	Method	Matrix	Recommended Container/Size	Preservative	Holding Time *	Other Notes
Coliform, Total (MF)	SM 9222B	water	sterile 120 ml container filled to 100 ml mark	Na2S203; chill recommended	30 hrs	(Ref Lab) for quantification of Total coliform colonies, use method 9223B Quantitray
Coliform, Total (P/A or Quantitray)	SM 9223B	DW, DW with PWSID, water	sterile 120 ml container filled to 100 ml mark	Na2SO3; chill recommended	30 hrs	(Contact SGS PM to make arrangements if hold time is other than 30 hours.)
E. coli (LT2 Quantitray)	SM 9223B	DW, DW with PWSID	sterile 120 ml container filled to 100 ml mark	Na2S203; <10˚ C	30 hrs	(Contact SGS PM to make arrangements if hold time is other than 30 hours.)
Color, True or Apparent	SM 2120B	water	1x250 ml HDPE	0-6° C	48 hrs	
Conductivity	SM 2510B	water	1x250 ml HDPE	0-6° C	28 days	
Corrosivity (see pH)						
Crpytosporidia	EPA 1623	water	1x10 L cubitainer	0-6° C	24 hrs	(Ref Lab) (can combo with Giardia)
Cyanide, Total	SM 4500CN-C,E	DW/W	1x125ml amber HDPE	(Sodium Arsenite if chlorinated) NaOH; 0-6° C	14 days	
Cyanide, Total	SM 4500CN-C,E	DW with PWSID	1x125ml amber HDPE	(Sodium Arsenite if chlorinated) NaOH; 2-6° C	14 days	
Cyanide, Weak Acid Dissociable	SM 4500CN-I	water	1x125ml amber HDPE	NaOH; 0-6° C	14 days	
Diesel Range Organics (DRO)	AK102	oil	1x20 ml scintillation vial	none	n/s	can combo with RRO
Diesel Range Organics (DRO)	AK102/8015C	soil	1x4 oz amber glass	0-6° C	14/40 days (*)	can combo with RRO
Diesel Range Organics (DRO)	AK102/8015C	water	2x1 L amber glass	HCl; 0-6° C	14/40 days (*)	can combo with RRO
Diesel Range Organics (DRO)-Low Vol.	AK102/8015C	water	2x250 ml amber glass	HCl; 0-6° C	14/40 days (*)	
Dioxins	EPA 1613	DW	2x1 L amber glass	Na2S203; 0-6° C	28 days	(Ref Lab)
Dioxins	EPA 1613	DW with PWSID	2x1 L amber glass	Na2S203; 2-6° C	28 days	(Ref Lab)
Dioxins	SW 8280B or 8290A	soil	1x4 oz amber	0-6° C	n/s	(Ref Lab)
Dioxins	SW 8280B or 8290A	water	2x1 L amber glass	0-6° C	n/s	(Ref Lab)
Diquat/Paraquat	EPA 549.2	DW	1x1 Liter amber poly	Na2S203; 0-6° C	7 days	(Ref Lab)
Diquat/Paraquat	EPA 549.2	DW with PWSID	1x1 Liter amber poly	Na2S203; 2-6° C	7 days	(Ref Lab)
Dissolved Metals (see Metals, Dissolved)						
Dissolved Organic Carbon (DOC)	SM 5310B	water	1x125 ml amber glass	HCl; 0-6° C	28 days	field-filter; unpres. if lab-filtered (should be field-filtered)
Dissolved Oxygen	SM 4500O2-G	water	BOD bottle w/ stopper	0-6° C	15 minutes (ASAP)	should be analyzed in the field; allow no headspace
EDB/DBCP/1,2,3-TCP	SW 8260C SIM	water	3x40 ml amber VOA vials w/ septa	HCl; 0-6° C	14 days	TB required, allow no headspace
EDB/DBCP/1,2,3-TCP	SW 8260C SIM	soil	1x4 oz prewt'd amber (2nd 4 oz unpreserve % solids jar if no other analyses)		14 days	TB required
EDB/DBCP/1,2,3-TCP	EPA 504.1	DW	3x40 ml amber VOA vials w/ septa	0-6° C	14 days	(Ref Lab) TB required allow no headspace
EDB/DBCP/1,2,3-TCP	EPA 504.1	DW with PWSID	3x40 ml amber VOA vials w/ septa	2-6° C	14 days	(Ref Lab) TB required allow no headspace
EDB/DBCP/1,2,3-TCP	SW 8011	soil	1x4 oz amber	0-6° C	14 days	(Ref Lab) allow no headspace
EDB/DBCP/1,2,3-TCP	SW 8011	water	3x40 ml amber VOA vials w/ septa	0-6° C	14 days	(Ref Lab) TB required allow no headspace
Endothall	EPA 548.1	DW	1x125 ml amber glass	Na2S203; 0-6° C	7 days	(Ref Lab)
Endothall	EPA 548.1	DW with PWSID	1x125 ml amber glass	Na2S203; 2-6° C	7 days	(Ref Lab)
Enterococci	Enterolert	water	sterile 120 ml container filled to 100 ml mark	Na2S203; 0-6° C	8 hrs	
EPH	NW-EPH	soil	1x4 oz amber glass	0-6° C	14/40 days (*)	(Ref Lab)
EPH	NW-EPH	water	2x500 ml amber (special order)	HCl; 0-6° C	7/40 days (*)	(Ref Lab)
Explosives	SW 8330A	soil	1x4 oz amber glass	0-6° C	7 days	(Ref Lab)
Explosives	SW 8330A	water	2x1 L amber glass	0-6° C	7 days	(Ref Lab)
Fluoride	EPA 300.0/SW 9056A	water	1x60 ml Nalgene	0-6° C	28 days	
Fluoride	EPA 300.0/SW 9056A	soil	1x4 oz glass	0-6° C	28 days	
Gasoline Range Organics (GRO)	AK101/8015C	oil	1x20 ml scintillation vial	none	n/s	(can combo with BTEX)

