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FINAL

SUMMARY REPORT

March 2019 through January 2020 Water Supply Well Monitoring

KING SALMON, ALASKA

SHANNON & WILSON

October 2021

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Submitted To: Alaska Department of Transportation & Public Facilities
2301 Peger Road
Fairbanks, Alaska 99709
Attn: Sammy Cummings and Marcus Zimmerman

Subject: FINAL SUMMARY REPORT, MARCH 2019 THROUGH JANUARY 2020
WATER SUPPLY WELL MONITORING, KING SALMON, ALASKA

Shannon & Wilson prepared this report to summarize the water supply well monitoring services performed March 2019 through January 2020. The services were conducted on behalf of the Alaska Department of Transportation & Public Facilities (DOT&PF). The scope of services was specified in Shannon & Wilson's revised proposal dated April 16, 2020 authorized on May 21, 2020 by DOT&PF under the Professional Services Agreement Number 25-19-1-013 Per- and Polyfluoroalkyl Substance (PFAS) Related Environmental & Engineering Services.

This report was prepared for the DOT&PF in accordance with the terms and conditions of Shannon & Wilson's contract, relevant DEC guidance documents, and Title 18 of the Alaska Administrative Code (AAC) Chapter 75.335.

Shannon & Wilson appreciates the opportunity to be of service to DOT&PF on this project. If you have questions concerning this report, please contact us.

Sincerely,

SHANNON & WILSON, INC.

Michael Jaramillo
Senior Chemist
Role: Environmental Lead

Kristen Freiburger
Associate
Role: Project Manager

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ACRONYMS

AAC	Alaska Administrative Code
AFFF	aqueous film forming foam
AKN	King Salmon Airport Terminal
ARFF	aircraft rescue and firefighting
bgs	below ground surface
°C	degrees Celsius
COC	chain-of-custody
DEC	Alaska Department of Environmental Conservation
DRM	Alaska Department of Administration Division of Risk Management
DONA	4,8-dioxa-3H-perfluorononanoic acid
DOT&PF	Alaska Department of Transportation & Public Facilities
EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
HFPO-DA	hexafluoropropylene oxide dimer acid
KSD	King Salmon Divert
LCS/LCSD	laboratory control spike/laboratory control spike duplicate
LDRC	Laboratory Data Review Checklist
LHA	Lifetime Health Advisory
LOD	limits of detection
LOQ	limit of quantification
MAROS	Monitoring and Remediation Optimization System
MS/MSD	matrix spike/matrix spike duplicate
µg/kg	microgram per kilogram
µS/cm	microsiemens per centimeter
N-EtFOSAA	N-ethyl perfluorooctane sulfonamidoacetic acid
N-MeFOSAA	N-methyl perfluorooctane sulfonamidoacetic acid
ng/L	nanograms per liter
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutanesulfonic acid
PFDA	perfluorodecanoic acid
PFDoA	perfluorododecanoic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFTeA	perfluorotetradecanoic acid
PFTrDA	perfluorotridecanoic acid
PFUnA	perfluoroundecanoic acid
PSDI	PFAS Site Discovery Investigation
ppt	parts per trillion

ACRONYMS

QA/QC	quality assurance/quality control
RPD	relative percent difference
SGS	SGS North America, Inc.
TestAmerica	Eurofins/TestAmerica Labs, Inc.
TDS	total dissolved solids
USAF	United States Air Force
WO	work order
YSI	multiprobe water quality meter
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid

1 INTRODUCTION

Shannon & Wilson, Inc. has prepared this summary report to document the initial well search and water supply well sampling, and quarterly/annual monitoring efforts at and near the King Salmon Airport (AKN) Terminal in King Salmon, Alaska. This report addresses activities conducted between March 2019 to January 2020 for the ongoing project. The AKN is an active Alaska Department of Environmental Conservation (DEC) contaminated site due to the presence of per- and polyfluoroalkyl substances (PFAS) in water supply well samples collected by DEC in December 2018 (File Number 2569.38.033, Hazard ID 26981).

1.1 Purpose and Objective

The purpose of the services described in this report was to evaluate the potential for human exposure to PFAS-containing water in water supply wells. Shannon & Wilson's objectives were to identify water supply wells potentially affected by PFAS contamination at and near the AKN, collect analytical groundwater samples for the analysis of PFAS from potentially affected water supply wells, and to establish and implement quarterly and annual monitoring criteria. Section 1.5 outlines the scope of services implemented to achieve these objectives.

1.2 Background

The AKN is located at 1 King Salmon Airport Road in King Salmon, Alaska. King Salmon sits north of the Naknek River in the Bristol Bay Borough (Figure 1). Figure 2 shows the AKN with the initial water supply well search area and identifies known aircraft rescue and firefighting (ARFF) sites associated with aqueous film forming foam (AFFF) releases. The geographic coordinates of the AKN terminal are latitude 58.6767 N, longitude -156.6492 W.

The AKN property was an active United States Air Force (USAF) installation known as King Salmon Divert (KSD) during the 1930s through the 1950s. During the 1940s, the land was used for aircraft storage and fuel stops for World War II. Ownership transferred to the Federal Aviation Administration (FAA) following World War II and remained a federal property until transferred to Alaska upon statehood in 1959. The USAF withdrew remaining permanent military personnel and aircraft from the KSD in 1994 but continues to lease multiple parcels of land surrounding the existing runway.

The airport meets the requirements defined in Title 14, Code of Federal Regulations, Part 139, which requires specific certification through the FAA. This certification requires,

among other things, ARFF to ensure safety in air transportation. As part of this certification, Part 139 Airports are required to conduct annual ARFF training for emergency response situations using AFFF in order to demonstrate compliance with the regulations. The FAA modified the requirement to use PFAS-containing AFFF during training exercises at the beginning of 2019; allowing the implementation of an FAA approved cart to test fire apparatus systems without discharging AFFF.

PFAS-containing AFFF was reportedly first used on AKN property in the 1970s. AFFF has been known to be stored on AKN property and used for training purposes on the AKN runway and additional locations on DOT&PF property. CH2M's March 2018 Preliminary Assessment Report for Perfluorinated Compounds, King Salmon Divert, Alaska summarized 11 known AFFF-release locations from old training areas located on the KSD. Discussions with DOT&PF staff revealed additional sites near the AKN runway where AFFF has been used for DOT&PF training and emergency response purposes. The precise locations of the DOT&PF training areas are unknown.

On August 20, 2018, the DEC published a Technical Memorandum outlining a new action level for the sum of five PFAS (perfluorooctanesulfonic acid [PFOS], perfluorooctanoic acid [PFOA], perfluorohexanesulfonic acid [PFHxS], perfluoroheptanoic acid [PFHpA], and perfluorononanoic acid [PFNA]) in drinking water. The action levels proposed in the August 2018 Technical Memorandum were submitted as proposed regulation. PFAS projects for the State of Alaska adopted the proposed regulatory action level from August 2018 to March 2019, per DEC direction. On April 9, 2019, DEC issued an amendment to its August 20, 2018 Technical Memorandum to realign the states action level with the U.S. Environmental Protection Agency (EPA) Lifetime Health Advisory (LHA) of 70 parts per trillion (ppt) for the sum of PFOS and PFOA. On October 2, 2019, DEC published a Technical Memorandum amending the April 9, 2019 Technical Memorandum and adding an additional testing requirement to analyze for and report all analytes for the appropriate PFAS analytical method, although the action level remains 70 ppt for the sum of PFOS and PFOA.

In late 2018, as part of a Cooperative Agreement with the EPA, the DEC Contaminated Sites Program conducted a limited PFAS Site Discovery Investigation (PSDI). This included identification of potentially PFAS impacted communities, prioritization of identified communities, collecting water supply well samples for the analysis of PFAS, and reporting. The AKN was identified as a potentially PFAS impacted community and DEC sampled the 9 water supply wells listed in Exhibit 1-1 below. The PFAS results of one water supply well exceeded the then DEC PFAS action level at that time for the sum of five PFAS (70 ppt, PFOS + PFOA + PFHxS + PFHpA + PFNA).

Exhibit 1-1: DEC Sample Locations

DEC Sample Name	Exceeds DEC Action Level[1]
KIN-01	No
KIN-02	No
KIN-03	Yes
KIN-04	Yes
KIN-05	No
KIN-06	No
KIN-07	No
KIN-08	No
KIN-09	No
KIN-10	No
KIN-11	No

Notes:

1 DEC PFAS action level for the sum of five PFAS (70 ppt; PFOS + PFOA + PFHxS + PFHpA + PFNA).

DEC = Alaska Department of Environmental Conservation; ppt = parts per trillion

Shannon & Wilson reviewed the analytical data provided by DEC and performed an internal quality assurance/quality control (QA/QC) assessment of the analytical data and completed a DEC laboratory data review checklist (LDRC). The Eurofins/TestAmerica Labs, Inc. (TestAmerica) work order (WO) 580-82900-1 and the associated LDRC are included in Appendix A. Only one sample and its field duplicate had PFAS results exceeding the DEC action level at the time the samples were collected. Table 1 summarizes the PFAS analytical results from DEC's PDSI at and near the AKN. Shannon & Wilson notes DEC submitted samples from the AKN and the Dillingham Airport concurrently; WO 580-82900-1 contains PFAS results for both airports. This report does not include any other reference to the King Salmon Airport PFAS results obtained by DEC.

1.3 Geology and Hydrology

The King Salmon area is underlain by glacial outwash plain sediments (Feulner, 1963). Known areas of permafrost exist along Eskimo Creek and west of the confluence of Eskimo Creek and Naknek River. Multiple USAF reports between 1985 and 2006 describe and characterize three aquifers under King Salmon, denoted as A, B, and C. In their *Final Uniform Federal Policy – Quality Assurance Project Plan for Site Inspections of Aqueous Film Forming Foam Areas, KSD, Alaska*, dated July 2019, CH2M provided the following discussion of the hydrogeology in the area surrounding the King Salmon Air Force Station:

Intense glaciation occurred during the Pleistocene period over much of the Alaska Peninsula, which produced the outwash sediment underlying much of KSD. At least three aquifer units are known to be present in the King Salmon area. These aquifers consist of unconsolidated, well-sorted to poorly sorted silty and gravelly sands, separated by aquitard units consisting of silty sands, silts, and clays. The aquitards separating these aquifers may be discontinuous (Science Applications International Corporation [SAIC], 1992).

*The shallowest aquifer, the A-Aquifer, is unconfined and comprised of moderately well-sorted sands and silty sands with discontinuous lenses of medium- to coarse-grained gravel at the base. The A-Aquifer outcrops in many areas within KSD, and the total depth to the A-Aquifer ranges from ground surface at water bodies and wetlands, to 45 feet below ground surface (bgs) along the northern margin of KSD. The saturated thickness ranges from 0 to 15 feet. Groundwater movement is generally toward local topographic lows and surface drainages such as wetlands, rivers, creeks, and ditches, and is most likely recharged by precipitation and surface water. Major drainages such as the Eskimo and Red Fox Creeks have eroded through the A-Aquifer. At the base of the A-Aquifer is a zone of lower hydraulic conductivity, consisting of a gravelly clayey silt and sandy silt, referred to as the A-Aquitard. The underlying A-Aquitard is from 7 to 22 feet thick (USAF, 2017b). The A-Aquitard has previously been reported to locally disrupt and modify the regional unconfined groundwater flow pattern (A-Aquifer) in some areas when encountered at its thickest points (*SAIC*, 1992). Some drinking water wells downgradient of the KSD may be screened in the A-Aquifer.*

The top of the B-Aquifer has been encountered at depths ranging from 50 to 80 feet bgs. The known thickness of this aquifer ranges from 15 to 40 feet. The B-Aquifer is situated in interbedded sequences of silty sands, sandy gravels, and silty sandy gravels. A second aquitard (the B-Aquitard) is present at the base of the B-Aquifer. The thickness of this B-Aquitard is estimated at between 10 and 120 feet (USAF, 2017b). This unit is comprised of predominantly sandy clay (SAIC, 1992). Groundwater in the B-Aquifer is probably in equilibrium with the A-Aquifer; similar piezometric surface has been measured in adjacent A-Aquifer and B-Aquifer monitoring wells. Groundwater flow direction in the B-Aquifer is south towards the Naknek River. Numerous residential drinking water-supply wells are screened in this aquifer.

The C-Aquifer underlies the B-Aquitard at a depth of approximately 205 feet bgs. KSD water-supply wells are reported to terminate in the C-Aquifer, which is thought to be a confined aquifer. The aquifer thickness and flow direction are unknown for the C-Aquifer (Paug-Vik Services [PVS], 2009a). Limited data from water supply well No. 5 suggest that the thickness of C-Aquifer is at least 20 feet (SAIC, 1992).

1.4 Contaminants of Concern and Action Levels

The primary contaminants of concern are PFOS and PFOA. As previously mentioned in Section 1.2, the October 2, 2019 DEC Technical Memorandum requires reporting for all PFAS analytes listed in a given analytical method. For the purposes of this project, samples were submitted for analytical method EPA Method 537.1 which includes the following list of 18 PFAS.

- PFOS
- PFOA
- PFHpA
- PFNA
- PFHxS
- perfluorobutanesulfonic acid (PFBS)
- perfluorodecanoic acid (PFDA)
- perfluorododecanoic acid (PFDoA)
- perfluorohexanoic acid (PFHxA)
- perfluorotetradecanoic acid (PFTeA)
- perfluorotridecanoic acid (PFTrDA)
- perfluoroundecanoic acid (PFUnA)
- hexafluoropropylene oxide dimer acid (HFPO-DA)
- N-ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)
- N-methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)
- 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)
- 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)
- 4,8-dioxa-3H-perfluorononanoic acid (DONA)

Of these contaminants of concern, only PFOS and PFOA are regulated with numeric action levels or cleanup levels, as summarized in Exhibit 1-2.

Exhibit 1-2: Applicable Regulatory Action Levels

Media	Analyte	Action Level[1]
Drinking water[2]	PFOS + PFOA	70 ppt
Groundwater[3]	PFOS	400 ppt
	PFOA	400 ppt
Soil[4]	PFOS	3.0 µg/kg
	PFOA	1.7 µg/kg

Notes:

1 ppt is equivalent to nanograms per liter (ng/L) and micrograms per kilogram (µg/kg)

2 ppt is equivalent to ng/L and ng/kg

3 Drinking water action level reported in DEC October 2019 Technical Memorandum.

4 DEC groundwater cleanup level reported in 18 AAC 75.345, Table C.

5 DEC migration to groundwater soil cleanup levels reported in 18 AAC 75.341, Table B1.

µg/kg = micrograms per kilogram, ng/kg = nanograms per kilogram, ng/L = nanograms per liter, ppt = parts per trillion

1.5 Scope of Services

Shannon & Wilson's scope of services summarized in this report includes the following:

- Conducting a water supply well search at and near the AKN to identify potentially PFAS impacted properties (Section 2.1);
- As practicable, completing water supply well surveys for each identified property within the search area to determine the presence or absence of a water supply well on the property and categorizing identified water supply wells based on water usage as defined by the water supply well owner/user (Section 2.2);
- Conducting initial water supply well sampling for PFAS for the wells identified in the search area (Section 2.3). Sample custody, storage, and transport is described in Section 2.4;
- Notifying the project team (DOT&PF, DEC, the Alaska Department of Health & Social Services [DHSS], and the Alaska Department of Administration, Division of Risk Management [DRM], as applicable) and residents of the analytical results of the PFAS sampling (Section 2.6).
- Establishing quarterly and annual water supply well monitoring criteria (Section 2.7);
- Implementing PFAS monitoring for those water supply wells meeting monitoring criteria (Section 2.8);
- Performing a QA/QC evaluation of the analytical data and field forms completed for this project; (Section 4); and
- Reporting findings.

This report provides a summary of the scope of services described above in addition to the source of alternative water provided to water supply well owners/users with wells exceeding the action level (Section 2.9), and public information provided (Section 2.10). Planned and future work and recommendations are described in Sections 5 and 6.3, respectively.

This report was prepared for the exclusive use of the DOT&PF and its representatives. This work presents Shannon & Wilson's professional judgment as to the conditions of the site. Information presented here is based on the sampling and analyses Shannon & Wilson performed. This report should not be used for other purposes without Shannon & Wilson's 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, Shannon & Wilson should be retained to review the applicability of the above 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 WATER SUPPLY WELL ACTIVITIES

This section summarizes water supply well activities performed as a part of this project from March 2019 through January 2020.

2.1 Water Supply Well Search

In March 2019, Shannon & Wilson Staff began the initial water supply well search by gathering information about the AKN, including but not limited to groundwater flow direction, surface water flow direction, suspected source area locations, DEC's PSDI analytical results (Section 1.2 and Table 1), well depths, and other relevant information available for the site to identify potentially PFAS-impacted properties and water supply

wells. Based on this information and in coordination with DOT&PF and DEC, a well search area was defined prior to the sampling event (Figure 2). One hundred thirty-six structures were identified within the search area 1.

2.2 Water Supply Well Survey

In March 2019, Shannon & Wilson staff began the water supply well survey which involved contacting owners/occupants of the 136 properties identified in the search area, as practicable, to determine the presence or absence of a water supply well on the property and obtain pertinent water supply well information. This was accomplished over the telephone, via email, and during initial sampling events through door-to-door visits using Private Well Inventory Survey Forms. During the door-to-door effort an attempt was made to contact the owner or occupant of each identified property in the search area. Our attempts included, if occupants were not present at the time the property was visited, personalized door tags were left in a location where it would be noticed and calling businesses if phone numbers were available. Copies of the completed Private Well Inventory Survey Forms are included in Appendix B.

During the water supply well survey effort, many locations were found to share wells with neighboring structures and 21 water supply wells were identified as described in Exhibit 2-1 below (20 water supply wells during the initial sampling effort and one additional location was sampled during subsequent monitoring events). Water supply wells were categorized to assess exposure risk by use as follows based on information provided by the water supply well owner/user.

- Category 1: wells used for drinking or cooking.
- Category 2: wells used for dish washing and other domestic purposes.
- Category 3: wells used for vegetable-garden irrigation and are not plumbed to indoor faucets or spigots. The well water is accessed by outdoor plumbing, but the well may be located underneath or inside the structure. These wells are considered non-drinking-water wells.
- Category 4: wells used for outdoor purposes only, such as irrigation of lawns or non-vegetable gardens or vehicle washing. These wells are considered non-drinking-water wells.

  Category 5: wells currently not in use. Wells that have been abandoned in place, are inoperable, disconnected, or intended for future use, are considered category 5 wells. These wells are considered non-drinking-water-wells.

Exhibit 2-1: Potentially PFAS Impacted Water Supply Wells

Location ID[a]	DEC Sample ID	Water Supply Well Category
AKNPW-001	KIN-01	2
AKNPW-003	KIN-03 / KIN-04	1
AKNPW-005	KIN-05	1
AKNPW-006	KIN-06	1
AKNPW-007	KIN-07	1
AKNPW-008	KIN-08	1
AKNPW-009	KIN-09	1
AKNPW-010	KIN-10	1
AKNPW-011	KIN-11	1
AKNPW-012	-	1
AKNPW-013	-	1
AKNPW-014	-	1
AKNPW-015	-	1
AKNPW-016	-	2
AKNPW-017	-	1
AKNPW-018[b]	-	1
AKNPW-020	-	1
AKNPW-204	-	1
AKNPW-208	-	1
AKNPW-422	-	1
AKNPW-424	-	2

Notes:

a. Sample IDs were assigned by Shannon & Wilson staff during the water supply well search.

b. Sample ID AKNPW-018 was surveyed during the July 2019 sampling event.

2.3 Initial Water Supply Well Sampling

From March 14 through 18, 2019, Shannon & Wilson staff sampled 20 water supply wells identified during the well search and survey. Exhibit 2-1 details the Location ID, DEC Sample ID, as applicable, and the address/location description. Samples were named based on the Location IDs.

The following Shannon & Wilson personnel collected analytical water samples for the March 2019 initial sampling and/or subsequent monitoring events. These individuals are State of Alaska Qualified Samplers per 18 AAC 75.333[b] and 18 AAC 78.088[b].

- Amber Masters, Environmental Scientist
- Craig Beebe, Geologist
- Cherissa Dukelow, Environmental Scientist
- Kristen Freiburger, Senior Chemist
- Alena Voigt, Environmental Scientist

Exhibit 2-2: Photographs of Water Supply Well Search and Initial Sampling.

Shannon & Wilson field staff collected water supply well samples from a location in the plumbing upstream of water treatment systems or water softeners. For the purposes of this project, Shannon & Wilson does not consider small (i.e., less than 18 inches in height) particulate filters to be treatment systems.

Water supply well systems were purged prior to sampling by allowing the water to run until water parameters stabilized and the water appeared clear. Shannon & Wilson field staff measured these parameters using a multiprobe water quality meter (YSI) and recorded pH, temperature, and conductivity approximately once every three to five minutes until sample collection. The following values were used to indicate stability for a minimum of three consecutive readings: ±0.1 pH, ±0.5 degrees Celsius (°C) temperature, and ±3 percent conductivity (microsiemens per centimeter [µS/cm]). Shannon & Wilson field staff discharged purge water to indoor sinks or to the ground surface depending on the water supply well's location. In most cases, indoor plumbing led to a private septic system.

Following parameter stabilization, field staff collected water samples for the analysis of PFOS, PFOA, PFHxS, PFHpA, PFNA, and PFBS by Method WS LC 0025, the laboratory's in-house method using laboratory-supplied containers. Copies of the Residential Well Sampling Logs are included in Appendix B.

2.4 Sample Custody, Storage, and Transport

Immediately after collection, the sample bottles for each water supply well were placed in Ziploc bags and stored in a designated sample cooler maintained between 0 °C and 6 °C with ice substitute separated from the sample bottles by a liner bag. Shannon & Wilson maintained custody of the samples until submitting them to the laboratory for analysis. Analytical samples and chain-of-custody (COC) forms were packaged for shipping in a hard-plastic cooler with an adequate quantity of frozen-ice substitute and packing material to prevent bottle breakage. Shannon & Wilson field staff applied custody seals to the cooler, which were observed to be intact upon receipt by the laboratory. Field staff shipped sample coolers to TestAmerica in West Sacramento, California for analysis of PFAS.

2.5 Special Considerations for PFAS Sampling

Shannon & Wilson field staff took appropriate precautions to prevent cross contamination during sampling, including discontinuing the use of personal protective equipment and field supplies known to contain PFASs, 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.

2.6 Notification of Results

Following validation of the analytical data, Shannon & Wilson prepared analytical-data tables for the project team (DOT&PF, DEC, DHSS, and DRM) and then called property owners and occupants to notify them of the results of the PFAS water testing.

Shannon & Wilson also prepared letters for owners and occupants informing them of the results for the sample collected from their well. These letters were tailored to each property and analytical sample, and included the following information:

- sample name;
- comparison of analytical results to DEC's or EPA's current action levels;
- description of the project; and
- pages of the TestAmerica laboratory report that apply to the owner or occupant's water supply well sample, including other PFAS results.

Where requested, Shannon & Wilson emailed results letters to owners and/or occupants.

A copy of the letter template used to report results to well owners/users is included in Appendix C.

2.7 Water Supply Well Monitoring Criteria

Through coordination with the DOT&PF and DEC, Shannon & Wilson established the following quarterly and annual water supply well monitoring criteria after the March 2019 sampling event. Per DEC direction, these criteria were established to monitor changes in PFAS concentrations over time near affected properties and movement towards potentially affected properties. The March 2019 sampling event included sampling for affected properties to confirm the analytical results for samples collected by DEC.

- Quarterly Criteria
  - Active category 1 and 2 water supply wells with a maximum combined PFOS and PFOA concentration greater than or equal to 35 ppt but less than 70 ppt during a previous sampling event, per DEC guidance; and
  - Active category 1 and 2 water supplies wells within 500 lateral feet of water supply wells with a combined PFOS and PFOA concentration was greater than or equal to 35 ppt during a previous sampling event.
- Annual Criteria
  - Active category 1 and 2 water supplies wells with a maximum combined PFOS and PFOA concentration was greater than or equal to 17.5 ppt but less than 70 ppt during a previous sampling event, per DEC guidance; and
  - Active category 1 and 2 water supplies wells within 500 lateral feet of water supply wells with a combined PFOS and PFOA concentration was greater than or equal to 17.5 ppt during a previous sampling event.

Lateral distance was measured from the GPS points collected during the initial round of sampling. Exhibit 2-3 outlines the seven water supply wells meeting quarterly and/or annual monitoring criteria.

Exhibit 2-3: Water Supply Wells Meeting Initial Monitoring Criteria

Location ID	DEC Sample ID	Monitoring Criteria
AKNPW-003	KIN-03 / KIN-04	Q/A
AKNPW-007	KIN-07	Q/A
AKNPW-008	KIN-08	Q/A
AKNPW-011	KIN-11	Q/A
AKNPW-012	-	Q/A
AKNPW-208	-	A

Notes:

a. Location IDs were assigned by Shannon & Wilson staff during the water supply well search.

A = annual; DEC = Alaska Department of Environmental Conservation; Q = quarterly

The AKNPW-003 exceeded the LHA after the October 2019 quarterly monitoring event. It was sampled during the January 2020 quarterly monitoring event at the request of the business owner but has been removed from the quarterly/annual monitoring schedules for future events. This is the current quarterly and annual monitoring criteria in place for the AKN.

2.8 Quarterly and Annual Monitoring

The first annual/quarterly monitoring event for the AKN occurred in July 2019. Additional quarterly monitoring events for the AKN occurred in October 2019 and January 2020. Shannon & Wilson field staff, Kristen Freiburger or Alena Voigt, collected water supply well samples from each well meeting the annual and quarterly criteria (Exhibit 2-4) and collected additional samples from locations not contacted/sampled during the initial sampling event. These samples were collected using the methods described in Section 2.3. Sample custody, storage, and transport was conducted as outlined in Section 2.4. Shannon & Wilson field staff followed the special considerations for PFAS sampling included in Section 2.5. Copies of the Residential Well Sampling Logs are included in Appendix B. Following validation of the analytical data, Shannon & Wilson made notification of results as described in Section 2.6.

Shannon & Wilson field staff collected water samples in July 2019 for the analysis of PFOS and PFOA reported by Method WS LC 0025, using laboratory-supplied containers. After updated guidance from the DEC, a revised report was requested to include PFHpA, PFNA, PFHxS, and PFBS.

Shannon & Wilson field staff collected water samples in October 2019 and January 2020 for the analysis of 18 PFAS analytes reported by EPA Method 537.1 (PFOS, PFOA, PFHpA,

PFNA, PFHxS, PFBS, PFDA, PFDoA, PFHxA, PFTeA, PFTrDA, PFUnA, HFPO-DA, N-EtFOSAA, N-MeFOSAA, 11CL-PF3OUdS, 9CL-PF3ONS and DONA), using laboratory-supplied containers.

2.9 Alternative Water Sources

The DOT&PF, with assistance from Shannon & Wilson, is exploring various options to provide affected residents with a permanent alternative water source. These may include, but are not limited to, point of entry treatment systems, constructing a community well outside of the affected area, and installing water supply wells in deeper aquifers. Temporary alternative water solutions currently in place for the two affected locations are described below.

2.9.1 AKNPW-204

According to a boring log, the AKNPW-204 well is installed to a depth of 60 feet below ground surface (bgs). Adjacent properties are suspected to have deeper wells, installed to 80-100 feet bgs. The depths of the adjacent wells are only approximate, and well-depth information is based on private property owners' knowledge. The highest concentration for the sum of PFOS and PFOA for AKNPW-204 was 120 ppt collected in March 2019. PFAS at adjacent, presumably deeper wells did not have detections greater than the LHA. Shannon & Wilson suspects the AKNPW-204 well is the shallowest well in the surrounding area and most likely to be impacted by PFAS contamination.

The business at AKNPW-204 used their water supply well for the deli and ice machine. Shannon & Wilson submitted a proposal to DOT&PF on March 27, 2019 to provide temporary alternative water for the business at AKNPW-204. The proposal was approved by DOT&PF on April 4, 2019. Due to the proximity of the AKNPW-011 water supply well to the AKNPW-204 business and the presence of water lines previously used to connect these locations, connecting the business at AKNPW-204 to the AKNPW-011 well was the most feasible interim option to provide alternate water to the store. The sum of five PFAS for AKNPW-011 was less than the DEC action level of 70 ppt. Johnson Drilling Company was subcontracted to purchase the necessary materials and connect the building associated with AKNPW-204 to the AKNPW-011 water supply well. The connection was completed in April 2019.

2.9.2 AKNPW-003

A well log is not available for AKNPW-003 water supply well but is believed to be shallower than adjacent wells. The highest concentration for the sum of PFOS and PFOA for

AKNPW-003 was 87 ppt collected in October 2019. PFAS at adjacent, presumably deeper wells did not have detections greater than the LHA.

The business at AKNPW-003 used their water supply well for drinking, cooking, bathing, etc. The water supply well was also used to fill the non-potable water tanks for fishing vessels during the commercial fishing season. Shannon & Wilson submitted a proposal to DOT&PF on March 27, 2019 to provide temporary alternative water for the business at AKNPW-003. The proposal was approved by DOT&PF on April 4, 2019. The proposed temporary alternative water solution included contracting Johnson Drilling Company to transport potable water from their non-public water supply well to a 1,000-gallon holding tank at the business at AKNPW-003. The water would be transported from Johnson Drilling Company to AKNPW-003 using 1,000-gallon holding tank mounted to a trailer. Initial samples from the water supply well at Johnson Drilling Company for the analysis of nitrate and total coliform, among other analyses per the DEC Drinking Water Program requirements, were collected on May 22, 2019 and submitted to SGS North America, Inc (SGS). The analytical results are discussed in Section 3.

Shannon & Wilson coordinated with DEC Drinking Water Program for the water hauling system and received DEC's approval on June 4, 2020. However, coordination for the installations were halted by the business owner for AKNPW-003 on June 6, 2020. During a follow up discussion with the business owner, Ms. Sammy Cummings of DOT&PF, and Mr. Michael Jaramillo of Shannon & Wilson on June 8, 2020, it was determined that AKNPW-003 prefers to receive bottled drinking/cooking water for their employees and for distribution to the fishing vessels. The water supply well is used to fill the non-potable water tanks for fishing vessels. The owner of AKNPW-003 notifies the fishing vessel captains that the water supply well is for non-potable uses only.

2.10 Public Information

The DOT&PF hosts a webpage (http://dot.alaska.gov/airportwater) describing the PFAS water-testing project. The webpage includes a project summary, list of contacts, simplified regional results map, and links to additional resources. The map is updated after each sampling event following the receipt of analytical data. Appendix C includes results notification letter templates and other information provided during the initial sampling event in March 2019 and subsequent monitoring events in July 2019, October 2019, and January 2020.

2.11 Deviations

In general, Shannon & Wilson conducted the work in accordance with the sampling procedures noted above, and based on ongoing discussion with DRM, DEC and DOT&PF. There were no deviations from the procedures described in Section 2.

3 ANALYTICAL RESULTS

The TestAmerica WOs are included in chronological order in Appendix A. The highest reported water supply well PFAS analytical results to date are shown on Figure 3.

3.1 March 2019 Initial Sampling Results

Shannon & Wilson submitted water supply well samples collected in March 2019 to TestAmerica for determination PFAS concentrations using Method WS LC 0025. This method analyzes for the PFOS, PFOA, PFHpA, PFNA, PFBS, and PFHxS. Table 2 summarizes the PFAS concentrations for the samples collected from the water supply wells during the initial sampling event. One sample location, AKNPW-204, exceeded the LHA of 70 ppt for the sum of PFOS and PFOA.

3.2 July 2019 Annual/Quarterly Monitoring Results

Shannon & Wilson submitted water supply well samples collected in July 2019 to TestAmerica for determination PFOS and PFOA concentrations using Method WS LC 0025, the laboratory's in-house method. Following the October 2019 Technical Memorandum, DEC requested that Shannon & Wilson have the laboratory re-report the PFAS results to include the remaining PFAS available from the method (PFHpA, PFNA, PFHxS, and PFBS). The laboratory provided this information in December 2019. While these additional PFAS results are reported, PFAS concentrations are only compared to the LHA of 70 ppt for the sum of PFOS and PFOA. Table 3 summarizes the PFAS concentrations for the samples collected from the water supply wells during the initial and subsequent monitoring events.

3.3 Quarterly Monitoring Results

The October 2019 and January 2020 quarterly samples were submitted for the analysis of 18 PFAS (PFOS, PFOA, PFHpA, PFNA, PFHxS, PFBS, PFDA, PFDoA, PFHxA, PFTeA, PFTrDA, PFUnA, HFPO-DA, N-EtFOSAA, N-MeFOSAA, 11CL-PF3OUdS, 9CL-PF3ONS and DONA) by EPA Method 537.1. Although all PFAS results for the analytical method are reported, PFAS concentrations are only compared to the LHA of 70 ppt for the sum of PFOS

and PFOA. Table 3 summarizes the PFAS concentrations for the samples collected from the water supply wells during the initial and subsequent monitoring events.

3.4 DEC Drinking Water Program Samples

Johnson Drilling Company submitted water supply well samples from the wells at Eddie's Fireplace Inn and Johnson Drilling Company to SGS for water quality analyses, as requested by the DEC Drinking Water Program. The requested analytical methods were:

- anions by EPA 300.0;
- metals by EPA 200.8;
- total coliform by SM21 9223B;
- total dissolved solids (TDS) by SM21 2540C;
- pH by SM21 4500-H B;
- alkalinity by SM21 2320B;
- hardness as calcium carbonate by SM21 2340B;
- conductivity by SM21 2510B; and
- nitrate and nitrite by SM21 4500NO3-F.

The laboratory reports are listed in chronological order in Appendix A, including the SGS laboratory reports for the above-listed samples.

4 QUALITY ASSURANCE AND QUALITY CONTROL

QA/QC procedures assist in producing data of acceptable quality and reliability. Shannon & Wilson reviewed the analytical results provided by TestAmerica and SGS for laboratory QC samples and conducted a QA assessment for this project.

By working in accordance with the proposed scope of services, Shannon & Wilson consider the samples collected for this project 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. Additional details regarding Shannon & Wilson's QA assessment are presented in Appendix D.

5 PLANNED AND FUTURE WORK

Shannon & Wilson will continue the well search to target properties not yet contacted/sampled in the search areas. This work will be completed through Shannon & Wilson's statewide contract with DOT&PF during subsequent water supply well monitoring activities. Shannon & Wilson will continue the quarterly and annual monitoring based on the schedule agreed upon with DOT&PF. A separate site characterization project will be conducted in 2020 upon DEC approval of the proposed site characterization work plan addendum. Shannon & Wilson will also continue investigating permanent solutions for drinking water for AKNPW-003 and AKNPW-204.

Quarterly water supply well sampling for 2020 was scheduled to take place in April 2020; however, the sampling event was postponed due to the world-wide concern regarding COVID-19. Shannon & Wilson collected the quarterly water supply well samples in July 2020. Decisions regarding future monitoring criteria and frequency will be discussed with DOT&PF and DEC prior to conducting sampling events.

6 DISCUSSION OF RESULTS AND RECOMMENDATIONS

Shannon & Wilson presents here a discussion of the PFAS concentrations reported for the water supply well samples collected at and near the AKN property for the current reporting period.

6.1 Comparison to Action Levels

The two category 1 wells AKNPW-003 and AKNPW-204 had detections for the sum of PFOS and PFOA greater than the LHA for the current reporting period. The exceedances are along the Alaska Peninsula Highway and along King Salmon-Naknek Road, respectively (Figure 2). Locations that exceed the LHA are depicted with red squares in Figure 3. PFOA and PFHxS are most frequently the highest detected PFAS in the water supply wells sampled to date. The wells with the highest PFOA concentrations are suspected to be screened in shallow portions of the A-Aquifer.

6.2 Trend Analysis

Shannon & Wilson assessed temporal data for locations included in the well-monitoring network using a Mann-Kendall nonparametric trend analysis and Monitoring and Remediation Optimization System (MAROS) classification (Gilbert, 1987; Aziz, et. al., 2016). The MAROS evaluation was developed by the Air Force Center for Engineering and the

Environment to assess concentration trends with confidence levels below 95 percent. MAROS further discriminates between "no trend" and "stable" contaminant concentrations by evaluating the Mann-Kendall trend statistic, confidence in trend, and coefficient of variation. These tests require data from a minimum of four sampling events to assess concentration trends, although eight or more data for a given location are preferred for statistical analyses.

Shannon & Wilson conducted the trend analysis for PFOS, PFOA, and PFOS+PFOA combined results using the EPA's Statistical Software ProUCL, version 5.1. However, the PFOS results were not detected for the locations evaluated and a meaningful assessment could not be conducted. Also, the Sum of PFOS and PFOA will reflect the PFOA results since PFOS was not detected for the locations evaluated. Table 5 presents the PFOS, PFOA, and LHA results for each monitoring location sampled at least four times (AKNPW-007, AKNPW-008, AKNPW-011, and AKNPW-12).

The results for AKNPW-007 and AKNPW-012 displayed stable trends for PFOA and LHA combined. Results for AKNPW-008 displayed a decreasing trend for PFOA and LHA combined. No trends were observed for AKNPW-011.

6.3 Recommendations

Based on previous work, Shannon & Wilson recommends the DOT&PF continue to:

- attempt to identify wells at properties where well status is unknown during subsequent water supply well monitoring activities;
- sample wells in the quarterly well monitoring network to obtain four more data points and provide more reliable trend analyses;
- work with the DEC and the DHSS to continue educating the public regarding the potential health effects of exposure to PFAS-containing water, as new information becomes available; and
- develop procedures to limit discharges of PFAS-containing AFFF to the ground, surface water bodies or groundwater from ARFF training or equipment testing where possible. This recommendation is not intended to limit or restrict AFFF use in any way during an emergency response.

Our recommendations are based on:

- Groundwater conditions inferred through water supply well samples collected from March 2019 to date.
- Soil conditions observed on, near, and downgradient of the AKN.

- The results of analytical testing performed on soil and water samples collected for the USAF PFAS Investigations and this DOT&PF Water Supply Well Investigation from water supply wells, monitoring wells, temporary well points and surface water on, near, and downgradient from the AKN.
- Publicly available literature and data Shannon & Wilson reviewed for this project, including USAF reports.
- Our understanding of the project and information provided by the DOT&PF, DRM, and other members of the project team.
- The limitations of Shannon & Wilson's approved scope described in the proposed Scope of Services dated August 23, 2019.

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. Shannon & Wilson has prepared and included in the *Important Information about your Environmental Report* Appendix to assist you and others in understanding the use and limitations of this report.

7 REFERENCES

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

Alaska Department of Environmental Conservation (DEC), 2019a, 18 AAC 75, Oil and other hazardous substances pollution control: Juneau, Alaska, Alaska Administrative Code (AAC), Title 18, Chapter 75, January available: http://dec.alaska.gov/commish/regulations/.

Alaska Department of Environmental Conservation (DEC), 2019b, 18 AAC 75.341, Soil cleanup levels: Juneau, Alaska, Alaska Administrative Code (AAC), Title 18, Chapter 75, Section 341, January, available: http://dec.alaska.gov/commish/regulations/.

Alaska Department of Environmental Conservation (DEC), 2019c, 18 AAC 80, Drinking water: Juneau, Alaska, Alaska Administrative Code (AAC), Title 18, Chapter 80, May, available: http://dec.alaska.gov/eh/dw/regulations.

Alaska Department of Environmental Conservation (DEC), 2019d, Field sampling guidance for contaminated sites and leaking underground storage tanks: Juneau, Alaska, DEC Division of Spill Prevention and Response, Contaminated Sites Program, October, available: http://dec.alaska.gov/spar/csp/guidance_forms/csguidance.htm.

Alaska Department of Environmental Conservation (DEC), 2019e, Technical memorandum - action levels for PFAS in water and guidance on sampling groundwater and drinking water (updated): Juneau, Alaska, Alaska Department of Environmental Conservation Division of Spill Prevention and Response Contaminated Sites Program and Division of Environmental Health Drinking Water Program, 4 p., October 2.

Aziz, J.J.; Vanderford, Mindy; Newell, C.J.; and others, 2006, Monitoring and remediation optimization system (MAROS) software, version 2.2, user guide: GSI Environmental, job no. 2236, prepared for Air Force Center for Environmental Excellence, March.

CH2M, July 2019, Final Uniform Federal Policy – Quality Assurance Project Plan for Sites Inspections of Aqueous Film Forming Foam Areas, King Salmon Divert, Alaska.

Feulner, Alvin J, 1963, Data on the wells in the King Salmon area, Alaska: Alaska Dept. of Health and Welfare Water-Hydrology. Data 24, 18p., illus., tables.

U.S. Environmental Protection Agency (EPA), 2016, Drinking water health advisory for perfluorooctanoic acid (PFOA): Washington, D.C., U.S. EPA Office of Water, Health and Ecological Criteria Division, EPA 822-R-16-005, May, available: https://www.epa.gov/sites/production/files/2016-05/documents/pfoa_health_advisory_final_508.pdf

U.S. Environmental Protection Agency (EPA), 2016, ProUCL, v. 5.1, statistical software: Washington, D.C., U.S. EPA, available: https://www.epa.gov/land-research/proucl-software.

Table 1 - December 2018 DEC Analytical Results

Sample Location	Sample Date	Perfluorohexanoic acid (PFHxA)	Perfluorobutanesulfonic acid (PFBS)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnA)	Perfluorododecanoic acid (PFDoA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeA)	N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptanoic acid (PFHpA)	Perfluorononanoic acid (PFNA)	Perfluorooctanesulfonic acid (PFOS)	Perfluorooctanoic acid (PFOA)	LHA Combined (PFOS + PFOA)	Sum of 5
		ppt	ppt	ppt	ppt	ppt	ppt	ppt	ppt	ppt	ppt	ppt	ppt	ppt	ppt	ppt	ppt
KIN-01	12/18/2018	7.5	3.4	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	1.2 J	0.87 J	<1.7	<1.7	2.4	2.4 ‡	4.47 J‡
KIN-03	12/18/2018	110	56	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	75	17	<1.7	1.2 J	62	63 J	**155 J‡**
KIN-04	12/18/2018	99	51	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	72	17	<1.7	1.4 J	62	63 J	**152 J‡**
KIN-05	12/18/2018	2.1	0.96 J	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	1.8	0.77 J	<1.7	<1.7	2.0	2.0 ‡	4.57 J‡
KIN-06	12/18/2018	1.6 J	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	2.0	2.0 ‡	2.00 ‡
KIN-07	12/18/2018	3.1	0.55 J	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	2.1	3.3	<1.7	<1.7	2.9	2.9 ‡	8.30 ‡
KIN-08	12/18/2018	5.3	1.5 J	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	2.4	1.1 J	<1.8	<1.8	5.0	5.0 ‡	8.50 J‡
KIN-09	12/18/2018	4.6	0.73 J	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	2.0	0.99 J	<1.8	<1.8	5.7	5.7 ‡	8.69 J‡
KIN-10	12/18/2018	0.50 J	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	0.55 J	0.55 J‡	0.550 J‡
KIN-11	12/19/2018	4.9	0.76 J	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	2.3	0.87 J	<1.8	<1.8	6.0	6.0 ‡	9.17 J‡

NOTES:
Samples from December 2018 were collected by DEC Contaminated Sites Program.
Sample *KIN-04* is a field duplicate of sample *KIN-03* .
The reported units, ppt, are equivalent to nanograms per liter.
At the time of the sampling event, the DEC action limit was the sum of EPA LHA level is 70 ppt for PFOS and PFOA
EPA LHA level is 70 ppt for PFOS and PFOA is included for reference.

