

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

August 2016



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

August 10, 2016

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Fairbanks, Alaska 99701

Prepared by:

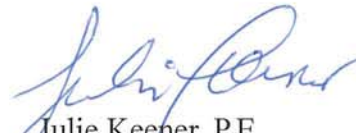
SHANNON & WILSON, INC.
2355 Hill Road
Fairbanks, Alaska 99709

Report Author:




Marcy Nadel
Geologist

Reviewed by:



Julie Keener, P.E.
Senior Engineer



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

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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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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 RFTC 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 Facilities (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 ($^{\circ}\text{C}$) 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:

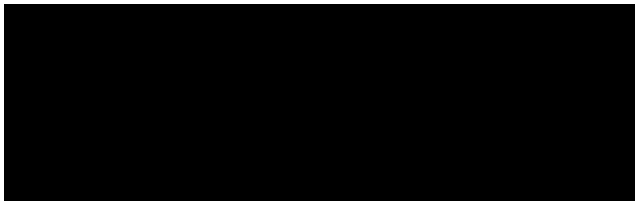
- sample name;
- analytical result for PFOS and PFOA;
- comparison of analytical results to PHA levels or LHA level;
- description of the project;
- those pages of the TestAmerica laboratory report that apply to the owner or occupant's water-well sample; and
- the updated RFTC fact sheet.

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.

SHANNON & WILSON, INC.

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.

SHANNON & WILSON, INC.

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-octadecanoic 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 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 B*	<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-octadecanoic 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-octadecanoic 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

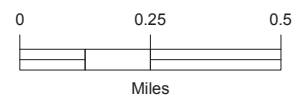
Analyte	EPA LHA Level	Units	Sample Name and Address or Location														
			471542	515485	521779	582573	593460-1	593460-2	536555-1	597507	597517-1	597517-2	671300	95630	95730	MW-207A	MW-504
Perfluorobutanoic Acid (PFBA)	—	ng/L	<2.2 B*	8.5 JH*	<4.0 B*	<2.3 B*	2.8 JH*	2.8 JH*	<1.8	<1.8 B*	<3.8 B*	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-octadecanoic 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*	1.1 J*	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.



LEGEND

- Well Search and Sample Areas
- Ahtna Private Well Search Area



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

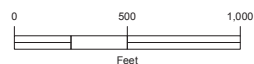
Figure 1



Image source: Pictometry, 2012

LEGEND

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



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.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 2

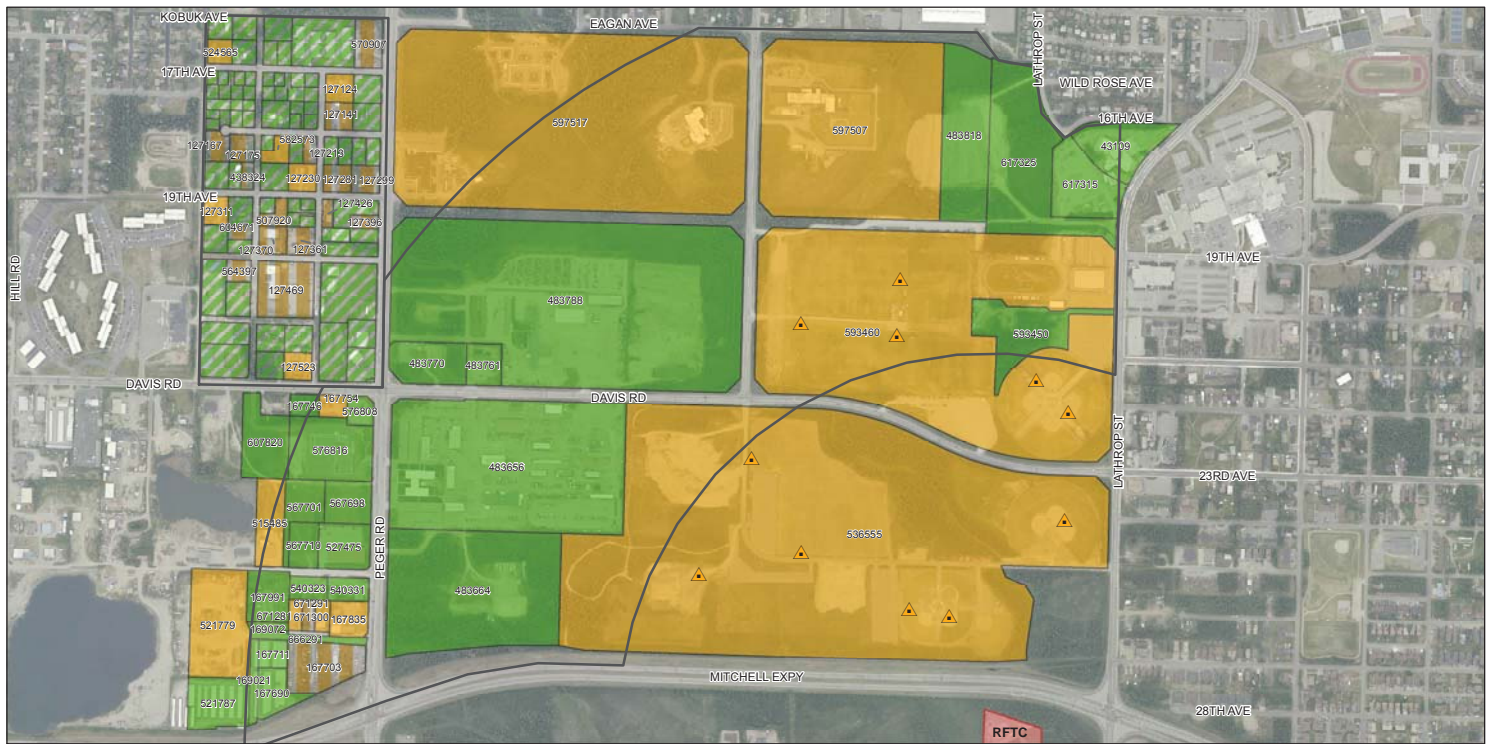


Image source: Pictometry, 2012

LEGEND

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



Regional Fire Training Center
Fairbanks, Alaska

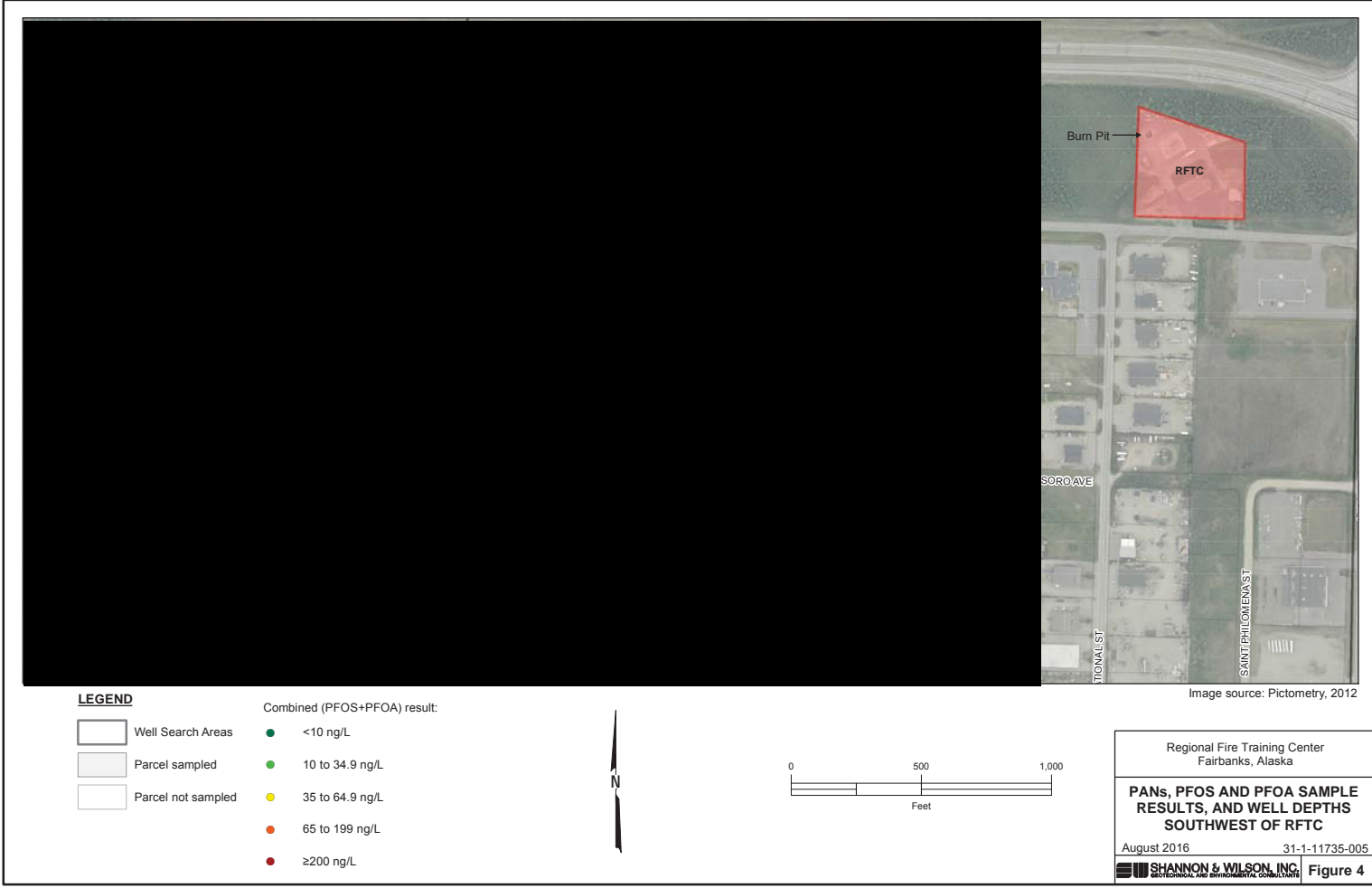
**PANS AND RESULTS OF WELL
SEARCH NORTHWEST OF RFTC**

August 2016

31-1-11735-005

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 3

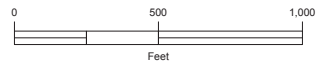


LEGEND

- 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



Regional Fire Training Center
Fairbanks, Alaska

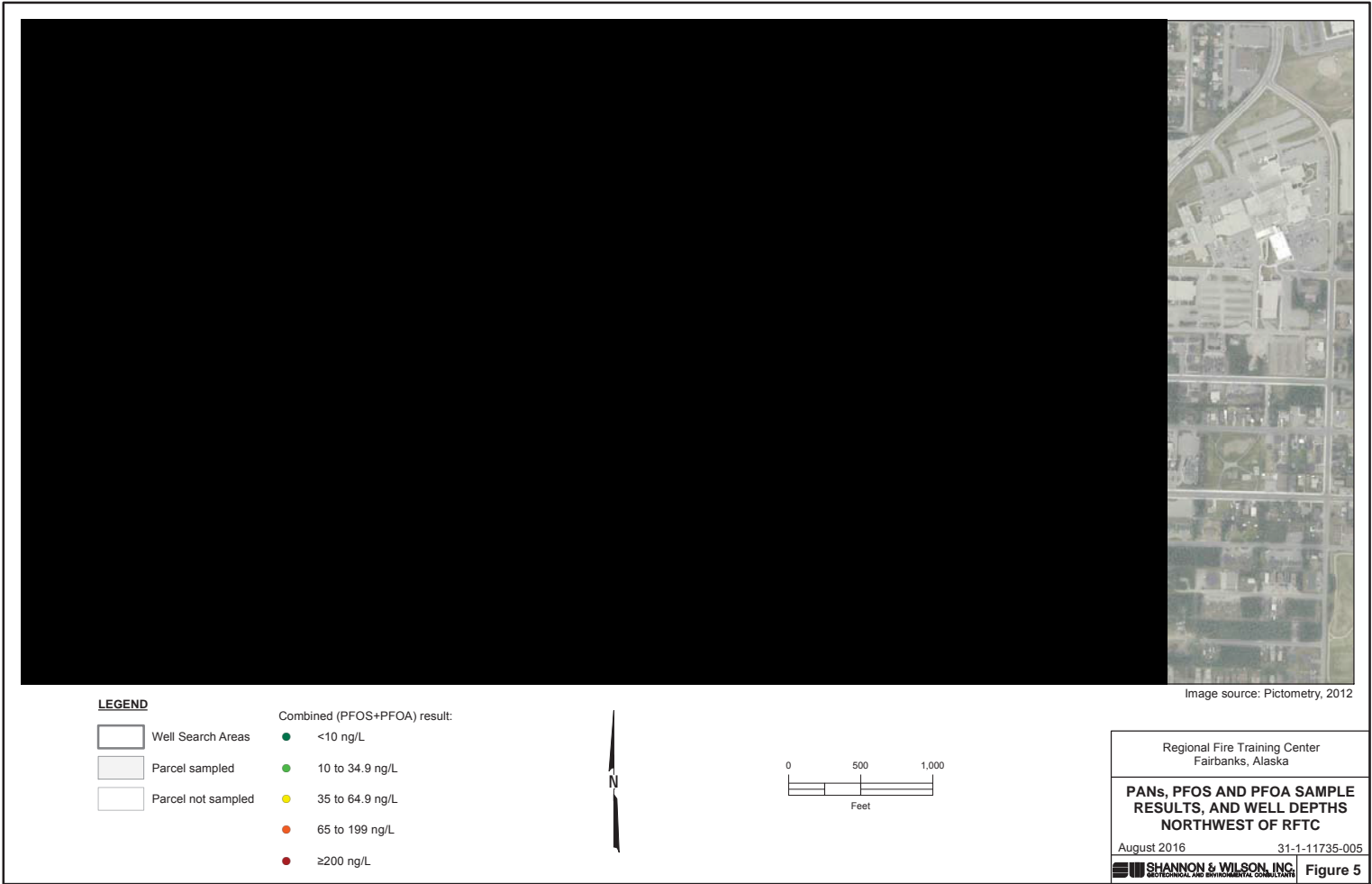
**PANS, PFOS AND PFOA SAMPLE
RESULTS, AND WELL DEPTHS
SOUTHWEST OF RFTC**

August 2016

31-1-11735-005

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 4



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

A handwritten signature in blue ink, appearing to read "JCF", is written over a horizontal line.

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

800 Cushman Street
Fairbanks, AK 99701

**PUBLIC WORKS DEPARTMENT
Engineering Division**

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

LINKS

Review your project
results through

TotalAccess

Have a Question?



Visit us at:

www.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.

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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.
α	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)

Case Narrative

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

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

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 5.5° 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-octadecanoic 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.

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: 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.

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: 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.

TestAmerica Sacramento

Client Sample Results

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

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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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: 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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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-octadecanoic 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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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: 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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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: 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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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: 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 (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

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

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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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

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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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: 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-octadecanoic 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-PFHxA	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

TestAmerica Sacramento

Client Sample Results

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-octadecanoic 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 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 PFDa (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	3O2 PFHx (25-150)	3C4 PFO/ (25-150)	3C4-PFHp (25-150)	3C5 PFPe (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 PFDaA = 13C2 PFDaA
18O2 PFHxS = 18O2 PFHxS
13C4 PFOS = 13C4 PFOS
13C4-PFHpA = 13C4-PFHpA
13C5 PFPeA = 13C5 PFPeA

TestAmerica Sacramento

QC Sample Results

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

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		02/28/16 12:22	02/28/16 17:45	1
Perfluoroxentanoic acid (PFPeA)	pD		2.0	0.99	ng/N		02/28/16 12:22	02/28/16 17:45	1
Perfluorohexanoic acid (PF6HA)	pD		2.0	0.79	ng/N		02/28/16 12:22	02/28/16 17:45	1
Perfluorohexanoic acid (PF6xA)	0.83L	J	2.0	0.80	ng/N		02/28/16 12:22	02/28/16 17:45	1
Perfluorooctanoic acid (PFOA)	pD		2.0	0.75	ng/N		02/28/16 12:22	02/28/16 17:45	1
Perfluorononanoic acid (PFpA)	pD		2.0	0.15	ng/N		02/28/16 12:22	02/28/16 17:45	1
Perfluorodecanoic acid (PFDA)	0.971	J	2.0	0.44	ng/N		02/28/16 12:22	02/28/16 17:45	1
Perfluoroundecanoic acid (PFUnA)	1.54	J	2.0	0.75	ng/N		02/28/16 12:22	02/28/16 17:45	1
Perfluorododecanoic acid (PFDoA)	pD		2.0	0.58	ng/N		02/28/16 12:22	02/28/16 17:45	1
Perfluorotridecanoic acid (PFTriA)	0.780	J	2.0	0.55	ng/N		02/28/16 12:22	02/28/16 17:45	1
Perfluorotetradecanoic acid (PFTeA)	1.1L	J	2.0	0.20	ng/N		02/28/16 12:22	02/28/16 17:45	1
Perfluoro-n-hexadecanoic acid (PF6HDA)	4.74	J	10	0.12	ng/N		02/28/16 12:22	02/28/16 17:45	1
Perfluoro-n-octadecanoic acid (PFODA)	pD		2.0	0.17	ng/N		02/28/16 12:22	02/28/16 17:45	1
Perfluorobutane Sulfonate (PFBS)	pD		2.0	0.92	ng/N		02/28/16 12:22	02/28/16 17:45	1
Perfluorohexane Sulfonate (PF6HS)	pD		2.0	0.87	ng/N		02/28/16 12:22	02/28/16 17:45	1
Perfluoro-1-hexanesulfonate (PF6xS)	pD		2.0	0.71	ng/N		02/28/16 12:22	02/28/16 17:45	1
Perfluorodecane sulfonate (PFDS)	pD		2.0	1.2	ng/N		02/28/16 12:22	02/28/16 17:45	1
Perfluorooctane Sulfonate (PFOS)	pD		2.0	1.3	ng/N		02/28/16 12:22	02/28/16 17:45	1
Perfluorooctane Sulfonamide (FOSA)	1.1L	J	2.0	0.14	ng/N		02/28/16 12:22	02/28/16 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	Limits
Perfluorobutanoic acid (PFBA)	40.0	39.8		ng/N		100	LO - 140
Perfluoroxentanoic acid (PFPeA)	40.0	41.5		ng/N		104	LO - 140
Perfluorohexanoic acid (PF6HA)	40.0	41.9		ng/N		105	LO - 140
Perfluorohexanoic acid (PF6xA)	40.0	38.9		ng/N		97	LO - 140
Perfluorooctanoic acid (PFOA)	40.0	3L.7		ng/N		92	LO - 140
Perfluorononanoic acid (PFpA)	40.0	37.0		ng/N		92	LO - 140
Perfluorodecanoic acid (PFDA)	40.0	41.9		ng/N		105	LO - 140

TestAmerica Sacramento

QC Sample Results

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 (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-hexadecanoic acid (PF6HDA)	40.0	37.L		ng/N		94	50 - 150
Perfluoro-n-octadecanoic acid (PFODA)	40.0	44.5		ng/N		111	50 - 150
Perfluorobutane Sulfonate (PFBS)	35.4	3L.5		ng/N		103	50 - 150
Perfluorohexane Sulfonate (PF6HS)	37.8	40.1		ng/N		10L	L0 - 140
Perfluoro-1-hexanesulfonate (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
Perfluorohexanoic acid (PF6HA)	40.0	42.1		ng/N		105	L0 - 140	0	30
Perfluorohexanoic 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

TestAmerica Sacramento

QC Sample Results

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 (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-heHdecanoic 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-hexanesulfonate (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

TestAmerica Sacramento

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.

TestAmerica Sacramento

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

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 462-0660

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

2355 S.W. Canyon Road
Portland, OR 97201-2498
(503) 223-6147

CHAIN-OF-CUSTODY RECORD

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 948-6309

Page 1 of 2
Laboratory Test America
Attn: David Altucker

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



320-17423 Chain of Custody

US NIST/NIJ

Time Sampled

Lab No.