Parameter	Method	Matrix	Recommended Container/Size	Preservative	Holding Time *	Other Notes
Gasoline Range Organics (GRO)	AK101/8015C	soil	1x4 oz prewt'd amber (2nd 4 oz unpreserve % solids jar if no other analyses)	MeOH+BFB; chill recommended	28 days for AK101 (14 days for BTEX)	field-preservation required; use 50 g soil & 25 ml MeOH (can combo with BTEX) TB required
Gasoline Range Organics (GRO)	AK101/8015C	water	3x40 ml amber VOA vials w/ septa	HCl; 0-6° C	14 days	(can combo with BTEX) allow no headspace; TB required
Giardia	EPA 1623	water	1x10 L cubitainer	0-6° C	**24 hrs**	(Ref Lab) (can combo with Crypto)
Glycols or Alcohols	SW 8015 modified	water	3x40 ml VOA vials	0-6° C	14 days	(Ref Lab) specify each compound
Glycols or Alcohols	SW 8015 modified	liquid	1x120 ml amber glass	n/a	14 days	(Ref Lab) specify each compound
Glycols or Alcohols	SW 8015 modified	solid	1x4 oz glass	0-6° C	14 days	(Ref Lab) specify each compound
Glyphosate	EPA 547	DW	1x125 ml amber glass	Na2S203; 0-6° C	7 days	(Ref Lab)
Glyphosate	EPA 547	DW with PWSID	1x125 ml amber glass	Na2S203; 2-6° C	7 days	(Ref Lab)
Gross Alpha &/or Gross Beta	EPA 900	water	1x1 L HDPE	HNO3 (preserved at lab)	none	(Ref Lab)
Gross Heating Value	ASTM D 240	oil	1x20 ml scintillation vial	none	n/s	
Haloacetic Acids Formation Potential	SM 5710/6251B	DW/W	2x1 Liter	0-6° C	ASAP/14 days	(Ref Lab)
Haloacetic Acids Formation Potential	SM 5710/6251B	DW/W with PWSID	2x1 Liter	2-6° C	ASAP/14 days	(Ref Lab)
Haloacetic Acids	EPA 552.3	DW/W	1 x 250 ml narrow mouth amber glass	NH4Cl; 0-6° C	14 days	(Ref Lab)
Haloacetic Acids	EPA 552.3	DW/W with PWSID	1 x 250 ml narrow mouth amber glass	NH4Cl; 2-6° C	14 days	(Ref Lab)
Hardness	SM 2340B	water	1x250 ml HDPE	HNO3	180 days	
Herbicides	EPA 515.4	DW	2x125 ml amber glass	Sodium Sulfite; 0-6° C	14 days	(Ref Lab)
Herbicides	EPA 515.4	DW with PWSID	2x125 ml amber glass	Sodium Sulfite; 2-6° C	14 days	(Ref Lab)
Herbicides	EPA 555	DW	2x1 L amber glass	Na2S203; 0-6° C	7/40 days (*)	(Ref Lab)
Herbicides	EPA 555	DW with PWSID	2x1 L amber glass	Na2S203; 2-6° C	7/40 days (*)	(Ref Lab)
Herbicides	SW 8151A	soil	1x4 oz amber	0-6° C	14/40 days (*)	(Ref Lab)
Herbicides	SW 8151A	water	2x1 L amber glass	0-6° C	7/40 days (*)	(Ref Lab)
Heterotrophic Plate Count (Pour Plate)	SM 9215B	water	sterile 120 ml container filled to 100 ml mark	Na2S203; chill recommended	**30 hrs for Pool/Spa** **8 hrs for Drinking** **& Reagent Water**	(Contact SGS PM to make arrangements if hold time is other than 30 hours.)
Ignitability, Seta Flash	SW 1020B	oil	1x4 oz glass	none	n/s	
Inorganic Contaminants, Primary	EPA 200.8 and 300.0, SM 4500CN-C,E, 4500NO3-F	DW	1x250 ml HDPE for metals; 1x120 ml Nalgene for cyanide; 1x60 ml Nalgene for NO2+NO3; 1x60 ml Nalgene for anions	HNO3 for metals; NaOH for CN; H2SO4 for NOx; none for F; 0-6° C	28/180 days; 14 days; 28 days; 28 days	If samples for metals are not acid preserved they must be received by the lab within 14 days of sampling
Inorganic Contaminants, Primary	EPA 200.8 and 300.0, SM 4500CN-C,E, 4500NO3-F	DW with PWSID	1x250 ml HDPE for metals; 1x120 ml Nalgene for cyanide; 1x60 ml Nalgene for NO2+NO3; 1x60 ml Nalgene for anions	HNO3 for metals; NaOH for CN; H2SO4 for NOx; none for F; 2-6° C	28/180 days; 14 days; 28 days; 28 days	If samples for metals are not acid preserved they must be received by the lab within 14 days of sampling
Karl Fisher Water Content	ASTM D 1744	oil	1x20 ml scintillation vial	none	n/s	
Kjeldahl Nitrogen: see Total Kjeldahl N						
Langlier Index	SM 2330B	DW	1x250 ml HDPE for metals 1x500 ml HDPE for other analyses	HNO3 for metals; 0-6° C for others	ASAP	(req's pH, TDS, Alkalinity & Hardness)
Langlier Index	SM 2330B	DW with PWSID	1x250 ml HDPE for metals 1x500 ml HDPE for other analyses	HNO3 for metals; 2-6° C for others	ASAP	(req's pH, TDS, Alkalinity & Hardness)
Lead in Paint	SW 6020A	solid	any	none	6 months	
Lead/Copper Rule	EPA 200.8	DW	1x1 L HDPE (No substitution)	HNO3	6 months	*"First Draw" collection required If samples for metals are not acid preserved they must be received by the lab within 14 days of sampling*
MBAS: see Surfactants						
Mercury, Dissolved	EPA 200.8/245.1 or SW 6020A/7470A	Water	1x250 mL HDPE	HNO3	28 days	field-filter; unpres. if lab-filtered (should be field-filtered) If samples for metals are not acid preserved they must be received by the lab within 14 days of sampling
Mercury, Methyl-	EPA 1630	Water	1x250 ml Teflon (special order)	HCl	90 days	(Ref Lab)
Mercury, Total	EPA 200.8/245.1 or SW 6020A/7470A	Water	1x250 mL HDPE	HNO3	28 days	If samples for metals are not acid preserved they must be received by the lab within 14 days of sampling
Mercury, Total	SW 6020A/7470A/7471B	soil	1x4 oz glass	none; 0-6° C	28 days	

