Summary Report
February to May 2016 Private Well Sampling
City of Fairbanks Regional Fire Training Center
Fairbanks, Alaska

August 2016

SHANNON & WILSON, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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Submitted To:
City of Fairbanks
800 Cushman Street
Fairbanks, Alaska 99701

Submitted By:
Shannon & Wilson, Inc.
2355 Hill Road
Fairbanks, Alaska 99709-5326

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SHANNON & WILSON, INC.

SUMMARY REPORT
FEBRUARY TO MAY 2016 PRIVATE WELL SAMPLING
CITY OF FAIRBANKS REGIONAL FIRE TRAINING CENTER
FAIRBANKS, ALASKA

August 10, 2016

Prepared for:
City of Fairbanks
800 Cushman Street
Fairbanks, Alaska 99701

Prepared by:

SHANNON & WILSON, INC.
2355 Hill Road
Fairbanks, Alaska 99709

Report Author: Marcy Nadel
Geologist

Reviewed by: Julie Keener, P.E.
Senior Engineer

Christopher Darrah C.P.G., CPESC
Senior Associate

Shannon & Wilson Project Number: 31-1-11735-004 and -005

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ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
ADOT&PF	Alaska Department of Transportation & Public Facilities
AFFF	aqueous film-forming foam
Ahtna	Ahtna Engineering Services, LLC
bgs	below ground surface
°C	degrees Celsius
COC	chain of custody
CoF	City of Fairbanks
DNR	Alaska Department of Natural Resources
EPA	U.S. Environmental Protection Agency
FNSB	Fairbanks North Star Borough
FYSA	Fairbanks Youth Soccer Association
GAC	granular activated carbon
IGSA	Interior Girls Softball Association
LHA	Lifetime Health Advisory
µg/L	microgram per liter
MW	monitoring well
ng/L	nanogram per liter
PAN	parcel account number
PFC	perfluorinated compound
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PHA	Provisional Health Advisory
QA	quality assurance
QC	quality control
RFTC	Regional Fire Training Center
TestAmerica	TestAmerica Laboratories, Inc.
TOC	top of casing
UCMR	EPA Unregulated Contaminant Monitoring Rule
WO	work order
YSI	multiprobe water quality meter

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FAIRBANKS, ALASKA

1.0 INTRODUCTION

Shannon & Wilson, Inc. has prepared this report to document our well search and private well sampling effort proximal to the Regional Fire Training Center (RFTC) at 1710 30th Avenue in Fairbanks, Alaska. The City of Fairbanks (CoF) owns the land and facility and leases space at the facility to the State of Alaska and other entities. The objective of the well search and sampling was to identify private wells and determine whether the subset of wells that we sampled have been affected by groundwater contamination associated with the burn pit at the RFTC. The RFTC burn pit is considered an active ADEC contaminated site, File Number 102.38.182.

This report was prepared for the City of Fairbanks in accordance with the terms and conditions of our City of Fairbanks Regional Fire Training Center Burn Pit Site Investigation services contract (Project No. FB-14-25), relevant Alaska Department of Environmental Conservation (ADEC) guidance documents, and 18 Alaska Administrative Code (AAC) 75.335. The tasks described herein were conducted as authorized by our Professional Services Contract and in response to proposal numbers 31-2-16864-004, -005, and -006.

1.1 Background

The CoF RFTC burn pit, or "combustible liquids pit," was constructed in 1984 and used for firefighting exercises for approximately 20 years. Fire-fighting agents used during training in the CoF burn pit include water, protein-based foam, and aqueous film-forming foam (AFFF). AFFF has since been found to contain perfluorinated compounds (PFCs), a category of persistent organic compounds that are considered emerging contaminants. Perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) are PFCs commonly found at sites where AFFFs were used. Due to their persistence, toxicity, and bioaccumulative potential, these compounds are of increasing concern to environmental and health agencies.

In our 2015 Phase 2 site investigation we sampled five soil borings and five temporary well points around the RTFC burn pit. Concentrations of PFOS and PFOA in onsite water samples exceeded ADEC-proposed groundwater-cleanup levels and other regulatory levels. Concentrations of PFCs in groundwater samples collected from around the burn pit were up to an estimated 550,000 nanograms per liter (ng/L) PFOS and 7,800 ng/L PFOA.

On September 1, 2015, ADEC representatives requested that offsite wells be sampled to determine if PFC contamination was present. In November 2015, we collected water samples from a Alaska Department of Transportation & Public Faculties (ADOT&PF) monitoring well (MW) on Davis Road (MW-507) and a Fairbanks North Star Borough (FNSB) irrigation well at the Interior Girls Softball Association (IGSA) softball fields, 0.2 miles and 0.8 miles northwest of the RFTC, respectively. PFCs were detected in samples from both offsite wells but concentrations were generally greater in MW-507. PFOS was detected at up to 63 ng/L and PFOA at up to 21 ng/L in the MW-507 sample and field duplicate sample.

The ratios of individual PFC concentration magnitudes in the offsite groundwater samples are similar to those in the onsite groundwater samples. Therefore, our December 2015 report concluded that the two data sets are reasonably inferred to be associated with a common source. We recommended a search for private water-supply wells within a half mile of the RFTC to determine if offsite exposure to PFCs exceeds health-based screening levels.

The topography in the RFTC area is generally flat; the site slopes gently to the north. The depth to groundwater at the time of onsite sampling ranged from approximately 7 feet to 8 feet below ground surface (bgs). Based on our experience and knowledge of hydrogeology in the Fairbanks area, the horizontal gradient in this area is relatively flat, typically averaging one foot to two feet per 1,000 feet. The groundwater-flow direction fluctuates seasonally and is dependent on the relative levels of the Tanana River and Chena River. Groundwater is typically recharged by the Tanana River and drained by the Chena River, causing a northwesterly groundwater flow. Depending on various seasonal factors, groundwater may be recharged by both rivers, causing a westerly or northerly flow. Permafrost, where present, likely impedes groundwater movement in the vicinity of the RFTC.

1.2 Contaminant of Concern and Regulatory Levels

The primary contaminants of concern in offsite wells are PFOS and PFOA. Cleanup levels have not been established for PFOS, PFOA, or other PFCs. The U.S. Environmental Protection Agency (EPA) has established a Lifetime Health Advisory (LHA) level for drinking water of 70 ng/L for PFOS, PFOA, or the sum of the two. The CoF has established this as the level above which action should be taken to reduce exposure in drinking water. Following ADEC guidance indicating the precision of the LHA level, we consider combined concentrations in excess of 65 ng/L to be exceedances of the LHA.

The CoF was notified of the new, LHA level on May 19, 2016. The LHA level supersedes the former Provisional Health Advisory (PHA) levels of 200 ng/L PFOS and 400 ng/L PFOA. Prior to publication of the LHA, PHA levels were used for this project.

1.3 Project Objectives and Scope

At the request of the ADEC, Shannon & Wilson, Inc. identified and sampled private wells in five areas near the RFTC to date. Our primary objective of the services described in this report was to evaluate the potential for human exposure to PFC-containing water in private water-supply wells. This report describes the findings of our initial private well search and sampling effort (Area 1), E.M. Jones Subdivision sampling effort (Area 2), and Northwest Quadrant well search and sampling effort (Area 3). We sampled a subset of identified private wells and MWs in these areas, described as follows. Expansion of our well search into each subsequent area was authorized iteratively based on the results of private well sampling. This report summarizes the findings of our February to May 2016 well search and sampling.

Our well searches sought to identify private water-supply wells, the owner of the property on which the well is located, if the well is in use, how the well is used (e.g., drinking, washing, irrigation, etc.), and well logs or well details if available. Following completion of the well search, we collected analytical water samples for determination of PFCs from a subset of identified private wells. We submitted the water samples to TestAmerica, Inc., for quantitation of 19 PFCs by Method WS-LC-0025.

Area 1 consists of the area within one half mile of the RFTC and west of Lathrop Street, plus 30th Avenue to Peger Road. Area 2 consists of the E.M. Jones Subdivision, a primarily residential area bound by Peger Road to the east, Davis Road to the south, Kiana Street to the west, and Kobuk Avenue to the north. Area 3 consists of the northwest quadrant between a half- and 1-mile radius of the RFTC. This area is bound by Eagan Avenue to the north, Lathrop Street to the east, and the Mitchell Expressway to the south. Our scope of services included a well search for Areas 1 and 3; we did not conduct a well search in Area 2.

2.0 FIELD ACTIVITIES

This section summarizes field activities performed between February 11 and May 17, 2016, in an effort to identify and sample private water-supply wells in our previously described search areas. These areas are shown in Figure 1, Private Well Search and Sample Areas.

2.1 Well Search and Sample Areas

On February 11, 2016, we began contacting owners and occupants in Area 1, our initial search area. Our well search methodology began with downloading a list of improved and unimproved parcels and the owners of those properties within the search area from the FNSB property database. We also referenced the Alaska Department of Natural Resources (DNR) Well Log Tracking System and subsurface water rights files listed on the DNR Water Estate Map.

The goal of our well search was to contact the owner or occupant of each improved parcel within the search area to identify the presence or absence of a well. We began by preparing a well search letter and fact sheet using CoF letterhead. The letters and fact sheets, included in Appendix A, describe the potential presence of PFCs in groundwater near the RFTC. Using FNSB records, we developed a list of property owners within Area 1 and subdivided the list into smaller extents. We prepared maps for each of these extents, and cross-referenced our lists with property records to determine which parcels were improved (i.e., developed) and which were vacant. We prepared mailers including the well search letter, one-page fact sheet, *Private Well Inventory Survey Form*, and pre-addressed envelope (Appendix A).

We mailed the well search letter to parcels along International and Industrial Avenues, the primarily commercial portion of Area 1, on February 9 and 10. We hand-delivered the well search letter to owners or occupants whose property adjoins Peger Lake, the primarily residential portion of Area 1, on February 11 and 12. We made a reasonable attempt to contact each owner or occupant in the search area. Where we were unable to make contact in person or via mail, we followed up via telephone where contact information was available, made multiple visits to the property in question, and/or questioned nearby property owners. We completed a *Private Well Inventory Survey Form* for each identified well, copies included in Appendix B for each of the three search areas. In some cases the *Survey Forms* were completed by the owner or occupant themselves, in others they were completed by Shannon & Wilson personnel in person or via telephone.

We used information obtained from completed *Survey Forms* and subsequent conversations with property owners and occupant to categorize wells based on use. These category designations were developed in coordination with the CoF and ADEC, and are described as follows.

- Category 1: wells that are used for drinking or cooking, as reported by owners or occupants

- Category 2: wells that are used for dish washing and other residential purposes. Homes or businesses where the occupants report that they do not drink the water, but where water-supply wells lead to kitchen or bathroom faucets, are considered category 2 wells.
- Category 3: wells that are used for industrial and outdoor purposes only, such as irrigation or cleaning. These wells are considered non-drinking-water wells.

We identified 29 parcels with confirmed active wells, five confirmed unused, and four inferred water wells within Area 1. Well search results are summarized in Tables 1 and 4, organized by presence or absence of a well and parcel account number (PAN). Please note that in most cases well depths are reported by owners, occupants, or developers. In some cases depths were obtained from well logs or drilling records. The results of the well search in Area 1 are depicted in Figure 2, PANS and Results of Well Search Southwest of RFTC.

TABLE 1
AREA 1 WELL SUMMARY

Yes – active well	29
Yes – inferred well	4
Yes – unused well	5
No – inferred	18
No – confirmed	73
Total parcels	129

On April 7, we expanded the sampling area to include Area 2. Groundwater monitoring of trichloroethene and benzene plumes originating at the ADOT&PF Peger Road Facility is ongoing by Ahtna Engineering Services, LLC (Ahtna), under the direction of the ADEC. The Ahtna private-well monitoring area includes the entirety of Area 2 and overlaps with several parcels in the northwest portion of Area 3 (Figure 1). According to Ahtna, the last private well search in the area was conducted in 2013. It is possible but unlikely that new wells have been installed in the Ahtna private-well monitoring area since 2013.

Mr. Andrew Weller of Ahtna provided well search records for this area on April 8; we made a reasonable attempt to contact the owners or occupants of identified, active and unused wells. We did not contact the owners or occupants of properties without wells, per Ahtna records. We were able to sample six private wells in the E.M. Jones subdivision. Although we did not conduct a well search within Area 2, we obtained relevant well-search data while scheduling sampling appointments. This information is summarize below in Table 2 and in Table 5.

TABLE 2
AREA 2 WELL SUMMARY

Yes – active well	6
Yes – inferred well	0
Yes – unused well	16
No – inferred	70
No – confirmed	2
Total parcels	94

On April 26, we expanded the search area to include Area 3 to the north of the Mitchell Expressway. Our well search methodology was the same as for Area 1, with the following exceptions. Our first contact attempt for properties in Area 3 was via telephone, where contact information was available. We revised the Area 1 well-search letter and fact sheet to reflect project changes on April 28; these documents are included in Appendix A. For properties contacted via telephone, we did not mail or hand-deliver the revised well-search letter.

Excluding MWs, we identified 10 parcels with confirmed active wells within Area 3. Several parcels contain more than one well; we have identified 20 water-supply wells in the northwest quadrant search area. Well-search results, including names and addresses, are summarized in Tables 3 and 5. The results of the well search in Area 3 are depicted in Figure 3, PANS and Results of Well Search Southwest of RFTC.

TABLE 3
AREA 3 WELL SUMMARY

Yes – active well	10
Yes – inferred well	0
Yes – unused well	2
No – inferred	0
No – confirmed	27
Total parcels	39

2.2 Private and Monitoring Well Sampling

We have conducted four sampling events that include mainly samples from Areas 1 through 3. Shannon & Wilson personnel Marcy Nadel, Geologist; Tiffany Green, Environmental Scientist; and Scott Hummel, Chemist collected analytical water samples from private wells and MWs in Areas 1 through 3. These individuals are State of Alaska Qualified Samplers per 18 AAC

75.333[c] and 18 AAC 78.088[c]. Copies of the original *Private Well Sampling Logs* and *Monitoring Well Sampling Logs* are included in Appendix C.

We collected water samples from a subset of identified private wells in these geographic areas. We selected wells to sample based on well use and proximity to wells of a similar depth. We initially sampled each category 1 well, where possible, and a representative subset of category 2 and 3 wells. We have since sampled additional wells in Areas 1 through 3; these results will be included in the next quarterly report. We also sampled two groundwater MWs associated with the ADOT&PF Peger Road Facility at 2301 Peger Road (PAN 483656). We obtained permission from Mr. Sam Myers of ADOT&PF and Mr. Jim Fish of ADEC prior to sampling these MWs.

We collected the private well samples from a location in the plumbing upstream of any water-treatment system or water softener, where possible. We purged the systems prior to sampling by allowing the water to run until its pH, temperature, and conductivity stabilized and the water appeared clear. We measured parameters using a multiprobe water quality meter (YSI) and recorded these measurements approximately once every three minutes until the parameters had stabilized. The following values were used to indicate stability: ±0.1 pH, ±0.5 degrees Celsius (°C) temperature, and ±3 percent conductivity. For residential and commercial systems we discharged purge water to an indoor sink or to the ground surface. In some cases indoor plumbing leads to the municipal sewer system; in other cases it leads to a private septic system.

For ADOT&PF MWs and IGSA irrigation wells, we treated purge water using a granular activated carbon (GAC) filter prior to discharge. We did not treat purge water from the Fairbanks Youth Soccer Association irrigation (FYSA) well. Following parameter stabilization, we collected PFC water samples using laboratory-supplied containers. In cases when the sampling location was difficult to access (e.g., close to the floor, in a corner, etc.) we collected the water sample using a disposable plastic cup and immediately transferred its contents to the laboratory-supplied containers.

For the two ADOT&PF MWs, we collected analytical water samples using a submersible pump and disposable non-Teflon tubing. We did not collect an equipment-rinsate sample for this phase, but have collected rinsate samples at a 10-percent frequency for the overall project. We measured the total well depth and depth to water in each MW prior to sampling. We measured the well depth of MW-504 as 26.8 feet below the top of casing (TOC) and MW-207A as 58.3 feet below the TOC. We observed that MW-504 appears to have been impacted by frost jacking; we removed 0.3 inches of PVC casing to allow us to replace the flush-mounted monument cap. Following sampling, we locked both wells using the original locks.

On February 22 and 23, we conducted our initial round of sampling (laboratory Work Order [WO] 17423). This sampling event consisted of ten private wells distributed within the search area and with a range of depths, and one field duplicate. On March 14, we collected an additional 10 samples from private wells in Area 1, one upgradient private-well sample, and one field duplicate (WO 17748). On April 18 and 19 we collected three private-well samples from Area 1, five samples from Area 2, one sample from Area 3, two upgradient wells samples, and two field duplicate samples (WO 18463). On May 16 and 17, we collected one private-well sample from Area 1, one sample from Area 2, nine samples from Area 3, one outlier well on Standard Avenue, two MW samples, one field duplicate sample (WO 19030).

Following consultation with ADEC and the CoF, we have since revisited wells identified during our Area 1 and Area 3 well searches and sampled most of these wells. Additionally, we were unable to collect a sample from PAN 87149 during our initial Area 1 sampling effort due to pump inoperability and availability of the owners. Analytical results for these samples will be included under separate cover.

2.3 Upgradient Wells

At the request of the ADEC, we identified and sampled three wells outside of Areas 1 through 3. There private wells are located between 0.4 and 0.6 miles west, south, and southwest from the RFTC. Based on knowledge of regional groundwater flow directions, these wells are considered upgradient or cross gradient from the RFTC.

- MSI Auto Parts at 1307 30th Avenue, estimated 30 foot deep well
- Young's Gear at 1711 Van Horn Road, 103 foot deep well
- City Electric at 3540 Holt Road, 91 foot deep well

These wells were sampled using the purge and sample-collection methods described for other private wells. We sampled the water-supply well at MSI Auto Parts as part of our March private well sampling event. We sampled the remaining two upgradient and cross gradient wells as part of our April sampling event.

2.4 Sample Custody, Storage, and Transport

Immediately after collection, the sample jars for each location were placed in a Ziploc bags and stored in a designated sample cooler maintained at approximately 4 °C with ice substitute. Shannon & Wilson maintained custody of the samples until submitting them to the laboratory for analysis. For shipping we packaged analytical samples and chain-of-custody (COC) forms in a

hard plastic cooler with an adequate quantity of frozen ice substitute, packing material as necessary to prevent bottle breakage, and a laboratory-supplied liner bag. We applied Shannon & Wilson custody seals to the cooler, which were observed to be intact upon receipt by the laboratory.

We shipped sample coolers to TestAmerica Laboratories, Inc. (TestAmerica) in West Sacramento, California using FedEx priority overnight service. This allowed sufficient time for the laboratory to analyze the samples within holding-time requirements of the analytical method. The complete TestAmerica laboratory reports are included in Appendix D (WOs 17423, 17748, 18463, and 19030).

2.5 Notification of Results

Upon completion of review of the analytical data, we prepared letters to owners and occupants informing them of the results for the sample from their well, including upgradient wells. These letters were tailored to each property and analytical sample, and included the following information:

- sample name;
- analytical result for PFOS and PFOA;
- comparison of analytical results to PHA levels or LHA level;
- description of the project;
- those pages of the TestAmerica laboratory report that apply to the owner or occupant's water-well sample; and
- the updated RFTC fact sheet.

When requested, results letters were e-mailed to owners or occupants instead of mailed in hard copy. We also contacted some owners and occupants via telephone to notify them of their results prior to letter preparation. At a minimum, we contacted the owners of those properties whose results exceeded the PHA levels or LHA level, and those who requested to be notified immediately. For our first two sampling events, we telephoned the owner or occupant of each residential property.

The CoF was notified of the new, LHA level on May 19, 2016. At the request of the CoF we prepared advisory letters to the owners and occupants of wells sampled before that date to notify them of the LHA level. We prepared 37 letters, tailored to each owner or occupant. The LHA letter template is included in Appendix A; highlighted portions of the template letter are those that varied with each mailing. The LHA letters were mailed on May 25, 2016.

2.6 Alternative Water Source

The CoF has chosen to provide bottled water deliveries at no cost to owners and occupants whose category 1 or 2 well water exceeds the LHA level, until they are provided with a long-term alternate water source. Some additional residents were offered bottled water deliveries due to their proximity to homes with LHA exceedances. Water deliveries are being coordinated by Mr. Ernie Misewicz, the Assistant Fire Chief of the Fairbanks Fire Department, and are ongoing. The following homes and businesses have been offered bottled water deliveries; some have declined.

2.7 Deviations

In general, we conducted our services in accordance with the approved proposals. The following are the deviations from our agreed-upon scope of services.

- Our three proposals call for downloading a list of improved parcels from the FNSB database. After cross-referencing the FNSB list with aerial photographs we discovered some inconsistencies; we therefore downloaded and used a list of both improved and unimproved parcels.
- Our proposal dated March 15, 2016, called for our first contact attempt with owners and occupants in the search area to be via telephone. We first contacted owners and occupants in Area 1 by mailing or delivering a well-search letter. We only contacted these individuals via telephone, where we were unable to reach them using other means.
- Our proposal dated April 14, 2016, stated that we will provide a *Private Well Inventory Survey Form* to owners and occupants in Area 3. We first contacted some owners and

occupants in Area 3 via telephone; in these cases, a well search letter and *Survey Form* were not provided.

- At the request of the CoF and ADEC, we prepared and mailed advisory letters to the owners or occupants of sampled wells in late May 2016 (Appendix A). These letters were intended to notifying them of the newly published EPA LHA level.

3.0 ANALYTICAL RESULTS

We submitted the water samples to TestAmerica for determination of PFCs using Method WS-LC-0025, the laboratory's in-house method. This method analyzes for 19 PFCs, including PFOS, PFOA, and the four other PFCs listed in the EPA's Unregulated Contaminant Monitoring Rule (UCMR). The TestAmerica laboratory reports and ADEC Laboratory Data Review Checklists for each WO are included in Appendix D.

Analytical results and other relevant information for Area 1 are depicted in Figure 4, PANs, PFOS and PFOA Results, and Well Depths Southwest of RFTC. Analytical results for Areas 2 and 3 are depicted in and Figure 5, PANs, PFOS and PFOA Results, and Well Depths Northwest of RFTC.

3.1 February Private Well Samples

Table 6 summarizes the concentrations of PFCs in February private well samples (WO 17423). Sample *87408* is a field duplicate of sample *87418.* The analytical result for one private well, sample *87173*, exceeds the EPA LHA level for combined PFOS and PFOA concentrations. This result is 220 ng/L PFOS and 9.7 ng/L PFOA for the well located at 2145 30th Avenue.

3.2 March Private Well Samples

Table 7 summarizes the concentrations of PFCs in March private well samples (WO 17748). Sample *522484* is a field duplicate of sample *522384.* The analytical results for three private wells exceed the LHA level. The highest of these results is 340 ng/L PFOS and 12 ng/L PFOA for sample *522484 /* 522384, the well located at 2051 30th Avenue.

3.3 April Private Well Samples

Table 8 summarizes the concentrations of PFCs in April private well samples (WO 18463). Sample *167854* is a field duplicate of sample *167754* and sample *526676* is a duplicate of *526576.* The analytical results for two private wells exceed the LHA level, samples *127124* and *526676 / 526576*. The higher of these two results is 68 ng/L PFOS and 14 ng/L PFOA for sample *127124*, the well located at 2525 17th Avenue.

3.4 May Private Well Samples

Table 9 summarizes the concentrations of PFCs in May private and groundwater MW samples (WO 19030). None of the analytical results in this WO exceed the LHA level. The highest results are 38 ng/L PFOS in samples *597517-2* and *MW-207A*, and 6.3 ng/L PFOA in sample *671300*.

4.0 QUALITY ASSURANCE/QUALITY CONTROL

Quality Assurance/Quality Control (QA/QC) procedures assist in producing data of acceptable quality and reliability. We reviewed the analytical results for laboratory QC samples and also conducted our own QA assessment for this project. We reviewed the chain-of-custody (COC) record and laboratory-receipt form to check that 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. Our 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.

The laboratory applies the letter 'J' to a detection less than the limit of quantitation but greater than the detection limit; this "flagged" datum is considered an estimated concentration. We reviewed the data using the current ADEC Laboratory Data Review Checklist and applied a standardized set of flags to any data brought into question during the review. During our QC review we applied flags indicating estimated data or analytical bias as applicable. Our QC review did not encounter QA/QC errors that resulted in flags for PFOS or PFOA analytical data.

We reviewed analytical sample results (TestAmerica WOs 17423, 17748, 18463, and 19030) for this project. The laboratory reports, including the case narratives describing the laboratory QA results in detail, along with completed ADEC data-review, are included in Appendix D. Laboratory QC procedures included evaluating surrogate recovery, performing continuing calibration checks, analyzing method blanks, and checking laboratory control samples to assess accuracy. Please refer to Appendix D for details regarding the results of our QA review for these four WOs.

By working in general accordance with our proposed scope of services, we consider the samples we collected for this project to be representative of site conditions at the locations and times they were obtained. Based on our QA review, no samples were rejected as unusable due to QC failures, and our completeness goal of obtaining 85 percent useable data was met. 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 our assessment.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Of the private and MW results discussed in this report, there are seven combined PFOS and PFOA concentrations exceeding the effective LHA level of 65 ng/L. Five of these wells are located on 30th Avenue to the west of the intersection with North Van Horn Court. The other two wells are located at [redacted] Avenue and in the Davis Road right-of-way next to the CoF maintenance yard (MW-507). These analytical results are summarized in Figure 4 for wells to the southwest of the RFTC (Area 1) and Figure 5 for wells to the northwest (Areas 2 and 3).

Based on our understanding of offsite private well data, Shannon & Wilson offers the following recommendations:

- continue to expand the private well search area as necessary to assess human exposure risk to PFOS- and PFOA-containing water;
- continue to provide an alternate water source to the occupants of homes or businesses whose well water exceeds the LHA level;
- continue to work with the ADEC and Alaska Department of Health and Human Services to educate the public regarding the potential health effects of exposure to PFC-containing water;
- decommission the RFTC burn pit; and
- install offsite groundwater MWs to the satisfaction of ADEC to study groundwater flow directions and the presence of permafrost.

Future private well search and sample results will be included under separate cover. We anticipate that this report will be the first of two 2016 quarterly reports describing offsite tasks and summarizing analytical results.

6.0 LIMITATIONS

The observations and conclusions described in this report are based solely on the scope of service described in and implemented pursuant to the signed agreements dated March 15, March 29, and April 14, 2016, between the City of Fairbanks and Shannon & Wilson, Inc. Shannon & Wilson has not performed any observation, investigation, study, or testing that is not specifically listed in the scope of service, or that was not developed in coordination with the City of Fairbanks. Other areas of contamination that were not obvious during our site work could be present at the site. Shannon & Wilson is not liable for failing to discover any condition whose discovery required the performance of services not authorized by the Agreement.

This report was prepared for the exclusive use of our Client and their representatives to document environmental conditions at the Regional Fire Training Center site. This work presents our professional judgment as to the conditions in the site. Information presented here is based on the sampling and analyses we performed. Our sampling was intended to confirm the presence or absence of selected contaminants at the sampled locations. It should not be construed as a definite conclusion about the soil conditions in the area, and it is possible our tests do not represent the highest levels of contamination at the site. In addition, conclusions cannot be drawn on the presence or absence of contaminants for which laboratory analyses were not performed. Interpretations and recommendations made by Shannon & Wilson are based solely upon information available to Shannon & Wilson at the time the interpretations and recommendations are made.

The information included in this report is based on limited sampling at the site and should be considered representative of the time and location at which the sampling occurred. It was not the intent of our investigation to detect the presence of soil, groundwater, or surface water contaminants other than those for which laboratory analyses were performed; no conclusions can be drawn on the presence or absence of other contaminants. The observed levels of contamination may be dependent upon changes due to natural forces or human activity. In addition, changes in government codes, regulations, or laws may occur. Due to such changes, or other factors beyond our control, our observations and recommendations applicable to this site may need to be revised. If substantial time has elapsed between submission of this report and the start of activities or action based upon it, we recommend this report be reviewed to determine the applicability of the conclusions. We have prepared and included in the Appendix E, "*Important Information about your Geotechnical/Environmental Report*," to assist you and others in understanding the use and limitations of our reports.

Within the limitations of scope, schedule, and budget, Shannon & Wilson has prepared this report in a professional manner, using that level of skill and care normally exercised for similar projects under similar conditions by reputable and competent environmental consultants currently practicing in this area.

The data presented in this report are based on limited research and sampling at the site and should be considered representative at the time of our observations. Note too that the passage of time may affect conditions at the sampling locations. Shannon & Wilson is not responsible for conditions or consequences arising from relevant facts that were concealed, withheld, or not fully disclosed at the time the report was prepared. We also note that the facts and conditions referenced in this report may change over time, and that the facts and conditions set forth here

are applicable to the facts and conditions as described only at the time of this report. We believe that the conclusions stated here are factual, but no guarantee is made or implied.

TABLE 4
AREA 1 WELL SEARCH RESULTS
Note: This table contains personal information and is not intended for public distribution.

This table contains personal information of residents in the search area. Content has been removed for confidentiality.

TABLE 5
AREA 2 AND 3 WELL SEARCH RESULTS
Note: This table contains personal information and is not intended for public distribution.

This table contains personal information of residents in the search area. Content has been removed for confidentiality.

TABLE 6
SUMMARY OF FEBRUARY 2016 PRIVATE WELL SAMPLE ANALYTICAL RESULTS

Analyte	EPA LHA Level	Units	Sample Location PAN and Address										
			87173	*87408*	*84718*	*87319*	*92801*	*629709*	*95451*	*563412*	*87301*	*562637*	*87335*
													
Perfluorobutanoic acid (PFBA)	—	ng/L	7.8 JH*	6.1 JH*	7.1 JH*	4.9 JH*	<2.7 B*	<3.5 B*	<3.1 B*	4.7 JH*	<4.1 B*	<3.9 B*	<3.9 B*
Perfluoropentanoic acid (PFPeA)	—	ng/L	18	11	10	8.8	3.5	3.6	7.8	7.3	5.9	7.2	6.1
Perfluorohexanoic acid (PFHxA)	—	ng/L	22	20	19	16	3.6	5.1	7.3	12	10	8.0	8.1
Perfluoroheptanoic acid (PFHpA)	—	ng/L	6.8 JH*	<4.1 B*	<4.1 B*	<3.6 B*	<1.7 B*	<1.7 B*	<2.6 B*	<2.5 B*	<2.6 B*	<2.8 B*	<2.4 B*
Perfluorooctanoic acid (PFOA)	70†	ng/L	9.7	5.0	4.4	3.3	1.5 J	2.6	3.1	3.9	2.3	2.9	2.8
Perfluorononanoic acid (PFNA)	—	ng/L	1.5 J	<1.8	<1.8	<1.8	<1.7	<1.7	0.88 J	<1.7	<1.7	<1.8	<1.8
Perfluorodecanoic acid (PFDA)	—	ng/L	<1.8 B*	<1.8 B*	<1.8	<1.8 B*	<1.7 B*	<1.7 B*	<1.8 B*	<1.7 B*	<1.7	<1.8 B*	<1.8 B*
Perfluoroundecanoic acid (PFUnA)	—	ng/L	<1.8 B*	<1.8 B*	<1.8	<1.8	<1.7 B*	<1.7	<1.8	<1.7 B*	<1.7	<1.8 B*	<1.8 B*
Perfluorododecanoic acid (PFDoA)	—	ng/L	<1.8	<1.8	<1.8	<1.8	<1.7	<1.7	<1.8	<1.7	<1.7	<1.8	<1.8
Perfluorotridecanoic Acid (PFTriA)	—	ng/L	<1.8	<1.8	<1.8	<1.8	<1.7	<1.7	<1.8	<1.7	<1.7	<1.8	<1.8
Perfluorotetradecanoic acid (PFTeA)	—	ng/L	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.7 B*	<1.7 B*	<1.8 B*	<1.7 B*	<1.7 B*	<1.8 B*	<1.8 B*
Perfluoro-n-hexadecanoic acid (PFHxDA)	—	ng/L	<9.0 B*	<9.0 B*	<9.1 B*	<9.2 B*	<8.7 B*	<8.7 B*	<8.8 B*	<8.6 B*	<8.7 B*	<9.1 B*	<9.2 B*
Perfluoro-n-octandecanoic acid (PFODA)	—	ng/L	<1.8	<1.8	<1.8	0.64 J	<1.7	<1.7	<1.8	<1.7	<1.7	<1.8	<1.8
Perfluorobutane Sulfonate (PFBS)	—	ng/L	7.8	4.6	6.2	5.1	<1.7	<1.7	1.7 J	3.0	2.6	1.6 J	2.6
Perfluorohexane Sulfonate (PFHxS)	—	ng/L	54	38	36	27	2.3	2.0	6.4	14	15	5.9	11
Perfluoro-1-heptanesulfonate (PFHpS)	—	ng/L	3.0	<1.8	0.65 J	<1.8	<1.7	<1.7	<1.8	<1.7	<1.7	<1.8	<1.8
Perfluorodecane sulfonate (PFDS)	—	ng/L	<1.8	<1.8	<1.8	<1.8	<1.7	<1.7	<1.8	<1.7	<1.7	<1.8	<1.8
Perfluorooctane Sulfonate (PFOS)	70†	ng/L	**220**	37	43	32	2.6	2.1	10	13	30	6.7	10
Perfluorooctane Sulfonamide (FOSA)	—	ng/L	<4.6 B*	<1.8 B*	9.8 JH*	<1.8 B*	<1.7	<1.7	<1.8	<3.7 B*	<1.7	<1.8	<1.8

Notes: Sample *87408* is a field duplicate of sample *87418*.
PAN Parcel Account Number; PAN is also sample number (except for duplicate and background samples)
ng/L nanograms per liter
LHA Lifetime Health Advisory
† EPA LHA Level is 70 ng/L for PFOS and PFOA combined.
— EPA LHA level not established.
bold Result exceeds EPA LHA level.
< Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
J Estimated concentration, result is between method detection limit and RL; flag applied by laboratory.
J* Estimated concentration, result is flagged due to field-duplicate relative percent difference (RDP) or other QC failure; flag applied by Shannon & Wilson.
JH* Estimated concentration biased high; flag applied by Shannon & Wilson.
B* Analyte considered not detected at RL or concentration originally reported in the sample (higher of the two values) due to method-blank detection; flag applied by Shannon & Wilson.

TABLE 7
SUMMARY OF MARCH 2016 PRIVATE WELL SAMPLE ANALYTICAL RESULTS

Analyte	EPA LHA Level	Units	Sample Location PAN and Address											
			652286	*92924*	*87360*	*87190*	*3228039*	*87157*	*669077*	*87351*	*522384*	*522484*	*87386*	*87165*
			[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted] Ave
Perfluorobutanoic acid (PFBA)	—	ng/L	4.0	9.0	2.7	4.7	<1.8	7.6	5.1	3.9	13	12	5.0	8.3
Perfluoropentanoic acid (PFPeA)	—	ng/L	6.3	13	1.3 J	5.9	5.2	10	7.1	3.8	21	28	10	18
Perfluorohexanoic acid (PFHxA)	—	ng/L	12	20	2.1	15	5.2	15	12	7.5	29	31	14	24
Perfluoroheptanoic acid (PFHpA)	—	ng/L	2.8	4.8	0.89 J	3.0	1.1 J	3.6	2.9	2.3	8.9	9.4	4.6	7.3
Perfluorooctanoic acid (PFOA)	70†	ng/L	6.2	4.6	2.6	3.8	5.8	6.0	3.9	3.6	12	11	5.5	7.5
Perfluorononanoic acid (PFNA)	—	ng/L	0.73 J	1.2 J	<1.8	<1.8	<1.8	1.3 J	<1.8	<1.8	2.8	2.3	0.86 J	4.1
Perfluorodecanoic acid (PFDA)	—	ng/L	<1.8	<1.8 B*	<1.8 B*	<1.8	<1.8 B*	<1.8 B*	<1.8 B*	<1.8	<1.8 B*	<1.8 B*	<1.8 B*	<1.8
Perfluoroundecanoic acid (PFUnA)	—	ng/L	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Perfluorododecanoic acid (PFDoA)	—	ng/L	<1.8	<1.8	<1.8	<1.8	<1.8 B*	<1.8 B*	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Perfluorotridecanoic Acid (PFTriA)	—	ng/L	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Perfluorotetradecanoic acid (PFTeA)	—	ng/L	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*
Perfluoro-n-hexadecanoic acid (PFHxDA)	—	ng/L	<9.0	0.62 J	<8.8	<8.9	0.35 J	1.2 J	<8.8	0.72 J	<9.2	<9.2	<9.0	2.7 J
Perfluoro-n-octandecanoic acid (PFODA)	—	ng/L	<1.8	<1.8	<1.8	<1.8	<1.8 B*	<1.8 B*	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Perfluorobutane Sulfonate (PFBS)	—	ng/L	2.8	4.6	<1.8	2.4	<1.8	3.4	3.0	1.8	9.5	12	2.9	8.3
Perfluorohexane Sulfonate (PFHxS)	—	ng/L	16	23	1.8	13	2.3	18	13	9.3	61	78	17	52
Perfluoro-1-heptanesulfonate (PFHpS)	—	ng/L	<1.8	<1.8	<1.8	<1.8	<1.8	0.93 J	<1.8	<1.8	3.7 J*	5.7 J*	<1.8	3.5
Perfluorodecane sulfonate (PFDS)	—	ng/L	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Perfluorooctane Sulfonate (PFOS)	70†	ng/L	42	42	2.1	35	1.9	**75**	35	9.5	**330**	**340**	15	**160**
Perfluorooctane Sulfonamide (FOSA)	—	ng/L	<1.8	<1.8	<1.8	<1.8	<1.8	3.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8

Notes:
Sample *522484* is a field duplicate of sample *522384*.
PAN Parcel Account Number; PAN is also sample number (except for duplicate and background samples)
ng/L nanograms per liter
LHA Lifetime Health Advisory
† EPA LHA Level is 70 ng/L for PFOS and PFOA combined.
— EPA LHA level not established.
bold Result exceeds EPA LHA level.
< Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
J Estimated concentration, result is between method detection limit and RL; flag applied by laboratory.
J* Estimated concentration, result is flagged due to field-duplicate relative percent difference (RPD) or other QC failure; flag applied by Shannon & Wilson.
B* Analyte considered not detected at RL or concentration originally reported in the sample (higher of the two values) due to method-blank detection; flag applied by Shannon & Wilson.

TABLE 8
SUMMARY OF APRIL 2016 PRIVATE WELL SAMPLE ANALYTICAL RESULTS

Analyte	EPA LHA Level	Units	Sample Location PAN and Address												
			167754	*167854*	*127124*	*526576*	*526676*	*127523*	*95443*	*454974*	*127311*	*127230*	*524565*	*411866*	*4527158*
															
Perfluorobutanoic acid (PFBA)	—	ng/L	6.8 JH*	5.5 JH*	8.0 B	4.0 JH*	4.0 JH*	5.1 JH*	<1.9 B*	<1.8 B*	4.6 JH*	9.8 B	<1.9 B*	3.8 JH*	<1.8 B*
Perfluoropentanoic acid (PFPeA)	—	ng/L	13	13	24	4.5	5.5	12	5.4	5.4	9.9	16	1.4 J	2.6	2.5
Perfluorohexanoic acid (PFHxA)	—	ng/L	17	18	26	9.3	9.0	14	5.0	6.1	13	13	2.8	3.8	2.7
Perfluoroheptanoic acid (PFHpA)	—	ng/L	4.7	4.5	7.5	0.93 J	1.0 J	4.2	2.1	2.0	4.0	5.0	<1.9	0.96 J	0.82 J
Perfluorooctanoic acid (PFOA)	70†	ng/L	8.3	8.9	14	3.0	3.4	6.6	3.2	2.7	6.2	12	1.9	2.3	3.3
Perfluorononanoic acid (PFNA)	—	ng/L	0.97 J*	1.4 J*	3.4	<1.8	<1.8	1.2 J	<1.9	<1.8	1.1 J	2.1	<1.9	<1.8	<1.8
Perfluorodecanoic acid (PFDA)	—	ng/L	<1.8	<1.8	1.3 J	0.77 J	0.84 J	<1.8	<1.9	<1.8	<1.9	<1.8	<1.9	<1.8	<1.8
Perfluoroundecanoic acid (PFUnA)	—	ng/L	0.77 J	<1.8	0.76 J	0.87 J	<1.8	0.71 J	<1.9	<1.8	1.0 J	<1.8	<1.9	<1.8	<1.8
Perfluorododecanoic acid (PFDoA)	—	ng/L	1.1 J	1.0 J	1.0 J	0.93 J	<1.8	<1.8	<1.9	<1.8	<1.9	<1.8	<1.9	<1.8	<1.8
Perfluorotridecanoic Acid (PFTriA)	—	ng/L	<1.8	<1.8	<1.9	<1.8	<1.8	<1.8	<1.9	<1.8	<1.9	<1.8	<1.9	<1.8	<1.8
Perfluorotetradecanoic acid (PFTeA)	—	ng/L	0.61 J	1.2 J	0.7 J	0.9 J*	0.36 J*	1.4 J	0.47 J	0.81 J	0.91 J	0.9 J	0.5 J	<1.8	0.93 J
Perfluoro-n-hexadecanoic acid (PFHxDA)	—	ng/L	<1.8 B*	<1.8 B*	<1.9 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.9 B*	<1.8 B*	<1.9 B*	<2.6 B*	<1.9 B*	<1.8 B*	<1.8 B*
Perfluoro-n-octandecanoic acid (PFODA)	—	ng/L	<1.8	0.97 J	<1.9	<1.8	<1.8	<1.8	<1.9	<1.8	<1.9	<1.8	<1.9	<1.8	<1.8
Perfluorobutane Sulfonate (PFBS)	—	ng/L	7.9	9.0	6.5	3.2	3.6	7.9	2.0	1.3 J	7.8	4.4	1.5 J	<1.8	<1.8
Perfluorohexane Sulfonate (PFHxS)	—	ng/L	38	49	48	15	12	38	5.4	4.2	31	42	5.2	1.5 J	1.6 J
Perfluoro-1-heptanesulfonate (PFHpS)	—	ng/L	1.9	2.3	2.9	1.4 J*	0.81 J*	1.5 J	<1.9	<1.8	1.4 J	1.2 J	0.88 J	<1.8	<1.8
Perfluorodecane sulfonate (PFDS)	—	ng/L	<1.8	<1.8	<1.9	<1.8	<1.8	<1.8	<1.9	<1.8	<1.9	<1.8	<1.9	<1.8	<1.8
Perfluorooctane Sulfonate (PFOS)	70†	ng/L	47	51	**68**	**65**	49	55	5.7	6.7	29	19	21	<1.8	<1.8
Perfluorooctane Sulfonamide (FOSA)	—	ng/L	<1.8	4.3	0.97 J	<1.8	<1.8	<1.8	<1.9	<1.8	<1.9	12	7.1	<1.8	<1.8

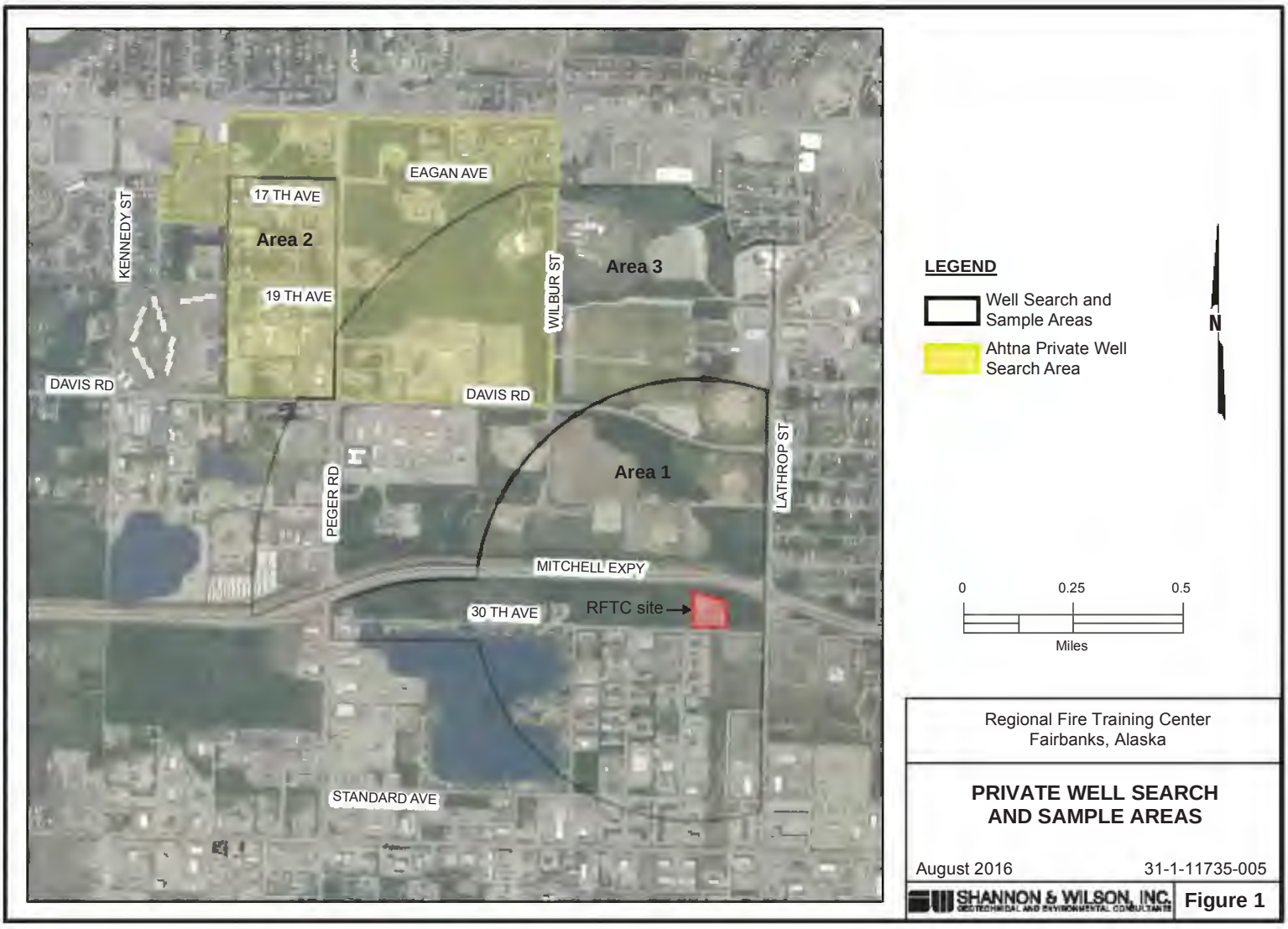
Notes:
Sample *167854* is a field duplicate of sample *167754* and sample *526676* is a duplicate of *526576*.
PAN Parcel Account Number; PAN is also sample number (except for duplicate and background samples)
LHA Lifetime Health Advisory
† EPA LHA Level is 70 ng/L for PFOS and PFOA combined.
— EPA LHA level not established.
bold Result exceeds EPA LHA level.
< Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
J Estimated concentration, result is between method detection limit and RL; flag applied by laboratory.
J* Estimated concentration, result is flagged due to field-duplicate relative percent difference (RDP) or other QC failure; flag applied by Shannon & Wilson.
JH* Estimated concentration biased high; flag applied by Shannon & Wilson.
B Compound was found in the method blank and sample (i.e., method-blank detection); flag applied by laboratory.
B* Analyte considered not detected at RL or concentration originally reported in the sample (higher of the two values) due to method-blank detection; flag applied by Shannon & Wilson.

TABLE 9
SUMMARY OF MAY 2016 PRIVATE AND MONITORING WELL SAMPLE ANALYTICAL RESULTS

Analyte	EPA LHA Level	Units	Sample Name and Address or Location														
			471542	*515485*	*521779*	*582573*	*593460-1*	*593460-2*	*536555-1*	*597507*	*597517-1*	*597517-2*	*671300*	*95630*	*95730*	*MW-207A*	*MW-504*
Perfluorobutanoic Acid (PFBA)	—	ng/L	<2.2 B*	8.5 JH*	<4.0 B*	<2.3 B*	2.8 JH*	2.8 JH*	<1.8	<1.8 B*	<3.8 B*	3.5 JH*	<7.4 B*	<4.7 B*	4.1 B*	3.3 JH*	<1.8 J*
Perfluoropentanoic Acid (PFPeA)	—	ng/L	<2.2 B*	10 JH*	<4.9 B*	<2.4 B*	3.1	4.4	1.7 J	1.6 J	6.8 JH*	7.5	8.3 JH*	<5.9 B*	<6.1 B*	5.2	<1.8 J*
Perfluorohexanoic Acid (PFHxA)	—	ng/L	1.4 J	8.7	4.6	3.1	3.9	5.3	1.3 J	2.3	6.8	13	8.0	6.7	7.4	9.5	4.8 J*
Perfluoroheptanoic Acid (PFHpA)	—	ng/L	1.0 J	4.2	2.0	1.2 J	1.7 J	1.7 J	<1.8	1.1 J	3.2	2.5	4.0	2.9	2.6	2.4	1.0 J*
Perfluorooctanoic Acid (PFOA)	70†	ng/L	1.2 J	6.1	2.7	1.7 J	3.1	5.5	0.94 J	3.7	4.5	5.7	6.3	4.1	4.2	4.7	2.6 J*
Perfluorononanoic Acid (PFNA)	—	ng/L	<1.8	1.0 J	0.75 J	<1.8	1.2 J	2.8	<1.8	1.8	0.86 J	0.68 J	1.5 J	0.75 J	0.96 J	0.71 J	<1.8 J*
Perfluorodecanoic Acid (PFDA)	—	ng/L	0.40 J	<1.8	<1.8	<1.8	0.91 J	1.6 J	<1.8	1.8	<1.8	0.82 J	0.86 J	0.42 J	0.55 J	<1.7	<1.8 J*
Perfluoroundecanoic Acid (PFUnA)	—	ng/L	<1.8	<1.8 J*	<1.8	<1.8	<1.8 B*	<1.8 B*	<1.8	<1.8 B*	<1.8	<1.8	<1.8	<1.9	<1.8	<1.7	<1.8 J*
Perfluorododecanoic Acid (PFDoA)	—	ng/L	<1.8	<1.8	<1.8	0.57 J	<1.8	0.88 J	<1.8 J*	0.58 J	<1.8	<1.8	<1.8	0.57 J	0.57 J	<1.7	<1.8 J*
Perfluorotridecanoic Acid (PFTriA)	—	ng/L	<1.8	<1.8 J*	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.9	<1.8	<1.7	<1.8 J*
Perfluorotetradecanoic Acid (PFTeA)	—	ng/L	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.9 B*	<1.8 B*	<1.7 B*	<1.8 B*
Perfluoro-n-hexadecanoic Acid (PFHxDA)	—	ng/L	1.8	<1.8	<1.8	<1.8	0.44 J	0.96 J	<1.8	<1.8	<1.8	<1.8	0.62 J	2.4 J*	0.78 J*	0.30 J	<1.8 J*
Perfluoro-n-octandecanoic Acid (PFODA)	—	ng/L	2.2 JL*	<1.8 J*	2.8 JL*	0.89 JL*	<1.8 J*	<1.8 J*	<1.8 J*	<1.8 J*	0.84 JL*	<1.8 J*	2.1 JL*	2.0 JL*	1.6 JL*	<1.7 J*	<1.8 J*
Perfluorobutane Sulfonate (PFBS)	—	ng/L	0.93 J	2.4	1.6 J	1.5 J*	1.8	1.9	<1.8	<1.8	3.2 J*	8.1	2.4	2.4 J*	2.6	3.7	1.1 J*
Perfluorohexane Sulfonate (PFHxS)	—	ng/L	2.0	14	8.3	8.5 J*	7.5	12	1.3 J	4.0	22 J*	40	12	12 J*	15	21	0.88 J*
Perfluoro-1-heptanesulfonate(PFHpS)	—	ng/L	<1.8	<1.8	<1.8	<1.8	<1.8	0.75 J	<1.8	<1.8	<1.8	1.4 J	<1.8	<1.9	<1.8	1.3 J	<1.8 J*
Perfluorodecane Sulfonate (PFDS)	—	ng/L	<1.8 J*	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.9 J*	<1.8	<1.7	<1.8 J*
Perfluorooctane Sulfonate (PFOS)	70†	ng/L	<1.8 J*	24	9.3	11	17	31	2.3	11	12	38	20	16 J*	17	38	1.7 J*
Perfluorooctane Sulfonamide (FOSA)	—	ng/L	<1.8 J*	0.65 J	<1.8	<1.8 J*	1. 1J*	10 J*	<1.8	<1.8	<1.8	<1.8	<1.8	<1.9	<1.8	<1.7 J*	<1.8 J*

Notes: Sample *95730* is a field duplicate of sample *95630*.

ng/L nanograms per liter
LHA Lifetime Health Advisory
FYSA Fairbanks Youth Soccer Association
GHSA Golden Heart Softball Association
DOT&PF Department of Transportation & Public Facilities
† EPA LHA Level is 70 ng/L for PFOS and PFOA combined.
— EPA LHA level not established.
< Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
J Estimated concentration, result is between method detection limit and RL; flag applied by laboratory.
J* Estimated concentration, result is flagged due to field-duplicate relative percent difference (RDP) or other QC failure; flag applied by Shannon & Wilson.
JH* Estimated concentration biased high; flag applied by Shannon & Wilson.
JL* Estimated concentration biased low; flag applied by Shannon & Wilson.
B Compound was found in the method blank and sample (i.e., method-blank detection); flag applied by laboratory.
B* Analyte considered not detected at RL or concentration originally reported in the sample (higher of the two values) due to method-blank detection; flag applied by Shannon & Wilson.