BOLD Detected concentration exceeds the regulatory limit.
‡ Minimum concentration, the LHA or Sum of 5 combined concentration includes one or more result that is not detected greater than the MDL.
< Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
J Estimated concentration, detected greater than the method detection limit (MDL) and less than the RL. Flag applied by the laboratory.
EPA = Environmental Protection Agency; LHA = Lifetime Health Advisory; ppt = parts per trillion

Table 2 - March 2019 Initial Water Supply Well Analytical Results

Sample Location	Sample Date	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptanoic acid (PFHpA)	Perfluorononanoic acid (PFNA)	Perfluorobutanesulfonic acid (PFBS)	Perfluorooctanesulfonic acid (PFOS)	Perfluorooctanoic acid (PFOA)	LHA Combined (PFOS + PFOA)
		ppt	ppt	ppt	ppt	ppt	ppt	ppt
AKNPW-001	03/15/2019	2.5	1.5 J	<2.0	3.5	2.3	2.6	4.9
AKNPW-003	03/15/2019	58	13	<2.0	45	<2.0	53	53 ‡
AKNPW-005	03/15/2019	1.9 J	0.95 J	<2.0	1.1 J	<2.0	1.5 J	1.5 J‡
AKNPW-006	03/18/2019	<2.0	<2.0	<2.0	<2.0	<2.0	1.7 J	1.7 J‡
AKNPW-007	03/15/2019	2.3 I	3.4	<2.0	<2.0	<2.0	2.4	2.4 ‡
AKNPW-008	03/15/2019	2.1	1.1 J	<2.0	2.4 I	<2.0	3.4	3.4 ‡
AKNPW-009	03/15/2019	1.9 J	1.4 J I	<2.0	1.8 J I	<2.0	4.8	4.8 ‡
AKNPW-010	03/15/2019	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	N/A
AKNPW-011	03/15/2019	2.3	1.1 J	<2.0	<2.0	<2.0	4.9	4.9 ‡
AKNPW-012	03/14/2019	6.4	2.3	<2.0	1.8 J	<2.0	12	12 ‡
AKNPW-013	03/15/2019	8.2	5.2	<2.0	2.8 I	<2.0	4.1	4.1 ‡
AKNPW-014	03/15/2019	<2.0	3.0	<2.0	<2.0	<2.0	1.4 J	1.4 J‡
AKNPW-015	03/15/2019	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	N/A
AKNPW-016	03/16/2019	4.1 I	1.4 J I	<2.0	1.6 J I	<2.0	6.5	6.5 ‡
AKNPW-017	03/16/2019	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	N/A
AKNPW-020	03/18/2019	1.6 J I	<2.0	<2.0	3.6	<2.0	<2.0	N/A
AKNPW-204	03/15/2019	120	21	<2.0	31	10	110	**120**
AKNPW-208	03/18/2019	9.9	3.2	<2.0	4.4	<2.0	21	21 ‡
AKNPW-422	03/15/2019	1.6 J	<2.0	<2.0	1.0 J	<2.0	3.0	3.0 ‡
AKNPW-424	03/15/2019	42	7.2	1.7 J	39	<2.0	10	10 ‡

NOTES:
Highest reported result is reported for field-duplicate samples.
The reported units, ppt, are equivalent to nanograms per liter.
EPA LHA level is 70 ppt for PFOS and PFOA
‡ Minimum concentration, the LHA combined concentration includes one or more result that is not detected greater than the MDL.
< Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
I The reported value represents the estimated maximum possible concentration. Flag applied by the laboratory.
J Estimated concentration, detected greater than the method detection limit (MDL) and less than the RL. Flag applied by the laboratory.
BOLD Detected concentration exceeds the regulatory limit.
N/A Not applicable. The sum of PFOS and PFOA concentration could not be calculated because one or more PFAS was not detected in the project sample.
EPA = Environmental Protection Agency; LHA = Lifetime Health Advisory; ppt = parts per trillion

Table 3 - Historical Summary of Water Supply Well Analytical Results

Sample Location	Sample Date	Perfluorohexanesulfonic acid (PFHxS)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorononanoic acid (PFNA)	Perfluorobutanesulfonic acid (PFBS)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnA)	Perfluorododecanoic acid (PFDoA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeA)	N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	4,8-Dioxa-3H-perfluorononanoic acid (DONA)	Hexafluoropropylene oxide dimer acid (HFPO-DA)	Perfluorooctanesulfonic acid (PFOS)	Perfluorooctanoic acid (PFOA)	LHA Combined (PFOS + PFOA)
AKNPW-001	03/15/2019	2.5	---	1.5 J	<2.0	3.5	---	---	---	---	---	---	---	---	---	---	---	2.3	2.6	4.9
AKNPW-003	03/15/2019	58	---	13	<2.0	45	---	---	---	---	---	---	---	---	---	---	---	<2.0	53	53 ‡
	10/29/2019	100	130	19	<1.7	58	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	0.46 J	2.0	85	**87**
	01/16/2020	56	77	11	<1.7	34	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	0.98 J	47	48 J
AKNPW-005	03/15/2019	1.9 J	---	0.95 J	<2.0	1.1 J	---	---	---	---	---	---	---	---	---	---	---	<2.0	1.5 J	1.5 J‡
	07/25/2019	1.9 J	---	<2.0	<2.0	1.1 J	---	---	---	---	---	---	---	---	---	---	---	<2.0	1.8 J	1.8 J‡
AKNPW-006	03/18/2019	<2.0	---	<2.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	<2.0	1.7 J	1.7 J‡
AKNPW-007	03/15/2019	2.3 I	---	3.4	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	<2.0	2.4	2.4 ‡
	07/25/2019	2.4	---	3.1	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	<2.0	2.2	2.2 ‡
	10/29/2019	2.4	3.2	3.3	<1.6	0.86 J	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	2.5	2.5 ‡
	01/16/2020	2.2	2.5	2.8	<1.7	0.79 J	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	2.3	2.3 ‡
AKNPW-008	03/15/2019	2.1	---	1.1 J	<2.0	2.4 I	---	---	---	---	---	---	---	---	---	---	---	<2.0	3.4	3.4 ‡
	07/26/2019	1.5 J	---	<2.0	<2.0	1.6 J	---	---	---	---	---	---	---	---	---	---	---	<2.0	2.8	2.8 ‡
	10/29/2019	1.4 J	3.5	0.64 J	<1.8	1.3 J	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	0.83 J	<1.8	<1.8	<1.8	<1.8	2.6	2.6 ‡
	01/16/2020	1.5 J	2.8	0.63 J	<1.7	0.88 J	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	2.5	2.5 ‡
AKNPW-009	03/15/2019	1.9 J	---	1.4 J I	<2.0	1.8 J I	---	---	---	---	---	---	---	---	---	---	---	<2.0	4.8	4.8 ‡
AKNPW-010	03/15/2019	<2.0	---	<2.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	<2.0	<2.0	N/A
AKNPW-011	03/15/2019	2.3	---	1.1 J	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	<2.0	4.9	4.9 ‡
	07/24/2019	2.1	---	<2.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	<2.0	4.2	4.2 ‡
	10/29/2019	1.7	3.6	0.70 J	<1.7	0.54 J	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	4.2	4.2 ‡
	01/16/2020	2.3	4.2	0.88 J	<1.7	0.72 J	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	5.1	5.1 ‡
AKNPW-012	03/14/2019	6.4	---	2.3	<2.0	1.8 J	---	---	---	---	---	---	---	---	---	---	---	<2.0	12	12 ‡
	07/24/2019	6.7	---	2.6	<2.0	2.5	---	---	---	---	---	---	---	---	---	---	---	<2.0	13	13 ‡
	10/29/2019	8.0	11	2.6	<1.6	2.0	<1.6	<1.6	<1.6	<1.6	<1.6	0.55 J	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	16	16 ‡
	01/16/2020	6.1	8.8	2.0	<1.8	1.6 J	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	11	11 ‡
AKNPW-013	03/15/2019	8.2	---	5.2	<2.0	2.8 I	---	---	---	---	---	---	---	---	---	---	---	<2.0	4.1	4.1 ‡
AKNPW-014	03/15/2019	<2.0	---	3.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	<2.0	1.4 J	1.4 J‡
AKNPW-015	03/15/2019	<2.0	---	<2.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	<2.0	<2.0	N/A
AKNPW-016	03/16/2019	4.1 I	---	1.4 J I	<2.0	1.6 J I	---	---	---	---	---	---	---	---	---	---	---	<2.0	6.5	6.5 ‡
AKNPW-017	03/16/2019	<2.0	---	<2.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	<2.0	<2.0	N/A
AKNPW-018	07/24/2019	<2.0	---	<2.0	<2.0	<2.0	---	---	---	---	---	---	---	---	---	---	---	<2.0	<2.0	N/A

Table 3 - Historical Summary of Water Supply Well Analytical Results

Sample Location	Sample Date	Perfluorohexanesulfonic acid (PFHxS)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorononanoic acid (PFNA)	Perfluorobutanesulfonic acid (PFBS)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnA)	Perfluorododecanoic acid (PFDoA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeA)	N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)[1]	N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)[1]	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	4,8-Dioxa-3H-perfluorononanoic acid (DONA)	Hexafluoropropylene oxide dimer acid (HFPO-DA)	Perfluorooctanesulfonic acid (PFOS)	Perfluorooctanoic acid (PFOA)	LHA Combined (PFOS + PFOA)
AKNPW-020	03/18/2019	1.6 J I	---	<2.0	<2.0	3.6	---	---	---	---	---	---	---	---	---	---	---	<2.0	<2.0	N/A
AKNPW-204	03/15/2019	120	---	21	<2.0	31	---	---	---	---	---	---	---	---	---	---	---	10	110	**120**
AKNPW-208	03/18/2019	9.9	---	3.2	<2.0	4.4	---	---	---	---	---	---	---	---	---	---	---	<2.0	21	21 ‡
	07/25/2019	9.7	---	3.9	0.93 J	4.3	---	---	---	---	---	---	---	---	---	---	---	2.7	23	26
AKNPW-422	03/15/2019	1.6 J	---	<2.0	<2.0	1.0 J	---	---	---	---	---	---	---	---	---	---	---	<2.0	3.0	3.0 ‡
	07/25/2019	1.7 J	---	<2.0	<2.0	1.1 J	---	---	---	---	---	---	---	---	---	---	---	<2.0	3.1	3.1 ‡
AKNPW-424	03/15/2019	42	---	7.2	1.7 J	39	---	---	---	---	---	---	---	---	---	---	---	<2.0	10	10 ‡
	07/25/2019	6.4	---	1.2 J	<2.0	8.0	---	---	---	---	---	---	---	---	---	---	---	<2.0	2.4	2.4 ‡

NOTES:
Highest reported result is reported for field-duplicate samples.
The reported units, ppt, are equivalent to nanograms per liter.

†	EPA LHA level is 70 ppt for PFOS and PFOA
‡	Minimum concentration, the LHA combined concentration includes one or more result that is not detected greater than the MDL.
<	Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
I	The reported value represents the estimated maximum possible concentration. Flag applied by the laboratory.
J	Estimated concentration, detected greater than the method detection limit (MDL) and less than the RL. Flag applied by the laboratory.
N/A	Not applicable. The sum of PFOS and PFOA concentration could not be calculated because one or more PFAS was not detected in the project sample.
---	Analyte not reported for this event.
BOLD	Detected concentration exceeds the regulatory limit.
	EPA = Environmental Protection Agency; LHA = Lifetime Health Advisory; ppt = parts per trillion

Table 4 - May 2019 DEC Drinking Water Program Analytical Results

	Analyte	Units	*Eddie's Fireplace Inn*	*Johnson Drilling*
EPA 200.8	Aluminum	mg/L	<0.01	<0.01
	Antimony	mg/L	<0.0005	<0.0005
	Arsenic	mg/L	<0.0025	<0.0025
	Barium	mg/L	0.00363	<0.0015
	Cadmium	mg/L	<0.00025	<0.00025
	Calcium	mg/L	6.05	9.99
	Chromium	mg/L	<0.001	<0.001
	Copper	mg/L	0.00122	0.00217
	Iron	mg/L	<0.125	0.428
	Lead	mg/L	<0.0001	0.000243
	Magnesium	mg/L	5.4	5.23
	Manganese	mg/L	0.185	0.329
	Nickel	mg/L	<0.001	<0.001
	Potassium	mg/L	5.01	2.57
	Selenium	mg/L	<0.0025	<0.0025
	Silver	mg/L	<0.0005	<0.0005
	Sodium	mg/L	59.8	5.24
	Thallium	mg/L	<0.0005	<0.0005
	Zinc	mg/L	<0.005	<0.005
EPA 300.0	Chloride	mg/L	21.9	3.59
	Fluoride	mg/L	<0.1	<0.1
	Sulfate	mg/L	6.13	5.18
SM21 4500-H B	pH		8.3	7.8
SM21 4500NO3-F	Nitrate+Nitrite	mg/L	<0.1	<0.1
SM21 2540C	Total Dissolved Solids	mg/L	234	106
SM21 2340B	Hardness as CaCO3	mg/L	37.4	46.5
SM21 2510B	Conductivity	umhos/cm	345	121
SM21 2320B	Alkalinity	mg/L	136	50.5
	CO3 Alkalinity	mg/L	<5.00	<5.00
	HCO3 Alkalinity	mg/L	133	50.5
	OH Alkalinity	mg/L	<5.00	<5.00
SM23 4500S D	E. Coli		Negative	Negative
	Total Coliform		Negative	Negative

Notes:

EPA	Environmental
mg/L	milligram per liter
µg/L	microgram per liter
umhos/cm	micromhos per centimeter
<	Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control failures.

Table 5 - King Salmon Water Supply Well Trend Analysis

Sample Name	Sample Date	Sample Location	PFOS (ppt)	PFOA (ppt)	LHA Combined (PFOS + PFOA)	Exceed LHA Level?[a]	Trends[b]
AKNPW-007	Mar-2019	AKNPW-007	<2.0	2.4	2.4 ‡	No	Cannot assess a trend for PFOS; Stable trend for PFOA and LHA
	Jul-2019		<2.0	2.2	2.2 ‡		
	Oct-2019		<1.6	2.5	2.5 ‡		
	Jan-2020		<1.7	2.3	2.3 ‡		
AKNPW-008	Mar-2019	AKNPW-008	<2.0	3.4	3.4 ‡	No	Cannot assess a trend for PFOS; Decreasing trend for PFOA and LHA
	Jul-2019		<2.0	2.8	2.8 ‡		
	Oct-2019		<1.8	2.6	2.6 ‡		
	Jan-2020		<1.7	2.5	2.5 ‡		
AKNPW-011	Mar-2019	AKNPW-011	<2.0	4.9	4.9 ‡	No	Cannot assess a trend for PFOS; No trend for PFOA and LHA
	Jul-2019		<2.0	4.2	4.2 ‡		
	Oct-2019		<1.7	4.2	4.2 ‡		
	Jan-2020		<1.7	5.1	5.1 ‡		
AKNPW-012	Mar-2019	AKNPW-012	<2.0	12	12 ‡	No	Cannot assess a trend for PFOS; Stable trend for PFOA and LHA
	Jul-2019		<2.0	13	13 ‡		
	Oct-2019		<1.6	16	16 ‡		
	Jan-2020		<1.8	11	11 ‡		

NOTES:
The higher detected result is reported for field-duplicate samples.
Trends were only evaluated for locations with more than four results and at least one detected result.

a EPA LHA level is 70 ng/L for PFOS and PFOA combined.

b Mann-Kendall trend analysis at a 95% confidence level was calculated using the EPA statistics software ProUCL Version 5.1 and further evaluated using the MAROS decision matrix.

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

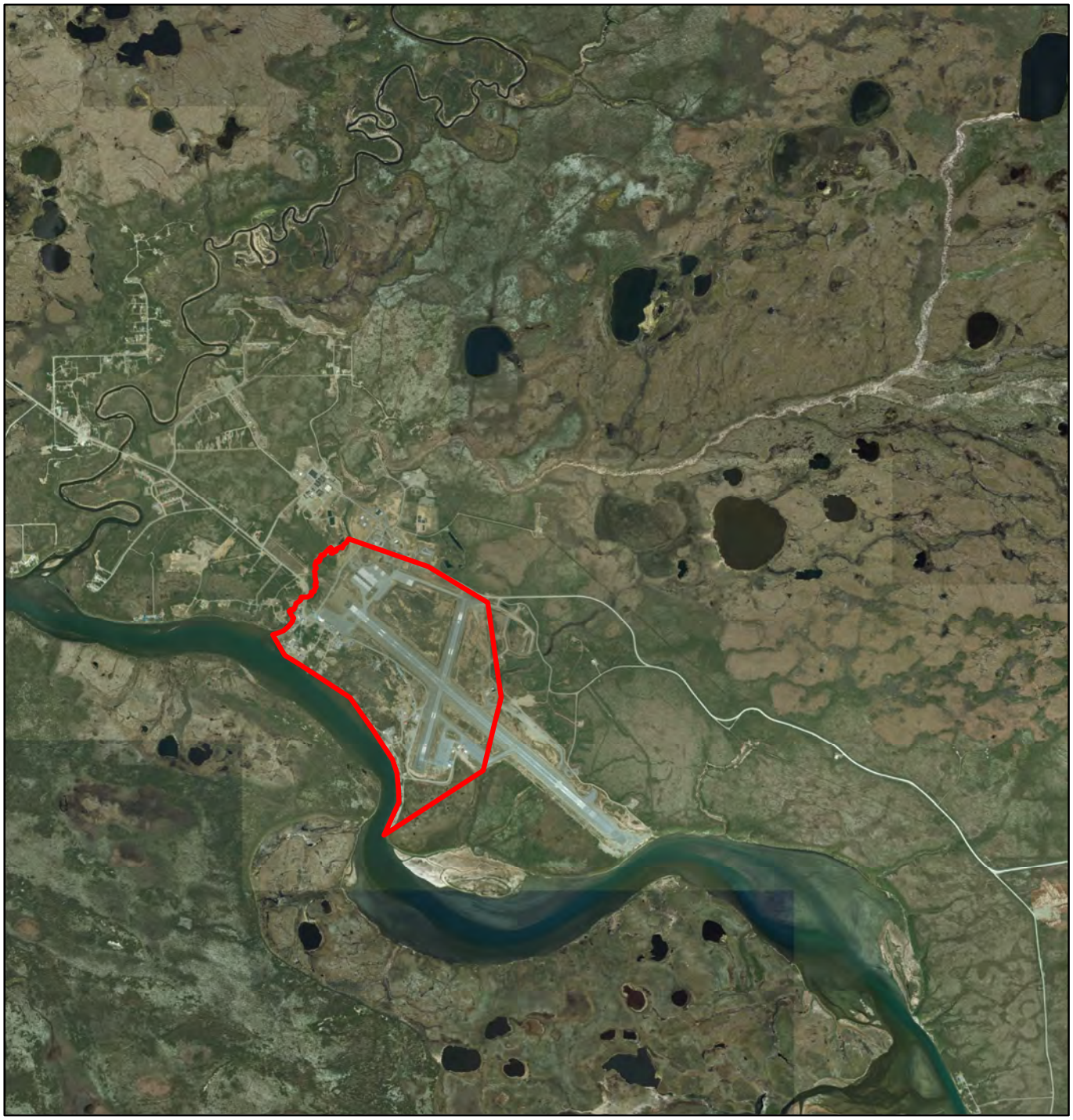
‡ Minimum concentration, the LHA combined concentration includes one or more result that is not detected greater than the MDL.

EPA Environmental Protection Agency

LHA Lifetime Health Advisory

MAROS Monitoring and Remediation Optimization System

ppt parts per trillion; equivalent to nanograms per liter



Legend

Well Search Area and Project Vicinity

King Salmon, Alaska

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

0 1 2

Miles

N

March 2019 to January 2020
Water Supply Well Monitoring
King Salmon, Alaska

Vicinity Map

October 2020

102582-009

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 1

0 1,800 3,600

Feet

LEGEND

Aircraft Rescue and Firefighting (ARFF) Site

Well Search Area 1

Well Search Area 2

N

March 2019 to January 2020
Water Supply Well Monitoring
King Salmon, Alaska

Well Search Extent

October 2020

102582-009

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Figure 2

LEGEND

Wells sampled after April 2019; compared to EPA health advisory

- ≤17 parts per trillion (ppt)
- 18-69 ppt
- ≥70 ppt (over LHA)

Wells sampled before April 2019; compared to former DEC action level*

- ≤17 parts per trillion (ppt)
- 18-65 ppt
- ≥65 ppt (over ADEC action level)
- Areas of known AFFF use

* Sum of PFOS, PFOA, PFHxS, PFHpA, and PFNA

0 0.25 0.5

Miles

N

March 2019 to January 2020
Water Supply Well Monitoring
King Salmon, Alaska

Highest Reported Water Supply Well Anlytical Results

October 2020

102582-009

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GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 3

APPENDIX A: ANALYTICAL REPORTS AND ASSOCIATED LDRCS

Appendix A

Analytical Reports and Associated LDRCs

CONTENTS

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-82900-1
Client Project/Site: PFAS, AK Drinking Water December

For:
Alaska Department of Env. Conservation
Post Office Box 1542
Haines, Alaska 99827

Attn: Anne Marie Palmieri

M. Elaine Walker

Authorized for release by:
1/16/2019 2:49:13 PM

Elaine Walker, Project Manager II
(253)248-4972
elaine.walker@testamericainc.com

Table of Contents

Job ID: 580-82900-1

Laboratory: TestAmerica Seattle

Narrative

Job Narrative
580-82900-1

Receipt
Twenty-one samples were received on 12/26/2018 11:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.0º C.

The samples were forwarded to Eurofins Lancaster Lab for Method 537 DW PSAS analysis. Their report is included here.

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
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)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
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)

Accreditation/Certification Summary

Client: Alaska Department of Env. Conservation
Project/Site: PFAS, AK Drinking Water December

TestAmerica Job ID: 580-82900-1

Laboratory: TestAmerica Seattle

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-024	01-19-19
ANAB	DoD ELAP		L2236	01-19-22
ANAB	ISO/IEC 17025		L2236	01-19-19
California	State Program	9	2901	11-05-19
Montana (UST)	State Program	8	N/A	04-30-20
Nevada	State Program	9	WA000502019-1	07-31-19
Oregon	NELAP	10	WA100007	11-05-19
US Fish & Wildlife	Federal		LE058448-0	07-31-19
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-19

Sample Summary

Client: Alaska Department of Env. Conservation
Project/Site: PFAS, AK Drinking Water December

TestAmerica Job ID: 580-82900-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-82900-1	DIL-01	Water	12/17/18 09:40	12/26/18 11:00
580-82900-2	DIL-02	Water	12/17/18 10:40	12/26/18 11:00
580-82900-3	DIL-03	Water	12/17/18 11:10	12/26/18 11:00
580-82900-4	DIL-04	Water	12/17/18 11:20	12/26/18 11:00
580-82900-5	DIL-05	Water	12/17/18 11:50	12/26/18 11:00
580-82900-6	DIL-06	Water	12/17/18 11:50	12/26/18 11:00
580-82900-7	DIL-07	Water	12/17/18 13:30	12/26/18 11:00
580-82900-8	DIL-08	Water	12/17/18 14:00	12/26/18 11:00
580-82900-9	DIL-09	Water	12/17/18 14:20	12/26/18 11:00
580-82900-10	DIL-10	Water	12/17/18 15:15	12/26/18 11:00
580-82900-11	KIN-01	Water	12/18/18 14:50	12/26/18 11:00
580-82900-12	KIN-02 (field blank)	Water	12/18/18 14:50	12/26/18 11:00
580-82900-13	KIN-03	Water	12/18/18 15:10	12/26/18 11:00
580-82900-14	KIN-04	Water	12/18/18 15:10	12/26/18 11:00
580-82900-15	KIN-05	Water	12/18/18 15:50	12/26/18 11:00
580-82900-16	KIN-06	Water	12/18/18 16:10	12/26/18 11:00
580-82900-17	KIN-07	Water	12/18/18 16:40	12/26/18 11:00
580-82900-18	KIN-08	Water	12/18/18 16:45	12/26/18 11:00
580-82900-19	KIN-09	Water	12/18/18 17:00	12/26/18 11:00
580-82900-20	KIN-10	Water	12/18/18 17:30	12/26/18 11:00
580-82900-21	KIN-11	Water	12/19/18 10:15	12/26/18 11:00

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ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

TestAmerica
880 Riverside Parkway
West Sacramento CA 95605

Report Date: January 14, 2019 11:17

Project: Alaska DEC

Account #: 01042
Group Number: 2021414
SDG: TAK30
State of Sample Origin: AK

Electronic Copy To TestAmerica Attn: Elaine Walker

Respectfully Submitted,

Kay Hower

(717) 556-7364

To view our laboratory's current scopes of accreditation please go to https://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/certifications-and-accreditations-eurofins-lancaster-laboratories-environmental/ . Historical copies may be requested through your project manager.

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SAMPLE INFORMATION

Client Sample Description	Sample Collection Date/Time	ELLE#
DIL-01 Grab Water	12/17/2018 09:40	9953226
DIL-02 Grab Water	12/17/2018 10:40	9953227
DIL-03 Grab Water	12/17/2018 11:10	9953228
DIL-04 Grab Water	12/17/2018 11:20	9953229
DIL-05 Grab Water	12/17/2018 11:50	9953230
DIL-06 Grab Water	12/17/2018 11:50	9953231
DIL-07 Grab Water	12/17/2018 13:30	9953232
DIL-08 Grab Water	12/17/2018 14:00	9953233
DIL-09 Grab Water	12/17/2018 14:20	9953234
DIL-10 Grab Water	12/17/2018 15:15	9953235
KIN-01 Grab Water	12/18/2018 14:50	9953236
KIN-02 (field blank) Grab Water	12/18/2018 14:50	9953237
KIN-03 Grab Water	12/18/2018 15:10	9953238
KIN-04 Grab Water	12/18/2018 15:10	9953239
KIN-05 Grab Water	12/18/2018 15:50	9953240
KIN-06 Grab Water	12/18/2018 16:10	9953241
KIN-07 Grab Water	12/18/2018 16:40	9953242
KIN-08 Grab Water	12/18/2018 16:45	9953243
KIN-09 Grab Water	12/18/2018 17:00	9953244
KIN-10 Grab Water	12/18/2018 17:30	9953245
KIN-11 Grab Water	12/19/2018 10:15	9953246

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Sample Description: DIL-01 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/17/2018 09:40
SDG#: TAK30-01

TestAmerica
ELLE Sample #: WW 9953226
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.48	1.9	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.48	1.9	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	0.51 J	0.48	1.9	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.48	1.9	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.48	1.9	1
14070	Perfluoroheptanoic acid	375-85-9	3.9	0.48	1.9	1
14070	Perfluorohexanesulfonate	355-46-4	2.2	0.48	1.9	1
14070	Perfluorohexanoic acid	307-24-4	8.2	0.48	1.9	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.48	1.9	1
14070	Perfluoro-octanesulfonate	1763-23-1	N.D.	0.48	1.9	1
14070	Perfluorooctanoic acid	335-67-1	3.8	0.48	1.9	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.48	1.9	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.48	1.9	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.48	1.9	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 19:22	Marissa C Drexinger	1
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DIL-02 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/17/2018 10:40
SDG#: TAK30-02

TestAmerica
ELLE Sample #: WW 9953227
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.44	1.7	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.44	1.7	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	4.4	0.44	1.7	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.44	1.7	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.44	1.7	1
14070	Perfluoroheptanoic acid	375-85-9	3.6	0.44	1.7	1
14070	Perfluorohexanesulfonate	355-46-4	12	0.44	1.7	1
14070	Perfluorohexanoic acid	307-24-4	17	0.44	1.7	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.44	1.7	1
14070	Perfluoro-octanesulfonate	1763-23-1	3.4	0.44	1.7	1
14070	Perfluorooctanoic acid	335-67-1	2.5	0.44	1.7	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.44	1.7	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.44	1.7	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.44	1.7	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 19:34	Marissa C Drexinger	1
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

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Analysis Report

Sample Description: DIL-03 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/17/2018 11:10
SDG#: TAK30-03

TestAmerica
ELLE Sample #: WW 9953228
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.45	1.8	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.45	1.8	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	3.0	0.45	1.8	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.45	1.8	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.45	1.8	1
14070	Perfluoroheptanoic acid	375-85-9	3.6	0.45	1.8	1
14070	Perfluorohexanesulfonate	355-46-4	10	0.45	1.8	1
14070	Perfluorohexanoic acid	307-24-4	12	0.45	1.8	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.45	1.8	1
14070	Perfluoro-octanesulfonate	1763-23-1	3.5	0.45	1.8	1
14070	Perfluorooctanoic acid	335-67-1	2.3	0.45	1.8	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.45	1.8	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.45	1.8	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.45	1.8	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/08/2019 16:39	Joshua P Trost	1
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

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Analysis Report

Sample Description: DIL-04 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/17/2018 11:20
SDG#: TAK30-04

TestAmerica
ELLE Sample #: WW 9953229
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.42	1.7	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.42	1.7	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	0.70 J	0.42	1.7	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.42	1.7	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.42	1.7	1
14070	Perfluoroheptanoic acid	375-85-9	N.D.	0.42	1.7	1
14070	Perfluorohexanesulfonate	355-46-4	0.62 J	0.42	1.7	1
14070	Perfluorohexanoic acid	307-24-4	5.0	0.42	1.7	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.42	1.7	1
14070	Perfluoro-octanesulfonate	1763-23-1	N.D.	0.42	1.7	1
14070	Perfluorooctanoic acid	335-67-1	0.49 J	0.42	1.7	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.42	1.7	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.42	1.7	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.42	1.7	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 19:57	Marissa C Drexinger	1
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

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Sample Description: DIL-05 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/17/2018 11:50
SDG#: TAK30-05

TestAmerica
ELLE Sample #: WW 9953230
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.44	1.8	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.44	1.8	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	51	0.44	1.8	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.44	1.8	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.44	1.8	1
14070	Perfluoroheptanoic acid	375-85-9	3.3	0.44	1.8	1
14070	Perfluorohexanesulfonate	355-46-4	140	4.4	18	10
14070	Perfluorohexanoic acid	307-24-4	39	0.44	1.8	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.44	1.8	1
14070	Perfluoro-octanesulfonate	1763-23-1	37	0.44	1.8	1
14070	Perfluorooctanoic acid	335-67-1	5.2	0.44	1.8	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.44	1.8	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.44	1.8	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.44	1.8	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 20:09	Marissa C Drexinger	1
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/08/2019 16:51	Joshua P Trost	10
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

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Analysis Report

Sample Description: DIL-06 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/17/2018 11:50
SDG#: TAK30-06

TestAmerica
ELLE Sample #: WW 9953231
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.43	1.7	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.43	1.7	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	54	0.43	1.7	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.43	1.7	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.43	1.7	1
14070	Perfluoroheptanoic acid	375-85-9	3.3	0.43	1.7	1
14070	Perfluorohexanesulfonate	355-46-4	130	4.3	17	10
14070	Perfluorohexanoic acid	307-24-4	39	0.43	1.7	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.43	1.7	1
14070	Perfluoro-octanesulfonate	1763-23-1	36	0.43	1.7	1
14070	Perfluorooctanoic acid	335-67-1	4.8	0.43	1.7	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.43	1.7	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.43	1.7	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.43	1.7	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 20:20	Marissa C Drexinger	1
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/08/2019 17:02	Joshua P Trost	10
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

*=This limit was used in the evaluation of the final result

Sample Description: DIL-07 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/17/2018 13:30
SDG#: TAK30-07

TestAmerica
ELLE Sample #: WW 9953232
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.43	1.7	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.43	1.7	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	0.47 J	0.43	1.7	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.43	1.7	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.43	1.7	1
14070	Perfluoroheptanoic acid	375-85-9	N.D.	0.43	1.7	1
14070	Perfluorohexanesulfonate	355-46-4	N.D.	0.43	1.7	1
14070	Perfluorohexanoic acid	307-24-4	N.D.	0.43	1.7	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.43	1.7	1
14070	Perfluoro-octanesulfonate	1763-23-1	N.D.	0.43	1.7	1
14070	Perfluorooctanoic acid	335-67-1	N.D.	0.43	1.7	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.43	1.7	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.43	1.7	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.43	1.7	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 20:32	Marissa C Drexinger	1
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

*=This limit was used in the evaluation of the final result

Sample Description: DIL-08 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/17/2018 14:00
SDG#: TAK30-08

TestAmerica
ELLE Sample #: WW 9953233
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.43	1.7	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.43	1.7	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	4.2	0.43	1.7	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.43	1.7	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.43	1.7	1
14070	Perfluoroheptanoic acid	375-85-9	1.3 J	0.43	1.7	1
14070	Perfluorohexanesulfonate	355-46-4	2.4	0.43	1.7	1
14070	Perfluorohexanoic acid	307-24-4	9.4	0.43	1.7	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.43	1.7	1
14070	Perfluoro-octanesulfonate	1763-23-1	N.D.	0.43	1.7	1
14070	Perfluorooctanoic acid	335-67-1	1.2 J	0.43	1.7	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.43	1.7	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.43	1.7	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.43	1.7	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 20:55	Marissa C Drexinger	1
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

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Analysis Report

Sample Description: **DIL-09 Grab Water**
Alaska DEC

Project Name: **Alaska DEC**

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/17/2018 14:20
SDG#: TAK30-09

TestAmerica
ELLE Sample #: **WW 9953234**
ELLE Group #: **2021414**
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.42	1.7	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.42	1.7	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	2.5	0.42	1.7	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.42	1.7	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.42	1.7	1
14070	Perfluoroheptanoic acid	375-85-9	0.85 J	0.42	1.7	1
14070	Perfluorohexanesulfonate	355-46-4	12	0.42	1.7	1
14070	Perfluorohexanoic acid	307-24-4	4.0	0.42	1.7	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.42	1.7	1
14070	Perfluoro-octanesulfonate	1763-23-1	5.0	0.42	1.7	1
14070	Perfluorooctanoic acid	335-67-1	2.0	0.42	1.7	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.42	1.7	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.42	1.7	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.42	1.7	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 21:07	Marissa C Drexinger	1
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

*=This limit was used in the evaluation of the final result

Sample Description: DIL-10 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/17/2018 15:15
SDG#: TAK30-10

TestAmerica
ELLE Sample #: WW 9953235
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.45	1.8	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.45	1.8	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	11	0.45	1.8	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.45	1.8	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.45	1.8	1
14070	Perfluoroheptanoic acid	375-85-9	9.7	0.45	1.8	1
14070	Perfluorohexanesulfonate	355-46-4	7.0	0.45	1.8	1
14070	Perfluorohexanoic acid	307-24-4	44	0.45	1.8	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.45	1.8	1
14070	Perfluoro-octanesulfonate	1763-23-1	N.D.	0.45	1.8	1
14070	Perfluorooctanoic acid	335-67-1	1.9	0.45	1.8	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.45	1.8	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.45	1.8	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.45	1.8	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 21:18	Marissa C Drexinger	1
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

*=This limit was used in the evaluation of the final result

Sample Description: KIN-01 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/18/2018 14:50
SDG#: TAK30-11

TestAmerica
ELLE Sample #: WW 9953236
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.42	1.7	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.42	1.7	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	3.4	0.42	1.7	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.42	1.7	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.42	1.7	1
14070	Perfluoroheptanoic acid	375-85-9	0.87 J	0.42	1.7	1
14070	Perfluorohexanesulfonate	355-46-4	1.2 J	0.42	1.7	1
14070	Perfluorohexanoic acid	307-24-4	7.5	0.42	1.7	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.42	1.7	1
14070	Perfluoro-octanesulfonate	1763-23-1	N.D.	0.42	1.7	1
14070	Perfluorooctanoic acid	335-67-1	2.4	0.42	1.7	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.42	1.7	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.42	1.7	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.42	1.7	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 21:30	Marissa C Drexinger	1
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: KIN-02 (field blank) Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/18/2018 14:50
SDG#: TAK30-12FB

TestAmerica
ELLE Sample #: WW 9953237
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.42	1.7	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.42	1.7	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	N.D.	0.42	1.7	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.42	1.7	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.42	1.7	1
14070	Perfluoroheptanoic acid	375-85-9	N.D.	0.42	1.7	1
14070	Perfluorohexanesulfonate	355-46-4	N.D.	0.42	1.7	1
14070	Perfluorohexanoic acid	307-24-4	N.D.	0.42	1.7	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.42	1.7	1
14070	Perfluoro-octanesulfonate	1763-23-1	N.D.	0.42	1.7	1
14070	Perfluorooctanoic acid	335-67-1	N.D.	0.42	1.7	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.42	1.7	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.42	1.7	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.42	1.7	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 21:41	Marissa C Drexinger	1
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

*=This limit was used in the evaluation of the final result

Sample Description: KIN-03 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/18/2018 15:10
SDG#: TAK30-13

TestAmerica
ELLE Sample #: WW 9953238
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.43	1.7	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.43	1.7	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	56	0.43	1.7	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.43	1.7	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.43	1.7	1
14070	Perfluoroheptanoic acid	375-85-9	17	0.43	1.7	1
14070	Perfluorohexanesulfonate	355-46-4	75	4.3	17	10
14070	Perfluorohexanoic acid	307-24-4	110	4.3	17	10
14070	Perfluorononanoic acid	375-95-1	N.D.	0.43	1.7	1
14070	Perfluoro-octanesulfonate	1763-23-1	1.2 J	0.43	1.7	1
14070	Perfluorooctanoic acid	335-67-1	62	4.3	17	10
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.43	1.7	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.43	1.7	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.43	1.7	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 21:53	Marissa C Drexinger	1
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/08/2019 17:14	Joshua P Trost	10
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

*=This limit was used in the evaluation of the final result

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Sample Description: KIN-04 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/18/2018 15:10
SDG#: TAK30-14

TestAmerica
ELLE Sample #: WW 9953239
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.44	1.7	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.44	1.7	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	51	4.4	17	10
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.44	1.7	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.44	1.7	1
14070	Perfluoroheptanoic acid	375-85-9	17	0.44	1.7	1
14070	Perfluorohexanesulfonate	355-46-4	72	4.4	17	10
14070	Perfluorohexanoic acid	307-24-4	99	4.4	17	10
14070	Perfluorononanoic acid	375-95-1	N.D.	0.44	1.7	1
14070	Perfluoro-octanesulfonate	1763-23-1	1.4 J	0.44	1.7	1
14070	Perfluorooctanoic acid	335-67-1	62	4.4	17	10
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.44	1.7	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.44	1.7	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.44	1.7	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 22:05	Marissa C Drexinger	1
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/08/2019 17:26	Joshua P Trost	10
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

*=This limit was used in the evaluation of the final result

Sample Description: KIN-05 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/18/2018 15:50
SDG#: TAK30-15

TestAmerica
ELLE Sample #: WW 9953240
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.43	1.7	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.43	1.7	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	0.96 J	0.43	1.7	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.43	1.7	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.43	1.7	1
14070	Perfluoroheptanoic acid	375-85-9	0.77 J	0.43	1.7	1
14070	Perfluorohexanesulfonate	355-46-4	1.8	0.43	1.7	1
14070	Perfluorohexanoic acid	307-24-4	2.1	0.43	1.7	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.43	1.7	1
14070	Perfluoro-octanesulfonate	1763-23-1	N.D.	0.43	1.7	1
14070	Perfluorooctanoic acid	335-67-1	2.0	0.43	1.7	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.43	1.7	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.43	1.7	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.43	1.7	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 22:16	Marissa C Drexinger	1
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

*=This limit was used in the evaluation of the final result

Sample Description: KIN-06 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/18/2018 16:10
SDG#: TAK30-16

TestAmerica
ELLE Sample #: WW 9953241
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.43	1.7	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.43	1.7	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	N.D.	0.43	1.7	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.43	1.7	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.43	1.7	1
14070	Perfluoroheptanoic acid	375-85-9	N.D.	0.43	1.7	1
14070	Perfluorohexanesulfonate	355-46-4	N.D.	0.43	1.7	1
14070	Perfluorohexanoic acid	307-24-4	1.6 J	0.43	1.7	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.43	1.7	1
14070	Perfluoro-octanesulfonate	1763-23-1	N.D.	0.43	1.7	1
14070	Perfluorooctanoic acid	335-67-1	2.0	0.43	1.7	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.43	1.7	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.43	1.7	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.43	1.7	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 22:28	Marissa C Drexinger	1
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

*=This limit was used in the evaluation of the final result

Sample Description: KIN-07 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/18/2018 16:40
SDG#: TAK30-17

TestAmerica
ELLE Sample #: WW 9953242
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.42	1.7	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.42	1.7	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	0.55 J	0.42	1.7	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.42	1.7	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.42	1.7	1
14070	Perfluoroheptanoic acid	375-85-9	3.3	0.42	1.7	1
14070	Perfluorohexanesulfonate	355-46-4	2.1	0.42	1.7	1
14070	Perfluorohexanoic acid	307-24-4	3.1	0.42	1.7	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.42	1.7	1
14070	Perfluoro-octanesulfonate	1763-23-1	N.D.	0.42	1.7	1
14070	Perfluorooctanoic acid	335-67-1	2.9	0.42	1.7	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.42	1.7	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.42	1.7	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.42	1.7	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 22:39	Marissa C Drexinger	1
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

*=This limit was used in the evaluation of the final result

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Sample Description: KIN-08 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/18/2018 16:45
SDG#: TAK30-18

TestAmerica
ELLE Sample #: WW 9953243
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.44	1.8	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.44	1.8	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	1.5 J	0.44	1.8	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.44	1.8	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.44	1.8	1
14070	Perfluoroheptanoic acid	375-85-9	1.1 J	0.44	1.8	1
14070	Perfluorohexanesulfonate	355-46-4	2.4	0.44	1.8	1
14070	Perfluorohexanoic acid	307-24-4	5.3	0.44	1.8	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.44	1.8	1
14070	Perfluoro-octanesulfonate	1763-23-1	N.D.	0.44	1.8	1
14070	Perfluorooctanoic acid	335-67-1	5.0	0.44	1.8	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.44	1.8	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.44	1.8	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.44	1.8	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 23:03	Marissa C Drexinger	1
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

*=This limit was used in the evaluation of the final result

Sample Description: KIN-09 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/18/2018 17:00
SDG#: TAK30-19

TestAmerica
ELLE Sample #: WW 9953244
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.44	1.8	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.44	1.8	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	0.73 J	0.44	1.8	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.44	1.8	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.44	1.8	1
14070	Perfluoroheptanoic acid	375-85-9	0.99 J	0.44	1.8	1
14070	Perfluorohexanesulfonate	355-46-4	2.0	0.44	1.8	1
14070	Perfluorohexanoic acid	307-24-4	4.6	0.44	1.8	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.44	1.8	1
14070	Perfluoro-octanesulfonate	1763-23-1	N.D.	0.44	1.8	1
14070	Perfluorooctanoic acid	335-67-1	5.7	0.44	1.8	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.44	1.8	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.44	1.8	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.44	1.8	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 23:14	Marissa C Drexinger	1
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

*=This limit was used in the evaluation of the final result

Sample Description: KIN-10 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/18/2018 17:30
SDG#: TAK30-20

TestAmerica
ELLE Sample #: WW 9953245
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.42	1.7	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.42	1.7	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	N.D.	0.42	1.7	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.42	1.7	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.42	1.7	1
14070	Perfluoroheptanoic acid	375-85-9	N.D.	0.42	1.7	1
14070	Perfluorohexanesulfonate	355-46-4	N.D.	0.42	1.7	1
14070	Perfluorohexanoic acid	307-24-4	0.50 J	0.42	1.7	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.42	1.7	1
14070	Perfluoro-octanesulfonate	1763-23-1	N.D.	0.42	1.7	1
14070	Perfluorooctanoic acid	335-67-1	0.55 J	0.42	1.7	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.42	1.7	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.42	1.7	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.42	1.7	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18362013	01/05/2019 23:26	Marissa C Drexinger	1
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18362013	12/29/2018 06:00	Robert Brown	1

*=This limit was used in the evaluation of the final result

Sample Description: KIN-11 Grab Water
Alaska DEC

Project Name: Alaska DEC

Submittal Date/Time: 12/21/2018 11:20
Collection Date/Time: 12/19/2018 10:15
SDG#: TAK30-21

TestAmerica
ELLE Sample #: WW 9953246
ELLE Group #: 2021414
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1**		**ng/l**	**ng/l**	**ng/l**	
14070	NEtFOSAA	2991-50-6	N.D.	0.46	1.8	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14070	NMeFOSAA	2355-31-9	N.D.	0.46	1.8	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14070	Perfluorobutanesulfonate	375-73-5	0.76 J	0.46	1.8	1
14070	Perfluorodecanoic acid	335-76-2	N.D.	0.46	1.8	1
14070	Perfluorododecanoic acid	307-55-1	N.D.	0.46	1.8	1
14070	Perfluoroheptanoic acid	375-85-9	0.87 J	0.46	1.8	1
14070	Perfluorohexanesulfonate	355-46-4	2.3	0.46	1.8	1
14070	Perfluorohexanoic acid	307-24-4	4.9	0.46	1.8	1
14070	Perfluorononanoic acid	375-95-1	N.D.	0.46	1.8	1
14070	Perfluoro-octanesulfonate	1763-23-1	N.D.	0.46	1.8	1
14070	Perfluorooctanoic acid	335-67-1	6.0	0.46	1.8	1
14070	Perfluorotetradecanoic acid	376-06-7	N.D.	0.46	1.8	1
14070	Perfluorotridecanoic acid	72629-94-8	N.D.	0.46	1.8	1
14070	Perfluoroundecanoic acid	2058-94-8	N.D.	0.46	1.8	1

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14070	14 PFAS PW Water	EPA 537 Version 1.1	1	18363006	01/04/2019 02:39	Marissa C Drexinger	1
14381	DW PFAS Prep	EPA 537 Version 1.1	1	18363006	12/30/2018 16:00	Anthony C Polaski	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: TestAmerica
Reported: 01/14/2019 11:17

Group Number: 2021414

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	MDL**	LOQ
	ng/l	ng/l	ng/l
Batch number: 18362013	Sample number(s): 9953226-9953245		
NEtFOSAA	N.D.	0.50	2.0
NMeFOSAA	N.D.	0.50	2.0
Perfluorobutanesulfonate	N.D.	0.50	2.0
Perfluorodecanoic acid	N.D.	0.50	2.0
Perfluorododecanoic acid	N.D.	0.50	2.0
Perfluoroheptanoic acid	N.D.	0.50	2.0
Perfluorohexanesulfonate	N.D.	0.50	2.0
Perfluorohexanoic acid	N.D.	0.50	2.0
Perfluorononanoic acid	N.D.	0.50	2.0
Perfluoro-octanesulfonate	N.D.	0.50	2.0
Perfluorooctanoic acid	N.D.	0.50	2.0
Perfluorotetradecanoic acid	N.D.	0.50	2.0
Perfluorotridecanoic acid	N.D.	0.50	2.0
Perfluoroundecanoic acid	N.D.	0.50	2.0
Batch number: 18363006	Sample number(s): 9953246		
NEtFOSAA	N.D.	0.50	2.0
NMeFOSAA	N.D.	0.50	2.0
Perfluorobutanesulfonate	N.D.	0.50	2.0
Perfluorodecanoic acid	N.D.	0.50	2.0
Perfluorododecanoic acid	N.D.	0.50	2.0
Perfluoroheptanoic acid	N.D.	0.50	2.0
Perfluorohexanesulfonate	N.D.	0.50	2.0
Perfluorohexanoic acid	N.D.	0.50	2.0
Perfluorononanoic acid	N.D.	0.50	2.0
Perfluoro-octanesulfonate	N.D.	0.50	2.0
Perfluorooctanoic acid	N.D.	0.50	2.0
Perfluorotetradecanoic acid	N.D.	0.50	2.0
Perfluorotridecanoic acid	N.D.	0.50	2.0
Perfluoroundecanoic acid	N.D.	0.50	2.0

LCS/LCSD

Analysis Name	LCS Spike Added ng/l	LCS Conc ng/l	LCSD Spike Added ng/l	LCSD Conc ng/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

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Quality Control Summary

Client Name: TestAmerica
Reported: 01/14/2019 11:17

Group Number: 2021414

LCS/LCSD

Analysis Name	LCS Spike Added ng/l	LCS Conc ng/l	LCSD Spike Added ng/l	LCSD Conc ng/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 18362013	Sample number(s): 9953226-9953245								
NEtFOSAA	80	96.93	80	88.19	121	110	70-130	9	30
NMeFOSAA	80	92.21	80	89.91	115	112	70-130	3	30
Perfluorobutanesulfonate	70.76	74.25	70.76	72.25	105	102	70-130	3	30
Perfluorodecanoic acid	80	88.68	80	83.54	111	104	70-130	6	30
Perfluorododecanoic acid	80	89.81	80	82.37	112	103	70-130	9	30
Perfluoroheptanoic acid	80	84.18	80	83.65	105	105	70-130	1	30
Perfluorohexanesulfonate	75.64	81.12	75.64	85.31	107	113	70-130	5	30
Perfluorohexanoic acid	80	82.76	80	83.45	103	104	70-130	1	30
Perfluorononanoic acid	80	83.17	80	83.37	104	104	70-130	0	30
Perfluoro-octanesulfonate	76.48	74.5	76.48	74.69	97	98	70-130	0	30
Perfluorooctanoic acid	80	87	80	82.61	109	103	70-130	5	30
Perfluorotetradecanoic acid	80	83.32	80	81.06	104	101	70-130	3	30
Perfluorotridecanoic acid	80	93.25	80	91.1	117	114	70-130	2	30
Perfluoroundecanoic acid	80	90.07	80	90.46	113	113	70-130	0	30
Batch number: 18363006	Sample number(s): 9953246								
NEtFOSAA	20	22.44			112		70-130		
NMeFOSAA	20	21.28			106		70-130		
Perfluorobutanesulfonate	18.12	17.2			95		70-130		
Perfluorodecanoic acid	20.48	21.08			103		70-130		
Perfluorododecanoic acid	20.48	20.88			102		70-130		
Perfluoroheptanoic acid	20.48	20.01			98		70-130		
Perfluorohexanesulfonate	19.36	19.37			100		70-130		
Perfluorohexanoic acid	20.48	19.61			96		70-130		
Perfluorononanoic acid	20.48	20.32			99		70-130		
Perfluoro-octanesulfonate	19.58	18.29			93		70-130		
Perfluorooctanoic acid	20.48	20.21			99		70-130		
Perfluorotetradecanoic acid	20.48	21.29			104		70-130		
Perfluorotridecanoic acid	20.48	20.5			100		70-130		
Perfluoroundecanoic acid	20.48	21.86			107		70-130		

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

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Quality Control Summary

Client Name: TestAmerica
Reported: 01/14/2019 11:17

Group Number: 2021414

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 14 PFAS PW Water
Batch number: 18362013

	13C2-PFHxA	13C2-PFDA	D5-NetFOSAA
9953226	103	104	95
9953227	99	105	105
9953228	96	94	96
9953229	98	102	91
9953230	100	102	106
9953231	100	103	102
9953232	100	107	104
9953233	92	93	100
9953234	115	113	114
9953235	87	108	112
9953236	99	102	95
9953237	114	113	112
9953238	91	96	89
9953239	104	108	115
9953240	103	109	105
9953241	109	118	120
9953242	117	125	116
9953243	125	123	130
9953244	114	107	127
9953245	102	98	97
Blank	101	102	100
LCS	95	101	103
LCSD	102	99	95
Limits:	70-130	70-130	70-130

Analysis Name: 14 PFAS PW Water
Batch number: 18363006

	13C2-PFHxA	13C2-PFDA	D5-NetFOSAA
9953246	93	93	88
Blank	95	100	97
LCS	97	107	94
Limits:	70-130	70-130	70-130

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

30939 2021414 9953226-46 214965

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☒ Other: CERCLA

Client Contact	Project Manager: Annemarie Palmieri	Site Contact:	Date:	COC No:
Company Name: Alaska DEC	Tel/Fax: 907-746-3184	Lab Contact:	Carrier:	1 of 2 COCs
Address: 410 Willoughby Ave	Analysis Turnaround Time			Sampler:
City/State/Zip: Juneau, AK 99801	☐ CALENDAR DAYS 10 ☒ WORKING DAYS			For Lab Use Only:
Phone: 907-746-3184	TAT if different from Below _____			Walk-in Client:
Fax: 907-746-3185	☐ 2 weeks			Lab Sampling:
Project Name:	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Method 537	Sample Specific Notes:
DIL-01	12-17-18	0940	G	WA	1	N		X	
DIL-02	12-17-18	1040	G	WA	1	N		X	
DIL-03	12-17-18	1110	G	WA	1	N		X	
DIL-04	12-17-18	1120	G	WA	1	N		X	
DIL-05	12-17-18	1150	G	WA	1	N		X	
DIL-06	12-17-18	1150	G	WA	1	N		X	
DIL-07	12-17-18	1330	G	WA	1	N		X	
DIL-08	12-17-18	1400	G	WA	1	N		X	
DIL-09	12-17-18	1420	G	WA	1	N		X	
DIL-10	12-17-18	1515	G	WA	1	N		X	
KIN-01	12-18-18	1450	G	WA	1	N		X	
KIN-02 (field blank)	12-18-18	1450	G	WA	1	N		X	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☒ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:
email results to: annemarie.palmieri@alaska.gov

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temp. (°C): Obs'd: 5.0	Corr'd: _____	Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
A. Cuccia	DEC	12/20/18 0900			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
				ELLE	12-21-18 1120

1/16/2019

30939 2021414 9953226-46

TestAmerica Sacramento
880 Riverside Parkway

West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Chain of Custody Record

214966

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☒ Other: LERLLA

Client Contact	Project Manager: Anne Marie Palmieri	Site Contact:	Date:	COC No:
Company Name: Alaska Dept. of Env. Cons.	Tel/Fax: 907-766-3184	Lab Contact:	Carrier:	2 of 2 COCs
Address: 410 Willoughby Ave	Analysis Turnaround Time			Sampler:
City/State/Zip: Juneau, AK 99801	☐ CALENDAR DAYS 10 ☒ WORKING DAYS			For Lab Use Only:
Phone: 907-766-3184	TAT if different from Below ____			Walk-in Client:
Fax: 907-766-3185	☐ 2 weeks			Lab Sampling:
Project Name:	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	537 / PFAS	Sample Specific Notes:
KIN-03	12/18/18	1510	G	WA	1	N		X	
KIN-04	12/18/18	1510	G	WA	1	N		X	
KIN-05	12/18/18	1550	G	WA	1	N		X	
KIN-06	12/18/18	1610	G	WA	1	N		X	
KIN-07	12/18/18	1640	G	WA	1	N		X	
KIN-08	12/18/18	1645	G	WA	1	N		X	
KIN-09 ([illegible] AMP)	12/18/18	1700	G	WA	1	N		X	
KIN-10	12/18/18	1730	G	WA	1	N		X	
KIN-11	12-19-18	10:15	G	WA	1	N		X	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ______

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☒ Disposal by Lab ☐ Archive for ______ Months

Special Instructions/QC Requirements & Comments:
email results to: annemarie.palmieri@alaska.gov

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 5.0 Corr'd: ______ Therm ID No.: ______

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	DEC	12/20/18 0900			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	ELLE	12-21-18 1120

State/Province of Origin: AK

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	N/A
Samples Chilled:	Yes	Total Trip Blank Qty:	0
Paperwork Enclosed:	Yes	Air Quality Samples Present:	No
Samples Intact:	Yes		
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Cory Jeremiah (10469) at 17:44 on 12/21/2018

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperature

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT42-02	5.0	DT	Wet	Y	Loose	N

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mL**	milliliter(s)
C	degrees Celsius	**MPN**	Most Probable Number
cfu	colony forming units	**N.D.**	non-detect
CP Units	cobalt-chloroplatinate units	**ng**	nanogram(s)
F	degrees Fahrenheit	**NTU**	nephelometric turbidity units
g	gram(s)	**pg/L**	picogram/liter
IU	International Units	**RL**	Reporting Limit
kg	kilogram(s)	**TNTC**	Too Numerous To Count
L	liter(s)	**µg**	microgram(s)
lb.	pound(s)	**µL**	microliter(s)
m3	cubic meter(s)	**umhos/cm**	micromhos/cm
meq	milliequivalents	**MCL**	Maximum Contamination Limit
mg	milligram(s)		

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value >= the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column >40%. The lower result is reported.
P^	Concentration difference between the primary and confirmation column > 40%. The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

TestAmerica Sacramento
880 Riverside Parkway

West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

30434 207144 TDJ226-46 214965

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☒ Other: CERCLA 82900

Client Contact	Project Manager: Annemarie Palmieri	Site Contact:	Date:	COC No:
Company Name: Alaska DEC	Tel/Fax: 907-746-3184	Lab Contact:	Carrier:	1 of 2 COCs
Address: 410 Willoughby Ave	Analysis Turnaround Time			Sampler:
City/State/Zip: Juneau, AK 99801	☐ CALENDAR DAYS 10 ☒ WORKING DAYS			For Lab Use Only:
Phone: 907-746-3184	TAT if different from Below _____			Walk-in Client:
Fax: 907-746-3185	☐ 2 weeks			Lab Sampling:
Project Name:	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
PO #	☐ 1 day			

	Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	Method 537	Sample Specific Notes:
1	DIL-01	12-17-18	0940	G	WA	1	N		X	
2	DIL-02	12-17-18	1040	G	WA	1	N		X	
3	DIL-03	12-17-18	1110	G	WA	1	N		X	
4	DIL-04	12-17-18	1120	G	WA	1	N		X	
5	DIL-05	12-17-18	1150	G	WA	1	N		X	
6	DIL-06	12-17-18	1150	G	WA	1	N		X	
7	DIL-07	12-17-18	1330	G	WA	1	N		X	
8	DIL-08	12-17-18	1400	G	WA	1	N		X	
9	DIL-09	12-17-18	1420	G	WA	1	N		X	
10	DIL-10	12-17-18	1515	G	WA	1	N		X	
11	KIN-01	12-18-18	1450	G	WA	1	N		X	
	KIN-02 (field blank)	12-18-18	1450	G	WA	1	N		X	

580-82900 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☒ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:
email results to: annemarie.palmieri@alaska.gov

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 5.0 Corr'd: _____ | Therm ID No.: _____

	Company	Date/Time	Received by:	Company	Date/Time
Relinquished by:	DEC	12/20/18 0900			
Relinquished by:			Received by:		
Relinquished by:			Received in Laboratory by:	ELLE	12-21-18 1120

30939 2021414 4953226-46

TestAmerica Sacramento
880 Riverside Parkway

West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Chain of Custody Record

214966

82900

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☒ Other: CERCLA

Client Contact	
Company Name:	Alaska Dept. of Env. Cons.
Address:	410 Willoughby Ave
City/State/Zip:	Juneau, AK 99801
Phone:	907-766-3184
Fax:	907-766-3185
Project Name:	
Site:	
P O #	

Project Manager: Anne Marie Palmieri
Tel/Fax: 907-766-3184

Analysis Turnaround Time
☐ CALENDAR DAYS 10 ☒ WORKING DAYS
TAT if different from Below ______
☐ 2 weeks
☐ 1 week
☐ 2 days
☐ 1 day

Site Contact: | Date:
Lab Contact: | Carrier:

COC No: 2 of 2 COCs
Sampler:
For Lab Use Only:
Walk-in Client:
Lab Sampling:
Job / SDG No.:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	537 / PFAS	Sample Specific Notes:
13	KIN-03	12/18/18	1510	G	WA	1	N		X	
	KIN-04	12/18/18	1510	G	WA	1	N		X	
15	KIN-05	12/18/18	1550	G	WA	1	N		X	
	KIN-06	12/18/18	1610	G	WA	1	N		X	
17	KIN-07	12/18/18	1640	G	WA	1	N		X	
	KIN-08	12/18/18	1645	G	WA	1	N		X	
19	KIN-09 (AMP)	12/18/18	1700	G	WA	1	N		X	
	KIN-10	12/18/18	1730	G	WA	1	N		X	
21	KIN-11	12-19-18	10:15	G	WA	1	N		X	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ______

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☒ Disposal by Lab ☐ Archive for ______ Months

Special Instructions/QC Requirements & Comments:
email results to: annemarie.palmieri@alaska.gov

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 5.0 Corr'd: ______ Therm ID No.: ______

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	DEC	12/20/18 0900			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Company: EUC	Date/Time: 12-21-18 1120

Laboratory Data Review Checklist

Completed By:

Cacy Wilfer

Title:

Environmental Engineering Staff

Date:

March 12, 2019

CS Report Name:

King Salmon DOT&PF PFAS

Report Date:

January 16, 2019

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

TestAmerica Laboratories, Inc.

Laboratory Report Number:

580-82900-1

ADEC File Number:

Hazard Identification Number:

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   ○ Yes ◉ No Comments:

ADEC has not approved an analytical laboratory for analysis of PFAS. However, the laboratory is certified for perfluorinated alkyl acids in drinking water analysis by the National Environmental Laboratory Accreditation Program (NELAP) in Oregon.

   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 Comments:

ADEC has not approved an analytical laboratory for analysis of all submitted PFAS. However, Eurofins Lancaster Laboratories is certified for PFOS and PFOA in drinking water analysis by ADEC.

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   ◉ Yes ○ No Comments:

   b. Correct Analyses requested?

   ◉ Yes ○ No Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   ◉ Yes ○ No Comments:

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   ◉ Yes ○ No Comments:

Analysis of PFAS does not require a preservative other than temperature control.

   c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

   ◉ Yes ○ No Comments:

The sample receipt form notes that the samples were received in good condition.

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 Comments:

There were no discrepancies documented by the laboratory.

e. Data quality or usability affected?

Comments:

The data quality and/or usability were not affected.

4. Case Narrative

a. Present and understandable?

◉ Yes ○ No Comments:

The samples arrived in good condition, properly preserved, and that the temperature of the sample cooler upon receipt at the laboratory was 5.0º C.

b. Discrepancies, errors, or QC failures identified by the lab?

○ Yes ◉ No Comments:

There were no discrepancies, errors, or QC failures documented in the case narrative.

c. Were all corrective actions documented?

○ Yes ◉ No Comments:

N/A; there were no corrective actions documented in the case narrative.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The case narrative does not note an effect on data quality/usability.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

◉ Yes ○ No Comments:

b. All applicable holding times met?

◉ Yes ○ No Comments:

The laboratory indicates that the water samples were analyzed using direct injection and in-line analysis. The 28-day hold time for analysis was met for all samples.

c. All soils reported on a dry weight basis?

○ Yes ◉ No Comments:

N/A; soil samples were not submitted with this work order.

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

◉ Yes ○ No Comments:

The LOQ is less than applicable ADEC action level for drinking water and ADEC groundwater cleanup levels for PFOS and PFOA.

e. Data quality or usability affected?

○ Yes ◉ No Comments:

The data quality and usability were not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

◉ Yes ○ No Comments:

ii. All method blank results less than limit of quantitation (LOQ)?

◉ Yes ○ No Comments:

iii. If above LOQ, what samples are affected?

Comments:

None; PFAS compounds were not detected in method blank sample.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ◉ No Comments:

Qualification of the results was not required; see above.

v. Data quality or usability affected?

Comments:

The data quality and/or usability were not affected.

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 Comments:

LCS/LCSD samples were reported for PFAS analyses.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

( ) Yes (●) No Comments:

Metals and inorganics were not analyzed as part of this work order.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

(●) Yes ( ) No Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

(●) Yes ( ) No Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

N/A; analytical accuracy and precision were within acceptable limits.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

( ) Yes (●) No Comments:

Qualification of the data was not required; see above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and usability were not affected.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

(•) Yes ( ) No Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

(•) Yes ( ) No Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

( ) Yes (•) No Comments:

N/A; there were no IDA recovery failures associated with this work order.

iv. Data quality or usability affected?

Comments:

The data quality and usability are not affected; see above.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples?
(If not, enter explanation below.)

( ) Yes (•) No Comments:

PFAS are not volatile compounds; therefore, a trip blank is not required.

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 Comments:

N/A; a trip blank is not required.

iii. All results less than LOQ?

( ) Yes (•) No Comments:

N/A; a trip blank is not required.

iv. If above LOQ, what samples are affected?

Comments:

None; a trip blank was not submitted with this work order.

v. Data quality or usability affected?

Comments:

The data quality and usability were not affected; see above.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

(•) Yes ( ) No Comments:

ii. Submitted blind to lab?

(•) Yes ( ) No Comments:

The field-duplicate pairs *DIL-05 / DIL-06* and *KIN-03 / KIN-04* were submitted with this work order.

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (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 Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The data quality and usability were not affected; see above.

f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below).

(•) Yes ( ) No ( ) Not Applicable

The field-blank sample *KIN-02* was submitted with this work order.

i. All results less than LOQ?

(•) Yes ( ) No Comments:

ii. If above LOQ, what samples are affected?

Comments:

None; PFAS compounds were not detected in the field-blank sample.

iii. Data quality or usability affected?

Comments:

The data quality and usability were not affected; see above.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

( ) Yes (•) No Comments:

There were no additional flags/qualifiers required for this work order.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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

TestAmerica Job ID: 320-48588-1
Client Project/Site: King Salmon

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

Attn: Kristen Freiburger

Authorized for release by:
3/28/2019 2:14:48 PM

David Alltucker, Project Manager I
(916)374-4383
david.alltucker@testamericainc.com

Table of Contents

Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Qualifiers

LCMS

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.
I	Value is EMPC (estimated maximum possible concentration).

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
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)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
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)

Job ID: 320-48588-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-48588-1

Receipt
The samples were received on 3/21/2019 9:55 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.9º C.

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

Organic Prep
Method(s) PFAS Prep: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-284138.

Method(s) PFAS Prep: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-284173.

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: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-112 — Lab Sample ID: 320-48588-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	1.8	J	2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.4		2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.3		2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanoic acid (PFOA)	12		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-012 — Lab Sample ID: 320-48588-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	1.7	J	2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.3		2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.2		2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanoic acid (PFOA)	12		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-013 — Lab Sample ID: 320-48588-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	2.8	I	2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	8.2		2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	5.2		2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanoic acid (PFOA)	4.1		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-008 — Lab Sample ID: 320-48588-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	2.4	I	2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.1		2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.1	J	2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanoic acid (PFOA)	3.4		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-005 — Lab Sample ID: 320-48588-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	1.1	J	2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.9	J	2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.95	J	2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-005 (Continued) — Lab Sample ID: 320-48588-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	1.5	J	2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-003 — Lab Sample ID: 320-48588-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	45		2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	58		2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	13		2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanoic acid (PFOA)	53		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-014 — Lab Sample ID: 320-48588-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	3.0		2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanoic acid (PFOA)	1.4	J	2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-009 — Lab Sample ID: 320-48588-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	1.8	J I	2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.9	J	2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.4	J I	2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanoic acid (PFOA)	4.8		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-007 — Lab Sample ID: 320-48588-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	2.3	I	2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.4		2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanoic acid (PFOA)	2.4		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-001 — Lab Sample ID: 320-48588-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	3.5		2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.5		2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.5	J	2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-001 (Continued) — Lab Sample ID: 320-48588-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	2.6		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.3		2.0	1.3	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-422 — Lab Sample ID: 320-48588-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	1.0	J	2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.6	J	2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanoic acid (PFOA)	3.0		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-010 — Lab Sample ID: 320-48588-12

No Detections.

Client Sample ID: AKNPW-424 — Lab Sample ID: 320-48588-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	39		2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	42		2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	7.2		2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanoic acid (PFOA)	10		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorononanoic acid (PFNA)	1.7	J	2.0	0.65	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-204 — Lab Sample ID: 320-48588-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	31		2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	110		2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	20		2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanoic acid (PFOA)	100		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanesulfonic acid (PFOS)	10		2.0	1.3	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-015 — Lab Sample ID: 320-48588-15

No Detections.

Client Sample ID: AKNPW-304 — Lab Sample ID: 320-48588-16

This Detection Summary does not include radiochemical test results.

Client Sample ID: AKNPW-304 (Continued) — Lab Sample ID: 320-48588-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	31		2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	120		2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	21		2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanoic acid (PFOA)	110		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanesulfonic acid (PFOS)	10		2.0	1.3	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-011 — Lab Sample ID: 320-48588-17

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	2.3		2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.1	J	2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanoic acid (PFOA)	4.9		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-016 — Lab Sample ID: 320-48588-18

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	1.6	J I	2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	4.1	I	2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.4	J I	2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanoic acid (PFOA)	6.5		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-017 — Lab Sample ID: 320-48588-19

No Detections.

Client Sample ID: AKNPW-020 — Lab Sample ID: 320-48588-20

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	3.6		2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.6	J I	2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-208 — Lab Sample ID: 320-48588-21

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	4.4		2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	9.9		2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.2		2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: AKNPW-208 (Continued) — Lab Sample ID: 320-48588-21

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	21		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-006 — Lab Sample ID: 320-48588-22

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	1.7	J	2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-112
Date Collected: 03/14/19 16:11
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-1
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**1.8**	**J**	2.0	0.92	ng/L		03/26/19 13:17	03/26/19 17:17	1
Perfluorohexanesulfonic acid (PFHxS)	**6.4**		2.0	0.87	ng/L		03/26/19 13:17	03/26/19 17:17	1
Perfluoroheptanoic acid (PFHpA)	**2.3**		2.0	0.80	ng/L		03/26/19 13:17	03/26/19 17:17	1
Perfluorooctanoic acid (PFOA)	**12**		2.0	0.75	ng/L		03/26/19 13:17	03/26/19 17:17	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 13:17	03/26/19 17:17	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 13:17	03/26/19 17:17	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*107*		*25 - 150*	*03/26/19 13:17*	*03/26/19 17:17*	*1*
13C4 PFHpA	*117*		*25 - 150*	*03/26/19 13:17*	*03/26/19 17:17*	*1*
13C4 PFOA	*107*		*25 - 150*	*03/26/19 13:17*	*03/26/19 17:17*	*1*
13C4 PFOS	*111*		*25 - 150*	*03/26/19 13:17*	*03/26/19 17:17*	*1*
13C5 PFNA	*101*		*25 - 150*	*03/26/19 13:17*	*03/26/19 17:17*	*1*
13C3 PFBS	*106*		*25 - 150*	*03/26/19 13:17*	*03/26/19 17:17*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-012
Date Collected: 03/14/19 16:21
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-2
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**1.7**	**J**	2.0	0.92	ng/L		03/26/19 13:17	03/26/19 17:35	1
Perfluorohexanesulfonic acid (PFHxS)	**6.3**		2.0	0.87	ng/L		03/26/19 13:17	03/26/19 17:35	1
Perfluoroheptanoic acid (PFHpA)	**2.2**		2.0	0.80	ng/L		03/26/19 13:17	03/26/19 17:35	1
Perfluorooctanoic acid (PFOA)	**12**		2.0	0.75	ng/L		03/26/19 13:17	03/26/19 17:35	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 13:17	03/26/19 17:35	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 13:17	03/26/19 17:35	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*111*		*25 - 150*	*03/26/19 13:17*	*03/26/19 17:35*	*1*
13C4 PFHpA	*113*		*25 - 150*	*03/26/19 13:17*	*03/26/19 17:35*	*1*
13C4 PFOA	*110*		*25 - 150*	*03/26/19 13:17*	*03/26/19 17:35*	*1*
13C4 PFOS	*108*		*25 - 150*	*03/26/19 13:17*	*03/26/19 17:35*	*1*
13C5 PFNA	*111*		*25 - 150*	*03/26/19 13:17*	*03/26/19 17:35*	*1*
13C3 PFBS	*105*		*25 - 150*	*03/26/19 13:17*	*03/26/19 17:35*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-013
Date Collected: 03/15/19 08:31
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-3
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**2.8**	**I**	2.0	0.92	ng/L		03/26/19 13:17	03/26/19 17:54	1
Perfluorohexanesulfonic acid (PFHxS)	**8.2**		2.0	0.87	ng/L		03/26/19 13:17	03/26/19 17:54	1
Perfluoroheptanoic acid (PFHpA)	**5.2**		2.0	0.80	ng/L		03/26/19 13:17	03/26/19 17:54	1
Perfluorooctanoic acid (PFOA)	**4.1**		2.0	0.75	ng/L		03/26/19 13:17	03/26/19 17:54	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 13:17	03/26/19 17:54	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 13:17	03/26/19 17:54	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*108*		*25 - 150*	*03/26/19 13:17*	*03/26/19 17:54*	*1*
13C4 PFHpA	*121*		*25 - 150*	*03/26/19 13:17*	*03/26/19 17:54*	*1*
13C4 PFOA	*113*		*25 - 150*	*03/26/19 13:17*	*03/26/19 17:54*	*1*
13C4 PFOS	*113*		*25 - 150*	*03/26/19 13:17*	*03/26/19 17:54*	*1*
13C5 PFNA	*106*		*25 - 150*	*03/26/19 13:17*	*03/26/19 17:54*	*1*
13C3 PFBS	*109*		*25 - 150*	*03/26/19 13:17*	*03/26/19 17:54*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-008
Date Collected: 03/15/19 09:55
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-4
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**2.4**	**I**	2.0	0.92	ng/L		03/26/19 13:17	03/26/19 18:12	1
Perfluorohexanesulfonic acid (PFHxS)	**2.1**		2.0	0.87	ng/L		03/26/19 13:17	03/26/19 18:12	1
Perfluoroheptanoic acid (PFHpA)	**1.1**	**J**	2.0	0.80	ng/L		03/26/19 13:17	03/26/19 18:12	1
Perfluorooctanoic acid (PFOA)	**3.4**		2.0	0.75	ng/L		03/26/19 13:17	03/26/19 18:12	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 13:17	03/26/19 18:12	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 13:17	03/26/19 18:12	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*114*		*25 - 150*	*03/26/19 13:17*	*03/26/19 18:12*	*1*
13C4 PFHpA	*116*		*25 - 150*	*03/26/19 13:17*	*03/26/19 18:12*	*1*
13C4 PFOA	*114*		*25 - 150*	*03/26/19 13:17*	*03/26/19 18:12*	*1*
13C4 PFOS	*110*		*25 - 150*	*03/26/19 13:17*	*03/26/19 18:12*	*1*
13C5 PFNA	*111*		*25 - 150*	*03/26/19 13:17*	*03/26/19 18:12*	*1*
13C3 PFBS	*111*		*25 - 150*	*03/26/19 13:17*	*03/26/19 18:12*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-005
Date Collected: 03/15/19 10:04
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-5
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**1.1**	**J**	2.0	0.92	ng/L		03/26/19 13:17	03/26/19 18:31	1
Perfluorohexanesulfonic acid (PFHxS)	**1.9**	**J**	2.0	0.87	ng/L		03/26/19 13:17	03/26/19 18:31	1
Perfluoroheptanoic acid (PFHpA)	**0.95**	**J**	2.0	0.80	ng/L		03/26/19 13:17	03/26/19 18:31	1
Perfluorooctanoic acid (PFOA)	**1.5**	**J**	2.0	0.75	ng/L		03/26/19 13:17	03/26/19 18:31	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 13:17	03/26/19 18:31	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 13:17	03/26/19 18:31	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*113*		*25 - 150*	*03/26/19 13:17*	*03/26/19 18:31*	*1*
13C4 PFHpA	*116*		*25 - 150*	*03/26/19 13:17*	*03/26/19 18:31*	*1*
13C4 PFOA	*108*		*25 - 150*	*03/26/19 13:17*	*03/26/19 18:31*	*1*
13C4 PFOS	*109*		*25 - 150*	*03/26/19 13:17*	*03/26/19 18:31*	*1*
13C5 PFNA	*113*		*25 - 150*	*03/26/19 13:17*	*03/26/19 18:31*	*1*
13C3 PFBS	*108*		*25 - 150*	*03/26/19 13:17*	*03/26/19 18:31*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-003
Date Collected: 03/15/19 10:38
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-6
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**45**		2.0	0.92	ng/L		03/26/19 13:17	03/26/19 18:49	1
Perfluorohexanesulfonic acid (PFHxS)	**58**		2.0	0.87	ng/L		03/26/19 13:17	03/26/19 18:49	1
Perfluoroheptanoic acid (PFHpA)	**13**		2.0	0.80	ng/L		03/26/19 13:17	03/26/19 18:49	1
Perfluorooctanoic acid (PFOA)	**53**		2.0	0.75	ng/L		03/26/19 13:17	03/26/19 18:49	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 13:17	03/26/19 18:49	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 13:17	03/26/19 18:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*111*		*25 - 150*	*03/26/19 13:17*	*03/26/19 18:49*	*1*
13C4 PFHpA	*112*		*25 - 150*	*03/26/19 13:17*	*03/26/19 18:49*	*1*
13C4 PFOA	*110*		*25 - 150*	*03/26/19 13:17*	*03/26/19 18:49*	*1*
13C4 PFOS	*105*		*25 - 150*	*03/26/19 13:17*	*03/26/19 18:49*	*1*
13C5 PFNA	*106*		*25 - 150*	*03/26/19 13:17*	*03/26/19 18:49*	*1*
13C3 PFBS	*105*		*25 - 150*	*03/26/19 13:17*	*03/26/19 18:49*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-014
Date Collected: 03/15/19 10:47
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-7
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		03/26/19 13:17	03/26/19 19:08	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.87	ng/L		03/26/19 13:17	03/26/19 19:08	1
Perfluoroheptanoic acid (PFHpA)	**3.0**		2.0	0.80	ng/L		03/26/19 13:17	03/26/19 19:08	1
Perfluorooctanoic acid (PFOA)	**1.4**	**J**	2.0	0.75	ng/L		03/26/19 13:17	03/26/19 19:08	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 13:17	03/26/19 19:08	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 13:17	03/26/19 19:08	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*113*		*25 - 150*	*03/26/19 13:17*	*03/26/19 19:08*	*1*
13C4 PFHpA	*114*		*25 - 150*	*03/26/19 13:17*	*03/26/19 19:08*	*1*
13C4 PFOA	*125*		*25 - 150*	*03/26/19 13:17*	*03/26/19 19:08*	*1*
13C4 PFOS	*118*		*25 - 150*	*03/26/19 13:17*	*03/26/19 19:08*	*1*
13C5 PFNA	*110*		*25 - 150*	*03/26/19 13:17*	*03/26/19 19:08*	*1*
13C3 PFBS	*112*		*25 - 150*	*03/26/19 13:17*	*03/26/19 19:08*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-009
Date Collected: 03/15/19 11:35
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-8
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**1.8**	**J I**	2.0	0.92	ng/L		03/26/19 13:17	03/26/19 19:45	1
Perfluorohexanesulfonic acid (PFHxS)	**1.9**	**J**	2.0	0.87	ng/L		03/26/19 13:17	03/26/19 19:45	1
Perfluoroheptanoic acid (PFHpA)	**1.4**	**J I**	2.0	0.80	ng/L		03/26/19 13:17	03/26/19 19:45	1
Perfluorooctanoic acid (PFOA)	**4.8**		2.0	0.75	ng/L		03/26/19 13:17	03/26/19 19:45	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 13:17	03/26/19 19:45	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 13:17	03/26/19 19:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*107*		*25 - 150*	*03/26/19 13:17*	*03/26/19 19:45*	*1*
13C4 PFHpA	*107*		*25 - 150*	*03/26/19 13:17*	*03/26/19 19:45*	*1*
13C4 PFOA	*109*		*25 - 150*	*03/26/19 13:17*	*03/26/19 19:45*	*1*
13C4 PFOS	*110*		*25 - 150*	*03/26/19 13:17*	*03/26/19 19:45*	*1*
13C5 PFNA	*99*		*25 - 150*	*03/26/19 13:17*	*03/26/19 19:45*	*1*
13C3 PFBS	*102*		*25 - 150*	*03/26/19 13:17*	*03/26/19 19:45*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-007
Date Collected: 03/15/19 12:40
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-9
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		03/26/19 13:17	03/26/19 20:03	1
Perfluorohexanesulfonic acid (PFHxS)	**2.3**	**I**	2.0	0.87	ng/L		03/26/19 13:17	03/26/19 20:03	1
Perfluoroheptanoic acid (PFHpA)	**3.4**		2.0	0.80	ng/L		03/26/19 13:17	03/26/19 20:03	1
Perfluorooctanoic acid (PFOA)	**2.4**		2.0	0.75	ng/L		03/26/19 13:17	03/26/19 20:03	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 13:17	03/26/19 20:03	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 13:17	03/26/19 20:03	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*110*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:03*	*1*
13C4 PFHpA	*114*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:03*	*1*
13C4 PFOA	*109*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:03*	*1*
13C4 PFOS	*110*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:03*	*1*
13C5 PFNA	*105*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:03*	*1*
13C3 PFBS	*107*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:03*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-001
Date Collected: 03/15/19 15:01
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-10
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**3.5**		2.0	0.92	ng/L		03/26/19 13:17	03/26/19 20:22	1
Perfluorohexanesulfonic acid (PFHxS)	**2.5**		2.0	0.87	ng/L		03/26/19 13:17	03/26/19 20:22	1
Perfluoroheptanoic acid (PFHpA)	**1.5**	**J**	2.0	0.80	ng/L		03/26/19 13:17	03/26/19 20:22	1
Perfluorooctanoic acid (PFOA)	**2.6**		2.0	0.75	ng/L		03/26/19 13:17	03/26/19 20:22	1
Perfluorooctanesulfonic acid (PFOS)	**2.3**		2.0	1.3	ng/L		03/26/19 13:17	03/26/19 20:22	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 13:17	03/26/19 20:22	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*114*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:22*	*1*
13C4 PFHpA	*119*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:22*	*1*
13C4 PFOA	*115*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:22*	*1*
13C4 PFOS	*117*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:22*	*1*
13C5 PFNA	*108*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:22*	*1*
13C3 PFBS	*107*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:22*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-422
Date Collected: 03/15/19 15:33
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-11
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**1.0**	**J**	2.0	0.92	ng/L		03/26/19 13:17	03/26/19 20:40	1
Perfluorohexanesulfonic acid (PFHxS)	**1.6**	**J**	2.0	0.87	ng/L		03/26/19 13:17	03/26/19 20:40	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		03/26/19 13:17	03/26/19 20:40	1
Perfluorooctanoic acid (PFOA)	**3.0**		2.0	0.75	ng/L		03/26/19 13:17	03/26/19 20:40	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 13:17	03/26/19 20:40	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 13:17	03/26/19 20:40	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*113*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:40*	*1*
13C4 PFHpA	*118*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:40*	*1*
13C4 PFOA	*113*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:40*	*1*
13C4 PFOS	*111*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:40*	*1*
13C5 PFNA	*112*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:40*	*1*
13C3 PFBS	*109*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:40*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-010
Date Collected: 03/15/19 16:00
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-12
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		03/26/19 13:17	03/26/19 20:58	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.87	ng/L		03/26/19 13:17	03/26/19 20:58	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		03/26/19 13:17	03/26/19 20:58	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.75	ng/L		03/26/19 13:17	03/26/19 20:58	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 13:17	03/26/19 20:58	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 13:17	03/26/19 20:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*110*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:58*	*1*
13C4 PFHpA	*119*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:58*	*1*
13C4 PFOA	*111*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:58*	*1*
13C4 PFOS	*110*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:58*	*1*
13C5 PFNA	*113*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:58*	*1*
13C3 PFBS	*106*		*25 - 150*	*03/26/19 13:17*	*03/26/19 20:58*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-424
Date Collected: 03/15/19 16:56
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-13
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	39		2.0	0.92	ng/L		03/26/19 13:17	03/26/19 21:17	1
Perfluorohexanesulfonic acid (PFHxS)	42		2.0	0.87	ng/L		03/26/19 13:17	03/26/19 21:17	1
Perfluoroheptanoic acid (PFHpA)	7.2		2.0	0.80	ng/L		03/26/19 13:17	03/26/19 21:17	1
Perfluorooctanoic acid (PFOA)	10		2.0	0.75	ng/L		03/26/19 13:17	03/26/19 21:17	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 13:17	03/26/19 21:17	1
Perfluorononanoic acid (PFNA)	1.7	J	2.0	0.65	ng/L		03/26/19 13:17	03/26/19 21:17	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*111*		*25 - 150*	*03/26/19 13:17*	*03/26/19 21:17*	*1*
13C4 PFHpA	*117*		*25 - 150*	*03/26/19 13:17*	*03/26/19 21:17*	*1*
13C4 PFOA	*114*		*25 - 150*	*03/26/19 13:17*	*03/26/19 21:17*	*1*
13C4 PFOS	*113*		*25 - 150*	*03/26/19 13:17*	*03/26/19 21:17*	*1*
13C5 PFNA	*113*		*25 - 150*	*03/26/19 13:17*	*03/26/19 21:17*	*1*
13C3 PFBS	*109*		*25 - 150*	*03/26/19 13:17*	*03/26/19 21:17*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-204
Date Collected: 03/15/19 17:14
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-14
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	31		2.0	0.92	ng/L		03/26/19 13:17	03/26/19 21:35	1
Perfluorohexanesulfonic acid (PFHxS)	110		2.0	0.87	ng/L		03/26/19 13:17	03/26/19 21:35	1
Perfluoroheptanoic acid (PFHpA)	20		2.0	0.80	ng/L		03/26/19 13:17	03/26/19 21:35	1
Perfluorooctanoic acid (PFOA)	100		2.0	0.75	ng/L		03/26/19 13:17	03/26/19 21:35	1
Perfluorooctanesulfonic acid (PFOS)	10		2.0	1.3	ng/L		03/26/19 13:17	03/26/19 21:35	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 13:17	03/26/19 21:35	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*112*		*25 - 150*	*03/26/19 13:17*	*03/26/19 21:35*	*1*
13C4 PFHpA	*121*		*25 - 150*	*03/26/19 13:17*	*03/26/19 21:35*	*1*
13C4 PFOA	*122*		*25 - 150*	*03/26/19 13:17*	*03/26/19 21:35*	*1*
13C4 PFOS	*111*		*25 - 150*	*03/26/19 13:17*	*03/26/19 21:35*	*1*
13C5 PFNA	*117*		*25 - 150*	*03/26/19 13:17*	*03/26/19 21:35*	*1*
13C3 PFBS	*108*		*25 - 150*	*03/26/19 13:17*	*03/26/19 21:35*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-015
Date Collected: 03/15/19 17:13
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-15
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		03/26/19 13:17	03/26/19 21:54	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.87	ng/L		03/26/19 13:17	03/26/19 21:54	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		03/26/19 13:17	03/26/19 21:54	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.75	ng/L		03/26/19 13:17	03/26/19 21:54	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 13:17	03/26/19 21:54	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 13:17	03/26/19 21:54	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*106*		*25 - 150*	*03/26/19 13:17*	*03/26/19 21:54*	*1*
13C4 PFHpA	*107*		*25 - 150*	*03/26/19 13:17*	*03/26/19 21:54*	*1*
13C4 PFOA	*109*		*25 - 150*	*03/26/19 13:17*	*03/26/19 21:54*	*1*
13C4 PFOS	*108*		*25 - 150*	*03/26/19 13:17*	*03/26/19 21:54*	*1*
13C5 PFNA	*105*		*25 - 150*	*03/26/19 13:17*	*03/26/19 21:54*	*1*
13C3 PFBS	*98*		*25 - 150*	*03/26/19 13:17*	*03/26/19 21:54*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-304
Date Collected: 03/15/19 17:04
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-16
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	31		2.0	0.92	ng/L		03/26/19 13:17	03/26/19 22:12	1
Perfluorohexanesulfonic acid (PFHxS)	120		2.0	0.87	ng/L		03/26/19 13:17	03/26/19 22:12	1
Perfluoroheptanoic acid (PFHpA)	21		2.0	0.80	ng/L		03/26/19 13:17	03/26/19 22:12	1
Perfluorooctanoic acid (PFOA)	110		2.0	0.75	ng/L		03/26/19 13:17	03/26/19 22:12	1
Perfluorooctanesulfonic acid (PFOS)	10		2.0	1.3	ng/L		03/26/19 13:17	03/26/19 22:12	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 13:17	03/26/19 22:12	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*110*		*25 - 150*	*03/26/19 13:17*	*03/26/19 22:12*	*1*
13C4 PFHpA	*117*		*25 - 150*	*03/26/19 13:17*	*03/26/19 22:12*	*1*
13C4 PFOA	*116*		*25 - 150*	*03/26/19 13:17*	*03/26/19 22:12*	*1*
13C4 PFOS	*116*		*25 - 150*	*03/26/19 13:17*	*03/26/19 22:12*	*1*
13C5 PFNA	*124*		*25 - 150*	*03/26/19 13:17*	*03/26/19 22:12*	*1*
13C3 PFBS	*110*		*25 - 150*	*03/26/19 13:17*	*03/26/19 22:12*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-011
Date Collected: 03/15/19 18:11
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-17
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		03/26/19 13:17	03/26/19 22:31	1
Perfluorohexanesulfonic acid (PFHxS)	**2.3**		2.0	0.87	ng/L		03/26/19 13:17	03/26/19 22:31	1
Perfluoroheptanoic acid (PFHpA)	**1.1**	**J**	2.0	0.80	ng/L		03/26/19 13:17	03/26/19 22:31	1
Perfluorooctanoic acid (PFOA)	**4.9**		2.0	0.75	ng/L		03/26/19 13:17	03/26/19 22:31	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 13:17	03/26/19 22:31	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 13:17	03/26/19 22:31	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*104*		*25 - 150*	*03/26/19 13:17*	*03/26/19 22:31*	*1*
13C4 PFHpA	*115*		*25 - 150*	*03/26/19 13:17*	*03/26/19 22:31*	*1*
13C4 PFOA	*107*		*25 - 150*	*03/26/19 13:17*	*03/26/19 22:31*	*1*
13C4 PFOS	*101*		*25 - 150*	*03/26/19 13:17*	*03/26/19 22:31*	*1*
13C5 PFNA	*111*		*25 - 150*	*03/26/19 13:17*	*03/26/19 22:31*	*1*
13C3 PFBS	*101*		*25 - 150*	*03/26/19 13:17*	*03/26/19 22:31*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-016
Date Collected: 03/16/19 12:37
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-18
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**1.6**	**J I**	2.0	0.92	ng/L		03/26/19 14:37	03/27/19 02:49	1
Perfluorohexanesulfonic acid (PFHxS)	**4.1**	**I**	2.0	0.87	ng/L		03/26/19 14:37	03/27/19 02:49	1
Perfluoroheptanoic acid (PFHpA)	**1.4**	**J I**	2.0	0.80	ng/L		03/26/19 14:37	03/27/19 02:49	1
Perfluorooctanoic acid (PFOA)	**6.5**		2.0	0.75	ng/L		03/26/19 14:37	03/27/19 02:49	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 14:37	03/27/19 02:49	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 14:37	03/27/19 02:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*113*		*25 - 150*	*03/26/19 14:37*	*03/27/19 02:49*	*1*
13C4 PFHpA	*119*		*25 - 150*	*03/26/19 14:37*	*03/27/19 02:49*	*1*
13C4 PFOA	*109*		*25 - 150*	*03/26/19 14:37*	*03/27/19 02:49*	*1*
13C4 PFOS	*116*		*25 - 150*	*03/26/19 14:37*	*03/27/19 02:49*	*1*
13C5 PFNA	*108*		*25 - 150*	*03/26/19 14:37*	*03/27/19 02:49*	*1*
13C3 PFBS	*108*		*25 - 150*	*03/26/19 14:37*	*03/27/19 02:49*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-017
Date Collected: 03/16/19 15:19
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-19
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		03/26/19 14:37	03/27/19 03:07	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.87	ng/L		03/26/19 14:37	03/27/19 03:07	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		03/26/19 14:37	03/27/19 03:07	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.75	ng/L		03/26/19 14:37	03/27/19 03:07	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 14:37	03/27/19 03:07	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 14:37	03/27/19 03:07	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*112*		*25 - 150*	*03/26/19 14:37*	*03/27/19 03:07*	*1*
13C4 PFHpA	*109*		*25 - 150*	*03/26/19 14:37*	*03/27/19 03:07*	*1*
13C4 PFOA	*109*		*25 - 150*	*03/26/19 14:37*	*03/27/19 03:07*	*1*
13C4 PFOS	*110*		*25 - 150*	*03/26/19 14:37*	*03/27/19 03:07*	*1*
13C5 PFNA	*105*		*25 - 150*	*03/26/19 14:37*	*03/27/19 03:07*	*1*
13C3 PFBS	*105*		*25 - 150*	*03/26/19 14:37*	*03/27/19 03:07*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-020
Date Collected: 03/18/19 17:43
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-20
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**3.6**		2.0	0.92	ng/L		03/26/19 14:37	03/27/19 03:26	1
Perfluorohexanesulfonic acid (PFHxS)	**1.6**	**J I**	2.0	0.87	ng/L		03/26/19 14:37	03/27/19 03:26	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		03/26/19 14:37	03/27/19 03:26	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.75	ng/L		03/26/19 14:37	03/27/19 03:26	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 14:37	03/27/19 03:26	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 14:37	03/27/19 03:26	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*111*		*25 - 150*	*03/26/19 14:37*	*03/27/19 03:26*	*1*
13C4 PFHpA	*116*		*25 - 150*	*03/26/19 14:37*	*03/27/19 03:26*	*1*
13C4 PFOA	*110*		*25 - 150*	*03/26/19 14:37*	*03/27/19 03:26*	*1*
13C4 PFOS	*112*		*25 - 150*	*03/26/19 14:37*	*03/27/19 03:26*	*1*
13C5 PFNA	*111*		*25 - 150*	*03/26/19 14:37*	*03/27/19 03:26*	*1*
13C3 PFBS	*103*		*25 - 150*	*03/26/19 14:37*	*03/27/19 03:26*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-208
Date Collected: 03/18/19 11:26
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-21
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**4.4**		2.0	0.92	ng/L		03/26/19 14:37	03/27/19 03:44	1
Perfluorohexanesulfonic acid (PFHxS)	**9.9**		2.0	0.87	ng/L		03/26/19 14:37	03/27/19 03:44	1
Perfluoroheptanoic acid (PFHpA)	**3.2**		2.0	0.80	ng/L		03/26/19 14:37	03/27/19 03:44	1
Perfluorooctanoic acid (PFOA)	**21**		2.0	0.75	ng/L		03/26/19 14:37	03/27/19 03:44	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 14:37	03/27/19 03:44	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 14:37	03/27/19 03:44	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*100*		*25 - 150*	*03/26/19 14:37*	*03/27/19 03:44*	*1*
13C4 PFHpA	*114*		*25 - 150*	*03/26/19 14:37*	*03/27/19 03:44*	*1*
13C4 PFOA	*108*		*25 - 150*	*03/26/19 14:37*	*03/27/19 03:44*	*1*
13C4 PFOS	*103*		*25 - 150*	*03/26/19 14:37*	*03/27/19 03:44*	*1*
13C5 PFNA	*100*		*25 - 150*	*03/26/19 14:37*	*03/27/19 03:44*	*1*
13C3 PFBS	*102*		*25 - 150*	*03/26/19 14:37*	*03/27/19 03:44*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-006
Date Collected: 03/18/19 12:32
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-22
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		03/26/19 14:37	03/27/19 04:03	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.87	ng/L		03/26/19 14:37	03/27/19 04:03	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		03/26/19 14:37	03/27/19 04:03	1
Perfluorooctanoic acid (PFOA)	**1.7**	**J**	2.0	0.75	ng/L		03/26/19 14:37	03/27/19 04:03	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 14:37	03/27/19 04:03	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 14:37	03/27/19 04:03	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*112*		*25 - 150*	*03/26/19 14:37*	*03/27/19 04:03*	*1*
13C4 PFHpA	*117*		*25 - 150*	*03/26/19 14:37*	*03/27/19 04:03*	*1*
13C4 PFOA	*112*		*25 - 150*	*03/26/19 14:37*	*03/27/19 04:03*	*1*
13C4 PFOS	*113*		*25 - 150*	*03/26/19 14:37*	*03/27/19 04:03*	*1*
13C5 PFNA	*111*		*25 - 150*	*03/26/19 14:37*	*03/27/19 04:03*	*1*
13C3 PFBS	*105*		*25 - 150*	*03/26/19 14:37*	*03/27/19 04:03*	*1*

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)					
Lab Sample ID	Client Sample ID	PFHxS (25-150)	PFHpA (25-150)	PFOA (25-150)	PFOS (25-150)	PFNA (25-150)	3C3-PFBS (25-150)
320-48588-1	AKNPW-112	107	117	107	111	101	106
320-48588-2	AKNPW-012	111	113	110	108	111	105
320-48588-3	AKNPW-013	108	121	113	113	106	109
320-48588-4	AKNPW-008	114	116	114	110	111	111
320-48588-5	AKNPW-005	113	116	108	109	113	108
320-48588-6	AKNPW-003	111	112	110	105	106	105
320-48588-7	AKNPW-014	113	114	125	118	110	112
320-48588-8	AKNPW-009	107	107	109	110	99	102
320-48588-9	AKNPW-007	110	114	109	110	105	107
320-48588-10	AKNPW-001	114	119	115	117	108	107
320-48588-11	AKNPW-422	113	118	113	111	112	109
320-48588-12	AKNPW-010	110	119	111	110	113	106
320-48588-13	AKNPW-424	111	117	114	113	113	109
320-48588-14	AKNPW-204	112	121	122	111	117	108
320-48588-15	AKNPW-015	106	107	109	108	105	98
320-48588-16	AKNPW-304	110	117	116	116	124	110
320-48588-17	AKNPW-011	104	115	107	101	111	101
320-48588-18	AKNPW-016	113	119	109	116	108	108
320-48588-19	AKNPW-017	112	109	109	110	105	105
320-48588-20	AKNPW-020	111	116	110	112	111	103
320-48588-21	AKNPW-208	100	114	108	103	100	102
320-48588-22	AKNPW-006	112	117	112	113	111	105
LCS 320-284138/2-A	Lab Control Sample	98	100	98	100	98	97
LCS 320-284173/2-A	Lab Control Sample	106	110	108	107	98	103
LCSD 320-284138/3-A	Lab Control Sample Dup	110	113	101	106	102	103
LCSD 320-284173/3-A	Lab Control Sample Dup	106	113	107	112	104	108
MB 320-284138/1-A	Method Blank	102	109	105	98	96	95
MB 320-284173/1-A	Method Blank	108	117	115	113	106	108

Surrogate Legend

PFHxS = 18O2 PFHxS
PFHpA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFOS = 13C4 PFOS
PFNA = 13C5 PFNA
13C3-PFBS = 13C3 PFBS

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-284138/1-A
Matrix: Water
Analysis Batch: 284202

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 284138

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		03/26/19 13:17	03/26/19 16:22	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.87	ng/L		03/26/19 13:17	03/26/19 16:22	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		03/26/19 13:17	03/26/19 16:22	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.75	ng/L		03/26/19 13:17	03/26/19 16:22	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 13:17	03/26/19 16:22	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 13:17	03/26/19 16:22	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*102*		*25 - 150*	*03/26/19 13:17*	*03/26/19 16:22*	*1*
13C4 PFHpA	*109*		*25 - 150*	*03/26/19 13:17*	*03/26/19 16:22*	*1*
13C4 PFOA	*105*		*25 - 150*	*03/26/19 13:17*	*03/26/19 16:22*	*1*
13C4 PFOS	*98*		*25 - 150*	*03/26/19 13:17*	*03/26/19 16:22*	*1*
13C5 PFNA	*96*		*25 - 150*	*03/26/19 13:17*	*03/26/19 16:22*	*1*
13C3 PFBS	*95*		*25 - 150*	*03/26/19 13:17*	*03/26/19 16:22*	*1*

Lab Sample ID: LCS 320-284138/2-A
Matrix: Water
Analysis Batch: 284202

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 284138

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanesulfonic acid (PFBS)	17.7	16.2		ng/L		92	72 - 151
Perfluorohexanesulfonic acid (PFHxS)	18.2	17.6		ng/L		97	73 - 157
Perfluoroheptanoic acid (PFHpA)	20.0	19.2		ng/L		96	71 - 138
Perfluorooctanoic acid (PFOA)	20.0	19.8		ng/L		99	70 - 140
Perfluorooctanesulfonic acid (PFOS)	18.6	17.5		ng/L		94	69 - 144
Perfluorononanoic acid (PFNA)	20.0	19.3		ng/L		97	73 - 147

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
18O2 PFHxS	*98*		*25 - 150*
13C4 PFHpA	*100*		*25 - 150*
13C4 PFOA	*98*		*25 - 150*
13C4 PFOS	*100*		*25 - 150*
13C5 PFNA	*98*		*25 - 150*
13C3 PFBS	*97*		*25 - 150*

Lab Sample ID: LCSD 320-284138/3-A
Matrix: Water
Analysis Batch: 284202

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 284138

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanesulfonic acid (PFBS)	17.7	16.9		ng/L		96	72 - 151	4	30
Perfluorohexanesulfonic acid (PFHxS)	18.2	15.9		ng/L		87	73 - 157	10	30
Perfluoroheptanoic acid (PFHpA)	20.0	16.7		ng/L		84	71 - 138	13	30
Perfluorooctanoic acid (PFOA)	20.0	18.9		ng/L		95	70 - 140	4	30

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-284138/3-A
Matrix: Water
Analysis Batch: 284202

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 284138

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)			18.6	17.2		ng/L		93	69 - 144	2	30
Perfluorononanoic acid (PFNA)			20.0	19.1		ng/L		95	73 - 147	1	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
18O2 PFHxS	*110*		*25 - 150*
13C4 PFHpA	*113*		*25 - 150*
13C4 PFOA	*101*		*25 - 150*
13C4 PFOS	*106*		*25 - 150*
13C5 PFNA	*102*		*25 - 150*
13C3 PFBS	*103*		*25 - 150*

Lab Sample ID: MB 320-284173/1-A
Matrix: Water
Analysis Batch: 284227

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 284173

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		03/26/19 14:37	03/27/19 01:54	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.87	ng/L		03/26/19 14:37	03/27/19 01:54	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		03/26/19 14:37	03/27/19 01:54	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.75	ng/L		03/26/19 14:37	03/27/19 01:54	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		03/26/19 14:37	03/27/19 01:54	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		03/26/19 14:37	03/27/19 01:54	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*108*		*25 - 150*	*03/26/19 14:37*	*03/27/19 01:54*	*1*
13C4 PFHpA	*117*		*25 - 150*	*03/26/19 14:37*	*03/27/19 01:54*	*1*
13C4 PFOA	*115*		*25 - 150*	*03/26/19 14:37*	*03/27/19 01:54*	*1*
13C4 PFOS	*113*		*25 - 150*	*03/26/19 14:37*	*03/27/19 01:54*	*1*
13C5 PFNA	*106*		*25 - 150*	*03/26/19 14:37*	*03/27/19 01:54*	*1*
13C3 PFBS	*108*		*25 - 150*	*03/26/19 14:37*	*03/27/19 01:54*	*1*

Lab Sample ID: LCS 320-284173/2-A
Matrix: Water
Analysis Batch: 284227

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 284173

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanesulfonic acid (PFBS)			17.7	17.3		ng/L		98	72 - 151
Perfluorohexanesulfonic acid (PFHxS)			18.2	17.2		ng/L		95	73 - 157
Perfluoroheptanoic acid (PFHpA)			20.0	18.1		ng/L		90	71 - 138
Perfluorooctanoic acid (PFOA)			20.0	19.6		ng/L		98	70 - 140
Perfluorooctanesulfonic acid (PFOS)			18.6	18.1		ng/L		97	69 - 144
Perfluorononanoic acid (PFNA)			20.0	20.3		ng/L		101	73 - 147

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
18O2 PFHxS	*106*		*25 - 150*
13C4 PFHpA	*110*		*25 - 150*

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-284173/2-A
Matrix: Water
Analysis Batch: 284227

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 284173

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFOA	108		25 - 150
13C4 PFOS	107		25 - 150
13C5 PFNA	98		25 - 150
13C3 PFBS	103		25 - 150

Lab Sample ID: LCSD 320-284173/3-A
Matrix: Water
Analysis Batch: 284227

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 284173

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanesulfonic acid (PFBS)	17.7	15.8		ng/L		90	72 - 151	9	30
Perfluorohexanesulfonic acid (PFHxS)	18.2	17.0		ng/L		94	73 - 157	1	30
Perfluoroheptanoic acid (PFHpA)	20.0	17.5		ng/L		88	71 - 138	3	30
Perfluorooctanoic acid (PFOA)	20.0	18.4		ng/L		92	70 - 140	6	30
Perfluorooctanesulfonic acid (PFOS)	18.6	18.3		ng/L		99	69 - 144	1	30
Perfluorononanoic acid (PFNA)	20.0	19.5		ng/L		97	73 - 147	4	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
18O2 PFHxS	106		25 - 150
13C4 PFHpA	113		25 - 150
13C4 PFOA	107		25 - 150
13C4 PFOS	112		25 - 150
13C5 PFNA	104		25 - 150
13C3 PFBS	108		25 - 150

LCMS

Prep Batch: 284138

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-48588-1	AKNPW-112	Total/NA	Water	PFAS Prep	
320-48588-2	AKNPW-012	Total/NA	Water	PFAS Prep	
320-48588-3	AKNPW-013	Total/NA	Water	PFAS Prep	
320-48588-4	AKNPW-008	Total/NA	Water	PFAS Prep	
320-48588-5	AKNPW-005	Total/NA	Water	PFAS Prep	
320-48588-6	AKNPW-003	Total/NA	Water	PFAS Prep	
320-48588-7	AKNPW-014	Total/NA	Water	PFAS Prep	
320-48588-8	AKNPW-009	Total/NA	Water	PFAS Prep	
320-48588-9	AKNPW-007	Total/NA	Water	PFAS Prep	
320-48588-10	AKNPW-001	Total/NA	Water	PFAS Prep	
320-48588-11	AKNPW-422	Total/NA	Water	PFAS Prep	
320-48588-12	AKNPW-010	Total/NA	Water	PFAS Prep	
320-48588-13	AKNPW-424	Total/NA	Water	PFAS Prep	
320-48588-14	AKNPW-204	Total/NA	Water	PFAS Prep	
320-48588-15	AKNPW-015	Total/NA	Water	PFAS Prep	
320-48588-16	AKNPW-304	Total/NA	Water	PFAS Prep	
320-48588-17	AKNPW-011	Total/NA	Water	PFAS Prep	
MB 320-284138/1-A	Method Blank	Total/NA	Water	PFAS Prep	
LCS 320-284138/2-A	Lab Control Sample	Total/NA	Water	PFAS Prep	
LCSD 320-284138/3-A	Lab Control Sample Dup	Total/NA	Water	PFAS Prep	

Prep Batch: 284173

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-48588-18	AKNPW-016	Total/NA	Water	PFAS Prep	
320-48588-19	AKNPW-017	Total/NA	Water	PFAS Prep	
320-48588-20	AKNPW-020	Total/NA	Water	PFAS Prep	
320-48588-21	AKNPW-208	Total/NA	Water	PFAS Prep	
320-48588-22	AKNPW-006	Total/NA	Water	PFAS Prep	
MB 320-284173/1-A	Method Blank	Total/NA	Water	PFAS Prep	
LCS 320-284173/2-A	Lab Control Sample	Total/NA	Water	PFAS Prep	
LCSD 320-284173/3-A	Lab Control Sample Dup	Total/NA	Water	PFAS Prep	

Analysis Batch: 284202

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-48588-1	AKNPW-112	Total/NA	Water	WS-LC-0025 At1	284138
320-48588-2	AKNPW-012	Total/NA	Water	WS-LC-0025 At1	284138
320-48588-3	AKNPW-013	Total/NA	Water	WS-LC-0025 At1	284138
320-48588-4	AKNPW-008	Total/NA	Water	WS-LC-0025 At1	284138
320-48588-5	AKNPW-005	Total/NA	Water	WS-LC-0025 At1	284138
320-48588-6	AKNPW-003	Total/NA	Water	WS-LC-0025 At1	284138
320-48588-7	AKNPW-014	Total/NA	Water	WS-LC-0025 At1	284138
320-48588-8	AKNPW-009	Total/NA	Water	WS-LC-0025 At1	284138
320-48588-9	AKNPW-007	Total/NA	Water	WS-LC-0025 At1	284138

LCMS (Continued)

Analysis Batch: 284202 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-48588-10	AKNPW-001	Total/NA	Water	WS-LC-0025 At1	284138
320-48588-11	AKNPW-422	Total/NA	Water	WS-LC-0025 At1	284138
320-48588-12	AKNPW-010	Total/NA	Water	WS-LC-0025 At1	284138
320-48588-13	AKNPW-424	Total/NA	Water	WS-LC-0025 At1	284138
320-48588-14	AKNPW-204	Total/NA	Water	WS-LC-0025 At1	284138
320-48588-15	AKNPW-015	Total/NA	Water	WS-LC-0025 At1	284138
320-48588-16	AKNPW-304	Total/NA	Water	WS-LC-0025 At1	284138
320-48588-17	AKNPW-011	Total/NA	Water	WS-LC-0025 At1	284138
MB 320-284138/1-A	Method Blank	Total/NA	Water	WS-LC-0025 At1	284138
LCS 320-284138/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025 At1	284138
LCSD 320-284138/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025 At1	284138

Analysis Batch: 284227

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-48588-18	AKNPW-016	Total/NA	Water	WS-LC-0025 At1	284173
320-48588-19	AKNPW-017	Total/NA	Water	WS-LC-0025 At1	284173
320-48588-20	AKNPW-020	Total/NA	Water	WS-LC-0025 At1	284173
320-48588-21	AKNPW-208	Total/NA	Water	WS-LC-0025 At1	284173
320-48588-22	AKNPW-006	Total/NA	Water	WS-LC-0025 At1	284173
MB 320-284173/1-A	Method Blank	Total/NA	Water	WS-LC-0025 At1	284173
LCS 320-284173/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025 At1	284173
LCSD 320-284173/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025 At1	284173

Client Sample ID: AKNPW-112
Date Collected: 03/14/19 16:11
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284138	03/26/19 13:17	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284202	03/26/19 17:17	D1R	TAL SAC

Client Sample ID: AKNPW-012
Date Collected: 03/14/19 16:21
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284138	03/26/19 13:17	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284202	03/26/19 17:35	D1R	TAL SAC

Client Sample ID: AKNPW-013
Date Collected: 03/15/19 08:31
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284138	03/26/19 13:17	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284202	03/26/19 17:54	D1R	TAL SAC

Client Sample ID: AKNPW-008
Date Collected: 03/15/19 09:55
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284138	03/26/19 13:17	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284202	03/26/19 18:12	D1R	TAL SAC

Client Sample ID: AKNPW-005
Date Collected: 03/15/19 10:04
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284138	03/26/19 13:17	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284202	03/26/19 18:31	D1R	TAL SAC

Client Sample ID: AKNPW-003
Date Collected: 03/15/19 10:38
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284138	03/26/19 13:17	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284202	03/26/19 18:49	D1R	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-014
Date Collected: 03/15/19 10:47
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284138	03/26/19 13:17	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284202	03/26/19 19:08	D1R	TAL SAC

Client Sample ID: AKNPW-009
Date Collected: 03/15/19 11:35
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284138	03/26/19 13:17	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284202	03/26/19 19:45	D1R	TAL SAC

Client Sample ID: AKNPW-007
Date Collected: 03/15/19 12:40
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284138	03/26/19 13:17	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284202	03/26/19 20:03	D1R	TAL SAC

Client Sample ID: AKNPW-001
Date Collected: 03/15/19 15:01
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284138	03/26/19 13:17	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284202	03/26/19 20:22	D1R	TAL SAC

Client Sample ID: AKNPW-422
Date Collected: 03/15/19 15:33
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-11
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284138	03/26/19 13:17	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284202	03/26/19 20:40	D1R	TAL SAC

Client Sample ID: AKNPW-010
Date Collected: 03/15/19 16:00
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-12
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284138	03/26/19 13:17	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284202	03/26/19 20:58	D1R	TAL SAC

Client Sample ID: AKNPW-424
Date Collected: 03/15/19 16:56
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-13
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284138	03/26/19 13:17	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284202	03/26/19 21:17	D1R	TAL SAC

Client Sample ID: AKNPW-204
Date Collected: 03/15/19 17:14
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-14
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284138	03/26/19 13:17	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284202	03/26/19 21:35	D1R	TAL SAC

Client Sample ID: AKNPW-015
Date Collected: 03/15/19 17:13
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-15
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284138	03/26/19 13:17	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284202	03/26/19 21:54	D1R	TAL SAC

Client Sample ID: AKNPW-304
Date Collected: 03/15/19 17:04
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-16
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284138	03/26/19 13:17	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284202	03/26/19 22:12	D1R	TAL SAC

Client Sample ID: AKNPW-011
Date Collected: 03/15/19 18:11
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-17
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284138	03/26/19 13:17	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284202	03/26/19 22:31	D1R	TAL SAC

Client Sample ID: AKNPW-016
Date Collected: 03/16/19 12:37
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-18
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284173	03/26/19 14:37	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284227	03/27/19 02:49	D1R	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Client Sample ID: AKNPW-017

Date Collected: 03/16/19 15:19
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-19

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284173	03/26/19 14:37	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284227	03/27/19 03:07	D1R	TAL SAC

Client Sample ID: AKNPW-020

Date Collected: 03/18/19 17:43
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-20

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284173	03/26/19 14:37	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284227	03/27/19 03:26	D1R	TAL SAC

Client Sample ID: AKNPW-208

Date Collected: 03/18/19 11:26
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-21

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284173	03/26/19 14:37	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284227	03/27/19 03:44	D1R	TAL SAC

Client Sample ID: AKNPW-006

Date Collected: 03/18/19 12:32
Date Received: 03/21/19 09:55

Lab Sample ID: 320-48588-22

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	284173	03/26/19 14:37	CJU	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			284227	03/27/19 04:03	D1R	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
ANAB	DoD / DOE		L2468	01-20-21
Arizona	State Program	9	AZ0708	08-11-19
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-20
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-19
Georgia	State Program	4	N/A	01-28-19 *
Hawaii	State Program	9	N/A	01-29-20
Illinois	NELAP	5	200060	03-17-19 *
Kansas	NELAP	7	E-10375	10-31-19
Louisiana	NELAP	6	30612	06-30-19
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-19
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-19
New York	NELAP	2	11666	03-31-19 *
Oregon	NELAP	10	4040	01-29-20
Pennsylvania	NELAP	3	68-01272	03-31-19 *
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-19
USDA	Federal		P330-18-00239	01-17-21
USEPA UCMR	Federal	1	CA00044	12-31-20
Utah	NELAP	8	CA00044	02-28-19 *
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19 *
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-19
Wyoming	State Program	8	8TMS-L	01-28-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Method	Method Description	Protocol	Laboratory
WS-LC-0025 At1	Fluorinated Alkyl Substances	TAL-SAC	TAL SAC
PFAS Prep	Preparation, Direct Inject PFAS	TAL-SAC	TAL SAC

Protocol References:

TAL-SAC = TestAmerica Laboratories, West Sacramento, Facility Standard Operating Procedure.

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: King Salmon

TestAmerica Job ID: 320-48588-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-48588-1	AKNPW-112	Water	03/14/19 16:11	03/21/19 09:55
320-48588-2	AKNPW-012	Water	03/14/19 16:21	03/21/19 09:55
320-48588-3	AKNPW-013	Water	03/15/19 08:31	03/21/19 09:55
320-48588-4	AKNPW-008	Water	03/15/19 09:55	03/21/19 09:55
320-48588-5	AKNPW-005	Water	03/15/19 10:04	03/21/19 09:55
320-48588-6	AKNPW-003	Water	03/15/19 10:38	03/21/19 09:55
320-48588-7	AKNPW-014	Water	03/15/19 10:47	03/21/19 09:55
320-48588-8	AKNPW-009	Water	03/15/19 11:35	03/21/19 09:55
320-48588-9	AKNPW-007	Water	03/15/19 12:40	03/21/19 09:55
320-48588-10	AKNPW-001	Water	03/15/19 15:01	03/21/19 09:55
320-48588-11	AKNPW-422	Water	03/15/19 15:33	03/21/19 09:55
320-48588-12	AKNPW-010	Water	03/15/19 16:00	03/21/19 09:55
320-48588-13	AKNPW-424	Water	03/15/19 16:56	03/21/19 09:55
320-48588-14	AKNPW-204	Water	03/15/19 17:14	03/21/19 09:55
320-48588-15	AKNPW-015	Water	03/15/19 17:13	03/21/19 09:55
320-48588-16	AKNPW-304	Water	03/15/19 17:04	03/21/19 09:55
320-48588-17	AKNPW-011	Water	03/15/19 18:11	03/21/19 09:55
320-48588-18	AKNPW-016	Water	03/16/19 12:37	03/21/19 09:55
320-48588-19	AKNPW-017	Water	03/16/19 15:19	03/21/19 09:55
320-48588-20	AKNPW-020	Water	03/18/19 17:43	03/21/19 09:55
320-48588-21	AKNPW-208	Water	03/18/19 11:26	03/21/19 09:55
320-48588-22	AKNPW-006	Water	03/18/19 12:32	03/21/19 09:55

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: David Alltucker

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 x6	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
~~AKNPW-101~~		1611	3/14/19		2	Groundwater
AKNPW-112		1611	3/14/19		2	
AKNPW-012		1621	3/14/19		2	
AKNPW-013		0831	3/15/19		2	
AKNPW-008		0955			2	
AKNPW-005		1004			2	
AKNPW-003		1038			2	
AKNPW-014		1047			2	
AKNPW-009		1135			2	
AKNPW-007		1240			2	

320-48588 Chain of Custody

Project Information	
Number:	102582-003
Name:	King Salmon
Contact:	KRF
Ongoing Project?	Yes ☒ No ☐
Sampler:	CAB, ARM, GCD

Sample Receipt	
Total No. of Containers:	44
COC Seals/Intact? (Y/N/NA)	Y
Received Good Cond./Cold	Y
Temp:	1.9°C
Delivery Method:	Goldstreak

Notes:
Please bill to 102582-003.

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: GCM Time: 1153	Signature: Time:	Signature: Time:
Printed Name: G. Cherissa Dukelow Date: 3/20/19	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson, Inc.	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 0955	Signature: Time:	Signature: Time:
Printed Name: Jennifer Darlington Date: 21 Mar 19	Printed Name: Date:	Printed Name: Date:
Company: TAW SnC 1.9°C	Company:	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

No. 35800

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
2355 Hill Road
Fairbanks, AK 99709
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CHAIN-OF-CUSTODY RECORD

Laboratory Test America
Attn: David Altucker

Turn Around Time:	Quote No:
☐ Normal ☐ Rush	J-Flags: ☐ Yes ☐ No
Please Specify	

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFAS +6	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
AKNPW-001		1501	3/15/19		2	Groundwater
AKNPW-422		1533			2	
AKNPW-010		1600			2	
AKNPW-424		1656			2	
AKNPW-204		1714			2	
AKNPW-015		1713			2	
AKNPW-304		1704			2	
AKNPW-011		1811			2	
AKNPW-016		1237	3/16/19		2	
AKNPW-017		1519			2	

Project Information	
Number:	102582-003
Name:	King Salmon
Contact:	KRF
Ongoing Project?	Yes ☒ No ☐
Sampler:	ARM, CAB, GCD

Sample Receipt	
Total No. of Containers:	
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Temp:	
Delivery Method:	

Reliquished By: 1.	Reliquished By: 2.	Reliquished By: 3.
Signature: Time: 1153	Signature: Time:	Signature: Time:
Printed Name: G. Cherissa Dunklow Date: 3/20/19	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson, Inc.	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 0755	Signature: Time:	Signature: Time:
Printed Name: Jennifer Darlington Date: 21 Mar 19	Printed Name: Date:	Printed Name: Date:
Company: TAW SRC 1.9°C	Company:	Company:

Notes:

Please bill to 102582-003.

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

No. 35833

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600
www.shannonwilson.com

CHAIN-OF-CUSTODY RECORD

Laboratory TestAmerica
Attn: David Alltucker

Turn Around Time:	Quote No:	J-Flags:
☐ Normal ☐ Rush		☐ Yes ☐ No
Please Specify		

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFAS +6	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
AKNPW-020		1743	3/18/19		2	Groundwater
AKNPW-208		11:26	"		2	"
AKNPW-006		12:32	"		2	"

Project Information	
Number:	102582-003
Name:	King Salmon
Contact:	KRF
Ongoing Project?	Yes ☒ No ☐
Sampler:	CAB, ARM, GCD

Sample Receipt	
Total No. of Containers:	
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Temp:	
Delivery Method:	

Notes:

Please bill to 102582-003

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 1153	Signature: Time:	Signature: Time:
Printed Name: G. Cherissa Dukelow Date: 3/21/19	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson, Inc.	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 0955	Signature: Time:	Signature: Time:
Printed Name: Jennifer Darlington Date: 21 Mar 19	Printed Name: Date:	Printed Name: Date:
Company: TAW SNC 1.9°C	Company:	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

No. 35802

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-48588-1

Login Number: 48588
List Number: 1
Creator: Horner, Nathaniel A

List Source: 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	102582-003, 102582
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.	True	
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.	True	
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.	N/A	
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.	N/A	

Laboratory Data Review Checklist

Completed By:

Adam Wyborny

Title:

Environmental Engineering Staff

Date:

April 1, 2019

CS Report Name:

King Salmon DOT&PF PFAS

Report Date:

March 28, 2019

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

TestAmerica Laboratories, Inc.

Laboratory Report Number:

320-48588-1

ADEC File Number:

2569.38.033

Hazard Identification Number:

26981

320-48588-1

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   (●) Yes ( ) No Comments:

The ADEC certified the TestAmerica Laboratories West Sacramento, CA location for the analysis of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) on February 6, 2018. These compounds were included in the ADEC's Contaminated Sites Laboratory Approval 17-020.

   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 Comments:

Analyses were performed by TestAmerica Laboratories, Inc. in West Sacramento, CA.

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   (●) Yes ( ) No Comments:

   b. Correct Analyses requested?

   (●) Yes ( ) No Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   (●) Yes ( ) No Comments:

The temperature blank was measured within the acceptable temperature range of 0° C to 6° C upon receipt at the laboratory.

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   (●) Yes ( ) No Comments:

Analysis of PFAS compounds does not require chemical preservation.

   c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

   (●) Yes ( ) No Comments:

The sample receipt form notes that the samples were received in good condition.

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 Comments:

There were no discrepancies noted in the sample receipt documentation.

e. Data quality or usability affected?

Comments:

The data quality and/or usability was not affected; see above.

4. Case Narrative

a. Present and understandable?

◉ Yes ○ No Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

◉ Yes ○ No Comments:

The samples arrived in good condition and properly preserved. The temperature of the sample cooler received with this shipment was 1.9 º C upon arrival at the laboratory.

The case narrative notes that there was insufficient sample volume available to perform a matrix spike (MS) and MS duplicate (MSD) in conjunction with preparation batches 320-284138 and 320-284173.

c. Were all corrective actions documented?

○ Yes ◉ No Comments:

No corrective actions were documented in the case narrative.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The case narrative does not note an effect on data quality.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

◉ Yes ○ No Comments:

b. All applicable holding times met?

(●) Yes ( ) No Comments:

The laboratory indicates that the water samples were analyzed using direct injection and in-line analysis. The 28-day hold time for analysis using direct aqueous injection (DAI) was met for all samples.

c. All soils reported on a dry weight basis?

( ) Yes (●) No Comments:

N/A; soil samples were not submitted with this work order.

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

(●) Yes ( ) No Comments:

The LOQ, equivalent to the TestAmerica Reporting Limit (RL), is less than the applicable ADEC regulatory limits for drinking water and soil.

e. Data quality or usability affected?

( ) Yes (●) No Comments:

The data quality and/or usability are not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

(●) Yes ( ) No Comments:

ii. All method blank results less than limit of quantitation (LOQ)?

(●) Yes ( ) No Comments:

iii. If above LOQ, what samples are affected?

Comments:

None; PFAS compounds were not detected in the method blank samples.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

( ) Yes (●) No Comments:

No samples are affected; therefore, qualification of the results was not required

v. Data quality or usability affected?

Comments:

The data quality and/or usability are not affected.

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 Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

( ) Yes (●) No Comments:

N/A; metals and/or inorganics were not analyzed as part of this work order.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

(●) Yes ( ) No Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

(●) Yes ( ) No Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

None; analytical accuracy and precision were demonstrated to be within acceptable limits.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

( ) Yes (●) No Comments:

Qualification of the data was not required; see above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or usability are not affected.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

(•) Yes ( ) No Comments:

The analytical method WS-LC-0025 uses IDA recovery, which entails adding a 13C-isotope of each target analyte, and assessing the recovery of each analyte. The isotopically-labeled compounds are discussed as surrogates for this method.

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

(•) Yes ( ) No Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

( ) Yes (•) No Comments:

N/A; there were no IDA recovery failures associated with this work order.

iv. Data quality or usability affected?

Comments:

The data quality and usability are not affected; see above.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples?
(If not, enter explanation below.)

( ) Yes (•) No Comments:

PFAS are not volatile compounds; therefore, a trip blank is not required.

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 Comments:

N/A; a trip blank is not required.

iii. All results less than LOQ?

○ Yes ◉ No Comments:

N/A; a trip blank is not required.

iv. If above LOQ, what samples are affected?

Comments:

None; a trip blank was not submitted with this work order.

v. Data quality or usability affected?

Comments:

The data quality and/or usability are not affected; see above.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

◉ Yes ○ No Comments:

ii. Submitted blind to lab?

◉ Yes ○ No Comments:

The field duplicate pairs *AKNPW-012* / *AKNPW-112* and *AKNPW-204* / *AKNPW-304* were submitted with this work order.

iii. Precision – All relative percent differences (RPD) less than specified DQOs?
(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 Comments:

The relative precision demonstrated between the detected PFAS results of the field duplicate samples was within the recommended DQO of 30% for all analytes.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The data quality and/or usability is not affected; see above.

f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below).

○ Yes ○ No ◉ Not Applicable

Samples for this project are not collected with reusable equipment, therefore a practical potential for equipment based cross-contamination does not exist.

i. All results less than LOQ?

◉ Yes ○ No Comments:

N/A; an equipment blank was not submitted with this work order.

ii. If above LOQ, what samples are affected?

Comments:

None; see above.

iii. Data quality or usability affected?

Comments:

The data quality and usability were not affected; see above.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

○ Yes ◉ No Comments:

There were no additional flags/qualifiers required for this work order.

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ANALYTICAL REPORT

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

Laboratory Job ID: 320-52782-1
Client Project/Site: King Salmon Annual
Revision: 1

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

Attn: Kristen Freiburger

Authorized for release by:
11/6/2019 9:14:06 AM

David Alltucker, Project Manager I
(916)374-4383
david.alltucker@testamericainc.com

Table of Contents

Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: King Salmon Annual

Job ID: 320-52782-1

Qualifiers

LCMS

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.

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
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)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
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)

Case Narrative

Client: Shannon & Wilson, Inc
Project/Site: King Salmon Annual

Job ID: 320-52782-1

Job ID: 320-52782-1

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

Job Narrative
320-52782-1

Revision - 11/6/19
This report has been revised to report additional analytes at client request.

Receipt
The samples were received on 7/30/2019 8:55 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.6º C.

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

Organic Prep
Method(s) PFAS Prep: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-312108.

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: King Salmon Annual

Job ID: 320-52782-1

Client Sample ID: AKNPW-018 — Lab Sample ID: 320-52782-1

No Detections.

Client Sample ID: AKNPW-012 — Lab Sample ID: 320-52782-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	13		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.7		2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.6		2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorobutanesulfonic acid (PFBS)	2.5		2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-011 — Lab Sample ID: 320-52782-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	4.2		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.1		2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-111 — Lab Sample ID: 320-52782-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	4.1		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.0		2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-424 — Lab Sample ID: 320-52782-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	2.4		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.4		2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.2	J	2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorobutanesulfonic acid (PFBS)	8.0		2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-422 — Lab Sample ID: 320-52782-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	3.1		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.7	J	2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.1	J	2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-208 — Lab Sample ID: 320-52782-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	23		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.7		2.0	1.3	ng/L	1		WS-LC-0025 At1	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

Client Sample ID: AKNPW-208 (Continued) — Lab Sample ID: 320-52782-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	9.7		2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorononanoic acid (PFNA)	0.93	J	2.0	0.65	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.9		2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorobutanesulfonic acid (PFBS)	4.3		2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-005 — Lab Sample ID: 320-52782-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	1.8	J	2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.9	J	2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.1	J	2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-007 — Lab Sample ID: 320-52782-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	2.2		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.4		2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.1		2.0	0.80	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: AKNPW-008 — Lab Sample ID: 320-52782-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	2.8		2.0	0.75	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.5	J	2.0	0.87	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.6	J	2.0	0.92	ng/L	1		WS-LC-0025 At1	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Shannon & Wilson, Inc
Project/Site: King Salmon Annual

Job ID: 320-52782-1

Client Sample ID: AKNPW-018
Date Collected: 07/24/19 15:45
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-1
Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	ND		2.0	0.75	ng/L		08/02/19 10:31	08/03/19 15:12	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		08/02/19 10:31	08/03/19 15:12	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.87	ng/L		08/02/19 10:31	08/03/19 15:12	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		08/02/19 10:31	08/03/19 15:12	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		08/02/19 10:31	08/03/19 15:12	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		08/02/19 10:31	08/03/19 15:12	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*112*		*25 - 150*	*08/02/19 10:31*	*08/03/19 15:12*	*1*
13C4 PFOS	*112*		*25 - 150*	*08/02/19 10:31*	*08/03/19 15:12*	*1*
18O2 PFHxS	*114*		*25 - 150*	*08/02/19 10:31*	*08/03/19 15:12*	*1*
13C5 PFNA	*112*		*25 - 150*	*08/02/19 10:31*	*08/03/19 15:12*	*1*
13C4 PFHpA	*116*		*25 - 150*	*08/02/19 10:31*	*08/03/19 15:12*	*1*
13C3 PFBS	*107*		*25 - 150*	*08/02/19 10:31*	*08/03/19 15:12*	*1*

Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: King Salmon Annual

Job ID: 320-52782-1

Client Sample ID: AKNPW-012

Date Collected: 07/24/19 17:23
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-2

Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**13**		2.0	0.75	ng/L		08/02/19 10:31	08/03/19 15:30	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		08/02/19 10:31	08/03/19 15:30	1
Perfluorohexanesulfonic acid (PFHxS)	**6.7**		2.0	0.87	ng/L		08/02/19 10:31	08/03/19 15:30	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		08/02/19 10:31	08/03/19 15:30	1
Perfluoroheptanoic acid (PFHpA)	**2.6**		2.0	0.80	ng/L		08/02/19 10:31	08/03/19 15:30	1
Perfluorobutanesulfonic acid (PFBS)	**2.5**		2.0	0.92	ng/L		08/02/19 10:31	08/03/19 15:30	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*105*		*25 - 150*	*08/02/19 10:31*	*08/03/19 15:30*	*1*
13C4 PFOS	*111*		*25 - 150*	*08/02/19 10:31*	*08/03/19 15:30*	*1*
18O2 PFHxS	*116*		*25 - 150*	*08/02/19 10:31*	*08/03/19 15:30*	*1*
13C5 PFNA	*103*		*25 - 150*	*08/02/19 10:31*	*08/03/19 15:30*	*1*
13C4 PFHpA	*114*		*25 - 150*	*08/02/19 10:31*	*08/03/19 15:30*	*1*
13C3 PFBS	*105*		*25 - 150*	*08/02/19 10:31*	*08/03/19 15:30*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon Annual

Job ID: 320-52782-1

Client Sample ID: AKNPW-011

Date Collected: 07/24/19 16:32
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-3

Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**4.2**		2.0	0.75	ng/L		08/02/19 10:31	08/03/19 15:49	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		08/02/19 10:31	08/03/19 15:49	1
Perfluorohexanesulfonic acid (PFHxS)	**2.1**		2.0	0.87	ng/L		08/02/19 10:31	08/03/19 15:49	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		08/02/19 10:31	08/03/19 15:49	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		08/02/19 10:31	08/03/19 15:49	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		08/02/19 10:31	08/03/19 15:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*108*		*25 - 150*	*08/02/19 10:31*	*08/03/19 15:49*	*1*
13C4 PFOS	*110*		*25 - 150*	*08/02/19 10:31*	*08/03/19 15:49*	*1*
18O2 PFHxS	*109*		*25 - 150*	*08/02/19 10:31*	*08/03/19 15:49*	*1*
13C5 PFNA	*107*		*25 - 150*	*08/02/19 10:31*	*08/03/19 15:49*	*1*
13C4 PFHpA	*111*		*25 - 150*	*08/02/19 10:31*	*08/03/19 15:49*	*1*
13C3 PFBS	*101*		*25 - 150*	*08/02/19 10:31*	*08/03/19 15:49*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon Annual

Job ID: 320-52782-1

Client Sample ID: AKNPW-111

Date Collected: 07/24/19 16:00
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-4

Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**4.1**		2.0	0.75	ng/L		08/02/19 10:31	08/03/19 16:07	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		08/02/19 10:31	08/03/19 16:07	1
Perfluorohexanesulfonic acid (PFHxS)	**2.0**		2.0	0.87	ng/L		08/02/19 10:31	08/03/19 16:07	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		08/02/19 10:31	08/03/19 16:07	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		08/02/19 10:31	08/03/19 16:07	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		08/02/19 10:31	08/03/19 16:07	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*110*		*25 - 150*	*08/02/19 10:31*	*08/03/19 16:07*	*1*
13C4 PFOS	*110*		*25 - 150*	*08/02/19 10:31*	*08/03/19 16:07*	*1*
18O2 PFHxS	*116*		*25 - 150*	*08/02/19 10:31*	*08/03/19 16:07*	*1*
13C5 PFNA	*111*		*25 - 150*	*08/02/19 10:31*	*08/03/19 16:07*	*1*
13C4 PFHpA	*113*		*25 - 150*	*08/02/19 10:31*	*08/03/19 16:07*	*1*
13C3 PFBS	*104*		*25 - 150*	*08/02/19 10:31*	*08/03/19 16:07*	*1*

Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: King Salmon Annual

Job ID: 320-52782-1

Client Sample ID: AKNPW-424

Date Collected: 07/25/19 15:14
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-5

Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**2.4**		2.0	0.75	ng/L		08/02/19 10:31	08/03/19 16:26	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		08/02/19 10:31	08/03/19 16:26	1
Perfluorohexanesulfonic acid (PFHxS)	**6.4**		2.0	0.87	ng/L		08/02/19 10:31	08/03/19 16:26	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		08/02/19 10:31	08/03/19 16:26	1
Perfluoroheptanoic acid (PFHpA)	**1.2**	**J**	2.0	0.80	ng/L		08/02/19 10:31	08/03/19 16:26	1
Perfluorobutanesulfonic acid (PFBS)	**8.0**		2.0	0.92	ng/L		08/02/19 10:31	08/03/19 16:26	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*112*		*25 - 150*	*08/02/19 10:31*	*08/03/19 16:26*	*1*
13C4 PFOS	*110*		*25 - 150*	*08/02/19 10:31*	*08/03/19 16:26*	*1*
18O2 PFHxS	*114*		*25 - 150*	*08/02/19 10:31*	*08/03/19 16:26*	*1*
13C5 PFNA	*114*		*25 - 150*	*08/02/19 10:31*	*08/03/19 16:26*	*1*
13C4 PFHpA	*116*		*25 - 150*	*08/02/19 10:31*	*08/03/19 16:26*	*1*
13C3 PFBS	*101*		*25 - 150*	*08/02/19 10:31*	*08/03/19 16:26*	*1*

Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: King Salmon Annual

Job ID: 320-52782-1

Client Sample ID: AKNPW-422

Date Collected: 07/25/19 14:23
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-6

Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**3.1**		2.0	0.75	ng/L		08/02/19 10:31	08/03/19 16:44	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		08/02/19 10:31	08/03/19 16:44	1
Perfluorohexanesulfonic acid (PFHxS)	**1.7**	**J**	2.0	0.87	ng/L		08/02/19 10:31	08/03/19 16:44	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		08/02/19 10:31	08/03/19 16:44	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		08/02/19 10:31	08/03/19 16:44	1
Perfluorobutanesulfonic acid (PFBS)	**1.1**	**J**	2.0	0.92	ng/L		08/02/19 10:31	08/03/19 16:44	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*107*		*25 - 150*	*08/02/19 10:31*	*08/03/19 16:44*	*1*
13C4 PFOS	*110*		*25 - 150*	*08/02/19 10:31*	*08/03/19 16:44*	*1*
18O2 PFHxS	*116*		*25 - 150*	*08/02/19 10:31*	*08/03/19 16:44*	*1*
13C5 PFNA	*106*		*25 - 150*	*08/02/19 10:31*	*08/03/19 16:44*	*1*
13C4 PFHpA	*117*		*25 - 150*	*08/02/19 10:31*	*08/03/19 16:44*	*1*
13C3 PFBS	*105*		*25 - 150*	*08/02/19 10:31*	*08/03/19 16:44*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon Annual

Job ID: 320-52782-1

Client Sample ID: AKNPW-208

Date Collected: 07/25/19 13:27
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-7

Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	23		2.0	0.75	ng/L		08/02/19 10:31	08/03/19 17:03	1
Perfluorooctanesulfonic acid (PFOS)	2.7		2.0	1.3	ng/L		08/02/19 10:31	08/03/19 17:03	1
Perfluorohexanesulfonic acid (PFHxS)	9.7		2.0	0.87	ng/L		08/02/19 10:31	08/03/19 17:03	1
Perfluorononanoic acid (PFNA)	0.93	J	2.0	0.65	ng/L		08/02/19 10:31	08/03/19 17:03	1
Perfluoroheptanoic acid (PFHpA)	3.9		2.0	0.80	ng/L		08/02/19 10:31	08/03/19 17:03	1
Perfluorobutanesulfonic acid (PFBS)	4.3		2.0	0.92	ng/L		08/02/19 10:31	08/03/19 17:03	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*102*		*25 - 150*	*08/02/19 10:31*	*08/03/19 17:03*	*1*
13C4 PFOS	*103*		*25 - 150*	*08/02/19 10:31*	*08/03/19 17:03*	*1*
18O2 PFHxS	*106*		*25 - 150*	*08/02/19 10:31*	*08/03/19 17:03*	*1*
13C5 PFNA	*96*		*25 - 150*	*08/02/19 10:31*	*08/03/19 17:03*	*1*
13C4 PFHpA	*106*		*25 - 150*	*08/02/19 10:31*	*08/03/19 17:03*	*1*
13C3 PFBS	*99*		*25 - 150*	*08/02/19 10:31*	*08/03/19 17:03*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon Annual

Job ID: 320-52782-1

Client Sample ID: AKNPW-005

Date Collected: 07/25/19 12:59
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-8

Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**1.8**	**J**	2.0	0.75	ng/L		08/02/19 10:31	08/03/19 17:40	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		08/02/19 10:31	08/03/19 17:40	1
Perfluorohexanesulfonic acid (PFHxS)	**1.9**	**J**	2.0	0.87	ng/L		08/02/19 10:31	08/03/19 17:40	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		08/02/19 10:31	08/03/19 17:40	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		08/02/19 10:31	08/03/19 17:40	1
Perfluorobutanesulfonic acid (PFBS)	**1.1**	**J**	2.0	0.92	ng/L		08/02/19 10:31	08/03/19 17:40	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*108*		*25 - 150*	*08/02/19 10:31*	*08/03/19 17:40*	*1*
13C4 PFOS	*117*		*25 - 150*	*08/02/19 10:31*	*08/03/19 17:40*	*1*
18O2 PFHxS	*113*		*25 - 150*	*08/02/19 10:31*	*08/03/19 17:40*	*1*
13C5 PFNA	*111*		*25 - 150*	*08/02/19 10:31*	*08/03/19 17:40*	*1*
13C4 PFHpA	*112*		*25 - 150*	*08/02/19 10:31*	*08/03/19 17:40*	*1*
13C3 PFBS	*110*		*25 - 150*	*08/02/19 10:31*	*08/03/19 17:40*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon Annual

Job ID: 320-52782-1

Client Sample ID: AKNPW-007

Date Collected: 07/25/19 16:40
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-9

Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**2.2**		2.0	0.75	ng/L		08/02/19 10:31	08/03/19 17:58	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		08/02/19 10:31	08/03/19 17:58	1
Perfluorohexanesulfonic acid (PFHxS)	**2.4**		2.0	0.87	ng/L		08/02/19 10:31	08/03/19 17:58	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		08/02/19 10:31	08/03/19 17:58	1
Perfluoroheptanoic acid (PFHpA)	**3.1**		2.0	0.80	ng/L		08/02/19 10:31	08/03/19 17:58	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		08/02/19 10:31	08/03/19 17:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*116*		*25 - 150*	*08/02/19 10:31*	*08/03/19 17:58*	*1*
13C4 PFOS	*99*		*25 - 150*	*08/02/19 10:31*	*08/03/19 17:58*	*1*
18O2 PFHxS	*112*		*25 - 150*	*08/02/19 10:31*	*08/03/19 17:58*	*1*
13C5 PFNA	*100*		*25 - 150*	*08/02/19 10:31*	*08/03/19 17:58*	*1*
13C4 PFHpA	*107*		*25 - 150*	*08/02/19 10:31*	*08/03/19 17:58*	*1*
13C3 PFBS	*101*		*25 - 150*	*08/02/19 10:31*	*08/03/19 17:58*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon Annual

Job ID: 320-52782-1

Client Sample ID: AKNPW-008

Date Collected: 07/26/19 09:50
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-10

Matrix: Water

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**2.8**		2.0	0.75	ng/L		08/02/19 10:31	08/03/19 18:17	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		08/02/19 10:31	08/03/19 18:17	1
Perfluorohexanesulfonic acid (PFHxS)	**1.5**	**J**	2.0	0.87	ng/L		08/02/19 10:31	08/03/19 18:17	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		08/02/19 10:31	08/03/19 18:17	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		08/02/19 10:31	08/03/19 18:17	1
Perfluorobutanesulfonic acid (PFBS)	**1.6**	**J**	2.0	0.92	ng/L		08/02/19 10:31	08/03/19 18:17	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*103*		*25 - 150*	*08/02/19 10:31*	*08/03/19 18:17*	*1*
13C4 PFOS	*107*		*25 - 150*	*08/02/19 10:31*	*08/03/19 18:17*	*1*
18O2 PFHxS	*112*		*25 - 150*	*08/02/19 10:31*	*08/03/19 18:17*	*1*
13C5 PFNA	*109*		*25 - 150*	*08/02/19 10:31*	*08/03/19 18:17*	*1*
13C4 PFHpA	*112*		*25 - 150*	*08/02/19 10:31*	*08/03/19 18:17*	*1*
13C3 PFBS	*103*		*25 - 150*	*08/02/19 10:31*	*08/03/19 18:17*	*1*

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: King Salmon Annual

Job ID: 320-52782-1

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Matrix: Water

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFOA (25-150)	PFOS (25-150)	PFHxS (25-150)	PFNA (25-150)	PFHpA (25-150)	3C3-PFBS (25-150)		
320-52782-1	AKNPW-018	112	112	114	112	116	107		
320-52782-2	AKNPW-012	105	111	116	103	114	105		
320-52782-3	AKNPW-011	108	110	109	107	111	101		
320-52782-4	AKNPW-111	110	110	116	111	113	104		
320-52782-5	AKNPW-424	112	110	114	114	116	101		
320-52782-6	AKNPW-422	107	110	116	106	117	105		
320-52782-7	AKNPW-208	102	103	106	96	106	99		
320-52782-8	AKNPW-005	108	117	113	111	112	110		
320-52782-9	AKNPW-007	116	99	112	100	107	101		
320-52782-10	AKNPW-008	103	107	112	109	112	103		
LCS 320-312108/2-A	Lab Control Sample	103	107	110	93	100	103		
LCSD 320-312108/3-A	Lab Control Sample Dup	111	111	113	91	106	109		
MB 320-312108/1-A	Method Blank	103	100	106	99	105	101		

Surrogate Legend

PFOA = 13C4 PFOA
PFOS = 13C4 PFOS
PFHxS = 18O2 PFHxS
PFNA = 13C5 PFNA
PFHpA = 13C4 PFHpA
13C3-PFBS = 13C3 PFBS

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-312108/1-A
Matrix: Water
Analysis Batch: 312271

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 312108

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	ND		2.0	0.75	ng/L		08/02/19 10:31	08/03/19 14:17	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		08/02/19 10:31	08/03/19 14:17	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.87	ng/L		08/02/19 10:31	08/03/19 14:17	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		08/02/19 10:31	08/03/19 14:17	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		08/02/19 10:31	08/03/19 14:17	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		08/02/19 10:31	08/03/19 14:17	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*103*		*25 - 150*	*08/02/19 10:31*	*08/03/19 14:17*	*1*
13C4 PFOS	*100*		*25 - 150*	*08/02/19 10:31*	*08/03/19 14:17*	*1*
18O2 PFHxS	*106*		*25 - 150*	*08/02/19 10:31*	*08/03/19 14:17*	*1*
13C5 PFNA	*99*		*25 - 150*	*08/02/19 10:31*	*08/03/19 14:17*	*1*
13C4 PFHpA	*105*		*25 - 150*	*08/02/19 10:31*	*08/03/19 14:17*	*1*
13C3 PFBS	*101*		*25 - 150*	*08/02/19 10:31*	*08/03/19 14:17*	*1*

Lab Sample ID: LCS 320-312108/2-A
Matrix: Water
Analysis Batch: 312271

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 312108

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanoic acid (PFOA)	20.0	18.1		ng/L		91	70 - 140
Perfluorooctanesulfonic acid (PFOS)	18.6	15.2		ng/L		82	69 - 144
Perfluorohexanesulfonic acid (PFHxS)	18.2	15.3		ng/L		84	73 - 157
Perfluorononanoic acid (PFNA)	20.0	19.1		ng/L		96	73 - 147
Perfluoroheptanoic acid (PFHpA)	20.0	18.6		ng/L		93	71 - 138
Perfluorobutanesulfonic acid (PFBS)	17.7	16.0		ng/L		91	72 - 151

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFOA	*103*		*25 - 150*
13C4 PFOS	*107*		*25 - 150*
18O2 PFHxS	*110*		*25 - 150*
13C5 PFNA	*93*		*25 - 150*
13C4 PFHpA	*100*		*25 - 150*
13C3 PFBS	*103*		*25 - 150*

Lab Sample ID: LCSD 320-312108/3-A
Matrix: Water
Analysis Batch: 312271

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 312108

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	20.0	18.7		ng/L		94	70 - 140	3	30
Perfluorooctanesulfonic acid (PFOS)	18.6	15.6		ng/L		84	69 - 144	2	30
Perfluorohexanesulfonic acid (PFHxS)	18.2	16.6		ng/L		91	73 - 157	8	30
Perfluorononanoic acid (PFNA)	20.0	19.8		ng/L		99	73 - 147	4	30
Perfluoroheptanoic acid (PFHpA)	20.0	18.8		ng/L		94	71 - 138	1	30

Method: WS-LC-0025 At1 - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-312108/3-A
Matrix: Water
Analysis Batch: 312271

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 312108

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanesulfonic acid (PFBS)			17.7	16.0		ng/L		90	72 - 151	0	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C4 PFOA	*111*		*25 - 150*
13C4 PFOS	*111*		*25 - 150*
18O2 PFHxS	*113*		*25 - 150*
13C5 PFNA	*91*		*25 - 150*
13C4 PFHpA	*106*		*25 - 150*
13C3 PFBS	*109*		*25 - 150*

LCMS

Prep Batch: 312108

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-52782-1	AKNPW-018	Total/NA	Water	PFAS Prep	
320-52782-2	AKNPW-012	Total/NA	Water	PFAS Prep	
320-52782-3	AKNPW-011	Total/NA	Water	PFAS Prep	
320-52782-4	AKNPW-111	Total/NA	Water	PFAS Prep	
320-52782-5	AKNPW-424	Total/NA	Water	PFAS Prep	
320-52782-6	AKNPW-422	Total/NA	Water	PFAS Prep	
320-52782-7	AKNPW-208	Total/NA	Water	PFAS Prep	
320-52782-8	AKNPW-005	Total/NA	Water	PFAS Prep	
320-52782-9	AKNPW-007	Total/NA	Water	PFAS Prep	
320-52782-10	AKNPW-008	Total/NA	Water	PFAS Prep	
MB 320-312108/1-A	Method Blank	Total/NA	Water	PFAS Prep	
LCS 320-312108/2-A	Lab Control Sample	Total/NA	Water	PFAS Prep	
LCSD 320-312108/3-A	Lab Control Sample Dup	Total/NA	Water	PFAS Prep	

Analysis Batch: 312271

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-52782-1	AKNPW-018	Total/NA	Water	WS-LC-0025 At1	312108
320-52782-2	AKNPW-012	Total/NA	Water	WS-LC-0025 At1	312108
320-52782-3	AKNPW-011	Total/NA	Water	WS-LC-0025 At1	312108
320-52782-4	AKNPW-111	Total/NA	Water	WS-LC-0025 At1	312108
320-52782-5	AKNPW-424	Total/NA	Water	WS-LC-0025 At1	312108
320-52782-6	AKNPW-422	Total/NA	Water	WS-LC-0025 At1	312108
320-52782-7	AKNPW-208	Total/NA	Water	WS-LC-0025 At1	312108
320-52782-8	AKNPW-005	Total/NA	Water	WS-LC-0025 At1	312108
320-52782-9	AKNPW-007	Total/NA	Water	WS-LC-0025 At1	312108
320-52782-10	AKNPW-008	Total/NA	Water	WS-LC-0025 At1	312108
MB 320-312108/1-A	Method Blank	Total/NA	Water	WS-LC-0025 At1	312108
LCS 320-312108/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025 At1	312108
LCSD 320-312108/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025 At1	312108

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: King Salmon Annual

Job ID: 320-52782-1

Client Sample ID: AKNPW-018
Date Collected: 07/24/19 15:45
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	312108	08/02/19 10:31	RDR	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			312271	08/03/19 15:12	P1N	TAL SAC

Client Sample ID: AKNPW-012
Date Collected: 07/24/19 17:23
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	312108	08/02/19 10:31	RDR	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			312271	08/03/19 15:30	P1N	TAL SAC

Client Sample ID: AKNPW-011
Date Collected: 07/24/19 16:32
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	312108	08/02/19 10:31	RDR	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			312271	08/03/19 15:49	P1N	TAL SAC

Client Sample ID: AKNPW-111
Date Collected: 07/24/19 16:00
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	312108	08/02/19 10:31	RDR	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			312271	08/03/19 16:07	P1N	TAL SAC

Client Sample ID: AKNPW-424
Date Collected: 07/25/19 15:14
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	312108	08/02/19 10:31	RDR	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			312271	08/03/19 16:26	P1N	TAL SAC

Client Sample ID: AKNPW-422
Date Collected: 07/25/19 14:23
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	312108	08/02/19 10:31	RDR	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			312271	08/03/19 16:44	P1N	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: King Salmon Annual

Job ID: 320-52782-1

Client Sample ID: AKNPW-208
Date Collected: 07/25/19 13:27
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	312108	08/02/19 10:31	RDR	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			312271	08/03/19 17:03	P1N	TAL SAC

Client Sample ID: AKNPW-005
Date Collected: 07/25/19 12:59
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	312108	08/02/19 10:31	RDR	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			312271	08/03/19 17:40	P1N	TAL SAC

Client Sample ID: AKNPW-007
Date Collected: 07/25/19 16:40
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	312108	08/02/19 10:31	RDR	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			312271	08/03/19 17:58	P1N	TAL SAC

Client Sample ID: AKNPW-008
Date Collected: 07/26/19 09:50
Date Received: 07/30/19 08:55

Lab Sample ID: 320-52782-10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PFAS Prep			1.00 mL	1.66 mL	312108	08/02/19 10:31	RDR	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1			312271	08/03/19 18:17	P1N	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: King Salmon Annual

Job ID: 320-52782-1

Laboratory: Eurofins TestAmerica, Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	01-20-21
ANAB	Dept. of Defense ELAP	L2468	09-04-19
ANAB	Dept. of Energy	L2468.01	01-20-21
ANAB	ISO/IEC 17025	L2468	01-20-21
Arkansas DEQ	State	19-042-0	06-17-20
California	State	2897	01-31-20
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-20
Georgia	State	4040	01-29-20
Hawaii	State	<cert No.>	01-29-20
Illinois	NELAP	200060	03-17-20
Kansas	NELAP	E-10375	10-31-19
Louisiana	NELAP	01944	06-30-20
Maine	State	2018009	04-14-20
Michigan	State	9947	01-29-20
Michigan	State Program	9947	01-31-20
Nevada	State	CA000442020-1	07-31-20
New Hampshire	NELAP	2997	04-18-20
New York	NELAP	11666	04-01-20
Oregon	NELAP	4040	01-29-20
Pennsylvania	NELAP	68-01272	09-05-19
Texas	NELAP	T104704399-19-13	05-31-20
US Fish & Wildlife	US Federal Programs	58448	07-31-20
USDA	US Federal Programs	P330-18-00239	07-31-21
USEPA UCMR	Federal	CA00044	12-31-20
Utah	NELAP	CA000442019-01	02-29-20
Vermont	State	VT-4040	04-16-20
Virginia	NELAP	460278	03-14-20
Washington	State	C581	05-05-20
West Virginia (DW)	State	9930C	12-31-19
Wyoming	State Program	8TMS-L	01-28-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: King Salmon Annual

Job ID: 320-52782-1

Method	Method Description	Protocol	Laboratory
WS-LC-0025 At1	Fluorinated Alkyl Substances	TAL-SAC	TAL SAC
PFAS Prep	Preparation, Direct Inject PFAS	TAL-SAC	TAL SAC

Protocol References:

TAL-SAC = TestAmerica Laboratories, West Sacramento, Facility Standard Operating Procedure.

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: King Salmon Annual

Job ID: 320-52782-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-52782-1	AKNPW-018	Water	07/24/19 15:45	07/30/19 08:55	
320-52782-2	AKNPW-012	Water	07/24/19 17:23	07/30/19 08:55	
320-52782-3	AKNPW-011	Water	07/24/19 16:32	07/30/19 08:55	
320-52782-4	AKNPW-111	Water	07/24/19 16:00	07/30/19 08:55	
320-52782-5	AKNPW-424	Water	07/25/19 15:14	07/30/19 08:55	
320-52782-6	AKNPW-422	Water	07/25/19 14:23	07/30/19 08:55	
320-52782-7	AKNPW-208	Water	07/25/19 13:27	07/30/19 08:55	
320-52782-8	AKNPW-005	Water	07/25/19 12:59	07/30/19 08:55	
320-52782-9	AKNPW-007	Water	07/25/19 16:40	07/30/19 08:55	
320-52782-10	AKNPW-008	Water	07/26/19 09:50	07/30/19 08:55	

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	PFOS/PFOA (537)	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
AKNPW-018		1545	7/24/19	X	2	GW
AKNPW-012		1723		X	2	GW
AKNPW-011		1632		X	2	GW
AKNPW-111		1600		X	2	GW
AKNPW-424		1514	7/25/19	X	2	GW
AKNPW-422		1423		X	2	GW
AKNPW-208		1327		X	2	GW
AKNPW-005		1259		X	2	GW
AKNPW-007		1640		X	2	GW
AKNPW-008		950	7/26/19	X	2	GW

320-52782 Chain of Custody

Project Information		Sample Receipt	
Number:	102582-003	Total No. of Containers:	20
Name:	King Salmon Annual	COC Seals/Intact? Y/N/NA	
Contact:	KRF	Received Good Cond./Cold	
Ongoing Project?	Yes [X] No [ ]	Temp:	
Sampler:	KRF	Delivery Method:	Goldstreak

Notes:
please log with 10-year data hold

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 1016	Signature: Time:	Signature: Time:
Printed Name: A. Masters Date: 7/29/19	Printed Name: Date:	Printed Name: Date:
Company: Shannon+Wilson Inc	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Time: 0955	Signature: Time:	Signature: Time:
Printed Name: Jennifer Darlington Date: 30 JUL 19	Printed Name: Date:	Printed Name: Date:
Company: ETAW SAC 4.1°C	Company:	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

No. 36025

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-52782-1

Login Number: 52782
List Number: 1
Creator: Thompson, Sarah W

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	job # 102582
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.	True	
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.	True	
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.	N/A	
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.	N/A	

Laboratory Data Review Checklist

Completed By:

Brittany Blood

Title:

Environmental Professional I

Date:

November 26, 2019

CS Report Name:

King Salmon DOT&PF PFAS

Report Date:

November 6, 2019

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

TestAmerica Laboratories, Inc.

Laboratory Report Number:

320-52782-1

ADEC File Number:

2569.38.033

Hazard Identification Number:

26981

320-52782-1

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   (●) Yes ( ) No Comments:

The ADEC certified the TestAmerica Laboratories West Sacramento, CA location for the analysis of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) on February 6, 2018. These compounds were included in the ADEC's Contaminated Sites Laboratory Approval 17-020.

   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 Comments:

Analyses were performed by TestAmerica Laboratories, Inc. in West Sacramento, CA.

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   (●) Yes ( ) No Comments:

   b. Correct Analyses requested?

   (●) Yes ( ) No Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   (●) Yes ( ) No Comments:

The temperature blank was measured within the acceptable temperature range of 0° C to 6° C upon receipt at the laboratory.

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   (●) Yes ( ) No Comments:

Analysis of PFAS compounds does not require chemical preservation.

   c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

   (●) Yes ( ) No Comments:

The sample receipt form notes that the samples were received in good condition.

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 Comments:

There were no discrepancies noted in the sample receipt documentation.

e. Data quality or usability affected?

Comments:

The data quality and/or usability was not affected; see above.

4. Case Narrative

a. Present and understandable?

◉ Yes ○ No Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

◉ Yes ○ No Comments:

The samples arrived in good condition and properly preserved. The temperature of the sample cooler received with this shipment was 4.6 º C upon arrival at the laboratory.

The case narrative notes that there was insufficient sample volume available to perform a matrix spike (MS) and MS duplicate (MSD) in conjunction with preparation batches 320-312108.

c. Were all corrective actions documented?

○ Yes ◉ No Comments:

No corrective actions were documented in the case narrative.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The case narrative does not note an effect on data quality.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

◉ Yes ○ No Comments:

b. All applicable holding times met?

(●) Yes ( ) No Comments:

The laboratory indicates that the water samples were analyzed using direct injection and in-line analysis. The 28-day hold time for analysis using direct aqueous injection (DAI) was met for all samples.

c. All soils reported on a dry weight basis?

( ) Yes (●) No Comments:

N/A; soil samples were not submitted with this work order.

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

(●) Yes ( ) No Comments:

The LOQ, equivalent to the TestAmerica Reporting Limit (RL), is less than the applicable ADEC regulatory limits for drinking water and soil.

e. Data quality or usability affected?

( ) Yes (●) No Comments:

The data quality and/or usability are not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

(●) Yes ( ) No Comments:

ii. All method blank results less than limit of quantitation (LOQ)?

(●) Yes ( ) No Comments:

iii. If above LOQ, what samples are affected?

Comments:

None; PFAS compounds were not detected in the method blank samples.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

( ) Yes (●) No Comments:

No samples are affected; therefore, qualification of the results was not required.

v. Data quality or usability affected?

Comments:

The data quality and/or usability are not affected.

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 Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

( ) Yes (●) No Comments:

N/A; metals and/or inorganics were not analyzed as part of this work order.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

(●) Yes ( ) No Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

(●) Yes ( ) No Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

None; analytical accuracy and precision were demonstrated to be within acceptable limits.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

( ) Yes (●) No Comments:

Qualification of the data was not required; see above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or usability are not affected.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

(•) Yes ( ) No Comments:

The analytical method WS-LC-0025 uses IDA recovery, which entails adding a 13C-isotope of each target analyte, and assessing the recovery of each analyte. The isotopically-labeled compounds are discussed as surrogates for this method.

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

(•) Yes ( ) No Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

( ) Yes (•) No Comments:

N/A; there were no IDA recovery failures associated with this work order.

iv. Data quality or usability affected?

Comments:

The data quality and usability are not affected; see above.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples?
(If not, enter explanation below.)

( ) Yes (•) No Comments:

PFAS are not volatile compounds; therefore, a trip blank is not required.

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 Comments:

N/A; a trip blank is not required.

iii. All results less than LOQ?

○ Yes ◉ No Comments:

N/A; a trip blank is not required.

iv. If above LOQ, what samples are affected?

Comments:

None; a trip blank was not submitted with this work order.

v. Data quality or usability affected?

Comments:

The data quality and/or usability are not affected; see above.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

◉ Yes ○ No Comments:

ii. Submitted blind to lab?

◉ Yes ○ No Comments:

The field duplicate pair *AKNPW-011* / *AKNPW-111* was submitted with this work order.

iii. Precision – All relative percent differences (RPD) less than specified DQOs?
(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 Comments:

The relative precision demonstrated between the detected PFAS results of the field duplicate samples was within the recommended DQO of 30% for all analytes.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The data quality and/or usability is not affected; see above.

f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below).

○ Yes ○ No ◉ Not Applicable

Samples for this project are not collected with reusable equipment, therefore a practical potential for equipment based cross-contamination does not exist.

i. All results less than LOQ?

◉ Yes ○ No Comments:

N/A; an equipment blank was not submitted with this work order.

ii. If above LOQ, what samples are affected?

Comments:

None; see above.

iii. Data quality or usability affected?

Comments:

The data quality and usability were not affected; see above.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

○ Yes ◉ No Comments:

There were no additional flags/qualifiers required for this work order.

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

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

Laboratory Job ID: 320-55873-1
Client Project/Site: KingSalmonP

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

Attn: Kristen Freiburger

Authorized for release by:
11/15/2019 1:16:10 PM

David Alltucker, Project Manager I
(916)374-4383
david.alltucker@testamericainc.com

Table of Contents

Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: KingSalmonP

Job ID: 320-55873-1

Qualifiers

LCMS

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.

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
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)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
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)

Case Narrative

Client: Shannon & Wilson, Inc
Project/Site: KingSalmonP

Job ID: 320-55873-1

Job ID: 320-55873-1

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

Job Narrative
320-55873-1

Receipt
The samples were received on 10/31/2019 12:20 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.3º C.

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

Organic Prep
Method 537.1 DW: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-337675.

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: KingSalmonP

Job ID: 320-55873-1

Client Sample ID: AKNPW-003 — Lab Sample ID: 320-55873-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.13		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.018		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	0.085		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.058		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.10		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.0020		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	0.00046	J	0.0017	0.00043	ug/L	1		537.1 DW	Total/NA

Client Sample ID: AKNPW-007 — Lab Sample ID: 320-55873-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.0032		0.0016	0.00041	ug/L	1		537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.0033		0.0016	0.00041	ug/L	1		537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	0.0025		0.0016	0.00041	ug/L	1		537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.00086	J	0.0016	0.00041	ug/L	1		537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.0024		0.0016	0.00041	ug/L	1		537.1 DW	Total/NA

Client Sample ID: AKNPW-008 — Lab Sample ID: 320-55873-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.0035		0.0018	0.00046	ug/L	1		537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.00064	J	0.0018	0.00046	ug/L	1		537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	0.0026		0.0018	0.00046	ug/L	1		537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.0013	J	0.0018	0.00046	ug/L	1		537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.0014	J	0.0018	0.00046	ug/L	1		537.1 DW	Total/NA
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	0.00083	J	0.0018	0.00046	ug/L	1		537.1 DW	Total/NA

Client Sample ID: AKNPW-011 — Lab Sample ID: 320-55873-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.0036		0.0017	0.00042	ug/L	1		537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.00070	J	0.0017	0.00042	ug/L	1		537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	0.0042		0.0017	0.00042	ug/L	1		537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.00054	J	0.0017	0.00042	ug/L	1		537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.0017		0.0017	0.00042	ug/L	1		537.1 DW	Total/NA

Client Sample ID: AKNPW-012 — Lab Sample ID: 320-55873-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.011		0.0016	0.00041	ug/L	1		537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.0026		0.0016	0.00041	ug/L	1		537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	0.016		0.0016	0.00041	ug/L	1		537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.0020		0.0016	0.00041	ug/L	1		537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.0080		0.0016	0.00041	ug/L	1		537.1 DW	Total/NA
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.00055	J	0.0016	0.00041	ug/L	1		537.1 DW	Total/NA

Client Sample ID: AKNPW-103 — Lab Sample ID: 320-55873-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.13		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.019		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

Client Sample ID: AKNPW-103 (Continued)

Lab Sample ID: 320-55873-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.083		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.058		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.098		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.0019		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: AKNPW-003

Date Collected: 10/29/19 10:38
Date Received: 10/31/19 12:20

Lab Sample ID: 320-55873-1

Matrix: Water

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.13**		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 09:17	1
Perfluoroheptanoic acid (PFHpA)	**0.018**		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 09:17	1
Perfluorooctanoic acid (PFOA)	**0.085**		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 09:17	1
Perfluorononanoic acid (PFNA)	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 09:17	1
Perfluorodecanoic acid (PFDA)	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 09:17	1
Perfluoroundecanoic acid (PFUnA)	ND		0.0017	0.00044	ug/L		11/11/19 14:00	11/14/19 09:17	1
Perfluorododecanoic acid (PFDoA)	ND		0.0017	0.00053	ug/L		11/11/19 14:00	11/14/19 09:17	1
Perfluorotridecanoic acid (PFTriA)	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 09:17	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 09:17	1
Perfluorobutanesulfonic acid (PFBS)	**0.058**		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 09:17	1
Perfluorohexanesulfonic acid (PFHxS)	**0.10**		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 09:17	1
Perfluorooctanesulfonic acid (PFOS)	**0.0020**		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 09:17	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 09:17	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 09:17	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 09:17	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 09:17	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	**0.00046**	**J**	0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 09:17	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 09:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*98*		*70 - 130*	*11/11/19 14:00*	*11/14/19 09:17*	*1*
13C2 PFDA	*109*		*70 - 130*	*11/11/19 14:00*	*11/14/19 09:17*	*1*
d5-NEtFOSAA	*101*		*70 - 130*	*11/11/19 14:00*	*11/14/19 09:17*	*1*
13C3 HFPO-DA	*80*		*70 - 130*	*11/11/19 14:00*	*11/14/19 09:17*	*1*

Client: Shannon & Wilson, Inc
Project/Site: KingSalmonP

Job ID: 320-55873-1

Client Sample ID: AKNPW-007

Date Collected: 10/29/19 14:37
Date Received: 10/31/19 12:20

Lab Sample ID: 320-55873-2

Matrix: Water

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.0032**		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 09:25	1
Perfluoroheptanoic acid (PFHpA)	**0.0033**		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 09:25	1
Perfluorooctanoic acid (PFOA)	**0.0025**		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 09:25	1
Perfluorononanoic acid (PFNA)	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 09:25	1
Perfluorodecanoic acid (PFDA)	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 09:25	1
Perfluoroundecanoic acid (PFUnA)	ND		0.0016	0.00042	ug/L		11/11/19 14:00	11/14/19 09:25	1
Perfluorododecanoic acid (PFDoA)	ND		0.0016	0.00051	ug/L		11/11/19 14:00	11/14/19 09:25	1
Perfluorotridecanoic acid (PFTriA)	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 09:25	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 09:25	1
Perfluorobutanesulfonic acid (PFBS)	**0.00086**	**J**	0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 09:25	1
Perfluorohexanesulfonic acid (PFHxS)	**0.0024**		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 09:25	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 09:25	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 09:25	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 09:25	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 09:25	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 09:25	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 09:25	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 09:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*104*		*70 - 130*	*11/11/19 14:00*	*11/14/19 09:25*	*1*
13C2 PFDA	*102*		*70 - 130*	*11/11/19 14:00*	*11/14/19 09:25*	*1*
d5-NEtFOSAA	*91*		*70 - 130*	*11/11/19 14:00*	*11/14/19 09:25*	*1*
13C3 HFPO-DA	*81*		*70 - 130*	*11/11/19 14:00*	*11/14/19 09:25*	*1*

Client: Shannon & Wilson, Inc
Project/Site: KingSalmonP

Job ID: 320-55873-1

Client Sample ID: AKNPW-008

Date Collected: 10/29/19 13:30
Date Received: 10/31/19 12:20

Lab Sample ID: 320-55873-3

Matrix: Water

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.0035**		0.0018	0.00046	ug/L		11/11/19 14:00	11/14/19 09:33	1
Perfluoroheptanoic acid (PFHpA)	**0.00064**	**J**	0.0018	0.00046	ug/L		11/11/19 14:00	11/14/19 09:33	1
Perfluorooctanoic acid (PFOA)	**0.0026**		0.0018	0.00046	ug/L		11/11/19 14:00	11/14/19 09:33	1
Perfluorononanoic acid (PFNA)	ND		0.0018	0.00046	ug/L		11/11/19 14:00	11/14/19 09:33	1
Perfluorodecanoic acid (PFDA)	ND		0.0018	0.00046	ug/L		11/11/19 14:00	11/14/19 09:33	1
Perfluoroundecanoic acid (PFUnA)	ND		0.0018	0.00047	ug/L		11/11/19 14:00	11/14/19 09:33	1
Perfluorododecanoic acid (PFDoA)	ND		0.0018	0.00057	ug/L		11/11/19 14:00	11/14/19 09:33	1
Perfluorotridecanoic acid (PFTriA)	ND		0.0018	0.00046	ug/L		11/11/19 14:00	11/14/19 09:33	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.0018	0.00046	ug/L		11/11/19 14:00	11/14/19 09:33	1
Perfluorobutanesulfonic acid (PFBS)	**0.0013**	**J**	0.0018	0.00046	ug/L		11/11/19 14:00	11/14/19 09:33	1
Perfluorohexanesulfonic acid (PFHxS)	**0.0014**	**J**	0.0018	0.00046	ug/L		11/11/19 14:00	11/14/19 09:33	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.0018	0.00046	ug/L		11/11/19 14:00	11/14/19 09:33	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.0018	0.00046	ug/L		11/11/19 14:00	11/14/19 09:33	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.0018	0.00046	ug/L		11/11/19 14:00	11/14/19 09:33	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	**0.00083**	**J**	0.0018	0.00046	ug/L		11/11/19 14:00	11/14/19 09:33	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		0.0018	0.00046	ug/L		11/11/19 14:00	11/14/19 09:33	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.0018	0.00046	ug/L		11/11/19 14:00	11/14/19 09:33	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.0018	0.00046	ug/L		11/11/19 14:00	11/14/19 09:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*103*		*70 - 130*	*11/11/19 14:00*	*11/14/19 09:33*	*1*
13C2 PFDA	*104*		*70 - 130*	*11/11/19 14:00*	*11/14/19 09:33*	*1*
d5-NEtFOSAA	*108*		*70 - 130*	*11/11/19 14:00*	*11/14/19 09:33*	*1*
13C3 HFPO-DA	*89*		*70 - 130*	*11/11/19 14:00*	*11/14/19 09:33*	*1*

Client: Shannon & Wilson, Inc
Project/Site: KingSalmonP

Job ID: 320-55873-1

Client Sample ID: AKNPW-011

Date Collected: 10/29/19 15:42
Date Received: 10/31/19 12:20

Lab Sample ID: 320-55873-4

Matrix: Water

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.0036**		0.0017	0.00042	ug/L		11/11/19 14:00	11/14/19 09:41	1
Perfluoroheptanoic acid (PFHpA)	**0.00070**	**J**	0.0017	0.00042	ug/L		11/11/19 14:00	11/14/19 09:41	1
Perfluorooctanoic acid (PFOA)	**0.0042**		0.0017	0.00042	ug/L		11/11/19 14:00	11/14/19 09:41	1
Perfluorononanoic acid (PFNA)	ND		0.0017	0.00042	ug/L		11/11/19 14:00	11/14/19 09:41	1
Perfluorodecanoic acid (PFDA)	ND		0.0017	0.00042	ug/L		11/11/19 14:00	11/14/19 09:41	1
Perfluoroundecanoic acid (PFUnA)	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 09:41	1
Perfluorododecanoic acid (PFDoA)	ND		0.0017	0.00052	ug/L		11/11/19 14:00	11/14/19 09:41	1
Perfluorotridecanoic acid (PFTriA)	ND		0.0017	0.00042	ug/L		11/11/19 14:00	11/14/19 09:41	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.0017	0.00042	ug/L		11/11/19 14:00	11/14/19 09:41	1
Perfluorobutanesulfonic acid (PFBS)	**0.00054**	**J**	0.0017	0.00042	ug/L		11/11/19 14:00	11/14/19 09:41	1
Perfluorohexanesulfonic acid (PFHxS)	**0.0017**		0.0017	0.00042	ug/L		11/11/19 14:00	11/14/19 09:41	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.0017	0.00042	ug/L		11/11/19 14:00	11/14/19 09:41	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.0017	0.00042	ug/L		11/11/19 14:00	11/14/19 09:41	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.0017	0.00042	ug/L		11/11/19 14:00	11/14/19 09:41	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		0.0017	0.00042	ug/L		11/11/19 14:00	11/14/19 09:41	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		0.0017	0.00042	ug/L		11/11/19 14:00	11/14/19 09:41	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.0017	0.00042	ug/L		11/11/19 14:00	11/14/19 09:41	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.0017	0.00042	ug/L		11/11/19 14:00	11/14/19 09:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*101*		*70 - 130*	*11/11/19 14:00*	*11/14/19 09:41*	*1*
13C2 PFDA	*107*		*70 - 130*	*11/11/19 14:00*	*11/14/19 09:41*	*1*
d5-NEtFOSAA	*98*		*70 - 130*	*11/11/19 14:00*	*11/14/19 09:41*	*1*
13C3 HFPO-DA	*74*		*70 - 130*	*11/11/19 14:00*	*11/14/19 09:41*	*1*

Client: Shannon & Wilson, Inc
Project/Site: KingSalmonP

Job ID: 320-55873-1

Client Sample ID: AKNPW-012

Date Collected: 10/29/19 17:05
Date Received: 10/31/19 12:20

Lab Sample ID: 320-55873-5

Matrix: Water

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.011**		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 10:13	1
Perfluoroheptanoic acid (PFHpA)	**0.0026**		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 10:13	1
Perfluorooctanoic acid (PFOA)	**0.016**		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 10:13	1
Perfluorononanoic acid (PFNA)	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 10:13	1
Perfluorodecanoic acid (PFDA)	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 10:13	1
Perfluoroundecanoic acid (PFUnA)	ND		0.0016	0.00042	ug/L		11/11/19 14:00	11/14/19 10:13	1
Perfluorododecanoic acid (PFDoA)	ND		0.0016	0.00051	ug/L		11/11/19 14:00	11/14/19 10:13	1
Perfluorotridecanoic acid (PFTriA)	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 10:13	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 10:13	1
Perfluorobutanesulfonic acid (PFBS)	**0.0020**		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 10:13	1
Perfluorohexanesulfonic acid (PFHxS)	**0.0080**		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 10:13	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 10:13	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	**0.00055**	**J**	0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 10:13	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 10:13	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 10:13	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 10:13	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 10:13	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.0016	0.00041	ug/L		11/11/19 14:00	11/14/19 10:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*106*		*70 - 130*	*11/11/19 14:00*	*11/14/19 10:13*	*1*
13C2 PFDA	*109*		*70 - 130*	*11/11/19 14:00*	*11/14/19 10:13*	*1*
d5-NEtFOSAA	*100*		*70 - 130*	*11/11/19 14:00*	*11/14/19 10:13*	*1*
13C3 HFPO-DA	*91*		*70 - 130*	*11/11/19 14:00*	*11/14/19 10:13*	*1*

Client: Shannon & Wilson, Inc
Project/Site: KingSalmonP

Job ID: 320-55873-1

Client Sample ID: AKNPW-103

Date Collected: 10/29/19 10:58
Date Received: 10/31/19 12:20

Lab Sample ID: 320-55873-6

Matrix: Water

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.13**		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 10:21	1
Perfluoroheptanoic acid (PFHpA)	**0.019**		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 10:21	1
Perfluorooctanoic acid (PFOA)	**0.083**		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 10:21	1
Perfluorononanoic acid (PFNA)	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 10:21	1
Perfluorodecanoic acid (PFDA)	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 10:21	1
Perfluoroundecanoic acid (PFUnA)	ND		0.0017	0.00044	ug/L		11/11/19 14:00	11/14/19 10:21	1
Perfluorododecanoic acid (PFDoA)	ND		0.0017	0.00053	ug/L		11/11/19 14:00	11/14/19 10:21	1
Perfluorotridecanoic acid (PFTriA)	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 10:21	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 10:21	1
Perfluorobutanesulfonic acid (PFBS)	**0.058**		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 10:21	1
Perfluorohexanesulfonic acid (PFHxS)	**0.098**		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 10:21	1
Perfluorooctanesulfonic acid (PFOS)	**0.0019**		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 10:21	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 10:21	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 10:21	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 10:21	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 10:21	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 10:21	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.0017	0.00043	ug/L		11/11/19 14:00	11/14/19 10:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*102*		*70 - 130*	*11/11/19 14:00*	*11/14/19 10:21*	*1*
13C2 PFDA	*100*		*70 - 130*	*11/11/19 14:00*	*11/14/19 10:21*	*1*
d5-NEtFOSAA	*90*		*70 - 130*	*11/11/19 14:00*	*11/14/19 10:21*	*1*
13C3 HFPO-DA	*88*		*70 - 130*	*11/11/19 14:00*	*11/14/19 10:21*	*1*

Surrogate Summary

Client: Shannon & Wilson, Inc
Project/Site: KingSalmonP

Job ID: 320-55873-1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	PFHxA (70-130)	PFDA (70-130)	-NEtFOS/ (70-130)	HFPODA (70-130)
320-55873-1	AKNPW-003	98	109	101	80
320-55873-2	AKNPW-007	104	102	91	81
320-55873-3	AKNPW-008	103	104	108	89
320-55873-4	AKNPW-011	101	107	98	74
320-55873-5	AKNPW-012	106	109	100	91
320-55873-6	AKNPW-103	102	100	90	88
LLCS 320-337675/2-A	Lab Control Sample	109	108	98	80
LLCSD 320-337675/3-A	Lab Control Sample Dup	88	107	103	73
MB 320-337675/1-A	Method Blank	94	106	109	89

Surrogate Legend

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA
d5-NEtFOSAA = d5-NEtFOSAA
HFPODA = 13C3 HFPO-DA

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Lab Sample ID: MB 320-337675/1-A
Matrix: Water
Analysis Batch: 338388

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 337675

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.0020	0.00050	ug/L		11/11/19 14:00	11/14/19 08:37	1
Perfluoroheptanoic acid (PFHpA)	ND		0.0020	0.00050	ug/L		11/11/19 14:00	11/14/19 08:37	1
Perfluorooctanoic acid (PFOA)	ND		0.0020	0.00050	ug/L		11/11/19 14:00	11/14/19 08:37	1
Perfluorononanoic acid (PFNA)	ND		0.0020	0.00050	ug/L		11/11/19 14:00	11/14/19 08:37	1
Perfluorodecanoic acid (PFDA)	ND		0.0020	0.00050	ug/L		11/11/19 14:00	11/14/19 08:37	1
Perfluoroundecanoic acid (PFUnA)	ND		0.0020	0.00051	ug/L		11/11/19 14:00	11/14/19 08:37	1
Perfluorododecanoic acid (PFDoA)	ND		0.0020	0.00062	ug/L		11/11/19 14:00	11/14/19 08:37	1
Perfluorotridecanoic acid (PFTriA)	ND		0.0020	0.00050	ug/L		11/11/19 14:00	11/14/19 08:37	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.0020	0.00050	ug/L		11/11/19 14:00	11/14/19 08:37	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.0020	0.00050	ug/L		11/11/19 14:00	11/14/19 08:37	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.0020	0.00050	ug/L		11/11/19 14:00	11/14/19 08:37	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.0020	0.00050	ug/L		11/11/19 14:00	11/14/19 08:37	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.0020	0.00050	ug/L		11/11/19 14:00	11/14/19 08:37	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.0020	0.00050	ug/L		11/11/19 14:00	11/14/19 08:37	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		0.0020	0.00050	ug/L		11/11/19 14:00	11/14/19 08:37	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		0.0020	0.00050	ug/L		11/11/19 14:00	11/14/19 08:37	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.0020	0.00050	ug/L		11/11/19 14:00	11/14/19 08:37	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.0020	0.00050	ug/L		11/11/19 14:00	11/14/19 08:37	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*94*		*70 - 130*	*11/11/19 14:00*	*11/14/19 08:37*	*1*
13C2 PFDA	*106*		*70 - 130*	*11/11/19 14:00*	*11/14/19 08:37*	*1*
d5-NEtFOSAA	*109*		*70 - 130*	*11/11/19 14:00*	*11/14/19 08:37*	*1*
13C3 HFPO-DA	*89*		*70 - 130*	*11/11/19 14:00*	*11/14/19 08:37*	*1*

Lab Sample ID: LLCS 320-337675/2-A
Matrix: Water
Analysis Batch: 338390

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 337675

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	0.00400	0.00397		ug/L		99	50 - 150
Perfluoroheptanoic acid (PFHpA)	0.00400	0.00420		ug/L		105	50 - 150
Perfluorooctanoic acid (PFOA)	0.00400	0.00424		ug/L		106	50 - 150
Perfluorononanoic acid (PFNA)	0.00401	0.00406		ug/L		101	50 - 150
Perfluorodecanoic acid (PFDA)	0.00400	0.00402		ug/L		101	50 - 150
Perfluoroundecanoic acid (PFUnA)	0.00400	0.00388		ug/L		97	50 - 150
Perfluorododecanoic acid (PFDoA)	0.00402	0.00371		ug/L		92	50 - 150
Perfluorotridecanoic acid (PFTriA)	0.00400	0.00386		ug/L		96	50 - 150
Perfluorotetradecanoic acid (PFTeA)	0.00400	0.00375		ug/L		94	50 - 150
Perfluorobutanesulfonic acid (PFBS)	0.00354	0.00329		ug/L		93	50 - 150

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: LLCS 320-337675/2-A
Matrix: Water
Analysis Batch: 338390

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 337675

Analyte			Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Perfluorohexanesulfonic acid (PFHxS)			0.00364	0.00378		ug/L		104	50 - 150		
Perfluorooctanesulfonic acid (PFOS)			0.00371	0.00364		ug/L		98	50 - 150		
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)			0.00400	0.00357		ug/L		89	50 - 150		
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)			0.00400	0.00382		ug/L		96	50 - 150		
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O			0.00373	0.00334		ug/L		90	50 - 150		
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF			0.00377	0.00325		ug/L		86	50 - 150		
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)			0.00400	0.00409		ug/L		102	50 - 150		
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)			0.00377	0.00415		ug/L		110	50 - 150		

Surrogate	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
13C2 PFHxA	*109*		*70 - 130*
13C2 PFDA	*108*		*70 - 130*
d5-NEtFOSAA	*98*		*70 - 130*
13C3 HFPO-DA	*80*		*70 - 130*

Lab Sample ID: LLCSD 320-337675/3-A
Matrix: Water
Analysis Batch: 338390

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 337675

Analyte			Spike Added	LLCSD Result	LLCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)			0.00400	0.00318		ug/L		80	50 - 150	22	50
Perfluoroheptanoic acid (PFHpA)			0.00400	0.00386		ug/L		97	50 - 150	8	50
Perfluorooctanoic acid (PFOA)			0.00400	0.00431		ug/L		108	50 - 150	2	50
Perfluorononanoic acid (PFNA)			0.00401	0.00390		ug/L		97	50 - 150	4	50
Perfluorodecanoic acid (PFDA)			0.00400	0.00390		ug/L		97	50 - 150	3	50
Perfluoroundecanoic acid (PFUnA)			0.00400	0.00385		ug/L		96	50 - 150	0.7	50
Perfluorododecanoic acid (PFDoA)			0.00402	0.00399		ug/L		99	50 - 150	7	50
Perfluorotridecanoic acid (PFTriA)			0.00400	0.00393		ug/L		98	50 - 150	2	50
Perfluorotetradecanoic acid (PFTeA)			0.00400	0.00392		ug/L		98	50 - 150	4	50
Perfluorobutanesulfonic acid (PFBS)			0.00354	0.00228		ug/L		64	50 - 150	36	50
Perfluorohexanesulfonic acid (PFHxS)			0.00364	0.00353		ug/L		97	50 - 150	7	50
Perfluorooctanesulfonic acid (PFOS)			0.00371	0.00358		ug/L		96	50 - 150	2	50
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)			0.00400	0.00377		ug/L		94	50 - 150	6	50
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)			0.00400	0.00387		ug/L		97	50 - 150	1	50
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O			0.00373	0.00333		ug/L		89	50 - 150	0.2	50

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: LLCSD 320-337675/3-A
Matrix: Water
Analysis Batch: 338390

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 337675

Analyte			Spike Added	LLCSD Result	LLCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF			0.00377	0.00340		ug/L		90	50 - 150	4	50
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)			0.00400	0.00326		ug/L		81	50 - 150	23	50
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)			0.00377	0.00388		ug/L		103	50 - 150	7	50

Surrogate	*LLCSD %Recovery*	*LLCSD Qualifier*	*Limits*
13C2 PFHxA	*88*		*70 - 130*
13C2 PFDA	*107*		*70 - 130*
d5-NEtFOSAA	*103*		*70 - 130*
13C3 HFPO-DA	*73*		*70 - 130*

QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: KingSalmonP

Job ID: 320-55873-1

LCMS

Prep Batch: 337675

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-55873-1	AKNPW-003	Total/NA	Water	537.1 DW	
320-55873-2	AKNPW-007	Total/NA	Water	537.1 DW	
320-55873-3	AKNPW-008	Total/NA	Water	537.1 DW	
320-55873-4	AKNPW-011	Total/NA	Water	537.1 DW	
320-55873-5	AKNPW-012	Total/NA	Water	537.1 DW	
320-55873-6	AKNPW-103	Total/NA	Water	537.1 DW	
MB 320-337675/1-A	Method Blank	Total/NA	Water	537.1 DW	
LLCS 320-337675/2-A	Lab Control Sample	Total/NA	Water	537.1 DW	
LLCSD 320-337675/3-A	Lab Control Sample Dup	Total/NA	Water	537.1 DW	

Analysis Batch: 338388

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-55873-1	AKNPW-003	Total/NA	Water	537.1 DW	337675
320-55873-2	AKNPW-007	Total/NA	Water	537.1 DW	337675
320-55873-3	AKNPW-008	Total/NA	Water	537.1 DW	337675
320-55873-4	AKNPW-011	Total/NA	Water	537.1 DW	337675
MB 320-337675/1-A	Method Blank	Total/NA	Water	537.1 DW	337675

Analysis Batch: 338390

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-55873-5	AKNPW-012	Total/NA	Water	537.1 DW	337675
320-55873-6	AKNPW-103	Total/NA	Water	537.1 DW	337675
LLCS 320-337675/2-A	Lab Control Sample	Total/NA	Water	537.1 DW	337675
LLCSD 320-337675/3-A	Lab Control Sample Dup	Total/NA	Water	537.1 DW	337675

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: KingSalmonP

Job ID: 320-55873-1

Client Sample ID: AKNPW-003
Date Collected: 10/29/19 10:38
Date Received: 10/31/19 12:20

Lab Sample ID: 320-55873-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			291.8 mL	10.00 mL	337675	11/11/19 14:00	DTH	TAL SAC
Total/NA	Analysis	537.1 DW		1			338388	11/14/19 09:17	JRB	TAL SAC

Client Sample ID: AKNPW-007
Date Collected: 10/29/19 14:37
Date Received: 10/31/19 12:20

Lab Sample ID: 320-55873-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			305.3 mL	10.00 mL	337675	11/11/19 14:00	DTH	TAL SAC
Total/NA	Analysis	537.1 DW		1			338388	11/14/19 09:25	JRB	TAL SAC

Client Sample ID: AKNPW-008
Date Collected: 10/29/19 13:30
Date Received: 10/31/19 12:20

Lab Sample ID: 320-55873-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			274.1 mL	10.00 mL	337675	11/11/19 14:00	DTH	TAL SAC
Total/NA	Analysis	537.1 DW		1			338388	11/14/19 09:33	JRB	TAL SAC

Client Sample ID: AKNPW-011
Date Collected: 10/29/19 15:42
Date Received: 10/31/19 12:20

Lab Sample ID: 320-55873-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			295.8 mL	10.00 mL	337675	11/11/19 14:00	DTH	TAL SAC
Total/NA	Analysis	537.1 DW		1			338388	11/14/19 09:41	JRB	TAL SAC

Client Sample ID: AKNPW-012
Date Collected: 10/29/19 17:05
Date Received: 10/31/19 12:20

Lab Sample ID: 320-55873-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			303.5 mL	10.00 mL	337675	11/11/19 14:00	DTH	TAL SAC
Total/NA	Analysis	537.1 DW		1			338390	11/14/19 10:13	JRB	TAL SAC

Client Sample ID: AKNPW-103
Date Collected: 10/29/19 10:58
Date Received: 10/31/19 12:20

Lab Sample ID: 320-55873-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			291.9 mL	10.00 mL	337675	11/11/19 14:00	DTH	TAL SAC
Total/NA	Analysis	537.1 DW		1			338390	11/14/19 10:21	JRB	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: KingSalmonP

Job ID: 320-55873-1

Laboratory: Eurofins TestAmerica, Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	01-20-21
ANAB	Dept. of Defense ELAP	L2468	01-20-21
ANAB	Dept. of Energy	L2468.01	01-20-21
ANAB	ISO/IEC 17025	L2468	01-20-21
Arizona	State	AZ0708	08-11-20
Arkansas DEQ	State	19-042-0	06-17-20
California	State	2897	01-31-20
Colorado	State	CA0004	08-31-20
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-20
Georgia	State	4040	01-29-20
Hawaii	State	<cert No.>	01-29-20
Illinois	NELAP	200060	03-17-20
Kansas	NELAP	E-10375	10-31-20 *
Louisiana	NELAP	01944	06-30-20
Maine	State	2018009	04-14-20
Michigan	State	9947	01-29-20
Michigan	State Program	9947	01-31-20
Nevada	State	CA000442020-1	07-31-20
New Hampshire	NELAP	2997	04-18-20
New Jersey	NELAP	CA005	06-30-20
New York	NELAP	11666	04-01-20
Oregon	NELAP	4040	01-29-20
Pennsylvania	NELAP	68-01272	03-31-20
Texas	NELAP	T104704399-19-13	05-31-20
US Fish & Wildlife	US Federal Programs	58448	07-31-20
USDA	US Federal Programs	P330-18-00239	07-31-21
Utah	NELAP	CA000442019-01	02-29-20
Vermont	State	VT-4040	04-16-20
Virginia	NELAP	460278	03-14-20
Washington	State	C581	05-05-20
West Virginia (DW)	State	9930C	12-31-19
Wyoming	State Program	8TMS-L	01-28-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: KingSalmonP

Job ID: 320-55873-1

Method	Method Description	Protocol	Laboratory
537.1 DW	Perfluorinated Alkyl Acids (LC/MS)	EPA	TAL SAC
537.1 DW	Extraction of Perfluorinated Alkyl Acids	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

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: KingSalmonP

Job ID: 320-55873-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-55873-1	AKNPW-003	Water	10/29/19 10:38	10/31/19 12:20	
320-55873-2	AKNPW-007	Water	10/29/19 14:37	10/31/19 12:20	
320-55873-3	AKNPW-008	Water	10/29/19 13:30	10/31/19 12:20	
320-55873-4	AKNPW-011	Water	10/29/19 15:42	10/31/19 12:20	
320-55873-5	AKNPW-012	Water	10/29/19 17:05	10/31/19 12:20	
320-55873-6	AKNPW-103	Water	10/29/19 10:58	10/31/19 12:20	

SHANNON & WILSON, INC.
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1321 Bannock Street, Suite 200
Denver, CO 80204
(303) 825-3800

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

Page 1 of 1

Laboratory Test America / Eurofins
Attn: David Alltucker

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	18 PFAS / EPA 537.1	Total Number of Containers	Remarks/Matrix
AKNPW-003		1038	10/29/19		✓	✓	2	Water (Drinking)
AKNPW-007		1437			✓	✓	2	
AKNPW-008		1330			✓	✓	2	
AKNPW-011		1542			✓	✓	2	
AKNPW-012		1705			✓	✓	2	
AKNPW-103		1058	↓		✓	✓	2	↓

320-55873 Chain of Custody

Project Information		Sample Receipt	
Project Number: 102582-003		Total Number of Containers	
Project Name: KingSalmonP		COC Seals/Intact? Y/N/NA	
Contact: KRF		Received Good Cond./Cold	
Ongoing Project? Yes ☑ No ☐		Delivery Method:	
Sampler: ADV		(attach shipping bill, if any)	

Instructions

Requested Turnaround Time: STANDARD

Special Instructions:
18 PFAS by EPA 537.1

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Alena Voigt Time: 0640	Signature: Alena Voigt Time: 1230	Signature: Time:
Printed Name: Alena Voigt Date: 10/30/19	Printed Name: Alena Voigt Date: 10/30/19	Printed Name: Date:
Company: Shannon+Wilson	Company: Shannon+Wilson	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Alena Voigt Time: 1220	Signature: Time: 1220	Signature: Time:
Printed Name: Alena Voigt Date: 10/30/19	Printed Name: David Alltucker Date: 10/31/19	Printed Name: Date:
Company: Shannon+Wilson	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

F-19-91/UR

2.JC

No. 34987

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-55873-1

Login Number: 55873
List Number: 1
Creator: Kovalyov, Nikita

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	
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	gel packs
Cooler Temperature is acceptable.	True	
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.	True	
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.	N/A	
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.	N/A	

Laboratory Data Review Checklist

Completed By:

Amber Masters

Title:

Environmental Scientist

Date:

11/25/019

Consultant Firm:

Shannon and Wilson, Inc.

Laboratory Name:

Eurofins TestAmerica Laboratories, Inc.

Laboratory Report Number:

320-55873-1

Laboratory Report Date:

11/15/2019

CS Site Name:

King Salmon DOT&PF PFAS

ADEC File Number:

2569.38.033

Hazard Identification Number:

26981

320-55873-1

Laboratory Report Date:

11/15/2019

CS Site Name:

King Salmon DOT&PF PFAS

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 ADEC certified the TestAmerica Laboratories West Sacramento, CA location for the analysis of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) on February 6, 2018. These compounds were included in the ADEC's Contaminated Sites Laboratory Approval 17-020.

   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 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:

   The temperature blank was measured within the acceptable temperature range of 0° C to 6° C upon receipt at the laboratory.

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☒ No☐ N/A☐ Comments:

   Samples were preserved with Trizma.

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Laboratory Report Date:

11/15/2019

CS Site Name:

King Salmon DOT&PF PFAS

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

The sample receipt form notes that the samples were received in good condition.

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:

There were no discrepancies noted in the sample receipt documentation.

e. Data quality or usability affected?

Comments:

The data quality and/or usability was not affected; see above.

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 samples arrived in good condition and properly preserved. The temperature of the sample cooler received with this shipment was 2.3 º C upon arrival at the laboratory.

The case narrative notes that there was insufficient sample volume available to perform a matrix spike (MS) and MS duplicate (MSD) in conjunction with preparation batch 320-337675.

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective actions were documented in the case narrative.

320-55873-1

Laboratory Report Date:

11/15/2019

CS Site Name:

King Salmon DOT&PF PFAS

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The case narrative does not note an effect on data quality.

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:

c. All soils reported on a dry weight basis?

Yes☐ No☐ N/A☒ Comments:

N/A; soil samples were not submitted with this work order.

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

The LOQ, equivalent to the Eurofins TestAmerica Reporting Limit (RL), is less than the applicable ADEC regulatory limits for drinking water .

e. Data quality or usability affected?

The data quality and/or usability are not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

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CS Site Name:

King Salmon DOT&PF PFAS

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☐ No☐ N/A☒ Comments:

None; PFAS compounds were not detected in the method blank samples.

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

Samples are not affected; therefore, qualification of the results was not required

v. Data quality or usability affected?

Comments:

The data quality and/or usability are not affected.

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:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

N/A; metals and/or inorganics were not analyzed as part of this work order.

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:

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Laboratory Report Date:

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CS Site Name:

King Salmon DOT&PF PFAS

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:

None; analytical accuracy and precision were demonstrated to be within acceptable limits.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

Qualification of the data was not required; see above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or usability are not affected.

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:

Insufficient sample volume was available to perform a MS/MSD with the associated preparatory batch.

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

N/A; metals and/or inorganics were not analyzed as a part of this work order.

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Laboratory Report Date:

11/15/2019

CS Site Name:

King Salmon DOT&PF PFAS

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:

See above.

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. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☐ No☐ N/A☒ Comments:

See above.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

See above.

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:

Data quality and/or usability is not affected.

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:

The analytical method 537.1 uses IDA recovery, which entails adding a 13C-isotope of each target analyte, and assessing the recovery of each analyte. The isotopically-labeled compounds are discussed as surrogates for this method.

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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; all other analyses see the laboratory report pages)

Yes☒ No☐ N/A☐ Comments:

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:

N/A; there were no IDA recovery failures associated with this work order.

iv. Data quality or usability affected?

Comments:

The data quality and usability are not affected; 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:

PFAS are not volatile compounds; therefore, a trip blank is not required.

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:

N/A; a trip blank is not required.

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

N/A; a trip blank is not required.

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

N/A; a trip blank is not required.

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Laboratory Report Date:

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CS Site Name:

King Salmon DOT&PF PFAS

v. Data quality or usability affected?

Comments:

N/A; a trip blank is not required.

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 pair *AKNPW-003* / *AKNPW-103* was submitted with this work order.

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:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The data quality and/or usability is not affected; see above.

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

Samples for this project are not collected with reusable equipment, therefore a practical potential for equipment based cross-contamination does not exist.

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Laboratory Report Date:

11/15/2019

CS Site Name:

King Salmon DOT&PF PFAS

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☐ Comments:

N/A; an equipment blank was not submitted with this work order.

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

None; see above.

iii. Data quality or usability affected?

Comments:

The data quality and usability were not affected; see above.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes☐ No☐ N/A☐ Comments:

There were no additional flags/qualifiers required for this work order.

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

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

Laboratory Job ID: 320-57929-1
Client Project/Site: King Salmon PFAS

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

Attn: Marcy Nadel

Authorized for release by:
1/30/2020 10:40:39 AM

David Alltucker, Project Manager I
(916)374-4383
david.alltucker@testamericainc.com

Table of Contents

Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: King Salmon PFAS

Job ID: 320-57929-1

Qualifiers

LCMS

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.

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
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)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
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)

Job ID: 320-57929-1

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

Job Narrative
320-57929-1

Receipt
The samples were received on 1/21/2020 11:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.4° C.

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

Organic Prep
Method 537.1 DW: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-352415.

Method 537.1 DW: Extracts are light amber in color. AKNPW-008 (320-57929-3) and AKNPW-011 (320-57929-4)

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: King Salmon PFAS

Job ID: 320-57929-1

Client Sample ID: AKNPW-003 — Lab Sample ID: 320-57929-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.077		0.0018	0.00045	ug/L	1		537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.011		0.0018	0.00045	ug/L	1		537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	0.047		0.0018	0.00045	ug/L	1		537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.034		0.0018	0.00045	ug/L	1		537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.056		0.0018	0.00045	ug/L	1		537.1 DW	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.00098	J	0.0018	0.00045	ug/L	1		537.1 DW	Total/NA

Client Sample ID: AKNPW-007 — Lab Sample ID: 320-57929-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.0025		0.0017	0.00042	ug/L	1		537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.0028		0.0017	0.00042	ug/L	1		537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	0.0023		0.0017	0.00042	ug/L	1		537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.00079	J	0.0017	0.00042	ug/L	1		537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.0022		0.0017	0.00042	ug/L	1		537.1 DW	Total/NA

Client Sample ID: AKNPW-008 — Lab Sample ID: 320-57929-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.0028		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.00063	J	0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	0.0025		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.00088	J	0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.0015	J	0.0017	0.00043	ug/L	1		537.1 DW	Total/NA

Client Sample ID: AKNPW-011 — Lab Sample ID: 320-57929-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.0042		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.00088	J	0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	0.0051		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.00072	J	0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.0023		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA

Client Sample ID: AKNPW-012 — Lab Sample ID: 320-57929-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.0088		0.0018	0.00045	ug/L	1		537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.0020		0.0018	0.00045	ug/L	1		537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	0.011		0.0018	0.00045	ug/L	1		537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.0016	J	0.0018	0.00045	ug/L	1		537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.0061		0.0018	0.00045	ug/L	1		537.1 DW	Total/NA

Client Sample ID: AKNPW-103 — Lab Sample ID: 320-57929-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.072		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.010		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	0.042		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.032		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.053		0.0017	0.00043	ug/L	1		537.1 DW	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.00094	J	0.0017	0.00043	ug/L	1		537.1 DW	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Shannon & Wilson, Inc
Project/Site: King Salmon PFAS

Job ID: 320-57929-1

Client Sample ID: AKNPW-003

Date Collected: 01/16/20 10:53
Date Received: 01/21/20 11:40

Lab Sample ID: 320-57929-1

Matrix: Water

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.077**		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 13:31	1
Perfluoroheptanoic acid (PFHpA)	**0.011**		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 13:31	1
Perfluorooctanoic acid (PFOA)	**0.047**		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 13:31	1
Perfluorononanoic acid (PFNA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 13:31	1
Perfluorodecanoic acid (PFDA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 13:31	1
Perfluoroundecanoic acid (PFUnA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 13:31	1
Perfluorododecanoic acid (PFDoA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 13:31	1
Perfluorotridecanoic acid (PFTriA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 13:31	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 13:31	1
Perfluorobutanesulfonic acid (PFBS)	**0.034**		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 13:31	1
Perfluorohexanesulfonic acid (PFHxS)	**0.056**		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 13:31	1
Perfluorooctanesulfonic acid (PFOS)	**0.00098**	**J**	0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 13:31	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 13:31	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 13:31	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 13:31	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 13:31	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 13:31	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 13:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*87*		*70 - 130*	*01/22/20 15:43*	*01/24/20 13:31*	*1*
13C2 PFDA	*91*		*70 - 130*	*01/22/20 15:43*	*01/24/20 13:31*	*1*
d5-NEtFOSAA	*84*		*70 - 130*	*01/22/20 15:43*	*01/24/20 13:31*	*1*
13C3 HFPO-DA	*84*		*70 - 130*	*01/22/20 15:43*	*01/24/20 13:31*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon PFAS

Job ID: 320-57929-1

Client Sample ID: AKNPW-007

Date Collected: 01/16/20 12:38
Date Received: 01/21/20 11:40

Lab Sample ID: 320-57929-2

Matrix: Water

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.0025**		0.0017	0.00042	ug/L		01/22/20 15:43	01/24/20 13:39	1
Perfluoroheptanoic acid (PFHpA)	**0.0028**		0.0017	0.00042	ug/L		01/22/20 15:43	01/24/20 13:39	1
Perfluorooctanoic acid (PFOA)	**0.0023**		0.0017	0.00042	ug/L		01/22/20 15:43	01/24/20 13:39	1
Perfluorononanoic acid (PFNA)	ND		0.0017	0.00042	ug/L		01/22/20 15:43	01/24/20 13:39	1
Perfluorodecanoic acid (PFDA)	ND		0.0017	0.00042	ug/L		01/22/20 15:43	01/24/20 13:39	1
Perfluoroundecanoic acid (PFUnA)	ND		0.0017	0.00042	ug/L		01/22/20 15:43	01/24/20 13:39	1
Perfluorododecanoic acid (PFDoA)	ND		0.0017	0.00042	ug/L		01/22/20 15:43	01/24/20 13:39	1
Perfluorotridecanoic acid (PFTriA)	ND		0.0017	0.00042	ug/L		01/22/20 15:43	01/24/20 13:39	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.0017	0.00042	ug/L		01/22/20 15:43	01/24/20 13:39	1
Perfluorobutanesulfonic acid (PFBS)	**0.00079**	**J**	0.0017	0.00042	ug/L		01/22/20 15:43	01/24/20 13:39	1
Perfluorohexanesulfonic acid (PFHxS)	**0.0022**		0.0017	0.00042	ug/L		01/22/20 15:43	01/24/20 13:39	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.0017	0.00042	ug/L		01/22/20 15:43	01/24/20 13:39	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.0017	0.00042	ug/L		01/22/20 15:43	01/24/20 13:39	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.0017	0.00042	ug/L		01/22/20 15:43	01/24/20 13:39	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		0.0017	0.00042	ug/L		01/22/20 15:43	01/24/20 13:39	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		0.0017	0.00042	ug/L		01/22/20 15:43	01/24/20 13:39	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.0017	0.00042	ug/L		01/22/20 15:43	01/24/20 13:39	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.0017	0.00042	ug/L		01/22/20 15:43	01/24/20 13:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*87*		*70 - 130*	*01/22/20 15:43*	*01/24/20 13:39*	*1*
13C2 PFDA	*85*		*70 - 130*	*01/22/20 15:43*	*01/24/20 13:39*	*1*
d5-NEtFOSAA	*82*		*70 - 130*	*01/22/20 15:43*	*01/24/20 13:39*	*1*
13C3 HFPO-DA	*74*		*70 - 130*	*01/22/20 15:43*	*01/24/20 13:39*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon PFAS

Job ID: 320-57929-1

Client Sample ID: AKNPW-008

Date Collected: 01/16/20 13:45
Date Received: 01/21/20 11:40

Lab Sample ID: 320-57929-3

Matrix: Water

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.0028**		0.0017	0.00043	ug/L		01/22/20 15:43	01/28/20 14:33	1
Perfluoroheptanoic acid (PFHpA)	**0.00063**	**J**	0.0017	0.00043	ug/L		01/22/20 15:43	01/28/20 14:33	1
Perfluorooctanoic acid (PFOA)	**0.0025**		0.0017	0.00043	ug/L		01/22/20 15:43	01/28/20 14:33	1
Perfluorononanoic acid (PFNA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/28/20 14:33	1
Perfluorodecanoic acid (PFDA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/28/20 14:33	1
Perfluoroundecanoic acid (PFUnA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/28/20 14:33	1
Perfluorododecanoic acid (PFDoA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/28/20 14:33	1
Perfluorotridecanoic acid (PFTriA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/28/20 14:33	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/28/20 14:33	1
Perfluorobutanesulfonic acid (PFBS)	**0.00088**	**J**	0.0017	0.00043	ug/L		01/22/20 15:43	01/28/20 14:33	1
Perfluorohexanesulfonic acid (PFHxS)	**0.0015**	**J**	0.0017	0.00043	ug/L		01/22/20 15:43	01/28/20 14:33	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/28/20 14:33	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/28/20 14:33	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/28/20 14:33	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/28/20 14:33	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/28/20 14:33	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/28/20 14:33	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/28/20 14:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*80*		*70 - 130*	*01/22/20 15:43*	*01/28/20 14:33*	*1*
13C2 PFDA	*94*		*70 - 130*	*01/22/20 15:43*	*01/28/20 14:33*	*1*
d5-NEtFOSAA	*84*		*70 - 130*	*01/22/20 15:43*	*01/28/20 14:33*	*1*
13C3 HFPO-DA	*88*		*70 - 130*	*01/22/20 15:43*	*01/28/20 14:33*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon PFAS

Job ID: 320-57929-1

Client Sample ID: AKNPW-011

Date Collected: 01/16/20 17:33
Date Received: 01/21/20 11:40

Lab Sample ID: 320-57929-4

Matrix: Water

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.0042**		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 13:55	1
Perfluoroheptanoic acid (PFHpA)	**0.00088**	**J**	0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 13:55	1
Perfluorooctanoic acid (PFOA)	**0.0051**		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 13:55	1
Perfluorononanoic acid (PFNA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 13:55	1
Perfluorodecanoic acid (PFDA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 13:55	1
Perfluoroundecanoic acid (PFUnA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 13:55	1
Perfluorododecanoic acid (PFDoA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 13:55	1
Perfluorotridecanoic acid (PFTriA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 13:55	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 13:55	1
Perfluorobutanesulfonic acid (PFBS)	**0.00072**	**J**	0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 13:55	1
Perfluorohexanesulfonic acid (PFHxS)	**0.0023**		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 13:55	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 13:55	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 13:55	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 13:55	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 13:55	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 13:55	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 13:55	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 13:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*85*		*70 - 130*	*01/22/20 15:43*	*01/24/20 13:55*	*1*
13C2 PFDA	*90*		*70 - 130*	*01/22/20 15:43*	*01/24/20 13:55*	*1*
d5-NEtFOSAA	*88*		*70 - 130*	*01/22/20 15:43*	*01/24/20 13:55*	*1*
13C3 HFPO-DA	*78*		*70 - 130*	*01/22/20 15:43*	*01/24/20 13:55*	*1*

Client: Shannon & Wilson, Inc
Project/Site: King Salmon PFAS

Job ID: 320-57929-1

Client Sample ID: AKNPW-012

Date Collected: 01/16/20 18:45
Date Received: 01/21/20 11:40

Lab Sample ID: 320-57929-5

Matrix: Water

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.0088**		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 14:03	1
Perfluoroheptanoic acid (PFHpA)	**0.0020**		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 14:03	1
Perfluorooctanoic acid (PFOA)	**0.011**		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 14:03	1
Perfluorononanoic acid (PFNA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 14:03	1
Perfluorodecanoic acid (PFDA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 14:03	1
Perfluoroundecanoic acid (PFUnA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 14:03	1
Perfluorododecanoic acid (PFDoA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 14:03	1
Perfluorotridecanoic acid (PFTriA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 14:03	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 14:03	1
Perfluorobutanesulfonic acid (PFBS)	**0.0016**	**J**	0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 14:03	1
Perfluorohexanesulfonic acid (PFHxS)	**0.0061**		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 14:03	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 14:03	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 14:03	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 14:03	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 14:03	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 14:03	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 14:03	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.0018	0.00045	ug/L		01/22/20 15:43	01/24/20 14:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*83*		*70 - 130*	*01/22/20 15:43*	*01/24/20 14:03*	*1*
13C2 PFDA	*88*		*70 - 130*	*01/22/20 15:43*	*01/24/20 14:03*	*1*
d5-NEtFOSAA	*84*		*70 - 130*	*01/22/20 15:43*	*01/24/20 14:03*	*1*
13C3 HFPO-DA	*74*		*70 - 130*	*01/22/20 15:43*	*01/24/20 14:03*	*1*

Client Sample ID: AKNPW-103

Date Collected: 01/16/20 11:23
Date Received: 01/21/20 11:40

Lab Sample ID: 320-57929-6

Matrix: Water

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.072**		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 14:11	1
Perfluoroheptanoic acid (PFHpA)	**0.010**		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 14:11	1
Perfluorooctanoic acid (PFOA)	**0.042**		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 14:11	1
Perfluorononanoic acid (PFNA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 14:11	1
Perfluorodecanoic acid (PFDA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 14:11	1
Perfluoroundecanoic acid (PFUnA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 14:11	1
Perfluorododecanoic acid (PFDoA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 14:11	1
Perfluorotridecanoic acid (PFTriA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 14:11	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 14:11	1
Perfluorobutanesulfonic acid (PFBS)	**0.032**		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 14:11	1
Perfluorohexanesulfonic acid (PFHxS)	**0.053**		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 14:11	1
Perfluorooctanesulfonic acid (PFOS)	**0.00094**	**J**	0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 14:11	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 14:11	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 14:11	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 14:11	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 14:11	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 14:11	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.0017	0.00043	ug/L		01/22/20 15:43	01/24/20 14:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*80*		*70 - 130*	*01/22/20 15:43*	*01/24/20 14:11*	*1*
13C2 PFDA	*83*		*70 - 130*	*01/22/20 15:43*	*01/24/20 14:11*	*1*
d5-NEtFOSAA	*87*		*70 - 130*	*01/22/20 15:43*	*01/24/20 14:11*	*1*
13C3 HFPO-DA	*71*		*70 - 130*	*01/22/20 15:43*	*01/24/20 14:11*	*1*

Surrogate Summary

Client: Shannon & Wilson, Inc
Project/Site: King Salmon PFAS

Job ID: 320-57929-1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	PFHxA (70-130)	PFDA (70-130)	-NEtFOS/ (70-130)	HFPODA (70-130)
320-57929-1	AKNPW-003	87	91	84	84
320-57929-2	AKNPW-007	87	85	82	74
320-57929-3	AKNPW-008	80	94	84	88
320-57929-4	AKNPW-011	85	90	88	78
320-57929-5	AKNPW-012	83	88	84	74
320-57929-6	AKNPW-103	80	83	87	71
LCS 320-352415/2-A	Lab Control Sample	90	83	93	75
LCSD 320-352415/3-A	Lab Control Sample Dup	83	87	89	77
MB 320-352415/1-A	Method Blank	92	89	93	78

Surrogate Legend

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA
d5-NEtFOSAA = d5-NEtFOSAA
HFPODA = 13C3 HFPO-DA

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Lab Sample ID: MB 320-352415/1-A
Matrix: Water
Analysis Batch: 352814

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 352415

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.0020	0.00050	ug/L		01/22/20 15:43	01/24/20 13:07	1
Perfluoroheptanoic acid (PFHpA)	ND		0.0020	0.00050	ug/L		01/22/20 15:43	01/24/20 13:07	1
Perfluorooctanoic acid (PFOA)	ND		0.0020	0.00050	ug/L		01/22/20 15:43	01/24/20 13:07	1
Perfluorononanoic acid (PFNA)	ND		0.0020	0.00050	ug/L		01/22/20 15:43	01/24/20 13:07	1
Perfluorodecanoic acid (PFDA)	ND		0.0020	0.00050	ug/L		01/22/20 15:43	01/24/20 13:07	1
Perfluoroundecanoic acid (PFUnA)	ND		0.0020	0.00050	ug/L		01/22/20 15:43	01/24/20 13:07	1
Perfluorododecanoic acid (PFDoA)	ND		0.0020	0.00050	ug/L		01/22/20 15:43	01/24/20 13:07	1
Perfluorotridecanoic acid (PFTriA)	ND		0.0020	0.00050	ug/L		01/22/20 15:43	01/24/20 13:07	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.0020	0.00050	ug/L		01/22/20 15:43	01/24/20 13:07	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.0020	0.00050	ug/L		01/22/20 15:43	01/24/20 13:07	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.0020	0.00050	ug/L		01/22/20 15:43	01/24/20 13:07	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.0020	0.00050	ug/L		01/22/20 15:43	01/24/20 13:07	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.0020	0.00050	ug/L		01/22/20 15:43	01/24/20 13:07	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.0020	0.00050	ug/L		01/22/20 15:43	01/24/20 13:07	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		0.0020	0.00050	ug/L		01/22/20 15:43	01/24/20 13:07	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		0.0020	0.00050	ug/L		01/22/20 15:43	01/24/20 13:07	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.0020	0.00050	ug/L		01/22/20 15:43	01/24/20 13:07	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.0020	0.00050	ug/L		01/22/20 15:43	01/24/20 13:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*92*		*70 - 130*	*01/22/20 15:43*	*01/24/20 13:07*	*1*
13C2 PFDA	*89*		*70 - 130*	*01/22/20 15:43*	*01/24/20 13:07*	*1*
d5-NEtFOSAA	*93*		*70 - 130*	*01/22/20 15:43*	*01/24/20 13:07*	*1*
13C3 HFPO-DA	*78*		*70 - 130*	*01/22/20 15:43*	*01/24/20 13:07*	*1*

Lab Sample ID: LCS 320-352415/2-A
Matrix: Water
Analysis Batch: 352767

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 352415

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	0.00400	0.00354		ug/L		89	70 - 130
Perfluoroheptanoic acid (PFHpA)	0.00400	0.00368		ug/L		92	70 - 130
Perfluorooctanoic acid (PFOA)	0.00400	0.00360		ug/L		90	70 - 130
Perfluorononanoic acid (PFNA)	0.00400	0.00366		ug/L		92	70 - 130
Perfluorodecanoic acid (PFDA)	0.00400	0.00348		ug/L		87	70 - 130
Perfluoroundecanoic acid (PFUnA)	0.00400	0.00339		ug/L		85	70 - 130
Perfluorododecanoic acid (PFDoA)	0.00400	0.00335		ug/L		84	70 - 130
Perfluorotridecanoic acid (PFTriA)	0.00400	0.00403		ug/L		101	70 - 130
Perfluorotetradecanoic acid (PFTeA)	0.00400	0.00319		ug/L		80	70 - 130
Perfluorobutanesulfonic acid (PFBS)	0.00354	0.00307		ug/L		87	70 - 130

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: LCS 320-352415/2-A
Matrix: Water
Analysis Batch: 352767

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 352415

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Perfluorohexanesulfonic acid (PFHxS)			0.00364	0.00328		ug/L		90	70 - 130		
Perfluorooctanesulfonic acid (PFOS)			0.00371	0.00306		ug/L		83	70 - 130		
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)			0.00400	0.00353		ug/L		88	70 - 130		
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)			0.00400	0.00366		ug/L		92	70 - 130		
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O			0.00373	0.00320		ug/L		86	70 - 130		
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF			0.00377	0.00371		ug/L		98	70 - 130		
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)			0.00400	0.00352		ug/L		88	70 - 130		
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)			0.00377	0.00347		ug/L		92	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*90*		*70 - 130*
13C2 PFDA	*83*		*70 - 130*
d5-NEtFOSAA	*93*		*70 - 130*
13C3 HFPO-DA	*75*		*70 - 130*

Lab Sample ID: LCSD 320-352415/3-A
Matrix: Water
Analysis Batch: 352767

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 352415

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)			0.00400	0.00343		ug/L		86	70 - 130	3	30
Perfluoroheptanoic acid (PFHpA)			0.00400	0.00354		ug/L		88	70 - 130	4	30
Perfluorooctanoic acid (PFOA)			0.00400	0.00361		ug/L		90	70 - 130	0	30
Perfluorononanoic acid (PFNA)			0.00400	0.00357		ug/L		89	70 - 130	2	30
Perfluorodecanoic acid (PFDA)			0.00400	0.00343		ug/L		86	70 - 130	2	30
Perfluoroundecanoic acid (PFUnA)			0.00400	0.00335		ug/L		84	70 - 130	1	30
Perfluorododecanoic acid (PFDoA)			0.00400	0.00353		ug/L		88	70 - 130	5	30
Perfluorotridecanoic acid (PFTriA)			0.00400	0.00359		ug/L		90	70 - 130	12	30
Perfluorotetradecanoic acid (PFTeA)			0.00400	0.00340		ug/L		85	70 - 130	6	30
Perfluorobutanesulfonic acid (PFBS)			0.00354	0.00307		ug/L		87	70 - 130	0	30
Perfluorohexanesulfonic acid (PFHxS)			0.00364	0.00330		ug/L		91	70 - 130	1	30
Perfluorooctanesulfonic acid (PFOS)			0.00371	0.00324		ug/L		87	70 - 130	5	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)			0.00400	0.00364		ug/L		91	70 - 130	3	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)			0.00400	0.00382		ug/L		95	70 - 130	4	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O			0.00373	0.00329		ug/L		88	70 - 130	3	30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: LCSD 320-352415/3-A
Matrix: Water
Analysis Batch: 352767

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 352415

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF			0.00377	0.00368		ug/L		98	70 - 130	1	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)			0.00400	0.00340		ug/L		85	70 - 130	3	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)			0.00377	0.00341		ug/L		90	70 - 130	2	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFHxA	*83*		*70 - 130*
13C2 PFDA	*87*		*70 - 130*
d5-NEtFOSAA	*89*		*70 - 130*
13C3 HFPO-DA	*77*		*70 - 130*

QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: King Salmon PFAS

Job ID: 320-57929-1

LCMS

Prep Batch: 352415

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-57929-1	AKNPW-003	Total/NA	Water	537.1 DW	
320-57929-2	AKNPW-007	Total/NA	Water	537.1 DW	
320-57929-3	AKNPW-008	Total/NA	Water	537.1 DW	
320-57929-4	AKNPW-011	Total/NA	Water	537.1 DW	
320-57929-5	AKNPW-012	Total/NA	Water	537.1 DW	
320-57929-6	AKNPW-103	Total/NA	Water	537.1 DW	
MB 320-352415/1-A	Method Blank	Total/NA	Water	537.1 DW	
LCS 320-352415/2-A	Lab Control Sample	Total/NA	Water	537.1 DW	
LCSD 320-352415/3-A	Lab Control Sample Dup	Total/NA	Water	537.1 DW	

Analysis Batch: 352767

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 320-352415/2-A	Lab Control Sample	Total/NA	Water	537.1 DW	352415
LCSD 320-352415/3-A	Lab Control Sample Dup	Total/NA	Water	537.1 DW	352415

Analysis Batch: 352814

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-57929-1	AKNPW-003	Total/NA	Water	537.1 DW	352415
320-57929-2	AKNPW-007	Total/NA	Water	537.1 DW	352415
320-57929-4	AKNPW-011	Total/NA	Water	537.1 DW	352415
320-57929-5	AKNPW-012	Total/NA	Water	537.1 DW	352415
320-57929-6	AKNPW-103	Total/NA	Water	537.1 DW	352415
MB 320-352415/1-A	Method Blank	Total/NA	Water	537.1 DW	352415

Analysis Batch: 353559

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-57929-3	AKNPW-008	Total/NA	Water	537.1 DW	352415

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: King Salmon PFAS

Job ID: 320-57929-1

Client Sample ID: AKNPW-003
Date Collected: 01/16/20 10:53
Date Received: 01/21/20 11:40

Lab Sample ID: 320-57929-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			279.7 mL	1.00 mL	352415	01/22/20 15:43	JER	TAL SAC
Total/NA	Analysis	537.1 DW		1			352814	01/24/20 13:31	JRB	TAL SAC

Client Sample ID: AKNPW-007
Date Collected: 01/16/20 12:38
Date Received: 01/21/20 11:40

Lab Sample ID: 320-57929-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			298.2 mL	1.00 mL	352415	01/22/20 15:43	JER	TAL SAC
Total/NA	Analysis	537.1 DW		1			352814	01/24/20 13:39	JRB	TAL SAC

Client Sample ID: AKNPW-008
Date Collected: 01/16/20 13:45
Date Received: 01/21/20 11:40

Lab Sample ID: 320-57929-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			292.2 mL	1.00 mL	352415	01/22/20 15:43	JER	TAL SAC
Total/NA	Analysis	537.1 DW		1			353559	01/28/20 14:33	P1N	TAL SAC

Client Sample ID: AKNPW-011
Date Collected: 01/16/20 17:33
Date Received: 01/21/20 11:40

Lab Sample ID: 320-57929-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			293.3 mL	1.00 mL	352415	01/22/20 15:43	JER	TAL SAC
Total/NA	Analysis	537.1 DW		1			352814	01/24/20 13:55	JRB	TAL SAC

Client Sample ID: AKNPW-012
Date Collected: 01/16/20 18:45
Date Received: 01/21/20 11:40

Lab Sample ID: 320-57929-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			279.9 mL	1.00 mL	352415	01/22/20 15:43	JER	TAL SAC
Total/NA	Analysis	537.1 DW		1			352814	01/24/20 14:03	JRB	TAL SAC

Client Sample ID: AKNPW-103
Date Collected: 01/16/20 11:23
Date Received: 01/21/20 11:40

Lab Sample ID: 320-57929-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			287.6 mL	1.00 mL	352415	01/22/20 15:43	JER	TAL SAC
Total/NA	Analysis	537.1 DW		1			352814	01/24/20 14:11	JRB	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: King Salmon PFAS

Job ID: 320-57929-1

Laboratory: Eurofins TestAmerica, Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	01-20-21
ANAB	Dept. of Defense ELAP	L2468	01-20-21
ANAB	Dept. of Energy	L2468.01	01-20-21
ANAB	ISO/IEC 17025	L2468	01-20-21
Arizona	State	AZ0708	08-11-20
Arkansas DEQ	State	19-042-0	06-17-20
California	State	2897	01-31-20 *
Colorado	State	CA0004	08-31-20
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-20
Hawaii	State	<cert No.>	01-29-20 *
Illinois	NELAP	200060	03-17-20
Kansas	NELAP	E-10375	10-31-20 *
Louisiana	NELAP	01944	06-30-20
Maine	State	2018009	04-14-20
Michigan	State	9947	01-29-20 *
Michigan	State Program	9947	01-31-20
Nevada	State	CA000442020-1	07-31-20
New Hampshire	NELAP	2997	04-18-20
New Jersey	NELAP	CA005	06-30-20
New York	NELAP	11666	04-01-20
Oregon	NELAP	4040	01-29-20
Pennsylvania	NELAP	68-01272	03-31-20
Texas	NELAP	T104704399-19-13	05-31-20
US Fish & Wildlife	US Federal Programs	58448	07-31-20
USDA	US Federal Programs	P330-18-00239	07-31-21
Utah	NELAP	CA000442019-01	02-29-20
Vermont	State	VT-4040	04-16-20
Virginia	NELAP	460278	03-14-20
Washington	State	C581	05-05-20
West Virginia (DW)	State	9930C	12-31-19 *
West Virginia (DW)	State	9930C	12-31-20
Wyoming	State Program	8TMS-L	01-28-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: King Salmon PFAS

Job ID: 320-57929-1

Method	Method Description	Protocol	Laboratory
537.1 DW	Perfluorinated Alkyl Acids (LC/MS)	EPA	TAL SAC
537.1 DW	Extraction of Perfluorinated Alkyl Acids	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

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: King Salmon PFAS

Job ID: 320-57929-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-57929-1	AKNPW-003	Water	01/16/20 10:53	01/21/20 11:40	
320-57929-2	AKNPW-007	Water	01/16/20 12:38	01/21/20 11:40	
320-57929-3	AKNPW-008	Water	01/16/20 13:45	01/21/20 11:40	
320-57929-4	AKNPW-011	Water	01/16/20 17:33	01/21/20 11:40	
320-57929-5	AKNPW-012	Water	01/16/20 18:45	01/21/20 11:40	
320-57929-6	AKNPW-103	Water	01/16/20 11:23	01/21/20 11:40	

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTODY RECORD

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

3990 Collins Way, Suite 100
Lake Oswego, OR 97035
(503) 223-6147

2043 Westport Center Drive
St. Louis, MO 63146-3564
(314) 699-9660

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

1321 Bannock Street, Suite 200
Denver, CO 80204
(303) 825-3800

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

Page 1 of 1

Laboratory Test America/Eurofins
Attn: David Alltucker

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	18 PFAS/ EPA 537.1	Total Number of Containers	Remarks/Matrix
AKNPW-003		10:53	1/16/2020		✓	✓	2	Drinking Water
AKNPW-007		12:38			✓	✓	2	
AKNPW-008		13:45			✓	✓	2	
AKNPW-011		17:33			✓	✓	2	
AKNPW-012		18:45			✓	✓	2	
AKNPW-103		11:23	↓		✓	✓	2	↓

320-57929 Chain of Custody

Project Information		Sample Receipt	
Project Number:	102582-003	Total Number of Containers	
Project Name:	King Salmon PFAS	COC Seals/Intact? Y/N/NA	
Contact:	KRF	Received Good Cond./Cold	
Ongoing Project?	Yes ☑ No ☐	Delivery Method:	
Sampler:	ADV	(attach shipping bill, if any)	

Instructions	
Requested Turnaround Time:	STANDARD
Special Instructions:	18 PFAS by EIA 537.1

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Alena Voigt Time: 6:35	Signature: Alena Voigt Time: 1200	Signature: Time:
Printed Name: Alena Voigt Date: 1/17/2020	Printed Name: Alena Voigt Date: 1/20/2020	Printed Name: Date:
Company: Shannon+Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Alena Voigt Time: 12:30	Signature: Time: 11:45	Signature: Time:
Printed Name: Alena Voigt Date: 1/17/2020	Printed Name: David Hu Date: 1/20/20	Printed Name: Date:
Company: Shannon+Wilson	Company: TA-Sv	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

2.4c

No. 35007

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-57929-1

Login Number: 57929
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	1085451, 1085450
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.	True	
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.	True	
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.	N/A	
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.	N/A	

Laboratory Data Review Checklist

Completed By:

Rachel Willis

Title:

Environmental Scientist

Date:

January 30, 2020

Consultant Firm:

Shannon and Wilson, Inc.

Laboratory Name:

TestAmerica Laboratories, Inc.

Laboratory Report Number:

320-57929-1

Laboratory Report Date:

January 30, 2020

CS Site Name:

ADOT&PF King Salmon Airport Statewide PFAS

ADEC File Number:

2569.38.033

Hazard Identification Number:

26981

320-57929-1

Laboratory Report Date:

January 30, 2020

CS Site Name:

ADOT&PF King Salmon Airport Statewide PFAS

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 ADEC certified the TestAmerica Laboratories West Sacramento, CA location for the analysis of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) on February 6, 2018. These compounds were included in the ADEC's Contaminated Sites Laboratory Approval 17-020.

   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:

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:

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☒ No☐ N/A☐ Comments:

   Samples were preserved with Trizma.

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c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

The sample receipt form notes that the samples were received in good condition.

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:

There were no discrepancies noted in the sample receipt documentation.

e. Data quality or usability affected?

Comments:

The data quality and/or usability was not affected; see above.

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 samples arrived in good condition and properly preserved. The temperature of the sample cooler received with this shipment was 2.3 º C upon arrival at the laboratory.

There was insufficient sample volume available to perform a matrix spike (MS) and MS duplicate (MSD) in conjunction with preparation batch 320-352415.

The extracts for project samples *AKNPW-008* and *AKNPW-011* were light amber in color.

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective actions were documented in the case narrative.

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d. What is the effect on data quality/usability according to the case narrative?

Comments:

The case narrative does not note an effect on data quality.

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:

c. All soils reported on a dry weight basis?

Yes☐ No☐ N/A☒ Comments:

Soil samples were not submitted with this work order.

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

The LOQ, equivalent to the TestAmerica Reporting Limit (RL), is less than the applicable ADEC regulatory limits for drinking water .

e. Data quality or usability affected?

The data quality and/or usability are not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

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ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

PFAS compounds were not detected in the method blank sample.

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

PFAS compounds were not detected in the method blank sample. Therefore, qualification of the results was not required

v. Data quality or usability affected?

Comments:

The data quality and/or usability are not affected.

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:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

N/A; metals and/or inorganics were not analyzed as part of this work order.

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:

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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:

None; analytical accuracy and precision were demonstrated to be within acceptable limits.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

Qualification of the data was not required; see above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or usability are not affected.

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:

Insufficient sample volume was available to perform a MS/MSD with the associated preparatory batch. However, the laboratory analyzed an LCS and LCSD to assess laboratory accuracy and precision.

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

N/A; metals and/or inorganics were not analyzed as a part of this work order.

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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:

See above.

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. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☐ No☐ N/A☒ Comments:

See above.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

See above.

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:

Data quality and/or usability is not affected. We are unable to assess matrix interference in laboratory methods.

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:

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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; all other analyses see the laboratory report pages)

Yes☒ No☐ N/A☐ Comments:

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:

N/A; there were no IDA recovery failures associated with this work order.

iv. Data quality or usability affected?

Comments:

The data quality and usability are not affected; 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:

PFAS are not volatile compounds; therefore, a trip blank is not required.

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:

A trip blank is not required.

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

A trip blank is not required.

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

A trip blank is not required.

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v. Data quality or usability affected?

Comments:

A trip blank is not required.

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 pair *AKNPW-003* / *AKNPW-103* was submitted with this work order.

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☒ No☐ N/A☐ Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The data quality and/or usability is not affected; see above.

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

Samples for this project are not collected with reusable equipment; a practical potential for equipment based cross-contamination does not exist.

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i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☐ Comments:

N/A; an equipment blank was not submitted with this work order.

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

None; see above.

iii. Data quality or usability affected?

Comments:

The data quality and usability were not affected; see above.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes☐ No☐ N/A☐ Comments:

There were no additional flags/qualifiers required for this work order.

Laboratory Report of Analysis

To: Shannon & Wilson-Fairbanks
2355 Hill Rd.
Fairbanks, AK 99701
(907)479-0600

Report Number: **1192542**

Client Project: **Eddie's Fireplace Inn**

Dear Kristen Freiburger,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Jennifer at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Jennifer Dawkins Date
Project Manager
Jennifer.Dawkins@sgs.com

Case Narrative

SGS Client: Shannon & Wilson-Fairbanks

SGS Project: 1192542

Project Name/Site: Eddie's Fireplace Inn

Refer to sample receipt form for information on sample condition.

WTI/5192] **1509502 MB**
2510B - Conductivity - Conducitivity of the MB was detected above the LOQ. Associated samples are greater than 10X the MB conductivity.

* QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to the associated field samples.

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
Eddie's Fireplace Inn	1192542001	05/22/2019	05/23/2019	Drinking Water

Method	Method Description
SM21 2320B	Alkalinity as CaCO3 w/ PIWA
SM21 2510B	Conductivity SM2510B w/ PIWA
SM21 2340B	Hardness as CaCO3 by ICP-MS
EPA 300.0	Ion Chromatographic Analysis w/ PIWA
EP200.8	Metals in Water by ICP-MS PIWA
SM21 4500NO3-F	Nitrate/Nitrite Flow injection Pres.
SM21 4500-H B	pH Analysis w/ PIWA
SM21 9223B	Total Coliform P/A Qualitative
SM21 2540C	Total Dissolved Solids SM182540C w/PIWA

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Detectable Results Summary

Client Sample ID: **Eddie's Fireplace Inn**
Lab Sample ID: 1192542001

Metals by ICP/MS
Microbiology Laboratory

Private Individual Analysis

Parameter	Result	Units
Hardness as CaCO3	37400	ug/L
E. Coli	Negative	100mL
Total Coliform	Negative	100mL
Alkalinity	136000	ug/L
Barium	3.63	ug/L
Calcium	6050	ug/L
Chloride	21900	ug/L
Conductivity	345	umhos/cm
Copper	1.22	ug/L
HCO3 Alkalinity	133000	ug/L
Magnesium	5400	ug/L
Manganese	185	ug/L
pH	8.3	pH units
Potassium	5010	ug/L
Sodium	59800	ug/L
Sulfate	6130	ug/L

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Results of **Eddie's Fireplace Inn**

Client Sample ID: **Eddie's Fireplace Inn**
Client Project ID: **Eddie's Fireplace Inn**
Lab Sample ID: 1192542001
Lab Project ID: 1192542

Collection Date: 05/22/19 13:30
Received Date: 05/23/19 08:22
Matrix: Drinking Water
Solids (%):
Location:

Results by

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Dissolved Solids	234000	*	10000	3100	ug/L	1	(<500)	05/24/19 15:53

Batch Information

Analytical Batch: STS6283
Analytical Method: SM21 2540C
Analyst: EWW
Analytical Date/Time: 05/24/19 15:53
Container ID: 1192542001-D

Print Date: 06/07/2019 11:20:36AM

Results of **Eddie's Fireplace Inn**

Client Sample ID: **Eddie's Fireplace Inn**
Client Project ID: **Eddie's Fireplace Inn**
Lab Sample ID: 1192542001
Lab Project ID: 1192542

Collection Date: 05/22/19 13:30
Received Date: 05/23/19 08:22
Matrix: Drinking Water
Solids (%):
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Hardness as CaCO3	37400		5000	5000	ug/L	1		05/31/19 16:27

Batch Information

Analytical Batch: MMS10525
Analytical Method: SM21 2340B
Analyst: DSH
Analytical Date/Time: 05/31/19 16:27
Container ID: 1192542001-B

Prep Batch: MXX32441
Prep Method: E200.2
Prep Date/Time: 05/29/19 11:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 06/07/2019 11:20:36AM

Results of **Eddie's Fireplace Inn**

Client Sample ID: **Eddie's Fireplace Inn**
Client Project ID: **Eddie's Fireplace Inn**
Lab Sample ID: 1192542001
Lab Project ID: 1192542

Collection Date: 05/22/19 13:30
Received Date: 05/23/19 08:22
Matrix: Drinking Water
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
E. Coli	Negative		1	1	100mL	1		05/23/19 18:03
Total Coliform	Negative		1	1	100mL	1		05/23/19 18:03

Batch Information

Analytical Batch: BTF17362
Analytical Method: SM21 9223B
Analyst: ACF
Analytical Date/Time: 05/23/19 18:03
Container ID: 1192542001-A

Print Date: 06/07/2019 11:20:36AM

Results of **Eddie's Fireplace Inn**

Client Sample ID: **Eddie's Fireplace Inn**
Client Project ID: **Eddie's Fireplace Inn**
Lab Sample ID: 1192542001
Lab Project ID: 1192542

Collection Date: 05/22/19 13:30
Received Date: 05/23/19 08:22
Matrix: Drinking Water
Solids (%):
Location:

Results by **Private Individual Analysis**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Aluminum	20.0	U	20.0	6.20	ug/L	1		05/31/19 16:27
Antimony	1.00	U	1.00	0.310	ug/L	1	(<6)	05/31/19 16:27
Arsenic	5.00	U	5.00	1.50	ug/L	1	(<10)	05/31/19 16:27
Barium	3.63		3.00	0.940	ug/L	1	(<2000)	05/31/19 16:27
Cadmium	0.500	U	0.500	0.150	ug/L	1	(<5)	05/31/19 16:27
Calcium	6050		500	150	ug/L	1		05/31/19 16:27
Chromium	2.00	U	2.00	0.800	ug/L	1	(<100)	05/31/19 16:27
Copper	1.22		1.00	0.310	ug/L	1	(<1000)	05/31/19 16:27
Iron	250	U	250	78.0	ug/L	1	(<300)	05/31/19 16:27
Lead	0.200	U	0.200	0.0700	ug/L	1	(<15)	05/31/19 16:27
Magnesium	5400		50.0	15.0	ug/L	1		05/31/19 16:27
Manganese	185	*	1.00	0.350	ug/L	1	(<50)	05/31/19 16:27
Nickel	2.00	U	2.00	0.620	ug/L	1	(<100)	05/31/19 16:27
Potassium	5010		500	150	ug/L	1		05/31/19 16:27
Selenium	5.00	U	5.00	1.50	ug/L	1	(<50)	05/31/19 16:27
Silver	1.00	U	1.00	0.310	ug/L	1	(<100)	05/31/19 16:27
Sodium	59800		500	150	ug/L	1		05/31/19 16:27
Thallium	1.00	U	1.00	0.310	ug/L	1	(<2)	05/31/19 16:27
Zinc	10.0	U	10.0	3.10	ug/L	1	(<5000)	05/31/19 16:27

Batch Information

Analytical Batch: MMS10525
Analytical Method: EP200.8
Analyst: DSH
Analytical Date/Time: 05/31/19 16:27
Container ID: 1192542001-B

Prep Batch: MXX32441
Prep Method: E200.2
Prep Date/Time: 05/29/19 11:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloride	21900	*	1000	250	ug/L	5	(<250)	06/04/19 18:33
Fluoride	200	U	200	50.0	ug/L	1	(<2)	06/04/19 17:36
Sulfate	6130	*	200	50.0	ug/L	1	(<250)	06/04/19 17:36

Print Date: 06/07/2019 11:20:36AM

Results of **Eddie's Fireplace Inn**

Client Sample ID: **Eddie's Fireplace Inn**
Client Project ID: **Eddie's Fireplace Inn**
Lab Sample ID: 1192542001
Lab Project ID: 1192542

Collection Date: 05/22/19 13:30
Received Date: 05/23/19 08:22
Matrix: Drinking Water
Solids (%):
Location:

Results by **Private Individual Analysis**

Batch Information

Analytical Batch: WIC5918
Analytical Method: EPA 300.0
Analyst: DMM
Analytical Date/Time: 06/04/19 17:36
Container ID: 1192542001-D

Prep Batch: WXX12851
Prep Method: METHOD
Prep Date/Time: 06/04/19 10:45
Prep Initial Wt./Vol.: 10 mL
Prep Extract Vol: 10 mL

Analytical Batch: WIC5918
Analytical Method: EPA 300.0
Analyst: DMM
Analytical Date/Time: 06/04/19 18:33
Container ID: 1192542001-D

Prep Batch: WXX12851
Prep Method: METHOD
Prep Date/Time: 06/04/19 10:45
Prep Initial Wt./Vol.: 10 mL
Prep Extract Vol: 10 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Alkalinity	136000		10000	2500	ug/L	1		05/24/19 11:04
CO3 Alkalinity	10000 U		10000	2500	ug/L	1		05/24/19 11:04
HCO3 Alkalinity	133000		10000	2500	ug/L	1		05/24/19 11:04
OH Alkalinity	10000 U		10000	2500	ug/L	1		05/24/19 11:04

Batch Information

Analytical Batch: WTI5193
Analytical Method: SM21 2320B
Analyst: EWW
Analytical Date/Time: 05/24/19 11:04
Container ID: 1192542001-D

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Conductivity	345		1.00	0.477	umhos/cm	1		05/24/19 11:04

Batch Information

Analytical Batch: WTI5192
Analytical Method: SM21 2510B
Analyst: EWW
Analytical Date/Time: 05/24/19 11:04
Container ID: 1192542001-D

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
pH	8.3		0.100	0.100	pH units	1	(6.5-8.5)	05/24/19 11:04

Print Date: 06/07/2019 11:20:36AM

Results of **Eddie's Fireplace Inn**

Client Sample ID: **Eddie's Fireplace Inn**
Client Project ID: **Eddie's Fireplace Inn**
Lab Sample ID: 1192542001
Lab Project ID: 1192542

Collection Date: 05/22/19 13:30
Received Date: 05/23/19 08:22
Matrix: Drinking Water
Solids (%):
Location:

Results by **Private Individual Analysis**

Batch Information

Analytical Batch: WTI5191
Analytical Method: SM21 4500-H B
Analyst: EWW
Analytical Date/Time: 05/24/19 11:04
Container ID: 1192542001-D

Print Date: 06/07/2019 11:20:36AM

Results of **Eddie's Fireplace Inn**

Client Sample ID: **Eddie's Fireplace Inn**
Client Project ID: **Eddie's Fireplace Inn**
Lab Sample ID: 1192542001
Lab Project ID: 1192542

Collection Date: 05/22/19 13:30
Received Date: 05/23/19 08:22
Matrix: Drinking Water
Solids (%):
Location:

Results by **Waters Department**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Nitrate/Nitrite-N	200	U	200	50.0	ug/L	2	(<10)	05/24/19 13:44

Batch Information

Analytical Batch: WFI2818
Analytical Method: SM21 4500NO3-F
Analyst: EWW
Analytical Date/Time: 05/24/19 13:44
Container ID: 1192542001-C

Print Date: 06/07/2019 11:20:36AM

Method Blank

Blank ID: MB for HBN 1794136 [BTF/17362]
Blank Lab ID: 1509096

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192542001

Results by **SM21 9223B**

Parameter	Results	LOQ/CL	DL	Units
E. Coli	Negative	1	1	100mL
Total Coliform	Negative	1	1	100mL

Batch Information

Analytical Batch: BTF17362
Analytical Method: SM21 9223B
Instrument:
Analyst: ACF
Analytical Date/Time: 5/23/2019 6:03:53PM

Print Date: 06/07/2019 11:20:38AM

Method Blank

Blank ID: MB for HBN 1794279 [MXX/32441]
Blank Lab ID: 1509741

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192542001

Results by **EP200.8**

Parameter	Results	LOQ/CL	DL	Units
Aluminum	10.0U	20.0	6.20	ug/L
Antimony	0.500U	1.00	0.310	ug/L
Arsenic	2.50U	5.00	1.50	ug/L
Barium	1.50U	3.00	0.940	ug/L
Cadmium	0.250U	0.500	0.150	ug/L
Calcium	250U	500	150	ug/L
Chromium	1.00U	2.00	0.800	ug/L
Copper	0.500U	1.00	0.310	ug/L
Iron	125U	250	78.0	ug/L
Lead	0.100U	0.200	0.0700	ug/L
Magnesium	25.0U	50.0	15.0	ug/L
Manganese	0.500U	1.00	0.350	ug/L
Nickel	1.00U	2.00	0.620	ug/L
Potassium	250U	500	150	ug/L
Selenium	2.50U	5.00	1.50	ug/L
Silver	0.500U	1.00	0.310	ug/L
Sodium	250U	500	150	ug/L
Thallium	0.500U	1.00	0.310	ug/L
Zinc	5.00U	10.0	3.10	ug/L

Batch Information

Analytical Batch: MMS10525
Analytical Method: EP200.8
Instrument: Perkin Elmer Nexlon P5
Analyst: DSH
Analytical Date/Time: 5/31/2019 3:36:18PM

Prep Batch: MXX32441
Prep Method: E200.2
Prep Date/Time: 5/29/2019 11:30:13AM
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1192542 [MXX32441]
Blank Spike Lab ID: 1509742
Date Analyzed: 05/31/2019 15:39

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192542001

Results by **EP200.8**

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Aluminum	1000	1020	102	(85-115)
Antimony	1000	1050	105	(85-115)
Arsenic	1000	971	97	(85-115)
Barium	1000	967	97	(85-115)
Cadmium	100	100	100	(85-115)
Calcium	10000	10000	100	(85-115)
Chromium	400	382	96	(85-115)
Copper	1000	1000	100	(85-115)
Iron	5000	4780	96	(85-115)
Lead	1000	1020	102	(85-115)
Magnesium	10000	10200	102	(85-115)
Manganese	500	514	103	(85-115)
Nickel	1000	1020	102	(85-115)
Potassium	10000	10100	101	(85-115)
Selenium	1000	997	100	(85-115)
Silver	100	96.9	97	(85-115)
Sodium	10000	10200	102	(85-115)
Thallium	10	10.0	100	(85-115)
Zinc	1000	1030	103	(85-115)

Batch Information

Analytical Batch: **MMS10525**
Analytical Method: **EP200.8**
Instrument: **Perkin Elmer Nexlon P5**
Analyst: **DSH**

Prep Batch: **MXX32441**
Prep Method: **E200.2**
Prep Date/Time: **05/29/2019 11:30**
Spike Init Wt./Vol.: 1000 ug/L Extract Vol: 50 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1509746
MS Sample ID: 1509749 MS
MSD Sample ID:

QC for Samples: 1192542001

Analysis Date: 05/31/2019 15:54
Analysis Date: 05/31/2019 15:57
Analysis Date:
Matrix: Water (Surface, Eff., Ground)

Results by **EP200.8**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Aluminum	10.0U	1000	931	93				70-130		
Antimony	0.500U	1000	999	100				70-130		
Arsenic	2.50U	1000	951	95				70-130		
Barium	1.50U	1000	931	93				70-130		
Cadmium	0.250U	100	95	95				70-130		
Calcium	250U	10000	9140	91				70-130		
Chromium	1.00U	400	373	93				70-130		
Copper	24.8	1000	984	96				70-130		
Iron	166J	5000	4780	92				70-130		
Lead	0.215	1000	981	98				70-130		
Magnesium	25.0U	10000	9510	95				70-130		
Manganese	0.488J	500	501	100				70-130		
Nickel	0.822J	1000	982	98				70-130		
Potassium	250U	10000	9440	94				70-130		
Selenium	2.50U	1000	968	97				70-130		
Silver	0.500U	100	90.5	91				70-130		
Sodium	50800	10000	61700	108				70-130		
Thallium	0.500U	10.0	9.48	95				70-130		
Zinc	11.3	1000	986	98				70-130		

Batch Information

Analytical Batch: MMS10525
Analytical Method: EP200.8
Instrument: Perkin Elmer NexIon P5
Analyst: DSH
Analytical Date/Time: 5/31/2019 3:57:12PM

Prep Batch: MXX32441
Prep Method: DW Digest for Metals on ICP-MS
Prep Date/Time: 5/29/2019 11:30:13AM
Prep Initial Wt./Vol.: 20.00mL
Prep Extract Vol: 50.00mL

Print Date: 06/07/2019 11:20:45AM

Method Blank

Blank ID: MB for HBN 1794172 [STS/6283]
Blank Lab ID: 1509260

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192542001

Results by **SM21 2540C**

Parameter	Results	LOQ/CL	DL	Units
Total Dissolved Solids	7000J	10000	3100	ug/L

Batch Information

Analytical Batch: STS6283
Analytical Method: SM21 2540C
Instrument:
Analyst: EWW
Analytical Date/Time: 5/24/2019 3:53:46PM

Print Date: 06/07/2019 11:20:49AM

Duplicate Sample Summary

Original Sample ID: 1192528001
Duplicate Sample ID: 1509263
QC for Samples:
1192542001

Analysis Date: 05/24/2019 15:53
Matrix: Drinking Water

Results by **SM21 2540C**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Dissolved Solids	163000	171000	ug/L	4.80	(< 5)

Batch Information

Analytical Batch: STS6283
Analytical Method: SM21 2540C
Instrument:
Analyst: EWW

Print Date: 06/07/2019 11:20:50AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1192542 [STS6283]
Blank Spike Lab ID: 1509261
Date Analyzed: 05/24/2019 15:53

Spike Duplicate ID: LCSD for HBN 1192542 [STS6283]
Spike Duplicate Lab ID: 1509262
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192542001

Results by **SM21 2540C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Total Dissolved Solids	333000	314000	94	333000	325000	98	(75-125)	3.40	(< 5)

Batch Information

Analytical Batch: **STS6283**
Analytical Method: **SM21 2540C**
Instrument:
Analyst: **EWW**

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Method Blank

Blank ID: MB for HBN 1794221 (WFI/2818)
Blank Lab ID: 1509577

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by **SM21 4500NO3-F**

Parameter	Results	LOQ/CL	DL	Units
Nitrate-N	100U	200	50.0	ug/L
Nitrite-N	100U	200	50.0	ug/L
Total Nitrate/Nitrite-N	54.6J	200	50.0	ug/L

Batch Information

Analytical Batch: WFI2818
Analytical Method: SM21 4500NO3-F
Instrument: Astoria segmented flow
Analyst: EWW
Analytical Date/Time: 5/24/2019 12:18:27PM

Method Blank

Blank ID: MB for HBN 1794221 (WFI/2818)
Blank Lab ID: 1509579

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192542001

Results by **SM21 4500NO3-F**

Parameter	Results	LOQ/CL	DL	Units
Nitrate-N	100U	200	50.0	ug/L
Nitrite-N	100U	200	50.0	ug/L
Total Nitrate/Nitrite-N	55.4J	200	50.0	ug/L

Batch Information

Analytical Batch: WFI2818
Analytical Method: SM21 4500NO3-F
Instrument: Astoria segmented flow
Analyst: EWW
Analytical Date/Time: 5/24/2019 1:03:57PM

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Method Blank

Blank ID: MB for HBN 1794221 (WFI/2818)
Blank Lab ID: 1509581

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192542001

Results by **SM21 4500NO3-F**

Parameter	Results	LOQ/CL	DL	Units
Nitrate-N	100U	200	50.0	ug/L
Nitrite-N	100U	200	50.0	ug/L
Total Nitrate/Nitrite-N	58.8J	200	50.0	ug/L

Batch Information

Analytical Batch: WFI2818
Analytical Method: SM21 4500NO3-F
Instrument: Astoria segmented flow
Analyst: EWW
Analytical Date/Time: 5/24/2019 2:03:27PM

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1192542 [WFI2818]
Blank Spike Lab ID: 1509576
Date Analyzed: 05/24/2019 12:16

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by **SM21 4500NO3-F**

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Nitrate-N	2500	2600	104	(70-130)
Nitrite-N	2500	2620	105	(90-110)
Total Nitrate/Nitrite-N	5000	5230	105	(90-110)

Batch Information

Analytical Batch: **WFI2818**
Analytical Method: **SM21 4500NO3-F**
Instrument: **Astoria segmented flow**
Analyst: **EWW**

Print Date: 06/07/2019 11:20:55AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1192542 [WFI2818]
Blank Spike Lab ID: 1509578
Date Analyzed: 05/24/2019 13:02

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192542001

Results by **SM21 4500NO3-F**

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Nitrate-N	2500	2460	99	(70-130)
Nitrite-N	2500	2420	97	(90-110)
Total Nitrate/Nitrite-N	5000	4880	98	(90-110)

Batch Information

Analytical Batch: **WFI2818**
Analytical Method: **SM21 4500NO3-F**
Instrument: **Astoria segmented flow**
Analyst: **EWW**

Print Date: 06/07/2019 11:20:55AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1192542 [WFI2818]
Blank Spike Lab ID: 1509580
Date Analyzed: 05/24/2019 14:01

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192542001

Results by **SM21 4500NO3-F**

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Nitrate-N	2500	2680	107	(70-130)
Nitrite-N	2500	2580	103	(90-110)
Total Nitrate/Nitrite-N	5000	5260	105	(90-110)

Batch Information

Analytical Batch: **WFI2818**
Analytical Method: **SM21 4500NO3-F**
Instrument: **Astoria segmented flow**
Analyst: **EWW**

Print Date: 06/07/2019 11:20:55AM

Matrix Spike Summary

Original Sample ID: 1192450001
MS Sample ID: 1509547 MS
MSD Sample ID: 1509548 MSD

QC for Samples: 1192542001

Analysis Date: 05/24/2019 13:52
Analysis Date: 05/24/2019 13:54
Analysis Date: 05/24/2019 13:56
Matrix: Drinking Water

Results by **SM21 4500NO3-F**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Total Nitrate/Nitrite-N	8720	20000	32100	117 *	20000	31400	114 *	90-110	2.10	(< 25)

Batch Information

Analytical Batch: WFI2818
Analytical Method: SM21 4500NO3-F
Instrument: Astoria segmented flow
Analyst: EWW
Analytical Date/Time: 5/24/2019 1:54:42PM

Print Date: 06/07/2019 11:20:56AM

Matrix Spike Summary

Original Sample ID: 1192511001
MS Sample ID: 1509549 MS
MSD Sample ID: 1509550 MSD

QC for Samples: 1192542001

Analysis Date: 05/24/2019 12:23
Analysis Date: 05/24/2019 12:25
Analysis Date: 05/24/2019 12:27
Matrix: Drinking Water

Results by **SM21 4500NO3-F**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Total Nitrate/Nitrite-N	13800	25000	38600	99	25000	40500	107	90-110	5.00	(< 25)

Batch Information

Analytical Batch: WFI2818
Analytical Method: SM21 4500NO3-F
Instrument: Astoria segmented flow
Analyst: EWW
Analytical Date/Time: 5/24/2019 12:25:27PM

Print Date: 06/07/2019 11:20:56AM

Duplicate Sample Summary

Original Sample ID: 1192528001
Duplicate Sample ID: 1509498
QC for Samples:
1192542001

Analysis Date: 05/24/2019 10:55
Matrix: Drinking Water

Results by **SM21 4500-H B**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
pH	7.0	7.00	pH units	0.00	(< 5)

Batch Information

Analytical Batch: WTI5191
Analytical Method: SM21 4500-H B
Instrument: Titration
Analyst: EWW

Print Date: 06/07/2019 11:20:58AM

Duplicate Sample Summary

Original Sample ID: 1192579002
Duplicate Sample ID: 1509499
QC for Samples:
1192542001

Analysis Date: 05/24/2019 12:09
Matrix: Water (Surface, Eff., Ground)

Results by **SM21 4500-H B**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
pH	7.8	7.90	pH units	1.30	(< 5)

Batch Information

Analytical Batch: WTI5191
Analytical Method: SM21 4500-H B
Instrument: Titration
Analyst: EWW

Print Date: 06/07/2019 11:20:58AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1192542 [WTI5191]
Blank Spike Lab ID: 1509495
Date Analyzed: 05/24/2019 09:18

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192542001

Results by **SM21 4500-H B**

Blank Spike (pH units)

Parameter	Spike	Result	Rec (%)	CL
pH	6.98	7.01	100	(99-101)

Batch Information

Analytical Batch: **WTI5191**
Analytical Method: **SM21 4500-H B**
Instrument: **Titration**
Analyst: **EWW**

Print Date: 06/07/2019 11:21:00AM

Method Blank

Blank ID: MB for HBN 1794212 [WTI/5192]
Blank Lab ID: 1509502

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192542001

Results by **SM21 2510B**

Parameter	Results	LOQ/CL	DL	Units
Conductivity	1.90*	1.00	0.477	umhos/cm

Batch Information

Analytical Batch: WTI5192
Analytical Method: SM21 2510B
Instrument: Titration
Analyst: EWW
Analytical Date/Time: 5/24/2019 9:43:24AM

Duplicate Sample Summary

Original Sample ID: 1192528001
Duplicate Sample ID: 1509503
QC for Samples:
1192542001

Analysis Date: 05/24/2019 10:55
Matrix: Drinking Water

Results by **SM21 2510B**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Conductivity	234	234	umhos/cm	0.00	(< 20)

Batch Information

Analytical Batch: WTI5192
Analytical Method: SM21 2510B
Instrument: Titration
Analyst: EWW

Print Date: 06/07/2019 11:21:02AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1192542 [WTI5192]
Blank Spike Lab ID: 1509501
Date Analyzed: 05/24/2019 09:12

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192542001

Results by **SM21 2510B**

Blank Spike (umhos/cm)

Parameter	Spike	Result	Rec (%)	CL
Conductivity	10.1	10.9	108	(90-110)

Batch Information

Analytical Batch: **WTI5192**
Analytical Method: **SM21 2510B**
Instrument: **Titration**
Analyst: **EWW**

Print Date: 06/07/2019 11:21:04AM

Method Blank

Blank ID: MB for HBN 1794213 [WTI/5193]
Blank Lab ID: 1509504

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192542001

Results by **SM21 2320B**

Parameter	Results	LOQ/CL	DL	Units
Alkalinity	3150J	10000	2500	ug/L

Batch Information

Analytical Batch: WTI5193
Analytical Method: SM21 2320B
Instrument: Titration
Analyst: EWW
Analytical Date/Time: 5/24/2019 9:43:24AM

Duplicate Sample Summary

Original Sample ID: 1192528001
Duplicate Sample ID: 1509506
QC for Samples:
1192542001

Analysis Date: 05/24/2019 10:55
Matrix: Drinking Water

Results by **SM21 2320B**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Alkalinity	91200	91230	ug/L	0.08	(< 25)

Batch Information

Analytical Batch: WTI5193
Analytical Method: SM21 2320B
Instrument: Titration
Analyst: EWW

Print Date: 06/07/2019 11:21:06AM

Duplicate Sample Summary

Original Sample ID: 1192579002
Duplicate Sample ID: 1509507
QC for Samples:
1192542001

Analysis Date: 05/24/2019 12:09
Matrix: Water (Surface, Eff., Ground)

Results by **SM21 2320B**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Alkalinity	42100	42150	ug/L	0.10	(< 25)

Batch Information

Analytical Batch: WTI5193
Analytical Method: SM21 2320B
Instrument: Titration
Analyst: EWW

Print Date: 06/07/2019 11:21:06AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1192542 [WTI5193]
Blank Spike Lab ID: 1509505
Date Analyzed: 05/24/2019 09:52

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192542001

Results by **SM21 2320B**

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Alkalinity	250000	238000	95	(85-115)

Batch Information

Analytical Batch: **WTI5193**
Analytical Method: **SM21 2320B**
Instrument: **Titration**
Analyst: **EWW**

Print Date: 06/07/2019 11:21:08AM

Method Blank

Blank ID: MB for HBN 1794605 [WXX/12851]
Blank Lab ID: 1511264

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192542001

Results by **EPA 300.0**

Parameter	Results	LOQ/CL	DL	Units
Chloride	100U	200	50.0	ug/L
Fluoride	100U	200	50.0	ug/L
Sulfate	100U	200	50.0	ug/L

Batch Information

Analytical Batch: WIC5918
Analytical Method: EPA 300.0
Instrument: 930 Metrohm compact IC flex
Analyst: DMM
Analytical Date/Time: 6/4/2019 2:32:42PM

Prep Batch: WXX12851
Prep Method: METHOD
Prep Date/Time: 6/4/2019 10:45:00AM
Prep Initial Wt./Vol.: 10 mL
Prep Extract Vol: 10 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1192542 [WXX12851]
Blank Spike Lab ID: 1511265
Date Analyzed: 06/04/2019 14:51

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192542001

Results by **EPA 300.0**

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Chloride	5000	4980	100	(90-110)
Fluoride	5000	5020	100	(90-110)
Sulfate	5000	4940	99	(90-110)

Batch Information

Analytical Batch: **WIC5918**
Analytical Method: **EPA 300.0**
Instrument: **930 Metrohm compact IC flex**
Analyst: **DMM**

Prep Batch: **WXX12851**
Prep Method: **METHOD**
Prep Date/Time: **06/04/2019 10:45**
Spike Init Wt./Vol.: 5000 ug/L Extract Vol: 10 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1510901
MS Sample ID: 1511269 MS
MSD Sample ID: 1511270 MSD

QC for Samples: 1192542001

Analysis Date: 06/04/2019 15:48
Analysis Date: 06/04/2019 15:59
Analysis Date: 06/04/2019 16:20
Matrix: Water (Surface, Eff., Ground)

Results by **EPA 300.0**

		Matrix Spike (ug/L)				Spike Duplicate (ug/L)						
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Chloride	100U	5000	5540	111	*	5000	5630	113	*	90-110	1.50	(< 15)
Fluoride	100U	5000	4580	92		5000	4490	90	*	90-110	2.10	(< 15)
Sulfate	100U	5000	4650	93		5000	4720	94		90-110	1.50	(< 15)

Batch Information

Analytical Batch: WIC5918
Analytical Method: EPA 300.0
Instrument: 930 Metrohm compact IC flex
Analyst: DMM
Analytical Date/Time: 6/4/2019 3:59:54PM

Prep Batch: WXX12851
Prep Method: EPA 300.0 Extraction Waters/Liquids
Prep Date/Time: 6/4/2019 10:45:00AM
Prep Initial Wt./Vol.: 10.00mL
Prep Extract Vol: 10.00mL

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1192542

Chain of Custody & Sample Receipt Form for Private Drinking Water Analyses (Non-PWS

CLIENT INFORMATION

Company Name:	Phone:	Please indicate the water source for these samples:
Shannon + Wilson Fairbanks		
Contact: Kristen Freibuger		☐ Private residential well/water system
E-mail (Required for reporting):		☐ Mobile Food Cart
Address;		☐ Non-regulated private water system
City/State/Zip		☐ Other (please list): _____

SAMPLE INFORMATION — CAN KIT

Please complete all applicable fields below including sample location, collection date/time, and all analyses requested.

	Sample Identification/Location	Collection Date	Collection Time (am/pm)	Total Coliform SM9223B (Presence/Absence)	Total Nitrate/Nitrite (SM21 4500NO3-F)	Arsenic (As) by 200.8	PIWA (pH, Alk, TDS, Cond, other anions)	Other (Pb/Cu, VOC, 200.8 metals, etc)	Total Coliform (SM9223 Quantitray)–SEAWATER	SM9215 Heterotrophic Plate Count	
1	Eddie's Fireplace Inn	5/22/19	1330	X	X	X	X				

Collected/Relinquished By:	Date	Time	Received by Lab By:	Date	Time
			NJW	5/23/19	0822

Method of payment: ☐ prepaid ☐ cash ☐ check # ☐ credit card Amount paid: $

Sample Comments/Special Instructions:
PIWA COC filled out in lab using coliform COC. NJW 5/23/19

SAMPLE CONDITION (FOR LAB USE ONLY)

	yes	no	n/a
Are samples RUSH or SHORT HOLD TIME?	☐	☑	☐
If yes, have you notified the lab?	☐	☐	☑
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was pH verified and compliant?	☑	☐	☐
Are there any issues with the samples? (i.e. frozen, incorrect containers, past 30 hour hold time)	☐	☑	☐

Delivery Method: ☐ Client ☐ Alert Courier ☐ Other: _____

Temperature upon receipt (if applicable): 11.1 DSJ

This section used for immediate notification of UNSATISFACTORY coliform results only:

Analysis Began:		Reported to:	
Analyst:		Reported to:	

Result			Signature:	Initials	Date	Time
	Total Coliform					
	E.Coli/Fecal					
	Other Bacteria		Email Positive Total Coliforms/E.coli to Project Manager, QC Notices, Micro, and Data Management.			

SGS

Chain of Custody for Drinking Water
Total Coliform Bacteria Samples

200 West Potter Rd
Anchorage, AK 99518
(907) 562-2343

***Water System Name:**	
Contact: Mike Swain	
Email:	
Invoice to: Shannon + Wilson Fairbanks	
Phone:	Fax:
Address	
City:	State: Zip:
Purchase Order/AFE#: ATN Kristen Freiburger	
Additional Reports to: 907 458 3146	
***Sample Location:**	Eddie's Fireplace Inn
***Date/Time of Collection:**	05 (MM) 22 (DD) 2019 (YYYY) 1:30 (HH:MM) AM/PM
Sample Collector: Mike Swain (Signature) (Initials)	

Info Required for ADEC Submittal- ***Missing or incorrect info may result in a delay.***

***PWSID #:**	
***Facility ID:**	
***Sample Point:**	
***Residual Cl (mg/L):**	

1192542 0A

Analysis Requested

- ☐ SM9223B-Total Coli P/A (Default)
- ☐ SM9223-Total Coli Quantitray MPN
- ☐ SM9215-Heterotrophic Plate Count

Sample Type: ☐ Drinking Water ☐ Saltwater

Sample ID "Eddie's Fireplace Inn" per ziploc container that held sample containers. NSW 5/23/19

Received by: (Signature) NSW (Initials)	Date: 5/23/19 (MM/DD/YY) Time: 0822 (HH:MM)
Temperature: ☐Ambient or 11.1 °C NSW	Delivery: ☐ Client or ☒ Other (specify): Alert

Please note if the above information is missing it may result in late reporting to the state for compliance

Sample Condition:

- ☐ **Sample over 30 hours old, results may be unreliable.** ***Note: Source water HPC has 8 hour holding tim***
- ☐ **The sample was received frozen or with visible ice, and was rejected.**
- ☐ **The sample was not received in a laboratory issue, pre-sterilized container, and was rejected.**

This section used for immediate notification of UNSATISFACTORY results only:

Analysis Began:	☐ SM9223B Presence/Absence
Analyst:	☐ SM9223 QuantTray
Result: Total Coliform:	
Result: E. coli / Fecal Coliform:	
Result: Other Bacteria:	
Reported to:	By: Fax: Phone: Email:
Reported to:	By: Fax: Phone: Email:
Analyst: (Signature) (Initials) (Date/Time)	**Email Positive Total Coliform/E.coli to Project Manager, QC Notices, Micro, and Data Management. Notify ADEC if PWSID is present**

ACE AIR CARGO

GEN ☐ Standard Service

PRI ☐ Priority Service

ACEPAK ☐ Small Package Service

Airport of Departure

3171274 3171274

SHIPPER'S NAME AND ADDRESS: Johnson Drilling

SHIPPER'S ACCOUNT NUMBER: JODRCO

CONSIGNEE'S NAME AND ADDRESS: SGS 562-2343

CONSIGNEE'S ACCOUNT NUMBER

NOT NEGOTIABLE
AIR WAYBILL
(AIR CONSIGNMENT NOTE)

ACE Air Cargo
5901 LOCKHEED AVE.
ANCHORAGE, ALASKA 99502

Copies 1, 2, 3 and 4 of this Air Waybill are originals and have the same validity.

It is agreed that the goods described herein are accepted in apparent good order and condition (except as noted) for carriage SUBJECT TO THE CONDITIONS OF CONTRACT ON THE REVERSE HEREOF. THE SHIPPER'S ATTENTION IS DRAWN OF THE NOTICE CONCERNING CARRIERS' LIMITATION OF LIABILITY. Shipper may increase such limitation of liability by declaring a higher value for carriage and paying a supplemental charge if required. Shipper or his agent agrees to release carrier of any payment dispute between himself and the consignee by remitting unpaid freight charges within 48 hours of billing by carrier.

Received in Good Condition

Place 7:49 am Date 5-23-19

TO EXPEDITE MOVEMENT, SHIPMENT MAY BE DIVERTED TO MOTOR OR OTHER CARRIER AS PER TARIFF RULE UNLESS SHIPPER GIVES OTHER INSTRUCTIONS HEREON.

ISSUING CARRIER'S AGENT NAME AND CITY

ALSO NOTIFY NAME AND ADDRESS

CHECK ONE: ☐ DOMESTIC ☐ INTERNATIONAL

AGENT'S IATA CODE | ACCOUNT NO.

ACCOUNTING INFORMATION: PX-JODRCO

AIRPORT OF DEPARTURE (ADDR OF FIRST CARRIER) AND REQUESTED ROUTING: AKN

ROUTING AND DESTINATION: ANC | BY FIRST CARRIER: KO | TO | BY | TO | BY

CURRENCY: PX | CHGS CODE | WT/VAL PPD X COLL | OTHER PPD X COLL | DECLARED VALUE FOR CARRIAGE | DECLARED VALUE FOR CUSTOMS

AIRPORT OF DESTINATION: ANC | FOR CARRIER USE ONLY: FLIGHT/DATE | FLIGHT/DATE

AMOUNT OF INSURANCE

INSURANCE - If shipper requests insurance in accordance with conditions on reverse hereof, indicate amount to be insured in figures in box marked amount of insurance.

HANDLING INFORMATION These commodities licensed by US for ultimate destination. Diversion contrary to US law is prohibited.

NO. OF PIECES RCP	GROSS WEIGHT	kg/lb	RATE CLASS / COMMODITY ITEM NO.	CHARGEABLE WEIGHT	RATE / CHARGE	TOTAL	NATURE AND QUANTITY OF GOODS (INCL. DIMENSIONS OR VOLUME)
1	10		acepak 6	10	18-82	18-82	1 Red cooler
1	10					18.82	

PREPAID	WEIGHT CHARGE	COLLECT
A. 18-82		

VALUATION CHARGE: D.

TAX: I. 1.47

TOTAL OTHER CHARGES DUE AGENT

TOTAL OTHER CHARGES DUE CARRIER: 4.71

P-UP ZONE | PICKUP CHARGES B. | ORIGIN ADVANCE CHARGES K. | DESCRIPTION OF ORIGIN ADVANCE

DEL ZONE | DELIVERY CHARGES C. | DEST. ADVANCE CHARGES L. | DESCRIPTION OF DEST. ADVANCE

OTHER CHARGES AND DESCRIPTION: F. FSC 13%

HAZMAT: YES / NO (NO circled) | ITEMS PREPAID | ITEMS COLLECT

Shipper certifies that the particulars on the face hereof are correct and that insofar as any part of the consignment contains restricted articles, such part is properly described by name and is in proper condition for carriage by air according to applicable national government regulations, and for international shipments, the current International Air Transport Association's Dangerous Goods Regulations.

G. COD | CURRENCY | (AMOUNT TO BE ENTERED BY SHIPPER)

SIGNATURE OF SHIPPER OR HIS AGENT

TOTAL PREPAID: 20.00 | TOTAL COLLECT

CURRENCY CONVERSION RATES | TOTAL COLLECTION IN DESTINATION CURRENCY

5/22/19 AKN LE

(Date) (Time) at (Place) SIGNATURE OF ISSUING CARRIER OR ITS AGENT

FOR CARRIERS USE ONLY AT DESTINATION | CHARGES AT DESTINATION | (ALL COLLECT CHARGES IN DESTINATION CURRENCY)

Notified on-
Notified on-
Notified on-

3171274

COPY 5
AIRPORT OF DESTINATION

SIGNATURE | RELEASING AGENT | RELEASE TIME | RELEASE DATE

CHECK # | CC | CASH | PAID BY (CIRCLE ONE) | TOTAL AMOUNT

Alert Expeditors Inc. #393414

Citywide Delivery • 440-3351
8421 Flamingo Drive • Anchorage, Alaska 99502

Date 5-23-19

From Johnson Drilling

To SGS Labs Anc

Collect ☐	Prepay ☐ Account ☐	Advance Charges ☐
Job #	PO# Acc 3171274	

Samples

Shipped Signature

Total Charge

Received By:

e-Sample Receipt Form

SGS Workorder #: 1192542

1 1 9 2 5 4 2

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		N/A Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	No	Cooler ID: 1 @ 11.1 °C Therm. ID: D51
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	
If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		**Proceed outside of temp per client.**
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)? **Note: If times differ <1hr, record details & login per COC. ***Note: If sample information on containers differs from COC, SGS will default to COC informatio	Yes	
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
		N/A ***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	N/A	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1192542001-A	Na2S2O3 for Chlorine Redu	OK			
1192542001-B	HNO3 to pH < 2	OK			
1192542001-C	H2SO4 to pH < 2	OK			
1192542001-D	No Preservative Required	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

Laboratory Report of Analysis

To: Shannon & Wilson-Fairbanks
2355 Hill Rd.
Fairbanks, AK 99701
(907)479-0600

Report Number: **1192543**

Client Project: **Const Yard Well**

Dear Kristen Freiburger,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Jennifer at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

_____

Jennifer Dawkins Date
Project Manager
Jennifer.Dawkins@sgs.com

Case Narrative

SGS Client: Shannon & Wilson-Fairbanks

SGS Project: 1192543

Project Name/Site: Const Yard Well

Refer to sample receipt form for information on sample condition.

WTI/5192] **1509502 MB**
2510B - Conductivity - Conducitivity of the MB was detected above the LOQ. Associated samples are greater than 10X the MB conductivity.

* QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to the associated field samples.

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
Const Yard Well	1192543001	05/22/2019	05/23/2019	Drinking Water

Method	Method Description
SM21 2320B	Alkalinity as CaCO3 w/ PIWA
SM21 2510B	Conductivity SM2510B w/ PIWA
SM21 2340B	Hardness as CaCO3 by ICP-MS
EPA 300.0	Ion Chromatographic Analysis w/ PIWA
EP200.8	Metals in Water by ICP-MS PIWA
SM21 4500NO3-F	Nitrate/Nitrite Flow injection Pres.
SM21 4500-H B	pH Analysis w/ PIWA
SM21 9223B	Total Coliform P/A Qualitative
SM21 2540C	Total Dissolved Solids SM182540C w/PIWA

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Detectable Results Summary

Client Sample ID: **Const Yard Well**
Lab Sample ID: 1192543001

Metals by ICP/MS
Microbiology Laboratory

Private Individual Analysis

Parameter	Result	Units
Hardness as CaCO3	46500	ug/L
E. Coli	Negative	100mL
Total Coliform	Negative	100mL
Alkalinity	50500	ug/L
Calcium	9990	ug/L
Chloride	3590	ug/L
Conductivity	121	umhos/cm
Copper	2.17	ug/L
HCO3 Alkalinity	50500	ug/L
Iron	428	ug/L
Lead	0.243	ug/L
Magnesium	5230	ug/L
Manganese	329	ug/L
pH	7.8	pH units
Potassium	2570	ug/L
Sodium	5240	ug/L
Sulfate	5180	ug/L

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Results of **Const Yard Well**

Client Sample ID: **Const Yard Well**
Client Project ID: **Const Yard Well**
Lab Sample ID: 1192543001
Lab Project ID: 1192543

Collection Date: 05/22/19 10:00
Received Date: 05/23/19 08:22
Matrix: Drinking Water
Solids (%):
Location:

Results by

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Dissolved Solids	106000	*	10000	3100	ug/L	1	(<500)	05/24/19 15:53

Batch Information

Analytical Batch: STS6283
Analytical Method: SM21 2540C
Analyst: EWW
Analytical Date/Time: 05/24/19 15:53
Container ID: 1192543001-A

Print Date: 06/07/2019 11:22:18AM

Results of **Const Yard Well**

Client Sample ID: **Const Yard Well**
Client Project ID: **Const Yard Well**
Lab Sample ID: 1192543001
Lab Project ID: 1192543

Collection Date: 05/22/19 10:00
Received Date: 05/23/19 08:22
Matrix: Drinking Water
Solids (%):
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Hardness as CaCO3	46500		5000	5000	ug/L	1		05/31/19 18:57

Batch Information

Analytical Batch: MMS10525
Analytical Method: SM21 2340B
Analyst: DSH
Analytical Date/Time: 05/31/19 18:57
Container ID: 1192543001-C

Prep Batch: MXX32449
Prep Method: E200.2
Prep Date/Time: 05/31/19 08:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Results of **Const Yard Well**

Client Sample ID: **Const Yard Well**
Client Project ID: **Const Yard Well**
Lab Sample ID: 1192543001
Lab Project ID: 1192543

Collection Date: 05/22/19 10:00
Received Date: 05/23/19 08:22
Matrix: Drinking Water
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
E. Coli	Negative		1	1	100mL	1		05/23/19 15:23
Total Coliform	Negative		1	1	100mL	1		05/23/19 15:23

Batch Information

Analytical Batch: BTF17361
Analytical Method: SM21 9223B
Analyst: ACF
Analytical Date/Time: 05/23/19 15:23
Container ID: 1192543001-B

Print Date: 06/07/2019 11:22:18AM

Results of **Const Yard Well**

Client Sample ID: **Const Yard Well**
Client Project ID: **Const Yard Well**
Lab Sample ID: 1192543001
Lab Project ID: 1192543

Collection Date: 05/22/19 10:00
Received Date: 05/23/19 08:22
Matrix: Drinking Water
Solids (%):
Location:

Results by **Private Individual Analysis**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Aluminum	20.0	U	20.0	6.20	ug/L	1		05/31/19 18:57
Antimony	1.00	U	1.00	0.310	ug/L	1	(<6)	05/31/19 18:57
Arsenic	5.00	U	5.00	1.50	ug/L	1	(<10)	05/31/19 18:57
Barium	3.00	U	3.00	0.940	ug/L	1	(<2000)	05/31/19 18:57
Cadmium	0.500	U	0.500	0.150	ug/L	1	(<5)	05/31/19 18:57
Calcium	9990		500	150	ug/L	1		05/31/19 18:57
Chromium	2.00	U	2.00	0.800	ug/L	1	(<100)	05/31/19 18:57
Copper	2.17		1.00	0.310	ug/L	1	(<1000)	05/31/19 18:57
Iron	428	*	250	78.0	ug/L	1	(<300)	05/31/19 18:57
Lead	0.243		0.200	0.0700	ug/L	1	(<15)	05/31/19 18:57
Magnesium	5230		50.0	15.0	ug/L	1		05/31/19 18:57
Manganese	329	*	1.00	0.350	ug/L	1	(<50)	05/31/19 18:57
Nickel	2.00	U	2.00	0.620	ug/L	1	(<100)	05/31/19 18:57
Potassium	2570		500	150	ug/L	1		05/31/19 18:57
Selenium	5.00	U	5.00	1.50	ug/L	1	(<50)	05/31/19 18:57
Silver	1.00	U	1.00	0.310	ug/L	1	(<100)	05/31/19 18:57
Sodium	5240		500	150	ug/L	1		05/31/19 18:57
Thallium	1.00	U	1.00	0.310	ug/L	1	(<2)	05/31/19 18:57
Zinc	10.0	U	10.0	3.10	ug/L	1	(<5000)	05/31/19 18:57

Batch Information

Analytical Batch: MMS10525
Analytical Method: EP200.8
Analyst: DSH
Analytical Date/Time: 05/31/19 18:57
Container ID: 1192543001-C

Prep Batch: MXX32449
Prep Method: E200.2
Prep Date/Time: 05/31/19 08:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloride	3590	*	200	50.0	ug/L	1	(<250)	06/04/19 18:53
Fluoride	200	U	200	50.0	ug/L	1	(<2)	06/04/19 18:53
Sulfate	5180	*	200	50.0	ug/L	1	(<250)	06/04/19 18:53

Print Date: 06/07/2019 11:22:18AM

Results of **Const Yard Well**

Client Sample ID: **Const Yard Well**
Client Project ID: **Const Yard Well**
Lab Sample ID: 1192543001
Lab Project ID: 1192543

Collection Date: 05/22/19 10:00
Received Date: 05/23/19 08:22
Matrix: Drinking Water
Solids (%):
Location:

Results by **Private Individual Analysis**

Batch Information

Analytical Batch: WIC5918
Analytical Method: EPA 300.0
Analyst: DMM
Analytical Date/Time: 06/04/19 18:53
Container ID: 1192543001-A

Prep Batch: WXX12851
Prep Method: METHOD
Prep Date/Time: 06/04/19 10:45
Prep Initial Wt./Vol.: 10 mL
Prep Extract Vol: 10 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Alkalinity	50500		10000	2500	ug/L	1		05/24/19 11:14
CO3 Alkalinity	10000 U		10000	2500	ug/L	1		05/24/19 11:14
HCO3 Alkalinity	50500		10000	2500	ug/L	1		05/24/19 11:14
OH Alkalinity	10000 U		10000	2500	ug/L	1		05/24/19 11:14

Batch Information

Analytical Batch: WTI5193
Analytical Method: SM21 2320B
Analyst: EWW
Analytical Date/Time: 05/24/19 11:14
Container ID: 1192543001-A

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Conductivity	121		1.00	0.477	umhos/cm	1		05/24/19 11:14

Batch Information

Analytical Batch: WTI5192
Analytical Method: SM21 2510B
Analyst: EWW
Analytical Date/Time: 05/24/19 11:14
Container ID: 1192543001-A

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
pH	7.8		0.100	0.100	pH units	1	(6.5-8.5)	05/24/19 11:14

Print Date: 06/07/2019 11:22:18AM

Results of **Const Yard Well**

Client Sample ID: **Const Yard Well**
Client Project ID: **Const Yard Well**
Lab Sample ID: 1192543001
Lab Project ID: 1192543

Collection Date: 05/22/19 10:00
Received Date: 05/23/19 08:22
Matrix: Drinking Water
Solids (%):
Location:

Results by **Private Individual Analysis**

Batch Information

Analytical Batch: WTI5191
Analytical Method: SM21 4500-H B
Analyst: EWW
Analytical Date/Time: 05/24/19 11:14
Container ID: 1192543001-A

Print Date: 06/07/2019 11:22:18AM

Results of **Const Yard Well**

Client Sample ID: **Const Yard Well**
Client Project ID: **Const Yard Well**
Lab Sample ID: 1192543001
Lab Project ID: 1192543

Collection Date: 05/22/19 10:00
Received Date: 05/23/19 08:22
Matrix: Drinking Water
Solids (%):
Location:

Results by **Waters Department**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Nitrate/Nitrite-N	200	U	200	50.0	ug/L	2	(<10)	05/24/19 13:45

Batch Information

Analytical Batch: WFI2818
Analytical Method: SM21 4500NO3-F
Analyst: EWW
Analytical Date/Time: 05/24/19 13:45
Container ID: 1192543001-D

Print Date: 06/07/2019 11:22:18AM

Method Blank

Blank ID: MB for HBN 1794135 [BTF/17361]
Blank Lab ID: 1509094

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192543001

Results by **SM21 9223B**

Parameter	Results	LOQ/CL	DL	Units
E. Coli	Negative	1	1	100mL
Total Coliform	Negative	1	1	100mL

Batch Information

Analytical Batch: BTF17361
Analytical Method: SM21 9223B
Instrument:
Analyst: ACF
Analytical Date/Time: 5/23/2019 12:10:00PM

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Method Blank

Blank ID: MB for HBN 1794365 [MXX/32449]
Blank Lab ID: 1510152

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192543001

Results by **EP200.8**

Parameter	Results	LOQ/CL	DL	Units
Aluminum	10.0U	20.0	6.20	ug/L
Antimony	0.500U	1.00	0.310	ug/L
Arsenic	2.50U	5.00	1.50	ug/L
Barium	1.50U	3.00	0.940	ug/L
Cadmium	0.250U	0.500	0.150	ug/L
Calcium	250U	500	150	ug/L
Chromium	1.00U	2.00	0.800	ug/L
Copper	0.500U	1.00	0.310	ug/L
Iron	125U	250	78.0	ug/L
Lead	0.0833J	0.200	0.0700	ug/L
Magnesium	25.0U	50.0	15.0	ug/L
Manganese	0.500U	1.00	0.350	ug/L
Nickel	1.00U	2.00	0.620	ug/L
Potassium	250U	500	150	ug/L
Selenium	2.50U	5.00	1.50	ug/L
Silver	0.500U	1.00	0.310	ug/L
Sodium	250U	500	150	ug/L
Thallium	0.500U	1.00	0.310	ug/L
Zinc	5.00U	10.0	3.10	ug/L

Batch Information

Analytical Batch: MMS10525
Analytical Method: EP200.8
Instrument: Perkin Elmer Nexlon P5
Analyst: DSH
Analytical Date/Time: 5/31/2019 6:48:54PM

Prep Batch: MXX32449
Prep Method: E200.2
Prep Date/Time: 5/31/2019 8:00:47AM
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1192543 [MXX32449]
Blank Spike Lab ID: 1510153
Date Analyzed: 05/31/2019 18:51

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192543001

Results by **EP200.8**

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Aluminum	1000	1070	107	(85-115)
Antimony	1000	1050	105	(85-115)
Arsenic	1000	1000	100	(85-115)
Barium	1000	991	99	(85-115)
Cadmium	100	102	102	(85-115)
Calcium	10000	10200	102	(85-115)
Chromium	400	406	101	(85-115)
Copper	1000	1050	105	(85-115)
Iron	5000	5050	101	(85-115)
Lead	1000	1070	107	(85-115)
Magnesium	10000	10800	108	(85-115)
Manganese	500	531	106	(85-115)
Nickel	1000	1040	104	(85-115)
Potassium	10000	10200	102	(85-115)
Selenium	1000	1040	104	(85-115)
Silver	100	97.7	98	(85-115)
Sodium	10000	10600	106	(85-115)
Thallium	10	10.2	102	(85-115)
Zinc	1000	1090	109	(85-115)

Batch Information

Analytical Batch: **MMS10525**
Analytical Method: **EP200.8**
Instrument: **Perkin Elmer Nexlon P5**
Analyst: **DSH**

Prep Batch: **MXX32449**
Prep Method: **E200.2**
Prep Date/Time: **05/31/2019 08:00**
Spike Init Wt./Vol.: 1000 ug/L Extract Vol: 50 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 06/07/2019 11:22:24AM

Matrix Spike Summary

Original Sample ID: 1510155
MS Sample ID: 1510156 MS
MSD Sample ID:

QC for Samples: 1192543001

Analysis Date: 05/31/2019 18:57
Analysis Date: 05/31/2019 19:00
Analysis Date:
Matrix: Water (Surface, Eff., Ground)

Results by **EP200.8**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Aluminum	6.63J	1000	1030	102				70-130		
Antimony	0.500U	1000	1070	107				70-130		
Arsenic	2.50U	1000	1000	100				70-130		
Barium	2.41J	1000	992	99				70-130		
Cadmium	0.250U	100	101	101				70-130		
Calcium	9990	10000	19500	95				70-130		
Chromium	1.00U	400	393	98				70-130		
Copper	2.17	1000	1060	105				70-130		
Iron	428	5000	5440	100				70-130		
Lead	0.243	1000	1060	106				70-130		
Magnesium	5230	10000	15700	105				70-130		
Manganese	329	500	851	104				70-130		
Nickel	0.703J	1000	1060	106				70-130		
Potassium	2570	10000	12300	97				70-130		
Selenium	2.50U	1000	1020	102				70-130		
Silver	0.500U	100	96.9	97				70-130		
Sodium	5240	10000	15400	102				70-130		
Thallium	0.500U	10.0	10.1	101				70-130		
Zinc	8.10J	1000	1070	106				70-130		

Batch Information

Analytical Batch: MMS10525
Analytical Method: EP200.8
Instrument: Perkin Elmer NexIon P5
Analyst: DSH
Analytical Date/Time: 5/31/2019 7:00:50PM

Prep Batch: MXX32449
Prep Method: DW Digest for Metals on ICP-MS
Prep Date/Time: 5/31/2019 8:00:47AM
Prep Initial Wt./Vol.: 20.00mL
Prep Extract Vol: 50.00mL

Print Date: 06/07/2019 11:22:25AM

Method Blank

Blank ID: MB for HBN 1794172 [STS/6283]
Blank Lab ID: 1509260

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192543001

Results by **SM21 2540C**

Parameter	Results	LOQ/CL	DL	Units
Total Dissolved Solids	7000J	10000	3100	ug/L

Batch Information

Analytical Batch: STS6283
Analytical Method: SM21 2540C
Instrument:
Analyst: EWW
Analytical Date/Time: 5/24/2019 3:53:46PM

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Duplicate Sample Summary

Original Sample ID: 1192528001
Duplicate Sample ID: 1509263
QC for Samples:
1192543001

Analysis Date: 05/24/2019 15:53
Matrix: Drinking Water

Results by **SM21 2540C**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Dissolved Solids	163000	171000	ug/L	4.80	(< 5)

Batch Information

Analytical Batch: STS6283
Analytical Method: SM21 2540C
Instrument:
Analyst: EWW

Print Date: 06/07/2019 11:22:30AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1192543 [STS6283]
Blank Spike Lab ID: 1509261
Date Analyzed: 05/24/2019 15:53

Spike Duplicate ID: LCSD for HBN 1192543 [STS6283]
Spike Duplicate Lab ID: 1509262
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192543001

Results by **SM21 2540C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Total Dissolved Solids	333000	314000	94	333000	325000	98	(75-125)	3.40	(< 5)

Batch Information

Analytical Batch: **STS6283**
Analytical Method: **SM21 2540C**
Instrument:
Analyst: **EWW**