Parameter	Method	Matrix	Recommended Container/Size	Preservative	Holding Time *	Other Notes
Mercury, Trace by CVAF (Low Level)	EPA 1631E	water	1x500 ml FLPE, Teflon or amber glass	HCl	90 days	TB recommended
Metals, Dissolved (other than Hex.Cr)	EPA 200.8	water	1x250 ml HDPE	HNO3	28 days for Hg 180 days for metals	field-filter; unpres. if lab-filtered (should be field-filtered) If samples for metals are not acid preserved they must be received by the lab within 14 days of sampling
Metals, Dissolved (other than Hex.Cr)	SW 6020A	water	1x250 ml HDPE	HNO3	28 days for Hg 180 days for metals	field-filter; unpres. if lab-filtered(should be field-filtered) If samples for metals are not acid preserved they must be received by the lab within 14 days of sampling
Metals, Total (other than Hex.Cr)	EPA 200.8	water	1x250 ml HDPE	HNO3	28 days for Hg 180 days for metals	
Metals, Total (other than Hex.Cr)	SW 6020A	soil	1x4 oz glass	0-6° C	28 days for Hg 180 days for metals	
Metals, Total (other than Hex.Cr)	SW 6020A	oil	1x20 ml scintillation vial	n/a	28 days for Hg 180 days for metals	
Metals, Wipes	SW 6020A	wipes	premoistened "Ghost Wipe"	n/a	28 days for Hg 180 days for metals	wipe 10x10 cm area
Methane/Light Gases	RSK 175	water	3x40 ml amber VOA vials w/ septa	HCl; 0-6° C	14 days	(Ref Lab) allow no headspace
Nitrate+Nitrite, Total	SM 4500NO3-F	DW/W	1x60 ml Nalgene	H2SO4; chill recommended	28 days	
Nitrate+Nitrite, Total	SM 4500NO3-F	DW with PWSID	1x60 ml Nalgene	H2SO4;2-6°C	28 days	
Nitrate	EPA 300.0/SW 9056A	DW/W	1x60 ml Nalgene	0-6° C	**48 hrs**	
Nitrate	EPA 300.0/SW 9056A	DW with PWSID	1x60 ml Nalgene	2-6°C	**48 hrs**	
Nitrate	EPA 300.0/SW 9056A	soil	1x4 oz glass	0-6° C	28 days	
Nitrite	EPA 300.0/SW 9056A	DW/W	1x60 ml Nalgene	0-6° C	**48 hrs**	
Nitrite	EPA 300.0/SW 9056A	DW with PWSID	1x60 ml Nalgene	2-6° C	**48 hrs**	
Nitrite	EPA 300.0/SW 9056A	soil	1x4 oz glass	0-6° C	28 days	
Odor	SM 2150B	DW	1x1L amber glass	0-6° C	**48 hrs**	(Ref Lab)
Odor	SM 2150B	DW with PWSID	1x1L amber glass	2-6° C	**24 hrs**	(Ref Lab)
Oil & Grease, HEM	EPA 1664A	water	2x1L amber glass	HCl; 0-6° C	28 days	
Oil Burn Specs (OBS)	40 CFR 279.11 (PCBs, As, Cd, Cr, Pb, Total Halogens & Ignitablity)	oil	1x4 oz glass	none	n/s	
Ortho-Phosphate	SM4500P-E	water	1x60 ml Nalgene	0-6° C	**48 hrs**	
PAH	EPA 525.2	DW	2x1 L amber glass	Sodium Sulfite; HCl; 0-6° C	14 days	(Ref Lab * verify cmpd list *)
PAH	EPA 525.2	DW with PWSID	2x1 L amber glass	Sodium Sulfite; HCl; 2-6° C	14 days	(Ref Lab * verify cmpd list *)
PAH	EPA 625M-SIM; SW 8270D-SIM	soil	1x4 oz amber glass	0-6° C	14/40 days (*)	
PAH	EPA 625M-SIM; SW 8270D-SIM	water	2x250 ml amber glass	0-6° C	7/40 days (*)	
PAH Trace	EPA 625M-SIM; SW 8270D-SIM	water	2x1 L amber glass	0-6° C	7/40 days (*)	
PCB Wipes	SW 8082A	wipes	1 gauze wipe w/ 4 oz glass (septa lid)	Hexane	n/s	wipe 10x10 cm area
PCBs	EPA 508	DW	2x1 L amber glass	Na2S203; 0-6° C	1 year (*)	(Ref Lab; can combo with Pest)
PCBs	EPA 508	DW with PWSID	2x1 L amber glass	Na2S203; 2-6° C	1 year (*)	(Ref Lab; can combo with Pest)
PCBs	EPA 608	water	2x1 L amber glass	0-6° C	1 year (*)	(Ref Lab; can combo with Pest)
PCBs	SW 8082A	oil	1x20 ml scintillation vial	none	n/s	
PCBs	SW 8082A	soil	1x4 oz glass	0-6° C	n/s	
PCBs	SW 8082A	water	2x1 L amber glass	0-6° C	n/s	
PCBs in Transformer Oil	SW 8082A	oil	1x20 ml scintillation vial	none	n/s	
Percent Solids (Moisture Content)	SM 2540G (modified)	soil	1x4 oz amber glass	0-6° C	14 days	
Pesticides	EPA 508	DW	2x1 L amber glass	Na2S203; 0-6° C	7/40 days (*)	(Ref Lab; can combo with PCBs)
Pesticides	EPA 508	DW with PWSID	2x1 L amber glass	Na2S203; 2-6° C	7/40 days (*)	(Ref Lab; can combo with PCBs)
Pesticides	EPA 608	water	2x1 L amber glass	0-6° C	7/40 days (*)	(Ref Lab; can combo with PCBs)
Pesticides	SW 8270D-SIM	oil	1x20 ml scintillation vial	none	n/s	
Pesticides	SW 8270D-SIM	soil	1x4 oz amber glass	0-6° C	14/40 days (*)	