Regional Fire Training Center
Fairbanks, Alaska

PRIVATE WELL SEARCH AND SAMPLE AREAS

August 2016 31-1-11735-005

SHANNON & WILSON, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 1

Image source: Pictometry, 2012

LEGEND

- RFTC Site
- Area 1 Boundary
- Well sample location
- Yes - active well
- Yes - inferred well
- Yes - unused well
- No - inferred
- No - confirmed

N

0 500 1,000
Feet

Regional Fire Training Center Burn Pit
Fairbanks, Alaska

PANS AND RESULTS OF WELL SEARCH SOUTHWEST OF RFTC

August 2016 31-1-11735-005

SHANNON & WILSON, INC. **Figure 2**

Image source: Pictometry, 2012

LEGEND

- RFTC Site
- Area 2 and 3 Boundaries
- FNSB irrigation well
- Well sample location
- Yes - active well
- Yes - unused well
- No - inferred
- No - confirmed

N

0 1,500
Feet

Regional Fire Training Center
Fairbanks, Alaska

PANS AND RESULTS OF WELL SEARCH NORTHWEST OF RFTC

August 2016 31-1-11735-005

SHANNON & WILSON, INC. **Figure 3**

Image source: Pictometry, 2012

LEGEND

- Well Search Areas
- Parcel sampled
- Parcel not sampled

Combined (PFOS+PFOA) result:

- <10 ng/L
- 10 to 34.9 ng/L
- 35 to 64.9 ng/L
- 65 to 199 ng/L
- ≥200 ng/L

N

0 500 1,000
Feet

Regional Fire Training Center
Fairbanks, Alaska

PANs, PFOS AND PFOA SAMPLE RESULTS, AND WELL DEPTHS SOUTHWEST OF RFTC

August 2016 31-1-11735-005

SHANNON & WILSON, INC. Figure 4

Image source: Pictometry, 2012

LEGEND

Well Search Areas

Parcel sampled

Parcel not sampled

Combined (PFOS+PFOA) result:

- <10 ng/L
- 10 to 34.9 ng/L
- 35 to 64.9 ng/L
- 65 to 199 ng/L
- ≥200 ng/L

N

0 500 1,000

Feet

Regional Fire Training Center
Fairbanks, Alaska

PANs, PFOS AND PFOA SAMPLE RESULTS, AND WELL DEPTHS NORTHWEST OF RFTC

August 2016 31-1-11735-005

SHANNON & WILSON, INC. **Figure 5**

APPENDIX A

WELL SEARCH LETTERS AND COF FACT SHEETS

CITY OF FAIRBANKS

800 Cushman Street
Fairbanks, AK 99701

PUBLIC WORKS DEPARTMENT
Engineering Division

Telephone (907) 459-6770
Fax (907) 452-5913

February 9, 2016

Dear Property Owner:

The City of Fairbanks (City) was recently alerted to concentrations of perfluorinated compounds (PFCs) in the groundwater at the Regional Fire Training Center (RFTC) at 1710 30th Avenue. From 1984 to around 2004, firefighters from the City and other agencies used Aqueous Film Forming Foam, a firefighting agent that contained PFCs, during training to extinguish petroleum fires at the RFTC. The PFCs recently discovered in the groundwater at the RFTC are in concentrations higher than the U.S. Environmental Protection Agency's preliminary health advisory levels. The City is working with an environmental consulting firm, Shannon & Wilson Inc., and the Alaska Department of Environmental Conservation to identify and sample private water wells near the RFTC to determine if these compounds are present above health advisory levels outside the RFTC property.

Enclosed is a Fact Sheet about PFCs, agency contact information to help address questions, and a Private Well Inventory Survey Form. The City asks that you review this information and return the survey by March 1 using the preaddressed envelope. Your participation in the survey helps ensure the study is not only thorough, but also identifies those in the area at risk of drinking PFC-contaminated water.

The City realizes the search area is served by the Golden Heart Utilities water system and that although our municipal code requires connection to the system where service is available, there may be still be some private wells in use which predate the system's installation. In such cases, the City is not going to mandate property owners decommission their wells. With this effort the City wants to identify those who may be at risk of drinking PFC-contaminated water from the RFTC; and if anyone is found to be at risk, the City may be able to assist those property owners with connection to the water system to provide access to clean drinking water.

If you have any questions, please see the list of contacts on the Fact Sheet to help direct you to the most appropriate person/agency for your inquiry. We look forward to receiving your completed survey.

CITY OF FAIRBANKS

Jackson C. Fox
Planning & Permitting Manager

City of Fairbanks

FACT SHEET – Well Testing for Perfluorinated Compounds

FEBRUARY 2016

Perfluorinated compounds (PFCs) are a group of manmade chemicals that have been used for a wide variety of residential, commercial, and industrial uses. PFCs are classified as emerging environmental contaminants because they do not have established regulatory standards, but evolving science has identified potential risk to human health and regulatory standards are under consideration. The City of Fairbanks has discovered PFC contamination at the Regional Fire Training Center (RFTC) at 1710 30th Avenue and is working in coordination with state regulators to identify affected wells and, when necessary, take responsive action. The initial well-search area consists of the area within ½ mile of the RFTC and west of Lathrop Street, as well as 30th Avenue to Peger Road.

KEY MESSAGES & QUICK FACTS

The City has confirmed that PFCs are present in the groundwater at the RFTC and would like to test nearby water wells.

The City will ask to test private wells where it believes PFCs could be present based on the known pattern of groundwater flow.

Test results will typically be available within three weeks.

The U.S. Environmental Protection Agency (EPA) issued a provisional health advisory for two forms of PFCs known as "PFOA" and "PFOS." A provisional health advisory is a concentration above which action should be taken to reduce exposure in drinking water. PFOA refers to perfluorooctanoic acid, and PFOS refers to perfluorooctane sulfonic acid.

The City is considering action to mitigate PFC exposures based on results in drinking water above the EPA provisional health advisory concentrations of:

PFOS: drinking water concentrations greater than 0.2 µg/L
PFOA: drinking water concentrations greater than 0.4 µg/L

Human health risks associated with PFC exposures have not been definitively established.

PFCs are used in a large number of products ranging from non-stick cookware, fabric waterproofing compound, stain-resistant carpeting, some food packaging, and firefighting agents.

From 1984 to 2004, firefighters from the City of Fairbanks and other agencies used Aqueous Film Forming Foam, a firefighting agent that contained PFCs, during training to extinguish petroleum fires at the RFTC.

PFCs are not known to degrade by natural processes.

For more information about PFCs, see http://www.atsdr.cdc.gov/pfc/index.html.

CONTACTS

For questions about well testing & study:
Shannon & Wilson Inc.
Julie Keener, Project Manager
Phone 907-458-3144
Email jak@shanwil.com

For regulatory questions:
Alaska Dept of Environmental Conservation,
Contaminated Sites Program
Robert Burgess, Environmental Program Specialist III
Phone 907-451-2153
Email robert.burgess@alaska.gov

For questions about PFC health effects:
Alaska Dept of Health & Social Services
Ali Hamade, Environmental Public Health Program Manager
Phone 907-269-8086
Email ali.hamade@alaska.gov

For questions about the RFTC & all other inquires:
City of Fairbanks, Engineering Division
Jackson Fox, Planning & Permitting Mgr
Phone 907-459-6758
Email jcfox@ci.fairbanks.ak.us

CITY OF FAIRBANKS

PUBLIC WORKS DEPARTMENT
Engineering Division

800 Cushman Street
Fairbanks, AK 99701

Telephone (907) 459-6770
Fax (907) 452-5913

April 28, 2016

Dear Property Owner:

The City of Fairbanks (City) was recently alerted to concentrations of perfluorinated compounds (PFCs) in the groundwater at the Regional Fire Training Center (RFTC) at 1710 30th Avenue. From 1984 to around 2004, firefighters from the City and other agencies used Aqueous Film Forming Foam, a firefighting agent that contained PFCs, during training to extinguish petroleum fires at the RFTC. The PFCs recently discovered in the groundwater at the RFTC are in concentrations higher than the U.S. Environmental Protection Agency's preliminary health advisory levels.

The City is working with an environmental consulting firm, Shannon & Wilson Inc., and the Alaska Department of Environmental Conservation to identify and sample private water wells near the RFTC to determine if these compounds are present above health advisory levels outside the RFTC property. In February Shannon & Wilson began contacting property owners and sampling private water-supply wells within approximately one-half mile of the RFTC. In April the well search area was expanded to include properties within approximately one mile to the west and northwest of the RFTC.

Enclosed is a Fact Sheet about PFCs, agency contact information to help address questions, and a Private Well Inventory Survey Form. The City asks that you review this information and return the survey as soon as possible using the preaddressed envelope. Your participation in the survey helps ensure the study is not only thorough, but also identifies those in the area at risk of drinking PFC-contaminated water.

The City realizes that a portion of the search area is served by the Golden Heart Utilities water system, although there may be private wells in use which predate the system's installation in those areas. In such cases, the City is not going to mandate property owners decommission their wells. With this effort the City seeks to identify those who may be at risk of drinking PFC-contaminated water from the RFTC; and if anyone is found to be at risk, the City may be able to assist those property owners with connection to the water system to provide access to clean drinking water.

If you have any questions, please see the list of contacts on the Fact Sheet to help direct you to the most appropriate person/agency for your inquiry. We look forward to receiving your completed survey.

CITY OF FAIRBANKS

Jackson C. Fox
Planning & Permitting Manager

City of Fairbanks

FACT SHEET – Well Testing for Perfluorinated Compounds

APRIL 2016

Perfluorinated compounds (PFCs) are a group of manmade chemicals that have been used for a wide variety of residential, commercial, and industrial uses. PFCs are classified as emerging environmental contaminants because they do not have established regulatory standards, but evolving science has identified potential risk to human health and regulatory standards are under consideration. The City of Fairbanks has discovered PFC contamination at the Regional Fire Training Center (RFTC) at 1710 30th Avenue and is working in coordination with state regulators to identify affected wells and, when necessary, take responsive action. The current well-search area consists of properties within approximately 1 mile to the west and northwest of the RFTC.

KEY MESSAGES & QUICK FACTS

The City has confirmed that PFCs are present in the groundwater at the RFTC and in water from some private wells to the west.

The City will ask to test private wells where it believes PFCs could be present based on the known pattern of groundwater flow.

Test results will typically be available within three weeks.

The U.S. Environmental Protection Agency (EPA) issued a provisional health advisory for two forms of PFCs known as "PFOA" and "PFOS." A provisional health advisory is a concentration above which action should be taken to reduce exposure in drinking water. PFOA refers to perfluorooctanoic acid; PFOS refers to perfluorooctane sulfonic acid.

The City is considering action to mitigate PFC exposures based on results in drinking water above the EPA provisional health advisory concentrations of:

PFOS: drinking water concentrations greater than 200 ng/L
PFOA: drinking water concentrations greater than 400 ng/L

Human health risks associated with PFC exposures have not been definitively established.

PFCs are used in a large number of products ranging from non-stick cookware, fabric waterproofing compound, stain-resistant carpeting, some food packaging, and firefighting agents.

From 1984 to 2004, firefighters from the City of Fairbanks and other agencies used Aqueous Film Forming Foam, a firefighting agent that contained PFCs, during training to extinguish petroleum fires at the RFTC.

PFCs are resistant to degradation by natural processes.

CONTACTS

For questions about well testing & study:
Shannon & Wilson Inc.
Julie Keener, Project Manager
Phone 907-458-3144
Email jak@shanwil.com

For regulatory questions:
Alaska Dept of Environmental Conservation,
Contaminated Sites Program
Robert Burgess, Environmental Program
Specialist III
Phone 907-451-2153
Email robert.burgess@alaska.gov

For questions about PFC health effects:
Alaska Dept of Health & Social Services
Ali Hamade, Public Health Scientist
Phone 907-269-8086
Email ali.hamade@alaska.gov

For questions about RFTC & all other inquires:
City of Fairbanks, Engineering Division
Jackson Fox, Planning & Permitting Mgr
Phone 907-459-6758
Email jcfox@ci.fairbanks.ak.us

CITY OF FAIRBANKS

800 Cushman Street
Fairbanks, AK 99701

PUBLIC WORKS DEPARTMENT
Engineering Division

Telephone (907) 459-6770
Fax (907) 452-5913

May 25, 2016

Dear Owner/Occupant Name:

Shannon & Wilson is working as a contractor for the City of Fairbanks to evaluate the potential presence of perfluorinated compounds (PFCs) in groundwater near the Regional Fire Training Center (RFTC) at 1730 30th Avenue. The well-water samples have been analyzed for 19 PFC analytes, including perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA).

On May 19, 2016, the U.S. Environmental Protection Agency published an updated health advisory level for PFCs. The new lifetime health advisory level is 70 nanograms per liter (ng/L) for PFOS, PFOA, or the sum of the two. The former provisional health advisory levels were 200 ng/L for PFOS and 400 ng/L for PFOA. Please note that the units of ng/L are equivalent to parts per trillion. There are no advisory levels for the other PFC analytes.

Shannon & Wilson has sampled 44 private water-supply wells and four monitoring wells in the RFTC area to date, including your well/s. The locations of these wells are shown in the enclosed map (Figure 1, PFC Sample Locations as of May 2016). The water sample from your well was mailed to TestAmerica Laboratories, Inc. on May 18, 2016; analytical results are forthcoming. The City is continuing to collect PFC water samples in order to evaluate the extent of PFC-containing groundwater in the area.

The PFOS and PFOA results for six of these wells exceed the new, lifetime health advisory level. The occupants of these homes and their nearest neighbors have been offered//The City is offering bottled water delivery at no cost; deliveries to homes on 30th Avenue began in March. The City is preparing a plan to provide owners and occupants whose well water exceeds the lifetime health advisory level with a long-term alternate water source. The City Council is considering connection to the municipal water supply system and other long-term water-supply solutions.

Please contact me at (907) 459-6758 or email jcfox@ci.fairbanks.ak.us if you have any questions or need additional information. For questions relating to well testing, environmental regulations, or other inquiries please refer to contact information on the enclosed Fact Sheet.

CITY OF FAIRBANKS

Jackson C. Fox
Planning & Permitting Manager

City of Fairbanks

FACT SHEET – Well Testing for Perfluorinated Compounds

MAY 2016

Perfluorinated compounds (PFCs) are a group of manmade chemicals that have been used for a wide variety of residential, commercial, and industrial uses. PFCs are classified as emerging environmental contaminants because they do not have established regulatory standards, but evolving science has identified potential risk to human health and regulatory standards are under consideration. The City of Fairbanks has discovered PFC contamination at the Regional Fire Training Center (RFTC) at 1710 30th Avenue and is working in coordination with state regulators to identify affected wells and, when necessary, take responsive action. The current well-search area consists of properties within approximately 1 mile to the west and northwest of the RFTC.

KEY MESSAGES & QUICK FACTS

The City has confirmed that PFCs are present in the groundwater at the RFTC and in water from some private wells to the west.

The City will ask to test private wells where it believes PFCs could be present based on the known pattern of groundwater flow. Test results will typically be available within three weeks.

The U.S. Environmental Protection Agency (EPA) issued a lifetime health advisory level for PFCs in May 2016. The health advisory level has been set with a sufficient margin of protection for a lifetime of exposure to PFOA and PFOS from drinking water, including for sensitive populations such as children. PFOA refers to perfluorooctanoic acid; PFOS refers to perfluorooctane sulfonate.

The City has adopted the EPA lifetime health advisory level of 70 nanograms per liter (ng/L) for PFOS, PFOA, or the sum of the two as the level above which action should be taken to reduce exposure in drinking water.

The new health advisory level has been set based on the latest peer-reviewed science. However, the human health risks associated with PFC exposures have not been definitively established.

PFCs are used in a large number of products ranging from non-stick cookware, fabric waterproofing compounds, stain-resistant carpeting, some food packaging, and firefighting agents.

From 1984 to 2004, firefighters from the City of Fairbanks and other agencies used Aqueous Film Forming Foam, a firefighting agent that contained PFCs, during training to extinguish petroleum fires at the RFTC.

PFCs are resistant to degradation by natural processes.

For more information, please visit:
www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos

CONTACTS

For questions about well testing & study:
Shannon & Wilson Inc.
Julie Keener, Project Manager
Phone 907-458-3144
Email jak@shanwil.com

For regulatory questions:
Alaska Dept of Environmental Conservation,
Contaminated Sites Program
Robert Burgess, Environmental Program Specialist III
Phone 907-451-2153
Email robert.burgess@alaska.gov

For questions about PFC health effects:
Alaska Dept of Health & Social Services
Ali Hamade, Public Health Scientist
Phone 907-269-8086
Email ali.hamade@alaska.gov

For questions about RFTC & all other inquires:
City of Fairbanks, Engineering Division
Jackson Fox, Planning & Permitting Mgr
Phone 907-459-6758
Email jcfox@ci.fairbanks.ak.us

APPENDIX B

COMPLETED PRIVATE WELL SURVEY FORMS

This appendix contains personal information. Content has been removed for confidentiality.

APPENDIX C

COPY OF PRIVATE AND MONITORING WELL SAMPLING LOGS

This appendix contains personal information. Content has been removed for confidentiality.

APPENDIX D

ANALYTICAL LABORATORY REPORTS AND ADEC DATA REVIEW CHECKLISTS

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: 320-17423-1
TestAmerica Sample Delivery Group: 31-1-11735-0004
Client Project/Site: City of Fairbanks Fire Training Area

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

Attn: Julie Keener

Authorized for release by:
3/2/2016 1:35:25 PM

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

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Definitions/Glossary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17423-1
SDG: 31-1-11735-0004

Qualifiers

LCMS

Qualifier	Qualifier Description
*	Isotope Dilution analyte is outside acceptance limits.
B	Compound was found in the blank and sample.
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, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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: 320-17423-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-17423-1

Receipt
The samples were received on 2/25/2016 10:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.5º C.

LCMS
Method(s) WS-LC-0025: The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: 87173 (320-17423-1), 87408 (320-17423-2), 84718 (320-17423-3), 87319 (320-17423-4), 92801 (320-17423-5), 629709 (320-17423-6), 95451 (320-17423-7), 563412 (320-17423-8), 87301 (320-17423-9), 562637 (320-17423-10) and 87335 (320-17423-11). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples.

Method(s) WS-LC-0025: The reporting limit for Perfluoro-n-hexadecanoic acid (PFHxDA) was raised due to problems with the calibration curve and low background levels in the instrument for this compound. Results below the new RL should be considered suspect. 87173 (320-17423-1), 87408 (320-17423-2), 84718 (320-17423-3), 87319 (320-17423-4), 92801 (320-17423-5), 629709 (320-17423-6), 95451 (320-17423-7), 563412 (320-17423-8), 87301 (320-17423-9), 562637 (320-17423-10), 87335 (320-17423-11) and (MB 320-101730/1-A)

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

Organic Prep
Method(s) 3535: Due to excessive sediment in sample column became clogged. The remainder of sample was loaded onto an additional column. After elution extracts were combined, respectively. 87408 (320-17423-2), 84718 (320-17423-3), 87319 (320-17423-4) and 87301 (320-17423-9)

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 320-101730.

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

Detection Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17423-1
SDG: 31-1-11735-0004

Client Sample ID: 87173 — Lab Sample ID: 320-17423-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	7.8	B	1.8	0.41	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	18		1.8	0.89	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	22		1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.8	B	1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	9.7		1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	1.5	J	1.8	0.59	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.87	J B	1.8	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluoroundecanoic acid (PFUnA)	1.2	J B	1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.77	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.3	J B	9.0	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	7.8		1.8	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	54		1.8	0.78	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-1-heptanesulfonate (PFHpS)	3.0		1.8	0.64	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	220		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonamide (FOSA)	4.6	B	1.8	0.58	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 87408 — Lab Sample ID: 320-17423-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	6.1	B	1.8	0.41	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	11		1.8	0.89	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	20		1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.1	B	1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	5.0		1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.58	J B	1.8	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluoroundecanoic acid (PFUnA)	1.1	J B	1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.37	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.9	J B	9.0	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	4.6		1.8	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	38		1.8	0.78	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	37		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonamide (FOSA)	1.8	B	1.8	0.57	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 84718 — Lab Sample ID: 320-17423-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	7.1	B	1.8	0.42	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	10		1.8	0.90	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	19		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.1	B	1.8	0.73	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	4.4		1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.50	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	3.8	J B	9.1	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	6.2		1.8	0.84	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	36		1.8	0.80	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-1-heptanesulfonate (PFHpS)	0.65	J	1.8	0.65	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	43		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17423-1
SDG: 31-1-11735-0004

Client Sample ID: 84718 (Continued) — Lab Sample ID: 320-17423-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctane Sulfonamide (FOSA)	9.8	B	1.8	0.58	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 87319 — Lab Sample ID: 320-17423-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.9	B	1.8	0.42	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	8.8		1.8	0.91	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	16		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.6	B	1.8	0.74	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	3.3		1.8	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.52	J B	1.8	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.0	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	3.8	J B	9.2	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA)	0.64	J	1.8	0.62	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	5.1		1.8	0.84	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	27		1.8	0.80	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	32		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonamide (FOSA)	1.4	J B	1.8	0.59	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 92801 — Lab Sample ID: 320-17423-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.7	B	1.7	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	3.5		1.7	0.86	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	3.6		1.7	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.5	J B	1.7	0.70	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	1.5	J	1.7	0.65	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.53	J B	1.7	0.38	ng/L	1		WS-LC-0025	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.83	J B	1.7	0.65	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.95	J B	1.7	0.17	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	3.1	J B	8.7	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	2.3		1.7	0.76	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	2.6		1.7	1.1	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 629709 — Lab Sample ID: 320-17423-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	3.5	B	1.7	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	3.6		1.7	0.86	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	5.1		1.7	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.6	J B	1.7	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	2.6		1.7	0.65	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.56	J B	1.7	0.38	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.70	J B	1.7	0.17	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.3	J B	8.7	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	2.0		1.7	0.75	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	2.1		1.7	1.1	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17423-1
SDG: 31-1-11735-0004

Client Sample ID: 95451 — Lab Sample ID: 320-17423-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	3.1	B	1.8	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	7.8		1.8	0.87	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	7.3		1.8	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.6	B	1.8	0.70	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	3.1		1.8	0.66	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.88	J	1.8	0.57	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.69	J B	1.8	0.39	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.22	J B	1.8	0.17	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.2	J B	8.8	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	1.7	J	1.8	0.80	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	6.4		1.8	0.76	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	10		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 563412 — Lab Sample ID: 320-17423-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.7	B	1.7	0.39	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	7.3		1.7	0.85	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	12		1.7	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.5	B	1.7	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	3.9		1.7	0.64	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.60	J B	1.7	0.38	ng/L	1		WS-LC-0025	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.70	J B	1.7	0.64	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.39	J B	1.7	0.17	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.4	J B	8.6	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	3.0		1.7	0.79	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	14		1.7	0.75	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	13		1.7	1.1	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonamide (FOSA)	3.7	B	1.7	0.55	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 87301 — Lab Sample ID: 320-17423-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.1	B	1.7	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	5.9		1.7	0.86	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	10		1.7	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.6	B	1.7	0.70	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	2.3		1.7	0.65	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.84	J B	1.7	0.17	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	5.6	J B	8.7	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	2.6		1.7	0.80	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	15		1.7	0.76	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	30		1.7	1.1	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 562637 — Lab Sample ID: 320-17423-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	3.9	B	1.8	0.42	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 562637 (Continued)

Lab Sample ID: 320-17423-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoropentanoic acid (PFPeA)	7.2		1.8	0.90	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	8.0		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.8	B	1.8	0.73	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	2.9		1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.52	J B	1.8	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.87	J B	1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.29	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.2	J B	9.1	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	1.6	J	1.8	0.84	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	5.9		1.8	0.79	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	6.7		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 87335

Lab Sample ID: 320-17423-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	3.9	B	1.8	0.42	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	6.1		1.8	0.91	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	8.1		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.4	B	1.8	0.73	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	2.8		1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.53	J B	1.8	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluoroundecanoic acid (PFUnA)	1.2	J B	1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.18	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.3	J B	9.2	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	2.6		1.8	0.84	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	11		1.8	0.80	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	10		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 87173

Date Collected: 02/22/16 11:04
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-1

Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	7.8	B	1.8	0.41	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluoropentanoic acid (PFPeA)	18		1.8	0.89	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorohexanoic acid (PFHxA)	22		1.8	0.71	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluoroheptanoic acid (PFHpA)	6.8	B	1.8	0.72	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorooctanoic acid (PFOA)	9.7		1.8	0.67	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorononanoic acid (PFNA)	1.5	J	1.8	0.59	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorodecanoic acid (PFDA)	0.87	J B	1.8	0.40	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluoroundecanoic acid (PFUnA)	1.2	J B	1.8	0.67	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.53	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorotetradecanoic acid (PFTeA)	0.77	J B	1.8	0.18	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.3	J B	9.0	0.11	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.8	0.61	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorobutane Sulfonate (PFBS)	7.8		1.8	0.83	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorohexane Sulfonate (PFHxS)	54		1.8	0.78	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluoro-1-heptanesulfonate (PFHpS)	3.0		1.8	0.64	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorooctane Sulfonate (PFOS)	220		1.8	1.2	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorooctane Sulfonamide (FOSA)	4.6	B	1.8	0.58	ng/L		02/26/16 12:22	02/28/16 18:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*3*	*	*25 - 150*	*02/26/16 12:22*	*02/28/16 18:49*	*1*
13C4 PFBA	*52*		*25 - 150*	*02/26/16 12:22*	*02/28/16 18:49*	*1*
13C2 PFHxA	*94*		*25 - 150*	*02/26/16 12:22*	*02/28/16 18:49*	*1*
13C4 PFOA	*123*		*25 - 150*	*02/26/16 12:22*	*02/28/16 18:49*	*1*
13C5 PFNA	*105*		*25 - 150*	*02/26/16 12:22*	*02/28/16 18:49*	*1*
13C2 PFDA	*126*		*25 - 150*	*02/26/16 12:22*	*02/28/16 18:49*	*1*
13C2 PFUnA	*129*		*25 - 150*	*02/26/16 12:22*	*02/28/16 18:49*	*1*
13C2 PFDoA	*115*		*25 - 150*	*02/26/16 12:22*	*02/28/16 18:49*	*1*
18O2 PFHxS	*123*		*25 - 150*	*02/26/16 12:22*	*02/28/16 18:49*	*1*
13C4 PFOS	*108*		*25 - 150*	*02/26/16 12:22*	*02/28/16 18:49*	*1*
13C4-PFHpA	*116*		*25 - 150*	*02/26/16 12:22*	*02/28/16 18:49*	*1*
13C5 PFPeA	*83*		*25 - 150*	*02/26/16 12:22*	*02/28/16 18:49*	*1*

Client Sample ID: 87408

Date Collected: 02/22/16 12:48
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-2

Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	6.1	B	1.8	0.41	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluoropentanoic acid (PFPeA)	11		1.8	0.89	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluorohexanoic acid (PFHxA)	20		1.8	0.71	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluoroheptanoic acid (PFHpA)	4.1	B	1.8	0.72	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluorooctanoic acid (PFOA)	5.0		1.8	0.67	ng/L		02/26/16 12:22	02/28/16 19:10	1

Client Sample ID: 87408

Date Collected: 02/22/16 12:48
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-2
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	ND		1.8	0.59	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluorodecanoic acid (PFDA)	**0.58**	**J B**	1.8	0.40	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluoroundecanoic acid (PFUnA)	**1.1**	**J B**	1.8	0.67	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.52	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluorotetradecanoic acid (PFTeA)	**0.37**	**J B**	1.8	0.18	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	**4.9**	**J B**	9.0	0.11	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.8	0.60	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluorobutane Sulfonate (PFBS)	**4.6**		1.8	0.83	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluorohexane Sulfonate (PFHxS)	**38**		1.8	0.78	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.64	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluorooctane Sulfonate (PFOS)	**37**		1.8	1.1	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluorooctane Sulfonamide (FOSA)	**1.8**	**B**	1.8	0.57	ng/L		02/26/16 12:22	02/28/16 19:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*3*	*	*25 - 150*	*02/26/16 12:22*	*02/28/16 19:10*	*1*
13C4 PFBA	*39*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:10*	*1*
13C2 PFHxA	*56*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:10*	*1*
13C4 PFOA	*72*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:10*	*1*
13C5 PFNA	*56*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:10*	*1*
13C2 PFDA	*49*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:10*	*1*
13C2 PFUnA	*53*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:10*	*1*
13C2 PFDoA	*52*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:10*	*1*
18O2 PFHxS	*91*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:10*	*1*
13C4 PFOS	*111*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:10*	*1*
13C4-PFHpA	*68*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:10*	*1*
13C5 PFPeA	*49*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:10*	*1*

Client Sample ID: 84718

Date Collected: 02/22/16 13:28
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-3
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**7.1**	**B**	1.8	0.42	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluoropentanoic acid (PFPeA)	**10**		1.8	0.90	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorohexanoic acid (PFHxA)	**19**		1.8	0.72	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluoroheptanoic acid (PFHpA)	**4.1**	**B**	1.8	0.73	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorooctanoic acid (PFOA)	**4.4**		1.8	0.68	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.60	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.40	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.68	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.53	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		02/26/16 12:22	02/28/16 19:32	1

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17423-1
SDG: 31-1-11735-0004

Client Sample ID: 84718

Date Collected: 02/22/16 13:28
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-3
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotetradecanoic acid (PFTeA)	0.50	J B	1.8	0.18	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	3.8	J B	9.1	0.11	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.8	0.61	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorobutane Sulfonate (PFBS)	6.2		1.8	0.84	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorohexane Sulfonate (PFHxS)	36		1.8	0.80	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluoro-1-heptanesulfonate (PFHpS)	0.65	J	1.8	0.65	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorooctane Sulfonate (PFOS)	43		1.8	1.2	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorooctane Sulfonamide (FOSA)	9.8	B	1.8	0.58	ng/L		02/26/16 12:22	02/28/16 19:32	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*1*	*	*25 - 150*	*02/26/16 12:22*	*02/28/16 19:32*	*1*
13C4 PFBA	*56*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:32*	*1*
13C2 PFHxA	*87*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:32*	*1*
13C4 PFOA	*94*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:32*	*1*
13C5 PFNA	*74*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:32*	*1*
13C2 PFDA	*68*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:32*	*1*
13C2 PFUnA	*74*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:32*	*1*
13C2 PFDoA	*71*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:32*	*1*
18O2 PFHxS	*120*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:32*	*1*
13C4 PFOS	*114*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:32*	*1*
13C4-PFHpA	*102*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:32*	*1*
13C5 PFPeA	*87*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:32*	*1*

Client Sample ID: 87319

Date Collected: 02/22/16 14:05
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-4
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	4.9	B	1.8	0.42	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluoropentanoic acid (PFPeA)	8.8		1.8	0.91	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorohexanoic acid (PFHxA)	16		1.8	0.72	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluoroheptanoic acid (PFHpA)	3.6	B	1.8	0.74	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorooctanoic acid (PFOA)	3.3		1.8	0.69	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.60	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorodecanoic acid (PFDA)	0.52	J B	1.8	0.40	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.69	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.54	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.51	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorotetradecanoic acid (PFTeA)	1.0	J B	1.8	0.18	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	3.8	J B	9.2	0.11	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluoro-n-octandecanoic acid (PFODA)	0.64	J	1.8	0.62	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorobutane Sulfonate (PFBS)	5.1		1.8	0.84	ng/L		02/26/16 12:22	02/28/16 19:53	1

Client Sample ID: 87319

Date Collected: 02/22/16 14:05
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-4
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexane Sulfonate (PFHxS)	**27**		1.8	0.80	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.65	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorooctane Sulfonate (PFOS)	**32**		1.8	1.2	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorooctane Sulfonamide (FOSA)	**1.4**	**J B**	1.8	0.59	ng/L		02/26/16 12:22	02/28/16 19:53	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*2*	*	*25 - 150*	*02/26/16 12:22*	*02/28/16 19:53*	*1*
13C4 PFBA	*57*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:53*	*1*
13C2 PFHxA	*92*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:53*	*1*
13C4 PFOA	*90*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:53*	*1*
13C5 PFNA	*59*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:53*	*1*
13C2 PFDA	*61*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:53*	*1*
13C2 PFUnA	*58*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:53*	*1*
13C2 PFDoA	*64*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:53*	*1*
18O2 PFHxS	*119*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:53*	*1*
13C4 PFOS	*110*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:53*	*1*
13C4-PFHpA	*99*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:53*	*1*
13C5 PFPeA	*87*		*25 - 150*	*02/26/16 12:22*	*02/28/16 19:53*	*1*

Client Sample ID: 92801

Date Collected: 02/22/16 14:40
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-5
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**2.7**	**B**	1.7	0.40	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluoropentanoic acid (PFPeA)	**3.5**		1.7	0.86	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorohexanoic acid (PFHxA)	**3.6**		1.7	0.69	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluoroheptanoic acid (PFHpA)	**1.5**	**J B**	1.7	0.70	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorooctanoic acid (PFOA)	**1.5**	**J**	1.7	0.65	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.57	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorodecanoic acid (PFDA)	**0.53**	**J B**	1.7	0.38	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluoroundecanoic acid (PFUnA)	**0.83**	**J B**	1.7	0.65	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.51	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.7	0.48	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorotetradecanoic acid (PFTeA)	**0.95**	**J B**	1.7	0.17	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	**3.1**	**J B**	8.7	0.11	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.7	0.59	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorobutane Sulfonate (PFBS)	ND		1.7	0.80	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorohexane Sulfonate (PFHxS)	**2.3**		1.7	0.76	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.7	0.62	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorodecane sulfonate (PFDS)	ND		1.7	1.1	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorooctane Sulfonate (PFOS)	**2.6**		1.7	1.1	ng/L		02/26/16 12:22	02/28/16 20:14	1

Client Sample ID: 92801

Date Collected: 02/22/16 14:40
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-5
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctane Sulfonamide (FOSA)	ND		1.7	0.56	ng/L		02/26/16 12:22	02/28/16 20:14	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*2*	*	*25 - 150*	*02/26/16 12:22*	*02/28/16 20:14*	*1*
13C4 PFBA	*70*		*25 - 150*	*02/26/16 12:22*	*02/28/16 20:14*	*1*
13C2 PFHxA	*107*		*25 - 150*	*02/26/16 12:22*	*02/28/16 20:14*	*1*
13C4 PFOA	*117*		*25 - 150*	*02/26/16 12:22*	*02/28/16 20:14*	*1*
13C5 PFNA	*106*		*25 - 150*	*02/26/16 12:22*	*02/28/16 20:14*	*1*
13C2 PFDA	*120*		*25 - 150*	*02/26/16 12:22*	*02/28/16 20:14*	*1*
13C2 PFUnA	*108*		*25 - 150*	*02/26/16 12:22*	*02/28/16 20:14*	*1*
13C2 PFDoA	*105*		*25 - 150*	*02/26/16 12:22*	*02/28/16 20:14*	*1*
18O2 PFHxS	*120*		*25 - 150*	*02/26/16 12:22*	*02/28/16 20:14*	*1*
13C4 PFOS	*112*		*25 - 150*	*02/26/16 12:22*	*02/28/16 20:14*	*1*
13C4-PFHpA	*116*		*25 - 150*	*02/26/16 12:22*	*02/28/16 20:14*	*1*
13C5 PFPeA	*101*		*25 - 150*	*02/26/16 12:22*	*02/28/16 20:14*	*1*

Client Sample ID: 629709

Date Collected: 02/22/16 16:15
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-6
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**3.5**	**B**	1.7	0.40	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluoropentanoic acid (PFPeA)	**3.6**		1.7	0.86	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorohexanoic acid (PFHxA)	**5.1**		1.7	0.68	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluoroheptanoic acid (PFHpA)	**1.6**	**J B**	1.7	0.69	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorooctanoic acid (PFOA)	**2.6**		1.7	0.65	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.57	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorodecanoic acid (PFDA)	**0.56**	**J B**	1.7	0.38	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.65	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.51	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.7	0.48	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorotetradecanoic acid (PFTeA)	**0.70**	**J B**	1.7	0.17	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	**4.3**	**J B**	8.7	0.11	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.7	0.58	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorobutane Sulfonate (PFBS)	ND		1.7	0.80	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorohexane Sulfonate (PFHxS)	**2.0**		1.7	0.75	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.7	0.62	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorodecane sulfonate (PFDS)	ND		1.7	1.0	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorooctane Sulfonate (PFOS)	**2.1**		1.7	1.1	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.7	0.55	ng/L		02/26/16 12:22	02/28/16 20:35	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*3*	*	*25 - 150*	*02/26/16 12:22*	*02/28/16 20:35*	*1*
13C4 PFBA	*64*		*25 - 150*	*02/26/16 12:22*	*02/28/16 20:35*	*1*
13C2 PFHxA	*101*		*25 - 150*	*02/26/16 12:22*	*02/28/16 20:35*	*1*
13C4 PFOA	*102*		*25 - 150*	*02/26/16 12:22*	*02/28/16 20:35*	*1*

Client Sample ID: 629709

Lab Sample ID: 320-17423-6
Matrix: Water
Date Collected: 02/22/16 16:15
Date Received: 02/25/16 10:15

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	78		25 - 150	02/26/16 12:22	02/28/16 20:35	1
13C2 PFDA	84		25 - 150	02/26/16 12:22	02/28/16 20:35	1
13C2 PFUnA	82		25 - 150	02/26/16 12:22	02/28/16 20:35	1
13C2 PFDoA	87		25 - 150	02/26/16 12:22	02/28/16 20:35	1
18O2 PFHxS	118		25 - 150	02/26/16 12:22	02/28/16 20:35	1
13C4 PFOS	116		25 - 150	02/26/16 12:22	02/28/16 20:35	1
13C4-PFHpA	113		25 - 150	02/26/16 12:22	02/28/16 20:35	1
13C5 PFPeA	93		25 - 150	02/26/16 12:22	02/28/16 20:35	1

Client Sample ID: 95451

Lab Sample ID: 320-17423-7
Matrix: Water
Date Collected: 02/22/16 11:33
Date Received: 02/25/16 10:15

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**3.1**	**B**	1.8	0.40	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluoropentanoic acid (PFPeA)	**7.8**		1.8	0.87	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorohexanoic acid (PFHxA)	**7.3**		1.8	0.69	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluoroheptanoic acid (PFHpA)	**2.6**	**B**	1.8	0.70	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorooctanoic acid (PFOA)	**3.1**		1.8	0.66	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorononanoic acid (PFNA)	**0.88**	**J**	1.8	0.57	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorodecanoic acid (PFDA)	**0.69**	**J B**	1.8	0.39	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.66	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.51	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.48	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorotetradecanoic acid (PFTeA)	**0.22**	**J B**	1.8	0.17	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	**4.2**	**J B**	8.8	0.11	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.8	0.59	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorobutane Sulfonate (PFBS)	**1.7**	**J**	1.8	0.80	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorohexane Sulfonate (PFHxS)	**6.4**		1.8	0.76	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.62	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorooctane Sulfonate (PFOS)	**10**		1.8	1.1	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.56	ng/L		02/26/16 12:29	02/28/16 20:56	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	2	*	25 - 150	02/26/16 12:29	02/28/16 20:56	1
13C4 PFBA	71		25 - 150	02/26/16 12:29	02/28/16 20:56	1
13C2 PFHxA	110		25 - 150	02/26/16 12:29	02/28/16 20:56	1
13C4 PFOA	108		25 - 150	02/26/16 12:29	02/28/16 20:56	1
13C5 PFNA	85		25 - 150	02/26/16 12:29	02/28/16 20:56	1
13C2 PFDA	89		25 - 150	02/26/16 12:29	02/28/16 20:56	1
13C2 PFUnA	94		25 - 150	02/26/16 12:29	02/28/16 20:56	1
13C2 PFDoA	106		25 - 150	02/26/16 12:29	02/28/16 20:56	1
18O2 PFHxS	126		25 - 150	02/26/16 12:29	02/28/16 20:56	1
13C4 PFOS	116		25 - 150	02/26/16 12:29	02/28/16 20:56	1
13C4-PFHpA	120		25 - 150	02/26/16 12:29	02/28/16 20:56	1

Client Sample ID: 95451

Date Collected: 02/22/16 11:33
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-7
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFPeA	103		25 - 150	02/26/16 12:29	02/28/16 20:56	1

Client Sample ID: 563412

Date Collected: 02/22/16 12:26
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-8
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**4.7**	**B**	1.7	0.39	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluoropentanoic acid (PFPeA)	**7.3**		1.7	0.85	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorohexanoic acid (PFHxA)	**12**		1.7	0.68	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluoroheptanoic acid (PFHpA)	**2.5**	**B**	1.7	0.69	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorooctanoic acid (PFOA)	**3.9**		1.7	0.64	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.56	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorodecanoic acid (PFDA)	**0.60**	**J B**	1.7	0.38	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluoroundecanoic acid (PFUnA)	**0.70**	**J B**	1.7	0.64	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.50	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.7	0.47	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorotetradecanoic acid (PFTeA)	**0.39**	**J B**	1.7	0.17	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	**4.4**	**J B**	8.6	0.11	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.7	0.58	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorobutane Sulfonate (PFBS)	**3.0**		1.7	0.79	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorohexane Sulfonate (PFHxS)	**14**		1.7	0.75	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.7	0.61	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorodecane sulfonate (PFDS)	ND		1.7	1.0	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorooctane Sulfonate (PFOS)	**13**		1.7	1.1	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorooctane Sulfonamide (FOSA)	**3.7**	**B**	1.7	0.55	ng/L		02/26/16 12:29	02/28/16 21:39	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	0.7	*	25 - 150	02/26/16 12:29	02/28/16 21:39	1
13C4 PFBA	58		25 - 150	02/26/16 12:29	02/28/16 21:39	1
13C2 PFHxA	94		25 - 150	02/26/16 12:29	02/28/16 21:39	1
13C4 PFOA	91		25 - 150	02/26/16 12:29	02/28/16 21:39	1
13C5 PFNA	68		25 - 150	02/26/16 12:29	02/28/16 21:39	1
13C2 PFDA	71		25 - 150	02/26/16 12:29	02/28/16 21:39	1
13C2 PFUnA	76		25 - 150	02/26/16 12:29	02/28/16 21:39	1
13C2 PFDoA	87		25 - 150	02/26/16 12:29	02/28/16 21:39	1
18O2 PFHxS	114		25 - 150	02/26/16 12:29	02/28/16 21:39	1
13C4 PFOS	115		25 - 150	02/26/16 12:29	02/28/16 21:39	1
13C4-PFHpA	102		25 - 150	02/26/16 12:29	02/28/16 21:39	1
13C5 PFPeA	90		25 - 150	02/26/16 12:29	02/28/16 21:39	1

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17423-1
SDG: 31-1-11735-0004

Client Sample ID: 87301

Date Collected: 02/23/16 10:55
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-9
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**4.1**	**B**	1.7	0.40	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluoropentanoic acid (PFPeA)	**5.9**		1.7	0.86	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorohexanoic acid (PFHxA)	**10**		1.7	0.69	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluoroheptanoic acid (PFHpA)	**2.6**	**B**	1.7	0.70	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorooctanoic acid (PFOA)	**2.3**		1.7	0.65	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.57	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.38	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.65	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.51	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.7	0.48	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorotetradecanoic acid (PFTeA)	**0.84**	**J B**	1.7	0.17	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	**5.6**	**J B**	8.7	0.11	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.7	0.59	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorobutane Sulfonate (PFBS)	**2.6**		1.7	0.80	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorohexane Sulfonate (PFHxS)	**15**		1.7	0.76	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.7	0.62	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorodecane sulfonate (PFDS)	ND		1.7	1.1	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorooctane Sulfonate (PFOS)	**30**		1.7	1.1	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.7	0.56	ng/L		02/26/16 12:29	02/28/16 22:00	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*1*	*	*25 - 150*	*02/26/16 12:29*	*02/28/16 22:00*	*1*
13C4 PFBA	*60*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:00*	*1*
13C2 PFHxA	*94*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:00*	*1*
13C4 PFOA	*95*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:00*	*1*
13C5 PFNA	*71*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:00*	*1*
13C2 PFDA	*69*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:00*	*1*
13C2 PFUnA	*55*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:00*	*1*
13C2 PFDoA	*60*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:00*	*1*
18O2 PFHxS	*111*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:00*	*1*
13C4 PFOS	*110*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:00*	*1*
13C4-PFHpA	*105*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:00*	*1*
13C5 PFPeA	*92*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:00*	*1*

Client Sample ID: 562637

Date Collected: 02/23/16 10:03
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-10
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**3.9**	**B**	1.8	0.42	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluoropentanoic acid (PFPeA)	**7.2**		1.8	0.90	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorohexanoic acid (PFHxA)	**8.0**		1.8	0.72	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluoroheptanoic acid (PFHpA)	**2.8**	**B**	1.8	0.73	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorooctanoic acid (PFOA)	**2.9**		1.8	0.68	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.60	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorodecanoic acid (PFDA)	**0.52**	**J B**	1.8	0.40	ng/L		02/26/16 12:29	02/28/16 22:21	1

Client Sample ID: 562637

Date Collected: 02/23/16 10:03
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-10

Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroundecanoic acid (PFUnA)	**0.87**	**J B**	1.8	0.68	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.53	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorotetradecanoic acid (PFTeA)	**0.29**	**J B**	1.8	0.18	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	**4.2**	**J B**	9.1	0.11	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.8	0.61	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorobutane Sulfonate (PFBS)	**1.6**	**J**	1.8	0.84	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorohexane Sulfonate (PFHxS)	**5.9**		1.8	0.79	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.65	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorooctane Sulfonate (PFOS)	**6.7**		1.8	1.2	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.58	ng/L		02/26/16 12:29	02/28/16 22:21	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*2*	*	*25 - 150*	*02/26/16 12:29*	*02/28/16 22:21*	*1*
13C4 PFBA	*69*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:21*	*1*
13C2 PFHxA	*105*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:21*	*1*
13C4 PFOA	*108*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:21*	*1*
13C5 PFNA	*98*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:21*	*1*
13C2 PFDA	*113*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:21*	*1*
13C2 PFUnA	*108*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:21*	*1*
13C2 PFDoA	*102*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:21*	*1*
18O2 PFHxS	*112*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:21*	*1*
13C4 PFOS	*116*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:21*	*1*
13C4-PFHpA	*113*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:21*	*1*
13C5 PFPeA	*100*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:21*	*1*

Client Sample ID: 87335

Date Collected: 02/22/16 16:38
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-11

Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**3.9**	**B**	1.8	0.42	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluoropentanoic acid (PFPeA)	**6.1**		1.8	0.91	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorohexanoic acid (PFHxA)	**8.1**		1.8	0.72	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluoroheptanoic acid (PFHpA)	**2.4**	**B**	1.8	0.73	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorooctanoic acid (PFOA)	**2.8**		1.8	0.68	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.60	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorodecanoic acid (PFDA)	**0.53**	**J B**	1.8	0.40	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluoroundecanoic acid (PFUnA)	**1.2**	**J B**	1.8	0.68	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.53	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorotetradecanoic acid (PFTeA)	**0.18**	**J B**	1.8	0.18	ng/L		02/26/16 12:29	02/28/16 22:43	1

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17423-1
SDG: 31-1-11735-0004

Client Sample ID: 87335
Date Collected: 02/22/16 16:38
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-11
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-hexadecanoic acid (PFHxDA)	**4.3**	**J B**	9.2	0.11	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.8	0.62	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorobutane Sulfonate (PFBS)	**2.6**		1.8	0.84	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorohexane Sulfonate (PFHxS)	**11**		1.8	0.80	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.65	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorooctane Sulfonate (PFOS)	**10**		1.8	1.2	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.58	ng/L		02/26/16 12:29	02/28/16 22:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*3*	*	*25 - 150*	*02/26/16 12:29*	*02/28/16 22:43*	*1*
13C4 PFBA	*58*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:43*	*1*
13C2 PFHxA	*93*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:43*	*1*
13C4 PFOA	*97*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:43*	*1*
13C5 PFNA	*86*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:43*	*1*
13C2 PFDA	*95*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:43*	*1*
13C2 PFUnA	*92*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:43*	*1*
13C2 PFDoA	*93*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:43*	*1*
18O2 PFHxS	*109*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:43*	*1*
13C4 PFOS	*106*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:43*	*1*
13C4-PFHpA	*106*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:43*	*1*
13C5 PFPeA	*89*		*25 - 150*	*02/26/16 12:29*	*02/28/16 22:43*	*1*

Isotope Dilution Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17423-1
SDG: 31-1-11735-0004

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	3C8 FOSA (25-150)	3C4 PFBA (25-150)	3C2 PFHx (25-150)	3C4 PFOA (25-150)	3C5 PFNA (25-150)	3C2 PFDA (25-150)	3C2 PFUn (25-150)	3C2 PFDo (25-150)
320-17423-1	87173	3 *	52	94	123	105	126	129	115
320-17423-2	87408	3 *	39	56	72	56	49	53	52
320-17423-3	84718	1 *	56	87	94	74	68	74	71
320-17423-4	87319	2 *	57	92	90	59	61	58	64
320-17423-5	92801	2 *	70	107	117	106	120	108	105
320-17423-6	629709	3 *	64	101	102	78	84	82	87
320-17423-7	95451	2 *	71	110	108	85	89	94	106
320-17423-8	563412	0.7 *	58	94	91	68	71	76	87
320-17423-9	87301	1 *	60	94	95	71	69	55	60
320-17423-10	562637	2 *	69	105	108	98	113	108	102
320-17423-11	87335	3 *	58	93	97	86	95	92	93
LCS 320-101730/2-A	Lab Control Sample	55	112	112	120	113	118	114	115
LCSD 320-101730/3-A	Lab Control Sample Dup	58	107	116	116	112	118	113	113
MB 320-101730/1-A	Method Blank	60	111	115	130	116	127	127	113

		Percent Isotope Dilution Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	18O2 PFHxS (25-150)	13C4 PFOS (25-150)	13C4-PFHpA (25-150)	13C5 PFPeA (25-150)
320-17423-1	87173	123	108	116	83
320-17423-2	87408	91	111	68	49
320-17423-3	84718	120	114	102	87
320-17423-4	87319	119	110	99	87
320-17423-5	92801	120	112	116	101
320-17423-6	629709	118	116	113	93
320-17423-7	95451	126	116	120	103
320-17423-8	563412	114	115	102	90
320-17423-9	87301	111	110	105	92
320-17423-10	562637	112	116	113	100
320-17423-11	87335	109	106	106	89
LCS 320-101730/2-A	Lab Control Sample	116	119	116	114
LCSD 320-101730/3-A	Lab Control Sample Dup	120	116	119	109
MB 320-101730/1-A	Method Blank	119	122	124	116

Surrogate Legend

13C8 FOSA = 13C8 FOSA
13C4 PFBA = 13C4 PFBA
13C2 PFHxA = 13C2 PFHxA
13C4 PFOA = 13C4 PFOA
13C5 PFNA = 13C5 PFNA
13C2 PFDA = 13C2 PFDA
13C2 PFUnA = 13C2 PFUnA
13C2 PFDoA = 13C2 PFDoA
18O2 PFHxS = 18O2 PFHxS
13C4 PFOS = 13C4 PFOS
13C4-PFHpA = 13C4-PFHpA
13C5 PFPeA = 13C5 PFPeA

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-101730/1-A
Matrix: Water
Analysis Batch: 101852

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 101730

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.801	J	2.0	0.4L	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1
Perfluoroxentanoic acid (PFPeA)	p D		2.0	0.99	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1
PerfluoroheHanoic acid (PF6 HA)	p D		2.0	0.79	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1
Perfluorohextanoic acid (PF6 xA)	0.83L	J	2.0	0.80	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1
Perfluorooctanoic acid (PFOA)	p D		2.0	0.75	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1
Perfluorononanoic acid (PFp A)	p D		2.0	0.L5	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1
Perfluorodecanoic acid (PFDA)	0.971	J	2.0	0.44	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1
Perfluoroundecanoic acid (PFUnA)	1.54	J	2.0	0.75	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1
Perfluorododecanoic acid (PFDoA)	p D		2.0	0.58	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1
Perfluorotridecanoic Acid (PFTriA)	0.780	J	2.0	0.55	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1
Perfluorotetradecanoic acid (PFTeA)	1.1L	J	2.0	0.20	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1
Perfluoro-n-heHadecanoic acid (PF6 HDA)	4.74	J	10	0.12	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1
Perfluoro-n-octandecanoic acid (PFODA)	p D		2.0	0.L7	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1
Perfluorobutane Sulfonate (PFBS)	p D		2.0	0.92	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1
PerfluoroheHane Sulfonate (PF6 HS)	p D		2.0	0.87	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1
Perfluoro-1-hextanesulfonate (PF6 xS)	p D		2.0	0.71	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1
Perfluorodecane sulfonate (PFDS)	p D		2.0	1.2	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1
Perfluorooctane Sulfonate (PFOS)	p D		2.0	1.3	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1
Perfluorooctane Sulfonamide (FOSA)	1.1L	J	2.0	0.L4	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*60*		*25 - 150*	*02/26/16 12:22*	*02/28/16 17:45*	*1*
13C4 PFBA	*111*		*25 - 150*	*02/26/16 12:22*	*02/28/16 17:45*	*1*
13C2 PFHxA	*115*		*25 - 150*	*02/26/16 12:22*	*02/28/16 17:45*	*1*
13C4 PFOA	*130*		*25 - 150*	*02/26/16 12:22*	*02/28/16 17:45*	*1*
13C5 PFNA	*116*		*25 - 150*	*02/26/16 12:22*	*02/28/16 17:45*	*1*
13C2 PFDA	*127*		*25 - 150*	*02/26/16 12:22*	*02/28/16 17:45*	*1*
13C2 PFUnA	*127*		*25 - 150*	*02/26/16 12:22*	*02/28/16 17:45*	*1*
13C2 PFDoA	*113*		*25 - 150*	*02/26/16 12:22*	*02/28/16 17:45*	*1*
18O2 PFHxS	*119*		*25 - 150*	*02/26/16 12:22*	*02/28/16 17:45*	*1*
13C4 PFOS	*122*		*25 - 150*	*02/26/16 12:22*	*02/28/16 17:45*	*1*
13C4-PFHpA	*124*		*25 - 150*	*02/26/16 12:22*	*02/28/16 17:45*	*1*
13C5 PFPeA	*116*		*25 - 150*	*02/26/16 12:22*	*02/28/16 17:45*	*1*

Lab Sample ID: LCS 320-101730/2-A
Matrix: Water
Analysis Batch: 101852

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 101730

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	40.0	39.8		ng/N		100	L0 - 140
Perfluoroxentanoic acid (PFPeA)	40.0	41.5		ng/N		104	L0 - 140
PerfluoroheHanoic acid (PF6 HA)	40.0	41.9		ng/N		105	L0 - 140
Perfluorohextanoic acid (PF6 xA)	40.0	38.9		ng/N		97	L0 - 140
Perfluorooctanoic acid (PFOA)	40.0	3L.7		ng/N		92	L0 - 140
Perfluorononanoic acid (PFp A)	40.0	37.0		ng/N		92	L0 - 140
Perfluorodecanoic acid (PFDA)	40.0	41.9		ng/N		105	L0 - 140

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCS 320-101730/2-A
Matrix: Water
Analysis Batch: 101852