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Method Blank

Blank ID: MB for HBN 1794221 (WFI/2818)
Blank Lab ID: 1509577

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by **SM21 4500NO3-F**

Parameter	Results	LOQ/CL	DL	Units
Nitrate-N	100U	200	50.0	ug/L
Nitrite-N	100U	200	50.0	ug/L
Total Nitrate/Nitrite-N	54.6J	200	50.0	ug/L

Batch Information

Analytical Batch: WFI2818
Analytical Method: SM21 4500NO3-F
Instrument: Astoria segmented flow
Analyst: EWW
Analytical Date/Time: 5/24/2019 12:18:27PM

Method Blank

Blank ID: MB for HBN 1794221 (WFI/2818)
Blank Lab ID: 1509579

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192543001

Results by **SM21 4500NO3-F**

Parameter	Results	LOQ/CL	DL	Units
Nitrate-N	100U	200	50.0	ug/L
Nitrite-N	100U	200	50.0	ug/L
Total Nitrate/Nitrite-N	55.4J	200	50.0	ug/L

Batch Information

Analytical Batch: WFI2818
Analytical Method: SM21 4500NO3-F
Instrument: Astoria segmented flow
Analyst: EWW
Analytical Date/Time: 5/24/2019 1:03:57PM

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Method Blank

Blank ID: MB for HBN 1794221 (WFI/2818)
Blank Lab ID: 1509581

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192543001

Results by **SM21 4500NO3-F**

Parameter	Results	LOQ/CL	DL	Units
Nitrate-N	100U	200	50.0	ug/L
Nitrite-N	100U	200	50.0	ug/L
Total Nitrate/Nitrite-N	58.8J	200	50.0	ug/L

Batch Information

Analytical Batch: WFI2818
Analytical Method: SM21 4500NO3-F
Instrument: Astoria segmented flow
Analyst: EWW
Analytical Date/Time: 5/24/2019 2:03:27PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1192543 [WFI2818]
Blank Spike Lab ID: 1509576
Date Analyzed: 05/24/2019 12:16

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by **SM21 4500NO3-F**

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Nitrate-N	2500	2600	104	(70-130)
Nitrite-N	2500	2620	105	(90-110)
Total Nitrate/Nitrite-N	5000	5230	105	(90-110)

Batch Information

Analytical Batch: **WFI2818**
Analytical Method: **SM21 4500NO3-F**
Instrument: **Astoria segmented flow**
Analyst: **EWW**

Print Date: 06/07/2019 11:22:35AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1192543 [WFI2818]
Blank Spike Lab ID: 1509578
Date Analyzed: 05/24/2019 13:02

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192543001

Results by **SM21 4500NO3-F**

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Nitrate-N	2500	2460	99	(70-130)
Nitrite-N	2500	2420	97	(90-110)
Total Nitrate/Nitrite-N	5000	4880	98	(90-110)

Batch Information

Analytical Batch: **WFI2818**
Analytical Method: **SM21 4500NO3-F**
Instrument: **Astoria segmented flow**
Analyst: **EWW**

Print Date: 06/07/2019 11:22:35AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1192543 [WFI2818]
Blank Spike Lab ID: 1509580
Date Analyzed: 05/24/2019 14:01

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192543001

Results by **SM21 4500NO3-F**

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Nitrate-N	2500	2680	107	(70-130)
Nitrite-N	2500	2580	103	(90-110)
Total Nitrate/Nitrite-N	5000	5260	105	(90-110)

Batch Information

Analytical Batch: **WFI2818**
Analytical Method: **SM21 4500NO3-F**
Instrument: **Astoria segmented flow**
Analyst: **EWW**

Print Date: 06/07/2019 11:22:35AM

Matrix Spike Summary

Original Sample ID: 1192450001
MS Sample ID: 1509547 MS
MSD Sample ID: 1509548 MSD

QC for Samples: 1192543001

Analysis Date: 05/24/2019 13:52
Analysis Date: 05/24/2019 13:54
Analysis Date: 05/24/2019 13:56
Matrix: Drinking Water

Results by **SM21 4500NO3-F**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Total Nitrate/Nitrite-N	8720	20000	32100	117 *	20000	31400	114 *	90-110	2.10	(< 25)

Batch Information

Analytical Batch: WFI2818
Analytical Method: SM21 4500NO3-F
Instrument: Astoria segmented flow
Analyst: EWW
Analytical Date/Time: 5/24/2019 1:54:42PM

Print Date: 06/07/2019 11:22:36AM

Matrix Spike Summary

Original Sample ID: 1192511001
MS Sample ID: 1509549 MS
MSD Sample ID: 1509550 MSD

QC for Samples: 1192543001

Analysis Date: 05/24/2019 12:23
Analysis Date: 05/24/2019 12:25
Analysis Date: 05/24/2019 12:27
Matrix: Drinking Water

Results by **SM21 4500NO3-F**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Total Nitrate/Nitrite-N	13800	25000	38600	99	25000	40500	107	90-110	5.00	(< 25)

Batch Information

Analytical Batch: WFI2818
Analytical Method: SM21 4500NO3-F
Instrument: Astoria segmented flow
Analyst: EWW
Analytical Date/Time: 5/24/2019 12:25:27PM

Print Date: 06/07/2019 11:22:36AM

Duplicate Sample Summary

Original Sample ID: 1192528001
Duplicate Sample ID: 1509498
QC for Samples:
1192543001

Analysis Date: 05/24/2019 10:55
Matrix: Drinking Water

Results by **SM21 4500-H B**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
pH	7.0	7.00	pH units	0.00	(< 5)

Batch Information

Analytical Batch: WTI5191
Analytical Method: SM21 4500-H B
Instrument: Titration
Analyst: EWW

Print Date: 06/07/2019 11:22:39AM

Duplicate Sample Summary

Original Sample ID: 1192579002
Duplicate Sample ID: 1509499
QC for Samples:
1192543001

Analysis Date: 05/24/2019 12:09
Matrix: Water (Surface, Eff., Ground)

Results by **SM21 4500-H B**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
pH	7.8	7.90	pH units	1.30	(< 5)

Batch Information

Analytical Batch: WTI5191
Analytical Method: SM21 4500-H B
Instrument: Titration
Analyst: EWW

Print Date: 06/07/2019 11:22:39AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1192543 [WTI5191]
Blank Spike Lab ID: 1509495
Date Analyzed: 05/24/2019 09:18

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192543001

Results by **SM21 4500-H B**

Blank Spike (pH units)

Parameter	Spike	Result	Rec (%)	CL
pH	6.98	7.01	100	(99-101)

Batch Information

Analytical Batch: **WTI5191**
Analytical Method: **SM21 4500-H B**
Instrument: **Titration**
Analyst: **EWW**

Print Date: 06/07/2019 11:22:39AM

Method Blank

Blank ID: MB for HBN 1794212 [WTI/5192]
Blank Lab ID: 1509502

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192543001

Results by **SM21 2510B**

Parameter	Results	LOQ/CL	DL	Units
Conductivity	1.90*	1.00	0.477	umhos/cm

Batch Information

Analytical Batch: WTI5192
Analytical Method: SM21 2510B
Instrument: Titration
Analyst: EWW
Analytical Date/Time: 5/24/2019 9:43:24AM

Print Date: 06/07/2019 11:22:41AM

Duplicate Sample Summary

Original Sample ID: 1192528001
Duplicate Sample ID: 1509503
QC for Samples:
1192543001

Analysis Date: 05/24/2019 10:55
Matrix: Drinking Water

Results by **SM21 2510B**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Conductivity	234	234	umhos/cm	0.00	(< 20)

Batch Information

Analytical Batch: WTI5192
Analytical Method: SM21 2510B
Instrument: Titration
Analyst: EWW

Print Date: 06/07/2019 11:22:42AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1192543 [WTI5192]
Blank Spike Lab ID: 1509501
Date Analyzed: 05/24/2019 09:12

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192543001

Results by **SM21 2510B**

Blank Spike (umhos/cm)

Parameter	Spike	Result	Rec (%)	CL
Conductivity	10.1	10.9	108	(90-110)

Batch Information

Analytical Batch: **WTI5192**
Analytical Method: **SM21 2510B**
Instrument: **Titration**
Analyst: **EWW**

Print Date: 06/07/2019 11:22:43AM

Method Blank

Blank ID: MB for HBN 1794213 [WTI/5193]
Blank Lab ID: 1509504

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192543001

Results by **SM21 2320B**

Parameter	Results	LOQ/CL	DL	Units
Alkalinity	3150J	10000	2500	ug/L

Batch Information

Analytical Batch: WTI5193
Analytical Method: SM21 2320B
Instrument: Titration
Analyst: EWW
Analytical Date/Time: 5/24/2019 9:43:24AM

Print Date: 06/07/2019 11:22:44AM

Duplicate Sample Summary

Original Sample ID: 1192528001
Duplicate Sample ID: 1509506
QC for Samples:
1192543001

Analysis Date: 05/24/2019 10:55
Matrix: Drinking Water

Results by **SM21 2320B**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Alkalinity	91200	91230	ug/L	0.08	(< 25)

Batch Information

Analytical Batch: WTI5193
Analytical Method: SM21 2320B
Instrument: Titration
Analyst: EWW

Print Date: 06/07/2019 11:22:45AM

Duplicate Sample Summary

Original Sample ID: 1192579002
Duplicate Sample ID: 1509507
QC for Samples:
1192543001

Analysis Date: 05/24/2019 12:09
Matrix: Water (Surface, Eff., Ground)

Results by **SM21 2320B**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Alkalinity	42100	42150	ug/L	0.10	(< 25)

Batch Information

Analytical Batch: WTI5193
Analytical Method: SM21 2320B
Instrument: Titration
Analyst: EWW

Print Date: 06/07/2019 11:22:45AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1192543 [WTI5193]
Blank Spike Lab ID: 1509505
Date Analyzed: 05/24/2019 09:52

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192543001

Results by **SM21 2320B**

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Alkalinity	250000	238000	95	(85-115)

Batch Information

Analytical Batch: **WTI5193**
Analytical Method: **SM21 2320B**
Instrument: **Titration**
Analyst: **EWW**

Print Date: 06/07/2019 11:22:47AM

Method Blank

Blank ID: MB for HBN 1794605 [WXX/12851]
Blank Lab ID: 1511264

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192543001

Results by **EPA 300.0**

Parameter	Results	LOQ/CL	DL	Units
Chloride	100U	200	50.0	ug/L
Fluoride	100U	200	50.0	ug/L
Sulfate	100U	200	50.0	ug/L

Batch Information

Analytical Batch: WIC5918
Analytical Method: EPA 300.0
Instrument: 930 Metrohm compact IC flex
Analyst: DMM
Analytical Date/Time: 6/4/2019 2:32:42PM

Prep Batch: WXX12851
Prep Method: METHOD
Prep Date/Time: 6/4/2019 10:45:00AM
Prep Initial Wt./Vol.: 10 mL
Prep Extract Vol: 10 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1192543 [WXX12851]
Blank Spike Lab ID: 1511265
Date Analyzed: 06/04/2019 14:51

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192543001

Results by **EPA 300.0**

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Chloride	5000	4980	100	(90-110)
Fluoride	5000	5020	100	(90-110)
Sulfate	5000	4940	99	(90-110)

Batch Information

Analytical Batch: **WIC5918**
Analytical Method: **EPA 300.0**
Instrument: **930 Metrohm compact IC flex**
Analyst: **DMM**

Prep Batch: **WXX12851**
Prep Method: **METHOD**
Prep Date/Time: **06/04/2019 10:45**
Spike Init Wt./Vol.: 5000 ug/L Extract Vol: 10 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1510901
MS Sample ID: 1511269 MS
MSD Sample ID: 1511270 MSD

QC for Samples: 1192543001

Analysis Date: 06/04/2019 15:48
Analysis Date: 06/04/2019 15:59
Analysis Date: 06/04/2019 16:20
Matrix: Water (Surface, Eff., Ground)

Results by **EPA 300.0**

		Matrix Spike (ug/L)				Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Chloride	100U	5000	5540	111	*	5000	5630	113	*	90-110	1.50	(< 15)
Fluoride	100U	5000	4580	92		5000	4490	90	*	90-110	2.10	(< 15)
Sulfate	100U	5000	4650	93		5000	4720	94		90-110	1.50	(< 15)

Batch Information

Analytical Batch: WIC5918
Analytical Method: EPA 300.0
Instrument: 930 Metrohm compact IC flex
Analyst: DMM
Analytical Date/Time: 6/4/2019 3:59:54PM

Prep Batch: WXX12851
Prep Method: EPA 300.0 Extraction Waters/Liquids
Prep Date/Time: 6/4/2019 10:45:00AM
Prep Initial Wt./Vol.: 10.00mL
Prep Extract Vol: 10.00mL

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1192543

Locations Nationwide

Alaska	Maryland
New Jersey	New York
North Carolina	Florida

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Section 1

CLIENT: Johnson Drilling Co

CONTACT: Steve W Thomas — PHONE #: 907 250 5051

PROJECT NAME: Const. Yard well — PROJECT/PERMIT#:

REPORTS TO: Shannon & Wilson — E-MAIL: krf@shanwil.com — Profile #:

INVOICE TO: Shannon & Wilson 2355 Hill Rd, Fbks — QUOTE #: Attn: Kristen — P.O.#: 99709

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Page ____ of ____

Section 3 — Preservative

Info Required for ADEC Submittal - Missing or incorrect info may result in a delay. Information may be found on your ADEC Monitoring Summary.

Section 2

RESERVED for lab use	Sample Location	Date of Collection	Time of Collection	# CONTAINERS	Comp / Grab	Analysis: ATEX				PWSID#	FAC ID #	Sample Pt. ID
(1) A-D												

Section 5

	Date	Time	
Relinquished By: (1)			Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	Date NSW 5/23/19 5/23/19	Time 0822	Received For Laboratory By: NSW

Section 4

Cooler ID: _____

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 11.1 DS1 or Ambient [ ]

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Delivery Method: Hand Delivery[ ] Commerical Delivery

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F083-Blank_COC_DWLong_20190104

SGS

Chain of Custody for Drinking Water
Total Coliform Bacteria Samples

200 West Potter Rd
Anchorage, AK 99518
(907) 562-2343

*Water System Name:	
Contact: Steve W Thomas	
Email: jdc@gci.net	
Invoice to: Shannon & Wilson Attn Kristen	
Phone: 907 458 3146 Fax:	
Address 2355 Hill Rd	
City: Fairbanks State: AK Zip: 99709	
Purchase Order/AFE#:	
Additional Reports to:	
*Sample Location: Const. Yard Well NSW 5/23/19	
*Date/Time of Collection: 05 (MM) 22 (DD) 2019 (YYYY) 10:00 (HH:MM) AM/PM	

Info Required for ADEC Submittal- *Missing or incorrect info may result in a delay.*

*PWSID #:	
*Facility ID:	
*Sample Point:	
*Residual Cl (mg/L):	

1192543 (1B)

Sample Collector: Steve W Thomas ST
Signature Initials
jdc@gci.net 907 250 5051

Analysis Requested

- ☐ SM9223B-Total Coli P/A (Default)
- ☐ SM9223-Total Coli Quantitray MPN
- ☐ SM9215-Heterotrophic Plate Count

Sample Type: ☑ Drinking Water ☐ Saltwater

Received by: NSW
Signature Initials

Date: 5/23/19 Time: 0822
MM/DD/YY HH:MM

Temperature: ☐Ambient or ___.___°C

Delivery: ☐ Client or ☐ Other (specify):_____

Please note if the above information is missing it may result in late reporting to the state for compliance

Sample Condition:

- ☐ **Sample over 30 hours old, results may be unreliable.** ***Note: Source water HPC has 8 hour holding tin***
- ☐ **The sample was received frozen or with visible ice, and was rejected.**
- ☐ **The sample was not received in a laboratory issue, pre-sterilized container, and was rejected.**

This section used for immediate notification of UNSATISFACTORY results only:

Analysis Began:	☐ SM9223B Presence/Absence
Analyst:	☐ SM9223 QuantTray
Result: Total Coliform:	
E. coli / Fecal Coliform:	
Other Bacteria:	
Reported to:	By: Fax:_____ Phone:_____ Email:_____
Reported to:	By: Fax:_____ Phone:_____ Email:_____
Analyst:	

Signature Initials Date/Time

Email Positive Total Coliform/E.coli to Project Manager, QC Notices, Micro, and Data Management. Notify ADEC if PWSID is present

Alert Expeditors Inc. **#393414**

Citywide Delivery • 440-3351
8421 Flamingo Drive • Anchorage, Alaska 99502

Date 5-23-19

From Johnson Drilling

To SGS Labs Anc

Collect ☐	Prepay ☐ Account ☐	Advance Charges ☐
Job #	PO# Acc 3171274	

Samples

Shipped Signature

Total Charge

Received By: 822

ACE AIR CARGO

GEN ☐ Standard Service

PRI ☐ Priority Service

ACEPAK ☐ Small Package Service

Airport of Departure

3171274 **3171274**

SHIPPER'S NAME AND ADDRESS	SHIPPER'S ACCOUNT NUMBER
Johnson Drilling	Jodrco

NOT NEGOTIABLE
AIR WAYBILL
(AIR CONSIGNMENT NOTE)

ACE Air Cargo
5901 LOCKHEED AVE.
ANCHORAGE, ALASKA 99502

Copies 1, 2, 3 and 4 of this Air Waybill are originals and have the same validity.

CONSIGNEE'S NAME AND ADDRESS	CONSIGNEE'S ACCOUNT NUMBER
SGS 562-2343	

It is agreed that the goods described herein are accepted in apparent good order and condition (except as noted) for carriage SUBJECT TO THE CONDITIONS OF CONTRACT ON THE REVERSE HEREOF. THE SHIPPER'S ATTENTION IS DRAWN OF THE NOTICE CONCERNING CARRIERS' LIMITATION OF LIABILITY. Shipper may increase such limitation of liability by declaring a higher value for carriage and paying a supplemental charge if required. Shipper or his agent agrees to release carrier of any payment dispute between himself and the consignee by remitting unpaid freight charges within 48 hours of billing by carrier.

Received in Good Condition ______

Place ______ Date 5-23-19

TO EXPEDITE MOVEMENT, SHIPMENT MAY BE DIVERTED TO MOTOR OR OTHER CARRIER AS PER TARIFF RULE UNLESS SHIPPER GIVES OTHER INSTRUCTIONS HEREON.

ISSUING CARRIER'S AGENT NAME AND CITY

ALSO NOTIFY NAME AND ADDRESS

CHECK ONE: ☐ DOMESTIC ☐ INTERNATIONAL

AGENT'S IATA CODE	ACCOUNT NO.	ACCOUNTING INFORMATION
		PX-JODRCO

AIRPORT OF DEPARTURE (ADDR OF FIRST CARRIER) AND REQUESTED ROUTING: AKN

ROUTING AND DESTINATION

TO	BY FIRST CARRIER	TO	BY	TO	BY
	KO				

CURRENCY	CHGS CODE	WT/VAL PPD	WT/VAL COLL	OTHER PPD	OTHER COLL	DECLARED VALUE FOR CARRIAGE	DECLARED VALUE FOR CUSTOMS
PX		X		X			

AIRPORT OF DESTINATION	FOR CARRIER USE ONLY FLIGHT/DATE	FLIGHT/DATE	AMOUNT OF INSURANCE
ANC			

INSURANCE - If shipper requests insurance in accordance with conditions on reverse hereof, indicate amount to be insured in figures in box marked amount of insurance.

HANDLING INFORMATION These commodities licensed by US for ultimate destination. Diversion contrary to US law is prohibited.

NO. OF PIECES RCP	GROSS WEIGHT	kg / lb	RATE CLASS COMMODITY ITEM NO.	CHARGEABLE WEIGHT	RATE / CHARGE	TOTAL	NATURE AND QUANTITY OF GOODS (INCL. DIMENSIONS OR VOLUME)
1	10		acepak 6	10	18.82	18.82	1 Red cooler
1	10					18.82	

	PREPAID	COLLECT
A. WEIGHT CHARGE	18.82	
D. VALUATION CHARGE		
I. TAX	1.47	
TOTAL OTHER CHARGES DUE AGENT		
TOTAL OTHER CHARGES DUE CARRIER	4.71	
G. COD (CURRENCY) (AMOUNT TO BE ENTERED BY SHIPPER)		
TOTAL PREPAID / TOTAL COLLECT	20.00	
CURRENCY CONVERSION RATES / CC CHARGES IN DESTINATION CURRENCY		
FOR CARRIERS USE ONLY AT DESTINATION / CHARGES AT DESTINATION		

P-UP ZONE	PICKUP CHARGES	ORIGIN ADVANCE CHARGES	DESCRIPTION OF ORIGIN ADVANCE
	B.	K.	

DEL ZONE	DELIVERY CHARGES	DEST. ADVANCE CHARGES	DESCRIPTION OF DEST. ADVANCE
	C.	L.	

OTHER CHARGES AND DESCRIPTION: F. FSC 13%

HAZMAT: YES / NO (circled: NO) — ITEMS PREPAID — ITEMS COLLECT

Shipper certifies that the particulars on the face hereof are correct and that insofar as any part of the consignment contains restricted articles, such part is properly described by name and is in proper condition for carriage by air according to applicable national government regulations, and for international shipments, the current International Air Transport Association's Dangerous Goods Regulations.

SIGNATURE OF SHIPPER OR HIS AGENT

5/22/19 AKN CE

(Date) (Time) at (Place) SIGNATURE OF ISSUING CARRIER OR ITS AGENT

Notified on- ______
Notified on- ______
Notified on- ______

3171274

COPY 5
AIRPORT OF DESTINATION

SIGNATURE ______
RELEASING AGENT ______
CHECK # ______
PAID BY (CIRCLE ONE) CASH CC
RELEASE TIME ______
TOTAL AMOUNT ______
RELEASE DATE ______

APPENDIX B: FIELD FORMS

Appendix B

Field Forms

CONTENTS

Water supply well field notes contain personal information.
This content has been removed for confidentiality.

APPENDIX C: PUBLIC INFORMATION

Appendix C

Public Information

CONTENTS

THE STATE of ALASKA
GOVERNOR MICHAEL J. DUNLEAVY

Department of Transportation and Public Facilities

STATEWIDE AVIATION

P.O. Box 196900, 99519-6900
4111 Aviation Avenue, 99502
Anchorage, AK
Main: 907.269.0730
Fax: 907.269.0489
dot.state.ak.us

King Salmon Private Well Sampling Notice

In January 2019, the Department of Transportation & Public Facilities (DOT&PF) was notified of concentrations of Per- and Polyfluoroalkyl Substances (PFAS) in groundwater on King Salmon Airport property.

Firefighters at the King Salmon Airport used aqueous film forming foam (AFFF), a standard firefighting agent that contains PFAS, to extinguish hydrocarbon fires during training exercises and emergency events.

Of the nine samples collected by the Alaska Department of Environmental Conservation (ADEC), one well located on airport property tested above the action level of 70 parts per trillion (ppt) for the sum of five PFAS compounds. The other eight wells had concentrations well below the action level of 70 ppt for the sum of five PFAS compounds.

DOT&PF has contracted Shannon & Wilson, Inc. to finish the preliminary investigation, which includes an in-depth well search and sampling event.

Well Search & Sampling Information

Friday, March 14, 2019 to Monday, March 19, 2019

- Shannon & Wilson, Inc. will be conducting further testing in the designated sampling area shown in the map above.
- Three samplers will be conducting site visits in King Salmon to identify and sample private wells.
- Residents located in the sampling area with an active well at their home or business should contact Shannon & Wilson staff at 907-371-9022 to schedule a sampling appointment.

Please visit http://www.dot.state.ak.us/airportwater/kingsalmon/ or email airportwater@alaska.gov if you have questions.

THE STATE of ALASKA
GOVERNOR MICHAEL J. DUNLEAVY

Department of Transportation and Public Facilities

STATEWIDE AVIATION

P.O. Box 196900, 99519-6900
4111 Aviation Avenue, 99502
Anchorage, AK
Main: 907.269.0730
Fax: 907.269.0489
dot.state.ak.us

March 11, 2019

Dear Property Owner or Occupant:

The Department of Transportation and Public Facilities (DOT&PF) was recently alerted to concentrations of per- and polyfluoroalkyl substances (PFAS) in groundwater near the King Salmon Airport. Firefighters at the King Salmon Airport used aqueous film forming foam (AFFF), a standard firefighting agent that contains PFAS, to extinguish hydrocarbon fires during training exercises and emergency events.

Of the nine wells sampled, one well located on airport property exceeded the Department of Environmental Conservation (DEC) action level of 70 parts per trillion (ppt) for the sum of five PFAS compounds. The other wells sampled on or near airport property had concentrations considerably lower than the action level.

The DOT&PF has contracted with environmental consulting firm Shannon & Wilson, Inc. to continue the preliminary investigation. Shannon & Wilson, Inc. will identify and sample private water wells near the airport to determine if these substances are present and above recommended levels. PFAS are emerging contaminants, research into the health effects of exposure to PFAS is ongoing.

Results of the water samples will be shared with property residents. If your well is found to have PFAS above the DEC action level, DOT&PF will assist with access to clean drinking water.

If you have any questions, please contact me, or see the list on the reverse side of this letter to identify the most appropriate person or agency for your inquiry. We appreciate your patience as we work through this process.

Sincerely,

Sammy Loud
PFAS Project Manager, DOT&PF Statewide Aviation

THE STATE of ALASKA
GOVERNOR MICHAEL J. DUNLEAVY

Department of Transportation and Public Facilities

STATEWIDE AVIATION

P.O. Box 196900, 99519-6900
4111 Aviation Avenue, 99502
Anchorage, AK
Main: 907.269.0730
Fax: 907.269.0489
dot.state.ak.us

PFAS Fact Sheet

March 2019

Per- and polyfluoroalkyl substances (PFAS) are a group of manmade chemicals that have been used for a wide variety of residential, commercial, and industrial uses. PFAS are considered emerging environmental contaminants and the health effects are not well known.

The presumed source of PFAS in groundwater in King Salmon is the use of a fire-fighting foam called aqueous film forming foam (AFFF). King Salmon Airport fire fighters used the foam to extinguish hydrocarbon fires during training exercises and emergency events.

The Dept. of Transportation and Public Facilities has hired Shannon & Wilson to test private wells for six PFAS. Two of the most common PFAS are perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA).

The Dept. of Environmental Conservation action level for drinking water is **70 parts per trillion** for the sum of five similar compounds. Out of caution, alternate water will be provided to those with levels above 65 parts per trillion.

We advise that residents with test results above this level do not use their water for drinking or cooking. If your well is considered affected, you can continue to shower, clean, and do laundry.

Test results are typically available within three to four weeks of sample collection. If your well is found to have PFAS above the state action level, DOT&PF will assist with access to clean drinking water.

PFAS are used in a large number of products ranging from fabric waterproofing compounds, non-stick cookware, stain-resistant carpeting, some food packaging, and firefighting foams.

For the sampling area map:
www.dot.alaska.gov/airportwater/kingsalmon

For questions about well testing:
Shannon & Wilson, Inc.
Kristen Freiburger, Project Manager
Phone: 907-458-3146
Email: krf@shanwil.com

For regulatory questions:
Dept. of Environmental Conservation
Bill O'Connell, Contaminated Sites Program
Phone: 907-269-3057
Email: bill.oconnell@alaska.gov

For questions about PFAS and health:
Dept. of Health & Social Services
Kristin Bridges, Public Health Scientist
Phone: 907-269-8028
Email: kristin.bridges@alaska.gov

To file an insurance claim:
Dept. of Admin., Risk Management
Britney Hunter, Risk Assessor
Phone: (907) 465-2183
Email: britney.hunter@alaska.gov

For questions about fire training and other inquiries:
Sammy Loud, DOT&PF Statewide Aviation
Phone: 907-888-5671
Email: airportwater@alaska.gov

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Private Well Inventory Survey Form

Date: _____ Parcel ID#: _____

Physical Address: _____

Name (Owner): _____

Name (Occupant): _____

Mailing Address (Owner): _____

Mailing Address (Occupant): _____

Owner Email: _____ Occupant Email: _____

Owner Phone: _____ Occupant Phone: _____

Preferred method of contact (circle): Email Phone

Number of people residing at this location:
Adults (18 and over) _____
Teenagers (13 to 17) _____
Children (12 and under) _____

Years at this residence: _____ Full-Time ☐ Seasonal ☐

---

1) From where do you obtain your drinking water?
   a) Residential (private) well ☐ b) Community well ☐
   c) Bottled water ☐ d) Other ☐ _____

2) If you have a private well, please answer the following questions:
   a) Where is the well located on the property? _____
   b) Is the well in use? Yes ☐ No ☐

3) If no, is the well usable, unusable, or properly abandoned?
   Usable ☐ Unusable ☐ Abandoned ☐ Method _____

   If yes, please check all that apply regarding the usage of your well water:
   - ☐ Drinking
   - ☐ Cooking food preparation
   - ☐ Other _____
   - ☐ Vegetable/grain Gardening
     -Size of Garden_____ sq.feet/acres
     -Average watering frequency using well water? (daily, weekly, etc.) _____

   a) When was the well installed? _____
   b) What is the well depth? _____
   c) What is the well diameter? _____
   d) What is the well type? ☐ Dug Well ☐ Driven ☐ Drilled ☐ Unknown
   e) Do you have any treatment on your well (e.g. water softener)? Please describe. _____
      _____

4) Sample Permission
   Does the Shannon & Wilson, Inc. have permission to sample your private well? ☐ Yes ☐ No

_____ _____
Signature Date

LEGEND

Sum of PFOS, PFOA, PFHxS, PFHpA, and PFNA results (ADEC action level)

- ≤17 parts per trillion (ppt)
- 18 - 64 ppt
- ≥65 ppt (over ADEC action level)
- Well Search Area
- Aircraft Rescue and Firefighting (ARFF) Site

0 0.25 0.5

Miles

N

King Salmon Airport
King Salmon, Alaska

PFAS WELL SEARCH AND SAMPLE LOCATIONS

March 11, 2019 102582

SHANNON & WILSON, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 1

Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)
Frequently Asked Questions

What are PFAS?

Perfluoroalkyl and polyfluoroalkyl substances (PFAS) are a large group of man-made chemicals that have been used in industry and consumer products worldwide since the 1950s.

- PFAS do not occur naturally, but are widespread in the environment.
- PFAS are found in people, wildlife and fish all over the world.
- Some PFAS can stay in people's bodies a long time.
- Some PFAS do not break down easily in the environment.

How can I be exposed to PFAS?

PFAS contamination may be in drinking water, food, indoor dust, some consumer products, and workplaces. Most non worker exposures occur through drinking contaminated water or eating food that contains PFAS.

Although some types of PFAS are no longer used, some products may still contain PFAS:

- Food packaging materials
- Nonstick cookware
- Stain resistant carpet treatments
- Water resistant clothing
- Cleaning products
- Paints, varnishes and sealants
- Firefighting foam
- Some cosmetics

How can I reduce my exposure to PFAS?

PFAS are present at low levels in some food products and in the environment (air, water, soil etc.), so you probably cannot prevent PFAS exposure altogether. However, if you live near known sources of PFAS contamination, you can take steps to reduce your risk of exposure.

- If your drinking water contains PFAS above the EPA Lifetime Health Advisory, consider using an alternative or treated water source for any activity in which you might swallow water:
  - » drinking
  - » food preparation
  - » cooking
  - » brushing teeth, and
  - » preparing infant formula
- Check for fish advisories for water bodies where you fish.
  - » Follow fish advisories that tell people to stop or limit eating fish from waters contaminated with PFAS or other compounds.
  - » Research has shown the benefits of eating fish, so continue to eat fish from safe sources as part of your healthy diet.
- Read consumer product labels and avoid using those with PFAS.

Agency for Toxic Substances and Disease Registry
Division of Community Health Investigations
ATSDR

How can PFAS affect people's health?

Some scientific studies suggest that certain PFAS may affect different systems in the body. NCEH/ATSDR is working with various partners to better understand how exposure to PFAS might affect people's health—especially how exposure to PFAS in water and food may be harmful. Although more research is needed, some studies in people have shown that certain PFAS may:

- affect growth, learning, and behavior of infants and older children
- lower a woman's chance of getting pregnant
- interfere with the body's natural hormones
- increase cholesterol levels
- affect the immune system and
- increase the risk of cancer

At this time, scientists are still learning about the health effects of exposures to mixtures of PFAS.

How can I learn more?

You can visit the following websites for more information:

- **CDC/ATSDR:**
  - CDC Info: https://www.cdc.gov/cdc-info/, or **(800) 232-4636**.
  - www.atsdr.cdc.gov/pfc/index.html
  - https://www.cdc.gov/exposurereport/index.html
- **Environmental Protection Agency (EPA):** https://www.epa.gov/chemical-research/research-and-polyfluoroalkyl-substances-pfas
- **Food and Drug Administration:** https://www.fda.gov/food/newsevents/constituentupdates/ucm479465.htm
- **National Toxicology Program:** https://ntp.niehs.nih.gov/pubhealth/hat/noms/pfoa/index.html

If you have questions about the products you use in your home, please contact the **Consumer Product Safety Commission (CPSC)** at **(800) 638-2772**.

List of Common PFAS and Their Abbreviations:

Abbreviation	Chemical name
PFOS	Perfluorooctane sulfonic acid
PFOA (or C8)	Perfluorooctanoic acid
PFNA	Perfluorononanoic acid
PFDA	Perfluorodecanoic acid
PFOSA (or FOSA)	Perfluorooctane sulfonaminde
MeFOSAA (aka Me-PFOSA-AcOH)	2-(N-Methyl-perfluorooctane sulfonamido) acetic acid
Et-FOSAA (aka Et-PFOSA-AcOH)	2-(N-Ethyl-perfluorooctane sulfonamido) acetic acid
PFHxS	Perfluorohexane sulfonic acid

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

March X, 2019

NAME
MAILING ADDRESS
King Salmon, AK 99576

RE: RESULTS OF MARCH 2019 PFAS PRIVATE WELL SAMPLING, KING SALMON AIRPORT

Dear Mr. and Mrs. XXXX,

Thank you for participating in our private-well sampling program to evaluate the potential presence of per- and polyfluoroalkyl substances (PFAS) in groundwater near the King Salmon Airport. Shannon & Wilson, Inc. collected a water sample on March X, 2019, from the well at your residence/business. Enclosed are the analytical results for the sample from your residential/commercial water-supply well at PHYSICAL ADDRESS. We have prepared an identical letter for your tenant/s NAME.

The well-water sample was analyzed for six PFAS compounds. Currently, the Alaska Department of Environmental Conservation (ADEC) action level for drinking water is 70 parts per trillion (ppt) for the sum of five compounds: PFOS, PFOA, PFHpA, PFHxS, and PFNA.

Results of the analysis conducted by TestAmerica Laboratories, Inc. indicate that PFOS was not/was detected at X ppt, PFOA was not/was detected at X ppt, and PFHxS was not/was detected at X ppt [list three largest values excluding PFBS /or/ the five PFAS compounds were not detected] in the water sample collected from your well. The sum of the five compounds is less than/greater than the ADEC action level. The portions of the original laboratory report that apply to your well (sample number *XXXXXX* and field-duplicate sample *XXXXXX*) are enclosed for your records.

We sampled over 60 private water-supply wells in King Salmon on behalf of the Alaska Department of Transportation and Public Facilities (DOT&PF). DOT&PF will provide an alternative drinking water source to the occupants of homes and businesses whose well water exceeds the ADEC action level, and who use their water for drinking or cooking. //OR// is

2355 HILL ROAD
FAIRBANKS, ALASKA 99709-5326
907-479-0600 • FAX 907-479-5691

offering your residence/business an alternate source of drinking water. Please contact [business name/phone] if you have any questions or concerns regarding bottled water delivery.

Please see the enclosed PFAS fact sheet for a link to the DOT&PF project website, and feel free to contact us if you have questions regarding your results.

Sincerely,

SHANNON & WILSON, INC.

Name
Title

Enc: Select Pages of Test America Laboratory Report No. 320-XXXXX
King Salmon Airport PFAS Fact Sheet

2355 HILL ROAD
FAIRBANKS, ALASKA 99709-5326
907-479-0600 • FAX 907-479-5691

THE STATE of ALASKA
GOVERNOR MICHAEL J. DUNLEAVY

Department of Transportation and Public Facilities

STATEWIDE AVIATION

P.O. Box 196900, 99519-6900
4111 Aviation Avenue, 99502
Anchorage, AK
Main: 907.269.0730
Fax: 907.269.0489
dot.state.ak.us

PFAS Fact Sheet

October 2019

Per- and polyfluoroalkyl substances (PFAS) are a group of manmade chemicals used for a wide variety of residential, commercial, and industrial uses. PFAS are considered emerging environmental contaminants and the health effects are not well-known.

The presumed source of PFAS in groundwater in King Salmon is the use of a fire-fighting foam called aqueous film forming foam (AFFF). King Salmon Airport firefighters used the foam to extinguish hydrocarbon fires during training exercises and emergency events.

The Alaska Department of Transportation & Public Facilities (DOT&PF) has hired Shannon & Wilson to test private wells for perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and other PFAS compounds.

The U.S. Environmental Protection Agency (EPA) lifetime health advisory (LHA) level for drinking water is **70 parts per trillion** for the sum of PFOS and PFOA.

We advise residents with test results above this level to not use their water for drinking or cooking. If your well is considered affected, you can continue to shower, clean, and do laundry.

Test results are typically available within four to five weeks of sample collection. If your well is found to have PFAS above the EPA LHA, DOT&PF will assist with access to an alternate source of drinking water.

PFAS are used in a large number of products ranging from fabric waterproofing compounds, non-stick cookware, stain-resistant carpeting, some food packaging, and firefighting foams.

For the sampling area map:
www.dot.alaska.gov/airportwater/kingsalmon/

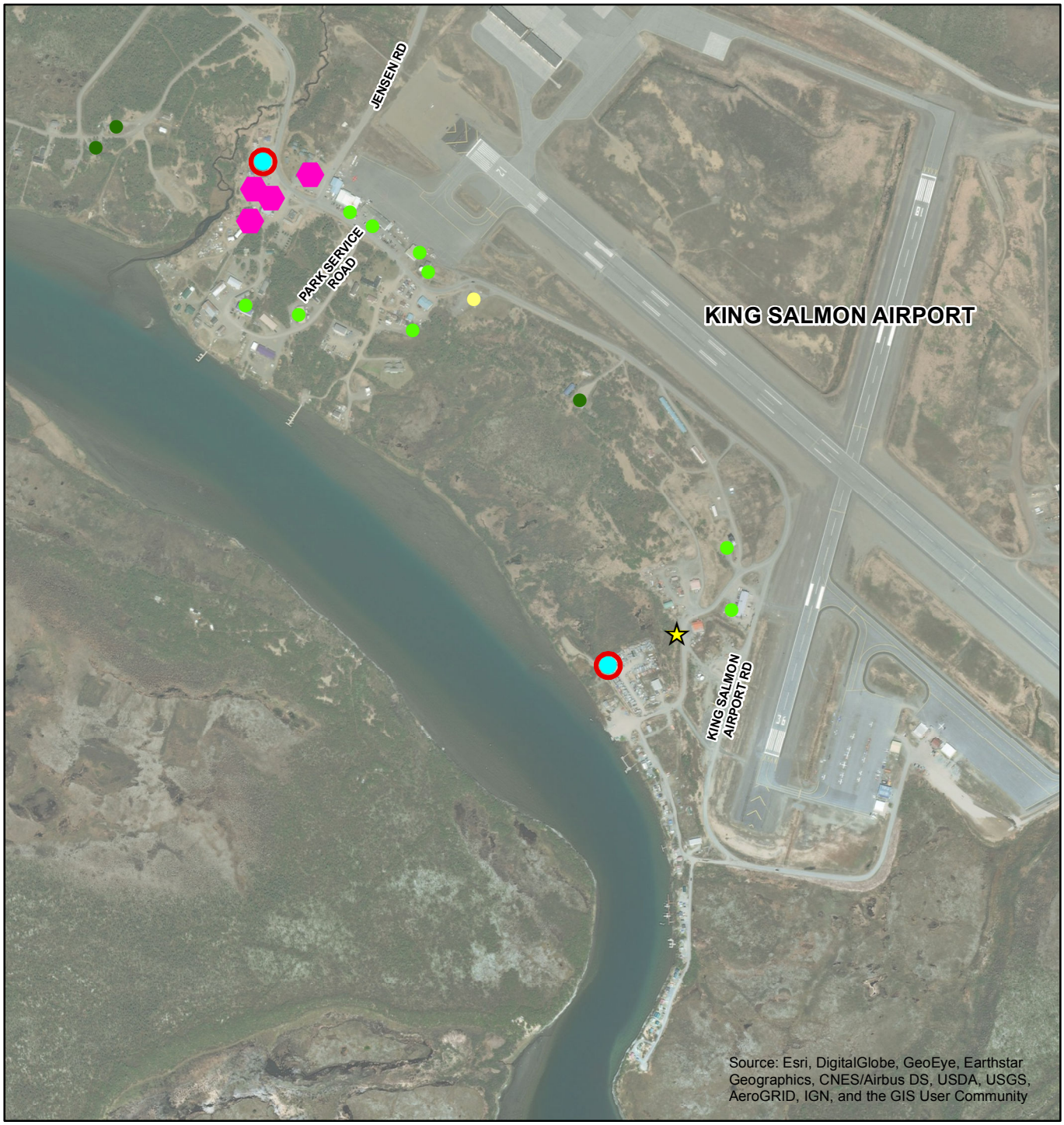
For questions about well testing:
Shannon & Wilson, Inc.
Michael Jaramillo, Project Manager
Phone: 907-458-3156
Email: mxj@shanwil.com

For regulatory questions:
Dept. of Environmental Conservation
Bill O'Connell, Contaminated Sites Program Phone: 907-269-3057
Email: bill.oconnell@alaska.gov

For questions about PFAS and health:
Dept. of Health & Social Services
Sarah Yoder, Public Health Specialist
Phone: 907-269-8054
Email: sarah.yoder@alaska.gov

To file an insurance claim:
Dept. of Admin., Risk Management
Sheri Gray, Risk Manager
Phone: 907-465-5724
Email: sheri.gray@alaska.gov

For questions about fire training and other inquiries:
Sammy Loud Cummings, DOT&PF
Statewide Aviation
Phone: 907-888-5671
Email: airportwater@alaska.gov



LEGEND

- "Affected" Location Based on Previous Sampling Events
- October 2019 Quarterly Sampling Event - with 500 foot buffer
- PFOS and PFOA not detected
- PFOS/PFOA detected below 17.5 ppt
- PFOS/PFOA detected between 18 - 69 ppt
- PFOS/PFOA detected greater than 70 ppt
- Unidentified Monitoring Well

0 0.2 0.4

Miles

N

King Salmon Airport
King Salmon, Alaska

OCTOBER 2019
QUARTERLY SAMPLING EVENT

October 2019 102582

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 1

APPENDIX D: QA/QC SUMMARY

Appendix D

QA/QC Summary

CONTENTS

APPENDIX D: QA/QC SUMMARY

QA/QC SUMMARY

QA/QC procedures assist in producing data of acceptable quality and reliability. Shannon & Wilson reviewed the analytical results for laboratory QC samples and conducted a QA assessment for this project. COC records and laboratory receipt forms were reviewed to check custody was not breached, sample holding times were met, and the samples were properly handled from the point of collection through analysis by the laboratory. Shannon & Wilson's QA review procedures allowed us to document the accuracy and precision of the analytical data, as well as check the analyses were sufficiently sensitive to detect analytes at levels below regulatory standards.

Shannon & Wilson reviewed analytical sample results (TestAmerica WOs 48588, 52782, 55873, 57929, and SGS WOs 1192542 and 1192543) for this project. The laboratory reports, including case narratives describing laboratory QA results, along with completed DEC data review checklists, are included in Appendix A. Details regarding Shannon & Wilson's QA assessment are presented below.

SAMPLE HANDLING

Coolers containing water samples were shipped via Alaska Airlines Cargo to perform analyses identified on the COC. The coolers with water samples contained a temperature blank to measure whether samples were kept appropriately cold. Laboratory personnel measured the temperature blank at the time the samples arrived at each of their facilities; the temperature blank was within the proper temperature range upon arrival at the laboratories.

Our review of COC records and laboratory sample-receipt documents did not reveal sample-handling anomalies that would affect the quality or usability of the data, and the samples were processed within the appropriate method holding times.

ANALYTICAL SENSITIVITY

Shannon & Wilson compared water supply well sample limits of detection (LODs) to the DEC regulatory limits. For groundwater data, LODs were less than DEC-established limits, where applicable.

The laboratory analyzes a method blank with each sample batch to assess laboratory cross contamination and to detect analyte carryover during analysis. In TestAmerica WOs, PFAS compounds were not detected in the method blank samples.

Conductivity was detected in the associated method blank at a concentration greater than the limit of quantitation (LOQ) for SGS WOs 1192542 and 1192543. The associated samples have detected results greater than ten times the method blank conductivity. Project samples were not affected by the method blank detections for conductivity.

ACCURACY

The laboratory assessed the accuracy of its analytical procedures by analyzing laboratory control samples (LCS), LCS duplicate samples (LCSD), matrix spike samples (MS), MS duplicate samples (MSD), and laboratory duplicate samples. LCS/LCSD analysis allows the laboratory to evaluate their ability to recover analytes added to clean matrices.

LCS/LCSD samples were reported for TestAmerica WOs 48588, 52782, 55873 and 57929. Laboratory accuracy was also measured for each sample by assessing the recovery of analyte surrogates added to the individual project samples. For these WOs, the LCS/LCSD and surrogate recovery data were within laboratory control limits, indicating the sample results are accurate.

For the SGS WOs 1192542 and 1192543, accuracy of analytical procedures was assessed as follows:

- LCS/LCSD and laboratory duplicate samples were analyzed for TDS.
- LCS and MS/MSD samples were analyzed for nitrate, total nitrate/nitrite, chloride, fluoride, and sulfate.
- LCS and laboratory duplicate samples were analyzed for pH, conductivity, and alkalinity analyses.

Recovery failures of nitrate, total nitrate/nitrite, chloride, and fluoride were recorded in either MS or MS/MSD samples. However, the parent sample associated with the MS and/or MSD is not a part of the project sample set; project samples are not affected.

PRECISION

Shannon & Wilson submitted five field duplicate samples in the WOs. To evaluate data precision and reproducibility of Shannon & Wilson's sampling techniques, Shannon & Wilson calculated the relative percent difference (RPD) between the sample and its duplicate. Shannon & Wilson can only evaluate RPDs if the results of the analysis for both the sample and its duplicate are greater than the LOQs for a given analyte. The field-

duplicate RPDs for detected analytes were within the project-specified data quality objective of 30% for groundwater.

Shannon & Wilson also evaluated laboratory analytical precision using RPD calculations. The LCS/LCSDs and MS/MSDs provide information regarding the reproducibility of laboratory procedures and are therefore a measure of the laboratory's analytical precision. The RPD results for the LCS/LCSD and MS/MSDs were within acceptable laboratory QC limits. However, the SGS WOs 1192542 and 1192543 only reported LCS and MS samples for metals analysis. Shannon & Wilson has no measure of laboratory precision for this analysis.

DATA QUALITY SUMMARY

By working in general accordance with the proposed scope of services, Shannon & Wilson considers the samples collected for this project to be representative of site conditions at the locations and times they were obtained. Based on Shannon & Wilson's QA review, no samples were rejected as unusable due to QC failures. In general, the quality of the analytical data for this project does not appear to have been compromised by analytical irregularities and is adequate for the purposes of Shannon & Wilson's assessment.

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.

IMPORTANT INFORMATION

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 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

IMPORTANT INFORMATION

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.

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

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