Parameter	Method	Matrix	Recommended Container/Size	Preservative	Holding Time *	Other Notes
Pesticides	SW 8270D-SIM	water	2x1 L amber glass	0-6° C	7/40 days (*)	
PFAs (Polyfluorochemicals)	PFAs	water	1x1 L polycarbonate (special order)	0-6° C w/Trizma	14 days	(Ref Lab) should include temp blank in same type bottle
PFAs (Polyfluorochemicals)	537	DW	2x250 ml polycarbonate (special order)	0-6° C w/Trizma	14 days	(Ref Lab) should include temp blank in same type bottle
PFAs (Polyfluorochemicals)	PFAs	Soil	1 x 4 oz polycarbonate (special order)	0-6° C	14 days	(Ref Lab) should include temp blank in same type bottle
PFAs (Polyfluorochemicals)	PFAs	Product	2x250 ml polycarbonate (special order)	0-6° C	14 days	(Ref Lab) should include temp blank in same type bottle
pH	SM 4500H-B	water	1x250 ml Nalgene	0-6° C	ASAP/7 days	should be field analyzed
pH Corrosivity	SW 9040C	liquid	1x4 oz glass	none	ASAP/7 days	
pH Corrosivity	SW 9045D	solid	1x4 oz glass	none	ASAP/7 days	
Phase II Inorganics	EPA 200.8; EPA 300.0	DW	1x250 ml HDPE for metals; 1x60 ml Nalgene for anions	HNO3 for metals, unpreserved for fluoride; 0-6° C	6 months; 28 days	If samples for metals are not acid preserved they must be received by the lab within 14 days of sampling
Phase II Inorganics	EPA 200.8; EPA 300.0	DW with PWSID	1x250 ml HDPE for metals; 1x60 ml Nalgene for anions	HNO3 for metals, unpreserved for fluoride; 2-6° C	6 months; 28 days	If samples for metals are not acid preserved they must be received by the lab within 14 days of sampling
Phase V Inorganics	EPA 200.8; SM 4500CN-C,E	DW	1x250 ml HDPE for metals; 1x125 ml Nalgene for cyanide	HNO3 for metals, NaOH for CN; 0-6° C	6 months; 14 days	(dechlorinate before collecting for cyanide if applicable) If samples for metals are not acid preserved they must be received by the lab within 14 days of sampling
Phase V Inorganics	EPA 200.8; SM 4500CN-C,E	DW with PWSID	1x250 ml HDPE for metals; 1x125 ml Nalgene for cyanide	HNO3 for metals, NaOH for CN; 2-6° C	6 months; 14 days	(dechlorinate before collecting for cyanide if applicable) If samples for metals are not acid preserved they must be received by the lab within 14 days of sampling
Phenols	EPA 420.1 or SW9065	water	1 x 500 ml HDPE	H2SO4; 0-6° C	28 days	(Ref Lab)
Phosphorus, Total	SM4500P-B,E	water	1x125 ml HDPE	H2SO4; 0-6° C	28 days	
PIWA (Private Individual Water Analysis)	SM 9223B, 2320B, 2510B, 2540C, 4500-H B, EPA 200.8, 300.0	water	sterile 120 ml container for coli 60 ml Nalgene for NO2+NO3 1x120 mL Nalgene for metals 1x500 ml HDPE for other analyses	Na2S2O3 for coli; HNO3 for metals; H2SO4 for NOx; chill recommended	**30 hrs for coli**	
Radiological Test Bank (i.e., Gross Alpha, Radium 226/228, Uranium)	EPA 900 EPA 903.1/904 EPA 200.8	DW	8x1 L HDPE (Note: Collect 2x1-L each quarter, then composite at the end of the year.)	HNO3 (preserved at lab)	180 days	(Ref Lab)
Radium 226/228	EPA 903.1/904	water	3x1 L HDPE	HNO3 (preserved at lab)	6 months	(Ref Lab)
Radon in DW	EPA 913 or SM 7500	water	3x40 ml amber VOA with septa	0-6° C	**72 hrs**	(Ref Lab)
Residual Chlorine, Free	SM 4500CL-F	water	1x60 ml Nalgene	0-6° C	**15 minutes**	should be field analyzed
Residual Chlorine, Total	SM 4500CL-G	water	1x60 ml Nalgene	0-6° C	**15 minutes**	should be field analyzed
Residual Range Organics (RRO)	AK103	oil	1x20 ml scintillation vial	none	n/s	(can combo with DRO)
Residual Range Organics (RRO)	AK103	soil	1x4 oz amber glass	0-6° C	14/40 days (*)	(can combo with DRO)
Residual Range Organics (RRO)	AK103	water	2x1 L amber glass	HCl; 0-6° C	14/40 days (*)	(can combo with DRO)
Residue, Filterable (TDS)	SM 2540C	water	1x125 mL HDPE	0-6° C	7 days	
Residue, Non-Filterable (TSS)	SM 2540D	water	1x1 L HDPE (entire volume required)	0-6° C	7 days	requires 1 full Liter
Residue, Settleable (SS or SM)	SM 2540F	water	1x1 L HDPE (entire volume required)	0-6° C	**48 hrs**	requires 1 full Liter
Residue, Suspended Volatile (SVS)	SM 2540E	water	1x1 L HDPE (entire volume required)	0-6° C	7 days	requires 1 full Liter
Residue, Total (TS)	SM 2540B	water	1x125 ml HDPE	0-6° C	7 days	
Residue, Total Volatile (TVS)	SM 2540E	water	1x125 ml HDPE	0-6° C	7 days	
Resistivity	SM 2510B	water	1x125 ml HDPE	0-6° C	28 days	
Salinity by Chloride	EPA 300.0	water	1x60 ml Nalgene	0-6° C	28 days	
Secondary Inorganic Contaminants	EPA 200.8, 300, SM 4500H-B, 2120B, 2330B, 2150B, 2320B, 2540C, 5540C	DW	1x250 mL HDPE for metals; 1x250 ml amber glass for MBAS; 1x1 L amber glass for odor; 1x1 L HDPE for other analyses	HNO3 for metals; none for others; 0-6° C	**48 hrs for anions, pH, MBAS, odor, Alkalinity, etc.**	(MBAS requires Ref Lab) If samples for metals are not acid preserved they must be received by the lab within 14 days of sampling
Secondary Inorganic Contaminants	EPA 200.8, 300, SM 4500H-B, 2120B, 2330B, 2150B, 2320B, 2540C, 5540C	DW with PWSID	1x250 mL HDPE for metals; 1x500 ml amber glass for MBAS; 1x1 L amber glass for odor; 1x1 L HDPE for other analyses	HNO3 for metals; none for others; 2-6° C	**48 hrs for anions, pH, MBAS, odor, Alkalinity, etc.**	(MBAS requires Ref Lab) If samples for metals are not acid preserved they must be received by the lab within 14 days of sampling
Semivolatile Organic Cmpds (SVOC)	EPA 525.2	DW	2x1 L amber glass	Sodium Sulfite; HCl; 0-6° C	14/40 days (*)	(Ref Lab * verify cmpd list *)
Semivolatile Organic Cmpds (SVOC)	EPA 525.2	DW with PWSID	2x1 L amber glass	Sodium Sulfite; HCl; 2-6° C	14/40 days (*)	(Ref Lab * verify cmpd list *)
Semivolatile Organic Cmpds (SVOC)	EPA 625	water	2x1 L amber glass	0-6° C	7/40 days (*)	
Semivolatile Organic Cmpds (SVOC)	SW 8270D	soil	1x4 oz amber glass	0-6° C	14/40 days (*)	