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 101730

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroundecanoic acid (PFUnA)	40.0	44.L		ng/N		112	L0 - 140
Perfluorododecanoic acid (PFDoA)	40.0	38.8		ng/N		97	L0 - 140
Perfluorotridecanoic Acid (PFTriA)	40.0	39.7		ng/N		99	50 - 150
Perfluorotetradecanoic acid (PFTeA)	40.0	33.L		ng/N		84	50 - 150
Perfluoro-n-heHadecanoic acid (PF6HDA)	40.0	37.L		ng/N		94	50 - 150
Perfluoro-n-octandecanoic acid (PFODA)	40.0	44.5		ng/N		111	50 - 150
Perfluorobutane Sulfonate (PFBS)	35.4	3L.5		ng/N		103	50 - 150
PerfluoroheHane Sulfonate (PF6HS)	37.8	40.1		ng/N		10L	L0 - 140
Perfluoro-1-hextanesulfonate (PF6xS)	38.1	41.3		ng/N		109	50 - 150
Perfluorodecane sulfonate (PFDS)	38.L	37.8		ng/N		98	50 - 150
Perfluorooctane Sulfonate (PFOS)	38.2	40.0		ng/N		105	L0 - 140
Perfluorooctane Sulfonamide (FOSA)	40.0	43.4		ng/N		108	L0 - 140

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*55*		*25 - 150*
13C4 PFBA	*112*		*25 - 150*
13C2 PFHxA	*112*		*25 - 150*
13C4 PFOA	*120*		*25 - 150*
13C5 PFNA	*113*		*25 - 150*
13C2 PFDA	*118*		*25 - 150*
13C2 PFUnA	*114*		*25 - 150*
13C2 PFDoA	*115*		*25 - 150*
18O2 PFHxS	*116*		*25 - 150*
13C4 PFOS	*119*		*25 - 150*
13C4-PFHpA	*116*		*25 - 150*
13C5 PFPeA	*114*		*25 - 150*

Lab Sample ID: LCSD 320-101730/3-A
Matrix: Water
Analysis Batch: 101852

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 101730

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	40.0	41.5		ng/N		104	L0 - 140	4	30
Perfluoroxentanoic acid (PFPeA)	40.0	40.0		ng/N		100	L0 - 140	4	30
PerfluoroheHanoic acid (PF6HA)	40.0	42.1		ng/N		105	L0 - 140	0	30
Perfluorohextanoic acid (PF6xA)	40.0	38.3		ng/N		9L	L0 - 140	1	30
Perfluorooctanoic acid (PFOA)	40.0	39.8		ng/N		100	L0 - 140	8	30
Perfluorononanoic acid (PFpA)	40.0	42.2		ng/N		105	L0 - 140	13	30
Perfluorodecanoic acid (PFDA)	40.0	41.5		ng/N		104	L0 - 140	1	30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCSD 320-101730/3-A
Matrix: Water
Analysis Batch: 101852

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 101730

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroundecanoic acid (PFUnA)			40.0	45.0		ng/N		112	L0 - 140	1	30
Perfluorododecanoic acid (PFDoA)			40.0	40.8		ng/N		102	L0 - 140	5	30
Perfluorotridecanoic Acid (PFTriA)			40.0	38.L		ng/N		9L	50 - 150	3	30
Perfluorotetradecanoic acid (PFTeA)			40.0	34.4		ng/N		8L	50 - 150	2	30
Perfluoro-n-heHadecanoic acid (PF6HDA)			40.0	38.0		ng/N		95	50 - 150	1	30
Perfluoro-n-octandecanoic acid (PFODA)			40.0	42.8		ng/N		107	50 - 150	4	30
Perfluorobutane Sulfonate (PFBS)			35.4	3L.4		ng/N		103	50 - 150	0	30
PerfluoroheHane Sulfonate (PF6HS)			37.8	35.9		ng/N		95	L0 - 140	11	30
Perfluoro-1-hextanesulfonate (PF6xS)			38.1	44.9		ng/N		118	50 - 150	8	30
Perfluorodecane sulfonate (PFDS)			38.L	37.9		ng/N		98	50 - 150	0	30
Perfluorooctane Sulfonate (PFOS)			38.2	39.7		ng/N		104	L0 - 140	1	30
Perfluorooctane Sulfonamide (FOSA)			40.0	41.4		ng/N		103	L0 - 140	5	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C8 FOSA	*58*		*25 - 150*
13C4 PFBA	*107*		*25 - 150*
13C2 PFHxA	*116*		*25 - 150*
13C4 PFOA	*116*		*25 - 150*
13C5 PFNA	*112*		*25 - 150*
13C2 PFDA	*118*		*25 - 150*
13C2 PFUnA	*113*		*25 - 150*
13C2 PFDoA	*113*		*25 - 150*
18O2 PFHxS	*120*		*25 - 150*
13C4 PFOS	*116*		*25 - 150*
13C4-PFHpA	*119*		*25 - 150*
13C5 PFPeA	*109*		*25 - 150*

QC Association Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17423-1
SDG: 31-1-11735-0004

LCMS

Prep Batch: 101730

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-17423-1	87173	Total/NA	Water	3535	
320-17423-2	87408	Total/NA	Water	3535	
320-17423-3	84718	Total/NA	Water	3535	
320-17423-4	87319	Total/NA	Water	3535	
320-17423-5	92801	Total/NA	Water	3535	
320-17423-6	629709	Total/NA	Water	3535	
320-17423-7	95451	Total/NA	Water	3535	
320-17423-8	563412	Total/NA	Water	3535	
320-17423-9	87301	Total/NA	Water	3535	
320-17423-10	562637	Total/NA	Water	3535	
320-17423-11	87335	Total/NA	Water	3535	
LCS 320-101730/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-101730/3-A	Lab Control Sample Dup	Total/NA	Water	3535	
MB 320-101730/1-A	Method Blank	Total/NA	Water	3535	

Analysis Batch: 101852

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-17423-1	87173	Total/NA	Water	WS-LC-0025	101730
320-17423-2	87408	Total/NA	Water	WS-LC-0025	101730
320-17423-3	84718	Total/NA	Water	WS-LC-0025	101730
320-17423-4	87319	Total/NA	Water	WS-LC-0025	101730
320-17423-5	92801	Total/NA	Water	WS-LC-0025	101730
320-17423-6	629709	Total/NA	Water	WS-LC-0025	101730
320-17423-7	95451	Total/NA	Water	WS-LC-0025	101730
320-17423-8	563412	Total/NA	Water	WS-LC-0025	101730
320-17423-9	87301	Total/NA	Water	WS-LC-0025	101730
320-17423-10	562637	Total/NA	Water	WS-LC-0025	101730
320-17423-11	87335	Total/NA	Water	WS-LC-0025	101730
LCS 320-101730/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	101730
LCSD 320-101730/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025	101730
MB 320-101730/1-A	Method Blank	Total/NA	Water	WS-LC-0025	101730

Lab Chronicle

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17423-1
SDG: 31-1-11735-0004

Client Sample ID: 87173
Date Collected: 02/22/16 11:04
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-1
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	3535			554.7 mL	1.00 mL	101730	02/26/16 12:22	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	554.7 mL	1.00 mL	101852	02/28/16 18:49	JRB	TAL SAC

Client Sample ID: 87408
Date Collected: 02/22/16 12:48
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-2
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	3535			556.3 mL	1.00 mL	101730	02/26/16 12:22	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	556.3 mL	1.00 mL	101852	02/28/16 19:10	JRB	TAL SAC

Client Sample ID: 84718
Date Collected: 02/22/16 13:28
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-3
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	3535			547 mL	1.00 mL	101730	02/26/16 12:22	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	547 mL	1.00 mL	101852	02/28/16 19:32	JRB	TAL SAC

Client Sample ID: 87319
Date Collected: 02/22/16 14:05
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-4
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	3535			544.5 mL	1.00 mL	101730	02/26/16 12:22	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	544.5 mL	1.00 mL	101852	02/28/16 19:53	JRB	TAL SAC

Client Sample ID: 92801
Date Collected: 02/22/16 14:40
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-5
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	3535			571.7 mL	1.00 mL	101730	02/26/16 12:22	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	571.7 mL	1.00 mL	101852	02/28/16 20:14	JRB	TAL SAC

Client Sample ID: 629709
Date Collected: 02/22/16 16:15
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-6
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	3535			577 mL	1.00 mL	101730	02/26/16 12:22	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	577 mL	1.00 mL	101852	02/28/16 20:35	JRB	TAL SAC

Lab Chronicle

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17423-1
SDG: 31-1-11735-0004

Client Sample ID: 95451
Date Collected: 02/22/16 11:33
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-7
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	3535			570.4 mL	1.00 mL	101730	02/26/16 12:29	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	570.4 mL	1.00 mL	101852	02/28/16 20:56	JRB	TAL SAC

Client Sample ID: 563412
Date Collected: 02/22/16 12:26
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-8
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	3535			580.5 mL	1.00 mL	101730	02/26/16 12:29	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	580.5 mL	1.00 mL	101852	02/28/16 21:39	JRB	TAL SAC

Client Sample ID: 87301
Date Collected: 02/23/16 10:55
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-9
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	3535			572.8 mL	1.00 mL	101730	02/26/16 12:29	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	572.8 mL	1.00 mL	101852	02/28/16 22:00	JRB	TAL SAC

Client Sample ID: 562637
Date Collected: 02/23/16 10:03
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-10
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	3535			549.1 mL	1.00 mL	101730	02/26/16 12:29	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	549.1 mL	1.00 mL	101852	02/28/16 22:21	JRB	TAL SAC

Client Sample ID: 87335
Date Collected: 02/22/16 16:38
Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-11
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	3535			546.2 mL	1.00 mL	101730	02/26/16 12:29	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	546.2 mL	1.00 mL	101852	02/28/16 22:43	JRB	TAL SAC

Laboratory References:

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

Certification Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17423-1
SDG: 31-1-11735-0004

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17
Alaska (UST)	State Program	10	UST-055	12-18-16
Arizona	State Program	9	AZ0708	08-11-16
Arkansas DEQ	State Program	6	88-0691	06-17-16
California	State Program	9	2897	01-31-17
Colorado	State Program	8	N/A	08-31-16
Connecticut	State Program	1	PH-0691	06-30-17
Florida	NELAP	4	E87570	06-30-16
Hawaii	State Program	9	N/A	01-31-17
Illinois	NELAP	5	200060	03-17-17
Kansas	NELAP	7	E-10375	05-31-16
Louisiana	NELAP	6	30612	06-30-16
Michigan	State Program	5	9947	01-31-18
Nevada	State Program	9	CA44	07-31-16
New Jersey	NELAP	2	CA005	06-30-16
New York	NELAP	2	11666	04-01-16
Oregon	NELAP	10	CA200005	01-29-17
Pennsylvania	NELAP	3	9947	03-31-16
Texas	NELAP	6	T104704399-15-9	05-31-16
US Fish & Wildlife	Federal		LE148388-0	10-31-16
USDA	Federal		P330-11-00436	12-30-17
USEPA UCMR	Federal	1	CA00044	11-06-16
Utah	NELAP	8	QUAN1	02-28-17
Virginia	NELAP Secondary AB	3	460278	03-14-16 *
Washington	State Program	10	C581	05-04-16
West Virginia (DW)	State Program	3	9930C	12-31-16
Wyoming	State Program	8	8TMS-Q	01-29-16 *

* Certification renewal pending - certification considered valid.

Method Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17423-1
SDG: 31-1-11735-0004

Method	Method Description	Protocol	Laboratory
WS-LC-0025	Perfluorinated Hydrocarbons	TAL SOP	TAL SAC

Protocol References:

TAL SOP = TestAmerica Laboratories, 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
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17423-1
SDG: 31-1-11735-0004

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-17423-1	87173	Water	02/22/16 11:04	02/25/16 10:15
320-17423-2	87408	Water	02/22/16 12:48	02/25/16 10:15
320-17423-3	84718	Water	02/22/16 13:28	02/25/16 10:15
320-17423-4	87319	Water	02/22/16 14:05	02/25/16 10:15
320-17423-5	92801	Water	02/22/16 14:40	02/25/16 10:15
320-17423-6	629709	Water	02/22/16 16:15	02/25/16 10:15
320-17423-7	95451	Water	02/22/16 11:33	02/25/16 10:15
320-17423-8	563412	Water	02/22/16 12:26	02/25/16 10:15
320-17423-9	87301	Water	02/23/16 10:55	02/25/16 10:15
320-17423-10	562637	Water	02/23/16 10:03	02/25/16 10:15
320-17423-11	87335	Water	02/22/16 16:38	02/25/16 10:15

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

2255 S.W. Canyon Road
Portland, OR 97201-2498
(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

Laboratory Test America
Attn: David Althucker

Analysis Parameters/Sample Container Description
(include preservative if used)

320-17423 Chain of Custody

Sample Identity	Lab No.	Time	Date Sampled	Comp	Grab	RFCS (WS-LC-0026)							Matrix
87173		1104	2/22/16		X	2						2	Water
87408		1248			X	2						2	
87418		1238			X	2						2	
87319		1405			X	2						2	
92801		1440			X	2						2	
629709		1615			X	2						2	
95451		1133			X	2						2	
563412		1226			X	2						2	
87301		1055	2/23/16		X	2						2	
562637		1003			X	2						2	

Project Information	Sample Receipt	
Project Number: 31-1-11735-004	Total Number of Containers	22
Project Name: Fairbanks FTC	COC Seals/Intact? Y/N/NA	
Contact: MDN/JAK	Received Good Cond./Cold	—
Ongoing Project? Yes ☒ No ☐	Delivery Method: FedEx	
Sampler: MDN/TXG	(attach shipping bill, if any)	

Instructions	
Requested Turnaround Time:	Standard
Special Instructions:	Please notify us upon receipt (FedEx)

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: M. Nadel Time: 1140	Signature Time	Signature Time
Printed Name: Marcy Nadel Date: 2/23/16	Printed Name: Date:	Printed Name Date:
Company: Shannon & Wilson	Company	Company

Received By: 1.	Received By: 2.	Received By: 3.
Signature: J. Sadler Time: 1015	Signature Time	Signature Time
Printed Name: J. Sadler Date: 2/25/16	Printed Name Date	Printed Name Date
Company	Company	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

No. 33950

CHAIN-OF-CUSTODY RECORD

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

400 N 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

2255 S.W. Canyon Road
Portland, OR 97201-2498
(503) 223-6147

2043 Westport Center Drive
St. Louis, MO 63146-3564
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Anchorage, AK 99518
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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

Laboratory Test America
Attn: David Althueker

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No	Time	Date Sampled	Comp	Grab	PFCs (WS-LC-0025)						Total Number of Containers	Remarks/Matrix
87335		1038	2/22/16		X	2						2	Water

Project Information	Sample Receipt
Project Number:	Total Number of Containers
Project Name:	COC Seals/Intact? Y/N/NA
Contact:	Received Good Cond./Cold
Ongoing Project? Yes ☐ No ☐	Delivery Method:
Sampler:	(attach shipping bill, if any)

Instructions

Requested Turnaround Time: See Instructions

Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: M. Nadel Time: 1140	Signature: Time:	Signature: Time:
Printed Name: Mary Nadel Date: 2/23/16	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 1015	Signature: Time:	Signature: Time:
Printed Name: J. Sader Date: 2/25/16	Printed Name: Date:	Printed Name: Date:
Company:	Company:	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

No. 33595

Login Sample Receipt Checklist

Client: Shannon & Wilson

Job Number: 320-17423-1
SDG Number: 31-1-11735-0004

Login Number: 17423
List Number: 1
Creator: Nelson, Kym D

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	
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: Marcy Nadel

Title: Geologist Date: March 03, 2016

CS Report Name: City of Fairbanks Fire Training Area Report Date: March 02, 2016

Consultant Firm: Shannon & Wilson, Inc.

Laboratory Name: TestAmerica, Inc. Laboratory Report Number: 320-17423

ADEC File Number: 102.38.182 ADEC RecKey Number:

1. Laboratory
   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
      ☐ Yes ☐ No ☒ NA (Please explain.) Comments:

      ADEC has not approved an analytical laboratory for this analysis.

   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 ☒ NA (Please explain.) Comments:

      Analyses were performed by TestAmerica, Inc. in Folsom, California.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

   b. Correct analyses requested?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

      The temperature blank or cooler was measured within the acceptable temperature range of 0 °C to 6 °C upon receipt at the laboratory, as specified in the EPA publication SW-846. This range has been approved by ADEC.

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?
☒Yes ☐ No ☐NA (Please explain.) Comments:

Analysis of PFCs does not require a preservative.

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒Yes ☐ No ☐NA (Please explain.) 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 ☒NA (Please explain.) Comments:

There were no discrepancies.

e. Data quality or usability affected? (Please explain.)
Comments:

No, the data quality and usability were not affected.

4. Case Narrative
a. Present and understandable?
☒Yes ☐ No ☐NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
☒Yes ☐ No ☐NA (Please explain.) Comments:

The case narrative identifies the following discrepancies: The Isotope Dilution Analyte (IDA) recovery associated with surrogate 13C8 FOSA in each of the 11 samples is below the method recommended limit of 25% to 150%. Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples. The reporting limit for PFHxDA was raised due to problems with the calibration curve and low background levels in the instrument for this compound. Results below the new PQL should be considered suspect. Organic prep method 3535: Due to excessive sediment the sample column became clogged for samples samples "87408," "84718," "87319," and "87301." The remainder of sample was loaded onto an additional column. After-elution extracts were combined. Additionally, insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with this organic prep batch.

c. Were all corrective actions documented?
☒Yes ☐ No ☐NA (Please explain.) Comments:

Yes; see above.

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

IDA recovery failures are considered to affect data quality, and are discussed in Section 6c. The method reporting limit and organic preparation batch comments are not considered to affect data quality or usability.

5. Samples Results
a. Correct analyses performed/reported as requested on COC?
☒Yes ☐ No ☐NA (Please explain.) Comments:

b. All applicable holding times met?
☒Yes ☐ No ☐NA (Please explain.) Comments:

The hold time of seven days until extraction was met.

c. All soils reported on a dry weight basis?
☐Yes ☐ No ☒NA (Please explain.) Comments:

N/A; no soil samples were submitted with this work order.

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?
☒Yes ☐ No ☐NA (Please explain.) Comments:

The PQL, equivalent to the TestAmerica Reporting or Requested Limit (RL), is less than applicable EPA provisional drinking water health advisory levels and ADEC proposed groundwater cleanup levels for PFOS and PFOA.

e. Data quality or usability affected?
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 ☐NA (Please explain.) Comments:

ii. All method blank results less than PQL?

☒Yes ☒ No ☐NA (Please explain.) Comments:

Eight PFC analytes were detected in the method blank (MB) at estimated concentrations less than their PQLs (reporting limits, or RLs). These analytes are PFBA, PFHpA, PFDA, PFUnA, PFTriA, PFTeA, PFHxDA, and FOSA.

iii. If above PQL, what samples are affected?

Comments:

Each of the 11 samples were associated with the MB containing detectable perfluorinated compounds. The results for PFTriA are considered unaffected because PFTriA is present at a concentration at least 10-fold greater than the MB concentration.

The results for PFBA, PFHpA, PFDA, PFUnA, PFTeA, PFHxDA, and FOSA are considered to affect at least one sample result because they were present at concentrations within 5 and 10 times that of the MB concentration, between the PQL and 5 times the MB concentration, or less than the PQL.

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

☒Yes ☐ No ☐NA (Please explain.) Comments:

Where not already qualified by the laboratory, these results are considered estimated and biased high (flagged 'JH'), or considered not detected and flagged 'B*' at either the reported sample result or the PQL, whichever is higher.

v. Data quality or usability affected? (Please explain.)

Comments:

Yes; see above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

☒Yes ☐ No ☐NA (Please explain.) Comments:

LCS/LCSD sample results were reported.

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

☐Yes ☐ No ☒NA (Please explain.) 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 ☐NA (Please explain.) Comments:

Yes; percent recoveries were between 60% and 140% or 150% depending on the analytes, as required by the laboratory method.

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 ☐NA (Please explain.) Comments:

Yes; LCS/LCSD RPDs were within the laboratory limit of 30%.

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

N/A; percent recoveries and RPDs were within acceptable limits.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
☐Yes ☐ No ☒NA (Please explain.) Comments:

N/A; no data flags are required.

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 ☐NA (Please explain.) 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 the 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 ☐NA (Please explain.) Comments:

With the exception of 13C8 FOSA, the percent recoveries are within the method recommended limit of 25% to 150%. The percent recovery for FOSA is below the method recommended limit for each of the 11 samples.

However, according to the laboratory, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which was achieved for all IDAs in the samples.

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

☒Yes ☐ No ☐NA (Please explain.) Comments:

N/A; the data did not require flags.

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

Comments:

The data quality and usability were not affected.

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 ☒NA (Please explain.) Comments:

PFCs are not volatile compounds, so 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 ☒NA (Please explain.) Comments:

No trip blank is required; see above.

iii. All results less than PQL?

☐Yes ☐ No ☒NA (Please explain.) Comments:

No trip blank is required; see above.

iv. If above PQL, what samples are affected?

Comments:

No trip blank is required; see above.

v. Data quality or usability affected? (Please explain.)

Comments:

The data quality and usability were not affected.

e. Field Duplicate

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

☒Yes ☐ No ☐NA (Please explain.) Comments:

ii. Submitted blind to lab?

☒Yes ☐ No ☐NA (Please explain.) Comments:

The field duplicate pair "87408" / "87418" was submitted for this work order.

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

The RPD value for FOSA is greater than 100%. The RPD values for the other PFC analytes, where calculable for detected results, meet QC criteria.

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

Comments:

Data quality for FOSA results in the field duplicate pair is considered affected. The results for "87408" and "87418" are considered estimated and flagged 'J' where not already qualified.

f. Decontamination or Equipment Blank (If not used explain why).

☐Yes ☐ No ☒NA (Please explain.) Comments:

Reusable equipment was not used in sample collection for this work order, so an equipment blank was not required.

i. All results less than PQL?

☐Yes ☐ No ☒NA (Please explain.) Comments:

N/A; an equipment blank was not required.

ii. If above PQL, what samples are affected?

Comments:

N/A; an equipment blank was not required.

iii. Data quality or usability affected? (Please explain.)

Comments:

The data quality and usability were not affected.

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

a. Defined and appropriate?

☐Yes ☐ No ☒NA (Please explain.) Comments:

There were no other data qualifiers used.

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: 320-17748-1
TestAmerica Sample Delivery Group: 31-1-11735-004
Client Project/Site: City of Fairbanks Fire Training Area

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

Attn: Julie Keener

Authorized for release by:
3/25/2016 11:16:12 AM

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

Table of Contents

Definitions/Glossary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17748-1
SDG: 31-1-11735-004

Qualifiers

LCMS

Qualifier	Qualifier Description
*	Isotope Dilution analyte is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

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, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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: 320-17748-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-17748-1

Receipt
The samples were received on 3/16/2016 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.7º C.

LCMS
Method(s) WS-LC-0025: The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: 652286 (320-17748-1), 3228039 (320-17748-2), 87157 (320-17748-3), 669077 (320-17748-4), 87351 (320-17748-5), 522384 (320-17748-6), 522484 (320-17748-7), 87386 (320-17748-8), 87165 (320-17748-9), 92924 (320-17748-10), 87360 (320-17748-11) and 87190 (320-17748-12). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples.

Method(s) WS-LC-0025: The reporting limit for perfluoro-n-hexadecanoic acid (PFHxDA) had to be raised for the following samples due to problems with the low levels of the calibration curve. 652286 (320-17748-1), 3228039 (320-17748-2), 87157 (320-17748-3), 669077 (320-17748-4), 87351 (320-17748-5), 522384 (320-17748-6), 522484 (320-17748-7), 87386 (320-17748-8), 87165 (320-17748-9), 92924 (320-17748-10), 87360 (320-17748-11) and 87190 (320-17748-12)

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

Organic Prep
Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 320-103929

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

Detection Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17748-1
SDG: 31-1-11735-004

Client Sample ID: 652286 — Lab Sample ID: 320-17748-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.0		1.8	0.41	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	6.3		1.8	0.89	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	12		1.8	0.70	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.8		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	6.2		1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.73	J	1.8	0.59	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.2	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	2.8		1.8	0.82	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	16		1.8	0.78	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	42		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 3228039 — Lab Sample ID: 320-17748-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoropentanoic acid (PFPeA)	5.2		1.8	0.88	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	5.2		1.8	0.70	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.1	J	1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	5.8		1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.62	J B	1.8	0.39	ng/L	1		WS-LC-0025	Total/NA
Perfluorododecanoic acid (PFDoA)	0.73	J B	1.8	0.52	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.6	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.35	J	8.9	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA)	0.72	J B	1.8	0.60	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	2.3		1.8	0.77	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	1.9		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 87157 — Lab Sample ID: 320-17748-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	7.6		1.8	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	10		1.8	0.87	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	15		1.8	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.6		1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	6.0		1.8	0.66	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	1.3	J	1.8	0.58	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	1.1	J B	1.8	0.39	ng/L	1		WS-LC-0025	Total/NA
Perfluorododecanoic acid (PFDoA)	0.78	J B	1.8	0.52	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.8	B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	1.2	J	8.8	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA)	0.84	J B	1.8	0.59	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	3.4		1.8	0.81	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	18		1.8	0.77	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-1-heptanesulfonate (PFHpS)	0.93	J	1.8	0.63	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	75		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonamide (FOSA)	3.8		1.8	0.56	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17748-1
SDG: 31-1-11735-004

Client Sample ID: 669077 — Lab Sample ID: 320-17748-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	5.1		1.8	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	7.1		1.8	0.87	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	12		1.8	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.9		1.8	0.70	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	3.9		1.8	0.66	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.54	J B	1.8	0.39	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.94	J B	1.8	0.17	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	3.0		1.8	0.81	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	13		1.8	0.76	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	35		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 87351 — Lab Sample ID: 320-17748-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	3.9		1.8	0.41	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	3.8		1.8	0.89	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	7.5		1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.3		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	3.6		1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.82	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.72	J	9.0	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	1.8		1.8	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	9.3		1.8	0.78	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	9.5		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 522384 — Lab Sample ID: 320-17748-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	13		1.8	0.42	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	21		1.8	0.91	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	29		1.8	0.73	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	8.9		1.8	0.74	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	12		1.8	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	2.8		1.8	0.60	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.47	J B	1.8	0.41	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.7	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	9.5		1.8	0.85	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	61		1.8	0.80	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-1-heptanesulfonate (PFHpS)	3.7		1.8	0.66	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	330		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 522484 — Lab Sample ID: 320-17748-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	12		1.8	0.42	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	28		1.8	0.91	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	31		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	9.4		1.8	0.74	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	11		1.8	0.69	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Client Sample ID: 522484 (Continued) — Lab Sample ID: 320-17748-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorononanoic acid (PFNA)	2.3		1.8	0.60	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.76	J B	1.8	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.65	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	12		1.8	0.84	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	78		1.8	0.80	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-1-heptanesulfonate (PFHpS)	5.7		1.8	0.65	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	340		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 87386 — Lab Sample ID: 320-17748-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	5.0		1.8	0.41	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	10		1.8	0.89	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	14		1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.6		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	5.5		1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.86	J	1.8	0.59	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.73	J B	1.8	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.2	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	2.9		1.8	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	17		1.8	0.79	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	15		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 87165 — Lab Sample ID: 320-17748-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	8.3		1.8	0.42	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	18		1.8	0.90	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	24		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	7.3		1.8	0.73	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	7.5		1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	4.1		1.8	0.60	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.2	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	2.7	J	9.1	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	8.3		1.8	0.84	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	52		1.8	0.79	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-1-heptanesulfonate (PFHpS)	3.5		1.8	0.65	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	160		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 92924 — Lab Sample ID: 320-17748-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	9.0		1.8	0.42	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	13		1.8	0.91	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	20		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.8		1.8	0.74	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	4.6		1.8	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	1.2	J	1.8	0.60	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 92924 (Continued)

Lab Sample ID: 320-17748-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorodecanoic acid (PFDA)	0.40	J B	1.8	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.0	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.62	J	9.2	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	4.6		1.8	0.84	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	23		1.8	0.80	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	42		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 87360

Lab Sample ID: 320-17748-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.7		1.8	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	1.3	J	1.8	0.87	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	2.1		1.8	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.89	J	1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	2.6		1.8	0.66	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.47	J B	1.8	0.39	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.94	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	1.8		1.8	0.77	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	2.1		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 87190

Lab Sample ID: 320-17748-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.7		1.8	0.41	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	5.9		1.8	0.88	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	15		1.8	0.70	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.0		1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	3.8		1.8	0.66	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.38	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	2.4		1.8	0.81	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	13		1.8	0.77	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	35		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: Mr 228M

Date Cdlle/ te6: 03vl4vlM11:27
Date Re/ ei5e6: 03vlMvlM10:00

Lab Sample ID: 320-17748-1

x atWb: c ateW

x ethd6: c S-LC-002r - PeWfludWhate6 Hy6Wd/ aWdns

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWepaW6	Analyze6	Dil Fa/
PeWfludWbutandi/ a/ i6 (PFBA)	4.0		1dC	0d41	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1
PeWfludWpentandi/ a/ i6 (PFPeA)	M3		1dC	0dC)	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1
PeWfludWheoandi/ a/ i6 (PFHoA)	12		1dC	0d70	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1
PeWfludWheptandi/ a/ i6 (PFHpA)	2.8		1dC	0d72	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1
PeWfludWd/ tandi/ a/ i6 (PFOA)	M2		1dC	0dB7	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1
PeWfludWndnandi/ a/ i6 (PF9 A)	0.73	N	1dC	0dP)	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1
j erFn oro8ecaSoic aci8 Lj kDAN	p D		1dC	0d8)	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1
j erFn oro. S8ecaSoic aci8 Lj k9 SAN	p D		1dC	0dB7	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1
j erFn oro8o8ecaSoic aci8 Lj kDoAN	p D		1dC	0dP2	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1
j erFn orotri8ecaSoic Aci8 Lj kTriAN	p D		1dC	0d4)	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1
PeWfludWtetWa6e/ andi/ a/ i6 (PFJeA)	1.2	NB	1dC	0d1C	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1
j erFn oro-S-&exa8ecaSoic aci8 Lj kHxDAN	p D		)d0	0d11	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1
j erFn oro-S-octaS8ecaSoic aci8 Lj k6 DAN	p D		1dC	0dB0	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1
PeWfludWbutane Sulfdnate (PFBS)	2.8		1dC	0dC2	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1
PeWfludWheoane Sulfdnate (PFHoS)	1M		1dC	0d7C	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1
j erFn oro-1-&eCtaSes. nFoSate Lj kHChN	p D		1dC	0dB4	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1
j erFn oro8ecaSe s. nFoSate Lj kDhN	p D		1dC	1d1	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1
PeWfludWd/ tane Sulfdnate (PFOS)	42		1dC	1d1	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1
j erFn orooctaSe h. nFoSami8e Lk6 hAN	p D		1dC	0dP7	Suy(		03y21y1B 10:2B	03y24y1B 00:2B	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*8*	*	*25 - 150*	*03/21/16 10:26*	*03/24/16 00:26*	*1*
13C4 PFBA	*56*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:26*	*1*
13C2 PFHxA	*83*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:26*	*1*
13C4 PFOA	*88*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:26*	*1*
13C5 PFNA	*80*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:26*	*1*
13C2 PFDA	*88*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:26*	*1*
13C2 PFUnA	*98*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:26*	*1*
13C2 PFDoA	*77*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:26*	*1*
18O2 PFHxS	*109*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:26*	*1*
13C4 PFOS	*108*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:26*	*1*
13C4-PFHpA	*94*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:26*	*1*
13C5 PFPeA	*85*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:26*	*1*

Client Sample ID: 322803T

Date Cdlle/ te6: 03vl4vlM12:14
Date Re/ ei5e6: 03vlMvlM10:00

Lab Sample ID: 320-17748-2

x atWb: c ateW

x ethd6: c S-LC-002r - PeWfludWhate6 Hy6Wd/ aWdns

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWepaW6	Analyze6	Dil Fa/
j erFn orob. taSoic aci8 Lj kUAN	p D		1dC	0d41	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1
PeWfludWpentandi/ a/ i6 (PFPeA)	r.2		1dC	0dCC	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1
PeWfludWheoandi/ a/ i6 (PFHoA)	r.2		1dC	0d70	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1
PeWfludWheptandi/ a/ i6 (PFHpA)	1.1	N	1dC	0d71	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1
PeWfludWd/ tandi/ a/ i6 (PFOA)	r.8		1dC	0dB7	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1
j erFn oroSoSaSoic aci8 Lj kpAN	p D		1dC	0dPC	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1

Client Sample ID: 322803T

Lab Sample ID: 320-17748-2

Date Cdlle/ te6: 03v14v1M12:14

x atWo: c ateW

Date Re/ ei5e6: 03v1Mv1M10:00

x ethd6: c S-LC-002r - PeWludWhate6 Hy6Wd/ aWdns (Cdntinue6)

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaWe6	Analyze6	Dil Fa/
PeWludWe6e/ andi/ a/ i6 (PFDA)	0.M2	NB	1dC	0d8)	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1
j erFn oro. S8ecaSoic aci8 Lj k9 SAN	p D		1dC	0dB7	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1
PeWludWd6d6e/ andi/ a/ i6 (PFDdA)	0.73	NB	1dC	0dP2	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1
j erFn orotri8ecaSoic Aci8 Lj k TriAN	p D		1dC	0d4)	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1
PeWludWtetWe6e/ andi/ a/ i6 (PFJeA)	1.M	NB	1dC	0d1C	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1
PeWludWl-n-heoa6e/ andi/ a/ i6 (PFHoDA)	0.3r	N	Cd)	0d11	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1
PeWludWl-n-d/ tan6e/ andi/ a/ i6 (PFODA)	0.72	NB	1dC	0dB0	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1
j erFn orob. taSe h. nFoSate Lj k Uh N	p D		1dC	0dC2	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1
PeWludWheoane Sulfdnate (PFHoS)	2.3		1dC	0d77	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1
j erFn oro-1-&eCtaSes. nFoSate Lj k HCh N	p D		1dC	0dB3	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1
j erFn oro8ecaSe s. nFoSate Lj k Dh N	p D		1dC	1d1	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1
PeWludWd/ tane Sulfdnate (PFOS)	1.T		1dC	1d1	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1
j erFn orooctaSe h. nFoSami8e Lk6 h AN	p D		1dC	0dP7	Suy(		03y21y1B 10:2B	03y24y1B 00:47	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*2*	*	*25 - 150*	*03/21/16 10:26*	*03/24/16 00:47*	*1*
13C4 PFBA	*43*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:47*	*1*
13C2 PFHxA	*79*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:47*	*1*
13C4 PFOA	*87*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:47*	*1*
13C5 PFNA	*72*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:47*	*1*
13C2 PFDA	*56*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:47*	*1*
13C2 PFUnA	*70*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:47*	*1*
13C2 PFDoA	*62*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:47*	*1*
18O2 PFHxS	*122*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:47*	*1*
13C4 PFOS	*112*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:47*	*1*
13C4-PFHpA	*87*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:47*	*1*
13C5 PFPeA	*75*		*25 - 150*	*03/21/16 10:26*	*03/24/16 00:47*	*1*

Client Sample ID: 871r 7

Lab Sample ID: 320-17748-3

Date Cdlle/ te6: 03v14v1M13:00

x atWo: c ateW

Date Re/ ei5e6: 03v1Mv1M10:00

x ethd6: c S-LC-002r - PeWludWhate6 Hy6Wd/ aWdns

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaWe6	Analyze6	Dil Fa/
PeWludWbutandi/ a/ i6 (PFBA)	7.M		1dC	0d40	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1
PeWludWpentandi/ a/ i6 (PFPeA)	10		1dC	0dC7	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1
PeWludWheoandi/ a/ i6 (PFHoA)	1r		1dC	0dB)	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1
PeWludWheptandi/ a/ i6 (PFHpA)	3.M		1dC	0d71	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1
PeWludWd/ tandi/ a/ i6 (PFOA)	M0		1dC	0dBB	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1
PeWludWndnandi/ a/ i6 (PF9 A)	1.3	N	1dC	0dPC	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1
PeWludWe6e/ andi/ a/ i6 (PFDA)	1.1	NB	1dC	0d8)	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1
j erFn oro. S8ecaSoic aci8 Lj k9 SAN	p D		1dC	0dBB	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1
PeWludWd6d6e/ andi/ a/ i6 (PFDdA)	0.78	NB	1dC	0dP2	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1
j erFn orotri8ecaSoic Aci8 Lj k TriAN	p D		1dC	0d4)	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1

Client Sample ID: 871r 7

Date Cdlle/ te6: 03v14v1M13:00
Date Re/ ei5e6: 03v1Mv1M10:00

Lab Sample ID: 320-17748-3

x atWo: c ateW

x ethd6: c S-LC-002r - PeWfludWhate6 Hy6Wd/ aWdns (Cdntinue6)

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaWe6	Analyze6	Dil Fa/
PeWfludWtetWa6e/ andi/ a/ i6 (PFJeA)	1.8	B	1dC	0d1C	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1
PeWfludWl-n-heoa6e/ andi/ a/ i6 (PFHoDA)	1.2	N	CdC	0d11	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1
PeWfludWl-n-d/ tan6e/ andi/ a/ i6 (PFODA)	0.84	NB	1dC	0dP)	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1
PeWfludWbutane Sulfdnate (PFBS)	3.4		1dC	0dC1	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1
PeWfludWheoane Sulfdnate (PFHoS)	18		1dC	0d77	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1
PeWfludWl-1-heptanesulfdnate (PFHpS)	0.T3	N	1dC	0dB3	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1
j erFn oro8ecaSe s. nfoSate Lj k DhN	p D		1dC	1d1	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1
PeWfludWd/ tane Sulfdnate (PFOS)	7r		1dC	1d1	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1
PeWfludWd/ tane Sulfdnami6e (FOSA)	3.8		1dC	0dPB	Suy(		03y21y1B 10:2B	03y24y1B 01:30	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*5*	*	*25 - 150*	*03/21/16 10:26*	*03/24/16 01:30*	*1*
13C4 PFBA	*46*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:30*	*1*
13C2 PFHxA	*74*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:30*	*1*
13C4 PFOA	*80*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:30*	*1*
13C5 PFNA	*66*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:30*	*1*
13C2 PFDA	*62*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:30*	*1*
13C2 PFUnA	*59*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:30*	*1*
13C2 PFDoA	*51*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:30*	*1*
18O2 PFHxS	*105*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:30*	*1*
13C4 PFOS	*103*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:30*	*1*
13C4-PFHpA	*94*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:30*	*1*
13C5 PFPeA	*74*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:30*	*1*

Client Sample ID: MMT077

Date Cdlle/ te6: 03v14v1M14:14
Date Re/ ei5e6: 03v1Mv1M10:00

Lab Sample ID: 320-17748-4

x atWo: c ateW

x ethd6: c S-LC-002r - PeWfludWhate6 Hy6Wd/ aWdns

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaWe6	Analyze6	Dil Fa/
PeWfludWbutandi/ a/ i6 (PFBA)	r.1		1dC	0d40	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1
PeWfludWpentandi/ a/ i6 (PFPeA)	7.1		1dC	0dC7	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1
PeWfludWheoandi/ a/ i6 (PFHoA)	12		1dC	0dB)	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1
PeWfludWheptandi/ a/ i6 (PFHpA)	2.T		1dC	0d70	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1
PeWfludWd/ tandi/ a/ i6 (PFOA)	3.T		1dC	0dBB	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1
j erFn oroSoSaSoic aci8 Lj kp AN	p D		1dC	0dP7	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1
PeWfludW6e/ andi/ a/ i6 (PFDA)	0.r4	NB	1dC	0d3)	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1
j erFn oro. S8ecaSoic aci8 Lj k9 SAN	p D		1dC	0dBB	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1
j erFn oro8o8ecaSoic aci8 Lj k DoAN	p D		1dC	0dP1	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1
j erFn orotri8ecaSoic Aci8 Lj k TriAN	p D		1dC	0d4C	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1
PeWfludWtetWa6e/ andi/ a/ i6 (PFJeA)	0.T4	NB	1dC	0d17	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1
j erFn oro-S-&exa8ecaSoic aci8 Lj k HxDAN	p D		CdC	0d11	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1
j erFn oro-S-octaS8ecaSoic aci8 Lj k6 DAN	p D		1dC	0dP)	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1
PeWfludWbutane Sulfdnate (PFBS)	3.0		1dC	0dC1	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1

Client Sample ID: MMT077

Date Cdlle/ te6: 03v14v1M14:14
Date Re/ ei5e6: 03v1MM1M10:00

Lab Sample ID: 320-17748-4

x atWb: c ateW

x ethd6: c S-LC-002r - PeWfludWhate6 Hy6Wd/ aWdns (Cdntinue6)

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaWW6	Analyze6	Dil Fa/
PeWfludWheoane Sulfdnate (PFHoS)	13		1dC	0d7B	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1
j erFn oro-1-&eCtaSes. nFoSate Lj kHChN	p D		1dC	0dB3	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1
j erFn oro8ecaSe s. nFoSate Lj kDhN	p D		1dC	1dl	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1
PeWfludWd/ tane Sulfdnate (PFOS)	3r		1dC	1dl	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1
j erFn orooctaSe h. nFoSami8e Lk6 hAN	p D		1dC	0dPB	Suy(		03y21y1B 10:2B	03y24y1B 01:P1	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*13*	*	*25 - 150*	*03/21/16 10:26*	*03/24/16 01:51*	*1*
13C4 PFBA	*60*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:51*	*1*
13C2 PFHxA	*86*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:51*	*1*
13C4 PFOA	*90*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:51*	*1*
13C5 PFNA	*86*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:51*	*1*
13C2 PFDA	*80*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:51*	*1*
13C2 PFUnA	*99*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:51*	*1*
13C2 PFDoA	*74*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:51*	*1*
18O2 PFHxS	*117*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:51*	*1*
13C4 PFOS	*109*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:51*	*1*
13C4-PFHpA	*98*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:51*	*1*
13C5 PFPeA	*79*		*25 - 150*	*03/21/16 10:26*	*03/24/16 01:51*	*1*

Client Sample ID: 873r 1

Date Cdlle/ te6: 03v14v1M0T:30
Date Re/ ei5e6: 03v1MM1M10:00

Lab Sample ID: 320-17748-r

x atWb: c ateW

x ethd6: c S-LC-002r - PeWfludWhate6 Hy6Wd/ aWdns

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaWW6	Analyze6	Dil Fa/
PeWfludWbutandi/ a/ i6 (PFBA)	3.T		1dC	0d41	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1
PeWfludWpentandi/ a/ i6 (PFPeA)	3.8		1dC	0dC)	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1
PeWfludWheoandi/ a/ i6 (PFHoA)	7.r		1dC	0d71	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1
PeWfludWheptandi/ a/ i6 (PFHpA)	2.3		1dC	0d72	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1
PeWfludWd/ tandi/ a/ i6 (PFOA)	3.M		1dC	0dB7	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1
j erFn oroSoSaSoic aci8 Lj kpAN	p D		1dC	0dP)	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1
j erFn oro8ecaSoic aci8 Lj kDAN	p D		1dC	0d40	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1
j erFn oro. S8ecaSoic aci8 Lj k9SAN	p D		1dC	0dB7	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1
j erFn oro8o8ecaSoic aci8 Lj kDoAN	p D		1dC	0dP3	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1
j erFn orotri8ecaSoic Aci8 Lj kTriAN	p D		1dC	0dP0	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1
PeWfludWtetWa6e/ andi/ a/ i6 (PFJeA)	0.82	NB	1dC	0d1C	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1
PeWfludWl-n-heoa6e/ andi/ a/ i6 (PFHoDA)	0.72	N	) d0	0d11	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1
j erFn oro-S-octaS8ecaSoic aci8 Lj k6DAN	p D		1dC	0dB0	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1
PeWfludWbutane Sulfdnate (PFBS)	1.8		1dC	0dC3	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1
PeWfludWheoane Sulfdnate (PFHoS)	T.3		1dC	0d7C	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1
j erFn oro-1-&eCtaSes. nFoSate Lj kHChN	p D		1dC	0dB4	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1
j erFn oro8ecaSe s. nFoSate Lj kDhN	p D		1dC	1dl	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1
PeWfludWd/ tane Sulfdnate (PFOS)	T.r		1dC	1dl	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1
j erFn orooctaSe h. nFoSami8e Lk6 hAN	p D		1dC	0dP7	Suy(		03y21y1B 10:2B	03y24y1B 02:12	1

Client Sample ID: 873r 1

Date Cdlle/ te6: 03v14v1M0T:30
Date Re/ ei5e6: 03v1Mv1M10:00

Lab Sample ID: 320-17748-r

x atWb: c ateW

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	3	*	25 - 150	03/21/16 10:26	03/24/16 02:12	1
13C4 PFBA	55		25 - 150	03/21/16 10:26	03/24/16 02:12	1
13C2 PFHxA	85		25 - 150	03/21/16 10:26	03/24/16 02:12	1
13C4 PFOA	85		25 - 150	03/21/16 10:26	03/24/16 02:12	1
13C5 PFNA	69		25 - 150	03/21/16 10:26	03/24/16 02:12	1
13C2 PFDA	63		25 - 150	03/21/16 10:26	03/24/16 02:12	1
13C2 PFUnA	75		25 - 150	03/21/16 10:26	03/24/16 02:12	1
13C2 PFDoA	56		25 - 150	03/21/16 10:26	03/24/16 02:12	1
18O2 PFHxS	110		25 - 150	03/21/16 10:26	03/24/16 02:12	1
13C4 PFOS	111		25 - 150	03/21/16 10:26	03/24/16 02:12	1
13C4-PFHpA	84		25 - 150	03/21/16 10:26	03/24/16 02:12	1
13C5 PFPeA	85		25 - 150	03/21/16 10:26	03/24/16 02:12	1

Client Sample ID: r 22384

Date Cdlle/ te6: 03v14v1M10:30
Date Re/ ei5e6: 03v1Mv1M10:00

Lab Sample ID: 320-17748-M

x atWb: c ateW

x ethd6: c S-LC-002r - PeWfludWhate6 Hy6Wd/ aWdns

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaWe6	Analyze6	Dil Fa/
PeWfludWbutandi/ a/ i6 (PFBA)	13		1dC	0d42	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1
PeWfludWpentandi/ a/ i6 (PFPeA)	21		1dC	0d) 1	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1
PeWfludWheoandi/ a/ i6 (PFHoA)	2T		1dC	0d73	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1
PeWfludWheptandi/ a/ i6 (PFHpA)	8.T		1dC	0d74	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1
PeWfludWd/ tandi/ a/ i6 (PFOA)	12		1dC	0dB)	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1
PeWfludWndnandi/ a/ i6 (PF9 A)	2.8		1dC	0dB0	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1
PeWfludW6e/ andi/ a/ i6 (PFDA)	0.47	NB	1dC	0d41	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1
j erFn oro. S8ecaSoic aci8 Lj k9 SAN	p D		1dC	0dB)	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1
j erFn oro8o8ecaSoic aci8 Lj k DoAN	p D		1dC	0dP4	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1
j erFn orotri8ecaSoic Aci8 Lj k TriAN	p D		1dC	0dP1	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1
PeWfludWtetW6e/ andi/ a/ i6 (PFJeA)	1.7	NB	1dC	0d1C	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1
j erFn oro-S-&exa8ecaSoic aci8 Lj k HxDAN	p D		) d2	0d11	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1
j erFn oro-S-octaS8ecaSoic aci8 Lj k6 DAN	p D		1dC	0dB2	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1
PeWfludWbutane Sulfdnate (PFBS)	T.r		1dC	0dCP	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1
PeWfludWheoane Sulfdnate (PFHoS)	M		1dC	0dC0	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1
PeWfludW-1-heptanesulfdnate (PFHpS)	3.7		1dC	0dBB	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1
j erFn oro8ecaSe s. nFoSate Lj k Dh N	p D		1dC	1d1	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1
PeWfludWd/ tane Sulfdnate (PFOS)	330		1dC	1d2	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1
j erFn orooctaSe h. nFoSami8e Lk6 h AN	p D		1dC	0dP)	Suy(		03y21y1B 10:2B	03y24y1B 02:34	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	3	*	25 - 150	03/21/16 10:26	03/24/16 02:34	1
13C4 PFBA	39		25 - 150	03/21/16 10:26	03/24/16 02:34	1
13C2 PFHxA	80		25 - 150	03/21/16 10:26	03/24/16 02:34	1
13C4 PFOA	98		25 - 150	03/21/16 10:26	03/24/16 02:34	1
13C5 PFNA	70		25 - 150	03/21/16 10:26	03/24/16 02:34	1
13C2 PFDA	71		25 - 150	03/21/16 10:26	03/24/16 02:34	1
13C2 PFUnA	74		25 - 150	03/21/16 10:26	03/24/16 02:34	1
13C2 PFDoA	68		25 - 150	03/21/16 10:26	03/24/16 02:34	1

Client Sample ID: r 22384

Date Cdlle/ te6: 03v14v1M10:30
Date Re/ ei5e6: 03v1Mv1M10:00

Lab Sample ID: 320-17748-M

x atWo: c ateW

x ethd6: c S-LC-002r - PeWfludWhate6 Hy6Wd/ aWdns (Cdntinue6)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
18O2 PFHxS	115		25 - 150	03/21/16 10:26	03/24/16 02:34	1
13C4 PFOS	97		25 - 150	03/21/16 10:26	03/24/16 02:34	1
13C4-PFHpA	96		25 - 150	03/21/16 10:26	03/24/16 02:34	1
13C5 PFPeA	70		25 - 150	03/21/16 10:26	03/24/16 02:34	1

Client Sample ID: r 22484

Date Cdlle/ te6: 03v14v1M10:20
Date Re/ ei5e6: 03v1Mv1M10:00

Lab Sample ID: 320-17748-7

x atWo: c ateW

x ethd6: c S-LC-002r - PeWfludWhate6 Hy6Wd/ aWdns

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaWe6	Analyze6	Dil Fa/
PeWfludWbutandi/ a/ i6 (PFBA)	12		1dC	0d42	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1
PeWfludWpentandi/ a/ i6 (PFPeA)	28		1dC	0d) 1	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1
PeWfludWheoandi/ a/ i6 (PFHoA)	31		1dC	0d72	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1
PeWfludWheptandi/ a/ i6 (PFHpA)	T.4		1dC	0d74	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1
PeWfludWd/ tandi/ a/ i6 (PFOA)	11		1dC	0dB)	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1
PeWfludWndnandi/ a/ i6 (PF9 A)	2.3		1dC	0dB0	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1
PeWfludW6e/ andi/ a/ i6 (PFDA)	0.7M	NB	1dC	0d40	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1
j erFn oro. S8ecaSoic aci8 Lj k9 SAN	pD		1dC	0dB)	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1
j erFn oro8o8ecaSoic aci8 Lj k DoAN	pD		1dC	0dP4	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1
j erFn orotri8ecaSoic Aci8 Lj k TriAN	pD		1dC	0dP1	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1
PeWfludWtetW6e/ andi/ a/ i6 (PFJeA)	0.Mr	NB	1dC	0d1C	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1
j erFn oro-S-&exa8ecaSoic aci8 Lj k HxDAN	pD		) d2	0d11	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1
j erFn oro-S-octaS8ecaSoic aci8 Lj k6 DAN	pD		1dC	0dB2	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1
PeWfludWbutane Sulfdnate (PFBS)	12		1dC	0dC4	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1
PeWfludWheoane Sulfdnate (PFHoS)	78		1dC	0dD0	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1
PeWfludW-1-heptanesulfdnate (PFHpS)	r.7		1dC	0dBP	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1
j erFn oro8ecaSe s. rFoSate Lj k DhN	pD		1dC	1d1	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1
PeWfludWd/ tane Sulfdnate (PFOS)	340		1dC	1d2	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1
j erFn orooctaSe h. rFoSami8e Lk6 hAN	pD		1dC	0dP)	Suy(		03y21y1B 10:2B	03y24y1B 02:PP	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	8	*	25 - 150	03/21/16 10:26	03/24/16 02:55	1
13C4 PFBA	42		25 - 150	03/21/16 10:26	03/24/16 02:55	1
13C2 PFHxA	75		25 - 150	03/21/16 10:26	03/24/16 02:55	1
13C4 PFOA	81		25 - 150	03/21/16 10:26	03/24/16 02:55	1
13C5 PFNA	62		25 - 150	03/21/16 10:26	03/24/16 02:55	1
13C2 PFDA	56		25 - 150	03/21/16 10:26	03/24/16 02:55	1
13C2 PFUnA	63		25 - 150	03/21/16 10:26	03/24/16 02:55	1
13C2 PFDoA	63		25 - 150	03/21/16 10:26	03/24/16 02:55	1
18O2 PFHxS	112		25 - 150	03/21/16 10:26	03/24/16 02:55	1
13C4 PFOS	89		25 - 150	03/21/16 10:26	03/24/16 02:55	1
13C4-PFHpA	88		25 - 150	03/21/16 10:26	03/24/16 02:55	1
13C5 PFPeA	69		25 - 150	03/21/16 10:26	03/24/16 02:55	1

Client Sample ID: 8738M

Lab Sample ID: 320-17748-8

Date Cdlle/ te6: 03v14v1M11:10

x atWb: c ateW

Date Re/ ei5e6: 03v1Mv1M10:00

x ethd6: c S-LC-002r - PeWfludWhate6 Hy6Wd/ aWdns

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaWe6	Analyze6	Dil Fa/
PeWfludWbutandi/ a/ i6 (PFBA)	r.0		1dC	0d41	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1
PeWfludWpentandi/ a/ i6 (PFPeA)	10		1dC	0dC)	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1
PeWfludWheoandi/ a/ i6 (PFHoA)	14		1dC	0d71	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1
PeWfludWheptandi/ a/ i6 (PFHpA)	4.M		1dC	0d72	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1
PeWfludWd/ tandi/ a/ i6 (PFOA)	r.r		1dC	0dBC	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1
PeWfludWndnandi/ a/ i6 (PF9 A)	0.8M	N	1dC	0dP)	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1
PeWfludWe6e/ andi/ a/ i6 (PFDA)	0.73	NB	1dC	0d40	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1
j erFn oro. S8ecaSoic aci8 Lj k9 SAN	p D		1dC	0dBC	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1
j erFn oro8o8ecaSoic aci8 Lj k DoAN	p D		1dC	0dP3	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1
j erFn orotri8ecaSoic Aci8 Lj k TriAN	p D		1dC	0dP0	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1
PeWfludWtetWe6e/ andi/ a/ i6 (PFJeA)	1.2	NB	1dC	0d1C	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1
j erFn oro-S-&exa8ecaSoic aci8 Lj k HxDAN	p D		) d0	0d11	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1
j erFn oro-S-octaS8ecaSoic aci8 Lj k 6 DAN	p D		1dC	0dB1	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1
PeWfludWbutane Sulfdnate (PFBS)	2.T		1dC	0dC3	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1
PeWfludWheoane Sulfdnate (PFHoS)	17		1dC	0d7)	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1
j erFn oro-1-&eOtaSes. rFoSate Lj k HOhN	p D		1dC	0dB4	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1
j erFn oro8ecaSe s. rFoSate Lj k DhN	p D		1dC	1d1	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1
PeWfludWd/ tane Sulfdnate (PFOS)	1r		1dC	1d2	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1
j erFn orooctaSe h. rFoSami8e Lk6 hAN	p D		1dC	0dPC	Suy(		03y21y1B 10:2B	03y24y1B 03:1B	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*1*	*	*25 - 150*	*03/21/16 10:26*	*03/24/16 03:16*	*1*
13C4 PFBA	*46*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:16*	*1*
13C2 PFHxA	*84*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:16*	*1*
13C4 PFOA	*88*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:16*	*1*
13C5 PFNA	*84*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:16*	*1*
13C2 PFDA	*56*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:16*	*1*
13C2 PFUnA	*75*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:16*	*1*
13C2 PFDoA	*57*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:16*	*1*
18O2 PFHxS	*120*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:16*	*1*
13C4 PFOS	*104*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:16*	*1*
13C4-PFHpA	*86*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:16*	*1*
13C5 PFPeA	*71*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:16*	*1*

Client Sample ID: 871Mr

Lab Sample ID: 320-17748-T

Date Cdlle/ te6: 03v14v1M13:0M

x atWb: c ateW

Date Re/ ei5e6: 03v1Mv1M10:00

x ethd6: c S-LC-002r - PeWfludWhate6 Hy6Wd/ aWdns

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaWe6	Analyze6	Dil Fa/
PeWfludWbutandi/ a/ i6 (PFBA)	8.3		1dC	0d42	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1
PeWfludWpentandi/ a/ i6 (PFPeA)	18		1dC	0d) 0	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1
PeWfludWheoandi/ a/ i6 (PFHoA)	24		1dC	0d72	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1
PeWfludWheptandi/ a/ i6 (PFHpA)	7.3		1dC	0d73	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1
PeWfludWd/ tandi/ a/ i6 (PFOA)	7.r		1dC	0dBC	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1
PeWfludWndnandi/ a/ i6 (PF9 A)	4.1		1dC	0dB0	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1
j erFn oro8ecaSoic aci8 Lj k DAN	p D		1dC	0d40	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1

Client Sample ID: 871Mr
Date Cdlle/ te6: 03v14v1M13:0M
Date Re/ ei5e6: 03v1Mv1M10:00

Lab Sample ID: 320-17748-T
x atWo: c ateW

x ethd6: c S-LC-002r - PeWludWhate6 Hy6Wd/ aWdns (Cdntinue6)

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaWe6	Analyze6	Dil Fa/
j erFn oro. S8ecaSoic aci8 Lj k9 SAN	p D		1dC	0dBC	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1
j erFn oro8o8ecaSoic aci8 Lj kDoAN	p D		1dC	0dP3	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1
j erFn orotri8ecaSoic Aci8 Lj kTriAN	p D		1dC	0dP0	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1
PeWludWtetWe6e/ andi/ a/ i6 (PFJeA)	1.2	NB	1dC	0d1C	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1
PeWludWl-n-heoa6e/ andi/ a/ i6 (PFHoDA)	2.7	N	) d1	0d11	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1
j erFn oro-S-octaS8ecaSoic aci8 Lj k6 DAN	p D		1dC	0dB1	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1
PeWludWbutane Sulfdnate (PFBS)	8.3		1dC	0dC4	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1
PeWludWheoane Sulfdnate (PFHoS)	r2		1dC	0d7)	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1
PeWludWl-1-heptanesulfdnate (PFHpS)	3.r		1dC	0dBP	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1
j erFn oro8ecaSe s. rFoSate Lj kDhN	p D		1dC	1d1	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1
PeWludWd/ tane Sulfdnate (PFOS)	1M0		1dC	1d2	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1
j erFn orooctaSe h. rFoSami8e Lk6 hAN	p D		1dC	0dPC	Suy(		03y21y1B 10:2B	03y24y1B 03:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*5*	*	*25 - 150*	*03/21/16 10:26*	*03/24/16 03:37*	*1*
13C4 PFBA	*46*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:37*	*1*
13C2 PFHxA	*85*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:37*	*1*
13C4 PFOA	*85*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:37*	*1*
13C5 PFNA	*48*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:37*	*1*
13C2 PFDA	*41*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:37*	*1*
13C2 PFUnA	*42*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:37*	*1*
13C2 PFDoA	*47*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:37*	*1*
18O2 PFHxS	*112*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:37*	*1*
13C4 PFOS	*102*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:37*	*1*
13C4-PFHpA	*94*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:37*	*1*
13C5 PFPeA	*72*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:37*	*1*

Client Sample ID: T2T24
Date Cdlle/ te6: 03v14v1M14:0r
Date Re/ ei5e6: 03v1Mv1M10:00

Lab Sample ID: 320-17748-10
x atWo: c ateW

x ethd6: c S-LC-002r - PeWludWhate6 Hy6Wd/ aWdns

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaWe6	Analyze6	Dil Fa/
PeWludWbutandi/ a/ i6 (PFBA)	T.0		1dC	0d42	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1
PeWludWpentandi/ a/ i6 (PFPeA)	13		1dC	0d) 1	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1
PeWludWheoandi/ a/ i6 (PFHoA)	20		1dC	0d72	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1
PeWludWheptandi/ a/ i6 (PFHpA)	4.8		1dC	0d74	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1
PeWludWd/ tandi/ a/ i6 (PFOA)	4.M		1dC	0dB)	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1
PeWludWndnandi/ a/ i6 (PF9 A)	1.2	N	1dC	0dB0	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1
PeWludWe6e/ andi/ a/ i6 (PFDA)	0.40	NB	1dC	0d40	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1
j erFn oro. S8ecaSoic aci8 Lj k9 SAN	p D		1dC	0dB)	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1
j erFn oro8o8ecaSoic aci8 Lj kDoAN	p D		1dC	0dP4	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1
j erFn orotri8ecaSoic Aci8 Lj kTriAN	p D		1dC	0dP1	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1
PeWludWtetWe6e/ andi/ a/ i6 (PFJeA)	1.0	NB	1dC	0d1C	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1
PeWludWl-n-heoa6e/ andi/ a/ i6 (PFHoDA)	0.M2	N	) d2	0d11	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1

Client Sample ID: T2T24

Date Cdlle/ te6: 03v14v1M14:0r
Date Re/ ei5e6: 03v1Mv1M10:00

Lab Sample ID: 320-17748-10

x atWb: c ateW

x ethd6: c S-LC-002r - PeWludWhate6 Hy6Wd/ aWdns (Cdntinue6)

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
j erFn oro-S-octaS8ecaSoic aci8 Lj k6 DAN	p D		1dC	0dB2	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1
PeWludWbutane Sulfdnate (PFBS)	**4.M**		1dC	0dC4	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1
PeWludWheoane Sulfdnate (PFHoS)	**23**		1dC	0dC0	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1
j erFn oro-1-&eCtaSes. nFoSate Lj kHChN	p D		1dC	0dBB	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1
j erFn oro8ecaSe s. nFoSate Lj kDhN	p D		1dC	1d1	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1
PeWludWd/ tane Sulfdnate (PFOS)	**42**		1dC	1d2	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1
j erFn orooctaSe h. nFoSami8e Lk6 hAN	p D		1dC	0dP)	Suy(		03y21y1B 10:2B	03y24y1B 03:P)	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*4*	*	*25 - 150*	*03/21/16 10:26*	*03/24/16 03:59*	*1*
13C4 PFBA	*47*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:59*	*1*
13C2 PFHxA	*75*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:59*	*1*
13C4 PFOA	*97*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:59*	*1*
13C5 PFNA	*62*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:59*	*1*
13C2 PFDA	*45*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:59*	*1*
13C2 PFUnA	*57*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:59*	*1*
13C2 PFDoA	*56*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:59*	*1*
18O2 PFHxS	*112*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:59*	*1*
13C4 PFOS	*111*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:59*	*1*
13C4-PFHpA	*86*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:59*	*1*
13C5 PFPeA	*82*		*25 - 150*	*03/21/16 10:26*	*03/24/16 03:59*	*1*

Client Sample ID: 873M0

Date Cdlle/ te6: 03v14v1M17:48
Date Re/ ei5e6: 03v1Mv1M10:00

Lab Sample ID: 320-17748-11

x atWb: c ateW

x ethd6: c S-LC-002r - PeWludWhate6 Hy6Wd/ aWdns

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
PeWludWbutandi/ a/ i6 (PFBA)	**2.7**		1dC	0d40	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1
PeWludWpentandi/ a/ i6 (PFPeA)	**1.3**	**N**	1dC	0dC7	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1
PeWludWheoandi/ a/ i6 (PFHoA)	**2.1**		1dC	0dB)	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1
PeWludWheptandi/ a/ i6 (PFHpA)	**0.8T**	**N**	1dC	0d71	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1
PeWludWd/ tandi/ a/ i6 (PFOA)	**2.M**		1dC	0dBB	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1
j erFn oroSoSaSoic aci8 Lj kp AN	p D		1dC	0dPC	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1
PeWludW6e/ andi/ a/ i6 (PFDA)	**0.47**	**NB**	1dC	0d8)	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1
j erFn oro. S8ecaSoic aci8 Lj k9 SAN	p D		1dC	0dBB	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1
j erFn oro8o8ecaSoic aci8 Lj kDoAN	p D		1dC	0dP2	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1
j erFn orotri8ecaSoic Aci8 Lj kTriAN	p D		1dC	0d4)	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1
PeWludWtetW6e/ andi/ a/ i6 (PFJeA)	**0.T4**	**NB**	1dC	0d1C	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1
j erFn oro-S-&exa8ecaSoic aci8 Lj kHxDAN	p D		CdC	0d11	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1
j erFn oro-S-octaS8ecaSoic aci8 Lj k6 DAN	p D		1dC	0dP)	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1
j erFn orob. taSe h. nFoSate Lj kUhN	p D		1dC	0dC1	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1
PeWludWheoane Sulfdnate (PFHoS)	**1.8**		1dC	0d77	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1
j erFn oro-1-&eCtaSes. nFoSate Lj kHChN	p D		1dC	0dB3	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1

Client Sample ID: 873M0
Date Cdlle/ te6: 03v14v1M17:48
Date Re/ ei5e6: 03v1Mv1M10:00

Lab Sample ID: 320-17748-11
x atWb: c ateW

x ethd6: c S-LC-002r - PeWfludWhate6 Hy6Wd/ aWdns (Cdntinue6)

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
j erFn oro8ecaSe s. nFoSate Lj kDhN	p D		1dC	1d1	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1
PeWfludWd/ tane Sulfdnate (PFOS)	2.1		1dC	1d1	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1
j erFn orooctaSe h. nFoSami8e Lk6 hAN	p D		1dC	0dPB	Suy(		03y21y1B 10:2B	03y24y1B 04:20	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*3*	*	*25 - 150*	*03/21/16 10:26*	*03/24/16 04:20*	*1*
13C4 PFBA	*64*		*25 - 150*	*03/21/16 10:26*	*03/24/16 04:20*	*1*
13C2 PFHxA	*87*		*25 - 150*	*03/21/16 10:26*	*03/24/16 04:20*	*1*
13C4 PFOA	*85*		*25 - 150*	*03/21/16 10:26*	*03/24/16 04:20*	*1*
13C5 PFNA	*83*		*25 - 150*	*03/21/16 10:26*	*03/24/16 04:20*	*1*
13C2 PFDA	*73*		*25 - 150*	*03/21/16 10:26*	*03/24/16 04:20*	*1*
13C2 PFUnA	*88*		*25 - 150*	*03/21/16 10:26*	*03/24/16 04:20*	*1*
13C2 PFDoA	*86*		*25 - 150*	*03/21/16 10:26*	*03/24/16 04:20*	*1*
18O2 PFHxS	*112*		*25 - 150*	*03/21/16 10:26*	*03/24/16 04:20*	*1*
13C4 PFOS	*111*		*25 - 150*	*03/21/16 10:26*	*03/24/16 04:20*	*1*
13C4-PFHpA	*85*		*25 - 150*	*03/21/16 10:26*	*03/24/16 04:20*	*1*
13C5 PFPeA	*82*		*25 - 150*	*03/21/16 10:26*	*03/24/16 04:20*	*1*

Client Sample ID: 871T0
Date Cdlle/ te6: 03v14v1M18:28
Date Re/ ei5e6: 03v1Mv1M10:00

Lab Sample ID: 320-17748-12
x atWb: c ateW

x ethd6: c S-LC-002r - PeWfludWhate6 Hy6Wd/ aWdns

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
PeWfludWbutandi/ a/ i6 (PFBA)	4.7		1dC	0d41	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1
PeWfludWpentandi/ a/ i6 (PFPeA)	r.T		1dC	0dCC	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1
PeWfludWheoandi/ a/ i6 (PFHoA)	1r		1dC	0d70	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1
PeWfludWheptandi/ a/ i6 (PFHpA)	3.0		1dC	0d71	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1
PeWfludWd/ tandi/ a/ i6 (PFOA)	3.8		1dC	0dBB	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1
j erFn oroSoSaSoic aci8 Lj kpAN	p D		1dC	0dPC	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1
j erFn oro8ecaSoic aci8 Lj kDAN	p D		1dC	0d8)	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1
j erFn oro. S8ecaSoic aci8 Lj k9SAN	p D		1dC	0dBB	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1
j erFn oro8o8ecaSoic aci8 Lj kDoAN	p D		1dC	0dP2	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1
j erFn orotri8ecaSoic Aci8 Lj kTriAN	p D		1dC	0d4)	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1
PeWfludWtetWe6e/ andi/ a/ i6 (PFJeA)	0.38	NB	1dC	0d1C	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1
j erFn oro-S-&exa8ecaSoic aci8 Lj kHxDAN	p D		Cd)	0d11	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1
j erFn oro-S-octaS8ecaSoic aci8 Lj k6DAN	p D		1dC	0dB0	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1
PeWfludWbutane Sulfdnate (PFBS)	2.4		1dC	0dC1	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1
PeWfludWheoane Sulfdnate (PFHoS)	13		1dC	0d77	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1
j erFn oro-1-&eOtaSes. nFoSate Lj kHChN	p D		1dC	0dB3	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1
j erFn oro8ecaSe s. nFoSate Lj kDhN	p D		1dC	1d1	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1
PeWfludWd/ tane Sulfdnate (PFOS)	3r		1dC	1d1	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1
j erFn orooctaSe h. nFoSami8e Lk6 hAN	p D		1dC	0dP7	Suy(		03y21y1B 10:2B	03y24y1B 04:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*2*	*	*25 - 150*	*03/21/16 10:26*	*03/24/16 04:41*	*1*
13C4 PFBA	*49*		*25 - 150*	*03/21/16 10:26*	*03/24/16 04:41*	*1*

Client Sample ID: 871T0
Date Cdlle/ te6: 03v14v1M18:28
Date Re/ ei5e6: 03v1MM1M10:00

Lab Sample ID: 320-17748-12
x atWb: c ateW

x ethd6: c S-LC-002r - PeWludWhate6 Hy6Wd/ aWdns (Cdntinue6)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	80		25 - 150	03/21/16 10:26	03/24/16 04:41	1
13C4 PFOA	87		25 - 150	03/21/16 10:26	03/24/16 04:41	1
13C5 PFNA	85		25 - 150	03/21/16 10:26	03/24/16 04:41	1
13C2 PFDA	70		25 - 150	03/21/16 10:26	03/24/16 04:41	1
13C2 PFUnA	87		25 - 150	03/21/16 10:26	03/24/16 04:41	1
13C2 PFDoA	75		25 - 150	03/21/16 10:26	03/24/16 04:41	1
18O2 PFHxS	110		25 - 150	03/21/16 10:26	03/24/16 04:41	1
13C4 PFOS	105		25 - 150	03/21/16 10:26	03/24/16 04:41	1
13C4-PFHpA	87		25 - 150	03/21/16 10:26	03/24/16 04:41	1
13C5 PFPeA	79		25 - 150	03/21/16 10:26	03/24/16 04:41	1

Isotope Dilution Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17748-1
SDG: 31-1-11735-004

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	3C8 FOSA (25-150)	3C4 PFBA (25-150)	3C2 PFHxA (25-150)	3C4 PFOA (25-150)	3C5 PFNA (25-150)	3C2 PFDA (25-150)	3C2 PFUnA (25-150)	3C2 PFDoA (25-150)
320-17748-1	652286	8 *	56	83	88	80	88	98	77
320-17748-2	3228039	2 *	43	79	87	72	56	70	62
320-17748-3	87157	5 *	46	74	80	66	62	59	51
320-17748-4	669077	13 *	60	86	90	86	80	99	74
320-17748-5	87351	3 *	55	85	85	69	63	75	56
320-17748-6	522384	3 *	39	80	98	70	71	74	68
320-17748-7	522484	8 *	42	75	81	62	56	63	63
320-17748-8	87386	1 *	46	84	88	84	56	75	57
320-17748-9	87165	5 *	46	85	85	48	41	42	47
320-17748-10	92924	4 *	47	75	97	62	45	57	56
320-17748-11	87360	3 *	64	87	85	83	73	88	86
320-17748-12	87190	2 *	49	80	87	85	70	87	75
LCS 320-103929/2-A	Lab Control Sample	42	87	89	94	89	89	87	80
LCSD 320-103929/3-A	Lab Control Sample Dup	38	92	81	82	83	75	95	77
MB 320-103929/1-A	Method Blank	32	89	88	97	93	105	107	87

		Percent Isotope Dilution Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	18O2 PFHxS (25-150)	13C4 PFOS (25-150)	13C4-PFHpA (25-150)	13C5 PFPeA (25-150)
320-17748-1	652286	109	108	94	85
320-17748-2	3228039	122	112	87	75
320-17748-3	87157	105	103	94	74
320-17748-4	669077	117	109	98	79
320-17748-5	87351	110	111	84	85
320-17748-6	522384	115	97	96	70
320-17748-7	522484	112	89	88	69
320-17748-8	87386	120	104	86	71
320-17748-9	87165	112	102	94	72
320-17748-10	92924	112	111	86	82
320-17748-11	87360	112	111	85	82
320-17748-12	87190	110	105	87	79
LCS 320-103929/2-A	Lab Control Sample	99	102	98	85
LCSD 320-103929/3-A	Lab Control Sample Dup	91	97	91	94
MB 320-103929/1-A	Method Blank	101	108	93	97

Surrogate Legend

13C8 FOSA = 13C8 FOSA
13C4 PFBA = 13C4 PFBA
13C2 PFHxA = 13C2 PFHxA
13C4 PFOA = 13C4 PFOA
13C5 PFNA = 13C5 PFNA
13C2 PFDA = 13C2 PFDA
13C2 PFUnA = 13C2 PFUnA
13C2 PFDoA = 13C2 PFDoA
18O2 PFHxS = 18O2 PFHxS
13C4 PFOS = 13C4 PFOS
13C4-PFHpA = 13C4-PFHpA
13C5 PFPeA = 13C5 PFPeA

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-103929/1-A
Matrix: Water
Analysis Batch: 104227

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 103929

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
j erFdorobdtaSoic aci(Bj k) A.	8D		2L0	0L4N	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFdoroxeStaSoic aci(Bj kj eA.	8D		2L0	0L99	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFdoro&eHaSoic aci(Bj k6HA.	8D		2L0	0L79	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFdoro&extaSoic aci(Bj k6xA.	8D		2L0	0LC0	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFdorooctaSoic aci(Bj kOA.	8D		2L0	0L7P	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFdoroSoSaSoic aci(Bj k8A.	8D		2L0	0LNP	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFdoro(ecaSoic aci(Bj kDA.	0L7N7	J	2L0	0L44	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFdorodS(ecaSoic aci(Bj kUSA.	0L972	J	2L0	0L7P	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFdoro(o(ecaSoic aci(Bj kDoA.	0LP90	J	2L0	0LPC	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFdorotri(ecaSoic Aci(Bj kTriA.	8D		2L0	0LPP	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFdorotetra(ecaSoic aci(Bj kTeA.	1L2C	J	2L0	0L20	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFdoro-S-&eHa(ecaSoic aci(Bj k6HDA.	8D		10	0L12	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFdoro-S-octaS(ecaSoic aci(Bj kODA.	0L7PP	J	2L0	0LN7	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFdorobdtaSe hdrFoSate Bj k) h.	8D		2L0	0L92	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFdoro&eHaSe hdrFoSate Bj k6Hh.	8D		2L0	0LC7	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFdoro-1-&extaSesdrFoSate Bj k6xh.	8D		2L0	0L71	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFdoro(ecaSe sdrFoSate Bj kDh.	8D		2L0	1L2	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFdorooctaSe hdrFoSate Bj kOh.	8D		2L0	1L3	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFdorooctaSe hdrFoSami(e BkOhA.	8D		2L0	0LN4	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*32*		*25 - 150*	*03/21/16 10:26*	*03/23/16 20:54*	*1*
13C4 PFBA	*89*		*25 - 150*	*03/21/16 10:26*	*03/23/16 20:54*	*1*
13C2 PFHxA	*88*		*25 - 150*	*03/21/16 10:26*	*03/23/16 20:54*	*1*
13C4 PFOA	*97*		*25 - 150*	*03/21/16 10:26*	*03/23/16 20:54*	*1*
13C5 PFNA	*93*		*25 - 150*	*03/21/16 10:26*	*03/23/16 20:54*	*1*
13C2 PFDA	*105*		*25 - 150*	*03/21/16 10:26*	*03/23/16 20:54*	*1*
13C2 PFUnA	*107*		*25 - 150*	*03/21/16 10:26*	*03/23/16 20:54*	*1*
13C2 PFDoA	*87*		*25 - 150*	*03/21/16 10:26*	*03/23/16 20:54*	*1*
18O2 PFHxS	*101*		*25 - 150*	*03/21/16 10:26*	*03/23/16 20:54*	*1*
13C4 PFOS	*108*		*25 - 150*	*03/21/16 10:26*	*03/23/16 20:54*	*1*
13C4-PFHpA	*93*		*25 - 150*	*03/21/16 10:26*	*03/23/16 20:54*	*1*
13C5 PFPeA	*97*		*25 - 150*	*03/21/16 10:26*	*03/23/16 20:54*	*1*

Lab Sample ID: LCS 320-103929/2-A
Matrix: Water
Analysis Batch: 104227

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 103929

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
j erFdorobdtaSoic aci(Bj k) A.	40L0	41L7		Suyp		104	N0 - 140
j erFdoroxeStaSoic aci(Bj kj eA.	40L0	43L0		Suyp		107	N0 - 140
j erFdoro&eHaSoic aci(Bj k6HA.	40L0	3CL0		Suyp		9P	N0 - 140
j erFdoro&extaSoic aci(Bj k6xA.	40L0	3NL9		Suyp		92	N0 - 140
j erFdorooctaSoic aci(Bj kOA.	40L0	37L2		Suyp		93	N0 - 140
j erFdoroSoSaSoic aci(Bj k8A.	40L0	37L1		Suyp		93	N0 - 140
j erFdoro(ecaSoic aci(Bj kDA.	40L0	34LC		Suyp		C7	N0 - 140

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCS 320-103929/2-A
Matrix: Water
Analysis Batch: 104227

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 103929

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
j erFrdorodS(ecaSoic aci(B} k USA.	40L0	39L7		Suyp		99	N0 - 140
j erFrdoro(o(ecaSoic aci(B} k DoA.	40L0	40LC		Suyp		102	N0 - 140
j erFrdorotri(ecaSoic Aci(B} k TriA.	40L0	37LP		Suyp		94	P0 - 1P0
j erFrdorotetra(ecaSoic aci(B} k TeA.	40L0	33L3		Suyp		C3	P0 - 1P0
j erFrdoro-S-&eHa(ecaSoic aci(B} k6 HDA.	40L0	32L3		Suyp		C1	P0 - 1P0
j erFrdoro-S-octaS(ecaSoic aci(B} k ODA.	40L0	42L1		Suyp		10P	P0 - 1P0
j erFrdorobdtaSe hdrFoSate B} k) h.	3PL4	2PL9		Suyp		73	P0 - 1P0
j erFrdoro&eHaSe hdrFoSate B} k6 Hh.	37LC	3PL7		Suyp		94	N0 - 140
j erFrdoro-1-&extaSesdrFoSate B} k6 xh.	3CL1	32L2		Suyp		C4	P0 - 1P0
j erFrdoro(ecaSe sdrFoSate B} k Dh.	3CLN	41L0		Suyp		10N	P0 - 1P0
j erFrdorooctaSe hdrFoSate B} k Oh.	3CL2	32L4		Suyp		CP	N0 - 140
j erFrdorooctaSe hdrFoSami(e BkOhA.	40L0	44L2		Suyp		110	N0 - 140

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*42*		*25 - 150*
13C4 PFBA	*87*		*25 - 150*
13C2 PFHxA	*89*		*25 - 150*
13C4 PFOA	*94*		*25 - 150*
13C5 PFNA	*89*		*25 - 150*
13C2 PFDA	*89*		*25 - 150*
13C2 PFUnA	*87*		*25 - 150*
13C2 PFDoA	*80*		*25 - 150*
18O2 PFHxS	*99*		*25 - 150*
13C4 PFOS	*102*		*25 - 150*
13C4-PFHpA	*98*		*25 - 150*
13C5 PFPeA	*85*		*25 - 150*

Lab Sample ID: LCSD 320-103929/3-A
Matrix: Water
Analysis Batch: 104227

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 103929

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
j erFrdorobdtaSoic aci(B} k) A.	40L0	3NL3		Suyp		91	N0 - 140	14	30
j erFrdoroxeStaSoic aci(B} kj eA.	40L0	37L4		Suyp		93	N0 - 140	14	30
j erFrdoro&eHaSoic aci(B} k6 HA.	40L0	37LC		Suyp		9P	N0 - 140	1	30
j erFrdoro&extaSoic aci(B} k6 xA.	40L0	39L0		Suyp		97	N0 - 140	P	30
j erFrdorooctaSoic aci(B} k OA.	40L0	42LP		Suyp		10N	N0 - 140	13	30
j erFrdoroSoSaSoic aci(B} k8 A.	40L0	3CL1		Suyp		9P	N0 - 140	3	30
j erFrdoro(ecaSoic aci(B} k DA.	40L0	44LN		Suyp		112	N0 - 140	2P	30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCSD 320-103929/3-A
Matrix: Water
Analysis Batch: 104227

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 103929

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
j erFdorodS(ecaSoic aci(Bj k USA.			40L0	34LC		Suyp		C7	N0 - 140	13	30
j erFdoro(o(ecaSoic aci(Bj k DoA.			40L0	39LC		Suyp		99	N0 - 140	2	30
j erFdorotri(ecaSoic Aci(Bj k TriA.			40L0	43l4		Suyp		109	P0 - 1P0	1P	30
j erFdorotetra(ecaSoic aci(Bj k TeA.			40L0	3CLP		Suyp		9N	P0 - 1P0	14	30
j erFdoro-S-&eHa(ecaSoic aci(Bj k6 HDA.			40L0	39lN		Suyp		99	P0 - 1P0	20	30
j erFdoro-S-octaS(ecaSoic aci(Bj k ODA.			40L0	4PL3		Suyp		113	P0 - 1P0	7	30
j erFdorobdtaSe h dnFoSate Bj k) h.			3PL4	32LP		Suyp		92	P0 - 1P0	23	30
j erFdoro&eHaSe h dnFoSate Bj k6 Hh.			37LC	34LP		Suyp		91	N0 - 140	3	30
j erFdoro-1-&extaSesdnFoSate Bj k6 xh.			3CL1	37l7		Suyp		99	P0 - 1P0	1N	30
j erFdoro(ecaSe sdnFoSate Bj k Dh.			3CLN	34LC		Suyp		90	P0 - 1P0	1N	30
j erFdorooctaSe h dnFoSate Bj k Oh.			3CL2	37l2		Suyp		97	N0 - 140	14	30
j erFdorooctaSe h dnFoSami(e Bk Oh A.			40L0	47LP		Suyp		119	N0 - 140	7	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C8 FOSA	*38*		*25 - 150*
13C4 PFBA	*92*		*25 - 150*
13C2 PFHxA	*81*		*25 - 150*
13C4 PFOA	*82*		*25 - 150*
13C5 PFNA	*83*		*25 - 150*
13C2 PFDA	*75*		*25 - 150*
13C2 PFUnA	*95*		*25 - 150*
13C2 PFDoA	*77*		*25 - 150*
18O2 PFHxS	*91*		*25 - 150*
13C4 PFOS	*97*		*25 - 150*
13C4-PFHpA	*91*		*25 - 150*
13C5 PFPeA	*94*		*25 - 150*

LCMS

Prep Batch: 103929

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-1774C-1	NP22CN	Totany9 A	G ater	3P3P	
320-1774C-2	322C036	Totany9 A	G ater	3P3P	
320-1774C-3	C71P7	Totany9 A	G ater	3P3P	
320-1774C-4	NN6077	Totany9 A	G ater	3P3P	
320-1774C-P	C73P1	Totany9 A	G ater	3P3P	
320-1774C-N	P223C4	Totany9 A	G ater	3P3P	
320-1774C-7	P224C4	Totany9 A	G ater	3P3P	
320-1774C-C	C73CN	Totany9 A	G ater	3P3P	
320-1774C-6	C71NP	Totany9 A	G ater	3P3P	
320-1774C-10	62624	Totany9 A	G ater	3P3P	
320-1774C-11	C73N0	Totany9 A	G ater	3P3P	
320-1774C-12	C7160	Totany9 A	G ater	3P3P	
Ll h 320-103626y2-A	Lab l oStronh ampre	Totany9 A	G ater	3P3P	
Ll hD 320-103626y8-A	Lab l oStronh ampre Dup	Totany9 A	G ater	3P3P	
MB 320-103626y1-A	Met&od BraSg	Totany9 A	G ater	3P3P	

Analysis Batch: 104227

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-1774C-1	NP22CN	Totany9 A	G ater	G h-Ll -002P	103626
320-1774C-2	322C036	Totany9 A	G ater	G h-Ll -002P	103626
320-1774C-3	C71P7	Totany9 A	G ater	G h-Ll -002P	103626
320-1774C-4	NN6077	Totany9 A	G ater	G h-Ll -002P	103626
320-1774C-P	C73P1	Totany9 A	G ater	G h-Ll -002P	103626
320-1774C-N	P223C4	Totany9 A	G ater	G h-Ll -002P	103626
320-1774C-7	P224C4	Totany9 A	G ater	G h-Ll -002P	103626
320-1774C-C	C73CN	Totany9 A	G ater	G h-Ll -002P	103626
320-1774C-6	C71NP	Totany9 A	G ater	G h-Ll -002P	103626
320-1774C-10	62624	Totany9 A	G ater	G h-Ll -002P	103626
320-1774C-11	C73N0	Totany9 A	G ater	G h-Ll -002P	103626
320-1774C-12	C7160	Totany9 A	G ater	G h-Ll -002P	103626
Ll h 320-103626y2-A	Lab l oStronh ampre	Totany9 A	G ater	G h-Ll -002P	103626
Ll hD 320-103626y8-A	Lab l oStronh ampre Dup	Totany9 A	G ater	G h-Ll -002P	103626
MB 320-103626y1-A	Met&od BraSg	Totany9 A	G ater	G h-Ll -002P	103626

Lab Chronicle

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17748-1
SDG: 31-1-11735-004

Client Sample ID: 871138
Date Collecte6: 02R4xR48 44:1M
Date v ecei5e6: 02R48R48 40:00

Lab Sample ID: 210-4MMk3-4
Watrid: / ater

Prep Type	Batch Type	Batch Wetho6	v un	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepare6 or Analyze6	Analyst	Lab
Total/NA	Prep	3535			557.7 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	557.7 mL	1.00 mL	104227	03/24/16 00:26	JRB	TAL SAC

Client Sample ID: 2113029
Date Collecte6: 02R4xR48 41:4x
Date v ecei5e6: 02R48R48 40:00

Lab Sample ID: 210-4MMk3-1
Watrid: / ater

Prep Type	Batch Type	Batch Wetho6	v un	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepare6 or Analyze6	Analyst	Lab
Total/NA	Prep	3535			562.4 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	562.4 mL	1.00 mL	104227	03/24/16 00:47	JRB	TAL SAC

Client Sample ID: 3M47M
Date Collecte6: 02R4xR48 42:00
Date v ecei5e6: 02R48R48 40:00

Lab Sample ID: 210-4MMk3-2
Watrid: / ater

Prep Type	Batch Type	Batch Wetho6	v un	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepare6 or Analyze6	Analyst	Lab
Total/NA	Prep	3535			566.8 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	566.8 mL	1.00 mL	104227	03/24/16 01:30	JRB	TAL SAC

Client Sample ID: 8890MM
Date Collecte6: 02R4xR48 4x:4x
Date v ecei5e6: 02R48R48 40:00

Lab Sample ID: 210-4MMk3-x
Watrid: / ater

Prep Type	Batch Type	Batch Wetho6	v un	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepare6 or Analyze6	Analyst	Lab
Total/NA	Prep	3535			569.6 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	569.6 mL	1.00 mL	104227	03/24/16 01:51	JRB	TAL SAC

Client Sample ID: 3M274
Date Collecte6: 02R4xR48 09:20
Date v ecei5e6: 02R48R48 40:00

Lab Sample ID: 210-4MMk3-7
Watrid: / ater

Prep Type	Batch Type	Batch Wetho6	v un	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepare6 or Analyze6	Analyst	Lab
Total/NA	Prep	3535			555.6 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	555.6 mL	1.00 mL	104227	03/24/16 02:12	JRB	TAL SAC

Client Sample ID: 71123x
Date Collecte6: 02R4xR48 40:20
Date v ecei5e6: 02R48R48 40:00

Lab Sample ID: 210-4MMk3-8
Watrid: / ater

Prep Type	Batch Type	Batch Wetho6	v un	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepare6 or Analyze6	Analyst	Lab
Total/NA	Prep	3535			541.2 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	541.2 mL	1.00 mL	104227	03/24/16 02:34	JRB	TAL SAC

Lab Chronicle

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17748-1
SDG: 31-1-11735-004

Client Sample ID: 711x3x
Date Collecte6: 02R4xR48 40:10
Date v ecei5e6: 02R48R48 40:00

Lab Sample ID: 210-4MMk3-M
Watrid: / ater

Prep Type	Batch Type	Batch Wetho6	v un	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepare6 or Analyze6	Analyst	Lab
Total/NA	Prep	3535			544.6 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	544.6 mL	1.00 mL	104227	03/24/16 02:55	JRB	TAL SAC

Client Sample ID: 3M238
Date Collecte6: 02R4xR48 44:40
Date v ecei5e6: 02R48R48 40:00

Lab Sample ID: 210-4MMk3-3
Watrid: / ater

Prep Type	Batch Type	Batch Wetho6	v un	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepare6 or Analyze6	Analyst	Lab
Total/NA	Prep	3535			553.7 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	553.7 mL	1.00 mL	104227	03/24/16 03:16	JRB	TAL SAC

Client Sample ID: 3M487
Date Collecte6: 02R4xR48 42:08
Date v ecei5e6: 02R48R48 40:00

Lab Sample ID: 210-4MMk3-9
Watrid: / ater

Prep Type	Batch Type	Batch Wetho6	v un	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepare6 or Analyze6	Analyst	Lab
Total/NA	Prep	3535			548.6 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	548.6 mL	1.00 mL	104227	03/24/16 03:37	JRB	TAL SAC

Client Sample ID: 9191x
Date Collecte6: 02R4xR48 4x:07
Date v ecei5e6: 02R48R48 40:00

Lab Sample ID: 210-4MMk3-40
Watrid: / ater

Prep Type	Batch Type	Batch Wetho6	v un	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepare6 or Analyze6	Analyst	Lab
Total/NA	Prep	3535			544 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	544 mL	1.00 mL	104227	03/24/16 03:59	JRB	TAL SAC

Client Sample ID: 3M280
Date Collecte6: 02R4xR48 4Mx3
Date v ecei5e6: 02R48R48 40:00

Lab Sample ID: 210-4MMk3-44
Watrid: / ater

Prep Type	Batch Type	Batch Wetho6	v un	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepare6 or Analyze6	Analyst	Lab
Total/NA	Prep	3535			565.5 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	565.5 mL	1.00 mL	104227	03/24/16 04:20	JRB	TAL SAC

Client Sample ID: 3M490
Date Collecte6: 02R4xR48 43:13
Date v ecei5e6: 02R48R48 40:00

Lab Sample ID: 210-4MMk3-41
Watrid: / ater

Prep Type	Batch Type	Batch Wetho6	v un	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepare6 or Analyze6	Analyst	Lab
Total/NA	Prep	3535			564.1 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	564.1 mL	1.00 mL	104227	03/24/16 04:41	JRB	TAL SAC

Lab Chronicle

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17748-1
SDG: 31-1-11735-004

Laboratory v eferences:

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

Certification Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17748-1
SDG: 31-1-11735-004

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17
Alaska (UST)	State Program	10	UST-055	12-18-16
Arizona	State Program	9	AZ0708	08-11-16
Arkansas DEQ	State Program	6	88-0691	06-17-16
California	State Program	9	2897	01-31-17
Colorado	State Program	8	N/A	08-31-16
Connecticut	State Program	1	PH-0691	06-30-17
Florida	NELAP	4	E87570	06-30-16
Hawaii	State Program	9	N/A	01-31-17
Illinois	NELAP	5	200060	03-17-17
Kansas	NELAP	7	E-10375	05-31-16
Louisiana	NELAP	6	30612	06-30-16
Michigan	State Program	5	9947	01-31-18
Nevada	State Program	9	CA44	07-31-16
New Jersey	NELAP	2	CA005	06-30-16
New York	NELAP	2	11666	04-01-16
Oregon	NELAP	10	CA200005	01-29-17
Pennsylvania	NELAP	3	9947	03-31-16
Texas	NELAP	6	T104704399-15-9	05-31-16
US Fish & Wildlife	Federal		LE148388-0	10-31-16
USDA	Federal		P330-11-00436	12-30-17
USEPA UCMR	Federal	1	CA00044	11-06-16
Utah	NELAP	8	QUAN1	02-28-17
Virginia	NELAP Secondary AB	3	460278	03-14-17
Washington	State Program	10	C581	05-04-16
West Virginia (DW)	State Program	3	9930C	12-31-16
Wyoming	State Program	8	8TMS-Q	01-29-17

Method Summary

Method	Method Description	Protocol	Laboratory
Gh-Cl -002P	j erFdoriSateH=f Hrocarbo Ss	TAOhuj	TAOhAl

Protocol References:

TAOhuj , TestAmerica CaboratoriesphtaSHarHu 8eratiSL j roceHdre

Laboratory References:

TAOhAl , TestAmerica hacrameStopCC0 RiversiHe j argwaf pG est hacrameStopl A 9P60PpTEO(916)373-P600

Sample Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17748-1
SDG: 31-1-11735-004

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-17748-1	652286	Water	03/14/16 11:27	03/16/16 10:00
320-17748-2	3228039	Water	03/14/16 12:14	03/16/16 10:00
320-17748-3	87157	Water	03/14/16 13:00	03/16/16 10:00
320-17748-4	669077	Water	03/14/16 14:14	03/16/16 10:00
320-17748-5	87351	Water	03/14/16 09:30	03/16/16 10:00
320-17748-6	522384	Water	03/14/16 10:30	03/16/16 10:00
320-17748-7	522484	Water	03/14/16 10:20	03/16/16 10:00
320-17748-8	87386	Water	03/14/16 11:10	03/16/16 10:00
320-17748-9	87165	Water	03/14/16 13:06	03/16/16 10:00
320-17748-10	92924	Water	03/14/16 14:05	03/16/16 10:00
320-17748-11	87360	Water	03/14/16 17:48	03/16/16 10:00
320-17748-12	87190	Water	03/14/16 18:28	03/16/16 10:00

320-17748 Chain of Custody

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CU

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

2255 S.W. Canyon Road
Portland, OR 97201-2498
(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

Laboratory Test America
Attn: David Althueker

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No	Time	Date Sampled	Comp	Grab	PFCs (WS-LC-0025)						Total Number of Containers	Remarks/Matrix
652286		1127	3/14/16		X	X						2	water
3229039		1214			X	X						2	
87157		1300			X	X						2	
6609077		1414			X	X						2	
87351		0930			X	X						2	
522384		1030			X	X						2	
522484		1020			X	X						2	
87386		1110			X	X						2	
87165		1306			X	X						2	
92924		1405			X	X						2	

Project Information		Sample Receipt	
Project Number	31-1-11735-004	Total Number of Containers	24
Project Name	COF Fire Training Center	COC Seals/Intact? Y/N/NA	
Contact	MDN/SAK	Received Good Cond./Cold	—
Ongoing Project?	Yes ☒ No ☐	Delivery Method	FedEx
Sampler	MDN / TKG	(attach shipping bill, if any)	

Instructions	
Requested Turnaround Time	Standard
Special Instructions	Please notify upon receipt

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [signature] Time: 0935	Signature: Time:	Signature: Time:
Printed Name: Marcy Nadel Date: 3/15/16	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company

Received By: 1.	Received By: 2.	Received By: 3.
Signature: [signature] Time: 1000	Signature: Time:	Signature: Time:
Printed Name: Shae VanOmmen Date: 3/16/16	Printed Name: Date:	Printed Name: Date:
Company: TAWS	Company:	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

3.7.c

No. 33951

3/25/2016

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

2255 S W Canyon Road
Portland, OR 97201-2498
(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

CHAIN-OF-CUSTODY RECORD

Laboratory Test America
Attn: David Althacker

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No	Time	Date Sampled	Comp	Grab	PAHs (WS-LC-0025)					Total Number of Containers	Remarks/Matrix
87360		1748	3/14/16		X	X					2	Water
87190		1828	↓		X	X					2	↓

Project Information	Sample Receipt
Project Number:	Total Number of Containers
Project Name:	COC Seals/Intact? Y/N/NA
Contact:	Received Good Cond./Cold
Ongoing Project? Yes ☐ No ☐	Delivery Method:
Sampler:	(attach shipping bill, if any)

Instructions

Requested Turnaround Time: see page

Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: M. Nadel Time: 0935	Signature: Time:	Signature: Time:
Printed Name: Mary Nadel Date: 3/15/16	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Time: 1000	Signature: Time:	Signature: Time:
Printed Name: Shane VanOmmen Date: 3/16/16	Printed Name: Date:	Printed Name: Date:
Company: TAWS	Company:	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

3.7-L

No. 33952

3/25/2016

Login Sample Receipt Checklist

Client: Shannon & Wilson

Job Number: 320-17748-1
SDG Number: 31-1-11735-004

Login Number: 17748
List Number: 1
Creator: Nelson, Kym D

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	
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?	N/A	
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: Tiffany Green

Title: Environmental Scientist Date: March 25, 2016

CS Report Name: City of Fairbanks Fire Training Area Report Date: March 25, 2016

Consultant Firm: Shannon & Wilson, Inc.

Laboratory Name: TestAmerica, Inc. Laboratory Report Number: 320-17748

ADEC File Number: 102.38.182 ADEC RecKey Number:

1. Laboratory
   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
      ☐ Yes ☐ No ☒ NA (Please explain.) Comments:

      The ADEC has not approved any analytical laboratory for perfluorinated compound (PFC) analysis.

   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 ☒ NA (Please explain.) Comments:

      Analyses were performed by TestAmerica, Inc. in Folsom, California.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

   b. Correct analyses requested?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

      The temperature blank or cooler was measured within the acceptable temperature range of 0 °C to 6 °C upon receipt at the laboratory, as specified in the EPA publication SW-846. This range has been approved by ADEC.

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?
☒Yes ☐ No ☐NA (Please explain.) Comments:

Analysis of PFCs does not require a preservative.

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒Yes ☐ No ☐NA (Please explain.) 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 ☒NA (Please explain.) Comments:

There were no discrepancies reported.

e. Data quality or usability affected? (Please explain.)
Comments:

No, the data quality and usability were unaffected.

4. Case Narrative
a. Present and understandable?
☒Yes ☐ No ☐NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
☒Yes ☐ No ☐NA (Please explain.) Comments:

The case narrative identifies the following discrepancies:

The Isotope Dilution Analyte (IDA) recovery for method WS-LC-0025 associated with the 12 samples is below the method-recommended limit of 25% to 150%. Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which was achieved for all IDA in the samples.

The reporting limit for PFHxDA was raised due to problems with the low levels of the calibration curve. Results below the revised PQL should be considered suspect.

Organic preparation method 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with sample 320-103929.

c. Were all corrective actions documented?
☒Yes ☐ No ☐NA (Please explain.) Comments:

Yes; see above.

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

Comments:

IDA recovery failures are considered to affect data quality, and are discussed in Section 6c. The method reporting limit and organic preparation batch comments are not considered to affect data quality or usability.

5. Samples Results

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

☒Yes ☐ No ☐NA (Please explain.) Comments:

b. All applicable holding times met?

☒Yes ☐ No ☐NA (Please explain.) Comments:

The hold time of seven days until extraction was met.

c. All soils reported on a dry weight basis?

☐Yes ☐ No ☒NA (Please explain.) Comments:

N/A; no soil samples were submitted with this work order.

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

☒Yes ☐ No ☐NA (Please explain.) Comments:

The PQL, equivalent to the TestAmerica Reporting Limit (RL), is less than applicable EPA provisional drinking water health advisory levels and ADEC proposed groundwater-cleanup levels for perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA).

e. Data quality or usability affected?

Comments:

The data quality and usability were unaffected.

6. QC Samples

a. Method Blank

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

☒Yes ☐ No ☐NA (Please explain.) Comments:

ii. All method blank results less than PQL?

☒Yes ☒ No ☐NA (Please explain.) Comments:

Five PFC analytes were detected in the MB at estimated concentrations less than their PQLs (reporting limits, or RLs). These analytes are perfluorodecanoic acid (PFDA), perfluorododecanoic acid (PFDoA), perfluorotetradecanoic acid (PFTeA), perfluoroundecanoic acid (PFUnA), and perfluoro-n-octandecanoic acid (PFODA).

iii. If above PQL, what samples are affected?

Comments:

Each of the twelve samples were associated with the MB containing detectable perfluorinated compounds. The results for PFUnA are considered unaffected because PFUnA was not detected in the project samples.

The results for PFDA, PFDoA, PFTeA, and PFODA are considered to affect at least one sample result because they were present in the MB at concentrations less than or equal to the LOQ, and the sample concentrations were within a factor of five of the MB concentrations.

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

☒Yes ☐ No ☐NA (Please explain.) Comments:

Where not already qualified by the laboratory, these results are considered not detected and flagged 'B*' at either the reported sample result or the PQL, whichever is higher.

v. Data quality or usability affected? (Please explain.)

Comments:

Yes; see above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

☒Yes ☐ No ☐NA (Please explain.) Comments:

LCS/LCSD sample results were reported.

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

☐Yes ☐ No ☒NA (Please explain.) 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 ☐NA (Please explain.) Comments:

Yes; percent recoveries were between 60% and 140% or 150% depending on the analytes, as required by the laboratory method.

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 ☐NA (Please explain.) Comments:

Yes; LCS/LCSD RPDs were within the laboratory limit of 30%.

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

Comments:

N/A; percent recoveries and RPDs were within acceptable limits.

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

☐Yes ☐ No ☒NA (Please explain.) Comments:

N/A; no data flags are required.

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

Comments:

The data quality and usability were unaffected.

c. Surrogates – Organics Only

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

☒Yes ☐ No ☐NA (Please explain.) Comments:

The analytical method WS-LC-0025 uses Isotope Dilution Analyte (IDA) recovery, which entails adding a 13C-isotope of each target analyte and assessing the recovery of each analyte. The isotopically labeled compounds are the 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 ☐NA (Please explain.) Comments:

With the exception of 13C8 perfluorooctane sulfonamide (FOSA), the percent recoveries are within the method-recommended limit of 25% to 150%. The percent recovery for FOSA is below the method recommended limit for each of the 12 samples. However, according to the laboratory, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which was achieved for all IDAs in the samples.

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

☐Yes ☐ No ☒NA (Please explain.) Comments:

The data did not require flags.

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

Comments:

The data quality and usability were unaffected.

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 ☒NA (Please explain.) Comments:

PFCs are not volatile compounds, so 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 ☒NA (Please explain.) Comments:

No trip blank is required; see above.

iii. All results less than PQL?

☐Yes ☐ No ☒NA (Please explain.) Comments:

No trip blank is required; see above.

iv. If above PQL, what samples are affected?

Comments:

No trip blank is required; see above.

v. Data quality or usability affected? (Please explain.)

Comments:

The data quality and usability were not affected.

e. Field Duplicate

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

☒Yes ☐ No ☐NA (Please explain.) Comments:

ii. Submitted blind to lab?

☒Yes ☐ No ☐NA (Please explain.) Comments:

The field duplicate pair "522384" / "522484" was submitted for this work order.

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$RPD\ (\%) = \text{Absolute value of: } \frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

☐Yes ☒ No ☐NA (Please explain.) Comments:

The following analytes did not meet recommended RPD criteria: PFDA RPD = 47%; PFTeA RPD = 89%; perfluoro-1-heptanesulfonate (PFHpS) RPD=43%. The RPD values for the other PFC analytes, where calculable for detected results, meet QC criteria.

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

Comments:

Data quality for PFDA, PFTeA, and PFHpS results in the field duplicate pair is considered affected. The results for "522384" and "522484" are considered estimated and flagged 'J*' where not already qualified.

f. Decontamination or Equipment Blank (If not used explain why).

☐Yes ☐ No ☒NA (Please explain.) Comments:

Reusable equipment was not used in sample collection for this work order, so an equipment blank is not required.

i. All results less than PQL?

☐Yes ☐ No ☒NA (Please explain.) Comments:

N/A; an equipment blank was not required.

ii. If above PQL, what samples are affected?

Comments:

N/A; an equipment blank was not required.

iii. Data quality or usability affected? (Please explain.)

Comments:

The data quality and usability were not affected.

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

a. Defined and appropriate?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

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: 320-18463-1
TestAmerica Sample Delivery Group: 31-1-11735-004
Client Project/Site: City of Fairbanks Fire Training Area
Revision: 1

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

Attn: Julie Keener

Authorized for release by:
5/18/2016 12:21:41 PM

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

Table of Contents

Definitions/Glossary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-18463-1
SDG: 31-1-11735-004

Qualifiers

LCMS

Qualifier	Qualifier Description
*	Isotope Dilution analyte is outside acceptance limits.
B	Compound was found in the blank and sample.
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, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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: 320-17483-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-17483-1

Receipt
The samples were received on 4/22/2016 11:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.9º C.

LCMS
Method(s) WS-LC-0025: The continuing calibration verification (CCV) associated with batch 109605 recovered above the upper control limit for Perfluorooctane Sulfonamide (FOSA). The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: 95443 (320-18463-3), 411866 (320-18463-4), 454974 (320-18463-5) and 4527158 (320-18463-9).

Method(s) WS-LC-0025: The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: 167754 (320-18463-1), 167854 (320-18463-2), 95443 (320-18463-3), 411866 (320-18463-4), 454974 (320-18463-5), 127311 (320-18463-6), 127230 (320-18463-7), 524565 (320-18463-8), 4527158 (320-18463-9), 526576 (320-18463-11), 526676 (320-18463-12) and 127523 (320-18463-13). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples.

Method(s) WS-LC-0025: Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for the following sample: (MB 320-107572/1-A). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

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

Organic Prep
Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 320-107572

Method(s) 3535: Samples were amber colored.167754 (320-18463-1), 167854 (320-18463-2), 95443 (320-18463-3), 411866 (320-18463-4), 454974 (320-18463-5), 127311 (320-18463-6), 127230 (320-18463-7), 524565 (320-18463-8), 4527158 (320-18463-9), 127124 (320-18463-10), 526576 (320-18463-11), 526676 (320-18463-12) and 127523 (320-18463-13) Samples 7 and 9 were clogged and took extra time to load into the columns.

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

Client Sample ID: 65228L — ba3 Sample ID: 0- 1764L5076

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkr(orob(taSoic aciB)/ g. A8	CL7	.	1L7	0L40	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro9eStaSoic aciB)/ g/ eA8	13		1L7	0L7P	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSoic aciB)/ gHxA8	1P		1L7	0LC6	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&e9taSoic aciB)/ gH9A8	4LP		1L7	0LP1	SdfN	1		G h-N -002j	Totarip A
/ erkr(orooctaSoic aciB)/ gOA8	7L3		1L7	0LCC	SdfN	1		G h-N -002j	Totarip A
/ erkr(oroSoSaSoic aciB)/ gp A8	0L6P	J	1L7	0Lj 7	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro(SBecaSoic aciB)/ gUSA8	0LPP	J	1L7	0LCC	SdfN	1		G h-N -002j	Totarip A
/ erkr(oroBoBecaSoic aciB)/ gDoA8	1L1	J	1L7	0Lj 1	SdfN	1		G h-N -002j	Totarip A
/ erkr(orotetraBecaSoic aciB)/ gTeA8	0LC1	J	1L7	0L17	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro-S-&exaBecaSoic aciB)/ gHxDA8	1L1	J .	1L7	0L11	SdfN	1		G h-N -002j	Totarip A
/ erkr(orob(taSe h(rhoSate)/ g. h8	PL6		1L7	0L71	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSe h(rhoSate)/ gHxh8	37		1L7	0LPP	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro-1-&e9taSes(rhoSate)/ gH9h8	1L6		1L7	0LC3	SdfN	1		G h-N -002j	Totarip A
/ erkr(orooctaSe h(rhoSate)/ gOh8	4P		1L7	1L1	SdfN	1		G h-N -002j	Totarip A

Client Sample ID: 65248L — ba3 Sample ID: 0- 1764L507-

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkr(orob(taSoic aciB)/ g. A8	j Lj	.	1L7	0L42	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro9eStaSoic aciB)/ g/ eA8	13		1L7	0L60	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSoic aciB)/ gHxA8	17		1L7	0LP2	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&e9taSoic aciB)/ gH9A8	4Lj		1L7	0LP3	SdfN	1		G h-N -002j	Totarip A
/ erkr(orooctaSoic aciB)/ gOA8	7L6		1L7	0LC7	SdfN	1		G h-N -002j	Totarip A
/ erkr(oroSoSaSoic aciB)/ gp A8	1L4	J	1L7	0LC0	SdfN	1		G h-N -002j	Totarip A
/ erkr(oroBoBecaSoic aciB)/ gDoA8	1L0	J	1L7	0Lj 3	SdfN	1		G h-N -002j	Totarip A
/ erkr(orotetraBecaSoic aciB)/ gTeA8	1L2	J	1L7	0L17	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro-S-&exaBecaSoic aciB)/ gHxDA8	1LP	J .	1L7	0L11	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro-S-octaSBecaSoic aciB)/ gODA8	0L6P	J	1L7	0LC1	SdfN	1		G h-N -002j	Totarip A
/ erkr(orob(taSe h(rhoSate)/ g. h8	6L0		1L7	0L74	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSe h(rhoSate)/ gHxh8	46		1L7	0L70	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro-1-&e9taSes(rhoSate)/ gH9h8	2L3		1L7	0LCj	SdfN	1		G h-N -002j	Totarip A
/ erkr(orooctaSe h(rhoSate)/ gOh8	j 1		1L7	1L2	SdfN	1		G h-N -002j	Totarip A
/ erkr(orooctaSe h(rhoSamiBe)gOhA8	4L3		1L7	0Lj 7	SdfN	1		G h-N -002j	Totarip A

Client Sample ID: 98LL0 — ba3 Sample ID: 0- 1764L5070

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkr(orob(taSoic aciB)/ g. A8	3L4	.	1L6	0L43	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro9eStaSoic aciB)/ g/ eA8	j L4		1L6	0L63	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSoic aciB)/ gHxA8	j L0		1L6	0LP4	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&e9taSoic aciB)/ gH9A8	2L1		1L6	0LPj	SdfN	1		G h-N -002j	Totarip A
/ erkr(orooctaSoic aciB)/ gOA8	3L2		1L6	0LP0	SdfN	1		G h-N -002j	Totarip A
/ erkr(orotetraBecaSoic aciB)/ gTeA8	0L4P	J	1L6	0L16	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro-S-&exaBecaSoic aciB)/ gHxDA8	1L2	J .	1L6	0L12	SdfN	1		G h-N -002j	Totarip A
/ erkr(orob(taSe h(rhoSate)/ g. h8	2L0		1L6	0L7C	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSe h(rhoSate)/ gHxh8	j L4		1L6	0L71	SdfN	1		G h-N -002j	Totarip A

T&is DetectioS h(mmarF Boes Sot iScr(Be raBioc&emicantest res(rtsL

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Client Sample ID: 98LL0 (Continued)

ba3 Sample ID: 0- 1764L5070

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkr(orooctaSe h (rhoSate)/ gOh8	j lP		1L6	1L2	SdfN	1		G h-N -002j	Totarip A

Client Sample ID: L66455

ba3 Sample ID: 0- 1764L507L

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkr(orob(taSoic aciB)/ g. A8	3L7	.	1L7	0L40	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro9eStaSoic aciB)/ g/ eA8	2LC		1L7	0L7P	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSoic aciB)/ gHxA8	3L7		1L7	0LC6	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&e9taSoic aciB)/ gH9A8	0L6C	J	1L7	0LP0	SdfN	1		G h-N -002j	Totarip A
/ erkr(orooctaSoic aciB)/ gOA8	2L3		1L7	0LCC	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro-S-&exaBecaSoic aciB)/ gHxDA8	1L4	J .	1L7	0L11	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSe h (rhoSate)/ gHxh8	1Lj	J	1L7	0LPC	SdfN	1		G h-N -002j	Totarip A

Client Sample ID: L8L92L

ba3 Sample ID: 0- 1764L5078

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkr(orob(taSoic aciB)/ g. A8	2L6	.	1L7	0L42	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro9eStaSoic aciB)/ g/ eA8	j L4		1L7	0L61	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSoic aciB)/ gHxA8	CL1		1L7	0LP2	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&e9taSoic aciB)/ gH9A8	2L0		1L7	0LP4	SdfN	1		G h-N -002j	Totarip A
/ erkr(orooctaSoic aciB)/ gOA8	2LP		1L7	0LC6	SdfN	1		G h-N -002j	Totarip A
/ erkr(orotetraBecaSoic aciB)/ gTeA8	0L71	J	1L7	0L17	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro-S-&exaBecaSoic aciB)/ gHxDA8	0LC2	J .	1L7	0L11	SdfN	1		G h-N -002j	Totarip A
/ erkr(orob(taSe h (rhoSate)/ g. h8	1L3	J	1L7	0L7j	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSe h (rhoSate)/ gHxh8	4L2		1L7	0L70	SdfN	1		G h-N -002j	Totarip A
/ erkr(orooctaSe h (rhoSate)/ gOh8	CLP		1L7	1L2	SdfN	1		G h-N -002j	Totarip A

Client Sample ID: 6- 2066

ba3 Sample ID: 0- 1764L5075

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkr(orob(taSoic aciB)/ g. A8	4LC	.	1L6	0L44	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro9eStaSoic aciB)/ g/ eA8	6L6		1L6	0L6j	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSoic aciB)/ gHxA8	13		1L6	0LPC	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&e9taSoic aciB)/ gH9A8	4L0		1L6	0LPP	SdfN	1		G h-N -002j	Totarip A
/ erkr(orooctaSoic aciB)/ gOA8	CL2		1L6	0LP2	SdfN	1		G h-N -002j	Totarip A
/ erkr(oroSoSaSoic aciB)/ gpA8	1L1	J	1L6	0LC3	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro(SBecaSoic aciB)/ gUSA8	1L0	J	1L6	0LP2	SdfN	1		G h-N -002j	Totarip A
/ erkr(orotetraBecaSoic aciB)/ gTeA8	0L61	J	1L6	0L16	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro-S-&exaBecaSoic aciB)/ gHxDA8	1L7	J .	1L6	0L12	SdfN	1		G h-N -002j	Totarip A
/ erkr(orob(taSe h (rhoSate)/ g. h8	PL7		1L6	0L76	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSe h (rhoSate)/ gHxh8	31		1L6	0L74	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro-1-&e9taSes(rhoSate)/ gH9h8	1L4	J	1L6	0LC6	SdfN	1		G h-N -002j	Totarip A
/ erkr(orooctaSe h (rhoSate)/ gOh8	26		1L6	1L2	SdfN	1		G h-N -002j	Totarip A

Client Sample ID: 6- 2- 01

ba3 Sample ID: 0- 1764L5072

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Client Sample ID: 6- 2- 01 (Continued) — ba3 Sample ID: 0- 1764L5072

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkr(orob(taSoic aciB)/ g. A8	6L7	.	1L7	0L42	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro9eStaSoic aciB)/ g/ eA8	1C		1L7	0L61	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSoic aciB)/ gHxA8	13		1L7	0LP2	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&e9taSoic aciB)/ gH9A8	j L0		1L7	0LP4	SdfN	1		G h-N -002j	Totarip A
/ erkr(orooctaSoic aciB)/ gOA8	12		1L7	0LC6	SdfN	1		G h-N -002j	Totarip A
/ erkr(oroSoSaSoic aciB)/ gp A8	2L1		1L7	0LC0	SdfN	1		G h-N -002j	Totarip A
/ erkr(orotetraBecaSoic aciB)/ gTeA8	0L60	J	1L7	0L17	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro-S-&exaBecaSoic aciB)/ gHxDA8	2LC	.	1L7	0L11	SdfN	1		G h-N -002j	Totarip A
/ erkr(orob(taSe h(rhoSate)/ g. h8	4L4		1L7	0L7j	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSe h(rhoSate)/ gHxh8	42		1L7	0L70	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro-1-&e9taSes(rhoSate)/ gH9h8	1L2	J	1L7	0LCC	SdfN	1		G h-N -002j	Totarip A
/ erkr(orooctaSe h(rhoSate)/ gOh8	16		1L7	1L2	SdfN	1		G h-N -002j	Totarip A
/ erkr(orooctaSe h(rhoSamiBe)gOh A8	12		1L7	0lj 6	SdfN	1		G h-N -002j	Totarip A

Client Sample ID: 8- L858 — ba3 Sample ID: 0- 1764L5074

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkr(orob(taSoic aciB)/ g. A8	1L0	J .	1L6	0L44	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro9eStaSoic aciB)/ g/ eA8	1L4	J	1L6	0L64	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSoic aciB)/ gHxA8	2L7		1L6	0LPj	SdfN	1		G h-N -002j	Totarip A
/ erkr(orooctaSoic aciB)/ gOA8	1L6		1L6	0LP1	SdfN	1		G h-N -002j	Totarip A
/ erkr(orotetraBecaSoic aciB)/ gTeA8	0lj 0	J	1L6	0L16	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro-S-&exaBecaSoic aciB)/ gHxDA8	1L1	J .	1L6	0L12	SdfN	1		G h-N -002j	Totarip A
/ erkr(orob(taSe h(rhoSate)/ g. h8	1lj	J	1L6	0L7P	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSe h(rhoSate)/ gHxh8	j L2		1L6	0L73	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro-1-&e9taSes(rhoSate)/ gH9h8	0L77	J	1L6	0LC7	SdfN	1		G h-N -002j	Totarip A
/ erkr(orooctaSe h(rhoSate)/ gOh8	21		1L6	1L2	SdfN	1		G h-N -002j	Totarip A
/ erkr(orooctaSe h(rhoSamiBe)gOh A8	PL1		1L6	0LC1	SdfN	1		G h-N -002j	Totarip A

Client Sample ID: L8- 2684 — ba3 Sample ID: 0- 1764L5079

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkr(orob(taSoic aciB)/ g. A8	2L3	.	1L7	0L41	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro9eStaSoic aciB)/ g/ eA8	2lj		1L7	0L76	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSoic aciB)/ gHxA8	2LP		1L7	0LP1	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&e9taSoic aciB)/ gH9A8	0L72	J	1L7	0LP3	SdfN	1		G h-N -002j	Totarip A
/ erkr(orooctaSoic aciB)/ gOA8	3L3		1L7	0LC7	SdfN	1		G h-N -002j	Totarip A
/ erkr(orotetraBecaSoic aciB)/ gTeA8	0L63	J	1L7	0L17	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro-S-&exaBecaSoic aciB)/ gHxDA8	1L7	.	1L7	0L11	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSe h(rhoSate)/ gHxh8	1LC	J	1L7	0LP6	SdfN	1		G h-N -002j	Totarip A

Client Sample ID: 6- 26- L — ba3 Sample ID: 0- 1764L50761

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkr(orob(taSoic aciB)/ g. A8	7L0	.	1L6	0L42	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro9eStaSoic aciB)/ g/ eA8	24		1L6	0L62	SdfN	1		G h-N -002j	Totarip A
/ erkr(oro&exaSoic aciB)/ gHxA8	2C		1L6	0LP3	SdfN	1		G h-N -002j	Totarip A

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Client Sample ID: 6- 26- L (Continued)

ba3 Sample ID: 0- 1764L50761

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkn(oro&e9taSoic aciB)/ gH9A8	Plj		1L6	0LP4	SdfN	1		G h-N -002j	Totanp A
/ erkn(orooctaSoic aciB)/ gOA8	14		1L6	0LC6	SdfN	1		G h-N -002j	Totanp A
/ erkn(oroSoSaSoic aciB)/ gp A8	3L4		1L6	0LC1	SdfN	1		G h-N -002j	Totanp A
/ erkn(oroBecaSoic aciB)/ gDA8	1L3	J	1L6	0L41	SdfN	1		G h-N -002j	Totanp A
/ erkn(oro(SBecaSoic aciB)/ gUSA8	0LPC	J	1L6	0LC6	SdfN	1		G h-N -002j	Totanp A
/ erkn(oroBoBecaSoic aciB)/ gDoA8	1L0	J	1L6	0Lj 4	SdfN	1		G h-N -002j	Totanp A
/ erkn(orotetraBecaSoic aciB)/ gTeA8	0LP0	J	1L6	0L17	SdfN	1		G h-N -002j	Totanp A
/ erkn(oro-S-&exaBecaSoic aciB)/ gHxDA8	1L4	J .	1L6	0L11	SdfN	1		G h-N -002j	Totanp A
/ erkn(orob(taSe h (nloSate)/ g. h8	CLj		1L6	0L7j	SdfN	1		G h-N -002j	Totanp A
/ erkn(oro&exaSe h (nloSate)/ gHxh8	47		1L6	0L71	SdfN	1		G h-N -002j	Totanp A
/ erkn(oro-1-&e9taSes(nloSate)/ gH9h8	2L6		1L6	0LCC	SdfN	1		G h-N -002j	Totanp A
/ erkn(orooctaSe h (nloSate)/ gOh8	C7		1L6	1L2	SdfN	1		G h-N -002j	Totanp A
/ erkn(orooctaSe h (nloSamiBe)gOhA8	0L6P	J	1L6	0Lj 6	SdfN	1		G h-N -002j	Totanp A

Client Sample ID: 8- 5825

ba3 Sample ID: 0- 1764L50766

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkn(orob(taSoic aciB)/ g. A8	4L0	.	1L7	0L42	SdfN	1		G h-N -002j	Totanp A
/ erkn(oro9eStaSoic aciB)/ g/ eA8	4Lj		1L7	0L60	SdfN	1		G h-N -002j	Totanp A
/ erkn(oro&exaSoic aciB)/ gHxA8	6L3		1L7	0LP2	SdfN	1		G h-N -002j	Totanp A
/ erkn(oro&e9taSoic aciB)/ gH9A8	0L63	J	1L7	0LP3	SdfN	1		G h-N -002j	Totanp A
/ erkn(orooctaSoic aciB)/ gOA8	3L0		1L7	0LC7	SdfN	1		G h-N -002j	Totanp A
/ erkn(oroBecaSoic aciB)/ gDA8	0LPP	J	1L7	0L40	SdfN	1		G h-N -002j	Totanp A
/ erkn(oro(SBecaSoic aciB)/ gUSA8	0L7P	J	1L7	0LC7	SdfN	1		G h-N -002j	Totanp A
/ erkn(oroBoBecaSoic aciB)/ gDoA8	0L63	J	1L7	0Lj 3	SdfN	1		G h-N -002j	Totanp A
/ erkn(orotetraBecaSoic aciB)/ gTeA8	0L60	J	1L7	0L17	SdfN	1		G h-N -002j	Totanp A
/ erkn(oro-S-&exaBecaSoic aciB)/ gHxDA8	1LC	J .	1L7	0L11	SdfN	1		G h-N -002j	Totanp A
/ erkn(orob(taSe h (nloSate)/ g. h8	3L2		1L7	0L74	SdfN	1		G h-N -002j	Totanp A
/ erkn(oro&exaSe h (nloSate)/ gHxh8	1j		1L7	0LP6	SdfN	1		G h-N -002j	Totanp A
/ erkn(oro-1-&e9taSes(nloSate)/ gH9h8	1L4	J	1L7	0LCj	SdfN	1		G h-N -002j	Totanp A
/ erkn(orooctaSe h (nloSate)/ gOh8	Cj		1L7	1L2	SdfN	1		G h-N -002j	Totanp A

Client Sample ID: 8- 5525

ba3 Sample ID: 0- 1764L5076-

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkn(orob(taSoic aciB)/ g. A8	4L0	.	1L7	0L42	SdfN	1		G h-N -002j	Totanp A
/ erkn(oro9eStaSoic aciB)/ g/ eA8	j Lj		1L7	0L61	SdfN	1		G h-N -002j	Totanp A
/ erkn(oro&exaSoic aciB)/ gHxA8	6L0		1L7	0LP2	SdfN	1		G h-N -002j	Totanp A
/ erkn(oro&e9taSoic aciB)/ gH9A8	1L0	J	1L7	0LP4	SdfN	1		G h-N -002j	Totanp A
/ erkn(orooctaSoic aciB)/ gOA8	3L4		1L7	0LC6	SdfN	1		G h-N -002j	Totanp A
/ erkn(oroBecaSoic aciB)/ gDA8	0L74	J	1L7	0L40	SdfN	1		G h-N -002j	Totanp A
/ erkn(orotetraBecaSoic aciB)/ gTeA8	0L3C	J	1L7	0L17	SdfN	1		G h-N -002j	Totanp A
/ erkn(oro-S-&exaBecaSoic aciB)/ gHxDA8	2L0	.	1L7	0L11	SdfN	1		G h-N -002j	Totanp A
/ erkn(orob(taSe h (nloSate)/ g. h8	3LC		1L7	0L74	SdfN	1		G h-N -002j	Totanp A
/ erkn(oro&exaSe h (nloSate)/ gHxh8	12		1L7	0L70	SdfN	1		G h-N -002j	Totanp A
/ erkn(oro-1-&e9taSes(nloSate)/ gH9h8	0L71	J	1L7	0LCj	SdfN	1		G h-N -002j	Totanp A

T&is DetectioS h (mmarF Boes Sot iScn(Be raBioc&emicantest res(ntsL

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Client Sample ID: 8- 5525 (Continued)

ba3 Sample ID: 0- 1764L5076-

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkr(orooctaSe h (rhoSate)/ gOh8	46		1L7	1L2	SdfN	1		G h -N -002j	Totarip A

Client Sample ID: 6- 28- 0

ba3 Sample ID: 0- 1764L5076 0

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkr(orob(taSoic aciB)/ g. A8	j L1	.	1L7	0L42	SdfN	1		G h -N -002j	Totarip A
/ erkr(oro9eStaSoic aciB)/ g/ eA8	12		1L7	0L60	SdfN	1		G h -N -002j	Totarip A
/ erkr(oro&exaSoic aciB)/ gHxA8	14		1L7	0LP1	SdfN	1		G h -N -002j	Totarip A
/ erkr(oro&e9taSoic aciB)/ gH9A8	4L2		1L7	0LP3	SdfN	1		G h -N -002j	Totarip A
/ erkr(orooctaSoic aciB)/ gOA8	CLC		1L7	0LC7	SdfN	1		G h -N -002j	Totarip A
/ erkr(oroSoSaSoic aciB)/ gp A8	1L2	J	1L7	0Lj 6	SdfN	1		G h -N -002j	Totarip A
/ erkr(oro(SBecaSoic aciB)/ gUSA8	0LP1	J	1L7	0LC7	SdfN	1		G h -N -002j	Totarip A
/ erkr(orotetraBecaSoic aciB)/ gTeA8	1L4	J	1L7	0L17	SdfN	1		G h -N -002j	Totarip A
/ erkr(oro-S-&exaBecaSoic aciB)/ gHxDA8	1L3	J .	1L7	0L11	SdfN	1		G h -N -002j	Totarip A
/ erkr(orob(taSe h (rhoSate)/ g. h8	PL6		1L7	0L73	SdfN	1		G h -N -002j	Totarip A
/ erkr(oro&exaSe h (rhoSate)/ gHxh8	37		1L7	0LP6	SdfN	1		G h -N -002j	Totarip A
/ erkr(oro-1-&e9taSes(rhoSate)/ gH9h8	1Lj	J	1L7	0LCj	SdfN	1		G h -N -002j	Totarip A
/ erkr(orooctaSe h (rhoSate)/ gOh8	j j		1L7	1L2	SdfN	1		G h -N -002j	Totarip A

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Client Sample ID: 18MMr 4

Date Cdlle/ te6: 04v17v18 05:27
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-1

x atWb: c ateW

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wd/ aWdns

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWd6	) nal(Ue6	Dil Ba/
f eWludWbutandi/ a/ i6 Ff BA) .	8z7	A	1L7	0L40	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1
f eWludWpentandi/ a/ i6 Ff Bf e) .	13		1L7	0L7P	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1
f eWludWPeoandi/ a/ i6 Ff By o) .	1M		1L7	0LC9	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1
f eWludWPeptandi/ a/ i6 Ff By p) .	4zM		1L7	0LP1	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1
f eWludWd/ tandi/ a/ i6 Ff B9) .	7z3		1L7	0LCC	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1
f eWludWndnandi/ a/ i6 Ff BN) .	0z5M	J	1L7	0Lj 7	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1
/ erkuorodecaSoic acid (/ gDA)	ND		1L7	0L39	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1
f eWludWun6e/ andi/ a/ i6 Ff BQn) .	0zMM	J	1L7	0LCC	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1
f eWludWd6d6e/ andi/ a/ i6 Ff BDd) .	1z1	J	1L7	0Lj 1	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1
/ erkuorotridecaSoic Acid (/ gTriA)	ND		1L7	0L47	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1
f eWludWtetWd6e/ andi/ a/ i6 Ff BTe) .	0z81	J	1L7	0L17	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1
f eWludWd-n-Peoa6e/ andi/ a/ i6 Ff By oD) .	1z1	J A	1L7	0L11	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1
/ erkuoro-S-octaSdecaSoic acid (/ gODA)	ND		1L7	0Lj 9	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1
f eWludWbutane SulHdnate Ff BAS.	M5		1L7	0L71	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1
f eWludWPeoane SulHdnate Ff By oS.	37		1L7	0LPP	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1
f eWludWd-1-PeptanesulHdnate Ff By pS.	1z5		1L7	0LC3	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1
/ erkuorodecaSe sumkoSate (/ gDh)	ND		1L7	1L1	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1
f eWludWd/ tane SulHdnate Ff B9 S.	4M		1L7	1L1	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1
/ erkuorooctaSe hurnkoSamide (gOhA)	ND		1L7	0Lj C	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:21	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*6*	*	*25 - 150*	*04/25/16 07:45*	*05/10/16 02:21*	*1*
13C4 PFBA	*61*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:21*	*1*
13C2 PFHxA	*98*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:21*	*1*
13C4 PFOA	*100*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:21*	*1*
13C5 PFNA	*89*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:21*	*1*
13C2 PFDA	*78*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:21*	*1*
13C2 PFUnA	*83*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:21*	*1*
13C2 PFDoA	*89*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:21*	*1*
18O2 PFHxS	*121*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:21*	*1*
13C4 PFOS	*127*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:21*	*1*
13C4-PFHpA	*110*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:21*	*1*
13C5 PFPeA	*89*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:21*	*1*

Client Sample ID: 18M7r 4

Date Cdlle/ te6: 04v17v18 05:32
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-2

x atWb: c ateW

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wd/ aWdns

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWd6	) nal(Ue6	Dil Ba/
f eWludWbutandi/ a/ i6 Ff BA) .	rzr	A	1L7	0L42	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1
f eWludWpentandi/ a/ i6 Ff Bf e) .	13		1L7	0L90	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1
f eWludWPeoandi/ a/ i6 Ff By o) .	17		1L7	0LP2	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1
f eWludWPeptandi/ a/ i6 Ff By p) .	4zr		1L7	0LP3	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1
f eWludWd/ tandi/ a/ i6 Ff B9) .	7z5		1L7	0LC7	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1

Client Sample ID: 18M7r 4
Date Cdlle/ te6: 04v17v18 05:32
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-2
x atWo: c ateW

x etPd6: c S-LC-002r - f eWlludWhate6 y (6Wd/ aWodns FCdntinue6.

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWe6	) nal(Ue6	Dil Ba/
f eWlludWndnandi/ a/ i6 Ff BN) .	1z4	J	1L7	0LC0	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1
/ erkruorodecaSoic acid (/ gDA)	ND		1L7	0L40	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1
/ erkruorouSdecaSoic acid (/ gp SA)	ND		1L7	0LC7	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1
f eWlludWd6d6e/ andi/ a/ i6 Ff BDd) .	1z0	J	1L7	0Lj 3	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1
/ erkruorotridecaSoic Acid (/ gTriA)	ND		1L7	0Lj 0	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1
f eWlludWtetWd6e/ andi/ a/ i6 Ff BTe) .	1z2	J	1L7	0L17	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1
f eWlludWl-n-Peoa6e/ andi/ a/ i6 Ff By oD) .	1zM	J A	1L7	0L11	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1
f eWlludWl-n-d/ tan6e/ andi/ a/ i6 Ff B9 D) .	0z5M	J	1L7	0LC1	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1
f eWlludWlbutane SulHdnate Ff BAS.	5z0		1L7	0L74	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1
f eWlludWlPeoane SulHdnate Ff By oS.	45		1L7	0L70	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1
f eWlludWl-1-PeptanesulHdnate Ff By pS.	2z3		1L7	0LCj	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1
/ erkruorodecaSe sumoSate (/ gDh)	ND		1L7	1L1	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1
f eWlludWld/ tane SulHdnate Ff B9 S.	r1		1L7	1L2	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1
f eWlludWld/ tane SulHdnami6e FB9 S) .	4z3		1L7	0Lj 7	S8f6		04f2j f1C 0P:4j	0j f10f1C 02:42	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*4*	*	*25 - 150*	*04/25/16 07:45*	*05/10/16 02:42*	*1*
13C4 PFBA	*65*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:42*	*1*
13C2 PFHxA	*98*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:42*	*1*
13C4 PFOA	*94*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:42*	*1*
13C5 PFNA	*73*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:42*	*1*
13C2 PFDA	*62*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:42*	*1*
13C2 PFUnA	*69*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:42*	*1*
13C2 PFDoA	*73*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:42*	*1*
18O2 PFHxS	*117*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:42*	*1*
13C4 PFOS	*127*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:42*	*1*
13C4-PFHpA	*110*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:42*	*1*
13C5 PFPeA	*96*		*25 - 150*	*04/25/16 07:45*	*05/10/16 02:42*	*1*

Client Sample ID: 5r 443
Date Cdlle/ te6: 04v17v18 10:44
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-3
x atWo: c ateW

x etPd6: c S-LC-002r - f eWlludWhate6 y (6Wd/ aWodns

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWe6	) nal(Ue6	Dil Ba/
f eWlludWlbutandi/ a/ i6 Ff BA) .	3z4	A	1L9	0L43	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1
f eWlludWlpentandi/ a/ i6 Ff Bf e) .	rz4		1L9	0L93	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1
f eWlludWlPeoandi/ a/ i6 Ff By o) .	rz0		1L9	0LP4	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1
f eWlludWlPeptandi/ a/ i6 Ff By p) .	2z1		1L9	0LPj	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1
f eWlludWld/ tandi/ a/ i6 Ff B9) .	3z2		1L9	0LP0	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1
/ erkruoroSoSaSoic acid (/ gNA)	ND		1L9	0LC1	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1
/ erkruorodecaSoic acid (/ gDA)	ND		1L9	0L41	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1
/ erkruorouSdecaSoic acid (/ gp SA)	ND		1L9	0LP0	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1
/ erkruorododecaSoic acid (/ gDoA)	ND		1L9	0Lj j	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1
/ erkruorotridecaSoic Acid (/ gTriA)	ND		1L9	0Lj 2	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1

Client Sample ID: 5r 443
Date Cdlle/ te6: 04v17v18 10:44
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-3
x atWb: c ateW

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wd/ aWdns FCdntinue6.

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWd6	) nal(Ue6	Dil Ba/
f eWludWtetWd6e/ andi/ a/ i6 FfBTe) .	0z4M	J	1L9	0L19	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1
f eWludWl-n-Peoa6e/ andi/ a/ i6 FfByoD) .	1z2	J A	1L9	0L12	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1
/ erkruoro-S-octaSdecaSoic acid (/ gODA)	ND		1L9	0LC3	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1
f eWludWlbutane SulHdnate FfBAS.	2z0		1L9	0L7C	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1
f eWludWlPeoane SulHdnate FfByoS.	rz4		1L9	0L71	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1
/ erkruoro-1-&eHtaSesurkoSate (/ gUHh)	ND		1L9	0LCP	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1
/ erkruorodecaSe surkoSate (/ gDh)	ND		1L9	1L1	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1
f eWludWld/ tane SulHdnate FfB9 S.	rzM		1L9	1L2	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1
/ erkruorooctaSe hurkoSamide (gOhA)	ND		1L9	0LC0	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:12	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*8*	*	*25 - 150*	*04/25/16 07:45*	*05/12/16 20:12*	*1*
13C4 PFBA	*77*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:12*	*1*
13C2 PFHxA	*114*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:12*	*1*
13C4 PFOA	*107*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:12*	*1*
13C5 PFNA	*101*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:12*	*1*
13C2 PFDA	*90*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:12*	*1*
13C2 PFUnA	*89*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:12*	*1*
13C2 PFDoA	*87*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:12*	*1*
18O2 PFHxS	*117*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:12*	*1*
13C4 PFOS	*144*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:12*	*1*
13C4-PFHpA	*119*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:12*	*1*
13C5 PFPeA	*119*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:12*	*1*

Client Sample ID: 411788
Date Cdlle/ te6: 04v17v18 11:r4
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-4
x atWb: c ateW

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wd/ aWdns

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWd6	) nal(Ue6	Dil Ba/
f eWludWlbutandi/ a/ i6 FfBA) .	3z7	A	1L7	0L40	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1
f eWludWlpentandi/ a/ i6 FfBfe) .	2z8		1L7	0L7P	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1
f eWludWlPeoandi/ a/ i6 FfByo) .	3z7		1L7	0LC9	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1
f eWludWlPeptandi/ a/ i6 FfByp) .	0z58	J	1L7	0LP0	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1
f eWludWld/ tandi/ a/ i6 FfB9) .	2z3		1L7	0LCC	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1
/ erkruoroSoSaSoic acid (/ gNA)	ND		1L7	0Lj P	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1
/ erkruorodecaSoic acid (/ gDA)	ND		1L7	0L39	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1
/ erkruorouSdecaSoic acid (/ gpSA)	ND		1L7	0LCC	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1
/ erkruorododecaSoic acid (/ gDoA)	ND		1L7	0Lj 1	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1
/ erkruorotridecaSoic Acid (/ gTriA)	ND		1L7	0L47	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1
/ erkruorotetradecaSoic acid (/ gTeA)	ND		1L7	0L1P	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1
f eWludWl-n-Peoa6e/ andi/ a/ i6 FfByoD) .	1z4	J A	1L7	0L11	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1
/ erkruoro-S-octaSdecaSoic acid (/ gODA)	ND		1L7	0Lj 9	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1
/ erkruorobutaSe hurkoSate (/ gBh)	ND		1L7	0L71	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1

Client Sample ID: 411788
Date Cdlle/ te6: 04v17v18 11:r 4
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-4
x atWb: c ateW

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wd/ aWdns FCdntinue6.

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWd6	) nal(Ue6	Dil Ba/
f eWludWdPeoane SulHdnate Ff By oS.	**1zr**	**J**	1L7	0LPC	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1
/ erkruoro-1-&eHtaSesurkoSate (/ gUHh)	ND		1L7	0LC3	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1
/ erkruorodecaSe surkoSate (/ gDh)	ND		1L7	1L1	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1
/ erkruorooctaSe hurkoSate (/ gOh)	ND		1L7	1L1	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1
/ erkruorooctaSe hurkoSamide (gOhA)	ND		1L7	0lj C	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:33	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*8*	*	*25 - 150*	*04/25/16 07:45*	*05/12/16 20:33*	*1*
13C4 PFBA	*73*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:33*	*1*
13C2 PFHxA	*110*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:33*	*1*
13C4 PFOA	*122*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:33*	*1*
13C5 PFNA	*96*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:33*	*1*
13C2 PFDA	*86*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:33*	*1*
13C2 PFUnA	*76*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:33*	*1*
13C2 PFDoA	*70*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:33*	*1*
18O2 PFHxS	*124*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:33*	*1*
13C4 PFOS	*140*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:33*	*1*
13C4-PFHpA	*124*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:33*	*1*
13C5 PFPeA	*115*		*25 - 150*	*04/25/16 07:45*	*05/12/16 20:33*	*1*

Client Sample ID: 4r 45M4
Date Cdlle/ te6: 04v17v18 13:33
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-r
x atWb: c ateW

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wd/ aWdns

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWd6	) nal(Ue6	Dil Ba/
f eWludWdbutandi/ a/ i6 Ff BA) .	**2z5**	**A**	1L7	0L42	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1
f eWludWdpentandi/ a/ i6 Ff Bf e) .	**rz4**		1L7	0L91	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1
f eWludWdPeoandi/ a/ i6 Ff By o) .	**8z1**		1L7	0LP2	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1
f eWludWdPeptandi/ a/ i6 Ff By p) .	**2z0**		1L7	0LP4	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1
f eWludWd/ tandi/ a/ i6 Ff B9) .	**2zM**		1L7	0LC9	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1
/ erkruoroSoSaSoic acid (/ gNA)	ND		1L7	0LC0	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1
/ erkruorodecaSoic acid (/ gDA)	ND		1L7	0L41	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1
/ erkruorouSdecaSoic acid (/ gp SA)	ND		1L7	0LC9	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1
/ erkruorododecaSoic acid (/ gDoA)	ND		1L7	0lj 4	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1
/ erkruorotridecaSoic Acid (/ gTriA)	ND		1L7	0lj 1	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1
f eWludWdtetW6e/ andi/ a/ i6 Ff BTe) .	**0z71**	**J**	1L7	0L17	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1
f eWludWd-n-Peoa6e/ andi/ a/ i6 Ff By oD) .	**0z82**	**J A**	1L7	0L11	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1
/ erkruoro-S-octaSdecaSoic acid (/ gODA)	ND		1L7	0LC2	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1
f eWludWdbutane SulHdnate Ff BAS.	**1z3**	**J**	1L7	0L7j	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1
f eWludWdPeoane SulHdnate Ff By oS.	**4z2**		1L7	0L70	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1
/ erkruoro-1-&eHtaSesurkoSate (/ gUHh)	ND		1L7	0LCC	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1
/ erkruorodecaSe surkoSate (/ gDh)	ND		1L7	1L1	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1
f eWludWd/ tane SulHdnate Ff B9 S.	**8zM**		1L7	1L2	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1
/ erkruorooctaSe hurkoSamide (gOhA)	ND		1L7	0lj 9	S8f6		04f2j f1C 0P:4j	0j f12f1C 20:j 4	1

Client Sample ID: 4r 45M4

Date Cdlle/ te6: 04v17v18 13:33
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-r

x atWb: c ateW

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	3	*	25 - 150	04/25/16 07:45	05/12/16 20:54	1
13C4 PFBA	80		25 - 150	04/25/16 07:45	05/12/16 20:54	1
13C2 PFHxA	121		25 - 150	04/25/16 07:45	05/12/16 20:54	1
13C4 PFOA	97		25 - 150	04/25/16 07:45	05/12/16 20:54	1
13C5 PFNA	85		25 - 150	04/25/16 07:45	05/12/16 20:54	1
13C2 PFDA	96		25 - 150	04/25/16 07:45	05/12/16 20:54	1
13C2 PFUnA	115		25 - 150	04/25/16 07:45	05/12/16 20:54	1
13C2 PFDoA	109		25 - 150	04/25/16 07:45	05/12/16 20:54	1
18O2 PFHxS	112		25 - 150	04/25/16 07:45	05/12/16 20:54	1
13C4 PFOS	136		25 - 150	04/25/16 07:45	05/12/16 20:54	1
13C4-PFHpA	122		25 - 150	04/25/16 07:45	05/12/16 20:54	1
13C5 PFPeA	123		25 - 150	04/25/16 07:45	05/12/16 20:54	1

Client Sample ID: 12MB11

Date Cdlle/ te6: 04v17v18 1r:0M
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-8

x atWb: c ateW

x etPd6: c S-LC-002r - f eWlludWhate6 y (6Wd/ aWdns

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWe6	) nal(Ue6	Dil Ba/
f eWlludWlbutandi/ a/ i6 Ff BA) .	4z8	A	1L9	0L44	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1
f eWlludWlpentandi/ a/ i6 Ff Bf e) .	5z5		1L9	0L9j	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1
f eWlludWlPeoandi/ a/ i6 Ff By o) .	13		1L9	0LPC	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1
f eWlludWlPeptandi/ a/ i6 Ff By p) .	4z0		1L9	0LPP	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1
f eWlludWld/ tandi/ a/ i6 Ff B9) .	8z2		1L9	0LP2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1
f eWlludWndnandi/ a/ i6 Ff BN) .	1z1	J	1L9	0LC3	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1
/ erkuorodecaSoic acid (/ gDA)	ND		1L9	0L42	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1
f eWlludWlun6e/ andi/ a/ i6 Ff BQn) .	1z0	J	1L9	0LP2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1
/ erkuorododecaSoic acid (/ gDoA)	ND		1L9	0Lj C	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1
/ erkuorotridecaSoic Acid (/ gTriA)	ND		1L9	0Lj 3	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1
f eWlludWltetWl6e/ andi/ a/ i6 Ff BTe) .	0z51	J	1L9	0L19	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1
f eWlludWl-n-Peoa6e/ andi/ a/ i6 Ff By oD) .	1z7	J A	1L9	0L12	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1
/ erkuoro-S-octaSdecaSoic acid (/ gODA)	ND		1L9	0LCj	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1
f eWlludWlbutane SulHdnate Ff BAS.	Mz7		1L9	0L79	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1
f eWlludWlPeoane SulHdnate Ff By oS.	31		1L9	0L74	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1
f eWlludWl-1-PeptanesulHdnate Ff By pS.	1z4	J	1L9	0LC9	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1
/ erkuorodecaSe sumoSate (/ gDh)	ND		1L9	1L2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1
f eWlludWld/ tane SulHdnate Ff B9 S.	25		1L9	1L2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1
/ erkuorooctaSe humoSamide (gOh A)	ND		1L9	0LC2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :32	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	4	*	25 - 150	04/25/16 07:45	05/10/16 05:32	1
13C4 PFBA	67		25 - 150	04/25/16 07:45	05/10/16 05:32	1
13C2 PFHxA	98		25 - 150	04/25/16 07:45	05/10/16 05:32	1
13C4 PFOA	91		25 - 150	04/25/16 07:45	05/10/16 05:32	1
13C5 PFNA	68		25 - 150	04/25/16 07:45	05/10/16 05:32	1
13C2 PFDA	51		25 - 150	04/25/16 07:45	05/10/16 05:32	1
13C2 PFUnA	54		25 - 150	04/25/16 07:45	05/10/16 05:32	1

Client Sample ID: 12M311
Date Cdlle/ te6: 04v17v18 1r:0M
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-8
x atWb: c ateW

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wd/ aWdns FCdntinue6.

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDoA	59		25 - 150	04/25/16 07:45	05/10/16 05:32	1
18O2 PFHxS	124		25 - 150	04/25/16 07:45	05/10/16 05:32	1
13C4 PFOS	121		25 - 150	04/25/16 07:45	05/10/16 05:32	1
13C4-PFHpA	101		25 - 150	04/25/16 07:45	05/10/16 05:32	1
13C5 PFPeA	92		25 - 150	04/25/16 07:45	05/10/16 05:32	1

Client Sample ID: 12M230
Date Cdlle/ te6: 04v17v18 18:3M
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-M
x atWb: c ateW

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wd/ aWdns

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWd6	) nal(Ue6	Dil Ba/
f eWludWbutandi/ a/ i6 Ff BA) .	5z7	A	1L7	0L42	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1
f eWludWpentandi/ a/ i6 Ff Bf e) .	18		1L7	0L91	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1
f eWludWPeoandi/ a/ i6 Ff By o) .	13		1L7	0LP2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1
f eWludWPeptandi/ a/ i6 Ff By p) .	rz0		1L7	0LP4	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1
f eWludWd/ tandi/ a/ i6 Ff B9) .	12		1L7	0LC9	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1
f eWludWndnandi/ a/ i6 Ff BN) .	2z1		1L7	0LC0	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1
/ erkuorodecaSoic acid (/ gDA)	ND		1L7	0L41	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1
/ erkuorouSdecaSoic acid (/ gp SA)	ND		1L7	0LC9	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1
/ erkuorododecaSoic acid (/ gDoA)	ND		1L7	0Lj 4	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1
/ erkuorotridecaSoic Acid (/ gTriA)	ND		1L7	0Lj 1	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1
f eWludWtetWd6e/ andi/ a/ i6 Ff BTe) .	0z50	J	1L7	0L17	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1
f eWludW-n-Peoa6e/ andi/ a/ i6 Ff By oD) .	2z8	A	1L7	0L11	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1
/ erkuoro-S-octaSdecaSoic acid (/ gODA)	ND		1L7	0LC2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1
f eWludWbutane SulHdnate Ff BAS.	4z4		1L7	0L7j	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1
f eWludWPeoane SulHdnate Ff By oS.	42		1L7	0L70	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1
f eWludW-1-PeptanesulHdnate Ff By pS.	1z2	J	1L7	0LCC	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1
/ erkuorodecaSe sumoSate (/ gDh)	ND		1L7	1L1	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1
f eWludWd/ tane SulHdnate Ff B9 S.	15		1L7	1L2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1
f eWludWd/ tane SulHdnami6e FB9 S) .	12		1L7	0Lj 9	S8f6		04f2j f1C 0P:4j	0j f10f1C 0j :j 3	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	2	*	25 - 150	04/25/16 07:45	05/10/16 05:53	1
13C4 PFBA	61		25 - 150	04/25/16 07:45	05/10/16 05:53	1
13C2 PFHxA	93		25 - 150	04/25/16 07:45	05/10/16 05:53	1
13C4 PFOA	84		25 - 150	04/25/16 07:45	05/10/16 05:53	1
13C5 PFNA	66		25 - 150	04/25/16 07:45	05/10/16 05:53	1
13C2 PFDA	57		25 - 150	04/25/16 07:45	05/10/16 05:53	1
13C2 PFUnA	57		25 - 150	04/25/16 07:45	05/10/16 05:53	1
13C2 PFDoA	56		25 - 150	04/25/16 07:45	05/10/16 05:53	1
18O2 PFHxS	117		25 - 150	04/25/16 07:45	05/10/16 05:53	1
13C4 PFOS	124		25 - 150	04/25/16 07:45	05/10/16 05:53	1
13C4-PFHpA	101		25 - 150	04/25/16 07:45	05/10/16 05:53	1
13C5 PFPeA	87		25 - 150	04/25/16 07:45	05/10/16 05:53	1

Client Sample ID: r 24r 8r

Date Cdlle/ te6: 04v17v18 1M2r
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-7

x atWo: c ateW

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wd/ aWodns

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWd6	) nal(Ue6	Dil Ba/
f eWludWbutandi/ a/ i6 Ff BA) .	1z0	J A	1L9	0L44	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1
f eWludWpentandi/ a/ i6 Ff Bf e) .	1z4	J	1L9	0L94	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1
f eWludWPeoandi/ a/ i6 Ff By o) .	2z7		1L9	0LPj	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1
/ erkuoro&eHtaSoic acid (/ gUHA)	ND		1L9	0LPC	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1
f eWludWd/ tandi/ a/ i6 Ff B9) .	1z5		1L9	0LP1	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1
/ erkuoroSoSaSoic acid (/ gNA)	ND		1L9	0LC2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1
/ erkuorodecaSoic acid (/ gDA)	ND		1L9	0L42	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1
/ erkuorouSdecaSoic acid (/ gp SA)	ND		1L9	0LP1	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1
/ erkuorododecaSoic acid (/ gDoA)	ND		1L9	0Lj C	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1
/ erkuorotridecaSoic Acid (/ gTriA)	ND		1L9	0Lj 2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1
f eWludWtetWd6e/ andi/ a/ i6 Ff BTe) .	0zr 0	J	1L9	0L19	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1
f eWludWd-n-Peoa6e/ andi/ a/ i6 Ff By oD) .	1z1	J A	1L9	0L12	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1
/ erkuoro-S-octaSdecaSoic acid (/ gODA)	ND		1L9	0LC4	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1
f eWludWbutane SulHdnate Ff BAS.	1zr	J	1L9	0L7P	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1
f eWludWPeoane SulHdnate Ff By oS.	rz2		1L9	0L73	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1
f eWludWd-1-PeptanesulHdnate Ff By pS.	0z77	J	1L9	0LC7	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1
/ erkuorodecaSe sumoSate (/ gDh)	ND		1L9	1L2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1
f eWludWd/ tane SulHdnate Ff B9 S.	21		1L9	1L2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1
f eWludWd/ tane SulHdnami6e FB9 S) .	Mz1		1L9	0LC1	S8f6		04f2j f1C 0P:4j	0j f10f1C 0C:1j	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*6*	*	*25 - 150*	*04/25/16 07:45*	*05/10/16 06:15*	*1*
13C4 PFBA	*83*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:15*	*1*
13C2 PFHxA	*102*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:15*	*1*
13C4 PFOA	*96*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:15*	*1*
13C5 PFNA	*85*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:15*	*1*
13C2 PFDA	*99*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:15*	*1*
13C2 PFUnA	*116*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:15*	*1*
13C2 PFDoA	*114*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:15*	*1*
18O2 PFHxS	*131*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:15*	*1*
13C4 PFOS	*132*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:15*	*1*
13C4-PFHpA	*100*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:15*	*1*
13C5 PFPeA	*102*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:15*	*1*

Client Sample ID: 4r 2M1r 7

Date Cdlle/ te6: 04v15v18 05:3r
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-5

x atWo: c ateW

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wd/ aWodns

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWd6	) nal(Ue6	Dil Ba/
f eWludWbutandi/ a/ i6 Ff BA) .	2z3	A	1L7	0L41	S8f6		04f2j f1C 0P:4j	0j f12f1C 21:1j	1
f eWludWpentandi/ a/ i6 Ff Bf e) .	2zr		1L7	0L79	S8f6		04f2j f1C 0P:4j	0j f12f1C 21:1j	1
f eWludWPeoandi/ a/ i6 Ff By o) .	2zM		1L7	0LP1	S8f6		04f2j f1C 0P:4j	0j f12f1C 21:1j	1
f eWludWPeptandi/ a/ i6 Ff By p) .	0z72	J	1L7	0LP3	S8f6		04f2j f1C 0P:4j	0j f12f1C 21:1j	1
f eWludWd/ tandi/ a/ i6 Ff B9) .	3z3		1L7	0LC7	S8f6		04f2j f1C 0P:4j	0j f12f1C 21:1j	1
/ erkuoroSoSaSoic acid (/ gNA)	ND		1L7	0Lj 9	S8f6		04f2j f1C 0P:4j	0j f12f1C 21:1j	1

Client Sample ID: 4r 2M1r 7

Date Cdlle/ te6: 04v15v18 05:3r
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-5

x atWb: c ateW

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wd/ aWdns FCdntinue6.

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWe6	) nal(Ue6	Dil Ba/
/ erkuorodecaSoic acid (/ gDA)	ND		1L7	0L40	S8f6		04f2j f1C 0P:4j	0j f12f1C21:1j	1
/ erkuorouSdecaSoic acid (/ gp SA)	ND		1L7	0LC7	S8f6		04f2j f1C 0P:4j	0j f12f1C21:1j	1
/ erkuorododecaSoic acid (/ gDoA)	ND		1L7	0Lj 3	S8f6		04f2j f1C 0P:4j	0j f12f1C21:1j	1
/ erkuorotridecaSoic Acid (/ gTriA)	ND		1L7	0Lj 0	S8f6		04f2j f1C 0P:4j	0j f12f1C21:1j	1
f eWludWtetWe6e/ andi/ a/ i6 Ff BTe) .	**0z53**	**J**	1L7	0L17	S8f6		04f2j f1C 0P:4j	0j f12f1C21:1j	1
f eWludW-n-Peoa6e/ andi/ a/ i6 Ff By oD) .	**1z7**	**A**	1L7	0L11	S8f6		04f2j f1C 0P:4j	0j f12f1C21:1j	1
/ erkuoro-S-octaSdecaSoic acid (/ gODA)	ND		1L7	0LC1	S8f6		04f2j f1C 0P:4j	0j f12f1C21:1j	1
/ erkuorobutaSe hurkoSate (/ gBh)	ND		1L7	0L73	S8f6		04f2j f1C 0P:4j	0j f12f1C21:1j	1
f eWludWPeoane SulHdnate Ff By oS.	**1z8**	**J**	1L7	0LP9	S8f6		04f2j f1C 0P:4j	0j f12f1C21:1j	1
/ erkuoro-1-&eHtaSesurkoSate (/ gUHh)	ND		1L7	0LC4	S8f6		04f2j f1C 0P:4j	0j f12f1C21:1j	1
/ erkuorodecaSe surkoSate (/ gDh)	ND		1L7	1L1	S8f6		04f2j f1C 0P:4j	0j f12f1C21:1j	1
/ erkuorooctaSe hurkoSate (/ gOh)	ND		1L7	1L2	S8f6		04f2j f1C 0P:4j	0j f12f1C21:1j	1
/ erkuorooctaSe hurkoSamide (gOhA)	ND		1L7	0Lj 7	S8f6		04f2j f1C 0P:4j	0j f12f1C21:1j	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*8*	*	*25 - 150*	*04/25/16 07:45*	*05/10/16 06:36*	*1*
13C8 FOSA	*7*	*	*25 - 150*	*04/25/16 07:45*	*05/12/16 21:15*	*1*
13C4 PFBA	*76*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:36*	*1*
13C4 PFBA	*82*		*25 - 150*	*04/25/16 07:45*	*05/12/16 21:15*	*1*
13C2 PFHxA	*95*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:36*	*1*
13C2 PFHxA	*119*		*25 - 150*	*04/25/16 07:45*	*05/12/16 21:15*	*1*
13C4 PFOA	*89*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:36*	*1*
13C4 PFOA	*101*		*25 - 150*	*04/25/16 07:45*	*05/12/16 21:15*	*1*
13C5 PFNA	*70*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:36*	*1*
13C5 PFNA	*83*		*25 - 150*	*04/25/16 07:45*	*05/12/16 21:15*	*1*
13C2 PFDA	*64*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:36*	*1*
13C2 PFDA	*82*		*25 - 150*	*04/25/16 07:45*	*05/12/16 21:15*	*1*
13C2 PFUnA	*69*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:36*	*1*
13C2 PFUnA	*88*		*25 - 150*	*04/25/16 07:45*	*05/12/16 21:15*	*1*
13C2 PFDoA	*65*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:36*	*1*
13C2 PFDoA	*80*		*25 - 150*	*04/25/16 07:45*	*05/12/16 21:15*	*1*
18O2 PFHxS	*122*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:36*	*1*
18O2 PFHxS	*124*		*25 - 150*	*04/25/16 07:45*	*05/12/16 21:15*	*1*
13C4 PFOS	*120*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:36*	*1*
13C4 PFOS	*155*	*	*25 - 150*	*04/25/16 07:45*	*05/12/16 21:15*	*1*
13C4-PFHpA	*99*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:36*	*1*
13C4-PFHpA	*120*		*25 - 150*	*04/25/16 07:45*	*05/12/16 21:15*	*1*
13C5 PFPeA	*101*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:36*	*1*
13C5 PFPeA	*120*		*25 - 150*	*04/25/16 07:45*	*05/12/16 21:15*	*1*

Client Sample ID: 12M124

Date Cdlle/ te6: 04v15v18 10:31
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-10

x atWb: c ateW

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wd/ aWdns

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWe6	) nal(Ue6	Dil Ba/
f eWludWbutandi/ a/ i6 Ff BA) .	**7z0**	**A**	1L9	0L42	S8f6		04f2j f1C 0P:4j	0j f10f1C0Cj P	1

Client Sample ID: 12M124
Date Cdlle/ te6: 04v15v18 10:31
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-10
x atWb: c ateW

x etPd6: c S-LC-002r - f eWlludWhate6 y (6Wd/ aWbdns FCdntinue6.

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWe6	) nal(Ue6	Dil Ba/
f eWlludWlpentandi/ a/ i6 Ff Bf e) .	24		1L9	0l92	S8f6		04f2j f1C 0P:4j	0j f10f1C 0Cj P	1
f eWlludWlPeoandi/ a/ i6 Ff By o) .	28		1L9	0LP3	S8f6		04f2j f1C 0P:4j	0j f10f1C 0Cj P	1
f eWlludWlPeptandi/ a/ i6 Ff By p) .	Mzr		1L9	0LP4	S8f6		04f2j f1C 0P:4j	0j f10f1C 0Cj P	1
f eWlludWld/ tandi/ a/ i6 Ff B9) .	14		1L9	0LC9	S8f6		04f2j f1C 0P:4j	0j f10f1C 0Cj P	1
f eWlludWndnandi/ a/ i6 Ff BN) .	3z4		1L9	0LC1	S8f6		04f2j f1C 0P:4j	0j f10f1C 0Cj P	1
f eWlludWl6e/ andi/ a/ i6 Ff BD) .	1z3	J	1L9	0l41	S8f6		04f2j f1C 0P:4j	0j f10f1C 0Cj P	1
f eWlludWlun6e/ andi/ a/ i6 Ff BQn) .	0zMB	J	1L9	0LC9	S8f6		04f2j f1C 0P:4j	0j f10f1C 0Cj P	1
f eWlludWld6d6e/ andi/ a/ i6 Ff BDd) .	1z0	J	1L9	0lj 4	S8f6		04f2j f1C 0P:4j	0j f10f1C 0Cj P	1
/ erkuorotridecaSoic Acid (/ gTriA)	ND		1L9	0lj 1	S8f6		04f2j f1C 0P:4j	0j f10f1C 0Cj P	1
f eWlludWltetWl6e/ andi/ a/ i6 Ff BTe) .	0zM0	J	1L9	0L17	S8f6		04f2j f1C 0P:4j	0j f10f1C 0Cj P	1
f eWlludWl-n-Peoa6e/ andi/ a/ i6 Ff By oD) .	1z4	J A	1L9	0L11	S8f6		04f2j f1C 0P:4j	0j f10f1C 0Cj P	1
/ erkuoro-S-octaSdecaSoic acid (/ gODA)	ND		1L9	0LC2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0Cj P	1
f eWlludWlbutane SulHdnate Ff BAS.	8zr		1L9	0L7j	S8f6		04f2j f1C 0P:4j	0j f10f1C 0Cj P	1
f eWlludWlPeoane SulHdnate Ff By oS.	47		1L9	0L71	S8f6		04f2j f1C 0P:4j	0j f10f1C 0Cj P	1
f eWlludWl-1-PeptanesulHdnate Ff By pS.	2z5		1L9	0LCC	S8f6		04f2j f1C 0P:4j	0j f10f1C 0Cj P	1
/ erkuorodecaSe sumoSate (/ gDh)	ND		1L9	1L1	S8f6		04f2j f1C 0P:4j	0j f10f1C 0Cj P	1
f eWlludWld/ tane SulHdnate Ff B9 S.	87		1L9	1L2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0Cj P	1
f eWlludWld/ tane SulHdnami6e FB9 S) .	0z5M	J	1L9	0lj 9	S8f6		04f2j f1C 0P:4j	0j f10f1C 0Cj P	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*52*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:57*	*1*
13C4 PFBA	*69*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:57*	*1*
13C2 PFHxA	*102*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:57*	*1*
13C4 PFOA	*119*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:57*	*1*
13C5 PFNA	*116*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:57*	*1*
13C2 PFDA	*107*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:57*	*1*
13C2 PFUnA	*120*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:57*	*1*
13C2 PFDoA	*104*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:57*	*1*
18O2 PFHxS	*126*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:57*	*1*
13C4 PFOS	*138*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:57*	*1*
13C4-PFHpA	*121*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:57*	*1*
13C5 PFPeA	*94*		*25 - 150*	*04/25/16 07:45*	*05/10/16 06:57*	*1*

Client Sample ID: r28rMB
Date Cdlle/ te6: 04v15v18 11:28
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-11
x atWb: c ateW

x etPd6: c S-LC-002r - f eWlludWhate6 y (6Wd/ aWbdns

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWe6	) nal(Ue6	Dil Ba/
f eWlludWlbutandi/ a/ i6 Ff BA) .	4z0	A	1L7	0l42	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1
f eWlludWlpentandi/ a/ i6 Ff Bf e) .	4zr		1L7	0l90	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1
f eWlludWlPeoandi/ a/ i6 Ff By o) .	5z3		1L7	0LP2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1
f eWlludWlPeptandi/ a/ i6 Ff By p) .	0z53	J	1L7	0LP3	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1
f eWlludWld/ tandi/ a/ i6 Ff B9) .	3z0		1L7	0LC7	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1

Client Sample ID: r 28r M8
Date Cdlle/ te6: 04v15v18 11:28
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-11
x atWo: c ateW

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wd/ aWodns FCdntinue6.

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWe6	) nal(Ue6	Dil Ba/
/ erkuoroSoSaSoic acid (/ gNA)	ND		1L7	0LC0	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1
f eWludWd6e/ andi/ a/ i6 Ff BD) .	0z4M	J	1L7	0L40	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1
f eWludWun6e/ andi/ a/ i6 Ff BQn) .	0z7M	J	1L7	0LC7	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1
f eWludWd6d6e/ andi/ a/ i6 Ff BDd) .	0z53	J	1L7	0Lj 3	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1
/ erkuorotridecaSoic Acid (/ gTriA)	ND		1L7	0Lj 0	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1
f eWludWtetWd6e/ andi/ a/ i6 Ff BTe) .	0z50	J	1L7	0L17	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1
f eWludWd-n-Peoa6e/ andi/ a/ i6 Ff By oD) .	1z8	J A	1L7	0L11	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1
/ erkuoro-S-octaSdecaSoic acid (/ gODA)	ND		1L7	0LC1	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1
f eWludWbutane SulHdnate Ff BAS.	3z2		1L7	0L74	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1
f eWludWPeoane SulHdnate Ff By oS.	1r		1L7	0LP9	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1
f eWludWd-1-PeptanesulHdnate Ff By pS.	1z4	J	1L7	0LCj	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1
/ erkuorodecaSe sumkoSate (/ gDh)	ND		1L7	1L1	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1
f eWludWd/ tane SulHdnate Ff B9 S.	8r		1L7	1L2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1
/ erkuoroocta Se humkoSamide (gOh A)	ND		1L7	0Lj 7	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:19	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*5*	*	*25 - 150*	*04/25/16 07:45*	*05/10/16 07:19*	*1*
13C4 PFBA	*74*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:19*	*1*
13C2 PFHxA	*98*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:19*	*1*
13C4 PFOA	*95*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:19*	*1*
13C5 PFNA	*63*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:19*	*1*
13C2 PFDA	*65*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:19*	*1*
13C2 PFUnA	*79*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:19*	*1*
13C2 PFDoA	*89*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:19*	*1*
18O2 PFHxS	*120*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:19*	*1*
13C4 PFOS	*116*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:19*	*1*
13C4-PFHpA	*107*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:19*	*1*
13C5 PFPeA	*99*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:19*	*1*

Client Sample ID: r 288M8
Date Cdlle/ te6: 04v15v18 11:30
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-12
x atWo: c ateW

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wd/ aWodns

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWe6	) nal(Ue6	Dil Ba/
f eWludWbutandi/ a/ i6 Ff BA) .	4z0	A	1L7	0L42	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1
f eWludWpentandi/ a/ i6 Ff Bf e) .	rzr		1L7	0L91	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1
f eWludWPeoandi/ a/ i6 Ff By o) .	5z0		1L7	0LP2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1
f eWludWPeptandi/ a/ i6 Ff By p) .	1z0	J	1L7	0LP4	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1
f eWludWd/ tandi/ a/ i6 Ff B9) .	3z4		1L7	0LC9	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1
/ erkuoroSoSaSoic acid (/ gNA)	ND		1L7	0LC0	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1
f eWludWd6e/ andi/ a/ i6 Ff BD) .	0z74	J	1L7	0L40	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1
/ erkuorouSdecaSoic acid (/ gp SA)	ND		1L7	0LC9	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1
/ erkuorododecaSoic acid (/ gDoA)	ND		1L7	0Lj 4	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1
/ erkuorotridecaSoic Acid (/ gTriA)	ND		1L7	0Lj 1	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1

Client Sample ID: r 288M8
Date Cdlle/ te6: 04v15v18 11:30
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-12
x atWb: c ateW

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wd/ aWdns FCdntinue6.

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWd6	) nal(Ue6	Dil Ba/
f eWludWtetWd6e/ andi/ a/ i6 Ff BTe) .	0z38	J	1L7	0L17	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1
f eWludWl-n-Peoa6e/ andi/ a/ i6 Ff By oD) .	2z0	A	1L7	0L11	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1
/ erkruoro-S-octaSdecaSoic acid (/ gODA)	ND		1L7	0LC2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1
f eWludWlbutane SulHdnate Ff BAS.	3z8		1L7	0L74	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1
f eWludWlPeoane SulHdnate Ff By oS.	12		1L7	0L70	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1
f eWludWl-1-PeptanesulHdnate Ff By pS.	0z71	J	1L7	0LCj	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1
/ erkruorodecaSe sumoSate (/ gDh)	ND		1L7	1L1	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1
f eWludWld/ tane SulHdnate Ff B9 S.	45		1L7	1L2	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1
/ erkruorooctaSe humoSamide (gOhA)	ND		1L7	0Lj 9	S8f6		04f2j f1C 0P:4j	0j f10f1C 0P:40	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*6*	*	*25 - 150*	*04/25/16 07:45*	*05/10/16 07:40*	*1*
13C4 PFBA	*80*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:40*	*1*
13C2 PFHxA	*108*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:40*	*1*
13C4 PFOA	*94*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:40*	*1*
13C5 PFNA	*78*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:40*	*1*
13C2 PFDA	*69*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:40*	*1*
13C2 PFUnA	*78*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:40*	*1*
13C2 PFDoA	*77*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:40*	*1*
18O2 PFHxS	*129*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:40*	*1*
13C4 PFOS	*125*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:40*	*1*
13C4-PFHpA	*111*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:40*	*1*
13C5 PFPeA	*105*		*25 - 150*	*04/25/16 07:45*	*05/10/16 07:40*	*1*

Client Sample ID: 12Mr 23
Date Cdlle/ te6: 04v15v18 13:27
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-13
x atWb: c ateW

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wd/ aWdns

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWd6	) nal(Ue6	Dil Ba/
f eWludWlbutandi/ a/ i6 Ff BA) .	rz1	A	1L7	0L42	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1
f eWludWlpentandi/ a/ i6 Ff Bf e) .	12		1L7	0L90	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1
f eWludWlPeoandi/ a/ i6 Ff By o) .	14		1L7	0LP1	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1
f eWludWlPeptandi/ a/ i6 Ff By p) .	4z2		1L7	0LP3	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1
f eWludWld/ tandi/ a/ i6 Ff B9) .	8z8		1L7	0LC7	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1
f eWludWlndnandi/ a/ i6 Ff BN) .	1z2	J	1L7	0Lj 9	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1
/ erkruorodecaSoic acid (/ gDA)	ND		1L7	0L40	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1
f eWludWlun6e/ andi/ a/ i6 Ff BQn) .	0zM1	J	1L7	0LC7	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1
/ erkruorododecaSoic acid (/ gDoA)	ND		1L7	0Lj 3	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1
/ erkruorotridecaSoic Acid (/ gTriA)	ND		1L7	0Lj 0	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1
f eWludWtetWd6e/ andi/ a/ i6 Ff BTe) .	1z4	J	1L7	0L17	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1
f eWludWl-n-Peoa6e/ andi/ a/ i6 Ff By oD) .	1z3	J A	1L7	0L11	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1
/ erkruoro-S-octaSdecaSoic acid (/ gODA)	ND		1L7	0LC1	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1
f eWludWlbutane SulHdnate Ff BAS.	M5		1L7	0L73	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1

Client Sample ID: 12Mr 23
Date Cdlle/ te6: 04v15v18 13:27
Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-13
x atWo: c ateW

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wd/ aWdns FCdntinue6.

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaWe6	) nal(Ue6	Dil Ba/
f eWludWPeoane SulHdnate FF By oS.	**37**		1L7	0LP9	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1
f eWludWd-1-PeptanesulHdnate FF By pS.	**1zr**	**J**	1L7	0LCj	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1
/ erkuorodecaSe sumoSate (/ gDh)	ND		1L7	1L1	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1
f eWludWd/ tane SulHdnate FF B9 S.	**r r**		1L7	1L2	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1
/ erkuorooctaSe humoSamide (gOhA)	ND		1L7	0Lj 7	S8f6		04f2j f1C 0P:4j	0j f10f1C 07:01	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*4*	*	*25 - 150*	*04/25/16 07:45*	*05/10/16 08:01*	*1*
13C4 PFBA	*68*		*25 - 150*	*04/25/16 07:45*	*05/10/16 08:01*	*1*
13C2 PFHxA	*105*		*25 - 150*	*04/25/16 07:45*	*05/10/16 08:01*	*1*
13C4 PFOA	*107*		*25 - 150*	*04/25/16 07:45*	*05/10/16 08:01*	*1*
13C5 PFNA	*84*		*25 - 150*	*04/25/16 07:45*	*05/10/16 08:01*	*1*
13C2 PFDA	*73*		*25 - 150*	*04/25/16 07:45*	*05/10/16 08:01*	*1*
13C2 PFUnA	*70*		*25 - 150*	*04/25/16 07:45*	*05/10/16 08:01*	*1*
13C2 PFDoA	*71*		*25 - 150*	*04/25/16 07:45*	*05/10/16 08:01*	*1*
18O2 PFHxS	*128*		*25 - 150*	*04/25/16 07:45*	*05/10/16 08:01*	*1*
13C4 PFOS	*125*		*25 - 150*	*04/25/16 07:45*	*05/10/16 08:01*	*1*
13C4-PFHpA	*109*		*25 - 150*	*04/25/16 07:45*	*05/10/16 08:01*	*1*
13C5 PFPeA	*95*		*25 - 150*	*04/25/16 07:45*	*05/10/16 08:01*	*1*

Isotope Dilution Summary

Client: Shannon & Wilson
j ro/ectySite: Citf oFkairbangs kire Trainin* Area

TestAmerica Job ID: 320-17483-1
SDG: 31-1-1153P-004

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	3C8 FOS/ (25-150)	3C4 PFB/ (25-150)	3C2 PFHx. (25-150)	3C4 PFO/ (25-150)	3C5 PFN/ (25-150)	3C2 PFD/ (25-150)	3C2 PFUn (25-150)	3C2 PFDo (25-150)
320-17483-1	1855P4	8 6	81	97	100	79	57	73	79
320-17483-2	1857P4	4 6	8P	97	94	53	82	89	53
320-17483-3	9P443	7 6	55	114	105	101	90	79	75
320-17483-4	411788	7 6	53	110	122	98	78	58	50
320-17483-P	4P4954	3 6	70	121	95	7P	98	11P	109
320-17483-8	125311	4 6	85	97	91	87	P1	P4	P9
320-17483-5	125230	2 6	81	93	74	88	P5	P5	P8
320-17483-7	P24P8P	8 6	73	102	98	7P	99	118	114
320-17483-9	4P251P7	7 6	58	9P	79	50	84	89	8P
320-17483-9	4P251P7	5 6	72	119	101	73	72	77	70
320-17483-10	125124	P2	89	102	119	118	105	120	104
320-17483-11	P28P58	P 6	54	97	9P	83	8P	59	79
320-17483-12	P28858	8 6	70	107	94	57	89	57	55
320-17483-13	125P23	4 6	87	10P	105	74	53	50	51
LCS 320-105P52y2-A	Lab Control Sample	85	10P	104	10P	105	109	119	110
LCSD 320-105P52y8-A	Lab Control Sample Dup	52	119	11P	109	112	117	124	115
MB 320-105P52y1-A	Method Blang	94	135	145	147	1P3 6	1P5 6	1PP 6	143

		Percent Isotope Dilution Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	3O2 PFHx (25-150)	3C4 PFOS (25-150)	3C4-PFHp (25-150)	3C5 PFPe (25-150)
320-17483-1	1855P4	121	125	110	79
320-17483-2	1857P4	115	125	110	98
320-17483-3	9P443	115	144	119	119
320-17483-4	411788	124	140	124	11P
320-17483-P	4P4954	112	138	122	123
320-17483-8	125311	124	121	101	92
320-17483-5	125230	115	124	101	75
320-17483-7	P24P8P	131	132	100	102
320-17483-9	4P251P7	122	120	99	101
320-17483-9	4P251P7	124	1PP 6	120	120
320-17483-10	125124	128	137	121	94
320-17483-11	P28P58	120	118	105	99
320-17483-12	P28858	129	12P	111	10P
320-17483-13	125P23	127	12P	109	9P
LCS 320-105P52y2-A	Lab Control Sample	10P	108	109	107
LCSD 320-105P52y8-A	Lab Control Sample Dup	113	113	117	118
MB 320-105P52y1-A	Method Blang	139	1P1 6	1P4 6	14P

Surrogate Legend

13C7 kOSA = 13C7 kOSA
13C4 j kBA = 13C4 j kBA
13C2 j kHxA = 13C2 j kHxA
13C4 j kOA = 13C4 j kOA
13CP j kNA = 13CP j kNA
13C2 j kDA = 13C2 j kDA
13C2 j kUnA = 13C2 j kUnA
13C2 j kDoA = 13C2 j kDoA
17O2 j kHxS = 17O2 j kHxS
13C4 j kOS = 13C4 j kOS

13C4-j kHpA = 13C4-j kHpA
13CPj kj eA = 13CPj kj eA

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-107572/1-A
Matrix: Water
Analysis Batch: 109605

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 107572

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
/ erkr(orob(taSoic aciB)/ g. A8	0LP37	J	2L0	0L4C	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1
/ erkr(oroxeStaSoic aciB)/ g/ eA8	p D		2L0	0L99	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1
/ erkr(oro&eHaSoic aciB)/ g6 HA8	p D		2L0	0LP9	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1
/ erkr(oro&extaSoic aciB)/ g6 xA8	p D		2L0	0L70	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1
/ erkr(orooctaSoic aciB)/ gOA8	p D		2L0	0LPj	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1
/ erkr(oroSoSaSoic aciB)/ gp A8	p D		2L0	0LCj	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1
/ erkr(oroBecaSoic aciB)/ gDA8	p D		2L0	0L44	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1
/ erkr(oro(SBecaSoic aciB)/ gUSA8	p D		2L0	0LPj	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1
/ erkr(oroBoBecaSoic aciB)/ gDoA8	p D		2L0	0Lj 7	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1
/ erkr(orotriBecaSoic AciB)/ gTriA8	p D		2L0	0Lj j	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1
/ erkr(orotetraBecaSoic aciB)/ gTeA8	p D		2L0	0L20	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1
/ erkr(oro-S-&eHaBecaSoic aciB)/ g6 HDA8	0L72j	J	2L0	0L12	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1
/ erkr(oro-S-octaSBecaSoic aciB)/ gODA8	p D		2L0	0LCP	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1
/ erkr(orob(taSe h(rhoSate)/ g. h8	p D		2L0	0L92	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1
/ erkr(oro&eHaSe h(rhoSate)/ g6 Hh8	p D		2L0	0L7P	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1
/ erkr(oro-1-&extaSes(rhoSate)/ g6 xh8	p D		2L0	0LP1	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1
/ erkr(oroBecaSe s(rhoSate)/ gDh8	p D		2L0	1L2	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1
/ erkr(orooctaSe h(rhoSate)/ gOh8	p D		2L0	1L3	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1
/ erkr(orooctaSe h(rhoSamiBe)gOhA8	p D		2L0	0LC4	SdfN		04f2j f1C 0P:4j	0j f11f1C 23:j 7	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*6**		*25 - 150*	*0*42541/ 0: 7*5*	*0541141/ 23758*	*1*
13C PFBA*	*13:*		*25 - 150*	*0*42541/ 0: 7*5*	*0541141/ 23758*	*1*
13C2 PFHxA	*1*:*		*25 - 150*	*0*42541/ 0: 7*5*	*0541141/ 23758*	*1*
13C PFOA*	*1*8*		*25 - 150*	*0*42541/ 0: 7*5*	*0541141/ 23758*	*1*
13C5 PFNA	*153*	*9*	*25 - 150*	*0*42541/ 0: 7*5*	*0541141/ 23758*	*1*
13C2 PFDA	*15:*	*9*	*25 - 150*	*0*42541/ 0: 7*5*	*0541141/ 23758*	*1*
13C2 PFUnA	*155*	*9*	*25 - 150*	*0*42541/ 0: 7*5*	*0541141/ 23758*	*1*
13C2 PFDoA	*1*3*		*25 - 150*	*0*42541/ 0: 7*5*	*0541141/ 23758*	*1*
18O2 PFHxS	*136*		*25 - 150*	*0*42541/ 0: 7*5*	*0541141/ 23758*	*1*
13C PFOS*	*151*	*9*	*25 - 150*	*0*42541/ 0: 7*5*	*0541141/ 23758*	*1*
13C-PFHpA*	*15**	*9*	*25 - 150*	*0*42541/ 0: 7*5*	*0541141/ 23758*	*1*
13C5 PFPeA	*1*5*		*25 - 150*	*0*42541/ 0: 7*5*	*0541141/ 23758*	*1*

Lab Sample ID: LCS 320-107572/2-A
Matrix: Water
Analysis Batch: 109370

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 107572

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
/ erkr(orob(taSoic aciB)/ g. A8	40L0	43L9		SdfN		110	P4 - 137
/ erkr(oroxeStaSoic aciB)/ g/ eA8	40L0	4j l0		SdfN		112	C9 - 134
/ erkr(oro&eHaSoic aciB)/ g6 HA8	40L0	4CLC		SdfN		11C	P0 - 13C
/ erkr(oro&extaSoic aciB)/ g6 xA8	40L0	43L0		SdfN		10P	C3 - 13j
/ erkr(orooctaSoic aciB)/ gOA8	40L0	4j l0		SdfN		112	C3 - 141
/ erkr(oroSoSaSoic aciB)/ gp A8	40L0	44L1		SdfN		110	P1 - 140
/ erkr(oroBecaSoic aciB)/ gDA8	40L0	44L0		SdfN		110	CC - 141

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCS 320-107572/2-A
Matrix: Water
Analysis Batch: 109370

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 107572

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
/ erk(oro(SBecaSoic aciB)/ gUSA8	40L0	42LP		SdfN		10P	C7 - 139
/ erk(oroBoBecaSoic aciB)/ gDoA8	40L0	4j l7		SdfN		11j	P1 - 139
/ erk(orotriBecaSoic AciB)/ gTriA8	40L0	j 4LC		SdfN		13P	j 1 - 139
/ erk(orotetraBecaSoic aciB)/ gTeA8	40L0	4CL1		SdfN		11j	4P - 130
/ erk(oro-S-&eHaBecaSoic aciB)/ g6HDA8	40L0	4j l7		SdfN		114	j 0 - 1j 0
/ erk(oro-S-octaSBecaSoic aciB)/ gODA8	40L0	37Lj		SdfN		9C	j 0 - 1j 0
/ erk(orob(taSe h(rhoSate)/ g. h8	3j l4	44L7		SdfN		12P	j j - 14P
/ erk(oro&eHaSe h(rhoSate)/ g6Hh8	3PL7	41l4		SdfN		109	j 7 - 137
/ erk(oro-1-&extaSes(rhoSate)/ g6xh8	37L1	41L1		SdfN		107	32 - 1P0
/ erk(oroBecaSe s(rhoSate)/ gDh8	37LC	j 1L1		SdfN		133	3j - 1j P
/ erk(orooctaSe h(rhoSate)/ gOh8	37l2	4CL4		SdfN		121	4P - 1C2
/ erk(orooctaSe h(rhoSamiBe)gOhA8	40L0	j j lj		SdfN		139	j 9 - 1C3

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*/:*		*25 - 150*
13C PFBA*	*105*		*25 - 150*
13C2 PFHxA	*10**		*25 - 150*
13C PFOA*	*105*		*25 - 150*
13C5 PFNA	*10:*		*25 - 150*
13C2 PFDA	*106*		*25 - 150*
13C2 PFUnA	*116*		*25 - 150*
13C2 PFDoA	*110*		*25 - 150*
18O2 PFHxS	*105*		*25 - 150*
13C PFOS*	*10/*		*25 - 150*
13C-PFHpA*	*106*		*25 - 150*
13C5 PFPeA	*108*		*25 - 150*

Lab Sample ID: LCSD 320-107572/3-A
Matrix: Water
Analysis Batch: 109370

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 107572

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
/ erk(orob(taSoic aciB)/ g. A8	40L0	40l4		SdfN		101	P4 - 137	7	30
/ erk(oroxeStaSoic aciB)/ g/ eA8	40L0	42l2		SdfN		10C	C9 - 134	C	30
/ erk(oro&eHaSoic aciB)/ g6HA8	40L0	43l3		SdfN		107	P0 - 13C	P	30
/ erk(oro&extaSoic aciB)/ g6xA8	40L0	37l4		SdfN		9C	C3 - 13j	11	30
/ erk(orooctaSoic aciB)/ gOA8	40L0	43lP		SdfN		109	C3 - 141	3	30
/ erk(oroSoSaSoic aciB)/ gpA8	40L0	42LP		SdfN		10P	P1 - 140	3	30
/ erk(oroBecaSoic aciB)/ gDA8	40L0	43L7		SdfN		109	CC - 141	1	30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCSD 320-107572/3-A
Matrix: Water
Analysis Batch: 109370

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 107572

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
/ erkn(oro(SBecaSoic aciB)/ gUSA8			40L0	37L2		SdfN		9C	C7 - 139	11	30
/ erkn(oroBoBecaSoic aciB)/ gDoA8			40L0	37L7		SdfN		9P	P1 - 139	1P	30
/ erkn(orotriBecaSoic AciB)/ gTriA8			40L0	4CL2		SdfN		11j	j 1 - 139	1P	30
/ erkn(orotetraBecaSoic aciB)/ gTeA8			40L0	37l4		SdfN		9C	4P - 130	17	30
/ erkn(oro-S-&eHaBecaSoic aciB)/ g6HDA8			40L0	3PL1		SdfN		93	j 0 - 1j 0	21	30
/ erkn(oro-S-octaSBecaSoic aciB)/ gODA8			40L0	37L1		SdfN		9j	j 0 - 1j 0	1	30
/ erkn(orob(taSe h (rhoSate)/ g. h8			3j l4	41LC		SdfN		117	j j - 14P	P	30
/ erkn(oro&eHaSe h (rhoSate)/ g6Hh8			3PL7	41L3		SdfN		109	j 7 - 137	0	30
/ erkn(oro-1-&extaSes(rhoSate)/ g6xh8			37L1	41l9		SdfN		110	32 - 1P0	2	30
/ erkn(oroBecaSe s(rhoSate)/ gDh8			37LC	49l3		SdfN		127	3j - 1j P	4	30
/ erkn(orooctaSe h (rhoSate)/ gOh8			37l2	41l9		SdfN		110	4P - 1C2	10	30
/ erkn(orooctaSe h (rhoSamiBe)gOhA8			40L0	49l4		SdfN		124	j 9 - 1C3	12	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C8 FOSA	*: 2*		*25 - 150*
13C PFBA*	*116*		*25 - 150*
13C2 PFHxA	*115*		*25 - 150*
13C PFOA*	*106*		*25 - 150*
13C5 PFNA	*112*		*25 - 150*
13C2 PFDA	*118*		*25 - 150*
13C2 PFUnA	*12**		*25 - 150*
13C2 PFDoA	*11:*		*25 - 150*
18O2 PFHxS	*113*		*25 - 150*
13C PFOS*	*113*		*25 - 150*
13C-PFHpA*	*118*		*25 - 150*
13C5 PFPeA	*11/*		*25 - 150*

LCMS

Prep Batch: 107572

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-174C3-1	1CPPj 4	Totarfi9 A	G ater	3j 3j	
320-174C3-2	1CP7j 4	Totarfi9 A	G ater	3j 3j	
320-174C3-3	6j 443	Totarfi9 A	G ater	3j 3j	
320-174C3-4	4117CC	Totarfi9 A	G ater	3j 3j	
320-174C3-j	4j 46P4	Totarfi9 A	G ater	3j 3j	
320-174C3-C	12P311	Totarfi9 A	G ater	3j 3j	
320-174C3-P	12P230	Totarfi9 A	G ater	3j 3j	
320-174C3-7	j 24j Cj	Totarfi9 A	G ater	3j 3j	
320-174C3-6	4j 2P1j 7	Totarfi9 A	G ater	3j 3j	
320-174C3-10	12P124	Totarfi9 A	G ater	3j 3j	
320-174C3-11	j 2Cj PC	Totarfi9 A	G ater	3j 3j	
320-174C3-12	j 2CCPC	Totarfi9 A	G ater	3j 3j	
320-174C3-13	12Pj 23	Totarfi9 A	G ater	3j 3j	
LI h 320-10Pj P2f2-A	Lab I oStronh ampre	Totarfi9 A	G ater	3j 3j	
LI hD 320-10Pj P2f3-A	Lab I oStronh ampre Dup	Totarfi9 A	G ater	3j 3j	
MB 320-10Pj P2f1-A	Met&od BraS8	Totarfi9 A	G ater	3j 3j	

Analysis Batch: 109370

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-174C3-1	1CPPj 4	Totarfi9 A	G ater	G h-LI -002j	10Pj P2
320-174C3-2	1CP7j 4	Totarfi9 A	G ater	G h-LI -002j	10Pj P2
320-174C3-C	12P311	Totarfi9 A	G ater	G h-LI -002j	10Pj P2
320-174C3-P	12P230	Totarfi9 A	G ater	G h-LI -002j	10Pj P2
320-174C3-7	j 24j Cj	Totarfi9 A	G ater	G h-LI -002j	10Pj P2
320-174C3-6	4j 2P1j 7	Totarfi9 A	G ater	G h-LI -002j	10Pj P2
320-174C3-10	12P124	Totarfi9 A	G ater	G h-LI -002j	10Pj P2
320-174C3-11	j 2Cj PC	Totarfi9 A	G ater	G h-LI -002j	10Pj P2
320-174C3-12	j 2CCPC	Totarfi9 A	G ater	G h-LI -002j	10Pj P2
320-174C3-13	12Pj 23	Totarfi9 A	G ater	G h-LI -002j	10Pj P2
LI h 320-10Pj P2f2-A	Lab I oStronh ampre	Totarfi9 A	G ater	G h-LI -002j	10Pj P2
LI hD 320-10Pj P2f3-A	Lab I oStronh ampre Dup	Totarfi9 A	G ater	G h-LI -002j	10Pj P2

Analysis Batch: 109605

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-174C3-3	6j 443	Totarfi9 A	G ater	G h-LI -002j	10Pj P2
320-174C3-4	4117CC	Totarfi9 A	G ater	G h-LI -002j	10Pj P2
320-174C3-j	4j 46P4	Totarfi9 A	G ater	G h-LI -002j	10Pj P2
320-174C3-6	4j 2P1j 7	Totarfi9 A	G ater	G h-LI -002j	10Pj P2
MB 320-10Pj P2f1-A	Met&od BraS8	Totarfi9 A	G ater	G h-LI -002j	10Pj P2

Client Sample ID: 871132
Date Collecte6: 42R8xR87 4v:- x
Date 5eceiTe6: 42R-R87 88:83

Lab Sample ID: 0-4M8x270M8
Watrid: / ater

Arep yBpe	Patch yBpe	Patch Wetho6	5zn	Dil Nactor	Initial smoznt	Ninal smoznt	Patch 9zmber	Arepare6 or snalBFe6	snalBut	Lab
Total/9A	PreH	3p3p			p87N3 mL	1N00 mL	105p52	04/2p/18 05:4p	6JA	TAL SAC
Total/9A	Analysis	WS-LC-002p		1	p87N3 mL	1N00 mL	10.350	0p/10/18 02:21	JRB	TAL SAC

Client Sample ID: 871x32
Date Collecte6: 42R8xR87 4v:0-
Date 5eceiTe6: 42R-R87 88:83

Lab Sample ID: 0-4M8x270M4
Watrid: / ater

Arep yBpe	Patch yBpe	Patch Wetho6	5zn	Dil Nactor	Initial smoznt	Ninal smoznt	Patch 9zmber	Arepare6 or snalBFe6	snalBut	Lab
Total/9A	PreH	3p3p			p48N mL	1N00 mL	105p52	04/2p/18 05:4p	6JA	TAL SAC
Total/9A	Analysis	WS-LC-002p		1	p48N mL	1N00 mL	10.350	0p/10/18 02:42	JRB	TAL SAC

Client Sample ID: v3220
Date Collecte6: 42R8xR87 84:22
Date 5eceiTe6: 42R-R87 88:83

Lab Sample ID: 0-4M8x270M0
Watrid: / ater

Arep yBpe	Patch yBpe	Patch Wetho6	5zn	Dil Nactor	Initial smoznt	Ninal smoznt	Patch 9zmber	Arepare6 or snalBFe6	snalBut	Lab
Total/9A	PreH	3p3p			p34 mL	1N00 mL	105p52	04/2p/18 05:4p	6JA	TAL SAC
Total/9A	Analysis	WS-LC-002p		1	p34 mL	1N00 mL	10.80p	0p/12/18 20:12	JRB	TAL SAC

Client Sample ID: 288x77
Date Collecte6: 42R8xR87 88:32
Date 5eceiTe6: 42R-R87 88:83

Lab Sample ID: 0-4M8x270M2
Watrid: / ater

Arep yBpe	Patch yBpe	Patch Wetho6	5zn	Dil Nactor	Initial smoznt	Ninal smoznt	Patch 9zmber	Arepare6 or snalBFe6	snalBut	Lab
Total/9A	PreH	3p3p			p8.N5 mL	1N00 mL	105p52	04/2p/18 05:4p	6JA	TAL SAC
Total/9A	Analysis	WS-LC-002p		1	p8.N5 mL	1N00 mL	10.80p	0p/12/18 20:33	JRB	TAL SAC

Client Sample ID: 232v12
Date Collecte6: 42R8xR87 80:00
Date 5eceiTe6: 42R-R87 88:83

Lab Sample ID: 0-4M8x270M3
Watrid: / ater

Arep yBpe	Patch yBpe	Patch Wetho6	5zn	Dil Nactor	Initial smoznt	Ninal smoznt	Patch 9zmber	Arepare6 or snalBFe6	snalBut	Lab
Total/9A	PreH	3p3p			p43 mL	1N00 mL	105p52	04/2p/18 05:4p	6JA	TAL SAC
Total/9A	Analysis	WS-LC-002p		1	p43 mL	1N00 mL	10.80p	0p/12/18 20:p4	JRB	TAL SAC

Client Sample ID: 8-1088
Date Collecte6: 42R8xR87 83:41
Date 5eceiTe6: 42R-R87 88:83

Lab Sample ID: 0-4M8x270M7
Watrid: / ater

Arep yBpe	Patch yBpe	Patch Wetho6	5zn	Dil Nactor	Initial smoznt	Ninal smoznt	Patch 9zmber	Arepare6 or snalBFe6	snalBut	Lab
Total/9A	PreH	3p3p			p15N mL	1N00 mL	105p52	04/2p/18 05:4p	6JA	TAL SAC
Total/9A	Analysis	WS-LC-002p		1	p15N mL	1N00 mL	10.350	0p/10/18 0p:32	JRB	TAL SAC

Client Sample ID: 8-1-04 — **Lab Sample ID: 0-4M8x270M1**
Date Collecte6: 42R8xR87 87:01 — **Watrid: / ater**
Date 5eceiTe6: 42R-R87 88:83

Arep yBpe	Patch yBpe	Patch Wetho6	5zn	Dil Nactor	Initial smoznt	Ninal smoznt	Patch 9zmber	Arepare6 or snalBFe6	snalBut	Lab
Total/9A	PreH	3p3p			p42N2 mL	1N00 mL	105p52	04/2p/18 05:4p	6JA	TAL SAC
Total/9A	Analysis	WS-LC-002p		1	p42N2 mL	1N00 mL	10.350	0p/10/18 0p:p3	JRB	TAL SAC

Client Sample ID: 3-2373 — **Lab Sample ID: 0-4M8x270M2**
Date Collecte6: 42R8xR87 81:-3 — **Watrid: / ater**
Date 5eceiTe6: 42R-R87 88:83

Arep yBpe	Patch yBpe	Patch Wetho6	5zn	Dil Nactor	Initial smoznt	Ninal smoznt	Patch 9zmber	Arepare6 or snalBFe6	snalBut	Lab
Total/9A	PreH	3p3p			p24N7 mL	1N00 mL	105p52	04/2p/18 05:4p	6JA	TAL SAC
Total/9A	Analysis	WS-LC-002p		1	p24N7 mL	1N00 mL	10.350	0p/10/18 08:1p	JRB	TAL SAC

Client Sample ID: 23-183x — **Lab Sample ID: 0-4M8x270M3**
Date Collecte6: 42R8vR87 4v:03 — **Watrid: / ater**
Date 5eceiTe6: 42R-R87 88:83

Arep yBpe	Patch yBpe	Patch Wetho6	5zn	Dil Nactor	Initial smoznt	Ninal smoznt	Patch 9zmber	Arepare6 or snalBFe6	snalBut	Lab
Total/9A	PreH	3p3p			pp2N mL	1N00 mL	105p52	04/2p/18 05:4p	6JA	TAL SAC
Total/9A	Analysis	WS-LC-002p		1	pp2N mL	1N00 mL	10.350	0p/10/18 08:38	JRB	TAL SAC
Total/9A	PreH	3p3p			pp2N mL	1N00 mL	105p52	04/2p/18 05:4p	6JA	TAL SAC
Total/9A	Analysis	WS-LC-002p		1	pp2N mL	1N00 mL	10.80p	0p/12/18 21:1p	JRB	TAL SAC

Client Sample ID: 8-18-2 — **Lab Sample ID: 0-4M8x270M4**
Date Collecte6: 42R8vR87 84:08 — **Watrid: / ater**
Date 5eceiTe6: 42R-R87 88:83

Arep yBpe	Patch yBpe	Patch Wetho6	5zn	Dil Nactor	Initial smoznt	Ninal smoznt	Patch 9zmber	Arepare6 or snalBFe6	snalBut	Lab
Total/9A	PreH	3p3p			p3.N7 mL	1N00 mL	105p52	04/2p/18 05:4p	6JA	TAL SAC
Total/9A	Analysis	WS-LC-002p		1	p3.N7 mL	1N00 mL	10.350	0p/10/18 08:p5	JRB	TAL SAC

Client Sample ID: 3-7317 — **Lab Sample ID: 0-4M8x270M5**
Date Collecte6: 42R8vR87 88:-7 — **Watrid: / ater**
Date 5eceiTe6: 42R-R87 88:83

Arep yBpe	Patch yBpe	Patch Wetho6	5zn	Dil Nactor	Initial smoznt	Ninal smoznt	Patch 9zmber	Arepare6 or snalBFe6	snalBut	Lab
Total/9A	PreH	3p3p			p47N mL	1N00 mL	105p52	04/2p/18 05:4p	6JA	TAL SAC
Total/9A	Analysis	WS-LC-002p		1	p47N mL	1N00 mL	10.350	0p/10/18 05:1.	JRB	TAL SAC

Client Sample ID: 3-7717 — **Lab Sample ID: 0-4M8x270M6-**
Date Collecte6: 42R8vR87 88:04 — **Watrid: / ater**
Date 5eceiTe6: 42R-R87 88:83

Arep yBpe	Patch yBpe	Patch Wetho6	5zn	Dil Nactor	Initial smoznt	Ninal smoznt	Patch 9zmber	Arepare6 or snalBFe6	snalBut	Lab
Total/9A	PreH	3p3p			p44N mL	1N00 mL	105p52	04/2p/18 05:4p	6JA	TAL SAC

Lab Chronicle

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17483-1
SDG: 31-1-1153p-004

Client Sample ID: 3-7717
Date Collected: 42/8/17 88:04
Date Received: 42/9-/17 88:83

Lab Sample ID: 0-4[illegible]x270[illegible]-
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	WS-LC-002p		1	44.4 mL	1.00 mL	10.350	0/10/18 05:40	JRB	TAL SAC

Client Sample ID: 8-13-0
Date Collected: 42/8/17 80:-x
Date Received: 42/9-/17 88:83

Lab Sample ID: 0-4[illegible]x270[illegible]0
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	PreH	3p3p			pp1.7 mL	1.00 mL	105p52	04/2p/18 05:4p	6JA	TAL SAC
Total/NA	Analysis	WS-LC-002p		1	pp1.7 mL	1.00 mL	10.350	0/10/18 07:01	JRB	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 770 Riverside Parkway, West Sacramento, CA . p80p, TEL (. 18)353-p800

Certification Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-18463-1
SDG: 31-1-11735-004

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17
Alaska (UST)	State Program	10	UST-055	12-18-16
Arizona	State Program	9	AZ0708	08-11-16
Arkansas DEQ	State Program	6	88-0691	06-17-17
California	State Program	9	2897	01-31-17
Colorado	State Program	8	CA00044	08-31-16
Connecticut	State Program	1	PH-0691	06-30-17
Florida	NELAP	4	E87570	06-30-16
Hawaii	State Program	9	N/A	01-31-17
Illinois	NELAP	5	200060	03-17-17
Kansas	NELAP	7	E-10375	07-31-16
Louisiana	NELAP	6	30612	06-30-16
Maine	State Program	1	CA0004	04-18-18
Michigan	State Program	5	9947	01-31-18
Nevada	State Program	9	CA00044	07-31-16
New Jersey	NELAP	2	CA005	06-30-16
New York	NELAP	2	11666	04-01-17
Oregon	NELAP	10	4040	01-29-17
Pennsylvania	NELAP	3	68-01272	03-31-17
Texas	NELAP	6	T104704399	05-31-16
US Fish & Wildlife	Federal		LE148388-0	10-31-16
USDA	Federal		P330-11-00436	12-30-17
USEPA UCMR	Federal	1	CA00044	11-06-16
Utah	NELAP	8	CA00044	02-28-17
Virginia	NELAP	3	460278	03-14-17
Washington	State Program	10	C581	05-05-17
West Virginia (DW)	State Program	3	9930C	12-31-16
Wyoming	State Program	8	8TMS-L	01-29-17

Method Summary

Method	Method Description	Protocol	Laboratory
G h -ul -002j	/ erkHbriSate= , F=rocarboSs	TAu h d /	TAu h Al

Protocol References:

TAu h d / p TestAmerica uaboratories8htaS=ar= d ReratiSO / roce=Hre

Laboratory References:

TAu h Al p TestAmerica h acrameSto8770 v iwersi=e / arL9 aF8G est h acrameSto8l A 6j C0j 8TEu (61C)3P3-j C00

Sample Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-18463-1
SDG: 31-1-11735-004

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-18463-1	167754	Water	04/18/16 09:28	04/22/16 11:15
320-18463-2	167854	Water	04/18/16 09:32	04/22/16 11:15
320-18463-3	95443	Water	04/18/16 10:44	04/22/16 11:15
320-18463-4	411866	Water	04/18/16 11:54	04/22/16 11:15
320-18463-5	454974	Water	04/18/16 13:33	04/22/16 11:15
320-18463-6	127311	Water	04/18/16 15:07	04/22/16 11:15
320-18463-7	127230	Water	04/18/16 16:37	04/22/16 11:15
320-18463-8	524565	Water	04/18/16 17:25	04/22/16 11:15
320-18463-9	4527158	Water	04/19/16 09:35	04/22/16 11:15
320-18463-10	127124	Water	04/19/16 10:31	04/22/16 11:15
320-18463-11	526576	Water	04/19/16 11:26	04/22/16 11:15
320-18463-12	526676	Water	04/19/16 11:30	04/22/16 11:15
320-18463-13	127523	Water	04/19/16 13:28	04/22/16 11:15

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTODY RECORD

Laboratory Test America
Attn: David Alltucker

400 N 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

2255 S.W. Canyon Road
Portland, OR 97201-2498
(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

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No	Time	Date Sampled	Comp	Grab	PAHs (WS-LC-0025)						Total Number of Containers	Remarks/Matrix
167754		0928	4/18/16		X	X						2	water
167854		0932			X	X						2	
95443		1044			X	X						2	
411866		1154			X	X						2	
454974		1333			X	X						2	
127311		1507			X	X						2	
127230		1637			X	X						2	
524565		1725			X	X						2	
4527158		0935	4/19/16		X	X						2	
127124		1031			X	X						2	

Project Information	Sample Receipt
Project Number:	Total Number of Containers
Project Name:	COC Seals/Intact? Y/N/NA
Contact:	Received Good Cond./Cold
Ongoing Project? Yes ☐ No ☐	Delivery Method
Sampler:	(attach shipping bill if any)

Instructions

Requested Turnaround Time:

Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: M. Neel Time: 0900	Signature: Time:	Signature: Time:
Printed Name: Mary Neel Date: 4/22/16	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Time: 1115	Signature: Time:	Signature: Time:
Printed Name: Wesley Sherman-Shockley Date: 4/22/16	Printed Name: Date:	Printed Name: Date:
Company: TAOS	Company:	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow -
Pink - S

F-19-91/UR

320-18463 Chain of Custody

4.9°C

No. 33954

5/18/2016

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTODY RECORD

Laboratory TEST America
Attn: David Hitchcock

400 N 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

9255 S.W. Canyon Road
Portland, OR 97201-2498
(503) 223-6147

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St Louis, MO 63146-3564
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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

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No	Time	Date Sampled	Comp.	Grab							Total Number of Containers	Remarks/Matrix
526576		1126	4/19/16		X	X						2	Water
526676		1130	↓		X	X						2	↓
127523		1328	↓		X	X						2	↓

Project Information		Sample Receipt	
Project Number	31-1-11735-004	Total Number of Containers	26
Project Name	CF RFTC	COC Seals/Intact? Y N/NA	—
Contact	MDN/JAK	Received Good Cond./Cold	—
Ongoing Project?	Yes ☒ No ☐	Delivery Method:	FedEx
Sampler	MDN	(attach shipping bill, if any)	

Instructions

Requested Turnaround Time: Standard

Special Instructions: Please notify upon receipt

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [signature] Time: 0900	Signature: Time:	Signature: Time:
Printed Name: Mary Nada Date: 4/20/16	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: [signature] Time: 1115	Signature: Time:	Signature: Time:
Printed Name: Wesley Sherman-Shaffer Date: 4/22/16	Printed Name: Date:	Printed Name: Date:
Company: TAWS	Company:	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

4.9°C

No. 33770

5/18/2016

Login Sample Receipt Checklist

Client: Shannon & Wilson

Job Number: 320-17483-1
SDG Number: 31-1-1153T-004

Login Number: 18463
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

Question	Answer	Comment
d acioavtiyitw' asnlt vhev<ec or is / =g bav<. rounc as measurec bwa suryew meter,	Rrue	
Rhe voolerls vustocwsealf ipAresentf is intavt,	Rrue	
SamAle vustocwsealsf ipAresentf are intavt,	N=O	
Rhe vooler or samAles co not aAAear to haye been vomAromisec or tamAerec ' ith,	Rrue	
SamAles ' ere reveiyec on ive,	Rrue	
Cooler RemAerature is avveAtable,	Rrue	
Cooler RemAerature is revorcec,	Rrue	
CI C is Aresent,	Rrue	
CI C is pillec out in in< anc le. ible,	Rrue	
CI C is pillec out ' ith all Aertinent inpormation,	Rrue	
Fs the ?ielc SamAlerls name Aresent on CI CH	Rrue	
Rhere are no cisvreAanvies bet' een the vontainers reveiyec anc the CI C,	Rrue	
SamAles are reveiyec ' ithin (olcin. Rime xe) vlucin. tests ' ith immeciate (RsP	Rrue	
SamAle vontainers haye le. ible labels,	Rrue	
Containers are not bro<en or lea<in. ,	Rrue	
SamAle vollevtion cate=times are Aroyicec,	Rrue	
OAAroAriate samAle vontainers are usec,	Rrue	
SamAle bottles are vomAletelwpillec,	Rrue	
SamAle Vreseryation qeripiec,	N=O	
Rhere is suppivient yol, por all reMuestec analwsesf invl, anwreMuestec z S=z SDs	Rrue	
Containers reMuirin. 6ero heacsAave haye no heacsAave or bubble is / 8mm x1=4"P,	Rrue	
z ultiAhasiv samAles are not Aresent,	Rrue	
SamAles co not reMuire sAlittin. or vomAositin. ,	Rrue	
d esicual Chlorine Chev<ec,	N=O	

Laboratory Data Review Checklist

Completed by: Adam Wyborny

Title: Environmental Engineering Staff Date: May 16, 2016

CS Report Name: City of Fairbanks Fire Training Area Report Date: May 16, 2016

Consultant Firm: Shannon & Wilson, Inc.

Laboratory Name: TestAmerica, Inc. Laboratory Report Number: 320-18463

ADEC File Number: 102.38.182 ADEC RecKey Number:

1. Laboratory
   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
      ☐ Yes ☐ No ☒ NA (Please explain.) Comments:

      The ADEC has not approved any analytical laboratory for perfluorinated compound (PFC) analysis.

   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 ☒ NA (Please explain.) Comments:

      Analyses were performed by TestAmerica, Inc. in Folsom, California.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

   b. Correct analyses requested?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

      The temperature blank or cooler was measured within the acceptable temperature range of 0 °C to 6 °C upon receipt at the laboratory, as specified in the EPA publication SW-846. This range has been approved by ADEC.

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?
☒Yes ☐ No ☐NA (Please explain.) Comments:

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

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒Yes ☐ No ☐NA (Please explain.) 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 ☒NA (Please explain.) Comments:

There were no discrepancies reported by the laboratory.

e. Data quality or usability affected? (Please explain.)
Comments:

The laboratory did not note any affect on data quality or usability.

4. Case Narrative
a. Present and understandable?
☒Yes ☐ No ☐NA (Please explain.) Comments:

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

☒Yes ☐ No ☐NA (Please explain.) Comments:

The case narrative identifies the following discrepancies and observations:

Method(s) WS-LC-0025: The continuing calibration verification (CCV) associated with batch 109605 recovered Perfluorooctane Sulfonamide (FOSA) above the upper control limit. The following samples are affected: 95443 (320-18463-3), 411866 (320-18463-4), 454974 (320-18463-5) and 4527158 (320-18463-9). The samples associated with this CCV did not contain detectable quantities of the affected analytes, so the data were unaffected.

Method(s) WS-LC-0025: The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: 167754 (320-18463-1), 167854 (320-18463-2), 95443 (320-18463-3), 411866 (320-18463-4), 454974 (320-18463-5), 127311 (320-18463-6), 127230 (320-18463-7), 524565 (320-18463-8), 4527158 (320-18463-9), 526576 (320-18463-11), 526676 (320-18463-12) and 127523 (320-18463-13). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples. The data are considered unaffected.

Method(s) WS-LC-0025: Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for project sample MB 320-107572/1-A. Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 320-107572.

Method(s) 3535: The following samples were amber colored:167754 (320-18463-1), 167854 (320-18463-2), 95443 (320-18463-3), 411866 (320-18463-4), 454974 (320-18463-5), 127311 (320-18463-6), 127230 (320-18463-7), 524565 (320-18463-8), 4527158 (320-18463-9), 127124 (320-18463-10), 526576 (320-18463-11), 526676 (320-18463-12) and 127523 (320-18463-13). Samples 7 and 9 were clogged and took extra time to load into the columns.

c. Were all corrective actions documented?

☐Yes ☐ No ☒NA (Please explain.) Comments:

No corrective actions were required.

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

Comments:

The method reporting limit and organic preparation batch comments are not considered to affect data quality or usability.

IDA-recovery failures can affect data quality, and are discussed in Section 6c.

According to the laboratory, quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries. In addition, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which was achieved for all IDAs in the samples. See Section 6c for further comments.

5. Samples Results
   a. Correct analyses performed/reported as requested on COC?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

   b. All applicable holding times met?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

The hold time of seven days until extraction was met.

   c. All soils reported on a dry weight basis?
      ☐Yes ☐ No ☒NA (Please explain.) Comments:

No soil samples were submitted with this work order.

   d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

The PQL, equivalent to the TestAmerica Reporting Limit (RL), is less than the applicable EPA provisional drinking-water health advisory levels and the ADEC proposed groundwater-cleanup levels for perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA).

   e. Data quality or usability affected?
      Comments:

The data quality and usability were unaffected.

6. QC Samples
   a. Method Blank
      i. One method blank reported per matrix, analysis and 20 samples?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

      ii. All method blank results less than PQL?
      ☒Yes ☒ No ☐NA (Please explain.) Comments:

Two PFC analytes were detected in the MB at estimated concentrations less than their PQLs (reporting limits, or RLs). These analytes are Perfluorobutanoic acid (PFBA) and Perfluoro-n-hexadecanoic acid (PFHxDA).

iii. If above PQL, what samples are affected?

Comments:

All of the project samples were associated with the MB containing detectable perfluorinated compounds.

The concentration of PFBA detected in the method blank is considered to affect all project samples except 127230 and 127124. Those samples are considered unaffected because PFBA was detected at concentrations greater than ten times the concentration detected in the method blank. The PFHxDA concentration detected in the method blank is considered to affect all project samples because PFHxDA concentrations were present in all samples at concentrations greater than the method detection limit (MDL) and within a factor of five of the MB concentrations.

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

☒Yes ☐ No ☐NA (Please explain.) Comments:

The PFBA concentrations detected in project samples 167754, 167854, 411866, 127311, 526576, 526676, and 127523, are considered biased high by the method blank detection and flagged 'JH*' in the analytical results table.

The PFBA concentrations detected in project samples 95443, 454974, 524565, and 4527158, are considered not detected due to the method blank detection and flagged 'B*' at either the reported sample result or the PQL, whichever is higher.

The PFHxDA concentrations detected in all project samples are considered not detected and flagged 'B*' at either the reported sample result or the PQL, whichever is higher.

v. Data quality or usability affected? (Please explain.)

Comments:

Yes; see above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

☒Yes ☐ No ☐NA (Please explain.) Comments:

LCS/LCSD sample results were reported.

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

☐Yes ☐ No ☒NA (Please explain.) 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 ☐NA (Please explain.) Comments:

Yes; percent recoveries were between 60% and 140% or 150%, depending on the analytes, as required by the laboratory method.

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 ☐NA (Please explain.) Comments:

Yes; LCS/LCSD RPDs were less than the laboratory limit of 30%.

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

No samples were affected; percent recoveries and RPDs were within acceptable limits.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
☐Yes ☐ No ☒NA (Please explain.) Comments:

No data flags are required; see above.

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

The data quality and usability were unaffected.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
☒Yes ☐ No ☐NA (Please explain.) Comments:

The analytical method WS-LC-0025 uses Isotope Dilution Analyte (IDA) recovery, which entails adding a 13C-isotope of each target analyte and assessing the recovery of each analyte. The isotopically labeled compounds are the 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 ☐NA (Please explain.) Comments:

The recovery of 13C4 perfluorodecane sulfonate (PFOS) was outside the method-recommended limit of 25% to 150% for project sample 4527158. However, PFOS was not detected in the associated sample so no qualification is necessary.

With the exception of 13C8 perfluorooctane sulfonamide (FOSA), the percent recoveries are within the method-recommended limit of 25% to 150% for all project samples. The percent recovery for FOSA is below the method-recommended limit for each of the project samples except 127124. However, according to the laboratory, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which was achieved for all IDAs in the samples.

The percent recoveries of 13C5 perfluorononanoic acid (PFNA), 13C2 perfluorodecanoic acid (PFDA), 13C2 perfluoroundecanoic acid (PFUnA), 13C4 perfluorodecane sulfonate (PFOS), and 13C4 perfluoroheptanoic acid (PFHpA), were outside the method-recommended limit of 25% to 150% for the method blank 320-107572/1-A. However, according to the laboratory, quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

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

☐Yes ☐ No ☒NA (Please explain.) Comments:

The data did not require flags.

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

Comments:

The data quality and usability were unaffected.

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 ☒NA (Please explain.) Comments:

PFCs are not volatile compounds, so 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 ☒NA (Please explain.) Comments:

No trip blank is required; see above.

iii. All results less than PQL?

☐Yes ☐ No ☒NA (Please explain.) Comments:

No trip blank is required; see above.

iv. If above PQL, what samples are affected?

Comments:

No trip blank is required; see above.

v. Data quality or usability affected? (Please explain.)

Comments:

The data quality and usability were not affected.

e. Field Duplicate

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

☒Yes ☐ No ☐NA (Please explain.) Comments:

ii. Submitted blind to lab?

☒Yes ☐ No ☐NA (Please explain.) Comments:

The field duplicate pairs "167754" / "167854" and "526576" / "526676" 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: $\dfrac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

☐Yes ☒ No ☐NA (Please explain.) Comments:

For the field duplicat pair "167754" / "167854" the following analytes did not meet recommended RPD criteria: PFNA RPD = 36%, and PFHxDA RPD = 65%. The RPD values for the other PFC analytes, where calculable for detected results, meet QC criteria. For the field duplicate pair "526576" / "526676", the following analytes did not meet recommended RPD criteria: PFTeA RPD = 86%, and PFHpS RPD = 53%. The RPD values for the other PFC analytes, where calculable for detected results, meet QC criteria.

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

Comments:

Data quality for PFNA and PFHxDA results in the field duplicate pair "167754" / "167854" is considered affected. The results are considered estimated and flagged 'J*' where not already qualified.

Data quality for PFTeA and PFHpS results in the field duplicate pair "526576" / "526676" is considered affected. The results are considered estimated and flagged 'J*' where not already qualified.

f. Decontamination or Equipment Blank (If not used explain why).

☐Yes ☐ No ☒NA (Please explain.) Comments:

Reusable equipment was not used in sample collection for this work order, so an equipment blank is not required.

i. All results less than PQL?

☐Yes ☐ No ☒NA (Please explain.) Comments:

N/A; an equipment blank was not required.

ii. If above PQL, what samples are affected?

Comments:

N/A; an equipment blank was not required.

iii. Data quality or usability affected? (Please explain.)

Comments:

The data quality and usability were not affected.

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

a. Defined and appropriate?

☐Yes ☐ No ☒NA (Please explain.) Comments:

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: 320-19030-1
Client Project/Site: City of Fairbanks Fire Training Area

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

Attn: Julie Keener

Authorized for release by:
6/23/2016 12:22:49 PM

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

Table of Contents

Definitions/Glossary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*	Isotope Dilution analyte is outside acceptance limits.
*	LCS or LCSD is outside acceptance limits.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
H	Sample was prepped or analyzed beyond the specified holding time
*	RPD of the LCS and LCSD exceeds the control limits

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, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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: 320-19030-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-19030-1

Receipt
The samples were received on 5/20/2016 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.9º C.

LCMS
Method(s) WS-LC-0025: One or more of the Isotope Dilution Analyte (IDA) recoveries is above the method recommended limit for the following samples: 95630 (320-19030-1), 471542 (320-19030-3), 582573 (320-19030-4), 597517-1 (320-19030-6) and 515485 (320-19030-7). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method(s) WS-LC-0025: One or more of the The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: 471542 (320-19030-3), 582573 (320-19030-4), 593460-2 (320-19030-10), 593460-1 (320-19030-12), MW-207A (320-19030-14) and MW-504 (320-19030-15). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples.

Method(s) WS-LC-0025: The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for prep batch 110951 had low recoveries for Perfluoro-n-octandecanoic acid (PFODA). The samples were re-extracted out of hold time and the reanalysis has the LCS and LCSD in control for this compound. Both sets of data are reported for this compound. The following samples are impacted. 95630 (320-19030-1), 95730 (320-19030-2), 471542 (320-19030-3), 671300 (320-19030-5), 597517-1 (320-19030-6), 515485 (320-19030-7), (LCS 320-110951/2-A) and (LCSD 320-110951/3-A)

Method(s) WS-LC-0025: The laboratory control sample (LCS) and laboratory control sample duplicate for prep batch 111096 had low recovery for Perfluoro-n-octandecanoic acid (PFODA). The samples were re-extracted out of hold time and the reanalysis has the LCS and LCSD in control for this compound. Both sets of data are reported for this compound. The following samples are impacted. 597507 (320-19030-9), 593460-2 (320-19030-10), 563555-1 (320-19030-11), 593460-1 (320-19030-12), 597517-2 (320-19030-13), MW-207A (320-19030-14), MW-504 (320-19030-15), (LCS 320-111096/2-A), (320-18954-A-11-A), (320-18954-A-11-B MS) and (320-18954-A-11-C MSD)

Method(s) WS-LC-0025: The laboratory control sample duplicate (LCSD) for prep batch 112821 recovered outside control limits for the following analytes: Perfluoro-n-octandecanoic acid (PFODA). The samples were either non-detect or J flagged below the reporting limit with the exception of samples 597507 (320-19030-9), which was detected at the reporting limit. As this was a re-extraction, no additional sample remains to perfom another extraction.

Method(s) WS-LC-0025: Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for the following sample: 563555-1 (320-19030-11). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method(s) WS-LC-0025: The following sample was re-extracted in prep batch 103509 but the analysis shows the sample wasn't spiked with the IDA compounds so it can't be quantified for perfluoro-n-octandecanoic acid (PFODA). The sample was used up in the re-extraction so a second re-extraction isn't possible. The original results are reported for this sample. 582573 (320-19030-4)

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

Organic Prep
Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 320-110951.

Method(s) 3535: These samples 95630 (320-19030-1), 95730 (320-19030-2), 471542 (320-19030-3), 582573 (320-19030-4), 671300 (320-19030-5), 597517-1 (320-19030-6), 515485 (320-19030-7) and 521779 (320-19030-8) came with a light yellowish orange color, but there was no sediment on the bottom.

Method(s) 3535: These samples 597507 (320-19030-9), 593460-2 (320-19030-10), 563555-1 (320-19030-11), 593460-1

Job ID: 320-19030-1 (Continued)

Laboratory: TestAmerica Sacramento (Continued)

(320-19030-12), 597517-2 (320-19030-13), MW-207A (320-19030-14) and MW-504 (320-19030-15) contain an orange color.

Method(s) 3535: These samples MW-207A (320-19030-14) and MW-504 (320-19030-15) came in containing some kind of dark orange residue on the bottom.

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 320-112821.

Method(s) 3535: The following samples 597507 (320-19030-9), 593460-2 (320-19030-10), 563555-1 (320-19030-11), 593460-1 (320-19030-12), 597517-2 (320-19030-13), MW-207A (320-19030-14) and MW-504 (320-19030-15) was re-prepared outside of preparation holding time due to low recovery in the LCS. Therefore, a second bottle was used for the re-extraction.

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with analytical batch 320-113509.

Method(s) 3535: The following samples 95630 (320-19030-1), 95730 (320-19030-2), 471542 (320-19030-3), 582573 (320-19030-4), 671300 (320-19030-5), 597517-1 (320-19030-6), 515485 (320-19030-7) and 521779 (320-19030-8) was re-prepared outside of preparation holding time due to low LCS and LCSD recoveries for one compound.

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

Detection Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

Client Sample ID: 95630 — Lab Sample ID: 320-19030-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.7	B	1.9	0.43	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	5.9	B	1.9	0.92	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	6.7		1.9	0.73	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.9		1.9	0.75	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	4.1		1.9	0.70	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.75	J	1.9	0.61	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.42	J	1.9	0.41	ng/L	1		WS-LC-0025	Total/NA
Perfluorododecanoic acid (PFDoA)	0.57	J	1.9	0.55	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.3	J B	1.9	0.19	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	2.4		1.9	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA)	2.0	*	1.9	0.63	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	2.4		1.9	0.86	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	12		1.9	0.81	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	16		1.9	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA) - RE	4.3	H	1.9	0.65	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 95730 — Lab Sample ID: 320-19030-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.1	B	1.8	0.41	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	6.1	B	1.8	0.89	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	7.4		1.8	0.70	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.6		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	4.2		1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.96	J	1.8	0.59	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.55	J	1.8	0.39	ng/L	1		WS-LC-0025	Total/NA
Perfluorododecanoic acid (PFDoA)	0.57	J	1.8	0.52	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.99	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.78	J	1.8	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA)	1.6	J *	1.8	0.60	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	2.6		1.8	0.82	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	15		1.8	0.78	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	17		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA) - RE	3.7	H	1.9	0.63	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 471542 — Lab Sample ID: 320-19030-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.2	B	1.8	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	2.2	B	1.8	0.87	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	1.4	J	1.8	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.0	J	1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	1.2	J	1.8	0.66	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.40	J	1.8	0.39	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.1	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

Client Sample ID: 471542 (Continued) — Lab Sample ID: 320-19030-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoro-n-hexadecanoic acid (PFHxDA)	1.8		1.8	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA)	2.2	*	1.8	0.59	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	0.93	J	1.8	0.81	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	2.0		1.8	0.77	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA) - RE	2.6	H	1.9	0.65	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 582573 — Lab Sample ID: 320-19030-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.3	B	1.8	0.42	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	2.4	B	1.8	0.90	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	3.1		1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.2	J	1.8	0.73	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	1.7	J	1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorododecanoic acid (PFDoA)	0.57	J	1.8	0.53	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.2	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA)	0.89	J *	1.8	0.61	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	1.5	J	1.8	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	8.5		1.8	0.79	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	11		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 671300 — Lab Sample ID: 320-19030-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	7.4	B	1.8	0.41	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	8.3	B	1.8	0.88	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	8.0		1.8	0.70	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.0		1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	6.3		1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	1.5	J	1.8	0.58	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.86	J	1.8	0.39	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.3	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.62	J	1.8	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA)	2.1	*	1.8	0.60	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	2.4		1.8	0.82	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	12		1.8	0.78	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	20		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA) - RE	1.6	J H	1.8	0.62	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 597517-1 — Lab Sample ID: 320-19030-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	3.8	B	1.8	0.42	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	6.8	B	1.8	0.90	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	6.8		1.8	0.71	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

Client Sample ID: 597517-1 (Continued) — Lab Sample ID: 320-19030-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	3.2		1.8	0.73	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	4.5		1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.86	J	1.8	0.59	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.96	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA)	0.84	J *	1.8	0.61	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	3.2		1.8	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	22		1.8	0.79	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	12		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 515485 — Lab Sample ID: 320-19030-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	8.5	B	1.8	0.41	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	10	B	1.8	0.89	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	8.7		1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.2		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	6.1		1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	1.0	J	1.8	0.59	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.90	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	2.4		1.8	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	14		1.8	0.78	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	24		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonamide (FOSA)	0.65	J	1.8	0.57	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 521779 — Lab Sample ID: 320-19030-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.0	B	1.8	0.41	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	4.9	B	1.8	0.89	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	4.6		1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.0		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	2.7		1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.75	J	1.8	0.59	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.86	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA)	2.8	*	1.8	0.61	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	1.6	J	1.8	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	8.3		1.8	0.79	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	9.3		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 597507 — Lab Sample ID: 320-19030-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	1.5	J B	1.8	0.41	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	1.6	J	1.8	0.89	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	2.3		1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.1	J	1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	3.7		1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	1.8		1.8	0.59	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	1.8		1.8	0.40	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

Client Sample ID: 597507 (Continued) — Lab Sample ID: 320-19030-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroundecanoic acid (PFUnA)	0.90	J B	1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorododecanoic acid (PFDoA)	0.58	J	1.8	0.53	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.79	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	4.0		1.8	0.79	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	11		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA) - RE	1.5	J H B *	1.9	0.63	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 593460-2 — Lab Sample ID: 320-19030-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.8	B	1.8	0.41	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	4.4		1.8	0.88	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	5.3		1.8	0.70	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.7	J	1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	5.5		1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	2.8		1.8	0.58	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	1.6	J	1.8	0.39	ng/L	1		WS-LC-0025	Total/NA
Perfluoroundecanoic acid (PFUnA)	1.1	J B	1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorododecanoic acid (PFDoA)	0.88	J	1.8	0.52	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.1	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.96	J	1.8	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	1.9		1.8	0.82	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	12		1.8	0.78	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-1-heptanesulfonate (PFHpS)	0.75	J	1.8	0.64	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	31		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonamide (FOSA)	10		1.8	0.57	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA) - RE	1.9	H B *	1.9	0.64	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 563555-1 — Lab Sample ID: 320-19030-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoropentanoic acid (PFPeA)	1.7	J	1.8	0.89	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	1.3	J	1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	0.94	J	1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.69	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	1.3	J	1.8	0.79	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	2.3		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA) - RE	0.67	J H B	1.9	0.63	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 593460-1 — Lab Sample ID: 320-19030-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.8	B	1.8	0.42	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	3.1		1.8	0.91	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	3.9		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.7	J	1.8	0.73	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	3.1		1.8	0.69	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 593460-1 (Continued) — Lab Sample ID: 320-19030-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorononanoic acid (PFNA)	1.2	J	1.8	0.60	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.91	J	1.8	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.83	J B	1.8	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.0	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.44	J	1.8	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	1.8		1.8	0.84	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	7.5		1.8	0.80	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	17		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonamide (FOSA)	1.1	J	1.8	0.58	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA) - RE	1.2	J H B	1.9	0.64	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 597517-2 — Lab Sample ID: 320-19030-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	3.5	B	1.8	0.41	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	7.5		1.8	0.88	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	13		1.8	0.70	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.5		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	5.7		1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.68	J	1.8	0.59	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.82	J	1.8	0.39	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.78	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	8.1		1.8	0.82	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	40		1.8	0.78	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-1-heptanesulfonate (PFHpS)	1.4	J	1.8	0.64	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	38		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA) - RE	0.89	J H B	1.9	0.63	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: MW-207A — Lab Sample ID: 320-19030-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	3.3	B	1.7	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	5.2		1.7	0.86	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	9.5		1.7	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.4		1.7	0.70	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	4.7		1.7	0.65	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.71	J	1.7	0.57	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.82	J B	1.7	0.17	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.30	J	1.7	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	3.7		1.7	0.80	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	21		1.7	0.76	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-1-heptanesulfonate (PFHpS)	1.3	J	1.7	0.62	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	38		1.7	1.1	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: MW-504 — Lab Sample ID: 320-19030-15

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

Client Sample ID: MW-504 (Continued)

Lab Sample ID: 320-19030-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	4.8		1.8	0.70	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.0	J	1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	2.6		1.8	0.66	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.76	J B	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	1.1	J	1.8	0.81	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	0.88	J	1.8	0.77	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	1.7	J	1.8	1.1	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 95630

Date Collected: 05/16/16 10:46
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-1

Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	4.7	B	1.9	0.43	ng/L		05/23/16 12:30	06/10/16 00:42	1
Perfluoropentanoic acid (PFPeA)	5.9	B	1.9	0.92	ng/L		05/23/16 12:30	06/10/16 00:42	1
Perfluorohexanoic acid (PFHxA)	6.7		1.9	0.73	ng/L		05/23/16 12:30	06/10/16 00:42	1
Perfluoroheptanoic acid (PFHpA)	2.9		1.9	0.75	ng/L		05/23/16 12:30	06/10/16 00:42	1
Perfluorooctanoic acid (PFOA)	4.1		1.9	0.70	ng/L		05/23/16 12:30	06/10/16 00:42	1
Perfluorononanoic acid (PFNA)	0.75	J	1.9	0.61	ng/L		05/23/16 12:30	06/10/16 00:42	1
Perfluorodecanoic acid (PFDA)	0.42	J	1.9	0.41	ng/L		05/23/16 12:30	06/10/16 00:42	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	0.70	ng/L		05/23/16 12:30	06/10/16 00:42	1
Perfluorododecanoic acid (PFDoA)	0.57	J	1.9	0.55	ng/L		05/23/16 12:30	06/10/16 00:42	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.9	0.52	ng/L		05/23/16 12:30	06/10/16 00:42	1
Perfluorotetradecanoic acid (PFTeA)	1.3	J B	1.9	0.19	ng/L		05/23/16 12:30	06/10/16 00:42	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	2.4		1.9	0.11	ng/L		05/23/16 12:30	06/10/16 00:42	1
Perfluoro-n-octandecanoic acid (PFODA)	2.0	*	1.9	0.63	ng/L		05/23/16 12:30	06/10/16 00:42	1
Perfluorobutane Sulfonate (PFBS)	2.4		1.9	0.86	ng/L		05/23/16 12:30	06/10/16 00:42	1
Perfluorohexane Sulfonate (PFHxS)	12		1.9	0.81	ng/L		05/23/16 12:30	06/10/16 00:42	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.9	0.67	ng/L		05/23/16 12:30	06/10/16 00:42	1
Perfluorodecane sulfonate (PFDS)	ND		1.9	1.1	ng/L		05/23/16 12:30	06/10/16 00:42	1
Perfluorooctane Sulfonate (PFOS)	16		1.9	1.2	ng/L		05/23/16 12:30	06/10/16 00:42	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.9	0.60	ng/L		05/23/16 12:30	06/10/16 00:42	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*39*		*25 - 150*	*05/23/16 12:30*	*06/10/16 00:42*	*1*
13C4 PFBA	*84*		*25 - 150*	*05/23/16 12:30*	*06/10/16 00:42*	*1*
13C2 PFHxA	*119*		*25 - 150*	*05/23/16 12:30*	*06/10/16 00:42*	*1*
13C4 PFOA	*133*		*25 - 150*	*05/23/16 12:30*	*06/10/16 00:42*	*1*
13C5 PFNA	*119*		*25 - 150*	*05/23/16 12:30*	*06/10/16 00:42*	*1*
13C2 PFDA	*124*		*25 - 150*	*05/23/16 12:30*	*06/10/16 00:42*	*1*
13C2 PFUnA	*136*		*25 - 150*	*05/23/16 12:30*	*06/10/16 00:42*	*1*
13C2 PFDoA	*127*		*25 - 150*	*05/23/16 12:30*	*06/10/16 00:42*	*1*
18O2 PFHxS	*152*	*	*25 - 150*	*05/23/16 12:30*	*06/10/16 00:42*	*1*
13C4 PFOS	*153*	*	*25 - 150*	*05/23/16 12:30*	*06/10/16 00:42*	*1*
13C4-PFHpA	*126*		*25 - 150*	*05/23/16 12:30*	*06/10/16 00:42*	*1*
13C5 PFPeA	*120*		*25 - 150*	*05/23/16 12:30*	*06/10/16 00:42*	*1*

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid (PFODA)	4.3	H	1.9	0.65	ng/L		06/13/16 09:50	06/16/16 08:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDoA	*118*		*25 - 150*	*06/13/16 09:50*	*06/16/16 08:51*	*1*

Client Sample ID: 95730
Date Collected: 05/16/16 10:50
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-2
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	4.1	B	1.8	0.41	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluoropentanoic acid (PFPeA)	6.1	B	1.8	0.89	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorohexanoic acid (PFHxA)	7.4		1.8	0.70	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluoroheptanoic acid (PFHpA)	2.6		1.8	0.72	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorooctanoic acid (PFOA)	4.2		1.8	0.67	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorononanoic acid (PFNA)	0.96	J	1.8	0.59	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorodecanoic acid (PFDA)	0.55	J	1.8	0.39	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.67	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorododecanoic acid (PFDoA)	0.57	J	1.8	0.52	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.49	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorotetradecanoic acid (PFTeA)	0.99	J B	1.8	0.18	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.78	J	1.8	0.11	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluoro-n-octandecanoic acid (PFODA)	1.6	J *	1.8	0.60	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorobutane Sulfonate (PFBS)	2.6		1.8	0.82	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorohexane Sulfonate (PFHxS)	15		1.8	0.78	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.64	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorooctane Sulfonate (PFOS)	17		1.8	1.1	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.57	ng/L		05/23/16 12:30	06/10/16 01:04	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*37*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:04*	*1*
13C4 PFBA	*78*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:04*	*1*
13C2 PFHxA	*113*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:04*	*1*
13C4 PFOA	*124*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:04*	*1*
13C5 PFNA	*114*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:04*	*1*
13C2 PFDA	*115*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:04*	*1*
13C2 PFUnA	*125*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:04*	*1*
13C2 PFDoA	*123*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:04*	*1*
18O2 PFHxS	*136*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:04*	*1*
13C4 PFOS	*147*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:04*	*1*
13C4-PFHpA	*119*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:04*	*1*
13C5 PFPeA	*114*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:04*	*1*

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid (PFODA)	3.7	H	1.9	0.63	ng/L		06/13/16 09:50	06/16/16 09:12	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDoA	*100*		*25 - 150*	*06/13/16 09:50*	*06/16/16 09:12*	*1*

Client Sample ID: 471542
Date Collected: 05/16/16 11:34
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-3
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**2.2**	**B**	1.8	0.40	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluoropentanoic acid (PFPeA)	**2.2**	**B**	1.8	0.87	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorohexanoic acid (PFHxA)	**1.4**	**J**	1.8	0.69	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluoroheptanoic acid (PFHpA)	**1.0**	**J**	1.8	0.71	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorooctanoic acid (PFOA)	**1.2**	**J**	1.8	0.66	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.58	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorodecanoic acid (PFDA)	**0.40**	**J**	1.8	0.39	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.66	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.51	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.49	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorotetradecanoic acid (PFTeA)	**1.1**	**J B**	1.8	0.18	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	**1.8**		1.8	0.11	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluoro-n-octandecanoic acid (PFODA)	**2.2**	*****	1.8	0.59	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorobutane Sulfonate (PFBS)	**0.93**	**J**	1.8	0.81	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorohexane Sulfonate (PFHxS)	**2.0**		1.8	0.77	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.63	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorooctane Sulfonate (PFOS)	ND		1.8	1.1	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.56	ng/L		05/23/16 12:30	06/10/16 01:25	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*6*	*	*25 - 150*	*05/23/16 12:30*	*06/10/16 01:25*	*1*
13C4 PFBA	*81*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:25*	*1*
13C2 PFHxA	*103*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:25*	*1*
13C4 PFOA	*95*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:25*	*1*
13C5 PFNA	*77*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:25*	*1*
13C2 PFDA	*65*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:25*	*1*
13C2 PFUnA	*70*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:25*	*1*
13C2 PFDoA	*77*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:25*	*1*
18O2 PFHxS	*144*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:25*	*1*
13C4 PFOS	*151*	*	*25 - 150*	*05/23/16 12:30*	*06/10/16 01:25*	*1*
13C4-PFHpA	*107*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:25*	*1*
13C5 PFPeA	*106*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:25*	*1*

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid (PFODA)	**2.6**	**H**	1.9	0.65	ng/L		06/13/16 09:50	06/16/16 09:34	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDoA	*83*		*25 - 150*	*06/13/16 09:50*	*06/16/16 09:34*	*1*

Client Sample ID: 582573

Date Collected: 05/16/16 12:41
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-4

Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**2.3**	**B**	1.8	0.42	ng/L		05/23/16 12:30	06/10/16 01:46	1
Perfluoropentanoic acid (PFPeA)	**2.4**	**B**	1.8	0.90	ng/L		05/23/16 12:30	06/10/16 01:46	1
Perfluorohexanoic acid (PFHxA)	**3.1**		1.8	0.71	ng/L		05/23/16 12:30	06/10/16 01:46	1
Perfluoroheptanoic acid (PFHpA)	**1.2**	**J**	1.8	0.73	ng/L		05/23/16 12:30	06/10/16 01:46	1
Perfluorooctanoic acid (PFOA)	**1.7**	**J**	1.8	0.68	ng/L		05/23/16 12:30	06/10/16 01:46	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.59	ng/L		05/23/16 12:30	06/10/16 01:46	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.40	ng/L		05/23/16 12:30	06/10/16 01:46	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.68	ng/L		05/23/16 12:30	06/10/16 01:46	1
Perfluorododecanoic acid (PFDoA)	**0.57**	**J**	1.8	0.53	ng/L		05/23/16 12:30	06/10/16 01:46	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		05/23/16 12:30	06/10/16 01:46	1
Perfluorotetradecanoic acid (PFTeA)	**1.2**	**J B**	1.8	0.18	ng/L		05/23/16 12:30	06/10/16 01:46	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	ND		1.8	0.11	ng/L		05/23/16 12:30	06/10/16 01:46	1
Perfluoro-n-octandecanoic acid (PFODA)	**0.89**	**J ***	1.8	0.61	ng/L		05/23/16 12:30	06/10/16 01:46	1
Perfluorobutane Sulfonate (PFBS)	**1.5**	**J**	1.8	0.83	ng/L		05/23/16 12:30	06/10/16 01:46	1
Perfluorohexane Sulfonate (PFHxS)	**8.5**		1.8	0.79	ng/L		05/23/16 12:30	06/10/16 01:46	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.65	ng/L		05/23/16 12:30	06/10/16 01:46	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/23/16 12:30	06/10/16 01:46	1
Perfluorooctane Sulfonate (PFOS)	**11**		1.8	1.2	ng/L		05/23/16 12:30	06/10/16 01:46	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.58	ng/L		05/23/16 12:30	06/10/16 01:46	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*8*	*	*25 - 150*	*05/23/16 12:30*	*06/10/16 01:46*	*1*
13C4 PFBA	*88*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:46*	*1*
13C2 PFHxA	*114*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:46*	*1*
13C4 PFOA	*129*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:46*	*1*
13C5 PFNA	*105*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:46*	*1*
13C2 PFDA	*93*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:46*	*1*
13C2 PFUnA	*121*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:46*	*1*
13C2 PFDoA	*110*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:46*	*1*
18O2 PFHxS	*160*	*	*25 - 150*	*05/23/16 12:30*	*06/10/16 01:46*	*1*
13C4 PFOS	*145*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:46*	*1*
13C4-PFHpA	*114*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:46*	*1*
13C5 PFPeA	*114*		*25 - 150*	*05/23/16 12:30*	*06/10/16 01:46*	*1*

Client Sample ID: 671300

Date Collected: 05/16/16 14:24
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-5

Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**7.4**	**B**	1.8	0.41	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluoropentanoic acid (PFPeA)	**8.3**	**B**	1.8	0.88	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluorohexanoic acid (PFHxA)	**8.0**		1.8	0.70	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluoroheptanoic acid (PFHpA)	**4.0**		1.8	0.71	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluorooctanoic acid (PFOA)	**6.3**		1.8	0.67	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluorononanoic acid (PFNA)	**1.5**	**J**	1.8	0.58	ng/L		05/23/16 12:30	06/10/16 02:07	1

Client Sample ID: 671300
Date Collected: 05/16/16 14:24
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-5
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanoic acid (PFDA)	**0.86**	**J**	1.8	0.39	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.67	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.52	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.49	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluorotetradecanoic acid (PFTeA)	**1.3**	**J B**	1.8	0.18	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	**0.62**	**J**	1.8	0.11	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluoro-n-octandecanoic acid (PFODA)	**2.1**	*****	1.8	0.60	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluorobutane Sulfonate (PFBS)	**2.4**		1.8	0.82	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluorohexane Sulfonate (PFHxS)	**12**		1.8	0.78	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.64	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluorooctane Sulfonate (PFOS)	**20**		1.8	1.1	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.57	ng/L		05/23/16 12:30	06/10/16 02:07	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*38*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:07*	*1*
13C4 PFBA	*52*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:07*	*1*
13C2 PFHxA	*114*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:07*	*1*
13C4 PFOA	*132*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:07*	*1*
13C5 PFNA	*131*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:07*	*1*
13C2 PFDA	*123*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:07*	*1*
13C2 PFUnA	*131*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:07*	*1*
13C2 PFDoA	*102*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:07*	*1*
18O2 PFHxS	*137*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:07*	*1*
13C4 PFOS	*129*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:07*	*1*
13C4-PFHpA	*124*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:07*	*1*
13C5 PFPeA	*107*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:07*	*1*

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid (PFODA)	**1.6**	**J H**	1.8	0.62	ng/L		06/13/16 09:50	06/16/16 10:16	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDoA	*134*		*25 - 150*	*06/13/16 09:50*	*06/16/16 10:16*	*1*

Client Sample ID: 597517-1
Date Collected: 05/16/16 16:21
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-6
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**3.8**	**B**	1.8	0.42	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluoropentanoic acid (PFPeA)	**6.8**	**B**	1.8	0.90	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorohexanoic acid (PFHxA)	**6.8**		1.8	0.71	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluoroheptanoic acid (PFHpA)	**3.2**		1.8	0.73	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorooctanoic acid (PFOA)	**4.5**		1.8	0.68	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorononanoic acid (PFNA)	**0.86**	**J**	1.8	0.59	ng/L		05/23/16 12:30	06/10/16 02:29	1

Client Sample ID: 597517-1

Date Collected: 05/16/16 16:21
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-6

Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanoic acid (PFDA)	ND		1.8	0.40	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.68	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.53	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorotetradecanoic acid (PFTeA)	**0.96**	**J B**	1.8	0.18	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	ND		1.8	0.11	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluoro-n-octandecanoic acid (PFODA)	**0.84**	**J ***	1.8	0.61	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorobutane Sulfonate (PFBS)	**3.2**		1.8	0.83	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorohexane Sulfonate (PFHxS)	**22**		1.8	0.79	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.65	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorooctane Sulfonate (PFOS)	**12**		1.8	1.2	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.58	ng/L		05/23/16 12:30	06/10/16 02:29	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*47*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:29*	*1*
13C4 PFBA	*66*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:29*	*1*
13C2 PFHxA	*118*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:29*	*1*
13C4 PFOA	*135*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:29*	*1*
13C5 PFNA	*130*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:29*	*1*
13C2 PFDA	*134*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:29*	*1*
13C2 PFUnA	*149*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:29*	*1*
13C2 PFDoA	*129*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:29*	*1*
18O2 PFHxS	*151*	*	*25 - 150*	*05/23/16 12:30*	*06/10/16 02:29*	*1*
13C4 PFOS	*146*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:29*	*1*
13C4-PFHpA	*116*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:29*	*1*
13C5 PFPeA	*117*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:29*	*1*

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid (PFODA)	ND	H	1.8	0.60	ng/L		06/13/16 09:50	06/16/16 11:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDoA	*125*		*25 - 150*	*06/13/16 09:50*	*06/16/16 11:41*	*1*

Client Sample ID: 515485

Date Collected: 05/16/16 17:10
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-7

Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**8.5**	**B**	1.8	0.41	ng/L		05/23/16 12:30	06/10/16 02:50	1
Perfluoropentanoic acid (PFPeA)	**10**	**B**	1.8	0.89	ng/L		05/23/16 12:30	06/10/16 02:50	1
Perfluorohexanoic acid (PFHxA)	**8.7**		1.8	0.71	ng/L		05/23/16 12:30	06/10/16 02:50	1
Perfluoroheptanoic acid (PFHpA)	**4.2**		1.8	0.72	ng/L		05/23/16 12:30	06/10/16 02:50	1
Perfluorooctanoic acid (PFOA)	**6.1**		1.8	0.67	ng/L		05/23/16 12:30	06/10/16 02:50	1
Perfluorononanoic acid (PFNA)	**1.0**	**J**	1.8	0.59	ng/L		05/23/16 12:30	06/10/16 02:50	1

Client Sample ID: 515485

Date Collected: 05/16/16 17:10
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-7
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanoic acid (PFDA)	ND		1.8	0.40	ng/L		05/23/16 12:30	06/10/16 02:50	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.67	ng/L		05/23/16 12:30	06/10/16 02:50	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.53	ng/L		05/23/16 12:30	06/10/16 02:50	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		05/23/16 12:30	06/10/16 02:50	1
Perfluorotetradecanoic acid (PFTeA)	**0.90**	**J B**	1.8	0.18	ng/L		05/23/16 12:30	06/10/16 02:50	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	ND		1.8	0.11	ng/L		05/23/16 12:30	06/10/16 02:50	1
Perfluoro-n-octandecanoic acid (PFODA)	ND	*	1.8	0.61	ng/L		05/23/16 12:30	06/10/16 02:50	1
Perfluorobutane Sulfonate (PFBS)	**2.4**		1.8	0.83	ng/L		05/23/16 12:30	06/10/16 02:50	1
Perfluorohexane Sulfonate (PFHxS)	**14**		1.8	0.78	ng/L		05/23/16 12:30	06/10/16 02:50	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.64	ng/L		05/23/16 12:30	06/10/16 02:50	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/23/16 12:30	06/10/16 02:50	1
Perfluorooctane Sulfonate (PFOS)	**24**		1.8	1.1	ng/L		05/23/16 12:30	06/10/16 02:50	1
Perfluorooctane Sulfonamide (FOSA)	**0.65**	**J**	1.8	0.57	ng/L		05/23/16 12:30	06/10/16 02:50	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*64*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:50*	*1*
13C4 PFBA	*55*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:50*	*1*
13C2 PFHxA	*111*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:50*	*1*
13C4 PFOA	*126*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:50*	*1*
13C5 PFNA	*126*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:50*	*1*
13C2 PFDA	*133*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:50*	*1*
13C2 PFUnA	*151*	*	*25 - 150*	*05/23/16 12:30*	*06/10/16 02:50*	*1*
13C2 PFDoA	*132*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:50*	*1*
18O2 PFHxS	*137*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:50*	*1*
13C4 PFOS	*127*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:50*	*1*
13C4-PFHpA	*126*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:50*	*1*
13C5 PFPeA	*105*		*25 - 150*	*05/23/16 12:30*	*06/10/16 02:50*	*1*

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid (PFODA)	ND	H	1.8	0.62	ng/L		06/13/16 09:50	06/16/16 12:03	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDoA	*131*		*25 - 150*	*06/13/16 09:50*	*06/16/16 12:03*	*1*

Client Sample ID: 521779

Date Collected: 05/16/16 15:10
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-8
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**4.0**	**B**	1.8	0.41	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluoropentanoic acid (PFPeA)	**4.9**	**B**	1.8	0.89	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorohexanoic acid (PFHxA)	**4.6**		1.8	0.71	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluoroheptanoic acid (PFHpA)	**2.0**		1.8	0.72	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorooctanoic acid (PFOA)	**2.7**		1.8	0.68	ng/L		05/23/16 12:30	06/10/16 04:15	1

Client Sample ID: 521779
Date Collected: 05/16/16 15:10
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-8
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	**0.75**	**J**	1.8	0.59	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.40	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.68	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.53	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorotetradecanoic acid (PFTeA)	**0.86**	**J B**	1.8	0.18	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	ND		1.8	0.11	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluoro-n-octandecanoic acid (PFODA)	**2.8**	*****	1.8	0.61	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorobutane Sulfonate (PFBS)	**1.6**	**J**	1.8	0.83	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorohexane Sulfonate (PFHxS)	**8.3**		1.8	0.79	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.64	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorooctane Sulfonate (PFOS)	**9.3**		1.8	1.2	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.58	ng/L		05/23/16 12:30	06/10/16 04:15	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*61*		*25 - 150*	*05/23/16 12:30*	*06/10/16 04:15*	*1*
13C4 PFBA	*76*		*25 - 150*	*05/23/16 12:30*	*06/10/16 04:15*	*1*
13C2 PFHxA	*119*		*25 - 150*	*05/23/16 12:30*	*06/10/16 04:15*	*1*
13C4 PFOA	*134*		*25 - 150*	*05/23/16 12:30*	*06/10/16 04:15*	*1*
13C5 PFNA	*125*		*25 - 150*	*05/23/16 12:30*	*06/10/16 04:15*	*1*
13C2 PFDA	*126*		*25 - 150*	*05/23/16 12:30*	*06/10/16 04:15*	*1*
13C2 PFUnA	*140*		*25 - 150*	*05/23/16 12:30*	*06/10/16 04:15*	*1*
13C2 PFDoA	*130*		*25 - 150*	*05/23/16 12:30*	*06/10/16 04:15*	*1*
18O2 PFHxS	*130*		*25 - 150*	*05/23/16 12:30*	*06/10/16 04:15*	*1*
13C4 PFOS	*134*		*25 - 150*	*05/23/16 12:30*	*06/10/16 04:15*	*1*
13C4-PFHpA	*129*		*25 - 150*	*05/23/16 12:30*	*06/10/16 04:15*	*1*
13C5 PFPeA	*124*		*25 - 150*	*05/23/16 12:30*	*06/10/16 04:15*	*1*

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid (PFODA)	ND	H	1.8	0.60	ng/L		06/13/16 09:50	06/16/16 12:24	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDoA	*127*		*25 - 150*	*06/13/16 09:50*	*06/16/16 12:24*	*1*

Client Sample ID: 597507
Date Collected: 05/17/16 11:56
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-9
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**1.5**	**J B**	1.8	0.41	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluoropentanoic acid (PFPeA)	**1.6**	**J**	1.8	0.89	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluorohexanoic acid (PFHxA)	**2.3**		1.8	0.71	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluoroheptanoic acid (PFHpA)	**1.1**	**J**	1.8	0.72	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluorooctanoic acid (PFOA)	**3.7**		1.8	0.68	ng/L		05/24/16 12:47	06/02/16 20:40	1

Client Sample ID: 597507
Date Collected: 05/17/16 11:56
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-9
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	1.8		1.8	0.59	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluorodecanoic acid (PFDA)	1.8		1.8	0.40	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluoroundecanoic acid (PFUnA)	0.90	J B	1.8	0.68	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluorododecanoic acid (PFDoA)	0.58	J	1.8	0.53	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluorotetradecanoic acid (PFTeA)	0.79	J B	1.8	0.18	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	ND		1.8	0.11	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.8	0.61	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluorobutane Sulfonate (PFBS)	ND		1.8	0.83	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluorohexane Sulfonate (PFHxS)	4.0		1.8	0.79	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.64	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluorooctane Sulfonate (PFOS)	11		1.8	1.2	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.58	ng/L		05/24/16 12:47	06/02/16 20:40	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*47*		*25 - 150*	*05/24/16 12:47*	*06/02/16 20:40*	*1*
13C4 PFBA	*60*		*25 - 150*	*05/24/16 12:47*	*06/02/16 20:40*	*1*
13C2 PFHxA	*101*		*25 - 150*	*05/24/16 12:47*	*06/02/16 20:40*	*1*
13C4 PFOA	*113*		*25 - 150*	*05/24/16 12:47*	*06/02/16 20:40*	*1*
13C5 PFNA	*100*		*25 - 150*	*05/24/16 12:47*	*06/02/16 20:40*	*1*
13C2 PFDA	*96*		*25 - 150*	*05/24/16 12:47*	*06/02/16 20:40*	*1*
13C2 PFUnA	*99*		*25 - 150*	*05/24/16 12:47*	*06/02/16 20:40*	*1*
13C2 PFDoA	*93*		*25 - 150*	*05/24/16 12:47*	*06/02/16 20:40*	*1*
18O2 PFHxS	*116*		*25 - 150*	*05/24/16 12:47*	*06/02/16 20:40*	*1*
13C4 PFOS	*99*		*25 - 150*	*05/24/16 12:47*	*06/02/16 20:40*	*1*
13C4-PFHpA	*106*		*25 - 150*	*05/24/16 12:47*	*06/02/16 20:40*	*1*
13C5 PFPeA	*85*		*25 - 150*	*05/24/16 12:47*	*06/02/16 20:40*	*1*

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid (PFODA)	1.5	J H B *	1.9	0.63	ng/L		06/07/16 11:40	06/12/16 12:28	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDoA	*101*		*25 - 150*	*06/07/16 11:40*	*06/12/16 12:28*	*1*

Client Sample ID: 593460-2
Date Collected: 05/17/16 14:02
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-10
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	2.8	B	1.8	0.41	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluoropentanoic acid (PFPeA)	4.4		1.8	0.88	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluorohexanoic acid (PFHxA)	5.3		1.8	0.70	ng/L		05/24/16 12:47	06/02/16 21:01	1

Client Sample ID: 593460-2

Date Collected: 05/17/16 14:02
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-10

Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.7	J	1.8	0.72	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluorooctanoic acid (PFOA)	5.5		1.8	0.67	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluorononanoic acid (PFNA)	2.8		1.8	0.58	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluorodecanoic acid (PFDA)	1.6	J	1.8	0.39	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluoroundecanoic acid (PFUnA)	1.1	J B	1.8	0.67	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluorododecanoic acid (PFDoA)	0.88	J	1.8	0.52	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.49	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluorotetradecanoic acid (PFTeA)	1.1	J B	1.8	0.18	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.96	J	1.8	0.11	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.8	0.60	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluorobutane Sulfonate (PFBS)	1.9		1.8	0.82	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluorohexane Sulfonate (PFHxS)	12		1.8	0.78	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluoro-1-heptanesulfonate (PFHpS)	0.75	J	1.8	0.64	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluorooctane Sulfonate (PFOS)	31		1.8	1.1	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluorooctane Sulfonamide (FOSA)	10		1.8	0.57	ng/L		05/24/16 12:47	06/02/16 21:01	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*3*	*	*25 - 150*	*05/24/16 12:47*	*06/02/16 21:01*	*1*
13C4 PFBA	*72*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:01*	*1*
13C2 PFHxA	*102*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:01*	*1*
13C4 PFOA	*90*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:01*	*1*
13C5 PFNA	*64*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:01*	*1*
13C2 PFDA	*52*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:01*	*1*
13C2 PFUnA	*57*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:01*	*1*
13C2 PFDoA	*61*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:01*	*1*
18O2 PFHxS	*123*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:01*	*1*
13C4 PFOS	*103*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:01*	*1*
13C4-PFHpA	*105*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:01*	*1*
13C5 PFPeA	*83*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:01*	*1*

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid (PFODA)	1.9	H B *	1.9	0.64	ng/L		06/07/16 11:40	06/12/16 12:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDoA	*70*		*25 - 150*	*06/07/16 11:40*	*06/12/16 12:49*	*1*

Client Sample ID: 563555-1

Date Collected: 05/17/16 15:43
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-11

Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		1.8	0.41	ng/L		05/24/16 12:47	06/02/16 21:22	1

Client Sample ID: 563555-1

Date Collected: 05/17/16 15:43
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-11

Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoropentanoic acid (PFPeA)	**1.7**	**J**	1.8	0.89	ng/L		05/24/16 12:47	06/02/16 21:22	1
Perfluorohexanoic acid (PFHxA)	**1.3**	**J**	1.8	0.71	ng/L		05/24/16 12:47	06/02/16 21:22	1
Perfluoroheptanoic acid (PFHpA)	ND		1.8	0.72	ng/L		05/24/16 12:47	06/02/16 21:22	1
Perfluorooctanoic acid (PFOA)	**0.94**	**J**	1.8	0.68	ng/L		05/24/16 12:47	06/02/16 21:22	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.59	ng/L		05/24/16 12:47	06/02/16 21:22	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.40	ng/L		05/24/16 12:47	06/02/16 21:22	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.68	ng/L		05/24/16 12:47	06/02/16 21:22	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.53	ng/L		05/24/16 12:47	06/02/16 21:22	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		05/24/16 12:47	06/02/16 21:22	1
Perfluorotetradecanoic acid (PFTeA)	**0.69**	**J B**	1.8	0.18	ng/L		05/24/16 12:47	06/02/16 21:22	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	ND		1.8	0.11	ng/L		05/24/16 12:47	06/02/16 21:22	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.8	0.61	ng/L		05/24/16 12:47	06/02/16 21:22	1
Perfluorobutane Sulfonate (PFBS)	ND		1.8	0.83	ng/L		05/24/16 12:47	06/02/16 21:22	1
Perfluorohexane Sulfonate (PFHxS)	**1.3**	**J**	1.8	0.79	ng/L		05/24/16 12:47	06/02/16 21:22	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.64	ng/L		05/24/16 12:47	06/02/16 21:22	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/24/16 12:47	06/02/16 21:22	1
Perfluorooctane Sulfonate (PFOS)	**2.3**		1.8	1.2	ng/L		05/24/16 12:47	06/02/16 21:22	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.58	ng/L		05/24/16 12:47	06/02/16 21:22	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*33*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:22*	*1*
13C4 PFBA	*55*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:22*	*1*
13C2 PFHxA	*100*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:22*	*1*
13C4 PFOA	*103*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:22*	*1*
13C5 PFNA	*100*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:22*	*1*
13C2 PFDA	*95*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:22*	*1*
13C2 PFUnA	*103*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:22*	*1*
13C2 PFDoA	*100*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:22*	*1*
18O2 PFHxS	*104*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:22*	*1*
13C4 PFOS	*91*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:22*	*1*
13C4-PFHpA	*97*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:22*	*1*
13C5 PFPeA	*81*		*25 - 150*	*05/24/16 12:47*	*06/02/16 21:22*	*1*

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid (PFODA)	**0.67**	**J H B**	1.9	0.63	ng/L		06/07/16 11:40	06/12/16 14:15	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDoA	*181*	*	*25 - 150*	*06/07/16 11:40*	*06/12/16 14:15*	*1*

Client Sample ID: 593460-1

Date Collected: 05/17/16 16:47
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-12

Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**2.8**	**B**	1.8	0.42	ng/L		05/24/16 12:47	06/02/16 22:47	1

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

Client Sample ID: 593460-1
Date Collected: 05/17/16 16:47
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-12
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoropentanoic acid (PFPeA)	3.1		1.8	0.91	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluorohexanoic acid (PFHxA)	3.9		1.8	0.72	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluoroheptanoic acid (PFHpA)	1.7	J	1.8	0.73	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluorooctanoic acid (PFOA)	3.1		1.8	0.69	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluorononanoic acid (PFNA)	1.2	J	1.8	0.60	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluorodecanoic acid (PFDA)	0.91	J	1.8	0.40	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluoroundecanoic acid (PFUnA)	0.83	J B	1.8	0.69	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.53	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluorotetradecanoic acid (PFTeA)	1.0	J B	1.8	0.18	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.44	J	1.8	0.11	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluoro-n-octandecanoic acid (PFODA)	ND	*	1.8	0.62	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluorobutane Sulfonate (PFBS)	1.8		1.8	0.84	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluorohexane Sulfonate (PFHxS)	7.5		1.8	0.80	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.65	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluorooctane Sulfonate (PFOS)	17		1.8	1.2	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluorooctane Sulfonamide (FOSA)	1.1	J	1.8	0.58	ng/L		05/24/16 12:47	06/02/16 22:47	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*9*	*	*25 - 150*	*05/24/16 12:47*	*06/02/16 22:47*	*1*
13C4 PFBA	*64*		*25 - 150*	*05/24/16 12:47*	*06/02/16 22:47*	*1*
13C2 PFHxA	*97*		*25 - 150*	*05/24/16 12:47*	*06/02/16 22:47*	*1*
13C4 PFOA	*113*		*25 - 150*	*05/24/16 12:47*	*06/02/16 22:47*	*1*
13C5 PFNA	*88*		*25 - 150*	*05/24/16 12:47*	*06/02/16 22:47*	*1*
13C2 PFDA	*81*		*25 - 150*	*05/24/16 12:47*	*06/02/16 22:47*	*1*
13C2 PFUnA	*81*		*25 - 150*	*05/24/16 12:47*	*06/02/16 22:47*	*1*
13C2 PFDoA	*78*		*25 - 150*	*05/24/16 12:47*	*06/02/16 22:47*	*1*
18O2 PFHxS	*113*		*25 - 150*	*05/24/16 12:47*	*06/02/16 22:47*	*1*
13C4 PFOS	*101*		*25 - 150*	*05/24/16 12:47*	*06/02/16 22:47*	*1*
13C4-PFHpA	*99*		*25 - 150*	*05/24/16 12:47*	*06/02/16 22:47*	*1*
13C5 PFPeA	*80*		*25 - 150*	*05/24/16 12:47*	*06/02/16 22:47*	*1*

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid (PFODA)	1.2	J H B	1.9	0.64	ng/L		06/07/16 11:40	06/12/16 14:36	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDoA	*91*		*25 - 150*	*06/07/16 11:40*	*06/12/16 14:36*	*1*

Client Sample ID: 597517-2
Date Collected: 05/17/16 11:15
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-13
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**3.5**	**B**	1.8	0.41	ng/L		05/24/16 12:47	06/02/16 23:09	1
Perfluoropentanoic acid (PFPeA)	**7.5**		1.8	0.88	ng/L		05/24/16 12:47	06/02/16 23:09	1
Perfluorohexanoic acid (PFHxA)	**13**		1.8	0.70	ng/L		05/24/16 12:47	06/02/16 23:09	1
Perfluoroheptanoic acid (PFHpA)	**2.5**		1.8	0.72	ng/L		05/24/16 12:47	06/02/16 23:09	1
Perfluorooctanoic acid (PFOA)	**5.7**		1.8	0.67	ng/L		05/24/16 12:47	06/02/16 23:09	1
Perfluorononanoic acid (PFNA)	**0.68**	**J**	1.8	0.59	ng/L		05/24/16 12:47	06/02/16 23:09	1
Perfluorodecanoic acid (PFDA)	**0.82**	**J**	1.8	0.39	ng/L		05/24/16 12:47	06/02/16 23:09	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.67	ng/L		05/24/16 12:47	06/02/16 23:09	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.52	ng/L		05/24/16 12:47	06/02/16 23:09	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.49	ng/L		05/24/16 12:47	06/02/16 23:09	1
Perfluorotetradecanoic acid (PFTeA)	**0.78**	**J B**	1.8	0.18	ng/L		05/24/16 12:47	06/02/16 23:09	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	ND		1.8	0.11	ng/L		05/24/16 12:47	06/02/16 23:09	1
Perfluoro-n-octandecanoic acid (PFODA)	ND	*	1.8	0.60	ng/L		05/24/16 12:47	06/02/16 23:09	1
Perfluorobutane Sulfonate (PFBS)	**8.1**		1.8	0.82	ng/L		05/24/16 12:47	06/02/16 23:09	1
Perfluorohexane Sulfonate (PFHxS)	**40**		1.8	0.78	ng/L		05/24/16 12:47	06/02/16 23:09	1
Perfluoro-1-heptanesulfonate (PFHpS)	**1.4**	**J**	1.8	0.64	ng/L		05/24/16 12:47	06/02/16 23:09	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/24/16 12:47	06/02/16 23:09	1
Perfluorooctane Sulfonate (PFOS)	**38**		1.8	1.1	ng/L		05/24/16 12:47	06/02/16 23:09	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.57	ng/L		05/24/16 12:47	06/02/16 23:09	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*38*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:09*	*1*
13C4 PFBA	*54*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:09*	*1*
13C2 PFHxA	*104*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:09*	*1*
13C4 PFOA	*119*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:09*	*1*
13C5 PFNA	*106*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:09*	*1*
13C2 PFDA	*104*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:09*	*1*
13C2 PFUnA	*124*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:09*	*1*
13C2 PFDoA	*110*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:09*	*1*
18O2 PFHxS	*112*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:09*	*1*
13C4 PFOS	*105*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:09*	*1*
13C4-PFHpA	*108*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:09*	*1*
13C5 PFPeA	*85*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:09*	*1*

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid (PFODA)	**0.89**	**J H B**	1.9	0.63	ng/L		06/07/16 11:40	06/12/16 14:57	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDoA	*107*		*25 - 150*	*06/07/16 11:40*	*06/12/16 14:57*	*1*

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

Client Sample ID: MW-207A
Date Collected: 05/17/16 14:27
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-14
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**3.3**	**B**	1.7	0.40	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluoropentanoic acid (PFPeA)	**5.2**		1.7	0.86	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluorohexanoic acid (PFHxA)	**9.5**		1.7	0.69	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluoroheptanoic acid (PFHpA)	**2.4**		1.7	0.70	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluorooctanoic acid (PFOA)	**4.7**		1.7	0.65	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluorononanoic acid (PFNA)	**0.71**	**J**	1.7	0.57	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.38	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.65	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.51	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.7	0.48	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluorotetradecanoic acid (PFTeA)	**0.82**	**J B**	1.7	0.17	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	**0.30**	**J**	1.7	0.11	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluoro-n-octandecanoic acid (PFODA)	ND	*	1.7	0.59	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluorobutane Sulfonate (PFBS)	**3.7**		1.7	0.80	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluorohexane Sulfonate (PFHxS)	**21**		1.7	0.76	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluoro-1-heptanesulfonate (PFHpS)	**1.3**	**J**	1.7	0.62	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluorodecane sulfonate (PFDS)	ND		1.7	1.1	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluorooctane Sulfonate (PFOS)	**38**		1.7	1.1	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.7	0.56	ng/L		05/24/16 12:47	06/02/16 23:30	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*8*	*	*25 - 150*	*05/24/16 12:47*	*06/02/16 23:30*	*1*
13C4 PFBA	*66*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:30*	*1*
13C2 PFHxA	*92*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:30*	*1*
13C4 PFOA	*91*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:30*	*1*
13C5 PFNA	*73*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:30*	*1*
13C2 PFDA	*68*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:30*	*1*
13C2 PFUnA	*71*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:30*	*1*
13C2 PFDoA	*75*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:30*	*1*
18O2 PFHxS	*118*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:30*	*1*
13C4 PFOS	*110*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:30*	*1*
13C4-PFHpA	*97*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:30*	*1*
13C5 PFPeA	*81*		*25 - 150*	*05/24/16 12:47*	*06/02/16 23:30*	*1*

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid (PFODA)	ND	H	1.9	0.64	ng/L		06/07/16 11:40	06/12/16 15:18	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDoA	*56*		*25 - 150*	*06/07/16 11:40*	*06/12/16 15:18*	*1*

Client Sample ID: MW-504
Date Collected: 05/17/16 15:43
Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-15
Matrix: Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		1.8	0.41	ng/L		05/24/16 12:47	06/02/16 23:51	1
Perfluoropentanoic acid (PFPeA)	ND		1.8	0.88	ng/L		05/24/16 12:47	06/02/16 23:51	1
Perfluorohexanoic acid (PFHxA)	**4.8**		1.8	0.70	ng/L		05/24/16 12:47	06/02/16 23:51	1
Perfluoroheptanoic acid (PFHpA)	**1.0**	**J**	1.8	0.71	ng/L		05/24/16 12:47	06/02/16 23:51	1
Perfluorooctanoic acid (PFOA)	**2.6**		1.8	0.66	ng/L		05/24/16 12:47	06/02/16 23:51	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.58	ng/L		05/24/16 12:47	06/02/16 23:51	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.39	ng/L		05/24/16 12:47	06/02/16 23:51	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.66	ng/L		05/24/16 12:47	06/02/16 23:51	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.52	ng/L		05/24/16 12:47	06/02/16 23:51	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.49	ng/L		05/24/16 12:47	06/02/16 23:51	1
Perfluorotetradecanoic acid (PFTeA)	**0.76**	**J B**	1.8	0.18	ng/L		05/24/16 12:47	06/02/16 23:51	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	ND		1.8	0.11	ng/L		05/24/16 12:47	06/02/16 23:51	1
Perfluoro-n-octandecanoic acid (PFODA)	ND	*	1.8	0.60	ng/L		05/24/16 12:47	06/02/16 23:51	1
Perfluorobutane Sulfonate (PFBS)	**1.1**	**J**	1.8	0.81	ng/L		05/24/16 12:47	06/02/16 23:51	1
Perfluorohexane Sulfonate (PFHxS)	**0.88**	**J**	1.8	0.77	ng/L		05/24/16 12:47	06/02/16 23:51	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.63	ng/L		05/24/16 12:47	06/02/16 23:51	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/24/16 12:47	06/02/16 23:51	1
Perfluorooctane Sulfonate (PFOS)	**1.7**	**J**	1.8	1.1	ng/L		05/24/16 12:47	06/02/16 23:51	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.57	ng/L		05/24/16 12:47	06/02/16 23:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*1*	*	*25 - 150*	*05/24/16 12:47*	*06/02/16 23:51*	*1*
13C4 PFBA	*8*	*	*25 - 150*	*05/24/16 12:47*	*06/02/16 23:51*	*1*
13C2 PFHxA	*11*	*	*25 - 150*	*05/24/16 12:47*	*06/02/16 23:51*	*1*
13C4 PFOA	*13*	*	*25 - 150*	*05/24/16 12:47*	*06/02/16 23:51*	*1*
13C5 PFNA	*13*	*	*25 - 150*	*05/24/16 12:47*	*06/02/16 23:51*	*1*
13C2 PFDA	*11*	*	*25 - 150*	*05/24/16 12:47*	*06/02/16 23:51*	*1*
13C2 PFUnA	*10*	*	*25 - 150*	*05/24/16 12:47*	*06/02/16 23:51*	*1*
13C2 PFDoA	*10*	*	*25 - 150*	*05/24/16 12:47*	*06/02/16 23:51*	*1*
18O2 PFHxS	*12*	*	*25 - 150*	*05/24/16 12:47*	*06/02/16 23:51*	*1*
13C4 PFOS	*10*	*	*25 - 150*	*05/24/16 12:47*	*06/02/16 23:51*	*1*
13C4-PFHpA	*12*	*	*25 - 150*	*05/24/16 12:47*	*06/02/16 23:51*	*1*
13C5 PFPeA	*10*	*	*25 - 150*	*05/24/16 12:47*	*06/02/16 23:51*	*1*

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid (PFODA)	ND	H	1.9	0.65	ng/L		06/07/16 11:40	06/12/16 15:40	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDoA	*82*		*25 - 150*	*06/07/16 11:40*	*06/12/16 15:40*	*1*

Isotope Dilution Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	3C8 FOSA (25-150)	3C4 PFBA (25-150)	3C2 PFHx (25-150)	3C4 PFOA (25-150)	3C5 PFNA (25-150)	3C2 PFDA (25-150)	3C2 PFUn (25-150)	3C2 PFDo (25-150)
320-19030-1	95630	39	84	119	133	119	124	136	127
320-19030-1 - RE	95630								118
320-19030-2	95730	37	78	113	124	114	115	125	123
320-19030-2 - RE	95730								100
320-19030-3	471542	6 *	81	103	95	77	65	70	77
320-19030-3 - RE	471542								83
320-19030-4	582573	8 *	88	114	129	105	93	121	110
320-19030-5	671300	38	52	114	132	131	123	131	102
320-19030-5 - RE	671300								134
320-19030-6	597517-1	47	66	118	135	130	134	149	129
320-19030-6 - RE	597517-1								125
320-19030-7	515485	64	55	111	126	126	133	151 *	132
320-19030-7 - RE	515485								131
320-19030-8	521779	61	76	119	134	125	126	140	130
320-19030-8 - RE	521779								127
320-19030-9	597507	47	60	101	113	100	96	99	93
320-19030-9 - RE	597507								101
320-19030-10	593460-2	3 *	72	102	90	64	52	57	61
320-19030-10 - RE	593460-2								70
320-19030-11	563555-1	33	55	100	103	100	95	103	100
320-19030-11 - RE	563555-1								181 *
320-19030-12	593460-1	9 *	64	97	113	88	81	81	78
320-19030-12 - RE	593460-1								91
320-19030-13	597517-2	38	54	104	119	106	104	124	110
320-19030-13 - RE	597517-2								107
320-19030-14	MW-207A	8 *	66	92	91	73	68	71	75
320-19030-14 - RE	MW-207A								56
320-19030-15	MW-504	1 *	8 *	11 *	13 *	13 *	11 *	10 *	10 *
320-19030-15 - RE	MW-504								82
LCS 320-110951/2-A	Lab Control Sample	28	119	123	126	125	127	132	130
LCS 320-111096/2-A	Lab Control Sample	42	102	100	101	96	96	95	89
LCS 320-112821/2-A	Lab Control Sample								98
LCS 320-113509/2-A	Lab Control Sample								115
LCSD 320-110951/3-A	Lab Control Sample Dup	28	114	121	131	123	127	131	123
LCSD 320-112821/3-A	Lab Control Sample Dup								104
LCSD 320-113509/3-A	Lab Control Sample Dup								126
MB 320-110951/1-A	Method Blank	29	128	131	144	139	138	148	137
MB 320-111096/1-A	Method Blank	39	109	108	115	115	107	105	111
MB 320-112821/1-A	Method Blank								106
MB 320-113509/1-A	Method Blank								122

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	3O2 PFHx (25-150)	3C4 PFOS (25-150)	3C4-PFHp (25-150)	3C5 PFPe (25-150)				
320-19030-1	95630	152 *	153 *	126	120				
320-19030-1 - RE	95630								
320-19030-2	95730	136	147	119	114				
320-19030-2 - RE	95730								
320-19030-3	471542	144	151 *	107	106				
320-19030-3 - RE	471542								

Isotope Dilution Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

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

		Percent Isotope Dilution Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	8O2 PFHx (25-150)	3C4 PFOS (25-150)	3C4-PFHp (25-150)	3C5 PFPe (25-150)
320-19030-4	582573	160 *	145	114	114
320-19030-5	671300	137	129	124	107
320-19030-5 - RE	671300				
320-19030-6	597517-1	151 *	146	116	117
320-19030-6 - RE	597517-1				
320-19030-7	515485	137	127	126	105
320-19030-7 - RE	515485				
320-19030-8	521779	130	134	129	124
320-19030-8 - RE	521779				
320-19030-9	597507	116	99	106	85
320-19030-9 - RE	597507				
320-19030-10	593460-2	123	103	105	83
320-19030-10 - RE	593460-2				
320-19030-11	563555-1	104	91	97	81
320-19030-11 - RE	563555-1				
320-19030-12	593460-1	113	101	99	80
320-19030-12 - RE	593460-1				
320-19030-13	597517-2	112	105	108	85
320-19030-13 - RE	597517-2				
320-19030-14	MW-207A	118	110	97	81
320-19030-14 - RE	MW-207A				
320-19030-15	MW-504	12 *	10 *	12 *	10 *
320-19030-15 - RE	MW-504				
LCS 320-110951/2-A	Lab Control Sample	139	136	124	128
LCS 320-111096/2-A	Lab Control Sample	102	104	93	97
LCS 320-112821/2-A	Lab Control Sample				
LCS 320-113509/2-A	Lab Control Sample				
LCSD 320-110951/3-A	Lab Control Sample Dup	134	134	123	129
LCSD 320-112821/3-A	Lab Control Sample Dup				
LCSD 320-113509/3-A	Lab Control Sample Dup				
MB 320-110951/1-A	Method Blank	146	148	136	143
MB 320-111096/1-A	Method Blank	117	112	110	104
MB 320-112821/1-A	Method Blank				
MB 320-113509/1-A	Method Blank				

Surrogate Legend

13C8 FOSA = 13C8 FOSA
13C4 PFBA = 13C4 PFBA
13C2 PFHxA = 13C2 PFHxA
13C4 PFOA = 13C4 PFOA
13C5 PFNA = 13C5 PFNA
13C2 PFDA = 13C2 PFDA
13C2 PFUnA = 13C2 PFUnA
13C2 PFDoA = 13C2 PFDoA
18O2 PFHxS = 18O2 PFHxS
13C4 PFOS = 13C4 PFOS
13C4-PFHpA = 13C4-PFHpA
13C5 PFPeA = 13C5 PFPeA

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-110951/1-A
Matrix: Water
Analysis Batch: 113162

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 110951

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfl. orob. tanoic aci4 LPF5A6	17u1	J	270	07d(	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. oro) entanoic aci4 LPFPeA6	172d	J	270	0799	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orohepanoic aci4 LPFHpA6	ND		270	0789	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orohe) tanoic aci4 LPFH) A6	ND		270	07O0	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orooctanoic aci4 LPFx A6	ND		270	078u	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orononanoic aci4 LPFNA6	ND		270	07(u	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. oro4ecanoic aci4 LPFDA6	ND		270	07dd	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. oro. n4ecanoic aci4 LPF* nA6	ND		270	078u	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. oro4o4ecanoic aci4 LPFDoA6	ND		270	07uO	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orotri4ecanoic Aci4 LPFTriA6	ND		270	07uu	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orotetra4ecanoic aci4 LPFTeA6	07(91	J	270	0720	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. oro-n-hepa4ecanoic aci4 LPFHpDA6	ND		270	0712	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. oro-n-octan4ecanoic aci4 LPFx DA6	ND		270	07(8	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orob. tane S. lfonate LPF5S6	ND		270	0792	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orohepane S. lfonate LPFHpS6	ND		270	07O8	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. oro-1-he) tanes. lfonate LPFH) S6	ND		270	0781	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. oro4ecane s. lfonate LPFDS6	ND		270	172	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orooctane S. lfonate LPFx S6	ND		270	173	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orooctane S. lfonami4e LFx SA6	ND		270	07(d	ng/U		0u/23/1(12:30	0(/09/1(23:39	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*29*		*25 - 150*	*05/23/16 12:30*	*06/09/16 23:39*	*1*
13C4 PFBA	*128*		*25 - 150*	*05/23/16 12:30*	*06/09/16 23:39*	*1*
13C2 PFHxA	*131*		*25 - 150*	*05/23/16 12:30*	*06/09/16 23:39*	*1*
13C4 PFOA	*144*		*25 - 150*	*05/23/16 12:30*	*06/09/16 23:39*	*1*
13C5 PFNA	*139*		*25 - 150*	*05/23/16 12:30*	*06/09/16 23:39*	*1*
13C2 PFDA	*138*		*25 - 150*	*05/23/16 12:30*	*06/09/16 23:39*	*1*
13C2 PFUnA	*148*		*25 - 150*	*05/23/16 12:30*	*06/09/16 23:39*	*1*
13C2 PFDoA	*137*		*25 - 150*	*05/23/16 12:30*	*06/09/16 23:39*	*1*
18O2 PFHxS	*146*		*25 - 150*	*05/23/16 12:30*	*06/09/16 23:39*	*1*
13C4 PFOS	*148*		*25 - 150*	*05/23/16 12:30*	*06/09/16 23:39*	*1*
13C4-PFHpA	*136*		*25 - 150*	*05/23/16 12:30*	*06/09/16 23:39*	*1*
13C5 PFPeA	*143*		*25 - 150*	*05/23/16 12:30*	*06/09/16 23:39*	*1*

Lab Sample ID: LCS 320-110951/2-A
Matrix: Water
Analysis Batch: 113162

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 110951

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfl. orob. tanoic aci4 LPF5A6	d070	3179		ng/U		C0	8d - 13O
Perfl. oro) entanoic aci4 LPFPeA6	d070	327O		ng/U		C2	(9 - 13d
Perfl. orohepanoic aci4 LPFHpA6	d070	3u73		ng/U		CO	80 - 13(
Perfl. orohe) tanoic aci4 LPFH) A6	d070	3u7(		ng/U		C9	(3 - 13u
Perfl. orooctanoic aci4 LPFx A6	d070	3(73		ng/U		91	(3 - 1d1
Perfl. orononanoic aci4 LPFNA6	d070	3971		ng/U		9O	81 - 1d0
Perfl. oro4ecanoic aci4 LPFDA6	d070	3(78		ng/U		92	((- 1d1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCS 320-110951/2-A
Matrix: Water
Analysis Batch: 113162

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 110951

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfl. oro. n4ecanoic aci4 LPF* nA6	d070	3(7O		ng/U		92	(O- 139
Perfl. oro4o4ecanoic aci4 LPFDoA6	d070	3u7u		ng/U		O9	81 - 139
Perfl. orotri4ecanoic Aci4 LPFTriA6	d070	3d7d		ng/U		O(	u1 - 139
Perfl. orotetra4ecanoic aci4 LPFTeA6	d070	2O72		ng/U		80	d8 - 130
Perfl. oro-n-hepa4ecanoic aci4 LPFHpDA6	d070	2u71		ng/U		(3	u0 - 1u0
Perfl. oro-n-octan4ecanoic aci4 LPFx DA6	d070	O73u	B	ng/U		21	u0 - 1u0
Perfl. orob. tane S. lfonate LPF5 S6	3u7d	287u		ng/U		8O	uu - 1d8
Perfl. orohepane S. lfonate LPFHpS6	3(7d	3978		ng/U		109	uO- 13O
Perfl. oro-1-he) tanes. lfonate LPFH) S6	3O71	3(7u		ng/U		9(	32 - 180
Perfl. oro4ecane s. lfonate LPFDS6	3O7(	307d		ng/U		89	3u - 1u8
Perfl. orooctane S. lfonate LPFx S6	3871	3170		ng/U		Od	d8 - 1(2
Perfl. orooctane S. lfonami4e LFx SA6	d070	337O		ng/U		Qu	u9 - 1(3

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*28*		*25 - 150*
13C4 PFBA	*119*		*25 - 150*
13C2 PFHxA	*123*		*25 - 150*
13C4 PFOA	*126*		*25 - 150*
13C5 PFNA	*125*		*25 - 150*
13C2 PFDA	*127*		*25 - 150*
13C2 PFUnA	*132*		*25 - 150*
13C2 PFDoA	*130*		*25 - 150*
18O2 PFHxS	*139*		*25 - 150*
13C4 PFOS	*136*		*25 - 150*
13C4-PFHpA	*124*		*25 - 150*
13C5 PFPeA	*128*		*25 - 150*

Lab Sample ID: LCSD 320-110951/3-A
Matrix: Water
Analysis Batch: 113162

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 110951

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfl. orob. tanoic aci4 LPF5 A6	d070	3270		ng/U		O0	8d - 13O	0	30
Perfl. oro) entanoic aci4 LPFPeA6	d070	327u		ng/U		O1	(9 - 13d	1	30
Perfl. orohepanoic aci4 LPFHpA6	d070	3d7(		ng/U		O(	80 - 13(	2	30
Perfl. orohe) tanoic aci4 LPFH) A6	d070	3d70		ng/U		Qu	(3 - 13u	u	30
Perfl. orooctanoic aci4 LPFx A6	d070	3u78		ng/U		O9	(3 - 1d1	2	30
Perfl. orononanoic aci4 LPFNA6	d070	397(		ng/U		99	81 - 1d0	1	30
Perfl. oro4ecanoic aci4 LPFDA6	d070	3O71		ng/U		9u	((- 1d1	d	30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCSD 320-110951/3-A
Matrix: Water
Analysis Batch: 113162

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 110951

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfl. oro. n4ecanoic aci4 LPF* nA6	d07.0	3u7(		ng/U		C9	(C- 139	3	30
Perfl. oro4o4ecanoic aci4 LPFDoA6	d07.0	3d7C		ng/U		C8	81 - 139	2	30
Perfl. orotri4ecanoic Aci4 LPFTriA6	d07.0	337C		ng/U		Cu	u1 - 139	2	30
Perfl. orotetra4ecanoic aci4 LPFTeA6	d07.0	307d		ng/U		8(	d8 - 130	C	30
Perfl. oro-n-hepa4ecanoic aci4 LPFHpDA6	d07.0	2C72		ng/U		81	u0 - 1u0	12	30
Perfl. oro-n-octan4ecanoic aci4 LPFx DA6	d07.0	107u	B	ng/U		2(	u0 - 1u0	23	30
Perfl. orob. tane S. lfonate LPF5 S6	3u7d	237d		ng/U		((	uu - 1d8	1(	30
Perfl. orohepane S. lfonate LPFHpS6	3(7d	d17C		ng/U		11u	uC- 13C	u	30
Perfl. oro-1-he) tanes. lfonate LPFH) S6	3C71	3(73		ng/U		9u	32 - 180	0	30
Perfl. oro4ecane s. lfonate LPFDS6	3C7(	3u7(		ng/U		92	3u - 1u8	1(	30
Perfl. orooctane S. lfonate LPFx S6	387I	337.0		ng/U		C9	d8 - 1(2	(	30
Perfl. orooctane S. lfonami4e LFx SA6	d07.0	387(		ng/U		9d	u9 - 1(3	11	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C8 FOSA	*28*		*25 - 150*
13C4 PFBA	*114*		*25 - 150*
13C2 PFHxA	*121*		*25 - 150*
13C4 PFOA	*131*		*25 - 150*
13C5 PFNA	*123*		*25 - 150*
13C2 PFDA	*127*		*25 - 150*
13C2 PFUnA	*131*		*25 - 150*
13C2 PFDoA	*123*		*25 - 150*
18O2 PFHxS	*134*		*25 - 150*
13C4 PFOS	*134*		*25 - 150*
13C4-PFHpA	*123*		*25 - 150*
13C5 PFPeA	*129*		*25 - 150*

Lab Sample ID: MB 320-111096/1-A
Matrix: Water
Analysis Batch: 112206

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 111096

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfl. orob. tanoic aci4 LPF5 A6	07u1u	J	2.0	07d(	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2C	1
Perfl. oro) entanoic aci4 LPFPeA6	ND		2.0	0799	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2C	1
Perfl. orohepanoic aci4 LPFHpA6	ND		2.0	0789	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2C	1
Perfl. orohe) tanoic aci4 LPFH) A6	ND		2.0	07C0	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2C	1
Perfl. orooctanoic aci4 LPFx A6	ND		2.0	078u	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2C	1
Perfl. orononanoic aci4 LPFNA6	ND		2.0	07(u	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2C	1
Perfl. oro4ecanoic aci4 LPFDA6	ND		2.0	07dd	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2C	1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: MB 320-111096/1-A
Matrix: Water
Analysis Batch: 112206

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 111096

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfl. oro. n4ecanoic aci4 LPF* nA6	07Ou3	J	270	078u	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2O	1
Perfl. oro4o4ecanoic aci4 LPFDoA6	ND		270	07uO	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2O	1
Perfl. orotri4ecanoic Aci4 LPFTriA6	ND		270	07uu	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2O	1
Perfl. orotetra4ecanoic aci4 LPFTeA6	07(u0	J	270	0720	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2O	1
Perfl. oro-n-hepa4ecanoic aci4 LPFHpDA6	ND		270	0712	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2O	1
Perfl. oro-n-octan4ecanoic aci4 LPFx DA6	ND		270	07(8	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2O	1
Perfl. orob. tane S. Ifonate LPF5 S6	ND		270	0792	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2O	1
Perfl. orohepane S. Ifonate LPFHpS6	ND		270	07O8	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2O	1
Perfl. oro-1-he) tanes. Ifonate LPFH) S6	ND		270	0781	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2O	1
Perfl. oro4ecane s. Ifonate LPFDS6	ND		270	172	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2O	1
Perfl. orooctane S. Ifonate LPFx S6	ND		270	173	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2O	1
Perfl. orooctane S. Ifonami4e LFx SA6	ND		270	07(d	ng/U		0u/2d/1(12:d8	0(/01/1(1(:2O	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*39*		*25 - 150*	*05/24/16 12:47*	*06/01/16 16:28*	*1*
13C4 PFBA	*109*		*25 - 150*	*05/24/16 12:47*	*06/01/16 16:28*	*1*
13C2 PFHxA	*108*		*25 - 150*	*05/24/16 12:47*	*06/01/16 16:28*	*1*
13C4 PFOA	*115*		*25 - 150*	*05/24/16 12:47*	*06/01/16 16:28*	*1*
13C5 PFNA	*115*		*25 - 150*	*05/24/16 12:47*	*06/01/16 16:28*	*1*
13C2 PFDA	*107*		*25 - 150*	*05/24/16 12:47*	*06/01/16 16:28*	*1*
13C2 PFUnA	*105*		*25 - 150*	*05/24/16 12:47*	*06/01/16 16:28*	*1*
13C2 PFDoA	*111*		*25 - 150*	*05/24/16 12:47*	*06/01/16 16:28*	*1*
18O2 PFHxS	*117*		*25 - 150*	*05/24/16 12:47*	*06/01/16 16:28*	*1*
13C4 PFOS	*112*		*25 - 150*	*05/24/16 12:47*	*06/01/16 16:28*	*1*
13C4-PFHpA	*110*		*25 - 150*	*05/24/16 12:47*	*06/01/16 16:28*	*1*
13C5 PFPeA	*104*		*25 - 150*	*05/24/16 12:47*	*06/01/16 16:28*	*1*

Lab Sample ID: LCS 320-111096/2-A
Matrix: Water
Analysis Batch: 112206

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 111096

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfl. orob. tanoic aci4 LPF5 A6	d070	3d7u		ng/U		Q(	8d - 13O
Perfl. oro) entanoic aci4 LPFPeA6	d070	337(		ng/U		Qd	(9 - 13d
Perfl. orohepanoic aci4 LPFHpA6	d070	3u7O		ng/U		Q9	80 - 13(
Perfl. orohe) tanoic aci4 LPFH) A6	d070	3u79		ng/U		90	(3 - 13u
Perfl. orooctanoic aci4 LPFx A6	d070	3d71		ng/U		Qu	(3 - 1d1
Perfl. orononanoic aci4 LPFNA6	d070	3(73		ng/U		91	81 - 1d0
Perfl. oro4ecanoic aci4 LPFDA6	d070	3872		ng/U		93	((- 1d1
Perfl. oro. n4ecanoic aci4 LPF* nA6	d070	3d7u		ng/U		Q(	(O- 139
Perfl. oro4o4ecanoic aci4 LPFDoA6	d070	337O		ng/U		Qu	81 - 139
Perfl. orotri4ecanoic Aci4 LPFTriA6	d070	3u79		ng/U		90	u1 - 139
Perfl. orotetra4ecanoic aci4 LPFTeA6	d070	3079		ng/U		88	d8 - 130

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCS 320-111096/2-A
Matrix: Water
Analysis Batch: 112206

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 111096

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfl. oro-n-hepa4ecanoic aci4 LPFHpDA6	d070	2u7d		ng/U		(3	u0 - 1u0
Perfl. oro-n-octan4ecanoic aci4 LPFx DA6	d070	(7(O	B	ng/U		18	u0 - 1u0
Perfl. orob. tane S. lfonate LPF5S6	3u7d	2870		ng/U		8(	uu - 1d8
Perfl. orohepane S. lfonate LPFHpS6	3(7d	2(70		ng/U		82	uO- 13O
Perfl. oro-1-he) tanes. lfonate LPFH) S6	3O71	3379		ng/U		O9	32 - 180
Perfl. oro4ecane s. lfonate LPFDS6	3O7(	3172		ng/U		O1	3u - 1u8
Perfl. orooctane S. lfonate LPFx S6	3871	3u7O		ng/U		98	d8 - 1(2
Perfl. orooctane S. lfonami4e LFx SA6	d070	3(78		ng/U		92	u9 - 1(3

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*42*		*25 - 150*
13C4 PFBA	*102*		*25 - 150*
13C2 PFHxA	*100*		*25 - 150*
13C4 PFOA	*101*		*25 - 150*
13C5 PFNA	*96*		*25 - 150*
13C2 PFDA	*96*		*25 - 150*
13C2 PFUnA	*95*		*25 - 150*
13C2 PFDoA	*89*		*25 - 150*
18O2 PFHxS	*102*		*25 - 150*
13C4 PFOS	*104*		*25 - 150*
13C4-PFHpA	*93*		*25 - 150*
13C5 PFPeA	*97*		*25 - 150*

Lab Sample ID: MB 320-112821/1-A
Matrix: Water
Analysis Batch: 113412

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 112821

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfl. oro-n-octan4ecanoic aci4 LPFx DA6	078(3	J	270	07(8	ng/U		0(/08/1(11:d0	0(/11/1(22:18	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDoA	*106*		*25 - 150*	*06/07/16 11:40*	*06/11/16 22:17*	*1*

Lab Sample ID: LCS 320-112821/2-A
Matrix: Water
Analysis Batch: 113412

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 112821

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfl. oro-n-octan4ecanoic aci4 LPFx DA6	d070	317(		ng/U		89	u0 - 1u0

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C2 PFDoA	98		25 - 150

Lab Sample ID: LCSD 320-112821/3-A
Matrix: Water
Analysis Batch: 113412

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 112821

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfl. oro-n-octan4ecanoic aci4 LPFx DA6	d070	uu70	B	ng/U		13O	u0 - 1u0	ud	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C2 PFDoA	104		25 - 150

Lab Sample ID: MB 320-113509/1-A
Matrix: Water
Analysis Batch: 113942

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 113509

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfl. oro-n-octan4ecanoic aci4 LPFx DA6	ND		270	07 8	ng/U		0(/13/1(09:u0	0(/1(/1(08:d8	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDoA	122		25 - 150	06/13/16 09:50	06/16/16 07:47	1

Lab Sample ID: LCS 320-113509/2-A
Matrix: Water
Analysis Batch: 113942

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 113509

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfl. oro-n-octan4ecanoic aci4 LPFx DA6	d070	d873		ng/U		11O	u0 - 1u0

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C2 PFDoA	115		25 - 150

Lab Sample ID: LCSD 320-113509/3-A
Matrix: Water
Analysis Batch: 113942

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 113509

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfl. oro-n-octan4ecanoic aci4 LPFx DA6	d070	dd71		ng/U		110	u0 - 1u0	8	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C2 PFDoA	126		25 - 150

LCMS

Prep Batch: 110951

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19030-1	95630	Total/NA	Water	3535	
320-19030-2	95730	Total/NA	Water	3535	
320-19030-3	471542	Total/NA	Water	3535	
320-19030-4	582573	Total/NA	Water	3535	
320-19030-5	671300	Total/NA	Water	3535	
320-19030-6	597517-1	Total/NA	Water	3535	
320-19030-7	515485	Total/NA	Water	3535	
320-19030-8	521779	Total/NA	Water	3535	
LCS 320-110951/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-110951/3-A	Lab Control Sample Dup	Total/NA	Water	3535	
MB 320-110951/1-A	Method Blank	Total/NA	Water	3535	

Prep Batch: 111096

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19030-9	597507	Total/NA	Water	3535	
320-19030-10	593460-2	Total/NA	Water	3535	
320-19030-11	563555-1	Total/NA	Water	3535	
320-19030-12	593460-1	Total/NA	Water	3535	
320-19030-13	597517-2	Total/NA	Water	3535	
320-19030-14	MW-207A	Total/NA	Water	3535	
320-19030-15	MW-504	Total/NA	Water	3535	
LCS 320-111096/2-A	Lab Control Sample	Total/NA	Water	3535	
MB 320-111096/1-A	Method Blank	Total/NA	Water	3535	

Analysis Batch: 112206

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19030-9	597507	Total/NA	Water	WS-LC-0025	111096
320-19030-10	593460-2	Total/NA	Water	WS-LC-0025	111096
320-19030-11	563555-1	Total/NA	Water	WS-LC-0025	111096
320-19030-12	593460-1	Total/NA	Water	WS-LC-0025	111096
320-19030-13	597517-2	Total/NA	Water	WS-LC-0025	111096
320-19030-14	MW-207A	Total/NA	Water	WS-LC-0025	111096
320-19030-15	MW-504	Total/NA	Water	WS-LC-0025	111096
LCS 320-111096/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	111096
MB 320-111096/1-A	Method Blank	Total/NA	Water	WS-LC-0025	111096

Prep Batch: 112821

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19030-9 - RE	597507	Total/NA	Water	3535	
320-19030-10 - RE	593460-2	Total/NA	Water	3535	
320-19030-11 - RE	563555-1	Total/NA	Water	3535	
320-19030-12 - RE	593460-1	Total/NA	Water	3535	
320-19030-13 - RE	597517-2	Total/NA	Water	3535	
320-19030-14 - RE	MW-207A	Total/NA	Water	3535	
320-19030-15 - RE	MW-504	Total/NA	Water	3535	
LCS 320-112821/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-112821/3-A	Lab Control Sample Dup	Total/NA	Water	3535	
MB 320-112821/1-A	Method Blank	Total/NA	Water	3535	

LCMS (Continued)

Analysis Batch: 113162

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19030-1	95630	Total/NA	Water	WS-LC-0025	110951
320-19030-2	95730	Total/NA	Water	WS-LC-0025	110951
320-19030-3	471542	Total/NA	Water	WS-LC-0025	110951
320-19030-4	582573	Total/NA	Water	WS-LC-0025	110951
320-19030-5	671300	Total/NA	Water	WS-LC-0025	110951
320-19030-6	597517-1	Total/NA	Water	WS-LC-0025	110951
320-19030-7	515485	Total/NA	Water	WS-LC-0025	110951
320-19030-8	521779	Total/NA	Water	WS-LC-0025	110951
LCS 320-110951/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	110951
LCSD 320-110951/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025	110951
MB 320-110951/1-A	Method Blank	Total/NA	Water	WS-LC-0025	110951

Analysis Batch: 113412

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19030-9 - RE	597507	Total/NA	Water	WS-LC-0025	112821
320-19030-10 - RE	593460-2	Total/NA	Water	WS-LC-0025	112821
LCS 320-112821/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	112821
LCSD 320-112821/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025	112821
MB 320-112821/1-A	Method Blank	Total/NA	Water	WS-LC-0025	112821

Prep Batch: 113509

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19030-1 - RE	95630	Total/NA	Water	3535	
320-19030-2 - RE	95730	Total/NA	Water	3535	
320-19030-3 - RE	471542	Total/NA	Water	3535	
320-19030-5 - RE	671300	Total/NA	Water	3535	
320-19030-6 - RE	597517-1	Total/NA	Water	3535	
320-19030-7 - RE	515485	Total/NA	Water	3535	
320-19030-8 - RE	521779	Total/NA	Water	3535	
LCS 320-113509/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-113509/3-A	Lab Control Sample Dup	Total/NA	Water	3535	
MB 320-113509/1-A	Method Blank	Total/NA	Water	3535	

Analysis Batch: 113559

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19030-11 - RE	563555-1	Total/NA	Water	WS-LC-0025	112821
320-19030-12 - RE	593460-1	Total/NA	Water	WS-LC-0025	112821
320-19030-13 - RE	597517-2	Total/NA	Water	WS-LC-0025	112821
320-19030-14 - RE	MW-207A	Total/NA	Water	WS-LC-0025	112821
320-19030-15 - RE	MW-504	Total/NA	Water	WS-LC-0025	112821

Analysis Batch: 113942

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19030-1 - RE	95630	Total/NA	Water	WS-LC-0025	113509
320-19030-2 - RE	95730	Total/NA	Water	WS-LC-0025	113509
320-19030-3 - RE	471542	Total/NA	Water	WS-LC-0025	113509
320-19030-5 - RE	671300	Total/NA	Water	WS-LC-0025	113509
320-19030-6 - RE	597517-1	Total/NA	Water	WS-LC-0025	113509
320-19030-7 - RE	515485	Total/NA	Water	WS-LC-0025	113509
320-19030-8 - RE	521779	Total/NA	Water	WS-LC-0025	113509
LCS 320-113509/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	113509

LCMS (Continued)

Analysis Batch: 113942 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 320-113509/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025	113509
MB 320-113509/1-A	Method Blank	Total/NA	Water	WS-LC-0025	113509

Client Sample ID: 87132 — **Lab Sample ID: 302-48232-4**
Date Collected: 27/41/41 42:61 — **Matrix: Water**
Date Received: 27/02/41 28:62

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			534.9 mL	1.0 mL	110951	05/23/16 12:30	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	534.9 mL	1.0 mL	113162	06/10/16 00:42	JRB	TAL SAC
Total/NA	Prep	3535	RE		515.8 mL	1.0 mL	113509	06/13/16 09:50	EW1	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	515.8 mL	1.0 mL	113942	06/16/16 08:51	JRB	TAL SAC

Client Sample ID: 87N32 — **Lab Sample ID: 302-48232-0**
Date Collected: 27/41/41 42:72 — **Matrix: Water**
Date Received: 27/02/41 28:62

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			557.8 mL	1.0 mL	110951	05/23/16 12:30	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	557.8 mL	1.0 mL	113162	06/10/16 01:04	JRB	TAL SAC
Total/NA	Prep	3535	RE		530.2 mL	1.0 mL	113509	06/13/16 09:50	EW1	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	530.2 mL	1.0 mL	113942	06/16/16 09:12	JRB	TAL SAC

Client Sample ID: 6N4760 — **Lab Sample ID: 302-48232-3**
Date Collected: 27/41/41 44:36 — **Matrix: Water**
Date Received: 27/02/41 28:62

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			567.1 mL	1.0 mL	110951	05/23/16 12:30	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	567.1 mL	1.0 mL	113162	06/10/16 01:25	JRB	TAL SAC
Total/NA	Prep	3535	RE		518.6 mL	1.0 mL	113509	06/13/16 09:50	EW1	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	518.6 mL	1.0 mL	113942	06/16/16 09:34	JRB	TAL SAC

Client Sample ID: 7907N3 — **Lab Sample ID: 302-48232-6**
Date Collected: 27/41/41 40:64 — **Matrix: Water**
Date Received: 27/02/41 28:62

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			551.6 mL	1.0 mL	110951	05/23/16 12:30	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	551.6 mL	1.0 mL	113162	06/10/16 01:46	JRB	TAL SAC

Client Sample ID: 1N4322 — **Lab Sample ID: 302-48232-7**
Date Collected: 27/41/41 46:06 — **Matrix: Water**
Date Received: 27/02/41 28:62

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			561 mL	1.0 mL	110951	05/23/16 12:30	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	561 mL	1.0 mL	113162	06/10/16 02:07	JRB	TAL SAC
Total/NA	Prep	3535	RE		542.2 mL	1.0 mL	113509	06/13/16 09:50	EW1	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	542.2 mL	1.0 mL	113942	06/16/16 10:16	JRB	TAL SAC

Lab Chronicle

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

Client Sample ID: 78N74N-4

Date Collected: 27/41/41 41:04
Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-1

Matrix: Water

Brep 5Tpe	y atch 5Tpe	y atch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	y atch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			550.1 mL	1.0 mL	110951	05/23/16 12:30	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	550.1 mL	1.0 mL	113162	06/10/16 02:29	JRB	TAL SAC
Total/NA	Prep	3535	RE		562.3 mL	1.0 mL	113509	06/13/16 09:50	EW1	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	562.3 mL	1.0 mL	113942	06/16/16 11:41	JRB	TAL SAC

Client Sample ID: 747697

Date Collected: 27/41/41 4N:42
Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-N

Matrix: Water

Brep 5Tpe	y atch 5Tpe	y atch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	y atch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			554.8 mL	1.0 mL	110951	05/23/16 12:30	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	554.8 mL	1.0 mL	113162	06/10/16 02:50	JRB	TAL SAC
Total/NA	Prep	3535	RE		543.9 mL	1.0 mL	113509	06/13/16 09:50	EW1	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	543.9 mL	1.0 mL	113942	06/16/16 12:03	JRB	TAL SAC

Client Sample ID: 704NN8

Date Collected: 27/41/41 47:42
Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-9

Matrix: Water

Brep 5Tpe	y atch 5Tpe	y atch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	y atch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			553.5 mL	1.0 mL	110951	05/23/16 12:30	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	553.5 mL	1.0 mL	113162	06/10/16 04:15	JRB	TAL SAC
Total/NA	Prep	3535	RE		558.9 mL	1.0 mL	113509	06/13/16 09:50	EW1	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	558.9 mL	1.0 mL	113942	06/16/16 12:24	JRB	TAL SAC

Client Sample ID: 78N72N

Date Collected: 27/4N/41 44:71
Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-8

Matrix: Water

Brep 5Tpe	y atch 5Tpe	y atch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	y atch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			553.8 mL	1.0 mL	111096	05/24/16 12:47	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	553.8 mL	1.0 mL	112206	06/02/16 20:40	JRB	TAL SAC
Total/NA	Prep	3535	RE		534.5 mL	1.0 mL	112821	06/07/16 11:40	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	534.5 mL	1.0 mL	113412	06/12/16 12:28	JRB	TAL SAC

Client Sample ID: 783612-0

Date Collected: 27/4N/41 46:20
Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-42

Matrix: Water

Brep 5Tpe	y atch 5Tpe	y atch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	y atch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			560.6 mL	1.0 mL	111096	05/24/16 12:47	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	560.6 mL	1.0 mL	112206	06/02/16 21:01	JRB	TAL SAC
Total/NA	Prep	3535	RE		526.5 mL	1.0 mL	112821	06/07/16 11:40	VPM	TAL SAC

Lab Chronicle

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

Client Sample ID: 783612-0
Date Collected: 27/4N/41 46:20
Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-42
Matrix: Water

Brep 5Tpe	y atch 5Tpe	y atch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	y atch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Analysis	WS-LC-0025	RE	1	526.5 mL	1.0 mL	113412	06/12/16 12:49	JRB	TAL SAC

Client Sample ID: 713777-4
Date Collected: 27/4N/41 47:63
Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-44
Matrix: Water

Brep 5Tpe	y atch 5Tpe	y atch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	y atch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			553.4 mL	1.0 mL	111096	05/24/16 12:47	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	553.4 mL	1.0 mL	112206	06/02/16 21:22	JRB	TAL SAC
Total/NA	Prep	3535	RE		531.7 mL	1.0 mL	112821	06/07/16 11:40	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	531.7 mL	1.0 mL	113559	06/12/16 14:15	JRB	TAL SAC

Client Sample ID: 783612-4
Date Collected: 27/4N/41 41:6N
Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-40
Matrix: Water

Brep 5Tpe	y atch 5Tpe	y atch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	y atch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			545.8 mL	1.0 mL	111096	05/24/16 12:47	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	545.8 mL	1.0 mL	112206	06/02/16 22:47	JRB	TAL SAC
Total/NA	Prep	3535	RE		524.5 mL	1.0 mL	112821	06/07/16 11:40	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	524.5 mL	1.0 mL	113559	06/12/16 14:36	JRB	TAL SAC

Client Sample ID: 78N74N-0
Date Collected: 27/4N/41 44:47
Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-43
Matrix: Water

Brep 5Tpe	y atch 5Tpe	y atch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	y atch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			558.9 mL	1.0 mL	111096	05/24/16 12:47	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	558.9 mL	1.0 mL	112206	06/02/16 23:09	JRB	TAL SAC
Total/NA	Prep	3535	RE		535.7 mL	1.0 mL	112821	06/07/16 11:40	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	535.7 mL	1.0 mL	113559	06/12/16 14:57	JRB	TAL SAC

Client Sample ID: MW-02NP
Date Collected: 27/4N/41 46:0N
Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-46
Matrix: Water

Brep 5Tpe	y atch 5Tpe	y atch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	y atch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			573.7 mL	1.0 mL	111096	05/24/16 12:47	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	573.7 mL	1.0 mL	112206	06/02/16 23:30	JRB	TAL SAC
Total/NA	Prep	3535	RE		524.8 mL	1.0 mL	112821	06/07/16 11:40	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	524.8 mL	1.0 mL	113559	06/12/16 15:18	JRB	TAL SAC

Lab Chronicle

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

Client Sample ID: MW-726
Date Collected: 27/4N/41 47:63
Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-47
Matrix: Water

Brep 5Tpe	y atch 5Tpe	y atch Method	Rsn	Dil zactor	Initial Pmosnt	z inal Pmosnt	y atch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			564.2 mL	1.0 mL	111096	05/24/16 12:47	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	564.2 mL	1.0 mL	112206	06/02/16 23:51	JRB	TAL SAC
Total/NA	Prep	3535	RE		520.5 mL	1.0 mL	112821	06/07/16 11:40	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	520.5 mL	1.0 mL	113559	06/12/16 15:40	JRB	TAL SAC

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

Certification Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17
Alaska (UST)	State Program	10	UST-055	12-18-16
Arizona	State Program	9	AZ0708	08-11-16
Arkansas DEQ	State Program	6	88-0691	06-17-17
California	State Program	9	2897	01-31-17
Colorado	State Program	8	CA00044	08-31-16
Connecticut	State Program	1	PH-0691	06-30-17
Florida	NELAP	4	E87570	06-30-17
Hawaii	State Program	9	N/A	01-31-17
Illinois	NELAP	5	200060	03-17-17
Kansas	NELAP	7	E-10375	07-31-16
Louisiana	NELAP	6	30612	06-30-17
Maine	State Program	1	CA0004	04-18-18
Michigan	State Program	5	9947	01-31-18
Nevada	State Program	9	CA00044	07-31-16
New Jersey	NELAP	2	CA005	06-30-16
New York	NELAP	2	11666	04-01-17
Oregon	NELAP	10	4040	01-29-17
Pennsylvania	NELAP	3	68-01272	03-31-17
Texas	NELAP	6	T104704399	07-31-17
US Fish & Wildlife	Federal		LE148388-0	10-31-16
USDA	Federal		P330-11-00436	12-30-17
USEPA UCMR	Federal	1	CA00044	11-06-16
Utah	NELAP	8	CA00044	02-28-17
Virginia	NELAP	3	460278	03-14-17
Washington	State Program	10	C581	05-05-17
West Virginia (DW)	State Program	3	9930C	12-31-16
Wyoming	State Program	8	8TMS-L	01-29-17

Method Summary

Client: Shannon & Wilson
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

Method	Method Description	Protocol	Laboratory
WS-LC-0025	Perfluorinated Hydrocarbons	TAL SOP	TAL SAC

Protocol References:

TAL SOP = TestAmerica Laboratories, 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
Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-19030-1	95630	Water	05/16/16 10:46	05/20/16 09:40
320-19030-2	95730	Water	05/16/16 10:50	05/20/16 09:40
320-19030-3	471542	Water	05/16/16 11:34	05/20/16 09:40
320-19030-4	582573	Water	05/16/16 12:41	05/20/16 09:40
320-19030-5	671300	Water	05/16/16 14:24	05/20/16 09:40
320-19030-6	597517-1	Water	05/16/16 16:21	05/20/16 09:40
320-19030-7	515485	Water	05/16/16 17:10	05/20/16 09:40
320-19030-8	521779	Water	05/16/16 15:10	05/20/16 09:40
320-19030-9	597507	Water	05/17/16 11:56	05/20/16 09:40
320-19030-10	593460-2	Water	05/17/16 14:02	05/20/16 09:40
320-19030-11	563555-1	Water	05/17/16 15:43	05/20/16 09:40
320-19030-12	593460-1	Water	05/17/16 16:47	05/20/16 09:40
320-19030-13	597517-2	Water	05/17/16 11:15	05/20/16 09:40
320-19030-14	MW-207A	Water	05/17/16 14:27	05/20/16 09:40
320-19030-15	MW-504	Water	05/17/16 15:43	05/20/16 09:40

320-19030 Chain of Custody

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTODY RECORD

Laboratory Test America
Attn: David Alltucker

400 N 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

2255 S W. Canyon Road
Portland, OR 97201-2498
(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

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	PFCs LWS-LC-0025					Total Number of Containers	Remarks/Matrix
95630		1046	5/16/16		X	X					2	Water
95730		1050			X	X					2	
471542		1134			X	X					2	
582573		1241			X	X					2	
671300		1424			X	X					2	
597517-1		1621			X	X					2	
515485		1710			X	X					2	
521779		1510			X	X					2	
597507		1156	5/17/16		X	X					2	
593460-2		1402			X	X					2	

Project Information	Sample Receipt	
Project Number: 31-1-11735-005	Total Number of Containers	30
Project Name: Rag Fire Train Comb	COC Seals/Intact? Y/N/NA	
Contact: MDN/JAK	Received Good Cond./Cold	
Ongoing Project? Yes ☒ No ☐	Delivery Method: FedEx	
Sampler: MDN/SWH	(attach shipping bill, if any)	

Instructions

Requested Turnaround Time: Std

Special Instructions: Please notify upon arrival of shipment

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: M. Nadel Time: 1000	Signature: Time:	Signature: Time:
Printed Name: Marcy Nadel Date: 5/18/16	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Time: 0940	Signature: Time:	Signature: Time:
Printed Name: Connor M. Edman Date: 5/20/16	Printed Name: Date:	Printed Name: Date:
Company: TAMS	Company:	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

No. 33840

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTODY RECORD

Laboratory Test America
Attn: David Alltucker

400 N 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

2255 S.W. Canyon Road
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(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

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp	Grab	PACS (WS-LC-0025)						Total Number of Containers	Remarks/Matrix
563555-1		1543	5/17/16		X	X						2	Water
593460-1		1647			X	X						2	
597517-2		1115			X	X						2	
MW-207A		1427			X	X						2	
MW-504		1543			X	X						2	

Project Information	Sample Receipt
Project Number:	Total Number of Containers
Project Name:	COC Seals/Intact? Y/N/NA
Contact:	Received Good Cond /Cold
Ongoing Project? Yes ☐ No ☐	Delivery Method:
Sampler:	(attach shipping bill, if any)

Instructions

Requested Turnaround Time:

Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: M. Nadel Time: 1000	Signature: Time:	Signature: Time:
Printed Name: Mary Nadel Date: 5/18/16	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Time: 0940	Signature: Time:	Signature: Time:
Printed Name: Connor M. Redman Date: 5/20/16	Printed Name: Date:	Printed Name: Date:
Company:	Company:	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

No. 33842

Login Sample Receipt Checklist

Client: Shannon & Wilson

Job Number: 320-19030-1

Login Number: 19030
List Number: 1
Creator: Nelson, Kym D

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	
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: Erica Blake

Title: Geologist Date: June 24, 2016

CS Report Name: City of Fairbanks Fire Training Area Report Date: June 23, 2016

Consultant Firm: Shannon & Wilson, Inc.

Laboratory Name: TestAmerica, Inc. Laboratory Report Number: 320-19030

ADEC File Number: 102.38.182 ADEC RecKey Number:

1. Laboratory
   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
      ☐ Yes ☐ No ☒ NA (Please explain.) Comments:

      The ADEC has not approved any analytical laboratory for perfluorinated compound (PFC) analysis.

   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 ☒ NA (Please explain.) Comments:

      Analyses were performed by TestAmerica, Inc. in Folsom, California.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

   b. Correct analyses requested?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

      The temperature blank or cooler was measured within the acceptable temperature range of 0 °C to 6 °C upon receipt at the laboratory, as specified in the EPA publication SW-846. This range has been approved by ADEC.

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?
☒Yes ☐ No ☐NA (Please explain.) Comments:

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

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒Yes ☐ No ☐NA (Please explain.) 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 ☒NA (Please explain.) Comments:

There were no discrepancies reported by the laboratory.

e. Data quality or usability affected? (Please explain.)
Comments:

The laboratory did not note any affect on data quality or usability.

4. Case Narrative
a. Present and understandable?
☒Yes ☐ No ☐NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
☒Yes ☐ No ☐NA (Please explain.) Comments:

Isotope Dilution Analyte (IDA) recoveries were outside the method-recommended recovery limits for several project samples. Refer to the Case Narrative for the sample list.

The laboratory control sample (LCS) and/or LCS duplicate (LCSD) for prep batches 110951, 111096 and 112821 had low recoveries for perfluoro-n-octandecanoic acid (PFODA).

Sample 582573 (320-19030-4) was re-extracted in prep batch 103509 but the analysis showed the sample wasn't spiked with the IDA compounds so it can't be quantified for perfluoro-n-octandecanoic acid (PFODA). The sample was used up in the re-extraction so a second re-extraction isn't possible. The original results are reported.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batches 320-110951, 320-112821. Insufficient sample volume was available to perform an MS/MSD/sample duplicate for analytical batch 320-113509.

The extract for all samples were orange or yellow in color. Samples MW-207A (320-19030-14) and MW-504 (320-19030-15) were received with some kind of dark orange residue on the bottom.

c. Were all corrective actions documented?
☒Yes ☐ No ☐NA (Please explain.) Comments:

The LCS and LCSD recovery failures for PFODA required re-extraction of the project samples to confirm the initial extraction results. The re-extractions were performed out of hold time with acceptable LCS and LCSD recoveries, with the exception of PFODA in the LCSD (Prep Batch 112821). Since the sample was a re-extraction there was not sufficient volume to re-extract a third time with passing QC for PFODA.

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

The laboratory does not specify any effect on the data quality or usability. Refer to Section 6.b for LCS/LCSD recovery failures and Section 6.c for IDA recovery failures.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?
☒Yes ☐ No ☐NA (Please explain.) Comments:

b. All applicable holding times met?
☐Yes ☒ No ☐NA (Please explain.) Comments:

Samples were re-extracted out of hold time to confirm the initial results for PFODA due to LCS and LCSD recovery failures. The original results were used for reporting purposes and are not affected by the hold time exceedance.

c. All soils reported on a dry weight basis?
☐Yes ☐ No ☒NA (Please explain.) Comments:

Soil samples were not submitted with this work order.

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?
☒Yes ☐ No ☐NA (Please explain.) Comments:

The PQLs, equivalent to the TestAmerica Reporting Limit (RL), are less than the applicable EPA provisional drinking-water health advisory levels and the ADEC proposed groundwater-cleanup levels for perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA).

e. Data quality or usability affected?
Comments:

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

6. QC Samples
   a. Method Blank
      i. One method blank reported per matrix, analysis and 20 samples?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

      ii. All method blank results less than PQL?
      ☐Yes ☒ No ☐NA (Please explain.) Comments:

PFC analytes were detected in the method blanks (MBs) at estimated concentrations less than their reporting limits (RL) but greater than the method detection limit (MDL). The analytes are: perfluorobutanoic acid (PFBA), perfluoropentanoic acid (PFPeA), perfluorotetradecanoic acid (PFTeA), perflouroundecanoic acid (PFUnA), and perflouro-n-octandecanoic (PFODA).

      iii. If above PQL, what samples are affected?
      Comments:

Project samples in the same preparatory batch are affected by the method blank detection if they have reported detections within ten times the method blank detection.

      iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

The PFBA concentrations detected in project sample 515485, 593460-2, 593460-1, 597517-2, and MW-207A are considered estimated results (biased high) and are flagged 'JH*' in the analytical results table.

The PFBA concentrations detected in project samples 95630, 95730, 471542, 582573, 671300, 597517-1, 521779, and 597507 are considered not detected due to the method blank detection and are flagged 'B*' at either the reported sample result or the reporting limit, whichever is higher.

The PFPeA concentrations detected in project samples 671300, 597517-1, and 515485 are considered estimated results (biased high) and are flagged 'JH*' in the analytical results table.

The PFPeA concentrations detected in project samples 95630, 95730, 471542, 582573, and 521779 are considered not detected due to the method blank detection and flagged 'B*' at either the reported sample result or the reporting limit, whichever is higher.

The PFTeA concentrations detected in all project samples are considered not detected and are flagged 'B*' at either the reported sample result or the reporting limit, whichever is higher.

The PFUnA concentrations detected in project samples 597507, 593460-2 and 593460-1 are considered not detected and are flagged 'B*' at either the reported sample result or the reporting limit, whichever is higher.

PFODA results from the re-extraction are associated with the method blank detection for PFODA. We are only reporting the original results and consider the method blank detections for PFODA to not affect the original sample results.

v. Data quality or usability affected? (Please explain.)

Comments:

Yes; see above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

☒Yes ☐ No ☐NA (Please explain.) Comments:

LCS/LCSD sample results were reported. Sufficient volume was not available to obtain MS/MSD samples. However, the LCS/LCSD samples are sufficient to assess accuracy and precision.

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

☐Yes ☐ No ☒NA (Please explain.) 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 ☐NA (Please explain.) Comments:

LCS and LCSD samples for prep batch 110951 and 111096 had low percent recoveries for PFODA.

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 ☐NA (Please explain.) Comments:

The LCS/LCSD RPD for PFODA in prep batch 112821 was outside accetpance criteria.

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

Comments:

All reported project sample results for PFODA are affected by the LCS and LCSD recovery failures. The results for prep batch 112821 were not used for reporting purposes. The project samples are not affected by the RPD failure.

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

☒Yes ☐ No ☐NA (Please explain.) Comments:

Project sample results for PFODA are considered estimated, biased low due to the LCS and LCSD recovery failures. Project samples results with detections for PFODA are flagged "JL*" and samples with non-detect results are flagged "J*" to note the inaccuracy of the QC failure.

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

Yes; see above.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
☒Yes ☐ No ☐NA (Please explain.) Comments:

The analytical method WS-LC-0025 uses Isotope Dilution Analyte (IDA) recovery, which entails adding a 13C-isotope or 18O-isotope for target analyte and assessing the recovery of each analyte. The isotopically labeled compounds are the 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 ☐NA (Please explain.) Comments:

The project sample MW-504 had recovery failures for all IDAs. The IDA recovery for 13C2 perfluorododecanoic acid (PFDoA) was outside QC criteria for project sample 563555-1. The analyte PFDoA is associated with the IDA recovery failure. The IDA recovery for 13C2 perfluoroundecanoic acid (PFUnA) was outside QC criteria for project sample 515485. The analytes PFUnA, PFTriA, and PFTeA are associated with the IDA recovery failure. The IDA recovery for 13C4 perfluorodecane sulfonate (PFOS) was outside QC criteria for project samples 95630 and 471542. The analytes PFDS and PFOS are associated with IDA recovery failure. The IDA recovery for 13C8 perfluorooctane sulfonamide (FOSA) was outside QC criteria for project samples 471542, 582573, 593460-2, 593460-1, and MW-270A. The analyte PFOSA is associated with the IDA recovery failure. The IDA recovery for 18O2 perfluorohexane sulfonate (PFHxS) was outside QC criteria for project samples 95630, 582573, and 597517-1. The analytes PFBS and PFHxS are associated with the IDA recovery failure.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
☒Yes ☐ No ☐NA (Please explain.) Comments:

The analytical results associated with the IDA recovery failures are considered estimated (no bias) and are flagged "J*" in the analytical tables.

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

Comments:

Yes; 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 ☒NA (Please explain.) Comments:

PFCs are not volatile compounds, so 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 ☒NA (Please explain.) Comments:

No trip blank is required; see above.

iii. All results less than PQL?

☐Yes ☐ No ☒NA (Please explain.) Comments:

No trip blank is required; see above.

iv. If above PQL, what samples are affected?

Comments:

No trip blank is required; see above.

v. Data quality or usability affected? (Please explain.)

Comments:

The data quality and usability were not affected.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?
☒Yes ☐ No ☐NA (Please explain.) Comments:

ii. Submitted blind to lab?
☒Yes ☐ No ☐NA (Please explain.) Comments:

The field duplicate pair "95630" / "95730" 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 ☐NA (Please explain.) Comments:

The field duplicate RPDs were within QC criteria (where calculable), with the exception of the RPD for perfluoro-n-hexadecanoic acid (PFHxDA). The PFHxDA results are for the field duplicate samples are considered estimated (no bias) and are flagged "J*" in the anlaytical table.

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

Comments:

Yes; see above.

f. Decontamination or Equipment Blank (If not used explain why).

☐Yes ☐ No ☒NA (Please explain.) Comments:

Reusable equipment was not used in sample collection for this work order, so an equipment blank is not required.

i. All results less than PQL?

☐Yes ☐ No ☒NA (Please explain.) Comments:

N/A; an equipment blank was not required.

ii. If above PQL, what samples are affected?

Comments:

N/A; an equipment blank was not required.

iii. Data quality or usability affected? (Please explain.)

Comments:

The data quality and usability were not affected.

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

a. Defined and appropriate?

☐Yes ☐ No ☒NA (Please explain.) Comments:

APPENDIX E

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Attachment to and part of Report: 31-1-11735-005

Date:	August 2016
To:	Mr. Jackson Fox, City of Fairbanks
Re:	February to May 2016 Private Well Sampling Summary Report, City of Fairbanks Regional Fire Training Center, Fairbanks, Alaska

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

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 which were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

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