Sample Identity

87173	1104	4/24/16	X	2	2	Water
87408	1248		X	2	2	
87418	1238		X	2	2	
87319	1405		X	2	2	
92801	1440		X	2	2	
624709	1615		X	2	2	
95451	1133		X	2	2	
563412	1226		X	2	2	
97301	1055	2/23/16	X	2	2	
562637	1003		X	2	2	

Project Information	Sample Receipt
Project Number: <u>31-1-11735-004</u>	Total Number of Containers: <u>22</u>
Project Name: <u>Fairbanks FRC</u>	COC Seals/Initialed: <u>N/NA</u>
Contact: <u>MDN/JAK</u>	Received Good Cond./Cold: <u>-</u>
Ongoing Project? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Delivery Method: <u>FEDEX</u>
Sampler: <u>MDN/TKG</u>	(attach shipping bill, if any)

Instructions
Requested Turnaround Time: <u>Standard</u>
Special Instructions: <u>Please notify us upon receipt (FedEx)</u>

Distribution White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

Relinquished By: 1. Signature: <u>M. Madell</u> Printed Name: <u>Marcy Nadei</u> Company: <u>Shannon & Wilson</u>	Relinquished By: 2. Signature: _____ Printed Name: _____ Company: _____	Relinquished By: 3. Signature: _____ Printed Name: _____ Company: _____
Received By: 1. Signature: <u>[Signature]</u> Printed Name: <u>J. Sadler</u> Company: _____	Received By: 2. Signature: _____ Printed Name: _____ Company: _____	Received By: 3. Signature: _____ Printed Name: _____ Company: _____



4400 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

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

Laboratory Test America Page 2 of 2
Attn: David Althueser

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

[illegible]

Project Information	Sample Receipt
Project Number:	Total Number of Containers <u>2</u>
Project Name:	COC Seals/Intact? Y/N/NA
Contact:	Received Good Cond./Cold
Ongoing Project? Yes <input type="checkbox"/> No <input type="checkbox"/>	Delivery Method:
Sampler:	(attach shipping bill, if any)
Instructions Requested Turnaround Time: _____ Special Instructions: _____	

Distribution White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

Relinquished By: 1. Signature <u>M. Nadel</u> Printed Name <u>Marcy Nadel</u> Company <u>Shannon & Wilkerson</u> Date <u>7/23/16</u>	Relinquished By: 2. Signature _____ Printed Name _____ Company _____ Date _____	Relinquished By: 3. Signature _____ Printed Name _____ Company _____ Date _____
Received By: 1. Signature <u>[Signature]</u> Printed Name <u>J. Sadler</u> Company _____ Date <u>7/23/16</u>	Received By: 2. Signature _____ Printed Name _____ Company _____ Date _____	Received By: 3. Signature _____ Printed Name _____ Company _____ Date _____

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 \leq 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 $<6\text{mm}$ (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:

Title: Date:

CS Report Name: Report Date:

Consultant Firm:

Laboratory Name: Laboratory Report Number:

ADEC File Number: 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:

- 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:

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 ($4^{\circ} \pm 2^{\circ} \text{C}$)?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

- 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 "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

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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.

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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.
α	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)

Case Narrative

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

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

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 3.7° 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-octadecanoic 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-octadecanoic 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.

TestAmerica Sacramento

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

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: 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.

TestAmerica Sacramento

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: 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.

TestAmerica Sacramento

Client Sample Results

Instrument: h&aSSoS WG iisoS
 Location: l itf oFkairbaSgs kire TraiSiSu Area

TestAmerica Job ID: 320-1774C-1
 hD5 : 31-1-1173P-004

Client Sample ID: M-228M

Date Cdlle/ te6: 03/14/2011:27

Date Re/ ei5e6: 03/11/2010:00

Lab Sample ID: 320-17748-1

x atWb: c ateW

x ethd6: c S-LC-002r - PeVudWhate6 Hy6W/ aVdms

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
PeVudWbutandi/ a/ i6 (PFBA)	4.0		1dC	0d#1	SuY		03/21/16 10:2B	03/24/16 00:2B	1
PeVudWpentandi/ a/ i6 (PFPeA)	M3		1dC	0dC	SuY		03/21/16 10:2B	03/24/16 00:2B	1
PeVudWheoandi/ a/ i6 (PFHoA)	12		1dC	0d0	SuY		03/21/16 10:2B	03/24/16 00:2B	1
PeVudWheptandi/ a/ i6 (PFHpA)	2.8		1dC	0d2	SuY		03/21/16 10:2B	03/24/16 00:2B	1
PeVudWld/ tandi/ a/ i6 (PFOA)	M2		1dC	0d7	SuY		03/21/16 10:2B	03/24/16 00:2B	1
PeVudWIndnandi/ a/ i6 (PF9A)	0.73	N	1dC	0dP	SuY		03/21/16 10:2B	03/24/16 00:2B	1
j erfn oro8ecaSoic aci8 lj kDAN	pD		1dC	0d8	SuY		03/21/16 10:2B	03/24/16 00:2B	1
j erfn oro. S8ecaSoic aci8 lj k9 SAN	pD		1dC	0d7	SuY		03/21/16 10:2B	03/24/16 00:2B	1
j erfn oro8o8ecaSoic aci8 lj kDoAN	pD		1dC	0d2	SuY		03/21/16 10:2B	03/24/16 00:2B	1
j erfn orotri8ecaSoic Aci8 lj kTriAN	pD		1dC	0d4	SuY		03/21/16 10:2B	03/24/16 00:2B	1
PeVudWitetW6e/ andi/ a/ i6 (PFJeA)	1.2	NB	1dC	0d1C	SuY		03/21/16 10:2B	03/24/16 00:2B	1
j erfn oro-S-8exa8ecaSoic aci8 lj kHxDAN	pD		) d	0d1	SuY		03/21/16 10:2B	03/24/16 00:2B	1
j erfn oro-S-octa8ecaSoic aci8 lj k6 DAN	pD		1dC	0dB0	SuY		03/21/16 10:2B	03/24/16 00:2B	1
PeVudWbutane Sulfdnate (PFBS)	2.8		1dC	0dC2	SuY		03/21/16 10:2B	03/24/16 00:2B	1
PeVudWheoane Sulfdnate (PFHoS)	1M		1dC	0d7C	SuY		03/21/16 10:2B	03/24/16 00:2B	1
j erfn oro-1-8eQa8es. rfoSate lj kHChN	pD		1dC	0dB4	SuY		03/21/16 10:2B	03/24/16 00:2B	1
j erfn oro8ecaSe s. rfoSate lj kDhN	pD		1dC	1dl	SuY		03/21/16 10:2B	03/24/16 00:2B	1
PeVudWld/ tane Sulfdnate (PFOS)	42		1dC	1dl	SuY		03/21/16 10:2B	03/24/16 00:2B	1
j erfn orooctaSe h. rfoSami8e lk6 hAN	pD		1dC	0dP7	SuY		03/21/16 10:2B	03/24/16 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: 03/14/2012:14

Date Re/ ei5e6: 03/11/2010:00

Lab Sample ID: 320-17748-2

x atWb: c ateW

x ethd6: c S-LC-002r - PeVudWhate6 Hy6W/ aVdms

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
j erfn orob. taSoic aci8 lj kUAN	pD		1dC	0d#1	SuY		03/21/16 10:2B	03/24/16 00:47	1
PeVudWpentandi/ a/ i6 (PFPeA)	r.2		1dC	0dCC	SuY		03/21/16 10:2B	03/24/16 00:47	1
PeVudWheoandi/ a/ i6 (PFHoA)	r.2		1dC	0d0	SuY		03/21/16 10:2B	03/24/16 00:47	1
PeVudWheptandi/ a/ i6 (PFHpA)	1.1	N	1dC	0d1	SuY		03/21/16 10:2B	03/24/16 00:47	1
PeVudWld/ tandi/ a/ i6 (PFOA)	r.8		1dC	0dB7	SuY		03/21/16 10:2B	03/24/16 00:47	1
j erfn oroSoSaSoic aci8 lj kp AN	pD		1dC	0dPC	SuY		03/21/16 10:2B	03/24/16 00:47	1

TestAmerica hacrameSto

Client Sample Results

Instrument: h&aSSoS WG iroS
 Location: I itf oFkairbaSgs kire TraiSiSu Area

TestAmerica Job ID: 320-1774C-1
 hD5 : 31-1-1173P-004

Client Sample ID: 322803T

Date Cdlle/ te6: 03M4M12:14

Date Re/ ei5e6: 03MMM10:00

Lab Sample ID: 320-17748-2

x atWb: c ateW

x ethd6: c S-LC-002r - PeViludWhate6 Hy6W/ aVldns (Cdntinue6)

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
PeViludW6e/ andi/ a/ i6 (PFDA)	0.12	NB	1c	0d8)	SuY		03Y21Y1B 10:2B	03Y24Y1B 00:47	1
j erfn oro. S8ecaSoic aci8 lj k9 SAN	pD		1c	0d7	SuY		03Y21Y1B 10:2B	03Y24Y1B 00:47	1
PeViludW6d6e/ andi/ a/ i6 (PFDDA)	0.73	NB	1c	0d2	SuY		03Y21Y1B 10:2B	03Y24Y1B 00:47	1
j erfn orotri8ecaSoic Aci8 lj kTriAN	pD		1c	0d4)	SuY		03Y21Y1B 10:2B	03Y24Y1B 00:47	1
PeViludWtetW6e/ andi/ a/ i6 (PFJA)	1.1	NB	1c	0d1C	SuY		03Y21Y1B 10:2B	03Y24Y1B 00:47	1
PeViludW-n-heoa6e/ andi/ a/ i6 (PFHoDA)	0.3r	N	0d	0d11	SuY		03Y21Y1B 10:2B	03Y24Y1B 00:47	1
PeViludW-n-d/ tan6e/ andi/ a/ i6 (PFODA)	0.72	NB	1c	0d0	SuY		03Y21Y1B 10:2B	03Y24Y1B 00:47	1
j erfn orob. taSe h. rfoSate lj kUhN	pD		1c	0d2	SuY		03Y21Y1B 10:2B	03Y24Y1B 00:47	1
PeViludWheoane Sulfdnate (PFHoS)	2.3		1c	0d7	SuY		03Y21Y1B 10:2B	03Y24Y1B 00:47	1
j erfn oro-1-&eQaSeS. rfoSate lj kHChN	pD		1c	0d3	SuY		03Y21Y1B 10:2B	03Y24Y1B 00:47	1
j erfn oro8ecaSe s. rfoSate lj kDhN	pD		1c	1d1	SuY		03Y21Y1B 10:2B	03Y24Y1B 00:47	1
PeViludWd/ tane Sulfdnate (PFOS)	1.1		1c	1d1	SuY		03Y21Y1B 10:2B	03Y24Y1B 00:47	1
j erfn oroocataSe h. rfoSami8e Lk6 hAN	pD		1c	0d7	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: 871r7

Date Cdlle/ te6: 03M4M13:00

Date Re/ ei5e6: 03MMM10:00

Lab Sample ID: 320-17748-3

x atWb: c ateW

x ethd6: c S-LC-002r - PeViludWhate6 Hy6W/ aVldns

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
PeViludWbutandi/ a/ i6 (PFBA)	7.1		1c	0d0	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:30	1
PeViludWpentandi/ a/ i6 (PFPeA)	10		1c	0d7	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:30	1
PeViludWheoandi/ a/ i6 (PFHoA)	1r		1c	0d8)	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:30	1
PeViludWheptandi/ a/ i6 (PFHpA)	3.1		1c	0d1	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:30	1
PeViludWd/ tandi/ a/ i6 (PFOA)	10		1c	0dB	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:30	1
PeViludWndnandi/ a/ i6 (PF9A)	1.3	N	1c	0dPC	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:30	1
PeViludW6e/ andi/ a/ i6 (PFDA)	1.1	NB	1c	0d8)	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:30	1
j erfn oro. S8ecaSoic aci8 lj k9 SAN	pD		1c	0dB	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:30	1
PeViludW6d6e/ andi/ a/ i6 (PFDDA)	0.78	NB	1c	0d2	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:30	1
j erfn orotri8ecaSoic Aci8 lj kTriAN	pD		1c	0d4)	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:30	1

TestAmerica hacrameSto

Client Sample Results

Location: h&SSoS WG insoS
j ro/ecthyite: l itf oFkairbaSgs kire TraiSiSu Area

TestAmerica Job ID: 320-1774C-1
hD5 : 31-1-1173P-004

Client Sample ID: 871r7

Date Cdlle/ te6: 03M4M13:00

Date Re/ ei5e6: 03M10:00

Lab Sample ID: 320-17748-3

x atWb: c ateW

x ethd6: c S-LC-002r - PeVudWhate6 Hy6W/ aVdms (Cdntinue6)

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
PeVudWitetW6e/ andi/ a/ i6 (PFJeA)	1.8	B	1c	0dl C	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:30	1
PeVudW-n-heoa6e/ andi/ a/ i6 (PFHoDA)	1.2	N	0c	0dl 1	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:30	1
PeVudW-n-d/ tan6e/ andi/ a/ i6 (PFODA)	0.84	NB	1c	0dP)	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:30	1
PeVudWbutane Sulfdnate (PFBS)	3.4		1c	0dC1	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:30	1
PeVudWheoane Sulfdnate (PFHoS)	18		1c	0d77	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:30	1
PeVudW-1-heptanesulfdnate (PFHps)	0.T3	N	1c	0dB3	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:30	1
j erfn oro8ecaSe s. rfoSate l j kDhN	pD		1c	1dl	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:30	1
PeVudWid/ tane Sulfdnate (PFOS)	7r		1c	1dl	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:30	1
PeVudWid/ tane Sulfdnami6e (FOSA)	3.8		1c	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: MM077

Date Cdlle/ te6: 03M4M14:14

Date Re/ ei5e6: 03M10:00

Lab Sample ID: 320-17748-4

x atWb: c ateW

x ethd6: c S-LC-002r - PeVudWhate6 Hy6W/ aVdms

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
PeVudWbutandi/ a/ i6 (PFBA)	r.1		1c	0d#0	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:P1	1
PeVudWpentandi/ a/ i6 (PFPeA)	7.1		1c	0dC7	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:P1	1
PeVudWheoandi/ a/ i6 (PFHoA)	12		1c	0dB)	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:P1	1
PeVudWheptandi/ a/ i6 (PFHpA)	2.T		1c	0d70	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:P1	1
PeVudWid/ tandi/ a/ i6 (PFOA)	3.T		1c	0dBB	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:P1	1
j erfn oroSoSaSoic aci8 l j kp AN	pD		1c	0dP7	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:P1	1
PeVudW6e/ andi/ a/ i6 (PFDA)	0.r4	NB	1c	0dB)	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:P1	1
j erfn oro. S8ecaSoic aci8 l j k9 SAN	pD		1c	0dBB	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:P1	1
j erfn oro8o8ecaSoic aci8 l j kDoAN	pD		1c	0dP1	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:P1	1
j erfn orotri8ecaSoic Aci8 l j kTriAN	pD		1c	0d#C	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:P1	1
PeVudWitetW6e/ andi/ a/ i6 (PFJeA)	0.T4	NB	1c	0dl 7	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:P1	1
j erfn oro-S-&exa8ecaSoic aci8 l j kHxDAN	pD		0c	0dl 1	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:P1	1
j erfn oro-S-octa8ecaSoic aci8 l j k6 DAN	pD		1c	0dP)	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:P1	1
PeVudWbutane Sulfdnate (PFBS)	3.0		1c	0dC1	SuY		03Y21Y1B 10:2B	03Y24Y1B 01:P1	1

TestAmerica hacrameSto

Client Sample Results

Instrument: h&aSSoS WG iisoS
 Location: I itf oFkairbaSgs kire TraiSiSu Area

TestAmerica Job ID: 320-1774C-1
 hD5 : 31-1-1173P-004

Client Sample ID: MM077

Date Cdlle/ te6: 03M4M14:14

Date Re/ ei5e6: 03MMM10:00

Lab Sample ID: 320-17748-4

x atWb: c ateW

x ethd6: c S-LC-002r - PeViludWhate6 Hy6W/ aVdms (Cdntinue6)

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
PeViludWheoane Sulfdnate (PFHoS)	13		1c	0dB	SuX		03Y21Y1B 10:2B	03Y24Y1B 01:P1	1
j erfr oro-1-&eCtaSes. rfoSate	pD		1c	0dB3	SuX		03Y21Y1B 10:2B	03Y24Y1B 01:P1	1
lj kHChN									
j erfr oro8ecaSe s. rfoSate lj kDhN	pD		1c	1dl	SuX		03Y21Y1B 10:2B	03Y24Y1B 01:P1	1
PeViludWld/ tane Sulfdnate (PFOS)	3r		1c	1dl	SuX		03Y21Y1B 10:2B	03Y24Y1B 01:P1	1
j erfr orooctaSe h. rfoSami8e Lk6 hAN	pD		1c	0dPB	SuX		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: 03M4M0T:30

Date Re/ ei5e6: 03MMM10:00

Lab Sample ID: 320-17748-r

x atWb: c ateW

x ethd6: c S-LC-002r - PeViludWhate6 Hy6W/ aVdms

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
PeViludWibutandi/ a/ i6 (PFBA)	3.T		1c	0d1	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1
PeViludWipentandi/ a/ i6 (PFPeA)	3.8		1c	0dC	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1
PeViludWheoandi/ a/ i6 (PFHoA)	7.r		1c	0d1	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1
PeViludWheptandi/ a/ i6 (PFHpA)	2.3		1c	0d2	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1
PeViludWld/ tandi/ a/ i6 (PFOA)	3.M		1c	0dB7	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1
j erfr oroSoSaSoic aci8 lj kp AN	pD		1c	0dP	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1
j erfr oro8ecaSoic aci8 lj kDAN	pD		1c	0d10	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1
j erfr oro. S8ecaSoic aci8 lj k9 SAN	pD		1c	0dB7	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1
j erfr oro8o8ecaSoic aci8 lj kDoAN	pD		1c	0dP3	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1
j erfr orotri8ecaSoic Aci8 lj kTriAN	pD		1c	0dP0	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1
PeViludWitetW6e/ andi/ a/ i6 (PFJeA)	0.82 NB		1c	0dlC	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1
PeViludWl-n-heoa6e/ andi/ a/ i6 (PFHoDA)	0.72 N		) d	0dl1	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1
j erfr oro-S-octaS8ecaSoic aci8 lj k6 DAN	pD		1c	0dB0	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1
PeViludWibutane Sulfdnate (PFBS)	1.8		1c	0dC3	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1
PeViludWheoane Sulfdnate (PFHoS)	T.3		1c	0dC	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1
j erfr oro-1-&eCtaSes. rfoSate	pD		1c	0dB4	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1
lj kHChN									
j erfr oro8ecaSe s. rfoSate lj kDhN	pD		1c	1dl	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1
PeViludWld/ tane Sulfdnate (PFOS)	T.r		1c	1dl	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1
j erfr orooctaSe h. rfoSami8e Lk6 hAN	pD		1c	0dP7	SuX		03Y21Y1B 10:2B	03Y24Y1B 02:12	1

TestAmerica hacrameSto

Client Sample Results

LineSt: h&aSSoS WG iisoS
j ro/ecthite: l itf oFkairbaSgs kire TraiSiSu Area

TestAmerica Job ID: 320-1774C-1
hD5 : 31-1-1173P-004

Client Sample ID: 873r 1

Date Cdille/ te6: 03M4MM0T:30

Date Re/ ei5e6: 03MMMM10:00

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 Cdille/ te6: 03M4MM10:30

Date Re/ ei5e6: 03MMMM10:00

Lab Sample ID: 320-17748-M

x atWb: c ateW

x ethd6: c S-LC-002r - PeViludWhate6 Hy6W/ aVidns										
Analyte	Result	Qualifier	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/	
PeViludWibutandi/ a/ i6 (PFBA)	13		1dC	0d#2	SuY		03Y21y1B 10:2B	03Y24y1B 02:34	1	
PeViludWipentandi/ a/ i6 (PFPeA)	21		1dC	0d 1	SuY		03Y21y1B 10:2B	03Y24y1B 02:34	1	
PeViludWihoeandi/ a/ i6 (PFHoA)	2T		1dC	0d73	SuY		03Y21y1B 10:2B	03Y24y1B 02:34	1	
PeViludWiheptandi/ a/ i6 (PFHpA)	8.T		1dC	0d74	SuY		03Y21y1B 10:2B	03Y24y1B 02:34	1	
PeViludWid/ tandi/ a/ i6 (PFOA)	12		1dC	0dB)	SuY		03Y21y1B 10:2B	03Y24y1B 02:34	1	
PeViludWindnandi/ a/ i6 (PF9 A)	2.8		1dC	0dB0	SuY		03Y21y1B 10:2B	03Y24y1B 02:34	1	
PeViludW6e/ andi/ a/ i6 (PFDA)	0.47	NB	1dC	0d#1	SuY		03Y21y1B 10:2B	03Y24y1B 02:34	1	
j erfrn oro. S8ecaSoic aci8 lj k9 SAN	pD		1dC	0dB)	SuY		03Y21y1B 10:2B	03Y24y1B 02:34	1	
j erfrn oro8o8ecaSoic aci8 lj kDoAN	pD		1dC	0dP4	SuY		03Y21y1B 10:2B	03Y24y1B 02:34	1	
j erfrn orotri8ecaSoic Aci8 lj kTriAN	pD		1dC	0dP1	SuY		03Y21y1B 10:2B	03Y24y1B 02:34	1	
PeViludWitetW6e/ andi/ a/ i6 (PFJeA)	1.7	NB	1dC	0dl C	SuY		03Y21y1B 10:2B	03Y24y1B 02:34	1	
j erfrn oro-S-8exa8ecaSoic aci8 lj kHxDAN	pD		) d2	0dl 1	SuY		03Y21y1B 10:2B	03Y24y1B 02:34	1	
j erfrn oro-S-octa8ecaSoic aci8 lj k6 DAN	pD		1dC	0dB2	SuY		03Y21y1B 10:2B	03Y24y1B 02:34	1	
PeViludWibutane Sulfdnate (PFBS)	T.r		1dC	0dCP	SuY		03Y21y1B 10:2B	03Y24y1B 02:34	1	
PeViludWihoeane Sulfdnate (PFHoS)	M		1dC	0dC0	SuY		03Y21y1B 10:2B	03Y24y1B 02:34	1	
PeViludW-1-heptanesulfdnate (PFHpS)	3.7		1dC	0dB8	SuY		03Y21y1B 10:2B	03Y24y1B 02:34	1	
j erfrn oro8ecaSe s. rfoSate lj kDhN	pD		1dC	1dl	SuY		03Y21y1B 10:2B	03Y24y1B 02:34	1	
PeViludWid/ tane Sulfdnate (PFOS)	330		1dC	1d2	SuY		03Y21y1B 10:2B	03Y24y1B 02:34	1	
j erfrn orooc8aSe h. rfoSami8e lk6 hAN	pD		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				

TestAmerica hacrameSto

Client Sample Results

Instrument: h&aSSoS WG iroS
 Location: I itf oFkairbaSgs kire TraiSiSu Area

TestAmerica Job ID: 320-1774C-1
 hD5 : 31-1-1173P-004

Client Sample ID: r 22384

Date Cdlle/ te6: 03M4M10:30

Date Re/ ei5e6: 03MMM10:00

Lab Sample ID: 320-17748-M

x atWb: c ateW

x ethd6: c S-LC-002r - PeVudWhate6 Hy6W/ 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: 03M4M10:20

Date Re/ ei5e6: 03MMM10:00

Lab Sample ID: 320-17748-7

x atWb: c ateW

x ethd6: c S-LC-002r - PeVudWhate6 Hy6W/ aWdns

Analyte	Result	Qualifier	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
PeVudWibutandi/ a/ i6 (PFBA)	12		1c	0d#2	SuX		03/21/16 10:26	03/24/16 02:34	1
PeVudWipentandi/ a/ i6 (PFPeA)	28		1c	0d 1	SuX		03/21/16 10:26	03/24/16 02:34	1
PeVudWiheoandi/ a/ i6 (PFHoA)	31		1c	0d#2	SuX		03/21/16 10:26	03/24/16 02:34	1
PeVudWiheptandi/ a/ i6 (PFHpA)	1.4		1c	0d#4	SuX		03/21/16 10:26	03/24/16 02:34	1
PeVudWid/ tandi/ a/ i6 (PFOA)	11		1c	0dB)	SuX		03/21/16 10:26	03/24/16 02:34	1
PeVudWindnandi/ a/ i6 (PF9A)	2.3		1c	0dB0	SuX		03/21/16 10:26	03/24/16 02:34	1
PeVudWi6e/ andi/ a/ i6 (PFDA)	0.7M NB		1c	0d#0	SuX		03/21/16 10:26	03/24/16 02:34	1
j erfr oro. S8ecaSoic aci8 lj k9 SAN	pD		1c	0dB)	SuX		03/21/16 10:26	03/24/16 02:34	1
j erfr oro8o8ecaSoic aci8 lj kDoAN	pD		1c	0dP4	SuX		03/21/16 10:26	03/24/16 02:34	1
j erfr orotri8ecaSoic Aci8 lj kTriAN	pD		1c	0dP1	SuX		03/21/16 10:26	03/24/16 02:34	1
PeVudWitetWi6e/ andi/ a/ i6 (PFJeA)	0.7M NB		1c	0d#C	SuX		03/21/16 10:26	03/24/16 02:34	1
j erfr oro-S&exa8ecaSoic aci8 lj kHxDAN	pD		) d	0d#1	SuX		03/21/16 10:26	03/24/16 02:34	1
j erfr oro-S-octa8ecaSoic aci8 lj k6 DAN	pD		1c	0dB2	SuX		03/21/16 10:26	03/24/16 02:34	1
PeVudWibutane Sulfdnate (PFBS)	12		1c	0dC4	SuX		03/21/16 10:26	03/24/16 02:34	1
PeVudWiheoane Sulfdnate (PFHoS)	78		1c	0dC0	SuX		03/21/16 10:26	03/24/16 02:34	1
PeVudWi-1-heptanesulfdnate (PFHpS)	r.7		1c	0dBP	SuX		03/21/16 10:26	03/24/16 02:34	1
j erfr oro8ecaSe s. rfoSate lj kDhN	pD		1c	1d#	SuX		03/21/16 10:26	03/24/16 02:34	1
PeVudWid/ tane Sulfdnate (PFOS)	340		1c	1d	SuX		03/21/16 10:26	03/24/16 02:34	1
j erfr orooctaSe h. rfoSami8e Lk6 hAN	pD		1c	0dP)	SuX		03/21/16 10:26	03/24/16 02:34	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

TestAmerica hacrameSto

Client Sample Results

Instrument: HS-SSoS WG iroS
 Location: I itf oFkairbaSgs kire TraiSiSu Area

TestAmerica Job ID: 320-1774C-1
 HD5 : 31-1-1173P-004

Client Sample ID: 8738M

Date Cdlle/ te6: 03M4M11:10

Date Re/ ei5e6: 03MMMM10:00

Lab Sample ID: 320-17748-8

x atWb: c ateW

x ethd6: c S-LC-002r - PeVudWhate6 Hy6W/ aVdms

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
PeVudWibutandi/ a/ i6 (PFBA)	r.0		1c	0d1	SuY		03y2y1B 10:2B	03y24y1B 03:1B	1
PeVudWipentandi/ a/ i6 (PFPeA)	10		1c	0dC	SuY		03y2y1B 10:2B	03y24y1B 03:1B	1
PeVudWiheoandi/ a/ i6 (PFHoA)	14		1c	0d1	SuY		03y2y1B 10:2B	03y24y1B 03:1B	1
PeVudWiheptandi/ a/ i6 (PFHpA)	4.M		1c	0d2	SuY		03y2y1B 10:2B	03y24y1B 03:1B	1
PeVudWid/ tandi/ a/ i6 (PFOA)	r.r		1c	0dC	SuY		03y2y1B 10:2B	03y24y1B 03:1B	1
PeVudWindnandi/ a/ i6 (PF9A)	0.8M N		1c	0dP	SuY		03y2y1B 10:2B	03y24y1B 03:1B	1
PeVudWl6e/ andi/ a/ i6 (PFDA)	0.73 NB		1c	0d0	SuY		03y2y1B 10:2B	03y24y1B 03:1B	1
j erfr oro. S8ecaSoic aci8 lj k9 SAN	pD		1c	0dC	SuY		03y2y1B 10:2B	03y24y1B 03:1B	1
j erfr oro8o8ecaSoic aci8 lj kDoAN	pD		1c	0dP3	SuY		03y2y1B 10:2B	03y24y1B 03:1B	1
j erfr orotri8ecaSoic Aci8 lj kTriAN	pD		1c	0dP0	SuY		03y2y1B 10:2B	03y24y1B 03:1B	1
PeVudWitetWl6e/ andi/ a/ i6 (PFJeA)	1.2 NB		1c	0d1C	SuY		03y2y1B 10:2B	03y24y1B 03:1B	1
j erfr oro-S-8exa8ecaSoic aci8 lj kHxDAN	pD		) d	0d1	SuY		03y2y1B 10:2B	03y24y1B 03:1B	1
j erfr oro-S-octa8ecaSoic aci8 lj k6 DAN	pD		1c	0d1	SuY		03y2y1B 10:2B	03y24y1B 03:1B	1
PeVudWibutane Sulfdnate (PFBS)	2.T		1c	0dC3	SuY		03y2y1B 10:2B	03y24y1B 03:1B	1
PeVudWiheoane Sulfdnate (PFHoS)	17		1c	0d7	SuY		03y2y1B 10:2B	03y24y1B 03:1B	1
j erfr oro-1-8eCtaSes. rfoSate lj kHChN	pD		1c	0d4	SuY		03y2y1B 10:2B	03y24y1B 03:1B	1
j erfr oro8ecaSe s. rfoSate lj kDhN	pD		1c	1d1	SuY		03y2y1B 10:2B	03y24y1B 03:1B	1
PeVudWid/ tane Sulfdnate (PFOS)	1r		1c	1d2	SuY		03y2y1B 10:2B	03y24y1B 03:1B	1
j erfr orooctaSe h. rfoSami8e lk6 hAN	pD		1c	0dPC	SuY		03y2y1B 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: 871M

Date Cdlle/ te6: 03M4M13:0M

Date Re/ ei5e6: 03MMMM10:00

Lab Sample ID: 320-17748-T

x atWb: c ateW

x ethd6: c S-LC-002r - PeVudWhate6 Hy6W/ aVdms

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
PeVudWibutandi/ a/ i6 (PFBA)	8.3		1c	0d2	SuY		03y2y1B 10:2B	03y24y1B 03:37	1
PeVudWipentandi/ a/ i6 (PFPeA)	18		1c	0d0	SuY		03y2y1B 10:2B	03y24y1B 03:37	1
PeVudWiheoandi/ a/ i6 (PFHoA)	24		1c	0d2	SuY		03y2y1B 10:2B	03y24y1B 03:37	1
PeVudWiheptandi/ a/ i6 (PFHpA)	7.3		1c	0d3	SuY		03y2y1B 10:2B	03y24y1B 03:37	1
PeVudWid/ tandi/ a/ i6 (PFOA)	7.r		1c	0dC	SuY		03y2y1B 10:2B	03y24y1B 03:37	1
PeVudWindnandi/ a/ i6 (PF9A)	4.1		1c	0d0	SuY		03y2y1B 10:2B	03y24y1B 03:37	1
j erfr oro8ecaSoic aci8 lj kDAN	pD		1c	0d0	SuY		03y2y1B 10:2B	03y24y1B 03:37	1

TestAmerica hacrameSto

Client Sample Results

LineSt: h&aSSoS WG insoS
j ro/ecthite: l itf oFkairbaSgs kire TraiSiSu Area

TestAmerica Job ID: 320-1774C-1
hD5 : 31-1-1173P-004

Client Sample ID: 871M

Date Cdlle/ te6: 03M4VMM13:0M

Date Re/ ei5e6: 03VMMM10:00

Lab Sample ID: 320-17748-T

x atWb: c ateW

x ethd6: c S-LC-002r - PeVudWhate6 Hy6W/ aVdms (Cdntinue6)

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
j erfr oro. S8ecaSoic aci8 lj k9 SAN	pD		1c	0dBC	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:37	1
j erfr oro8o8ecaSoic aci8 lj kDoAN	pD		1c	0dP3	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:37	1
j erfr orotri8ecaSoic Aci8 lj kTriAN	pD		1c	0dP0	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:37	1
PeVudWitetW6e/ andi/ a/ i6 (PFJeA)	1.2	NB	1c	0d1C	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:37	1
PeVudW-n-heoa6e/ andi/ a/ i6 (PFHoDA)	2.7	N	) dl	0d11	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:37	1
j erfr oro-S-octa8ecaSoic aci8 lj k6 DAN	pD		1c	0dB1	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:37	1
PeVudWibutane Sulfdnate (PFBS)	8.3		1c	0dC4	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:37	1
PeVudWheoane Sulfdnate (PFHoS)	r2		1c	0d7)	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:37	1
PeVudW-1-heptanesulfdnate (PFHps)	3.r		1c	0dBP	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:37	1
j erfr oro8ecaSe s. rfoSate lj kDhN	pD		1c	1dl	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:37	1
PeVudWid/ tane Sulfdnate (PFOS)	1M		1c	1d2	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:37	1
j erfr orooctaSe h. rfoSami8e lk6 hAN	pD		1c	0dPC	SuX		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: 03M4VMM14:0r

Date Re/ ei5e6: 03VMMM10:00

Lab Sample ID: 320-17748-10

x atWb: c ateW

x ethd6: c S-LC-002r - PeVudWhate6 Hy6W/ aVdms

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
PeVudWibutandi/ a/ i6 (PFBA)	T.0		1c	0d#2	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:P)	1
PeVudWipentandi/ a/ i6 (PFPeA)	13		1c	0d 1	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:P)	1
PeVudWheoandi/ a/ i6 (PFHoA)	20		1c	0d72	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:P)	1
PeVudWheptandi/ a/ i6 (PFHpA)	4.8		1c	0d74	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:P)	1
PeVudWid/ tandi/ a/ i6 (PFOA)	4.M		1c	0dB)	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:P)	1
PeVudWindnandi/ a/ i6 (PF9A)	1.2	N	1c	0dB0	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:P)	1
PeVudW6e/ andi/ a/ i6 (PFDA)	0.40	NB	1c	0d#0	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:P)	1
j erfr oro. S8ecaSoic aci8 lj k9 SAN	pD		1c	0dB)	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:P)	1
j erfr oro8o8ecaSoic aci8 lj kDoAN	pD		1c	0dP4	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:P)	1
j erfr orotri8ecaSoic Aci8 lj kTriAN	pD		1c	0dP1	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:P)	1
PeVudWitetW6e/ andi/ a/ i6 (PFJeA)	1.0	NB	1c	0d1C	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:P)	1
PeVudW-n-heoa6e/ andi/ a/ i6 (PFHoDA)	0.M2	N	) d2	0d11	SuX		03Y21Y1B 10:2B	03Y24Y1B 03:P)	1

TestAmerica hacrameSto

Client Sample Results

Instrument: h&aSSoS WG iisoS
 Location: I itf oFkairbaSgs kire TraiSiSu Area

TestAmerica Job ID: 320-1774C-1
 hD5 : 31-1-1173P-004

Client Sample ID: T2T24
Date Cdlle/ te6: 03M4M14:0r
Date Re/ ei5e6: 03MMM10:00

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

x ethd6: c S-LC-002r - PeVudWhate6 Hy6W/ aVdms (Cdntinue6)

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
j erfn oro-S-octaS8ecaSoic aci8	pD		1c	0dB2	SuY		03Y21Y1B 10:2B	03Y24Y1B 03:P)	1
lj k6 DAN									
PeVudWibutane Sulfdnate (PFBS)	4.M		1c	0d4	SuY		03Y21Y1B 10:2B	03Y24Y1B 03:P)	1
PeVudWheoane Sulfdnate (PFHoS)	23		1c	0d0	SuY		03Y21Y1B 10:2B	03Y24Y1B 03:P)	1
j erfn oro-1-&eCtaSes. rfoSate	pD		1c	0dB8	SuY		03Y21Y1B 10:2B	03Y24Y1B 03:P)	1
lj kHChN									
j erfn oro8ecaSe s. rfoSate lj kDhN	pD		1c	1d1	SuY		03Y21Y1B 10:2B	03Y24Y1B 03:P)	1
PeVudWid/ tane Sulfdnate (PFOS)	42		1c	1d2	SuY		03Y21Y1B 10:2B	03Y24Y1B 03:P)	1
j erfn orooctaSe h. rfoSami8e lk6 hAN	pD		1c	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: 873MD
Date Cdlle/ te6: 03M4M17:48
Date Re/ ei5e6: 03MMM10:00

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

x ethd6: c S-LC-002r - PeVudWhate6 Hy6W/ aVdms

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
PeVudWibutandi/ a/ i6 (PFBA)	2.7		1c	0d#0	SuY		03Y21Y1B 10:2B	03Y24Y1B 04:20	1
PeVudWipentandi/ a/ i6 (PFPeA)	1.3	N	1c	0dC7	SuY		03Y21Y1B 10:2B	03Y24Y1B 04:20	1
PeVudWheoandi/ a/ i6 (PFHoA)	2.1		1c	0dB)	SuY		03Y21Y1B 10:2B	03Y24Y1B 04:20	1
PeVudWiheptandi/ a/ i6 (PFHpA)	0.8T	N	1c	0d*1	SuY		03Y21Y1B 10:2B	03Y24Y1B 04:20	1
PeVudWid/ tandi/ a/ i6 (PFOA)	2.M		1c	0dB8	SuY		03Y21Y1B 10:2B	03Y24Y1B 04:20	1
j erfn oroSoSaSoic aci8 lj kp AN	pD		1c	0dPC	SuY		03Y21Y1B 10:2B	03Y24Y1B 04:20	1
PeVudWibe/ andi/ a/ i6 (PFDA)	0.47	NB	1c	0dB)	SuY		03Y21Y1B 10:2B	03Y24Y1B 04:20	1
j erfn oro. S8ecaSoic aci8 lj k9 SAN	pD		1c	0dB8	SuY		03Y21Y1B 10:2B	03Y24Y1B 04:20	1
j erfn oro8o8ecaSoic aci8 lj kDoAN	pD		1c	0dP2	SuY		03Y21Y1B 10:2B	03Y24Y1B 04:20	1
j erfn orotri8ecaSoic Aci8 lj kTriAN	pD		1c	0d#)	SuY		03Y21Y1B 10:2B	03Y24Y1B 04:20	1
PeVudWitetWibe/ andi/ a/ i6 (PFJeA)	0.T4	NB	1c	0d1C	SuY		03Y21Y1B 10:2B	03Y24Y1B 04:20	1
j erfn oro-S-&exa8ecaSoic aci8	pD		0c	0d11	SuY		03Y21Y1B 10:2B	03Y24Y1B 04:20	1
lj kHxDAN									
j erfn oro-S-octaS8ecaSoic aci8	pD		1c	0dP)	SuY		03Y21Y1B 10:2B	03Y24Y1B 04:20	1
lj k6 DAN									
j erfn orob. taSe h. rfoSate lj kUhN	pD		1c	0dC1	SuY		03Y21Y1B 10:2B	03Y24Y1B 04:20	1
PeVudWheoane Sulfdnate (PFHoS)	1.8		1c	0d*7	SuY		03Y21Y1B 10:2B	03Y24Y1B 04:20	1
j erfn oro-1-&eCtaSes. rfoSate	pD		1c	0dB3	SuY		03Y21Y1B 10:2B	03Y24Y1B 04:20	1
lj kHChN									

TestAmerica hacrameSto

Client Sample Results

Location: h&aSSoS WG insOS
 Project: I itf oFkairbaSgs kire TraiSiSu Area

TestAmerica Job ID: 320-1774C-1
 hD5 : 31-1-1173P-004

Client Sample ID: 873MD
Date Cdlle/ te6: 03M4MM17:48
Date Re/ ei5e6: 03MMM10:00

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

x ethd6: c S-LC-002r - PeVudWhate6 Hy6W/ aVdns (Cdntinue6)

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
j erfn oro8ecaSe s. rfoSate lj kDhN	pD		1c	1dl	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:20	1
PeVudWid/ tane Sulfdnate (PFOS)	2.1		1c	1dl	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:20	1
j erfn oroocataSe h. rfoSami8e lk6 hAN	pD		1c	0dPB	SuX		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: 03M4MM18:28
Date Re/ ei5e6: 03MMM10:00

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

x ethd6: c S-LC-002r - PeVudWhate6 Hy6W/ aVdns

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWpaW6	Analyze6	Dil Fa/
PeVudWibutandi/ a/ i6 (PFBA)	4.7		1c	0d#1	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:41	1
PeVudWipentandi/ a/ i6 (PFPeA)	r.T		1c	0dC	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:41	1
PeVudWiheoandi/ a/ i6 (PFHoA)	1r		1c	0d0	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:41	1
PeVudWiheptandi/ a/ i6 (PFHpA)	3.0		1c	0d1	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:41	1
PeVudWid/ tandi/ a/ i6 (PFOA)	3.8		1c	0dB	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:41	1
j erfn oroSoSaSoic aci8 lj kp AN	pD		1c	0dPC	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:41	1
j erfn oro8ecaSoic aci8 lj kDAN	pD		1c	0d8)	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:41	1
j erfn oro. S8ecaSoic aci8 lj k9 SAN	pD		1c	0dB	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:41	1
j erfn oro8o8ecaSoic aci8 lj kDoAN	pD		1c	0dP2	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:41	1
j erfn orotri8ecaSoic Aci8 lj kTriAN	pD		1c	0d#)	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:41	1
PeVudWitetW6e/ andi/ a/ i6 (PFJeA)	0.38 NB		1c	0dl C	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:41	1
j erfn oro-S-8exa8ecaSoic aci8 lj kHxDAN	pD		0d)	0dl 1	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:41	1
j erfn oro-S-octa8ecaSoic aci8 lj k6 DAN	pD		1c	0dB0	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:41	1
PeVudWibutane Sulfdnate (PFBS)	2.4		1c	0dC1	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:41	1
PeVudWiheoane Sulfdnate (PFHoS)	13		1c	0d7	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:41	1
j erfn oro-1-8eCtaSes. rfoSate lj kHChN	pD		1c	0dB3	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:41	1
j erfn oro8ecaSe s. rfoSate lj kDhN	pD		1c	1dl	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:41	1
PeVudWid/ tane Sulfdnate (PFOS)	3r		1c	1dl	SuX		03Y21Y1B 10:2B	03Y24Y1B 04:41	1
j erfn oroocataSe h. rfoSami8e lk6 hAN	pD		1c	0dP7	SuX		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

TestAmerica hacrameSto

Client Sample Results

Location: h&aSSoS WG iisoS
Project: I itf oFkairbaSgs kire TraiSiSu Area

TestAmerica Job ID: 320-1774C-1
hD5 : 31-1-1173P-004

Client Sample ID: 871T0

Date Cdlle/ te6: 03/14/18:28

Date Re/ ei5e6: 03/11/10:00

Lab Sample ID: 320-17748-12

x atWb: c ateW

x ethd6: c S-LC-002r - PeVudWhate6 Hy6W/ 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 FOS/ (25-150)	3C4 PFB/ (25-150)	3C2 PFHx (25-150)	3C4 PFO/ (25-150)	3C5 PFNA/ (25-150)	3C2 PFD/ (25-150)	3C2 PFUn (25-150)	3C2 PFDa (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	3O2 PFHx (25-150)	3C4 PFO: (25-150)	3C4-PFHp (25-150)	3C5 PFPe (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 PFDa = 13C2 PFDa
18O2 PFHxS = 18O2 PFHxS
13C4 PFOS = 13C4 PFOS
13C4-PFHpA = 13C4-PFHpA
13C5 PFPeA = 13C5 PFPeA

TestAmerica Sacramento

QC Sample Results

LineSt: h&aSSoS WG insoS
j ro/ecthyite: l itf oFkairbaSgs kire TraiSiSu Area

TestAmerica Job ID: 320-1774C-1
hD5 : 31-1-1173P-004

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 erFidoroObdtaSoic aci(B k) A.	8D		2L0	0L4N	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFidoroXeStaSoic aci(B kj eA.	8D		2L0	0L99	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFidoro&eHaSoic aci(B k6 HA.	8D		2L0	0L79	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFidoro&extaSoic aci(B k6 xA.	8D		2L0	0L00	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFidoroOctaSoic aci(B kOA.	8D		2L0	0L7P	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFidoroSoSaSoic aci(B k8 A.	8D		2L0	0LNP	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFidoro(ecaSoic aci(B kDA.	0L7N7	J	2L0	0L44	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFidoroD(ecaSoic aci(B kUSA.	0L972	J	2L0	0L7P	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFidoro(o(ecaSoic aci(B kDoA.	0L990	J	2L0	0LPC	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFidoroTri(ecaSoic Aci(B kTriA.	8D		2L0	0LPP	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFidoroTetra(ecaSoic aci(B kTeA.	1L2C	J	2L0	0L20	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFidoro-S-&eHa(ecaSoic aci(B k6 HDA.	8D		10	0L12	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFidoro-S-Octa(ecaSoic aci(B kODA.	0L7PP	J	2L0	0LNP	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFidoroObdtaSe h drioSate B k) h.	8D		2L0	0L92	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFidoro&eHaSe h drioSate B k6 Hh.	8D		2L0	0L77	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFidoro-1-&extaSeSdrioSate B k6 xh.	8D		2L0	0L71	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFidoro(ecaSe sdrioSate B kDh.	8D		2L0	1L2	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFidoroOctaSe h drioSate B kOh.	8D		2L0	1L3	Suyp		03y21y1N 10:2N	03y23y1N 20:P4	1
j erFidoroOctaSe h drioSami(e Bk OhA.	8D		2L0	0LNP	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	Limits
j erFidoroObdtaSoic aci(B k) A.	40L0	41L7		Suyp		104	ND - 140
j erFidoroXeStaSoic aci(B kj eA.	40L0	43L0		Suyp		107	ND - 140
j erFidoro&eHaSoic aci(B k6 HA.	40L0	30L0		Suyp		9P	ND - 140
j erFidoro&extaSoic aci(B k6 xA.	40L0	30N9		Suyp		92	ND - 140
j erFidoroOctaSoic aci(B kOA.	40L0	37L2		Suyp		93	ND - 140
j erFidoroSoSaSoic aci(B k8 A.	40L0	37L1		Suyp		93	ND - 140
j erFidoro(ecaSoic aci(B kDA.	40L0	34LC		Suyp		C7	ND - 140

TestAmerica hacrameSto

QC Sample Results

LineSt: h&aSSoS WG insoS
j ro/ecthyite: l itf oFkairbaSgs kire TraiSiSu Area

TestAmerica Job ID: 320-1774C-1
hD5 : 31-1-1173P-004

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 erFidorodS(ecaSoic aci(B k USA.	40L0	39L7		Suyp		99	ND - 140
j erFidoro(o(ecaSoic aci(B k DoA.	40L0	40LC		Suyp		102	ND - 140
j erFidorotri(ecaSoic Aci(B k TriA.	40L0	37LP		Suyp		94	P0 - 1P0
j erFidorotetra(ecaSoic aci(B k TeA.	40L0	33L3		Suyp		C3	P0 - 1P0
j erFidoro-S&eHa(ecaSoic aci(B k6 HDA.	40L0	32L3		Suyp		C1	P0 - 1P0
j erFidoro-S-octaS(ecaSoic aci(B k ODA.	40L0	42L1		Suyp		10P	P0 - 1P0
j erFidorobdtaSe h drioSate B k) h.	3PL4	2PL9		Suyp		73	P0 - 1P0
j erFidoro&eHaSe h drioSate B k6 Hh.	37LC	3PL7		Suyp		94	ND - 140
j erFidoro-1-&extaSeSdrioSate B k6 xh.	3CL1	32L2		Suyp		C4	P0 - 1P0
j erFidoro(ecaSe sdrioSate B k Dh.	3CLN	41L0		Suyp		10N	P0 - 1P0
j erFidoroocctaSe h drioSate B k Oh.	3CL2	32L4		Suyp		CP	ND - 140
j erFidoroocctaSe h drioSami(e Bk OhA.	40L0	44L2		Suyp		110	ND - 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 erFidorobdtaSoic aci(B k) A.	40L0	3N3		Suyp		91	ND - 140	14	30
j erFidoroxeStaSoic aci(B kj eA.	40L0	37L4		Suyp		93	ND - 140	14	30
j erFidoro&eHaSoic aci(B k6 HA.	40L0	37LC		Suyp		9P	ND - 140	1	30
j erFidoro&extaSoic aci(B k6 xA.	40L0	39L0		Suyp		97	ND - 140	P	30
j erFidoroocctaSoic aci(B k OA.	40L0	42LP		Suyp		10N	ND - 140	13	30
j erFidoroSoSaSoic aci(B k8 A.	40L0	3CL1		Suyp		9P	ND - 140	3	30
j erFidoro(ecaSoic aci(B k DA.	40L0	44LN		Suyp		112	ND - 140	2P	30

TestAmerica hacrameSto

QC Sample Results

LineSt: h&SSoS WG inSoS
j ro/ectyhte: l itf oFkairbaSgs kire TraiSiSu Area

TestAmerica Job ID: 320-1774C-1
hD5 : 31-1-1173P-004

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 erFidorodS(ecaSoic aci(B k USA.	40L0	34LC		Suyp		C7	ND - 140	13	30
j erFidoro(o(ecaSoic aci(B k DoA.	40L0	39LC		Suyp		99	ND - 140	2	30
j erFidorotri(ecaSoic Aci(B k TriA.	40L0	43L4		Suyp		109	P0 - 1P0	1P	30
j erFidorotetra(ecaSoic aci(B k TeA.	40L0	3QCP		Suyp		9N	P0 - 1P0	14	30
j erFidoro-S-&eHa(ecaSoic aci(B k HDA.	40L0	39LN		Suyp		99	P0 - 1P0	20	30
j erFidoro-S-octaS(ecaSoic aci(B k ODA.	40L0	4PL3		Suyp		113	P0 - 1P0	7	30
j erFidorobdtaSe h drioSate B k) h.	3PL4	32LP		Suyp		92	P0 - 1P0	23	30
j erFidoro&eHaSe h drioSate B k6 Hh.	37LC	34LP		Suyp		91	ND - 140	3	30
j erFidoro-1-&extaSeSdrioSate B k6 xh.	3Q1	37L7		Suyp		99	P0 - 1P0	1N	30
j erFidoro(ecaSe sdrfoSate B k Dh.	3QIN	34LC		Suyp		90	P0 - 1P0	1N	30
j erFidoroocctaSe h drioSate B k Oh.	3Q12	37L2		Suyp		97	ND - 140	14	30
j erFidoroocctaSe h drioSami(e Bk OhA.	40L0	47LP		Suyp		119	ND - 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

TestAmerica hacrameSto

QC Association Summary

LineSt: h&aSSoS WG inSoS
j ro/ectyhite: l itf oFkairbaSgs kire TraiSiS8 Area

TestAmerica Job ID: 320-1774C-1
hD5 : 31-1-1173P-004

LCMS

Prep Batch: 103929

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-1774C-1	NP22CN	Total9 A	Gater	3P3P	
320-1774C-2	322C036	Total9 A	Gater	3P3P	
320-1774C-3	C71P7	Total9 A	Gater	3P3P	
320-1774C-4	NN6077	Total9 A	Gater	3P3P	
320-1774C-P	C73P1	Total9 A	Gater	3P3P	
320-1774C-N	P223C4	Total9 A	Gater	3P3P	
320-1774C-7	P224C4	Total9 A	Gater	3P3P	
320-1774C-C	C73CN	Total9 A	Gater	3P3P	
320-1774C-6	C71NP	Total9 A	Gater	3P3P	
320-1774C-10	62624	Total9 A	Gater	3P3P	
320-1774C-11	C73N0	Total9 A	Gater	3P3P	
320-1774C-12	C7160	Total9 A	Gater	3P3P	
LI h 320-103626y2-A	Lab l oStronhampre	Total9 A	Gater	3P3P	
LI hD 320-103626y8-A	Lab l oStronhampre Dup	Total9 A	Gater	3P3P	
MB 320-103626yl-A	Met&od BræSg	Total9 A	Gater	3P3P	

Analysis Batch: 104227

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-1774C-1	NP22CN	Total9 A	Gater	G h-LI -002P	103626
320-1774C-2	322C036	Total9 A	Gater	G h-LI -002P	103626
320-1774C-3	C71P7	Total9 A	Gater	G h-LI -002P	103626
320-1774C-4	NN6077	Total9 A	Gater	G h-LI -002P	103626
320-1774C-P	C73P1	Total9 A	Gater	G h-LI -002P	103626
320-1774C-N	P223C4	Total9 A	Gater	G h-LI -002P	103626
320-1774C-7	P224C4	Total9 A	Gater	G h-LI -002P	103626
320-1774C-C	C73CN	Total9 A	Gater	G h-LI -002P	103626
320-1774C-6	C71NP	Total9 A	Gater	G h-LI -002P	103626
320-1774C-10	62624	Total9 A	Gater	G h-LI -002P	103626
320-1774C-11	C73N0	Total9 A	Gater	G h-LI -002P	103626
320-1774C-12	C7160	Total9 A	Gater	G h-LI -002P	103626
LI h 320-103626y2-A	Lab l oStronhampre	Total9 A	Gater	G h-LI -002P	103626
LI hD 320-103626y8-A	Lab l oStronhampre Dup	Total9 A	Gater	G h-LI -002P	103626
MB 320-103626yl-A	Met&od BræSg	Total9 A	Gater	G h-LI -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: 02/28/16 44:1M

Date v ecei5e6: 02/28/16 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: 02/28/16 41:4x

Date v ecei5e6: 02/28/16 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: 3M7M

Date Collecte6: 02/28/16 42:00

Date v ecei5e6: 02/28/16 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: 02/28/16 4x:4x

Date v ecei5e6: 02/28/16 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: 02/28/16 09:20

Date v ecei5e6: 02/28/16 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: 02/28/16 40:20

Date v ecei5e6: 02/28/16 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

TestAmerica Sacramento

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: 02/28/18 40:10

Date v ecei5e6: 02/28/18 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: 02/28/18 44:40

Date v ecei5e6: 02/28/18 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: 3M87

Date Collecte6: 02/28/18 42:08

Date v ecei5e6: 02/28/18 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: 02/28/18 4x:07

Date v ecei5e6: 02/28/18 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: 02/28/18 4Mx3

Date v ecei5e6: 02/28/18 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: 3M90

Date Collecte6: 02/28/18 43:13

Date v ecei5e6: 02/28/18 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

TestAmerica Sacramento

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

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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

LineSt: h&aSSoS WG iisoS
j ro/ectyhite: I itf oFkairbaSgs kire TraiSiSL Area

TestAmerica Job ID: 320-1774C-1
hD5 : 31-1-1173P-004

Method	Method Description	Protocol	Laboratory
G h-Q -002P	j erffloriSateH=f HrocarboSs	TAOhuj	TAOhAl

Protocol References:

TAOhuj , TestAmerica Caboratoriesph taSharHu 8eratiSL j roceHdre

Laboratory References:

TAOhAl , TestAmerica hacrameStop000 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



SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 532-8020

2355 Hill Road
Fairbanks, AK 99709
(907) 473-0600

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

CHAIN-OF-CU

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

320-17748 Chain of Custody

Page 1 of 2
Laboratory Test America
Attn: Daniel Altmeppen

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

Sample Identity	Lab No	Time	Date Sampled	Comp	Grab	Total Number of Containers	Remarks/Matrix
6522286		1127	3/14/16	X	X	2	water
3228039		1214		X	X	2	
87157		1300		X	X	2	
6069077		1414		X	X	2	
87351		0930		X	X	2	
522384		1030		X	X	2	
522484		1030		X	X	2	
87386		1110		X	X	2	
87165		1306		X	X	2	
92924		1405		X	X	2	

Project Information	Sample Receipt	Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Project Number <u>31-1-11735-004</u>	Total Number of Containers <u>24</u>	Signature <u>M. Nadel</u>	Signature _____	Signature _____
Project Name <u>CoF Fire Training</u>	COC Seals/Intact <u>0</u> IN/NA	Printed Name <u>Mary Nadel</u>	Printed Name _____	Printed Name _____
Contact <u>MDN/SPK Center</u>	Received Good Cond /Cold _____	Company <u>Shannon & Wilson</u>	Company _____	Company _____
Ongoing Project? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Delivery Method <u>FedEx</u>	Received By: 1. Signature <u>Shane VanDamen</u>	Received By: 2. Signature _____	Received By: 3. Signature _____
Sampler <u>MDN/TXG</u>	(attach shipping bill, if any)	Printed Name <u>Shane VanDamen</u>	Printed Name _____	Printed Name _____
Instructions		Company _____		
Requested Turnaround Time <u>Standard</u>		Company _____		
Special Instructions <u>Please notify upon receipt</u>		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



400 N. 34th Street, Suite 100 2043 Westport Center Drive
Seattle, WA 98103 St. Louis, MO 63146-3564
(206) 632-8920 (314) 699-9660

2055 Hill Road
Fairbanks, AK 99709
(907) 479-9600

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

Lab No

Comm

Laboratory Test Answer Page 2 of 2

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

Remarks/Matrix	

[illegible]

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 <input type="checkbox"/> No <input type="checkbox"/>		Delivery Method:	
Sampler:		(attach shipping bill, if any)	
Instructions			
Requested Turnaround Time			
Special Instructions:			

Relinquished By: 1. Signature: <u>M. Hadel</u> Printed Name: <u>Mary Hadel</u> Company: <u>Shannon & Wilson</u>	Relinquished By: 2. Signature: _____ Printed Name: _____ Company: _____	Relinquished By: 3. Signature: _____ Printed Name: _____ Company: _____
Received By: 1. Signature: <u>Shane VanDine</u> Printed Name: <u>Shane VanDine</u> Company: <u>TAWs</u>	Received By: 2. Signature: _____ Printed Name: _____ Company: _____	Received By: 3. Signature: _____ Printed Name: _____ Company: _____

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

3.7.6

No. 33952

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 \leq 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 $<6\text{mm}$ (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:

Title: Date:

CS Report Name: Report Date:

Consultant Firm:

Laboratory Name: Laboratory Report Number:

ADEC File Number: 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 ($4^{\circ} \pm 2^{\circ} \text{C}$)?
☒ 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-octadecanoic 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)

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

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

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

The 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

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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.

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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.
α	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)

Case Narrative

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

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

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 4.9° 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.

Detection Summary

Instrument: h&aSSoS WG iisoS
 Project Name: I itF okgairbaSus gire TraiSiSd Area

TestAmerica Job ID: 320-174C3-1
 hD5 : 31-1-11P3j -004

Client Sample ID: 65228L

ba3 Sample ID: 0- 1764L5076

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erk(orob(taSoic aciB)/ g. A8	Q7	.	117	0140	SdfN	1		G h-N -002j	TotariP A
/ erk(oro9eStaSoic aciB)/ g/ eA8	13		117	017P	SdfN	1		G h-N -002j	TotariP A
/ erk(oro&exaSoic aciB)/ gHxA8	1P		117	01C6	SdfN	1		G h-N -002j	TotariP A
/ erk(oro&e9taSoic aciB)/ gH9A8	41P		117	01P1	SdfN	1		G h-N -002j	TotariP A
/ erk(orooctaSoic aciB)/ gOA8	713		117	01C0	SdfN	1		G h-N -002j	TotariP A
/ erk(oroSoSaSoic aciB)/ gp A8	016P	J	117	01j 7	SdfN	1		G h-N -002j	TotariP A
/ erk(oro(SBecaSoic aciB)/ gUSA8	01PP	J	117	01C0	SdfN	1		G h-N -002j	TotariP A
/ erk(oroBoBecaSoic aciB)/ gDoA8	111	J	117	01j 1	SdfN	1		G h-N -002j	TotariP A
/ erk(orotetraBecaSoic aciB)/ gTeA8	01C1	J	117	0117	SdfN	1		G h-N -002j	TotariP A
/ erk(oro-S-&exaBecaSoic aciB)/ gHxDA8	111	J .	117	0111	SdfN	1		G h-N -002j	TotariP A
/ erk(orob(taSe h(rloSate)/ g. h8	116		117	0171	SdfN	1		G h-N -002j	TotariP A
/ erk(oro&exaSe h(rloSate)/ gHxh8	37		117	01PP	SdfN	1		G h-N -002j	TotariP A
/ erk(oro-1-&e9taSes(rloSate)/ gH9h8	116		117	01C3	SdfN	1		G h-N -002j	TotariP A
/ erk(orooctaSe h(rloSate)/ gOh8	4P		117	111	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
/ erk(orob(taSoic aciB)/ g. A8	j 1j	.	117	0142	SdfN	1		G h-N -002j	TotariP A
/ erk(oro9eStaSoic aciB)/ g/ eA8	13		117	0160	SdfN	1		G h-N -002j	TotariP A
/ erk(oro&exaSoic aciB)/ gHxA8	17		117	01P2	SdfN	1		G h-N -002j	TotariP A
/ erk(oro&e9taSoic aciB)/ gH9A8	41j		117	01P3	SdfN	1		G h-N -002j	TotariP A
/ erk(orooctaSoic aciB)/ gOA8	716		117	01C7	SdfN	1		G h-N -002j	TotariP A
/ erk(oroSoSaSoic aciB)/ gp A8	114	J	117	01C0	SdfN	1		G h-N -002j	TotariP A
/ erk(oroBoBecaSoic aciB)/ gDoA8	110	J	117	01j 3	SdfN	1		G h-N -002j	TotariP A
/ erk(orotetraBecaSoic aciB)/ gTeA8	112	J	117	0117	SdfN	1		G h-N -002j	TotariP A
/ erk(oro-S-&exaBecaSoic aciB)/ gHxDA8	11P	J .	117	0111	SdfN	1		G h-N -002j	TotariP A
/ erk(oro-S-octaSBecaSoic aciB)/ gODA8	016P	J	117	01C1	SdfN	1		G h-N -002j	TotariP A
/ erk(orob(taSe h(rloSate)/ g. h8	610		117	0174	SdfN	1		G h-N -002j	TotariP A
/ erk(oro&exaSe h(rloSate)/ gHxh8	46		117	0170	SdfN	1		G h-N -002j	TotariP A
/ erk(oro-1-&e9taSes(rloSate)/ gH9h8	213		117	01Cj	SdfN	1		G h-N -002j	TotariP A
/ erk(orooctaSe h(rloSate)/ gOh8	j 1		117	112	SdfN	1		G h-N -002j	TotariP A
/ erk(orooctaSe h(rloSamiBe)gOhA8	413		117	01j 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
/ erk(orob(taSoic aciB)/ g. A8	314	.	116	0143	SdfN	1		G h-N -002j	TotariP A
/ erk(oro9eStaSoic aciB)/ g/ eA8	j 14		116	0163	SdfN	1		G h-N -002j	TotariP A
/ erk(oro&exaSoic aciB)/ gHxA8	j 10		116	01P4	SdfN	1		G h-N -002j	TotariP A
/ erk(oro&e9taSoic aciB)/ gH9A8	211		116	01Pj	SdfN	1		G h-N -002j	TotariP A
/ erk(orooctaSoic aciB)/ gOA8	312		116	01P0	SdfN	1		G h-N -002j	TotariP A
/ erk(orotetraBecaSoic aciB)/ gTeA8	014P	J	116	0116	SdfN	1		G h-N -002j	TotariP A
/ erk(oro-S-&exaBecaSoic aciB)/ gHxDA8	112	J .	116	0112	SdfN	1		G h-N -002j	TotariP A
/ erk(orob(taSe h(rloSate)/ g. h8	210		116	017C	SdfN	1		G h-N -002j	TotariP A
/ erk(oro&exaSe h(rloSate)/ gHxh8	j 14		116	0171	SdfN	1		G h-N -002j	TotariP A

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

TestAmerica hacrameSto

Detection Summary

LineSt: h&aSSoS WG insoS
/ roeyctfhite: I itF okgairbaSus gire TraiSiSd Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

Client Sample ID: 98LL0 (Continued)

ba3 Sample ID: 0- 1764L5070

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erk(rooctaSe h(rloSate)/ gOh8	j LP		116	112	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
/ erk(roob(taSoic aciB)/ g. A8	317	.	117	0140	SdfN	1		G h-N -002j	Totarip A
/ erk(oro9eStaSoic aciB)/ g/ eA8	21C		117	017P	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSoic aciB)/ gHxA8	317		117	01C6	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&e9taSoic aciB)/ gH9A8	016C	J	117	01P0	SdfN	1		G h-N -002j	Totarip A
/ erk(rooctaSoic aciB)/ gOA8	213		117	01C0	SdfN	1		G h-N -002j	Totarip A
/ erk(oro-S-&exaBecaSoic aciB)/ gHxDA8	114	J.	117	0111	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSe h(rloSate)/ gHxh8	11j	J	117	01PC	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
/ erk(roob(taSoic aciB)/ g. A8	216	.	117	0142	SdfN	1		G h-N -002j	Totarip A
/ erk(oro9eStaSoic aciB)/ g/ eA8	j 14		117	0161	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSoic aciB)/ gHxA8	Q1		117	01P2	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&e9taSoic aciB)/ gH9A8	210		117	01P4	SdfN	1		G h-N -002j	Totarip A
/ erk(rooctaSoic aciB)/ gOA8	21P		117	01C6	SdfN	1		G h-N -002j	Totarip A
/ erk(rotetraBecaSoic aciB)/ gTeA8	0171	J	117	0117	SdfN	1		G h-N -002j	Totarip A
/ erk(oro-S-&exaBecaSoic aciB)/ gHxDA8	01C2	J.	117	0111	SdfN	1		G h-N -002j	Totarip A
/ erk(roob(taSe h(rloSate)/ g. h8	113	J	117	017j	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSe h(rloSate)/ gHxh8	412		117	0170	SdfN	1		G h-N -002j	Totarip A
/ erk(rooctaSe h(rloSate)/ gOh8	Q1P		117	112	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
/ erk(roob(taSoic aciB)/ g. A8	41C	.	116	0144	SdfN	1		G h-N -002j	Totarip A
/ erk(oro9eStaSoic aciB)/ g/ eA8	616		116	016j	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSoic aciB)/ gHxA8	13		116	01PC	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&e9taSoic aciB)/ gH9A8	410		116	01PP	SdfN	1		G h-N -002j	Totarip A
/ erk(rooctaSoic aciB)/ gOA8	Q12		116	01P2	SdfN	1		G h-N -002j	Totarip A
/ erk(oroSoSaSoic aciB)/ gp A8	111	J	116	01C3	SdfN	1		G h-N -002j	Totarip A
/ erk(oro(SBecaSoic aciB)/ gUSA8	110	J	116	01P2	SdfN	1		G h-N -002j	Totarip A
/ erk(rotetraBecaSoic aciB)/ gTeA8	0161	J	116	0116	SdfN	1		G h-N -002j	Totarip A
/ erk(oro-S-&exaBecaSoic aciB)/ gHxDA8	117	J.	116	0112	SdfN	1		G h-N -002j	Totarip A
/ erk(roob(taSe h(rloSate)/ g. h8	PL7		116	0176	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSe h(rloSate)/ gHxh8	31		116	0174	SdfN	1		G h-N -002j	Totarip A
/ erk(oro-1-&e9taSes(rloSate)/ gH9h8	114	J	116	01C6	SdfN	1		G h-N -002j	Totarip A
/ erk(rooctaSe h(rloSate)/ gOh8	26		116	112	SdfN	1		G h-N -002j	Totarip A

Client Sample ID: 6- 2- 01

ba3 Sample ID: 0- 1764L5072

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

TestAmerica hacrameSto

Detection Summary

Instrument: h&aSSoS WG iisoS
/ rojectfhite: I itF okgairbaSus gire TraiSiSd Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

Client Sample ID: 6- 2- 01 (Continued)

ba3 Sample ID: 0- 1764L5072

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erk(orob(taSoic aciB)/ g. A8	6L7	.	1L7	0L42	SdfN	1		G h-N -002j	Totarip A
/ erk(oro9eStaSoic aciB)/ g/ eA8	1C		1L7	0L61	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSoic aciB)/ gHxA8	13		1L7	0LP2	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&e9taSoic aciB)/ gH9A8	j l0		1L7	0LP4	SdfN	1		G h-N -002j	Totarip A
/ erk(oroocStaSoic aciB)/ gOA8	12		1L7	0LC6	SdfN	1		G h-N -002j	Totarip A
/ erk(oroSoSaSoic aciB)/ gP A8	2L1		1L7	0LC0	SdfN	1		G h-N -002j	Totarip A
/ erk(orotetraBecaSoic aciB)/ gTeA8	0L60	J	1L7	0L17	SdfN	1		G h-N -002j	Totarip A
/ erk(oro-S-&exaBecaSoic aciB)/ gHxDA8	2LC	.	1L7	0L11	SdfN	1		G h-N -002j	Totarip A
/ erk(orob(taSe h(rloSate)/ g. h8	4L4		1L7	0L7j	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSe h(rloSate)/ gHxh8	42		1L7	0L70	SdfN	1		G h-N -002j	Totarip A
/ erk(oro-1-&e9taSes(rloSate)/ gH9h8	1L2	J	1L7	0LCC	SdfN	1		G h-N -002j	Totarip A
/ erk(oroocStaSe h(rloSate)/ gOh8	16		1L7	1L2	SdfN	1		G h-N -002j	Totarip A
/ erk(oroocStaSe h(rloSamiBe)gOhA8	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
/ erk(orob(taSoic aciB)/ g. A8	1L0	J.	1L6	0L44	SdfN	1		G h-N -002j	Totarip A
/ erk(oro9eStaSoic aciB)/ g/ eA8	1L4	J	1L6	0L64	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSoic aciB)/ gHxA8	2L7		1L6	0LPj	SdfN	1		G h-N -002j	Totarip A
/ erk(oroocStaSoic aciB)/ gOA8	1L6		1L6	0LP1	SdfN	1		G h-N -002j	Totarip A
/ erk(orotetraBecaSoic aciB)/ gTeA8	0Lj 0	J	1L6	0L16	SdfN	1		G h-N -002j	Totarip A
/ erk(oro-S-&exaBecaSoic aciB)/ gHxDA8	1L1	J.	1L6	0L12	SdfN	1		G h-N -002j	Totarip A
/ erk(orob(taSe h(rloSate)/ g. h8	1Lj	J	1L6	0L7P	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSe h(rloSate)/ gHxh8	j l2		1L6	0L73	SdfN	1		G h-N -002j	Totarip A
/ erk(oro-1-&e9taSes(rloSate)/ gH9h8	0L77	J	1L6	0LC7	SdfN	1		G h-N -002j	Totarip A
/ erk(oroocStaSe h(rloSate)/ gOh8	21		1L6	1L2	SdfN	1		G h-N -002j	Totarip A
/ erk(oroocStaSe h(rloSamiBe)gOhA8	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
/ erk(orob(taSoic aciB)/ g. A8	2L3	.	1L7	0L41	SdfN	1		G h-N -002j	Totarip A
/ erk(oro9eStaSoic aciB)/ g/ eA8	2Lj		1L7	0L76	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSoic aciB)/ gHxA8	2LP		1L7	0LP1	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&e9taSoic aciB)/ gH9A8	0L72	J	1L7	0LP3	SdfN	1		G h-N -002j	Totarip A
/ erk(oroocStaSoic aciB)/ gOA8	3L3		1L7	0LC7	SdfN	1		G h-N -002j	Totarip A
/ erk(orotetraBecaSoic aciB)/ gTeA8	0L63	J	1L7	0L17	SdfN	1		G h-N -002j	Totarip A
/ erk(oro-S-&exaBecaSoic aciB)/ gHxDA8	1L7	.	1L7	0L11	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSe h(rloSate)/ 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
/ erk(orob(taSoic aciB)/ g. A8	7L0	.	1L6	0L42	SdfN	1		G h-N -002j	Totarip A
/ erk(oro9eStaSoic aciB)/ g/ eA8	24		1L6	0L62	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSoic aciB)/ gHxA8	2C		1L6	0LP3	SdfN	1		G h-N -002j	Totarip A

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

TestAmerica hacrameSto

Detection Summary

LineSt: h&aSSoS WG insoS
/ roycctfhite: l itF okgairbaSus gire TraiSiSd Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

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

ba3 Sample ID: 0- 1764L50761

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erk(oro&e9taSoic aciB)/ gH9A8	Plj		116	0LP4	SdfN	1		G h-N -002j	Totarip A
/ erk(oroocctaSoic aciB)/ gOA8	14		116	0LC6	SdfN	1		G h-N -002j	Totarip A
/ erk(oroSoSaSoic aciB)/ gp A8	314		116	0LC1	SdfN	1		G h-N -002j	Totarip A
/ erk(oroBecaSoic aciB)/ gDA8	113	J	116	0L41	SdfN	1		G h-N -002j	Totarip A
/ erk(oro(SBecaSoic aciB)/ gUSA8	0LPC	J	116	0LC6	SdfN	1		G h-N -002j	Totarip A
/ erk(oroBoBecaSoic aciB)/ gDoA8	110	J	116	0lj 4	SdfN	1		G h-N -002j	Totarip A
/ erk(orotetraBecaSoic aciB)/ gTeA8	0LPO	J	116	0L17	SdfN	1		G h-N -002j	Totarip A
/ erk(oro-S-&exaBecaSoic aciB)/ gHxDA8	114	J .	116	0L11	SdfN	1		G h-N -002j	Totarip A
/ erk(orob(taSe h(rloSate)/ g. h8	Clj		116	0L7j	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSe h(rloSate)/ gHxh8	47		116	0L71	SdfN	1		G h-N -002j	Totarip A
/ erk(oro-1-&e9taSes(rloSate)/ gH9h8	216		116	0LOC	SdfN	1		G h-N -002j	Totarip A
/ erk(oroocctaSe h(rloSate)/ gOh8	C7		116	112	SdfN	1		G h-N -002j	Totarip A
/ erk(oroocctaSe h(rloSamiBe)gOhA8	0L6P	J	116	0lj 6	SdfN	1		G h-N -002j	Totarip A

Client Sample ID: 8- 5825

ba3 Sample ID: 0- 1764L50761

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erk(orob(taSoic aciB)/ g. A8	410	.	117	0L42	SdfN	1		G h-N -002j	Totarip A
/ erk(oro9eStaSoic aciB)/ g/ eA8	4lj		117	0L60	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSoic aciB)/ gHxA8	613		117	0LP2	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&e9taSoic aciB)/ gH9A8	0L63	J	117	0LP3	SdfN	1		G h-N -002j	Totarip A
/ erk(oroocctaSoic aciB)/ gOA8	310		117	0LC7	SdfN	1		G h-N -002j	Totarip A
/ erk(oroBecaSoic aciB)/ gDA8	0LPP	J	117	0L40	SdfN	1		G h-N -002j	Totarip A
/ erk(oro(SBecaSoic aciB)/ gUSA8	0L7P	J	117	0LC7	SdfN	1		G h-N -002j	Totarip A
/ erk(oroBoBecaSoic aciB)/ gDoA8	0L63	J	117	0lj 3	SdfN	1		G h-N -002j	Totarip A
/ erk(orotetraBecaSoic aciB)/ gTeA8	0L60	J	117	0L17	SdfN	1		G h-N -002j	Totarip A
/ erk(oro-S-&exaBecaSoic aciB)/ gHxDA8	11C	J .	117	0L11	SdfN	1		G h-N -002j	Totarip A
/ erk(orob(taSe h(rloSate)/ g. h8	312		117	0L74	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSe h(rloSate)/ gHxh8	1j		117	0LP6	SdfN	1		G h-N -002j	Totarip A
/ erk(oro-1-&e9taSes(rloSate)/ gH9h8	114	J	117	0LQ	SdfN	1		G h-N -002j	Totarip A
/ erk(oroocctaSe h(rloSate)/ gOh8	Q		117	112	SdfN	1		G h-N -002j	Totarip A

Client Sample ID: 8- 5525

ba3 Sample ID: 0- 1764L50761

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erk(orob(taSoic aciB)/ g. A8	410	.	117	0L42	SdfN	1		G h-N -002j	Totarip A
/ erk(oro9eStaSoic aciB)/ g/ eA8	j lj		117	0L61	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSoic aciB)/ gHxA8	610		117	0LP2	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&e9taSoic aciB)/ gH9A8	110	J	117	0LP4	SdfN	1		G h-N -002j	Totarip A
/ erk(oroocctaSoic aciB)/ gOA8	314		117	0LC6	SdfN	1		G h-N -002j	Totarip A
/ erk(oroBecaSoic aciB)/ gDA8	0L74	J	117	0L40	SdfN	1		G h-N -002j	Totarip A
/ erk(orotetraBecaSoic aciB)/ gTeA8	0L3C	J	117	0L17	SdfN	1		G h-N -002j	Totarip A
/ erk(oro-S-&exaBecaSoic aciB)/ gHxDA8	210	.	117	0L11	SdfN	1		G h-N -002j	Totarip A
/ erk(orob(taSe h(rloSate)/ g. h8	31C		117	0L74	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSe h(rloSate)/ gHxh8	12		117	0L70	SdfN	1		G h-N -002j	Totarip A
/ erk(oro-1-&e9taSes(rloSate)/ gH9h8	0L71	J	117	0LQ	SdfN	1		G h-N -002j	Totarip A

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

TestAmerica hacrameSto

Detection Summary

LineSt: h&aSSoS WG inSoS
/ rojectfhite: I itF okgairbaSus gire TraiSiSd Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

Client Sample ID: 8- 5525 (Continued)

ba3 Sample ID: 0- 1764L5076-

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erk(rooctaSe h (rloSate)/ gOh8	46		117	112	SdfN	1		G h-N -002j	Totarip A

Client Sample ID: 6- 28- 0

ba3 Sample ID: 0- 1764L50760

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erk(roob(taSoic aciB)/ g. A8	j L1		117	0L42	SdfN	1		G h-N -002j	Totarip A
/ erk(oro9eStaSoic aciB)/ g/ eA8	12		117	0L60	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSoic aciB)/ gHxA8	14		117	0LP1	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&e9taSoic aciB)/ gH9A8	412		117	0LP3	SdfN	1		G h-N -002j	Totarip A
/ erk(rooctaSoic aciB)/ gOA8	CLC		117	0LC7	SdfN	1		G h-N -002j	Totarip A
/ erk(oroSoSaSoic aciB)/ gp A8	112 J		117	0lj 6	SdfN	1		G h-N -002j	Totarip A
/ erk(oro(SBecaSoic aciB)/ gUSA8	0LP1 J		117	0LC7	SdfN	1		G h-N -002j	Totarip A
/ erk(orotetraBecaSoic aciB)/ gTeA8	114 J		117	0L17	SdfN	1		G h-N -002j	Totarip A
/ erk(oro-S-&exaBecaSoic aciB)/ gHxDA8	113 J.		117	0L11	SdfN	1		G h-N -002j	Totarip A
/ erk(roob(taSe h (rloSate)/ g. h8	Pl6		117	0L73	SdfN	1		G h-N -002j	Totarip A
/ erk(oro&exaSe h (rloSate)/ gHxh8	37		117	0LP6	SdfN	1		G h-N -002j	Totarip A
/ erk(oro-1-&e9taSes(rloSate)/ gH9h8	1lj J		117	0LQ	SdfN	1		G h-N -002j	Totarip A
/ erk(rooctaSe h (rloSate)/ gOh8	j j		117	112	SdfN	1		G h-N -002j	Totarip A

Client Sample Results

LineSt: h&aSSoS WG insoS
/ rojectfhite: I itF okgairba.s gire TraiSiS8 Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

Client Sample ID: 18MM-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 eVudWhate6 y (6W/ aVdms

) nal(te	Result	QualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudWbutandi/ a/ i6 F BA) .	8Z	A	117	0L40	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1
f eVudWpentandi/ a/ i6 F Bf e) .	13		117	0L7P	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1
f eVudWPeoandi/ a/ i6 F By o) .	1M		117	0LC9	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1
f eVudWPeptandi/ a/ i6 F Byp) .	4ZM		117	0LP1	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1
f eVudWld/ tandi/ a/ i6 F B9) .	7Z		117	0LOC	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1
f eVudWIndnandi/ a/ i6 F BN) .	0ZM J		117	0lj 7	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1
/ erkurodecaSoic acid (/ gDA)	ND		117	0L39	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1
f eVudWun6e/ andi/ a/ i6	0ZM J		117	0LOC	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1
F BQn) .									
f eVudW6d6e/ andi/ a/ i6	1Z J		117	0lj 1	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1
F BDd) .									
/ erkurotridecaSoic Acid (/ gTriA)	ND		117	0L47	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1
f eVudWtetW6e/ andi/ a/ i6	0Z1 J		117	0L17	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1
F BTe) .									
f eVudW-n-Peoa6e/ andi/ a/ i6	1Z J A		117	0L11	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1
F By oD) .									
/ erkuro-S-octaSdecaSoic acid	ND		117	0lj 9	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1
(/ gODA)									
f eVudWbutane SulHinate F BAS.	M5		117	0L71	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1
f eVudWPeoane SulHinate	37		117	0LPP	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1
F By oS.									
f eVudW-1-PeptanesulHinate	1Z		117	0LC3	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1
F By pS.									
/ erkurodecaSe surioSate (/ gDh)	ND		117	1L1	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1
f eVudWld/ tane SulHinate F B9 S.	4M		117	1L1	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1
/ erkurooctaSe hunkoSamide (gOhA)	ND		117	0lj C	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	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 eVudWhate6 y (6W/ aVdms

) nal(te	Result	QualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudWbutandi/ a/ i6 F BA) .	rZ	A	117	0L42	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
f eVudWpentandi/ a/ i6 F Bf e) .	13		117	0L90	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
f eVudWPeoandi/ a/ i6 F By o) .	17		117	0LP2	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
f eVudWPeptandi/ a/ i6 F Byp) .	4Z		117	0LP3	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
f eVudWld/ tandi/ a/ i6 F B9) .	7Z		117	0LC7	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1

TestAmerica hacrameSto

Client Sample Results

LineSt: h&aSSoS WG insoS
/ rojectfhite: I itF okgairba.s gire TraiSiS8 Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

Client Sample ID: 18M7r4

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 eVudWhate6 y (6W/ aVdms FCdntinue6.

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudWindnandi/ a/ i6 f BN) .	1z	J	117	01C0	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
/ erknuorodecaSoic acid (/ gDA)	ND		117	01L40	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
/ erknuorouSdecaSoic acid (/ gp SA)	ND		117	01C7	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
f eVudWid6de/ andi/ a/ i6	1z	J	117	01j 3	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
f BDd) .									
/ erknuorotridecaSoic Acid (/ gTriA)	ND		117	01j 0	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
f eVudWitetW6e/ andi/ a/ i6	1z	J	117	01L7	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
f BTe) .									
f eVudWid-n-Peoae/ andi/ a/ i6	1z	J A	117	01L1	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
f By oD) .									
f eVudWid-n-d/ tan6e/ andi/ a/ i6	0z	M J	117	01C1	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
f B9 D) .									
f eVudWibutane SulHinate f BAS.	5z		117	01L74	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
f eVudWipeoane SulHinate	45		117	01L70	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
f By oS.									
f eVudWid-1-PeptanesulHinate	2z		117	01Cj	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
f By pS.									
/ erknuorodecaSe surioSate (/ gDh)	ND		117	111	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
f eVudWid/ tane SulHinate f B9 S.	r1		117	112	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
f eVudWid/ tane SulHnami6e	4z		117	01j 7	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
f B9 S) .									

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: 5r443

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 eVudWhate6 y (6W/ aVdms

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudWibutandi/ a/ i6 f BA) .	3z	A	119	01L43	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
f eVudWipentandi/ a/ i6 f Bf e) .	r z		119	01L93	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
f eVudWipeoandi/ a/ i6 f By o) .	r z		119	01P4	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
f eVudWipeptandi/ a/ i6 f By p) .	2z		119	01Pj	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
f eVudWid/ tandi/ a/ i6 f B9) .	3z		119	01P0	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
/ erknuoroSoSaSoic acid (/ gNA)	ND		119	01C1	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
/ erknuorodecaSoic acid (/ gDA)	ND		119	01L41	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
/ erknuorouSdecaSoic acid (/ gp SA)	ND		119	01P0	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
/ erknuorododecaSoic acid (/ gDoA)	ND		119	01j j	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
/ erknuorotridecaSoic Acid (/ gTriA)	ND		119	01j 2	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1

TestAmerica hacrameSto

Client Sample Results

LineSt: h&aSSoS WG insoS
/ roeyctfhite: I itF okgairba.s gire TraiSiS8 Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

Client Sample ID: 5r443

Date Cdille/ 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 eVudWhate6 y (6W/ aVdms FCdntinue6.

nal(te	Result	QualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudWitetW6e/ andi/ a/ i6 F BTe) .	0z4M J		119	0L19	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
f eVudWV-n-Peo6e/ andi/ a/ i6 F By oD) .	1z2 J A		119	0L12	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
/ erknuoro-S-octaSdecaSoic acid (/ gODA)	ND		119	0LC3	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
f eVudWVbutane SulHinate F BAS.	2z0		119	0L7C	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
f eVudWVPeoane SulHinate F By oS.	r z4		119	0L71	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
/ erknuoro-1-&eHtaSesurtoSate (/ gUhh)	ND		119	0LCP	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
/ erknuorodecaSe surtoSate (/ gDh)	ND		119	1L1	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
f eVudWid/ tane SulHinate F B9 S.	r zM		119	1L2	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
/ erknuorooctaSe hurtoSamide (gOhA)	ND		119	0LCO	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	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 Cdille/ 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 eVudWhate6 y (6W/ aVdms

nal(te	Result	QualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudWVbutandi/ a/ i6 F BA) .	3z7 A		117	0L40	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
f eVudWVpentandi/ a/ i6 F Bf e) .	2z8		117	0L7P	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
f eVudWVPeoandi/ a/ i6 F By o) .	3z7		117	0LC9	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
f eVudWVPeptandi/ a/ i6 F Byp) .	0z58 J		117	0LP0	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
f eVudWid/ tandi/ a/ i6 F B9) .	2z3		117	0LOC	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
/ erknuoroSoSaSoic acid (/ gNA)	ND		117	0lj P	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
/ erknuorodecaSoic acid (/ gDA)	ND		117	0L39	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
/ erknuorouSdecaSoic acid (/ gp SA)	ND		117	0LOC	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
/ erknuorododecaSoic acid (/ gDoA)	ND		117	0lj 1	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
/ erknuorotridecaSoic Acid (/ gTriA)	ND		117	0L47	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
/ erknuorotetradecaSoic acid (/ gTeA)	ND		117	0L1P	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
f eVudWV-n-Peo6e/ andi/ a/ i6 F By oD) .	1z4 J A		117	0L11	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
/ erknuoro-S-octaSdecaSoic acid (/ gODA)	ND		117	0lj 9	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
/ erknuorobutaSe hurtoSate (/ gBh)	ND		117	0L71	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1

TestAmerica hacrameSto

Client Sample Results

LineSt: h&aSSoS WG insoS
/ rojectfhite: I itF okgairba.s gire TraiSiS8 Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

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 eVudWhate6 y (6W/ aVdms FCdntinue6.

nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudWPeoane SulHinate	1z	J	117	0IPC	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
F By oS.									
/ erkuoro-1-&eHtaSesurloSate	ND		117	0LC3	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
(/ gUHh)									
/ erkuorodecaSe surloSate (/ gDh)	ND		117	1L1	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
/ erkuorooctaSe hurloSate (/ gOh)	ND		117	1L1	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
/ erkuorooctaSe hurloSamide (gOhA)	ND		117	0lj C	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	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: 4r45M4

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 eVudWhate6 y (6W/ aVdms

nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudWibutandi/ a/ i6 F BA) .	2z	A	117	0L42	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1
f eVudWipentandi/ a/ i6 F Bf e) .	r z		117	0L91	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1
f eVudWPeoandi/ a/ i6 F By o) .	8z		117	0LP2	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1
f eVudWipeptandi/ a/ i6 F By p) .	2z		117	0LP4	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1
f eVudWid/ tandi/ a/ i6 F B9) .	2z		117	0LC9	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1
/ erkuoroSoSaSoic acid (/ gNA)	ND		117	0LC0	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1
/ erkuorodecaSoic acid (/ gDA)	ND		117	0L41	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1
/ erkuorouSdecaSoic acid (/ gp SA)	ND		117	0LC9	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1
/ erkuorododecaSoic acid (/ gDoA)	ND		117	0lj 4	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1
/ erkuorotridecaSoic Acid (/ gTriA)	ND		117	0lj 1	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1
f eVudWitetW6e/ andi/ a/ i6	0z	J	117	0L17	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1
F BTe) .									
f eVudW-n-Peo6e/ andi/ a/ i6	0z	J A	117	0L11	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1
F By oD) .									
/ erkuoro-S-octaSdecaSoic acid	ND		117	0LC2	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1
(/ gODA)									
f eVudWibutane SulHinate F BAS.	1z	J	117	0L7j	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1
f eVudWPeoane SulHinate	4z		117	0L70	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1
F By oS.									
/ erkuoro-1-&eHtaSesurloSate	ND		117	0LCC	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1
(/ gUHh)									
/ erkuorodecaSe surloSate (/ gDh)	ND		117	1L1	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1
f eVudWid/ tane SulHinate F B9 S.	8z		117	1L2	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1
/ erkuorooctaSe hurloSamide (gOhA)	ND		117	0lj 9	S8f6		04f2j f1C0P:4j	0j f12f1C20:j 4	1

TestAmerica hacrameSto

Client Sample Results

Instrument: h&aSSoS WG iisoS
/ rojectfhte: I itF okgairBa.s gire TraiSiS8 Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

Client Sample ID: 4r45M4

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 eVudWhate6 y (6W/ aVdms									
nal(te	Result	QualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudWibutandi/ a/ i6 f BA) .	4z	A	119	0L44	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
f eVudWipentandi/ a/ i6 f Bf e) .	5z		119	0L9j	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
f eVudWipeoandi/ a/ i6 f By o) .	13		119	0LPC	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
f eVudWipeptandi/ a/ i6 f Byp) .	4z		119	0LPP	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
f eVudWid/ tandi/ a/ i6 f B9) .	8z		119	0LP2	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
f eVudWindnandi/ a/ i6 f BN) .	1z	J	119	0LC3	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
/ erkruorodecaSoic acid (/ gDA)	ND		119	0L42	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
f eVudWun6e/ andi/ a/ i6 f BQn) .	1z	J	119	0LP2	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
/ erkruorododecaSoic acid (/ gDoA)	ND		119	0lj C	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
/ erkruorotridecaSoic Acid (/ gTriA)	ND		119	0lj 3	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
f eVudWitetW6e/ andi/ a/ i6 f BTe) .	0z	J	119	0L19	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
f eVudWl-n-Peo6e/ andi/ a/ i6 f By oD) .	1z	J A	119	0L12	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
/ erkruoro-S-octaSdecaSoic acid (/ gODA)	ND		119	0LQj	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
f eVudWibutane SulHinate f BAS.	Mz		119	0L79	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
f eVudWipeoane SulHinate f By oS.	31		119	0L74	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
f eVudWl-1-PeptanesulHinate f BypS.	1z	J	119	0LC9	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
/ erkruorodecaSe surtoSate (/ gDh)	ND		119	1L2	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
f eVudWid/ tane SulHinate f B9 S.	25		119	1L2	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
/ erkruoroctaSe hunkoSamide (gOhA)	ND		119	0LC2	S8f6		04f2j f1C0P:4j	0j f10f1C0j :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

TestAmerica hacrameSto

Client Sample Results

Instrument: h&aSSoS WG iisoS
/ rojectfhite: I itF okgairba.s gire TraiSiS8 Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

Client Sample ID: 12M811

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 eVudWhate6 y (6W/ aVdms 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 eVudWhate6 y (6W/ aVdms

nal(te	Result	QualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudWibutandi/ a/ i6 F BA) .	57	A	117	0142	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
f eVudWipentandi/ a/ i6 F Bf e) .	18		117	0191	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
f eVudWipeoandi/ a/ i6 F By o) .	13		117	01P2	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
f eVudWipeptandi/ a/ i6 F By p) .	12		117	01P4	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
f eVudWid/ tandi/ a/ i6 F B9) .	12		117	01C9	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
f eVudWindnandi/ a/ i6 F BN) .	21		117	01C0	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
/ erkruorodecaSoic acid (/ gDA)	ND		117	0141	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
/ erkruorouSdecaSoic acid (/ gp SA)	ND		117	01C9	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
/ erkruorododecaSoic acid (/ gDoA)	ND		117	01j 4	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
/ erkruorotridecaSoic Acid (/ gTriA)	ND		117	01j 1	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
f eVudWitetW6e/ andi/ a/ i6 F BTe) .	050	J	117	0117	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
f eVudW-n-Peoae6e/ andi/ a/ i6 F By oD) .	26	A	117	0111	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
/ erkruoro-S-octaSdecaSoic acid (/ gODA)	ND		117	01C2	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
f eVudWibutane SulHinate F BAS.	44		117	017j	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
f eVudWipeoane SulHinate F By oS.	42		117	0170	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
f eVudW-1-PeptanesulHinate F By pS.	12	J	117	01C0	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
/ erkruorodecaSe surtoSate (/ gDh)	ND		117	111	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
f eVudWid/ tane SulHinate F B9 S.	15		117	112	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
f eVudWid/ tane SulHnami6e F B9 S) .	12		117	01j 9	S8f6		04f2j f1C0P:4j	0j f10f1C0j :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

TestAmerica hacrameSto

Client Sample Results

LineSt: h&aSSoS WG insoS
/ roeyctfhite: I itF okgairba.s gire TraiSiS8 Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

Client Sample ID: r 24r 8r

Date Cdlle/ te6: 04v17v18 1M2r

Date Re/ eihe6: 04v22v18 11:1r

Lab Sample ID: 320-17483-7

x atWb: c ateW

x etPd6: c S-LC-002r - f eVudWhate6 y (6W/ aVdms

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudWibutandi/ a/ i6 f BA) .	1x0	J A	119	0L44	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
f eVudWipentandi/ a/ i6 f Bf e) .	1x4	J	119	0L94	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
f eVudWipeoandi/ a/ i6 f By o) .	2x7		119	0LPj	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
/ erknuoro&ehtaSoic acid (/ gUHA)	ND		119	0LPC	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
f eVudWid/ tandi/ a/ i6 f B9) .	1x5		119	0LP1	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
/ erknuoroSoSaSoic acid (/ gNA)	ND		119	0LC2	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
/ erknuorodecaSoic acid (/ gDA)	ND		119	0L42	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
/ erknuorouSdecaSoic acid (/ gp SA)	ND		119	0LP1	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
/ erknuorododecaSoic acid (/ gDoA)	ND		119	0lj C	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
/ erknuorotridecaSoic Acid (/ gTriA)	ND		119	0lj 2	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
f eVudWitetW6e/ andi/ a/ i6 f BTe) .	0x0	J	119	0L19	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
f eVudW-n-Peo6e/ andi/ a/ i6 f By oD) .	1x1	J A	119	0L12	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
/ erknuoro-S-octaSdecaSoic acid (/ gODA)	ND		119	0LC4	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
f eVudWibutane SulHinate f BAS.	1x1	J	119	0L7P	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
f eVudWipeoane SulHinate f By oS.	1x2		119	0L73	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
f eVudW-1-PeptanesulHinate f By pS.	0x77	J	119	0LC7	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
/ erknuorodecaSe surtoSate (/ gDh)	ND		119	112	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
f eVudWid/ tane SulHinate f B9 S.	21		119	112	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
f eVudWid/ tane SulHnami6e f B9 S) .	M1		119	0LC1	S8f6		04f2j f1C0P:4j	0j f10f1C0C: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 2Mlr 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 eVudWhate6 y (6W/ aVdms

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudWibutandi/ a/ i6 f BA) .	2x3	A	117	0L41	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
f eVudWipentandi/ a/ i6 f Bf e) .	2x1		117	0L79	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
f eVudWipeoandi/ a/ i6 f By o) .	2xM		117	0LP1	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
f eVudWipeptandi/ a/ i6 f By p) .	0x72	J	117	0LP3	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
f eVudWid/ tandi/ a/ i6 f B9) .	3x3		117	0LC7	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
/ erknuoroSoSaSoic acid (/ gNA)	ND		117	0lj 9	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1

TestAmerica hacrameSto

Client Sample Results

LineSt: h&aSSoS WG insoS
/ royectfhite: I itF okgairba.s gire TraiSiS8 Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

Client Sample ID: 4r2Mlr7

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 eVudWhate6 y (6W/ aVdms FCdntinue6.

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
/ erknuorodecaSoic acid (/ gDA)	ND		1L7	0L40	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
/ erknuorouSdecaSoic acid (/ gp SA)	ND		1L7	0LC7	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
/ erknuorododecaSoic acid (/ gDoA)	ND		1L7	0lj 3	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
/ erknuorotridecaSoic Acid (/ gTriA)	ND		1L7	0lj 0	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
f eVudWitetW6e/ andi/ a/ i6 F BTe) .	0z3 J		1L7	0L17	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
f eVudWV-n-Peoa6e/ andi/ a/ i6 F By oD) .	1z7 A		1L7	0L11	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
/ erknuoro-S-octaSdecaSoic acid (/ gODA)	ND		1L7	0LC1	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
/ erknuorobutaSe hurnoSate (/ gBh)	ND		1L7	0L73	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
f eVudWVPeoane SulHinate F By oS.	1z8 J		1L7	0LP9	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
/ erknuoro-1-&eHtaSesurnoSate (/ gUhh)	ND		1L7	0LC4	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
/ erknuorodecaSe surnoSate (/ gDh)	ND		1L7	1L1	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
/ erknuorooctaSe hurnoSate (/ gOh)	ND		1L7	1L2	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
/ erknuorooctaSe hurnoSamide (gOhA)	ND		1L7	0lj 7	S8f6		04f2j f1C0P: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: 12Ml24

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 eVudWhate6 y (6W/ aVdms

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudWVbutandi/ a/ i6 F BA) .	7z0 A		1L9	0L42	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1

TestAmerica hacrameSto

Client Sample Results

LineSt: h&aSSoS WG insoS
/ rojectfhite: I itF okgairba.s gire TraiSiS8 Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

Client Sample ID: 12M24

Date Cdille/ 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 eVudWhate6 y (6W/ aVdms FCdntinue6.

) nal(te	Result	QualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudWipentandi/ a/ i6 F Bf e) .	24		119	0192	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1
f eVudWipeoandi/ a/ i6 F By o) .	28		119	01P3	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1
f eVudWipeptandi/ a/ i6 F By p) .	Mr		119	01P4	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1
f eVudWid/ tandi/ a/ i6 F B9) .	14		119	01C9	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1
f eVudWindnandi/ a/ i6 F BN) .	3z		119	01C1	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1
f eVudWid6e/ andi/ a/ i6 F BD) .	1z J		119	0141	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1
f eVudWidun6e/ andi/ a/ i6 F BQn) .	0zVB J		119	01C9	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1
f eVudWid6d6e/ andi/ a/ i6 F BDd) .	1z J		119	01j 4	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1
/ erkruorotridecaSoic Acid (/ gTriA)	ND		119	01j 1	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1
f eVudWitetW6e/ andi/ a/ i6 F BTe) .	0zV J		119	0117	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1
f eVudWid-n-Peoane/ andi/ a/ i6 F By oD) .	1z J A		119	0111	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1
/ erkruoro-S-octaSdecaSoic acid (/ gODA)	ND		119	01C2	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1
f eVudWidbutane SulHinate F BAS.	8z		119	017j	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1
f eVudWidPeoane SulHinate F By oS.	47		119	0171	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1
f eVudWid-1-PeptanesulHinate F By pS.	2z		119	01CC	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1
/ erkruorodecaSe surtoSate (/ gDh)	ND		119	111	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1
f eVudWid/ tane SulHinate F B9 S.	87		119	112	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1
f eVudWid/ tane SulHinati6e F B9 S) .	0zV J		119	01j 9	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj 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 PFDaA	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: r 28r MB

Date Cdille/ 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 eVudWhate6 y (6W/ aVdms

) nal(te	Result	QualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudWidbutandi/ a/ i6 F BA) .	4z A		117	0142	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
f eVudWipentandi/ a/ i6 F Bf e) .	4z		117	0190	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
f eVudWipeoandi/ a/ i6 F By o) .	5z		117	01P2	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
f eVudWipeptandi/ a/ i6 F By p) .	0z3 J		117	01P3	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
f eVudWid/ tandi/ a/ i6 F B9) .	3z		117	01C7	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1

TestAmerica hacrameSto

Client Sample Results

LineSt: h&aSSoS WG insoS
/ roectfhite: I itF okgairba.s gire TraiSiS8 Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

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 eVudWhate6 y (6W/ aVdms FCdntinue6.

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
/ erkurooSoSaSoic acid (/ gNA)	ND		1L7	0L00	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
f eVudW6e/ andi/ a/ i6 fF BD) .	0zMM J		1L7	0L40	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
f eVudW6e/ andi/ a/ i6 fF BQn) .	0z7M J		1L7	0LC7	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
f eVudW6d6e/ andi/ a/ i6 fF BDd) .	0z53 J		1L7	0lj 3	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
/ erkurootridecaSoic Acid (/ gTriA)	ND		1L7	0lj 0	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
f eVudW6e/ andi/ a/ i6 fF BTe) .	0z50 J		1L7	0L17	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
f eVudW6-n-Peoae6e/ andi/ a/ i6 fF By oD) .	1z8 J A		1L7	0L11	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
/ erkuroo-S-octaSdecaSoic acid (/ gODA)	ND		1L7	0LC1	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
f eVudW6butane SulHinate fF BAS.	3z2		1L7	0L74	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
f eVudW6Peoane SulHinate fF By oS.	1r		1L7	0LP9	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
f eVudW6-1-PeptanesulHinate fF By pS.	1z4 J		1L7	0LQ	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
/ erkuroodecaSe surtoSate (/ gDh)	ND		1L7	1L1	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
f eVudW6d/ tane SulHinate fF B9 S.	8r		1L7	1L2	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
/ erkuroooctaSe huroSamide (gOhA)	ND		1L7	0lj 7	S8f6		04f2j f1C0P:4j	0j f10f1C0P: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: r288MB

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 eVudWhate6 y (6W/ aVdms

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudW6butandi/ a/ i6 fF BA) .	4z0 A		1L7	0L42	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
f eVudW6pentandi/ a/ i6 fF Bf e) .	r z		1L7	0L91	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
f eVudW6Peoandi/ a/ i6 fF By o) .	5z0		1L7	0LP2	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
f eVudW6Peptandi/ a/ i6 fF By p) .	1z0 J		1L7	0LP4	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
f eVudW6d/ tandi/ a/ i6 fF B9) .	3z4		1L7	0LC9	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
/ erkurooSoSaSoic acid (/ gNA)	ND		1L7	0L00	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
f eVudW6e/ andi/ a/ i6 fF BD) .	0z74 J		1L7	0L40	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
/ erkuroouSdecaSoic acid (/ gp SA)	ND		1L7	0LC9	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
/ erkuroododecaSoic acid (/ gDoA)	ND		1L7	0lj 4	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
/ erkurootridecaSoic Acid (/ gTriA)	ND		1L7	0lj 1	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1

TestAmerica hacrameSto

Client Sample Results

LineSt: h&aSSoS WG insoS
/ rojectfhite: I itF okgairba.s gire TraiSiS8 Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

Client Sample ID: r288MB

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 eVudWhate6 y (6W/ aVdns FCdntinue6.

) nal(te	Result	QualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudWitetW6e/ andi/ a/ i6 F BTe) .	028	J	117	0117	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
f eVudW-n-Peo6e/ andi/ a/ i6 F By oD) .	220	A	117	0111	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
/ erkuoro-S-octaSdecaSoic acid (/ gODA)	ND		117	01C2	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
f eVudWbutane SulHinate F BAS.	328		117	0174	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
f eVudWPeoane SulHinate F By oS.	12		117	0170	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
f eVudW-1-PeptanesulHinate F By pS.	0271	J	117	01Cj	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
/ erkuorodecaSe surtoSate (/ gDh)	ND		117	111	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
f eVudWid/ tane SulHinate F B9 S.	45		117	112	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
/ erkuorooctaSe hunkoSamide (gOhA)	ND		117	01j 9	S8f6		04f2j f1C0P:4j	0j f10f1C0P: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: 12M 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 eVudWhate6 y (6W/ aVdns

) nal(te	Result	QualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudWbutandi/ a/ i6 F BA) .	r21	A	117	0142	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
f eVudWipentandi/ a/ i6 F Bf e) .	12		117	0190	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
f eVudWPeoandi/ a/ i6 F By o) .	14		117	01P1	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
f eVudWPeptandi/ a/ i6 F Byp) .	42		117	01P3	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
f eVudWid/ tandi/ a/ i6 F B9) .	828		117	01C7	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
f eVudWwindnandi/ a/ i6 F BN) .	12	J	117	01j 9	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
/ erkuorodecaSoic acid (/ gDA)	ND		117	0140	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
f eVudWun6e/ andi/ a/ i6 F BQn) .	02M	J	117	01C7	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
/ erkuorododecaSoic acid (/ gDoA)	ND		117	01j 3	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
/ erkuorotridecaSoic Acid (/ gTriA)	ND		117	01j 0	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
f eVudWitetW6e/ andi/ a/ i6 F BTe) .	124	J	117	0117	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
f eVudW-n-Peo6e/ andi/ a/ i6 F By oD) .	123	J A	117	0111	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
/ erkuoro-S-octaSdecaSoic acid (/ gODA)	ND		117	01C1	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
f eVudWbutane SulHinate F BAS.	M5		117	0173	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1

TestAmerica hacrameSto

Client Sample Results

LineSt: h&aSSoS WG iisoS
/ rojectfhite: I itF okgairbaS. s gire TraiSiS8 Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

Client Sample ID: 12M 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 eVudWhate6 y (6W/ aWdms FcDntinue6.

nal(te	Result	QualiHeW	RL	x DL	Qnit	D	f WpaW6	) nal(Ue6	Dil Ba/
f eVudWPeoane SulHinate	37		1L7	0LP9	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
Ff By oS.									
f eVudW-1-PeptanesulHinate	1x J		1L7	0LQ	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
Ff By pS.									
/ erkruorodecaSe surtoSate (/ gDh)	ND		1L7	1L1	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
f eVudWld/ tane SulHinate Ff B9 S.	rr		1L7	1L2	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
/ erkruorooctaSe hunkoSamide (gOhA)	ND		1L7	0Lj 7	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	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

TestAmerica hacrameSto

Isotope Dilution Summary

Client: Shannon & Wilson
 j ro/ectySite: Cttf 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 320-105P52y3-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 PFO/ (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 320-105P52y3-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
 13CPj kNA = 13CPj 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

TestAmerica Sacramento

Isotope Dilution Summary

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

TestAmerica Job ID: 320-17483-1
SDG: 31-1-1153P-004

$^{13}\text{C4-j kHpA} = ^{13}\text{C4-j kHpA}$
 $^{13}\text{CPj kjeA} = ^{13}\text{CPj kjeA}$

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

QC Sample Results

Instrument: h&aSSoS WG insoS
Project Name: I itF okgairbaSus gire TraiSiSd Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

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
/ erkl orob(taSoic aciB)/ g. A8	0LP37	J	2L0	0L4C	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkl oroxeStaSoic aciB)/ g/ eA8	pD		2L0	0L99	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkl oro&eHaSoic aciB)/ g6 HA8	pD		2L0	0LP9	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkl oro&extaSoic aciB)/ g6 xA8	pD		2L0	0L70	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkl orooctaSoic aciB)/ gOA8	pD		2L0	0LPj	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkl oroSoSaSoic aciB)/ gp A8	pD		2L0	0LQj	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkl oroBecaSoic aciB)/ gDA8	pD		2L0	0L44	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkl oro(SBecaSoic aciB)/ gUSA8	pD		2L0	0LPj	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkl oroBoBecaSoic aciB)/ gDoA8	pD		2L0	0lj 7	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkl orotriBecaSoic aciB)/ gTriA8	pD		2L0	0lj j	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkl orotetraBecaSoic aciB)/ gTeA8	pD		2L0	0L20	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkl oro-S-&eHaBecaSoic aciB)/ g6 HDA8	0L72j	J	2L0	0L12	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkl oro-S-octaSBecaSoic aciB)/ gODA8	pD		2L0	0LOP	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkl orob(taSe h(rloSate)/ g. h8	pD		2L0	0L92	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkl oro&eHaSe h(rloSate)/ g6 Hh8	pD		2L0	0L7P	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkl oro-1-&extaSe h(rloSate)/ g6 xh8	pD		2L0	0LP1	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkl oroBecaSe s(rloSate)/ gDh8	pD		2L0	1L2	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkl orooctaSe h(rloSate)/ gOh8	pD		2L0	1L3	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkl orooctaSe h(rloSamiBe)/ gOhA8	pD		2L0	0LC4	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	6*		25 - 150	0* 454l/ 0: 7* 5	054l 14l/ 23758	1
13C* PFBA	13:		25 - 150	0* 454l/ 0: 7* 5	054l 14l/ 23758	1
13C2 PFHxA	1*:		25 - 150	0* 454l/ 0: 7* 5	054l 14l/ 23758	1
13C* PFOA	1*8		25 - 150	0* 454l/ 0: 7* 5	054l 14l/ 23758	1
13C5 PFNA	153	9	25 - 150	0* 454l/ 0: 7* 5	054l 14l/ 23758	1
13C2 PFDA	15:	9	25 - 150	0* 454l/ 0: 7* 5	054l 14l/ 23758	1
13C2 PFUnA	155	9	25 - 150	0* 454l/ 0: 7* 5	054l 14l/ 23758	1
13C2 PFDoA	1*3		25 - 150	0* 454l/ 0: 7* 5	054l 14l/ 23758	1
18O2 PFHxS	136		25 - 150	0* 454l/ 0: 7* 5	054l 14l/ 23758	1
13C* PFOS	151	9	25 - 150	0* 454l/ 0: 7* 5	054l 14l/ 23758	1
13C*-PFHpA	15*	9	25 - 150	0* 454l/ 0: 7* 5	054l 14l/ 23758	1
13C5 PFPeA	1*5		25 - 150	0* 454l/ 0: 7* 5	054l 14l/ 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	Limits
/ erkl orob(taSoic aciB)/ g. A8	40L0	43L9		SdfN		110	P4 - 137
/ erkl oroxeStaSoic aciB)/ g/ eA8	40L0	4j L0		SdfN		112	C9 - 134
/ erkl oro&eHaSoic aciB)/ g6 HA8	40L0	4QC		SdfN		11C	P0 - 13C
/ erkl oro&extaSoic aciB)/ g6 xA8	40L0	43L0		SdfN		10P	C3 - 13j
/ erkl orooctaSoic aciB)/ gOA8	40L0	4j L0		SdfN		112	C3 - 141
/ erkl oroSoSaSoic aciB)/ gp A8	40L0	44L1		SdfN		110	P1 - 140
/ erkl oroBecaSoic aciB)/ gDA8	40L0	44L0		SdfN		110	CC- 141

TestAmerica hacrameSto

QC Sample Results

LineSt: h&aSSoS WG insoS
/ rojectfhite: I itF okgairbaSus gire TraiSiSd Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

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	4Q1		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(rloSate)/ g. h8	3j L4	44L7		SdfN		12P	j j - 14P
/ erk(oro&eHaSe h(rloSate)/ g6Hh8	3PL7	41L4		SdfN		109	j 7 - 137
/ erk(oro-1-&extaSeS(rloSate)/ g6xh8	37L1	41L1		SdfN		107	32 - 1P0
/ erk(oroBecaSe s(rloSate)/ gDh8	37LC	j 1L1		SdfN		133	3j - 1j P
/ erk(oroocctaSe h(rloSate)/ gOh8	37L2	4Q4		SdfN		121	4P - 1C2
/ erk(oroocctaSe h(rloSamiBe)/ 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(oroocctaSoic 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

TestAmerica hacrameSto

QC Sample Results

LineSt: h&aSSoS WG iisoS
/ rojectfhite: I itF okgairbaSus gire TraiSiSd Area

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

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
/ erk(oro(SBecaSoic aciB)/ gUSA8	40L0	37L2		SdfN		9C	C7 - 139	11	30
/ erk(oroBoBecaSoic aciB)/ gDoA8	40L0	37L7		SdfN		9P	P1 - 139	1P	30
/ erk(orotriBecaSoic aciB)/ gTriA8	40L0	4Q2		SdfN		11j	j 1 - 139	1P	30
/ erk(orotetraBecaSoic aciB)/ gTeA8	40L0	37L4		SdfN		9C	4P - 130	17	30
/ erk(oro-S-eHaBecaSoic aciB)/ g6HDA8	40L0	3PL1		SdfN		93	j 0 - 1j 0	21	30
/ erk(oro-S-octaSBecaSoic aciB)/ gODA8	40L0	37L1		SdfN		9j	j 0 - 1j 0	1	30
/ erk(orob(taSe h(rloSate)/ g. h8	3j L4	41LC		SdfN		117	j j - 14P	P	30
/ erk(oro&eHaSe h(rloSate)/ g6Hh8	3PL7	41L3		SdfN		109	j 7 - 137	0	30
/ erk(oro-1-&extaSeS(rloSate)/ g6xh8	37L1	41L9		SdfN		110	32 - 1P0	2	30
/ erk(oroBecaSe s(rloSate)/ gDh8	37LC	49L3		SdfN		127	3j - 1j P	4	30
/ erk(oroocctaSe h(rloSate)/ gOh8	37L2	41L9		SdfN		110	4P - 1C2	10	30
/ erk(oroocctaSe h(rloSamiBe)/ gOhA8	40L0	49L4		SdfN		124	j 9 - 1C3	12	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C8 FOSA	12		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

TestAmerica hacrameSto

QC Association Summary

LineSt: h&aSSoS WG iisoS
/ rojectfhite: I itF okgairbaS8s gire TraiSiSNArea

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

LCMS

Prep Batch: 107572

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-174C3-1	1CPPj 4	Total9 A	Gater	3j 3j	
320-174C3-2	1CP7j 4	Total9 A	Gater	3j 3j	
320-174C3-3	6j 443	Total9 A	Gater	3j 3j	
320-174C3-4	4117OC	Total9 A	Gater	3j 3j	
320-174C3-j	4j 46P4	Total9 A	Gater	3j 3j	
320-174C3-C	12P311	Total9 A	Gater	3j 3j	
320-174C3-P	12P230	Total9 A	Gater	3j 3j	
320-174C3-7	j 24j Q	Total9 A	Gater	3j 3j	
320-174C3-6	4j 2P1j 7	Total9 A	Gater	3j 3j	
320-174C3-10	12P124	Total9 A	Gater	3j 3j	
320-174C3-11	j 2Q PC	Total9 A	Gater	3j 3j	
320-174C3-12	j 2OCPC	Total9 A	Gater	3j 3j	
320-174C3-13	12Pj 23	Total9 A	Gater	3j 3j	
LI h 320-10Pj P2f2-A	Lab I oStronhampre	Total9 A	Gater	3j 3j	
LI hD 320-10Pj P2f3-A	Lab I oStronhampre Dup	Total9 A	Gater	3j 3j	
MB 320-10Pj P2f1-A	Met&od BræS8	Total9 A	Gater	3j 3j	

Analysis Batch: 109370

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-174C3-1	1CPPj 4	Total9 A	Gater	G h-LI -002j	10Pj P2
320-174C3-2	1CP7j 4	Total9 A	Gater	G h-LI -002j	10Pj P2
320-174C3-C	12P311	Total9 A	Gater	G h-LI -002j	10Pj P2
320-174C3-P	12P230	Total9 A	Gater	G h-LI -002j	10Pj P2
320-174C3-7	j 24j Q	Total9 A	Gater	G h-LI -002j	10Pj P2
320-174C3-6	4j 2P1j 7	Total9 A	Gater	G h-LI -002j	10Pj P2
320-174C3-10	12P124	Total9 A	Gater	G h-LI -002j	10Pj P2
320-174C3-11	j 2Q PC	Total9 A	Gater	G h-LI -002j	10Pj P2
320-174C3-12	j 2OCPC	Total9 A	Gater	G h-LI -002j	10Pj P2
320-174C3-13	12Pj 23	Total9 A	Gater	G h-LI -002j	10Pj P2
LI h 320-10Pj P2f2-A	Lab I oStronhampre	Total9 A	Gater	G h-LI -002j	10Pj P2
LI hD 320-10Pj P2f3-A	Lab I oStronhampre Dup	Total9 A	Gater	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	Total9 A	Gater	G h-LI -002j	10Pj P2
320-174C3-4	4117OC	Total9 A	Gater	G h-LI -002j	10Pj P2
320-174C3-j	4j 46P4	Total9 A	Gater	G h-LI -002j	10Pj P2
320-174C3-6	4j 2P1j 7	Total9 A	Gater	G h-LI -002j	10Pj P2
MB 320-10Pj P2f1-A	Met&od BræS8	Total9 A	Gater	G h-LI -002j	10Pj P2

TestAmerica hacrameSto

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: 871132

Date Collected: 4/26/18 4v:- x

Date Received: 4/26/18 8:58:33

Lab Sample ID: 0-4Mx270M

Watrid: / ater

Arep yBpe	Patch yBpe	Patch Wetho6	5 zn	Dil Nactor	Initial s moznt	Ninal s moznt	Patch 9 zmber	Arep6 or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	3p3p			p87N mL	1N0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p87N mL	1N0 mL	10. 350	0p/10/18 02:21	JRB	TAL SAC

Client Sample ID: 871x32

Date Collected: 4/26/18 4v:0-

Date Received: 4/26/18 8:58:33

Lab Sample ID: 0-4Mx270M

Watrid: / ater

Arep yBpe	Patch yBpe	Patch Wetho6	5 zn	Dil Nactor	Initial s moznt	Ninal s moznt	Patch 9 zmber	Arep6 or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	3p3p			p48N mL	1N0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p48N mL	1N0 mL	10. 350	0p/10/18 02:42	JRB	TAL SAC

Client Sample ID: v3220

Date Collected: 4/26/18 84:22

Date Received: 4/26/18 8:58:33

Lab Sample ID: 0-4Mx270M

Watrid: / ater

Arep yBpe	Patch yBpe	Patch Wetho6	5 zn	Dil Nactor	Initial s moznt	Ninal s moznt	Patch 9 zmber	Arep6 or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	3p3p			p34 mL	1N0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p34 mL	1N0 mL	10. 80p	0p/12/18 20:12	JRB	TAL SAC

Client Sample ID: 288x77

Date Collected: 4/26/18 88:32

Date Received: 4/26/18 8:58:33

Lab Sample ID: 0-4Mx270M

Watrid: / ater

Arep yBpe	Patch yBpe	Patch Wetho6	5 zn	Dil Nactor	Initial s moznt	Ninal s moznt	Patch 9 zmber	Arep6 or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	3p3p			p8. N mL	1N0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p8. N mL	1N0 mL	10. 80p	0p/12/18 20:33	JRB	TAL SAC

Client Sample ID: 232v12

Date Collected: 4/26/18 80:00

Date Received: 4/26/18 8:58:33

Lab Sample ID: 0-4Mx270M

Watrid: / ater

Arep yBpe	Patch yBpe	Patch Wetho6	5 zn	Dil Nactor	Initial s moznt	Ninal s moznt	Patch 9 zmber	Arep6 or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	3p3p			p43 mL	1N0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p43 mL	1N0 mL	10. 80p	0p/12/18 20:p4	JRB	TAL SAC

Client Sample ID: 8- 1088

Date Collected: 4/26/18 83:41

Date Received: 4/26/18 8:58:33

Lab Sample ID: 0-4Mx270M

Watrid: / ater

Arep yBpe	Patch yBpe	Patch Wetho6	5 zn	Dil Nactor	Initial s moznt	Ninal s moznt	Patch 9 zmber	Arep6 or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	3p3p			p15N mL	1N0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p15N mL	1N0 mL	10. 350	0p/10/18 0p:32	JRB	TAL SAC

TestAmerica Sacramento

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: 8- 1- 04

Date Collecte6: 42R- 87 87:01

Date 5 eceiTe6: 42R- 87 88:83

Lab Sample ID: 0- 4Mx270M

Watrid: / ater

Arep yBpe	Patch yBpe	Patch Wetho6	5 zn	Dil Nactor	Initial s moznt	Ninal s moznt	Patch 9 z mber	Arepare6 or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	3p3p			p42N mL	1N0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p42N mL	1N0 mL	10. 350	0p/10/18 0p:p3	JRB	TAL SAC

Client Sample ID: 3- 2373

Date Collecte6: 42R- 87 81:- 3

Date 5 eceiTe6: 42R- 87 88:83

Lab Sample ID: 0- 4Mx270M

Watrid: / ater

Arep yBpe	Patch yBpe	Patch Wetho6	5 zn	Dil Nactor	Initial s moznt	Ninal s moznt	Patch 9 z mber	Arepare6 or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	3p3p			p24N mL	1N0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p24N mL	1N0 mL	10. 350	0p/10/18 08:1p	JRB	TAL SAC

Client Sample ID: 23- 183x

Date Collecte6: 42R- 87 4v:03

Date 5 eceiTe6: 42R- 87 88:83

Lab Sample ID: 0- 4Mx270M

Watrid: / ater

Arep yBpe	Patch yBpe	Patch Wetho6	5 zn	Dil Nactor	Initial s moznt	Ninal s moznt	Patch 9 z mber	Arepare6 or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	3p3p			pp2N mL	1N0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	pp2N mL	1N0 mL	10. 350	0p/10/18 08:38	JRB	TAL SAC
Total/9 A	PreH	3p3p			pp2N mL	1N0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	pp2N mL	1N0 mL	10. 80p	0p/12/18 21:1p	JRB	TAL SAC

Client Sample ID: 8- 18- 2

Date Collecte6: 42R- 87 84:08

Date 5 eceiTe6: 42R- 87 88:83

Lab Sample ID: 0- 4Mx270M

Watrid: / ater

Arep yBpe	Patch yBpe	Patch Wetho6	5 zn	Dil Nactor	Initial s moznt	Ninal s moznt	Patch 9 z mber	Arepare6 or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	3p3p			p3. N mL	1N0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p3. N mL	1N0 mL	10. 350	0p/10/18 08:p5	JRB	TAL SAC

Client Sample ID: 3- 7317

Date Collecte6: 42R- 87 88:- 7

Date 5 eceiTe6: 42R- 87 88:83

Lab Sample ID: 0- 4Mx270M

Watrid: / ater

Arep yBpe	Patch yBpe	Patch Wetho6	5 zn	Dil Nactor	Initial s moznt	Ninal s moznt	Patch 9 z mber	Arepare6 or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	3p3p			p47N mL	1N0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p47N mL	1N0 mL	10. 350	0p/10/18 05:1.	JRB	TAL SAC

Client Sample ID: 3- 7717

Date Collecte6: 42R- 87 88:04

Date 5 eceiTe6: 42R- 87 88:83

Lab Sample ID: 0- 4Mx270M

Watrid: / ater

Arep yBpe	Patch yBpe	Patch Wetho6	5 zn	Dil Nactor	Initial s moznt	Ninal s moznt	Patch 9 z mber	Arepare6 or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	3p3p			p44M mL	1N0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC

TestAmerica Sacramento

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 Collecte6: 42RvR7 88:04

Date 5 eceiTe6: 42R - R7 88:83

Lab Sample ID: 0- 4Mx270M-

Watrid: / ater

Are yBpe	Patch yBpe	Patch Wetho6	5 zn	Dil Nactor	Initial s moz nt	Ninal s moz nt	Patch 9 z mber	Arepare6 or s nalBFe6	s nalBut	Lab
Total/9 A	Analysis	WS-LC-002p		1	p44M mL	1N00 mL	10. 350	0p/10/18 05:40	JRB	TAL SAC

Client Sample ID: 8- 13- 0

Date Collecte6: 42RvR7 80:- x

Date 5 eceiTe6: 42R - R7 88:83

Lab Sample ID: 0- 4Mx270M0

Watrid: / ater

Are yBpe	Patch yBpe	Patch Wetho6	5 zn	Dil Nactor	Initial s moz nt	Ninal s moz nt	Patch 9 z mber	Arepare6 or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	3p3p			pp1N mL	1N00 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	pp1N mL	1N00 mL	10. 350	0p/10/18 07:01	JRB	TAL SAC

LaboratorB 5 eferenceu:

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

LineSt: h&aSSoS WG iisoS
/ rojectfhite: I itF okgairbaSLs gire TraiSiSOArea

TestAmerica Job ID: 320-174C3-1
hD5 : 31-1-11P3j -004

Method	Method Description	Protocol	Laboratory
G h-ul -002j	/ erkHriSate= , F=rocarboSs	TAu hd /	TAu hAl

Protocol References:

TAu hd / p TestAmerica uaboratories8htaS=ar= d ReratiSO/ roce=Hre

Laboratory References:

TAu hAl p TestAmerica hacrameSto8770 v iwersi=e / arL9 af8G est hacrameSto8l A 6j 00j 8TEu (61C)3P3-j 000

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

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 532-8020

2655 Hill Road
Fairbanks, AK 99709
(907) 479-0808

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

1321 Bannock Street, Suite 200
Denver, CO 80204
(303) 825-3800

CHAIN-OF-CUSTODY RECORD

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

Page 1 of 2
Laboratory Test America
Attn: David Alltucker

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

Sample Identity	Lab No	Time	Date Sampled	Comp	Grab	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	
411806		1154		X	X	2	
454474		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	Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Project Number: <u>167754</u>	Total Number of Containers: <u>2</u>	Signature: <u>M. Hall</u>	Signature: _____	Signature: _____
Project Name: _____	COC Seals/Initialed: <u>N/A</u>	Printed Name: <u>Mary Nadey</u>	Printed Name: _____	Printed Name: _____
Contact: _____	Received Good: <u>Cond./Cold</u>	Company: <u>Shannon & Wilson</u>	Company: _____	Company: _____
Ongoing Project? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Delivery Method: <u>Hand</u>	Received By: <u>1.</u>	Received By: <u>2.</u>	Received By: <u>3.</u>
Sampler: _____	(attach shipping bill if any)	Signature: <u>Wesley Sherman</u>	Signature: _____	Signature: _____
Instructions		Printed Name: <u>Wesley Sherman</u>	Printed Name: _____	Printed Name: _____
Requested Turnaround Time: _____		Date: <u>4/24/16</u>	Date: _____	Date: _____
Special Instructions: _____		Company: <u>Shannon & Wilson</u>	Company: _____	Company: _____

Distribution: White - w/shipment - returned to Shannon & Wilson w/lab report

Yellow -
Pink - S



F-19-91/UR

320-18463 Chain of Custody

4.9°C

No. 33954



400 N 34th Street, Suite 100 2043 Westport Center Drive
Seattle, WA 98103 St Louis, MO 63146-3564
(206) 632-8020 (314) 699-9660

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

2055 S.W. Canyon Road
Portland, OR 97201-2498
(503) 223-6147

Lab No

Sampled

Time

Sampled

CHAIN-OF-CUSTODY RECORD

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

Laboratory Test America Page 2 of 2
Attn: David Hiltbraker

Analysis Parameters/Sample Container Description

(include preservative if used)

[illegible]

Project Information	Sample Receipt
Project Number: 31-11735-01	Total Number of Containers: 20
Project Name: GF RFTC	COC Seals/Intact? <input checked="" type="checkbox"/> N/NA
Contact: MDN/JAK	Received Good Cond./Cold: <input checked="" type="checkbox"/>
Ongoing Project? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Delivery Method: FedEx
Sampler: MDN	(attach shipping bill, if any)

Relinquished By: 1. Signature: <u>AM: Hall</u> Printed Name: <u>Marcy Nada</u> Company: <u>Shannon & Wilson</u>	Relinquished By: 2. Signature: _____ Printed Name: _____ Company: _____	Relinquished By: 3. Signature: _____ Printed Name: _____ Company: _____
Received By: 1. Signature: <u>Wesley Shermon-Shackles</u> Printed Name: <u>Wesley Shermon-Shackles</u> Company: <u>AWOS</u>	Received By: 2. Signature: _____ Printed Name: _____ Company: _____	Received By: 3. Signature: _____ Printed Name: _____ Company: _____

Instructions

Requested Turnaround Time,

Special Instructions: Please notify upon receipt

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

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 acioavtiytw' asnlk vhev<ec or is / æ bav<. rounc as measurec bwa suryew meter,	Rue	
Rhe voolerls vustocwsealf ipAresentf is intavt,	Rue	
SamAle vustocwsealsf ipAresentf are intavt,	N=O	
Rhe vooler or samAles co not aAAear to haye been vomAromisec or tamAerec ' ith,	Rue	
SamAles ' ere reveiyec on ive,	Rue	
Cooler RemAerature is avveAtable,	Rue	
Cooler RemAerature is revorcec,	Rue	
CI C is Aresent,	Rue	
CI C is pillec out in in< anc le. ible,	Rue	
CI C is pillec out ' ith all Aertinent inpprmation,	Rue	
Is the ?ielc SamAlerls name Aresent on CI CH	Rue	
Rhere are no cislveAanvies bet' een the vontainers reveiyec anc the CI C,	Rue	
SamAles are reveiyec ' ithin (olcin. Rime æ)vlucin. tests ' ith imieceate (RsP	Rue	
SamAle vontainers haye le. ible labels,	Rue	
Containers are not bro<en or lea<in. ,	Rue	
SamAle vollevtion cate=times are Aroyicec,	Rue	
OAAroAriate samAle vontainers are usec,	Rue	
SamAle bottles are vomAetelwpllec,	Rue	
SamAle Vreseryation qerijec,	N=O	
Rhere is suppvient yol, pr all reMuestec analvsesf invl, anwreMuestec z S= SDs	Rue	
Containers reMuirin. 6ero heacsAave haye no heacsAave or bubble is / 8mm x1=4"P,	Rue	
z ultiAhasiv samAles are not Aresent,	Rue	
SamAles co not reMuire sAlittin. or vomAositin. ,	Rue	
desicual 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 ($4^{\circ} \pm 2^{\circ} \text{C}$)?
☒ 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)

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

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

☐ Yes ☒ No ☐ NA (Please explain.)

Comments:

For the field duplicate 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

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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.

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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.
α	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)

Case Narrative

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

TestAmerica Job ID: 320-19030-1

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 3.9° 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-octadecanoic 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-octadecanoic 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-octadecanoic 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 perform 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-octadecanoic 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

Case Narrative

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

TestAmerica Job ID: 320-19030-1

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-octadecanoic 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-octadecanoic 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-octadecanoic 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-octadecanoic 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.

TestAmerica Sacramento

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-octadecanoic 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-octadecanoic 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-octadecanoic 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-octadecanoic 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-octadecanoic 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.

TestAmerica Sacramento

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-octadecanoic 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-octadecanoic 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-octadecanoic 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-octadecanoic 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-octadecanoic 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.

TestAmerica Sacramento

Detection Summary

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

TestAmerica Job ID: 320-19030-1

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-octadecanoic 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-octadecanoic 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.

TestAmerica Sacramento

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.

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-19030-1

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-octadecanoic 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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-19030-1

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-octadecanoic 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-PFHxA	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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-19030-1

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-octadecanoic 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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-19030-1

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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-19030-1

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-octadecanoic 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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-19030-1

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-octadecanoic 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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-19030-1

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-octadecanoic 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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-19030-1

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-octadecanoic 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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-19030-1

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-octadecanoic 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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-19030-1

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-octadecanoic 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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-19030-1

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-octadecanoic 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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-19030-1

Client Sample ID: 593460-1

Lab Sample ID: 320-19030-12

Date Collected: 05/17/16 16:47

Matrix: Water

Date Received: 05/20/16 09:40

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-octadecanoic 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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-19030-1

Client Sample ID: 597517-2

Lab Sample ID: 320-19030-13

Date Collected: 05/17/16 11:15

Matrix: Water

Date Received: 05/20/16 09:40

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-octadecanoic 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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-19030-1

Client Sample ID: MW-207A

Lab Sample ID: 320-19030-14

Date Collected: 05/17/16 14:27

Matrix: Water

Date Received: 05/20/16 09:40

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-octadecanoic 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-octadecanoic 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

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-19030-1

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-octadecanoic 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-octadecanoic acid (PFODA)	ND	H	1.9	0.65	ng/L		06/07/16 11:40	06/12/16 15:40	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C2 PFDoA	82		25 - 150				06/07/16 11:40	06/12/16 15:40	1

TestAmerica Sacramento

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

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		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 PFD0 (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
Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		3O2 PFHx (25-150)	3C4 PFO: (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								

TestAmerica Sacramento

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

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)			
		¹⁸ O ₂ PFHx (25-150)	¹³ C ₄ PFOA (25-150)	¹³ C ₄ -PFHp (25-150)	¹³ C ₅ 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 PFDaA = ¹³C₂ PFDaA
¹⁸O₂ PFHxS = ¹⁸O₂ PFHxS
¹³C₄ PFOS = ¹³C₄ PFOS
¹³C₄-PFHpA = ¹³C₄-PFHpA
¹³C₅ PFPeA = ¹³C₅ PFPeA

TestAmerica Sacramento

QC Sample Results

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

TestAmerica Job ID: 320-19030-1

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	17d	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	0700	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	07u	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. Ifonate LPF5S6	ND		270	072	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orohepane S. Ifonate LPFHpS6	ND		270	0708	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. oro-1-he) tanes. Ifonate LPFH) S6	ND		270	0781	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. oro4ecane s. Ifonate LPFDS6	ND		270	172	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orooctane S. Ifonate LPFx S6	ND		270	173	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orooctane S. Ifonami4e LFX S6	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	Limits
Perfl. orob. tanoic aci4 LPF5A6	d070	3179		ng/U		00	8d - 130
Perfl. oro) entanoic aci4 LPFPeA6	d070	3270		ng/U		02	(9 - 13d
Perfl. orohepanoic aci4 LPFHpA6	d070	3u73		ng/U		00	80 - 13(
Perfl. orohe) tanoic aci4 LPFH) A6	d070	3u7		ng/U		09	(3 - 13u
Perfl. orooctanoic aci4 LPFx A6	d070	3(73		ng/U		91	(3 - 1d1
Perfl. orononanoic aci4 LPFNA6	d070	3971		ng/U		90	81 - 1d0
Perfl. oro4ecanoic aci4 LPFDA6	d070	3(78		ng/U		92	((- 1d1

TestAmerica Sacramento

QC Sample Results

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

TestAmerica Job ID: 320-19030-1

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(70		ng/U		92	(0 - 139
Perfl. oro4o4ecanoic aci4 LPFDoA6	d070	3u7u		ng/U		09	81 - 139
Perfl. orotri4ecanoic Aci4 LPFTriA6	d070	3d7d		ng/U		Q	u1 - 139
Perfl. orotetra4ecanoic aci4 LPFTeA6	d070	2072		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	03u B		ng/U		21	u0 - 1u0
Perfl. orob. tane S. Ifonate LPF5S6	3u7d	287u		ng/U		80	uu - 1d8
Perfl. orohepane S. Ifonate LPFHpS6	3(7d	3978		ng/U		109	uO - 130
Perfl. oro-1-he) tanes. Ifonate LPFH) S6	3071	3(7u		ng/U		9(	32 - 180
Perfl. oro4ecane s. Ifonate LPFDS6	307	307d		ng/U		89	3u - 1u8
Perfl. orooctane S. Ifonate LPFx S6	3871	3170		ng/U		0d	d8 - 1(2
Perfl. orooctane S. Ifonami4e LFx SA6	d070	3370		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 LPF5A6	d070	3270		ng/U		00	8d - 130	0	30
Perfl. oro) entanoic aci4 LPFPeA6	d070	327u		ng/U		01	(9 - 13d	1	30
Perfl. orohepanoic aci4 LPFHpA6	d070	3d7		ng/U		Q	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		09	(3 - 1d1	2	30
Perfl. orononanoic aci4 LPFNA6	d070	397		ng/U		99	81 - 1d0	1	30
Perfl. oro4ecanoic aci4 LPFDA6	d070	3071		ng/U		9u	((- 1d1	d	30

TestAmerica Sacramento

QC Sample Results

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

TestAmerica Job ID: 320-19030-1

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	d070	3u7		ng/U		09	(O. 139	3	30
Perfl. oro4o4ecanoic aci4 LPFDoA6	d070	3d70		ng/U		08	81 - 139	2	30
Perfl. orotri4ecanoic Aci4 LPFTriA6	d070	3370		ng/U		0u	u1 - 139	2	30
Perfl. orotetra4ecanoic aci4 LPFTeA6	d070	307d		ng/U		8(	d8 - 130	0	30
Perfl. oro-n-hepa4ecanoic aci4 LPFHpDA6	d070	2072		ng/U		81	u0 - 1u0	12	30
Perfl. oro-n-octan4ecanoic aci4 LPFx DA6	d070	107u	B	ng/U		2(	u0 - 1u0	23	30
Perfl. orob. tane S. Ifonate LPF5S6	3u7d	237d		ng/U		((	uu - 1d8	1(	30
Perfl. orohepane S. Ifonate LPFHpS6	3(7d	d170		ng/U		11u	uO. 13O	u	30
Perfl. oro-1-he) tanes. Ifonate LPFH) S6	3071	3(73		ng/U		9u	32 - 180	0	30
Perfl. oro4ecane s. Ifonate LPFDS6	307	3u7		ng/U		92	3u - 1u8	1(	30
Perfl. orooctane S. Ifonate LPFx S6	3871	3370		ng/U		09	d8 - 1(2	(	30
Perfl. orooctane S. Ifonami4e Lfx SA6	d070	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 LPF5A6	07u1u	J	270	07d(	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. oro) entanoic aci4 LPFPeA6	ND		270	0799	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. orohepanoic aci4 LPFHpA6	ND		270	0789	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. orohe) tanoic aci4 LPFH) A6	ND		270	0700	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. orooctanoic aci4 LPFx A6	ND		270	078u	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. orononanoic aci4 LPFNA6	ND		270	07 u	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. oro4ecanoic aci4 LPFDA6	ND		270	07dd	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1

TestAmerica Sacramento

QC Sample Results

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

TestAmerica Job ID: 320-19030-1

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	070u3	J	270	070u	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. oro4o4ecanoic aci4 LPFDoA6	ND		270	070u	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. orotri4ecanoic Aci4 LPFTriA6	ND		270	070u	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. orotetra4ecanoic aci4 LPFTeA6	070u0	J	270	070u	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. oro-n-hepa4ecanoic aci4 LPFHpDA6	ND		270	070u	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. oro-n-octan4ecanoic aci4 LPFx DA6	ND		270	070u	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. orob. tane S. Ifonate LPF5S6	ND		270	070u	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. orohepane S. Ifonate LPFHpS6	ND		270	070u	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. oro-1-he) tanes. Ifonate LPFH) S6	ND		270	070u	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. oro4ecane s. Ifonate LPFDS6	ND		270	170	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. orooctane S. Ifonate LPFx S6	ND		270	170	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. orooctane S. Ifonami4e IFx SA6	ND		270	070u	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1

Isotope Dilution	%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	Limits
Perfl. orob. tanoic aci4 LPF5A6	d070	3d7u		ng/U		Q	8d - 130
Perfl. oro) entanoic aci4 LPFPeA6	d070	337		ng/U		Qd	(9 - 13d
Perfl. orohepanoic aci4 LPFHpA6	d070	3u70		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	3370		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

TestAmerica Sacramento

QC Sample Results

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

TestAmerica Job ID: 320-19030-1

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. Ifonate LPF5S6	3u7d	2870		ng/U		8(	uu - 1d8
Perfl. orohepane S. Ifonate LPFHpS6	3(7d	2(70		ng/U		82	uO- 130
Perfl. oro-1-he) tanes. Ifonate LPFH) S6	3O7d	3379		ng/U		O9	32 - 180
Perfl. oro4ecane s. Ifonate LPFDS6	3O7d	3172		ng/U		O1	3u - 1u8
Perfl. orooctane S. Ifonate LPFx S6	387d	3u70		ng/U		98	d8 - 1(2
Perfl. orooctane S. Ifonami4e IFx 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

Top Data: 1/20/17									
Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfl. oro-n-octan4ecanoic aci4 LPFx DA6	07(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

TestAmerica Sacramento

QC Sample Results

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

TestAmerica Job ID: 320-19030-1

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C2 PFDa	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		130	u0 - 1u0	ud	30
Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits						
13C2 PFDa	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	078	ng/U		06/13/16 09:u0	06/16/16 08:d8	1
Isotope Dilution	MB %Recovery	MB Qualifier	Limits						
13C2 PFDa	122		25 - 150						

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

Sample Data: 110012				Sample Data: 110009							
Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Perfl. oro-n-octan4ecanoic aci4 LPFx DA6			d070	d873		ng/U		110	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	LCS %Recovery	LCS Qualifier	Limits						
13C2 PFDa	126		25 - 150						

TestAmerica Sacramento

QC Association Summary

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

TestAmerica Job ID: 320-19030-1

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	

TestAmerica Sacramento

QC Association Summary

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

TestAmerica Job ID: 320-19030-1

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

TestAmerica Sacramento

QC Association Summary

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

TestAmerica Job ID: 320-19030-1

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

Lab Chronicle

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

TestAmerica Job ID: 320-19030-1

Client Sample ID: 87132

Date Collected: 27/41/41 42:61

Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-4

Matrix: Water

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTue	PnalTA	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

Date Collected: 27/41/41 42:72

Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-0

Matrix: Water

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTue	PnalTA	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

Date Collected: 27/41/41 44:36

Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-3

Matrix: Water

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTue	PnalTA	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

Date Collected: 27/41/41 40:64

Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-6

Matrix: Water

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTue	PnalTA	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

Date Collected: 27/41/41 46:06

Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-7

Matrix: Water

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTue	PnalTA	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

TestAmerica Sacramento

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	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTued	PnalTAat	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 4N42

Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-N

Matrix: Water

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTued	PnalTAat	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	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTued	PnalTAat	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: 27/4N41 44:71

Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-8

Matrix: Water

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTued	PnalTAat	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: 27/4N41 46:20

Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-42

Matrix: Water

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTued	PnalTAat	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

TestAmerica Sacramento

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: 27/4N41 46:20

Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-42

Matrix: Water

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTued	PnalTA	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: 27/4N41 47:63

Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-44

Matrix: Water

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTued	PnalTA	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: 27/4N41 41:6N

Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-40

Matrix: Water

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTued	PnalTA	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: 27/4N41 44:47

Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-43

Matrix: Water

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTued	PnalTA	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: 27/4N41 46:0N

Date Received: 27/02/41 28:62

Lab Sample ID: 302-48232-46

Matrix: Water

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTued	PnalTA	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

TestAmerica Sacramento

Lab Chronicle

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

TestAmerica Job ID: 320-19030-1

Client Sample ID: MW-726

Lab Sample ID: 302-48232-47

Date Collected: 27/4N41 47:63

Matrix: Water

Date Received: 27/02/41 28:62

Brep 5Tpe	yatch 5Tpe	yatch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Bprepared or PnalTued	PnalTA	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

TestAmerica Sacramento

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

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

555 Hill Road
Fairbanks, AK 99709
(907) 479-0608

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

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

1321 Bannock Street, Suite 200
Denver, CO 80204
(303) 825-3800

CHAIN-OF-CUSTODY RECORD

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

Page 1 of 2
Laboratory Test America
Attn: David Alltucker

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

LABS-LE-0035
Grab
Total Number of Containers

Remarks/Matrix

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	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	
547517-1		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: 31-1-1735-005	Total Number of Containers: 30
Project Name: <u>Reg Fire Train Center</u>	COC Seals/Initials: <u>Y/N/NA</u>
Contact: <u>MDN/JAK</u>	Received Good Cond./Cold
Ongoing Project? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Delivery Method: <u>FEDEX</u>
Sampler: <u>MDN/SWH</u>	(attach shipping bill, if any)

Instructions
Requested Turnaround Time: <u>Std</u>
Special Instructions: <u>Please notify upon arrival of shipment</u>

Distribution White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: <u>M. G. Ladd</u>	Signature: _____	Signature: _____
Printed Name: <u>Marcy Nardel</u>	Printed Name: _____	Printed Name: _____
Company: <u>Shannon & Wilson</u>	Company: _____	Company: _____
Received By: 1.	Received By: 2.	Received By: 3.
Signature: <u>Shannon & Wilson</u>	Signature: _____	Signature: _____
Printed Name: <u>Shannon & Wilson</u>	Printed Name: _____	Printed Name: _____
Company: <u>Shannon & Wilson</u>	Company: _____	Company: _____

CHAIN-OF-CUSTODY RECORD

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

Analysis Parameters/Sample Container Description (include preservative if used)
10

Laboratory Test America Page 2 of 2
Attn: David Altstucker

[illegible]

Project Information		Sample Receipt	
Project Number:		Total Number of Containers	2
Project Name:		COC Seals/Intact?	Y/N/NA
Contact:		Received Good Cond /Cold	
Ongoing Project?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Delivery Method:	
Sampler:	(attach shipping bill, if any)		
<div> <div>Instructions</div> <div> <div>Requested Turnaround Time:</div> <div>Special Instructions:</div> </div> </div>			

Distribution

White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

Login Sample Receipt Checklist

Client: Shannon & Wilson

Job Number: 320-19030-1

Login Number: 19030

List Source: TestAmerica Sacramento

List Number: 1

Creator: Nelson, Kym D

Question	Answer	Comment
Radioactivity wasn't checked or is \leq 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 $<6\text{mm}$ (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:

Title: Date:

CS Report Name: Report Date:

Consultant Firm:

Laboratory Name: Laboratory Report Number:

ADEC File Number: 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 ($4^{\circ} \pm 2^{\circ} \text{C}$)?
☒ 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-octadecanoic 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-octadecanoic 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-octadecanoic (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 acceptance 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)

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

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

☐ Yes ☒ No ☐ NA (Please explain.)

Comments:

The 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 analytical 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**

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