Parameter	Method	Matrix	Recommended Container/Size	Preservative	Holding Time *	Other Notes
Semivolatile Organic Cmpds (SVOC)	SW 8270D	water	2x1 L amber glass	0-6° C	7/40 days (*)	
Settleable Matter (SS or SM): see Residue, Settleable						
Solids, Total (TS): see Residue, Total						
Solids, Volatile (VS): see Residue, Volatile						
Specific Gravity	Lab SOP	liquid	1x125 ml amber glass	none	n/s	
SPLP … (see TCLP methods)	SW 1312…					
Sulfate	EPA 300.0/SW 9056A	soil	1x4 oz glass	0-6° C	28 days	
Sulfate	EPA 300.0/SW 9056A	water	1x60 ml Nalgene	0-6° C	28 days	
Sulfide, Total	SM 4500S-D	water	1x125 mL HDPE	NaOH+ZnAc; 0-6° C	7 days	
Sulfite	EPA 377.1	water	1x500 ml HDPE	5ml 2.5% EDTA	15 minutes	(Ref Lab)
Sulfolane	EPA 1625/SW8270D	soil	1x8 oz amber glass	0-6° C	14/40 days (*)	
Sulfolane	EPA 1625/SW8270D	water	2x1 L amber glass	0-6° C	7/40 days (*)	
Sulfur, Total	ASTM D 2622	oil	1x120 ml amber glass	none	n/s	(Ref Lab)
Surfactants (MBAS)	SM 5540C	water	1x500 mL amber glass	0-6° C	48 hrs	(Ref Lab)
Suspended Solids (SS or SM): see Residue, Settleable						
TAH	EPA 602 by 624/SW 8260B	water	3x40 ml amber VOA vials w/ septa	HCl; 0-6° C	14 days	allow no headspace
TAqH	EPA 625M-SIM; SW 8270D-SIM	water	2x250 ml amber glass	0-6° C	7/40 days (*)	
TAqH Trace	EPA 625M-SIM; SW 8270D-SIM	water	2x1 L amber glass	0-6° C	7/40 days (*)	
Tannin/Lignin	HACH	water	1x250 ml amber glass	0-6° C	28 days	(Ref Lab)
TCLP Herbicides	SW 1311/8151A	water	1x1 L amber glass	none	14/7/40 days	(Ref Lab)
TCLP Herbicides	SW 1311/8151A	oil	1x20 ml scintillation vial	none	14/7/40 days	(Ref Lab)
TCLP Herbicides	SW 1311/8151A	solid	1x8 oz amber glass	none	14/7/40 days	(Ref Lab)
TCLP Metals	SW 1311/6000/7000	water	1x500 mL or 1Liter HDPE	none	14/28 days (for Hg) 14/180 days (other)	
TCLP Metals	SW 1311/6000/7000	oil	1x20 ml scintillation vial	none	14/28 days (for Hg) 14/180 days (other)	
TCLP Metals	SW 1311/6000/7000	solid	1x8 oz amber glass	none	14/28 days (for Hg) 14/180 days (other)	
TCLP Pesticides	SW 1311/8270D-SIM	water	1x1 L amber glass	none	14/7/40 days	
TCLP Pesticides	SW 1311/8270D-SIM	oil	1x20 ml scintillation vial	none	14/7/40 days	
TCLP Pesticides	SW 1311/8270D-SIM	solid	1x8 oz amber glass	none	14/7/40 days	
TCLP Semivolatiles	SW 1311/8270D	water	1x1 L amber glass	none	14/7/40 days	
TCLP Semivolatiles	SW 1311/8270D	oil	1x20 ml scintillation vial	none	14/7/40 days	
TCLP Semivolatiles	SW 1311/8270D	solid	1x8 oz amber glass	none	14/7/40 days	
TCLP Volatiles	SW 1311/8260C	water	3x40 ml amber VOA vial w/ septa	none	14/14 days	
TCLP Volatiles	SW 1311/8260C	oil	1x20 ml scintillation vial	none	14/14 days	
TCLP Volatiles	SW 1311/8260C	solid	1x4 oz amber glass	none	14/14 days	
Thiocyanate	SM4500CN-M	water	1x125ml HDPE	HNO3; 0-6° C	28 days	(Ref Lab) Clean aqueous matrix only
Total Dissolved Solids (TDS): see Residue, Filterable						
Total Halogens	SW 5050/9056A	oil	1x60 ml amber glass	none	n/s	
Total Kjeldahl Nitrogen (TKN)	EPA 4500N-D	water	1x125 mL HDPE	H2SO4; 0-6° C	28 days	
Total Nitrogen (see: NO2/NO3, TKN and Ammonia)						
Total Organic Carbon (TOC)	TOC-SGS SOP	soil	1x4 oz amber	0-6° C	28 days	HT extended if frozen
Total Organic Carbon (TOC)	SM 5310B/SW 9060A	water	1x125 ml amber glass	HCl; 0-6° C	28 days	
Total Organic Halides (TOX)	SW 9020	soil	1x4 oz amber	0-6° C	28 days	(Ref Lab)
Total Organic Halides (TOX)	SW 9020	water	2x40 ml VOA or larger bottle	0-6° C	28 days	(Ref Lab)
Total Petroleum Hydrocarbons, HEM-SG	EPA 1664 SG	water	2x1 L amber glass	HCl; 0-6° C	28 days	
Total Solids: see Residue, Total						
Total Suspended Solids: see Residue, Non-Filterable						
Toxicity, SPP (for drilling mud)	40 CFR …	solid	1 Liter	0-6° C	90 days	(Ref Lab)

Parameter	Method	Matrix	Recommended Container/Size	Preservative	Holding Time *	Other Notes
TPH by 8015B: See GRO or DRO						
Trihalomethane Formation Potential	SM 5710/EPA 551.1	DW/W	1 Liter	0-6° C	ASAP/14 days	(Ref Lab)
Trihalomethane Formation Potential	SM 5710/EPA 551.1	DW with PWSID	1 Liter	2-6° C	ASAP/14 days	(Ref Lab)
Trihalomethanes (TTHM)	EPA 524.2	DW/W	3x40 ml amber VOA vials w/ septa	Ascorbic Acid/ HCl; 0-6° C	14 days	allow no headspace; TB required
Trihalomethanes (TTHM)	EPA 524.2	DW with PWSID	3x40 ml amber VOA vials w/ septa	Ascorbic Acid/ HCl; 2-6° C	14 days	allow no headspace; TB required
Turbidity	SM 2130B	water	1x60 ml Nalgene	0-6° C	48 hrs	
Turbidity	SM 2130B	DW with PWSID	1x60 ml Nalgene	2-6° C	48 hrs	
Uranium, Total	EPA 200.8	DW	1x250 ml HDPE	0-6° C	6 months	If samples for metals are not acid preserved they must be received by the lab within 14 days of sampling
Uranium, Total	EPA 200.8	DW with PWSID	1x250 ml HDPE	2-6° C	6 months	If samples for metals are not acid preserved they must be received by the lab within 14 days of sampling
UV 254	SM 5910B	DW	1x250 mL amber glass	0-6° C	48 hrs	(Ref Lab)
UV 254	SM 5910B	DW with PWSID	1x250 mL amber glass	2-6° C	48 hrs	(Ref Lab)
VOC: Volatile Organic Compounds	EPA 524.2	DW	3x40 ml amber VOA vials w/ septa	(Ascorbic Acid if chlorinated) HCl; 0-6° C	14 days	allow no headspace; TB required
VOC: Volatile Organic Compounds	EPA 524.2	DW with PWSID	3x40 ml amber VOA vials w/ septa	(Ascorbic Acid if chlorinated) HCl; 2-6° C	14 days	allow no headspace; TB required
VOC: Volatile Organic Compounds	EPA 624	water	3x40 ml amber VOA vials w/ septa	HCl; 0-6° C	14 days	allow no headspace; TB required
VOC: Volatile Organic Compounds	SW 8260C	oil	1x20 vial or 1x40 ml VOA w/ septa	0-6° C	14 days	allow no headspace
VOC: Volatile Organic Compounds - Low Level Halogens	SW 8260C	soil	1x4 oz prewt'd amber (2nd 4 oz unpreserve % solids jar if no other analyses)	MeOH+BFB; 0-6° C	14 days	field-preservation required; use 50 g soil & 25 ml MeOH (can combo with BTEX) TB required
VOC: Volatile Organic Compounds	SW 8260C	soil	1x4 oz prewt'd amber (2nd 4 oz unpreserve % solids jar if no other analyses)	MeOH+BFB; 0-6° C	14 days	field-preservation required; use 50 g soil & 25 ml MeOH (can combo with BTEX) TB required
VOC: Volatile Organic Compounds	SW 8260C	water	3x40 ml amber VOA vials w/ septa	HCl; 0-6° C	14 days	allow no headspace; TB required
VOC: Volatile Organic Compounds Low Level (5035A FROZEN)	SW 8260C Low Level	soil	2x40 ml VOA w/ septa; 5-ml DI water & stir bar (also provide jars for medium level VOC and % solids)	freeze w/in 48 hrs: -7 to -20° C	14 days	field-preservation required; 5 g soil in 5 ml DI water & freeze on side immediately. TB required
VPH	NW-VPH	soil	1x4 oz prewt'd amber (2nd 4 oz unpreserve % solids jar if no other analyses)	MeOH+BFB; 0-6° C	14 days	(Ref Lab) TB required; field-preservation required; use 50 g soil & 25 ml MeOH
VPH	NW-VPH	water	3x40 ml amber VOA vials w/ septa	HCl; 0-6° C	14 days	(Ref Lab) TB required; allow no headspace

** - Methods requiring semivolatile extraction by SW 3520/3550 have a hold time for extraction followed by a hold time for analysis of the extract.*

APPENDIX B: SURROGATE AND ISOTOPE DILUTION ANALYTE ASSOCIATIONS

Appendix B

Surrogate and Isotope Dilution Analyte Associations

Table 1 - Surrogate and Isotope Dilution Analyte Association

Analytical Method	Surrogate/ IDA	Surrogate/ IDA CAS No.	Associated Analyte	Associated Analyte CAS No.
AK101	4-Bromofluorobenzene <surr>	460-00-4	Gasoline Range Organics	GRO
AK102	5a Androstane <surr>	438-22-2	Diesel Range Organics	DRO
AK103	n-Triacontane-d62 <surr>	93952-07-9	Residual Range Organics	RRO
SW8260B (VOCs)	1,2-Dichloroethane-D4 <surr>	17060-07-0	1,1,1-Trichloroethane	71-55-6
			1,1-Dichloroethane	75-34-3
			1,1-Dichloroethene	75-35-4
			1,1-Dichloropropene	563-58-6
			1,2-Dichloroethane	107-06-2
			1,2-Dichloropropane	78-87-5
			2,2-Dichloropropane	594-20-7
			2-Butanone (MEK)	78-93-3
			4-Methyl-2-pentanone (MIBK)	108-10-1
			Benzene	71-43-2
			Bromochloromethane	74-97-5
			Bromodichloromethane	75-27-4
			Bromomethane	74-83-9
			Carbon disulfide	75-15-0
			Carbon tetrachloride	56-23-5
			Chloroethane	75-00-3
			Chloroform	67-66-3
			Chloromethane	74-87-3
			cis-1,2-Dichloroethene	156-59-2
			cis-1,3-Dichloropropene	10061-01-5
			Dibromomethane	74-95-3
			Dichlorodifluoromethane	75-71-8
			Methylene chloride	75-09-2
			Methyl-t-butyl ether	1634-04-4
			trans-1,2-Dichloroethene	156-60-5
			Trichloroethene	79-01-6
			Trichlorofluoromethane	75-69-4
			Vinyl chloride	75-01-4
	4-Bromofluorobenzene <surr>	460-00-4	1,1,2,2-Tetrachloroethane	79-34-5
			1,2,3-Trichlorobenzene	87-61-6
			1,2,3-Trichloropropane	96-18-4
			1,2,4-Trimethylbenzene	95-63-6
			1,2-Dibromo-3-chloropropane	96-12-8
			1,2-Dichlorobenzene	95-50-1
			1,3,5-Trimethylbenzene	108-67-8
			1,3-Dichlorobenzene	541-73-1
			1,4-Dichlorobenzene	106-46-7
			2-Chlorotoluene	95-49-8

Table 1 - Surrogate and Isotope Dilution Analyte Association

Analytical Method	Surrogate/ IDA	Surrogate/ IDA CAS No.	Associated Analyte	Associated Analyte CAS No.
SW8260B (VOCs)	4-Bromofluorobenzene <surr>	460-00-4	4-Chlorotoluene	106-43-4
			4-Isopropyltoluene	99-87-6
			Bromobenzene	108-86-1
			Hexachlorobutadiene	87-68-3
			Naphthalene	91-20-3
			n-Butylbenzene	104-51-8
			n-Propylbenzene	103-65-1
			sec-Butylbenzene	135-98-8
			tert-Butylbenzene	98-06-6
	Toluene-d8 <surr>	2037-26-5	1,1,1,2-Tetrachloroethane	630-20-6
			1,1,2-Trichloroethane	79-00-5
			1,2-Dibromoethane	106-93-4
			1,3-Dichloropropane	142-28-9
			2-Hexanone	591-78-6
			Bromoform	75-25-2
			Chlorobenzene	108-90-7
			Dibromochloromethane	124-48-1
			Ethylbenzene	100-41-4
			Isopropylbenzene (Cumene)	98-82-8
			o-Xylene	95-47-6
			P & M -Xylene	P & M -Xylene
			Styrene	100-42-5
			Tetrachloroethene	127-18-4
			Toluene	108-88-3
			trans-1,3-Dichloropropene	10061-02-6
			Xylenes (total)	1330-20-7
SW8270D SIM (PAH)	2-Methylnaphthalene-d10 <surr>	7297-45-2	1-Methylnaphthalene	90-12-0
			2-Methylnaphthalene	91-57-6
			Acenaphthene	83-32-9
			Acenaphthylene	208-96-8
			Anthracene	120-12-7
			Fluorene	86-73-7
			Naphthalene	91-20-3
			Phenanthrene	85-01-8
	Fluoranthene-d10 (surr)	93951-69-0	Benzo(a)Anthracene	56-55-3
			Benzo[a]pyrene	50-32-8
			Benzo[b]Fluoranthene	205-99-2
			Benzo[g,h,i]perylene	191-24-2
			Benzo[k]fluoranthene	207-08-9
			Chrysene	218-01-9
			Dibenzo[a,h]anthracene	53-70-3

Table 1 - Surrogate and Isotope Dilution Analyte Association

Analytical Method	Surrogate/ IDA	Surrogate/ IDA CAS No.	Associated Analyte	Associated Analyte CAS No.
SW8270D SIM (PAH)	Fluoranthene-d10 (surr)	93951-69-0	Fluoranthene	206-44-0
			Indeno[1,2,3-c,d] pyrene	193-39-5
			Pyrene	129-00-0
Modified EPA 537 (PFAS)	18O2-PFHxS	---	Perfluorohexansulfonic acid (PFHxS)	355-46-4
	13C2-PFHxA	---	Perfluorohexanoic acid (PFHxA)	307-24-4
	13C4-PFHpA	---	Perfluoroheptanoic acid (PFHpA)	375-85-9
	13C5-PFNA	---	Perfluorononanoic acid (PFNA)	375-95-1
	13C3-PFBS	---	Perfluorobutanesulfonic acid (PFBS)	375-73-5
	13C2-PFDA	---	Perfluorodecanoic acid (PFDA)	335-76-2
	13C2-PFUdA	---	Perfluoroundecanoic acid (PFUnA)	2058-94-8
	13C2-PFDoA	---	Perfluorododecanoic acid (PFDoA)	307-55-1
			Perfluorotridecanoic acid (PFTrDA)	72629-94-8
	13C2-PFTeDA	---	Perfluorotetradecanoic acid (PFTeA)	376-06-7
	13C3-HFPO-DA	---	Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6
	13C4-PFOS	---	Perfluorooctanesulfonic acid (PFOS)	1763-23-1
			4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4
			9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1
			11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	83329-89-9
	d3-MeFOSAA	---	N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	2355-31-9
	d5-EtFOSAA	---	N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	2991-50-6
	13C4-PFOA	---	Perfluorooctanoic acid (PFOA)	335-67-1

NOTES:
Surrogate associations for GRO, DRO, RRO, VOCs, and PAHs are based on information received February 2020 from SGS North America, Inc. and may not be representative of all labo
Surrogate associations for PFAS are based on information received February 2020 from Eurofins TestAmerica, Inc. and may not be representative of all laboratories.
PFAS analytes are associated with isotope dilution standards.
CAS No. = Chemical Abstract Service Number; DRO = diesel range organics; GRO = gasoline range organics; PAH = polynuclear aromatic hydrocarbons; PFAS = per- and poly-fluorinated alkyl substances; RRO = residual range organics; VOC = volatile organic compounds

APPENDIX E: CONCEPTUAL SITE MODEL

Appendix E

Conceptual Site Model

Print Form

Appendix A - Human Health Conceptual Site Model Scoping Form and Standardized Graphic

Site Name: ADOT & PF Bethel Airport Grant Aviation Plane Crash PFAS

File Number: 2407.38.030

Completed by: Ashley Jaramillo; Shannon & Wilson, Inc.

Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

General Instructions: Follow the italicized instructions in each section below.

1. General Information:

Sources *(check potential sources at the site)*

- ☐ USTs
- ☐ ASTs
- ☐ Dispensers/fuel loading racks
- ☐ Drums
- ☐ Vehicles
- ☐ Landfills
- ☐ Transformers
- ☒ Other: Aqueous Film Forming Foam (AFFF) release/plane crash site.

Release Mechanisms *(check potential release mechanisms at the site)*

- ☐ Spills
- ☐ Leaks
- ☒ Direct discharge
- ☐ Burning
- ☐ Other:

Impacted Media *(check potentially-impacted media at the site)*

- ☒ Surface soil (0-2 feet bgs*)
- ☒ Subsurface soil (>2 feet bgs)
- ☐ Air
- ☒ Sediment
- ☒ Groundwater
- ☐ Surface water
- ☒ Biota
- ☐ Other:

Receptors *(check receptors that could be affected by contamination at the site)*

- ☐ Residents (adult or child)
- ☒ Commercial or industrial worker
- ☒ Construction worker
- ☐ Subsistence harvester (i.e. gathers wild foods)
- ☐ Subsistence consumer (i.e. eats wild foods)
- ☒ Site visitor
- ☒ Trespasser
- ☐ Recreational user
- ☐ Farmer
- ☐ Other:

* bgs - below ground surface

2. Exposure Pathways: *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.) ☒

If the box is checked, label this pathway complete: Complete

Comments:

Analytical results indicate PFAS (PFOS, PFOA), VOCs (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzne, o-xylene, and total xylenes), GRO, DRO, and PAH (naphthalene) were detected above migration to groundwater cleanup levels in soil samples collected from the site.

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.) ☒

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)? ☒

If both boxes are checked, label this pathway complete: Complete

Comments:

Analytical results indicate PFAS (PFOS, PFOA), VOCs (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzne, o-xylene, and total xylenes), GRO, DRO, and PAH (naphthalene) were detected above migration to groundwater cleanup levels in soil samples collected from the site.

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future? ☒

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the groundwater is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350. ☒

If both boxes are checked, label this pathway complete: Complete

Comments:

No groundwater analytical samples were collected, this is an expected potential pathway.

2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future? ☐

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities). ☐

If both boxes are checked, label this pathway complete: Incomplete

Comments:

No surface water was present at the site during August 2020 field activities.

3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods? ☐

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)? ☒

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.) ☒

If all of the boxes are checked, label this pathway complete: Incomplete

Comments:

Analytical results indicate PFAS (PFOS, PFOA), VOCs (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzne, o-xylene, and total xylenes), GRO, DRO, and PAH (naphthalene) were detected above migration to groundwater cleanup levels in soil samples collected from the site.

c) Inhalation-

1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.) ☒

Are the contaminants in soil volatile (see Appendix D in the guidance document)? ☒

If both boxes are checked, label this pathway complete: Complete

Comments:

Analytical results indicate PFAS (PFOS, PFOA), VOCs (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzne, o-xylene, and total xylenes), GRO, DRO, and PAH (naphthalene) were detected above migration to groundwater cleanup levels in soil samples collected from the site.

2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminted soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures) ☐

Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)? ☒

If both boxes are checked, label this pathway complete: Incomplete

Comments:

Several Appendix D analytes are contaminants of potential concern, however, at this time, no analytical results are available to indicate if volatile compounds are present in the soil or groundwater. Additionally, no buildings are located in this area and are not anticipated to in the future given the proximity to the runways.

3. **Additional Exposure Pathways:** *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

Dermal Exposure to Contaminants in Groundwater and Surface Water

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are deemed protective of this pathway because dermal absorption is incorporated into the groundwater exposure equation for residential uses.

Check the box if further evaluation of this pathway is needed: ☒

Comments:

Inhalation of Volatile Compounds in Tap Water

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

DEC groundwater cleanup levels in 18 AAC 75, Table C are protective of this pathway because the inhalation of vapors during normal household activities is incorporated into the groundwater exposure equation.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

Due to the lack of current groundwater sample analytical results, the box was not checked. However, it may change following the collection of groundwater samples during future site characterization activities.

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM_{10}). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.

DEC human health soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because the inhalation of particulates is incorporated into the soil exposure equation.

Check the box if further evaluation of this pathway is needed: ☒

Comments:

Analytical results indicate PFAS (PFOS, PFOA), VOCs (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzne, o-xylene, and total xylenes), GRO, DRO, and PAH (naphthalene) were detected above migration to groundwater cleanup levels in soil samples collected from the site.

Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

Check the box if further evaluation of this pathway is needed: ☒

Comments:

Analytical results indicate PFAS (PFOS, PFOA), VOCs (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzne, o-xylene, and total xylenes), GRO, DRO, and PAH (naphthalene) were detected above migration to groundwater cleanup levels in soil samples collected from the site.

4. Other Comments *(Provide other comments as necessary to support the information provided in this form.)*

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: ADOT & PF Bethel Airport Grant Aviation Plane Crash PFAS

Completed By: Ashley Jaramillo; Shannon & Wilson, Inc.

Date Completed: 4/20/21

***Instructions*: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.**

(1) *Check the media that could be directly affected by the release.*

(2) *For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.*

Media	Transport Mechanisms
☑ Surface Soil (0-2 ft bgs)	☑ Direct release to surface soil — check soil ☑ Migration to subsurface — check soil ☑ Migration to groundwater — check groundwater ☑ Volatilization — check air ☑ Runoff or erosion — check surface water ☑ Uptake by plants or animals — check biota ☐ Other (list):
☑ Subsurface Soil (2-15 ft bgs)	☑ Direct release to subsurface soil — check soil ☑ Migration to groundwater — check groundwater ☑ Volatilization — check air ☑ Uptake by plants or animals — check biota ☐ Other (list):
☑ Ground-water	☑ Direct release to groundwater — check groundwater ☑ Volatilization — check air ☑ Flow to surface water body — check surface water ☑ Flow to sediment — check sediment ☑ Uptake by plants or animals — check biota ☐ Other (list):
☐ Surface Water	☐ Direct release to surface water — check surface water ☐ Volatilization — check air ☐ Sedimentation — check sediment ☐ Uptake by plants or animals — check biota ☐ Other (list):
☑ Sediment	☑ Direct release to sediment — check sediment ☐ Resuspension, runoff, or erosion — check surface water ☐ Uptake by plants or animals — check biota ☐ Other (list):

(3) *Check all exposure media identified in (2).*

(4) *Check all pathways that could be complete. The pathways identified in this column **must** agree with Sections 2 and 3 of the Human Health CSM Scoping Form.*

(5) *Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.*

Current & Future Receptors

Exposure Media	Exposure Pathway/Route	Residents (adults or children)	Commercial or industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
☑ soil	☑ Incidental Soil Ingestion		C/F	I	C/F			
	☑ Dermal Absorption of Contaminants from Soil		C/F	I	C/F			
	☑ Inhalation of Fugitive Dust		C/F	I	C/F			
☑ groundwater	☑ Ingestion of Groundwater		C/F	I	C/F			
	☑ Dermal Absorption of Contaminants in Groundwater		C/F	I	C/F			
	☐ Inhalation of Volatile Compounds in Tap Water							
☑ air	☑ Inhalation of Outdoor Air		C/F	I	C/F			
	☐ Inhalation of Indoor Air							
	☑ Inhalation of Fugitive Dust		C/F	I	C/F			
☐ surface water	☐ Ingestion of Surface Water							
	☐ Dermal Absorption of Contaminants in Surface Water							
	☐ Inhalation of Volatile Compounds in Tap Water							
☑ sediment	☑ Direct Contact with Sediment		C/F	I	C/F			
☑ biota	☐ Ingestion of Wild or Farmed Foods							

Revised, 10/01/2010

IMPORTANT INFORMATION

Important Information

About Your Environmental Report

IMPORTANT INFORMATION

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors that were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.
Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent

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such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary, because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process. To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

IMPORTANT INFORMATION

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland