

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6 Naval Air Station Whidbey Island, Oak Harbor, Washington

PREPARED BY: CH2M

DATE: September 22, 2020

Introduction

CH2M HILL, Inc. (CH2M) was contracted by Naval Facilities Engineering Command (NAVFAC) to:

- Determine the presence or absence of per- and polyfluoroalkyl substances (PFAS) and PFAS precursors in on-Base groundwater at Naval Air Station (NAS) Whidbey Island Area 6.
- Evaluate the distribution of PFAS in off-Base drinking water and groundwater (if detected on-Base).
- Evaluate the distribution of known on-Base contaminants 1,4-dioxane and vinyl chloride in off-Base drinking water and groundwater.

Area 6 is part of NAS Whidbey Island Ault Field, located at the northern end of Whidbey Island along the shoreline of the Strait of Juan de Fuca just north of Oak Harbor, Washington (**Figure 1**). This technical memorandum (TM) presents the results of the groundwater and drinking water investigation, which was performed in three stages between December 2017 and April 2019. Work was performed in accordance with the *Sampling and Analysis Plan, Site Inspection of Per- and Polyfluoroalkyl Substances and Additional Characterization of 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water for Remedial Design Refinement, Area 6, Ault Field, Naval Air Station Whidbey Island, Oak Harbor, Washington* (SAP) (CH2M, 2017a) and the *Sampling and Analysis Plan Addendum, Site Inspection of Per- and Polyfluoroalkyl Substances and Additional Characterization of 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water for Remedial Design Refinement, Area 6, Ault Field, Naval Air Station Whidbey Island, Oak Harbor, Washington* (CH2M, 2018). CH2M prepared this TM under the NAVFAC, Comprehensive Long-term Environmental Action—Navy 9000 Contract N62470-16-D-9000, Contract Task Order 4041.

Per- and Polyfluoroalkyl Substances

PFAS are manufactured chemicals that have been used since the 1950s in many household and industrial products because of their stain- and water-repellant properties. Within the Department of the Navy's (Navy's) operations, PFAS are most commonly associated with aqueous film-forming foam (AFFF) used primarily for firefighting (including emergency response, equipment testing and/or training, and fire suppression systems in buildings). PFAS can also be present in other industrial and household materials, in vapor suppression systems, and in waste streams. PFAS are now present virtually everywhere in the world because of the large amounts that have been manufactured and used. Once these compounds are released to the environment, they break down very slowly. PFAS are considered "contaminants of emerging concern," which have no Safe Drinking Water Act regulatory standards or routine water quality testing requirements. The United States Environmental Protection Agency (USEPA) is studying PFAS to determine if national regulation is needed. The State of Washington does not have an established state standard or promulgated screening value for any PFAS constituent in either groundwater or drinking water.

USEPA issued the third Unregulated Contaminant Monitoring Rule (UCMR3)¹ in May 2012. The UCMR3 required monitoring between 2013 and 2015, for 30 substances of all large public water systems (PWSs) serving more than 10,000 people and 800 representative PWSs serving 10,000 or fewer people. Six PFAS compounds were included in the UCMR3 contaminant list; of these six PFAS, USEPA issued health advisories² for only two, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), and has published toxicity values for another, perfluorobutane sulfonate (PFBS). Health advisory levels are not regulatory standards. They are health-based concentrations, which should offer a margin of protection for all Americans throughout their lives from adverse health effects resulting from exposure to PFOS and PFOA in drinking water. The USEPA Lifetime Health Advisory level is 70 parts per trillion (ppt) for PFOS and 70 ppt for PFOA. When both PFOS and PFOA are found in drinking water, the combined concentration should not exceed 70 ppt (USEPA, 2016a and 2016b).

Navy Policy

The Navy issued a policy in 2014 (Navy, 2014) requiring on-Base drinking water sampling for PFOA and PFOS for bases where groundwater was used as drinking water and PFAS could have been released nearby in the past. Under the policy, all installations not previously tested under UCMR3 that produce drinking water from on-Base sources and have an identified or suspected PFAS release within approximately 1-mile upgradient of the drinking water source were required to sample their finished drinking water by December 2015. In June 2016, the Navy issued additional policy (Navy, 2016a) that required all Navy bases not previously tested under UCMR3 or the 2014 policy (Navy, 2014) to test their finished drinking water, regardless of the water source (on-Base or municipal) or potential and known source of a PFAS release to the environment. The Ault Field water supply comes from the drinking water treatment plant facility at Mount Vernon 16 miles to the northwest, which is owned and operated by the City of Anacortes. Water from the Skagit River is pumped into the Mount Vernon water treatment plant and transported to NAS Whidbey Island via a pipeline. The City of Oak Harbor's drinking water supply (which is also supplied by the Anacortes water treatment plant) was sampled for six PFAS compounds under UCMR3 in 2013 and 2014. The results were nondetect for the six PFAS analyzed.

In June 2016, the Navy also issued a policy (Navy, 2016b) to identify and prioritize sites for investigation of drinking water resources, on- or off-Base, that are thought to be vulnerable to PFAS contamination from past Navy releases of PFAS, with a focus on releases of AFFF. Sites with drinking water sources (water supply wells, surface water bodies used for drinking water, and reservoirs) within 1 mile downgradient of known or potential releases of PFAS were assigned the highest priority. Drinking water near these high-priority, Priority 1 sites, was required to be sampled within fiscal year 2017. Priority 1 sites at NAS Whidbey Island in Island County, Washington, included the Ault Field Runway Ditches/Former Runway Fire Training School (Areas 16/31) and Outlying Landing Field (OLF) Coupeville. The Navy has sampled more than 200 drinking water wells downgradient from Ault Field and OLF Coupeville since November 2016. A routine, semi-annual drinking water sampling program is currently in place for drinking water wells with exceedances of the Lifetime Health Advisory level and surrounding parcels under the *Sampling and Analysis Plan Investigation of Per- and Polyfluoroalkyl Substances in Drinking Water Ault Field and Outlying Landing Field Coupeville* (Off-Base Drinking Water SAP) (CH2M, 2017b). As will be discussed in subsequent sections of this TM, although Area 6 was not identified as a Priority 1 site for PFAS investigation, its history as a municipal and industrial waste disposal facility is consistent with possible releases of PFAS.

Conceptual Site Model

This section presents a brief history of Area 6, background information about the site, a description of the environmental setting, and an evaluation of drinking water sources in the vicinity. This information comprises the

¹ The 1996 Safe Drinking Water Act amendments require that once every 5 years USEPA issue a new list of no more than 30 unregulated contaminants to be monitored by PWSs.

² USEPA issued a Lifetime Health Advisory level for PFOS and PFOA in May 2016, superseding the 2009 provisional health advisory. USEPA has not issued a health advisory for any other PFAS.

conceptual site model, which describes the relationship between potential contaminant sources and receptors through potential or actual migration and exposure pathways.

Site Description

Area 6 is a 260-acre tract in the southeastern corner of Ault Field. Area 6 is bordered by Ault Field Road to the north, State Highway 20 to the east, and the Oak Harbor landfill on the south and southwest (**Figure 2**). Privately-owned forested or logged land, and a former commercial sand and gravel quarry operation, are located immediately west of Area 6. Various businesses such as auto repair shops, an auto salvage yard, storage facilities, the Auld Holland Inn, and a mobile home park are located west and south of Area 6. Private residences are located to the east, west, and south of Area 6.

Site History and Current Status

There are two areas within Area 6 where wastes are known to have been disposed:

- The former industrial waste disposal area: This feature consisted of an acid disposal pit and an oily sludge pit (Foster, 2002). The acid disposal pit received approximately 300,000 to 700,000 gallons of acids, caustics, and solvents between the 1970s and 1980s. The oily sludge pit received approximately 100,000 to 600,000 gallons of liquid sludge between 1969 and the mid-1970s.
- The Area 6 landfill: This feature included 23 cut-and-fill trenches with native materials in between and received Navy waste from 1969 through the mid-1990s (Foster, 1997; URS, 1993; URS-AECOM, 2018). The landfill received both sanitary solid and industrial wastes (which may have contained hazardous constituents) from 1969 to 1983, Navy waste through 1992, yard waste and construction debris during 1993, and soil and sediments classified as nonhazardous (from other remedial actions) in 1995 and 1996 (Foster, 1997 and URS, 1993). There is no known disposal of regulated wastes since 1983 (URS, 1993).

The 1993 Record of Decision (ROD) identified trichloroethene (TCE), 1,1,1-trichloroethane (TCA), 1,1-dichloroethane (DCA), 1,1-dichloroethene (DCE), cis-1,2-DCE, and vinyl chloride as chemicals of concern (COCs) in groundwater (Navy, Ecology, and EPA, 1993). The conclusions of the associated risk assessment were that future migration of COCs in groundwater posed the greatest potential risk to human health. Remedial actions implemented following the 1993 ROD focused on minimizing the leaching of contaminants from the vadose zone to the groundwater system and capture/treatment of contaminated groundwater. In 2003, 1,4-dioxane was identified in groundwater at Area 6. The subsequent Focused Feasibility Study (URS-AECOM, 2018) listed the COCs that are part of a ROD Amendment as: TCE, 1,1-DCE, 1,1,1-TCA, vinyl chloride, and 1,4-dioxane. The ROD Amendment was finalized in 2019 (Navy, 2019).

The Area 6 landfill cap was constructed as part of the remedial action to prevent infiltration through the landfill that may result in leaching of contaminants to groundwater (Foster, 1997). An interim soil removal action was completed in 2001 at the former industrial waste disposal area to reduce the mass in the vadose zone source area; however, confirmation samples indicate that concentrations of TCE in soil between 0.21 and 8.2 ppm (21 to 8,200 ppb) remain in place post-excavation (Foster, 2002).

VOCs in groundwater, excluding 1,4-dioxane, are currently being treated with a groundwater extraction, treatment, and recharge (GETR) system constructed in 1995 (Sealaska, 2018). Currently, effluent from the GETR is discharged to land surface on the southern side of the Area 6 composting facility (**Figure 3**). The effluent flows to the north, following a natural surface water drainage, ultimately discharging to a swale north of Ault Field Road. The GETR system was not designed to treat 1,4-dioxane because the 1,4-dioxane was not identified in the groundwater until 2003. As such, 1,4-dioxane has been redistributed in the aquifer system via discharge of GETR effluent upgradient of the Area 6 source areas and subsequent infiltration to the groundwater system. An expansion and upgrade to the GETR is currently under development and will incorporate an advanced oxidation unit that will remediate both vinyl chloride and 1,4-dioxane (CTI-URS, 2017 and 2018).

Currently, the only structures at Area 6 are a groundwater treatment plant (URS, 2015) and a compost facility. Other site features include an approximately 40-acre engineered landfill cap, a stormwater detention basin, and various groundwater monitoring and extraction wells.

The off-Base land surrounding Area 6 is used for a combination of residential and commercial purposes. The City of Oak Harbor's primary source of water is through the City of Anacortes, which extracts and treats water from the Skagit River. There are also private and community drinking water wells downgradient and cross gradient of Area 6.

Physical Setting

Whidbey Island lies within the Puget lowland, a topographic and structural depression between the Olympic Mountains and the Cascade Range.

Four glacial units have been identified at Area 6 and include, from youngest to oldest:

- Vashon Recessional Outwash (thin and discontinuous layer of sand and gravel with some silt; unit only present in the eastern part of Area 6 at the ground surface overlying the Vashon Till [CTI-URS, 2018]), which is interpreted as being predominantly unsaturated in Area 6 based on published cross-sections (URS-AECOM, 2018).
- Vashon Till (laterally extensive layer of silty, fine sand with some gravel, containing localized layers of clay or silt typically present at ground surface).
- Vashon Advance Outwash (coarse, gravelly sand that gradually becomes finer grained with depth with local layers of silty sand, silt, or clay).
- Whidbey Formation Units 1 through 4 (alternating finer-grained and coarser-grained materials).

Figure 4 presents a north-south cross-section through Area 6 illustrating the relative thicknesses and vertical locations of the units. More detailed descriptions of the units can be found in CTI-URS, 2018 and URS Consultants (URS), 1993.

The United States Geological Survey has identified up to five major hydrostratigraphic units (aquifers) above bedrock in Island County, where NAS Whidbey Island is located (Jones, 1985; Sapik et al., 1988). The existing aquifer units are composed of sand or sand and gravel, while the adjacent confining layers are composed of till, glaciomarine drift, or nonglacial clay and silt. Perched, saturated zones may exist locally above noncontinuous areas of till or other clay-rich units.

The following three of these five upper aquifers have been identified at Area 6 (CTI-URS, 2018):

- The shallow aquifer is an unconfined groundwater unit found in the Vashon Advance Outwash beneath Area 6. The former industrial waste disposal area discharged directly into this unit.
- The intermediate aquifer is a moderately continuous groundwater body found in the sandy unit that corresponds to the Whidbey Formation Unit 2. Near Area 6, this aquifer is confined below the silt and clay of Whidbey Formation Unit 1, which acts as an aquitard.
- The deep aquifer is also a nearly continuous confined groundwater body found near Area 6. This aquifer is confined below the silt and clay of Whidbey Formation Unit 3 (which acts as an aquitard) and occupies a thick sand layer in Whidbey Formation Unit 4.

Based on potentiometric maps presented in the Annual 2017-2018 Groundwater Long-Term Monitoring Report (Sealaska, 2018), the groundwater flow direction in the Vashon Advance Outwash (shallow aquifer) underlying Area 6 is predominantly to the south. There is a potential local southwesterly component of groundwater flow in the northwestern corner of Area 6. Groundwater flow direction in the Whidbey Formation Unit 2 (intermediate aquifer) is predominantly to the southeast; however, measurements from a subset of Area 6 monitoring wells (6-I-01, 6-I-03, and 6-I-08) suggest a local component of groundwater flow to the northeast (URS, 1993).

Groundwater elevation data from wells completed in the Whidbey Formation Unit 4 (deep aquifer) suggest groundwater flow directions ranging from southeast to southwest (URS, 1993). Downward vertical hydraulic gradients exist at the site, with differences in groundwater elevations between the shallow and intermediate aquifer ranging from 5 to 20 feet and approximately 50 feet between the shallow and deep aquifer. The majority of monitoring infrastructure at Area 6 is completed within the shallow aquifer.

There is limited readily available information regarding the subsurface characteristics of the off-Base area surrounding Area 6. Regionally, Whidbey Island consists of a thick sequence of glacial and interglacial deposits overlying lower permeability bedrock. The relatively continuous lithologic/hydrostratigraphic units described above likely extend off-Base.

Contaminant Setting

Source Areas

1,4-dioxane and volatile organic compound (VOC) source areas include the former industrial waste disposal area and the Area 6 landfill. AFFF has historically been used at Ault Field (Area 31, Area 16) and OLF in Coupeville (CH2M, 2016), resulting in the presence of PFAS in groundwater downgradient from these areas. Although it is unknown whether AFFF was used or disposed of at Area 6, the historical site use as a disposal area suggests that it is feasible. Examples of potential PFAS-containing materials disposed at Area 6 include sediment excavated from NAS Whidbey Island runway ditch system within the Area 6 landfill in 1995 before construction of the cap (Foster, 1997) and wastes excavated as part of remedial actions at other NAS Whidbey Island sites (such as the Clover Valley Fire School [Sealaska, 2015]).

Nature and Extent

Previous investigations at NAS Whidbey Island have confirmed the presence of 1,4-dioxane and VOCs in groundwater exceeding project action levels (PALs). The 2019 ROD Amendment (Navy, 2019) included the following COCs:

COC	Remediation Goal (RG)	PALs
TCE	5 ppb	NA
1,1,1-TCA	200 ppb	NA
1,1-DCE	7 ppb	NA
Vinyl Chloride	0.029 ppb	0.29 ppb ^a and 2 ppb ^b
1,4-dioxane	0.44 ppb	0.44 ppb ^a and 35 ppb ^b

Notes:

^a PAL for the purposes of groundwater contaminant plume delineation.

^b PAL for the purposes of decision making regarding providing alternate drinking water sources.

The presence of PFAS in groundwater at Area 6 was unknown before conducting this investigation. The results of routine groundwater monitoring at Area 6 suggest the presence of two groundwater 1,4-dioxane and VOC plumes at Area 6 (Sealaska, 2018). The first plume is referred to as the western groundwater plume, which originates from the former industrial waste disposal area (**Figures 5 and 6**). Contaminants detected at concentrations exceeding risk levels in the western groundwater plume included 1,4 dioxane and multiple VOCs including TCE, 1,1,1-TCA, 1,1-DCE. The second plume is referred to as the southern groundwater plume which originates from the capped Area 6 landfill (**Figures 5 and 6**). Although the extent of these individual plumes is distinguishable for other COCs (Sealaska, 2018), the western and southern 1,4-dioxane plumes are comingled (**Figure 6**). The most recent interpretations of the groundwater plumes suggest that vinyl chloride and 1,4-dioxane have migrated off-Base at concentrations exceeding the respective PALs, that the off-Base extent of 1,4-dioxane has not been

delineated to the west or south, and that the interpretation of the off-Base extent of vinyl chloride is based on limited data (**Figures 5 and 6**) (Sealaska, 2018).

With respect to the vertical distribution of VOCs in the aquifer system, the 1993 Remedial Investigation (RI) Report (URS, 1993) concluded that the majority of groundwater contamination (COCs exceeding the respective screening level) was present in the shallow aquifer. Concentrations of detected COCs in the intermediate aquifer were either infrequent or near the detection limit; therefore, the presence in groundwater could not be confirmed. Subsequent sampling of intermediate aquifer wells between 1994 and 2006 has yielded similar results (nondetected results with limited reporting limits exceeding the screening levels for vinyl chloride, 1,1-DCE, TCE, and 1,4-dioxane). Results of remedial investigations in 1991 concluded that the deep aquifer had not been impacted by operations at Area 6 (Navy, Ecology, and USEPA, 1993). Detected concentrations at one deep monitoring well (6-D-04) were found to be the result of leaky casing joints allowing for groundwater from the shallow aquifer to enter the well. The well was subsequently pumped (to capture groundwater that leaked from the shallow aquifer) and abandoned. Groundwater samples for COCs have not been collected from deep aquifer monitoring wells since 1991 and 1,4-dioxane has not been analyzed in deep aquifer monitoring well samples. The current long-term groundwater monitoring program is focused on the shallow aquifer (Sealaska, 2018).

Transport Pathways and Receptors

Potential contaminant transport pathways and receptors at and near Area 6 include:

- Leaching of PFAS, VOCs, and/or 1,4-dioxane currently or historically present in the former industrial waste disposal area and/or the Area 6 landfill from soil and/or waste to groundwater.
- Transport via advection and dispersion in groundwater.
- Contaminated groundwater captured by GETR, released via GETR effluent to ground surface, transported north in surface water, and re-infiltrated to the underlying groundwater system.
- Ingestion by current and future users of drinking water wells in areas near Area 6.

Summary of Field Activities

This section provides a summary of field investigation activities and a summary of sampling activities conducted as part of the Area 6 field investigation in three stages: (1) on-Base groundwater monitoring well and GETR sampling, (2) Phase 1 off-Base drinking and groundwater well sampling, and (3) Phase 2 off-Base drinking and groundwater well sampling. All field activities were conducted in accordance with the standard operating procedures (SOPs) outlined in the SAP (CH2M, 2017a) and SAP Addendum (CH2M, 2018). Sample collection from private drinking water and groundwater wells was conducted only at parcels where permission to collect samples was granted by the owner.

On-Base Groundwater Monitoring Well and Treatment System Sampling

The first stage of the Area 6 field investigation included sampling 13 existing, on-Base groundwater monitoring wells and the GETR influent and effluent, to determine whether PFAS is present in groundwater underlying the site. The fieldwork was conducted in December 2017, with samples being submitted for laboratory analysis of PFAS and PFAS precursors. Because the on-Base extents of VOCs and 1,4-dioxane are evaluated through the semi-annual monitoring program, these constituents were not analyzed during this stage of the investigation.

Before groundwater quality sampling, a synoptic groundwater level gauging event was performed on December 4 and 5, 2017. Manual depth to groundwater and total well depth measurements were recorded for the wells included in the on-Base sampling investigation. Measurements were collected in accordance with the SOP for water level measurement. Area 6 groundwater monitoring well locations are presented on **Figure 7** and manual groundwater level measurements are presented in **Table 1**.

Groundwater quality and GETR samples were collected between December 5 and 12, 2017. Groundwater monitoring well samples were collected under low-flow and low-stress conditions, with the sample pump intake placed at approximately the middle of the well screen interval. In accordance with the SAP, the pumps used were Geotech PFAS-free bladder pumps. Because of the relatively remote access to well P-4 (north of Ault Field Road), this well was sampled via a PFAS-free bailer. Approximately one well volume of water was removed from the P-4 before sample collection. GETR influent and effluent samples were collected directly from sample ports at the Area 6 groundwater treatment plant.

For wells purged and sampled via low-flow procedures, depth-to-water readings and water quality parameters (WQPs) (specific conductance, pH, turbidity, temperature, dissolved oxygen, and oxidation-reduction potential [ORP]) were measured and recorded approximately every 5 minutes before sampling using a water quality meter that was calibrated daily (at a minimum).

WQPs were considered stabilized if the following criteria were met for three consecutive readings:

- Temperature remained constant
- pH was within 0.1 pH units
- Conductivity was within 10 percent
- Turbidity measurements were less than 10 nephelometric turbidity units or agreed within 10 percent
- ORP
- Dissolved oxygen within 0.2 milligrams per liter

Groundwater sample locations are shown on **Figures 8 and 9**. Stabilized WQPs recorded before sample collection are presented in **Table 2**. Depth-to-water, WQPs, and sample collection information were recorded on groundwater monitoring well and GETR sampling data sheets included in **Attachment 1**.

During sample collection, sample containers were filled in such a manner so as to minimize aeration of the samples. Quality control (QC) samples were collected at a rate of one field duplicate sample for every 10 samples and one matrix spike and matrix spike duplicate sample for every 20 samples collected. One equipment rinse blank sample was collected each day of sampling from decontaminated equipment.

Groundwater samples were shipped on ice under chain-of-custody protocols to Vista Laboratories in El Dorado Hills, California, a Department of Defense-accredited laboratory. Groundwater samples were analyzed for PFAS via Liquid Chromatography Mass Spectrometry and Tandem Mass Spectrometry (LCMSMS) Compliant with Quality Systems Manual (QSM) 5.1 Table B-15 14 PFAS were reported, consistent with the USEPA drinking water method (Method 537 Revision 1.1), which was current at the time of sampling (PFOA, PFOS, PFBS, and 11 other PFAS compounds). To inform the design for the planned Area 6 GETR upgrade (which includes addition of an oxidation treatment step), groundwater samples were submitted for evaluation of PFAS precursors via the total oxidizable precursor (TOP) Assay.

Phase 1 Off-Base Drinking Water and Groundwater Sampling

As will be discussed in the subsequent section “Summary of Sample Results”, PFAS was detected in samples collected from on-Base groundwater monitoring wells and the GETR influent and effluent. As a result, the Phase 1 off-Base groundwater and drinking water investigation was implemented. The Phase 1 off-Base drinking water and groundwater sampling area was selected based on groundwater flow direction and the location of on-Base waste disposal areas. The Phase 1 sampling area extended approximately a 1/2 mile in the direction of groundwater flow to the south to southeast and a 1/2 mile west of the western Area 6 boundary (**Figures 10 through 12**). The Phase 1 sampling area included approximately 280 properties and 15 off-Base groundwater monitoring wells. To address stakeholder concerns regarding the decision to not sample off-Base wells to the east of Area 6 (which is hydraulically cross gradient to on-Base disposal areas), 4 additional on-Base groundwater monitoring wells along the eastern Area 6 boundary were included in the Phase 1 investigation (CH2M, 2018).

The Phase 1 groundwater monitoring well sampling program was conducted between February 2018 and January 2019. Groundwater quality samples were collected from 4 additional on-Base monitoring wells along the

eastern boundary of Area 6 and 13 of the 15 off-Base monitoring wells identified in the SAP and SAP Addendum (CH2M, 2017a and 2018). Well MW-02 was not sampled because the well was not located during the investigation (it is likely paved over). Well MW-05 was not sampled because the well was dry. Groundwater samples were collected in accordance with the low-flow purging and sampling techniques described in the preceding section. Groundwater sample locations are shown on **Figures 8 and 9**. Stabilized WQPs recorded before sample collection are presented in **Table 2**. Depth-to-water, WQPs, and sample collection information were recorded on groundwater sampling data sheets included as **Attachment 1**.

A total of 20 samples (and associated field QC samples) were collected from private, off-Base drinking water and groundwater wells during the Phase 1 investigation between February and April 2018. Samples were collected in accordance with the SOP for *Drinking Water Sampling when Analyzing for PFAS*, provided in Appendix A of the SAP (CH2M, 2017a). Drinking water and private groundwater samples were collected from sample ports near the well, outside spigots, or faucets inside the home. Samples were collected directly into the appropriate bottleware. Based on information provided by residents and/or well completion logs, the majority of the off-Base, private wells sampled were completed in the shallow aquifer (approximately 100 feet in total depth or less). Three of the private wells sampled were approximately 200 to 270 feet in total depth. Off-Base drinking water and groundwater sample forms are included as **Attachment 2**.

Groundwater monitoring well, drinking water, and private groundwater well samples were submitted to Vista Laboratories for PFAS analysis. Groundwater PFAS analysis was performed using LCMSMS Compliant with QSM 5.1 Table B-15. Drinking water analysis was performed following USEPA Method 537 Revision 1.1. For both drinking water and groundwater analyses, 14 PFAS were reported (PFOA, PFOS, PFBS, and 11 other PFAS compounds), consistent with the analyte list in USEPA Method 537 Revision 1.1, which was the current drinking water method at the time of sampling. Groundwater and drinking water samples were also sent to Test America Laboratory in Seattle for analysis of vinyl chloride via Method 8260SIM and 1,4-dioxane via Method 8270SIM. Samples were collected from wells 6-S-42 and 6-S-43 and submitted for TOP Assay analysis because these wells are located within an area planned for construction of a new GETR system. Bottleware for analysis of vinyl chloride and 1,4-dioxane have Teflon-lined caps. To eliminate potential cross-contamination, PFAS samples were collected before handling bottleware for VOC and 1,4-dioxane samples and were stored in a separate cooler.

Phase 2 Off-Base Drinking Water and Groundwater Sampling

As will be discussed in the subsequent section “Summary of Sample Results”, PFAS was detected in samples collected from Phase 1 off-Base drinking water and groundwater wells, with five drinking water locations southwest of Area 6 exceeding the Lifetime Health Advisory level for PFOA and/or PFOS (**Figure 10**). As a result, the Phase 2 off-Base groundwater and drinking water investigation was implemented. The Phase 2 Off-Base Sampling Area included approximately 375 parcels within a 1/2 mile in the direction of groundwater flow to the southwest of the exceedance area. Sample request letters were mailed to parcel owners within the Phase 2 sampling area and to parcel owners within the Phase 1 sampling area that did not respond to the Phase 1 mailing.

Two wells were sampled as part of the Phase 2 investigation. One drinking water well of unknown depth located within the Phase 1 sampling area was sampled in August 2018. One inactive groundwater well, approximately 30 feet in total depth, located within the Phase 2 sampling area was sampled in April 2019. During initial reconnaissance, the inactive groundwater well was found to be buried by vegetation and debris and was inaccessible. Sampling of the well occurred after the property owner performed extensive, planned demolition (of the home on the property) and lot clearing activities. A second inactive well located within the Phase 2 sampling area will be sampled during future investigations at Area 6.

Samples from the drinking water well were collected from an outside spigot in accordance with the sample collection and handling procedures previously described. The inactive groundwater well was purged and sampled with temporary pump equipment. The dedicated pump was removed from the well and placed on plastic sheeting. A temporary pump was installed in the well and one-casing volume of water was purged. The temporary pump was removed from the well and the well was sampled using low-flow techniques via a peristaltic pump. Following sample collection, the dedicated pump was reinstalled in the well. Because the inactive well had been

buried by vegetation and debris for many years, the property owner was advised that it is recommended that the well be redeveloped and disinfected (depending on the planned use) before putting the well in service. Drinking water and private groundwater well sampling forms are included in **Attachment 2**.

Groundwater monitoring well, drinking water, and private groundwater well samples were submitted to Vista Laboratories for PFAS and to Test America Laboratory in Seattle for analysis of vinyl chloride and 1,4-dioxane.

In addition to collection of samples in support of the investigation prescribed in the Area 6 SAP (CH2M, 2017a) and SAP Addendum (CH2M, 2018), a second round of sampling at drinking water wells with PFOS and/or PFOA exceedances of the Lifetime Health Advisory level was conducted in August and September 2018 in support of the Engineering Evaluation/Cost Analysis (EE/CA) Long-term Solutions for Ault Field and Area 6 Drinking Water (CH2M, 2020). During this period, samples were collected from five drinking water wells in accordance with the collection and handling procedures previously described. Samples were submitted to Vista Laboratories and/or Test America Laboratory for analysis of PFAS, alkalinity (Method 2320B), total dissolved solids (Method 2540C), total suspended solids (Method 2540D), anions (USEPA 300.0), ammonia (Method 350.1), nitrate/nitrite (Method 353.2), phosphate/orthophosphate (Method 365.1), cations (Method 6010C), and dissolved organic carbon (Method 9060).

Sample Packing and Shipping Procedures

Sample bottles were properly labeled, placed into resealable zipper storage bags, then placed into a heavy-duty garbage bag, which was placed into the shipping coolers provided by the laboratories. The coolers were then packed with ice. The completed chains-of-custody, provided in **Attachment 3**, were included in the coolers. The coolers were shipped via FedEx overnight to the laboratories.

Investigation-derived Waste Management and Disposal

Wastes generated during the field activities were characterized as investigation-derived waste (IDW) and managed in accordance with the SAP, Waste Management Plan/Environmental Management Plan, and applicable SOPs. Solid IDW generated from temporary sample tubing and personal protective equipment, as well as liquid IDW (purge water and decontamination water from groundwater monitoring well sampling) were stored in 55-gallon stainless steel drums placed on a wooden pallet with secondary containment. Liquid IDW was sampled for waste characterization and analyzed for PFAS, VOCs, semivolatile organic compounds (SVOCs) (including low-level analysis for 1,4-dioxane), polyaromatic hydrocarbons, total Resource Conservation and Recovery Act of 1976 metals plus copper, nickel, and zinc, reactivity, and corrosivity. The solid and liquid IDW has been characterized as nonhazardous, PFAS-containing, and is not considered a dangerous waste (State of Washington Dangerous Waste Regulations WAC 173-3030). All drums have been transported off-Base for disposal.

Deviations from the Sampling and Analysis Plan

The following list summarizes deviations from the Final SAP (Navy, 2017b) and SAP Addendum (Navy, 2018b) during the site investigation activities and justification for those deviations:

- Off-Base groundwater monitoring well MW-02 was not sampled because staff were unable to locate the well, which is likely paved over.
- Off-Base groundwater monitoring well MW-05 was not sampled because the well was dry.
- One large diameter (2.5 foot) inactive, private groundwater well in the Phase 2 sampling area was not sampled because of logistical issues associated with sample collection and water management. Sampling of this location will be included in future field activities at Area 6.

Data quality and usability was not affected by these deviations.

Summary of Sample Results

This section provides a brief discussion of the project action limits. A summary of laboratory results for the groundwater and drinking water samples collected for analysis of PFAS compounds, including PFOA, PFOS, and PFBS, 1,4-dioxane, and vinyl chloride. A data validation summary and usability assessment are also provided.

Project Action Limits

As indicated in the SAP (Navy, 2017b) and the SAP Addendum (Navy, 2018b), the project action limits for this project are:

- USEPA Lifetime Health Advisory level for PFOA and PFOS: 70 ppt, unless both chemicals are detected, then 70 ppt is the Lifetime Health Advisory level for the cumulative concentration of the two chemicals.
- USEPA Regional Screening Level (RSL) for PFBS: 400,000 ppt (based on a hazard quotient = 1.0).
- PALs currently do not exist for the remaining 11 PFAS compounds. At the time of drafting this TM, there are no USEPA RSLs or any state regulatory screening levels available. Per Navy guidance at the time of this investigation, data were collected for the 14 analytes listed in USEPA Method 537 rev. 1.1.
- PFAS precursors do not have explicit screening levels, the presence or absence of the compounds were evaluated based on the pre-oxidation and post-oxidation PFAS concentrations via the TOP Assay.
- 1-4-Dioxane: Model Toxics Control Act (MTCA) Method B cleanup level (CUL) of 0.44 parts per billion (ppb) for the purposes of groundwater contaminant plume delineation. USEPA drinking water risk assessment analyses (USEPA, 2013) value of 35 ppb (modified for an excess cancer risk of 1×10^{-4}) for the purposes of decision making regarding providing alternate drinking water sources.
- Vinyl Chloride: Modified MTCA Method B CUL of 0.29 ppb (modified for an excess cancer risk of 1×10^{-5}) for the purposes of contaminant plume delineation. USEPA Federal maximum contaminant level of 2 ppb for the purposes of decision making regarding active treatment or providing alternate drinking water sources.

On-Base/Off-Base Groundwater Monitoring Well and On-Base Groundwater Extraction, Treatment, and Recharge Sampling Results

Tables 3 and 4 present a summary of detections and exceedances of PFAS and VOC/1,4-dioxane sample results, respectively, from 30 groundwater monitoring wells and the GETR influent and effluent. The spatial distribution of these data is shown on **Figures 8 and 9**. Comprehensive laboratory results and data validation summaries are presented in **Attachment 4**. The following is a summary of the groundwater sampling results from on- and off-Base groundwater monitoring wells and the GETR influent and effluent:

- **PFBS** – PFBS was detected in samples from 21 locations, ranging from an estimated 2.27 ppt in the sample collected from 6-S-27, to 62.5 ppt in the sample collected from MW-01. None of the detections of PFBS exceeded the RSL of 400,000 ppt.
- **PFOS** – PFOS was detected in samples from 5 locations ranging from an estimated 1.69 ppt in the sample collected from 6-S-28, to an estimated 5.6 ppt in the sample collected from 6-S-26. None of the groundwater monitoring well or GETR influent and effluent samples exceeded the USEPA Lifetime Health Advisory level of 70 ppt for PFOS.
- **PFOA** – PFOA was detected in samples from 17 locations, ranging from an estimated 1.09 ppt in the sample collected from 6-I-01 to 96.9 ppt in the sample collected from 6-S-44. One sample (from 6-S-44) exceeded the Lifetime Health Advisory level of 70 ppt for PFOA. None of the GETR influent and effluent samples exceeded the USEPA Lifetime Health Advisory level of 70 ppt for PFOA.

- **PFOA + PFOS** – The combined detections of PFOA and/or PFOS (PFOA + PFOS) ranged from 1.09 ppt in the sample collected from 6-I-01 to 96.9 ppm in the sample collected from 6-S-44. These results include wells where both PFOA and PFOS were detected as well as locations where only one of the constituents was detected. One sample (from 6-S-44) exceeded the Lifetime Health Advisory level of 70 ppt for PFOA + PFOS. Both PFOA and PFOS were detected in samples from 3 locations, ranging from 37.9 ppt in the sample collected from 6-S-27 to 57.9 ppt in the sample collected from 6-S-26. None of the groundwater monitoring well samples in which both PFOA and PFOS were detected exceeded the Lifetime Health Advisory level of 70 ppt for PFOA+PFOS.
- **Vinyl chloride** – As previously discussed, VOCs and SVOCs were not analyzed from groundwater monitoring wells sampled during the on-Base investigation in 2017 because of the known presence and extents of these constituents. Vinyl chloride was detected in one off-Base groundwater monitoring well, 6-S-43, at an estimated concentration of 1.8 ppb. This concentration exceeds the groundwater plume delineation PAL of 0.29 ppb.
- **1,4-Dioxane** – 1,4-dioxane was detected in samples from 6 locations, ranging from an estimated 0.15 ppb in the sample collected from 6-S-42 to 4.4 ppb in the sample collected from 6-S-11. Samples collected from 4 locations (6-DW-38A, 6-S-11, 6-S-12, and 6-S-43) exceed the groundwater plume delineation PAL of 0.44 ppb.

In general, PFOA was detected more frequently and at greater concentrations than PFOS in Area 6 groundwater monitoring wells and GETR influent/effluent samples (**Table 3 and Figure 8**). PFOA concentrations are greater in the northern portion of the site, near the former industrial waste disposal area (6-S-44) and areas influenced by the GETR effluent stream (6-S-26 and P-4), and decrease to the south. PFOS was generally detected (at lower concentrations than PFOA) in wells in the hydraulically downgradient (southern) portion of Area 6. Low-level concentrations of PFOA were detected in one of the intermediate aquifer wells (6-I-01) and from one shallow aquifer well along the eastern Area 6 boundary (6-S-02). **Table 5** presents a summary of the standard PFAS analysis compared to the PFAS TOP Assay results. If significant PFAS precursors were present, it would be expected that concentrations of PFAS constituents would be greater in the “-TOP” sample results than in the standard sample results. It should be noted that the presence of 1,4-dioxane in Area 6 groundwater and GETR samples influenced the TOP Assay in that the oxidant introduced during the analysis was consumed by 1,4-dioxane rather than by precursor oxidation processes, which necessitated the laboratory to introduce more oxidant than anticipated to overcome the consumption by 1,4-dioxane. Although there are some instances where PFAS constituent concentrations are slightly greater in either the standard samples or the TOP Assay samples (for example, 6-S-44, 6-S-26 and P-4), in general PFAS concentrations are within the same order of magnitude, lending uncertainty regarding the presence of precursors in Area 6 groundwater.

Vinyl chloride and 1,4-dioxane results are summarized in **Table 4** and presented on **Figure 9**. The full suite of analytical data and data validation reports are included in **Attachment 4**. The magnitude of detected concentrations in groundwater monitoring wells and the spatial distribution of detections is consistent with the data collected as part of the semi-annual long-term groundwater monitoring program (Sealaska, 2018).

Off-Base, Private Drinking Water, and Groundwater Sampling Results

A total of 22 drinking water and/or private groundwater well samples were collected from the Phase 1 and 2 sampling areas between February 2018 and April 2019. Samples included 12 single-resident drinking water wells, 6 community drinking water wells, and 4 private groundwater wells (irrigation or inactive). All samples collected were analyzed for the 14 PFAS compounds specified in accordance with the SAP, vinyl chloride, and 1,4-dioxane. A summary of detections and exceedances are provided in **Tables 6 and 7** and are shown on **Figures 10 through 12**. Comprehensive laboratory results and data validation summaries are presented in **Attachment 5**. The following is a summary of the off-Base drinking water and private groundwater well sample results:

- **PFBS** – PFBS was detected in samples from 10 locations, ranging from an estimated 2.27 ppt in RW12, to 68.2 ppt in RW19P. None of the detections of PFBS exceeded the RSL of 400,000 ppt.

- **PFOS** – PFOS was detected in samples from 9 locations, ranging from an estimated 2.77 ppt in RW04 to 95.7 ppt in RW08. Samples from three locations exceeded the Lifetime Health Advisory level of 70 ppt for PFOS at least once during the two rounds of sampling.
- **PFOA** – PFOA was detected in samples from 10 locations, ranging from an estimated 1.03 ppt in RW12 to 57.7 ppt in RW05. None of the samples exceeded the Lifetime Health Advisory level of 70 ppt for PFOA.
- **PFOA + PFOS** – The combined detections of PFOA and/or PFOS (PFOA+PFOS) ranged from an estimated 1.03 ppt in RW12 to 150.7 ppt in RW05 (19 samples from 10 locations). These results include wells where both PFOA and PFOS were detected as well as locations where only one of the constituents was detected. Twelve samples from five locations exceeded the Lifetime Health Advisory level of 70 ppt for PFOA + PFOS during the two rounds of sampling. Both PFOA and PFOS were detected in 18 samples from nine locations ranging from 6.9 ppt in RW04 to 150.7 ppt at RW05. The Lifetime Health Advisory level of 70 ppm was exceeded in 12 samples from five locations that had detections of both PFOA and PFOS.
- **Vinyl chloride** – Vinyl chloride was detected in one off-Base drinking water well sample, RW18, at an estimated concentration of 0.014 ppb. This concentration does not exceed either the PAL for groundwater plume delineation (0.29 ppb) or the PAL for the purposes of decision making regarding active treatment or providing alternate drinking water sources (2 ppb).
- **1,4-Dioxane** – 1,4-dioxane was detected in samples from five locations, ranging from an estimated 0.053 ppb in RW05 to 0.26 ppb in RW08. None of the detected concentrations exceeded the PAL for groundwater plume delineation (0.44 ppb) or the PAL for the purposes of decision making regarding active treatment or providing alternate drinking water sources (35 ppb).

Of the 22 private wells sampled, PFOS and/or PFOA were detected only in shallow aquifer wells to the southwest of Area 6 (**Figure 10**). PFOS and/or PFOA were not detected in the deeper wells located to the south and southwest of Area 6. As discussed in the preceding section, PFOA was more frequently detected and detected at greater concentrations than PFOS in groundwater monitoring well samples. In contrast to the on-Base groundwater samples, private wells generally had detections of both PFOA and PFOS (**Table 6**). Additionally, in 4 of the 5 wells with exceedances of the Lifetime Health Advisory level, PFOS was detected at greater concentrations than PFOA. As shown on **Figures 11 and 12**, the private wells with detections of vinyl chloride and 1,4-dioxane coincided with locations with exceedances of the Lifetime Health Advisory level for PFOS and PFOA.

Data Validation Summary

QC deficiencies were identified by the data validator and were qualified as necessary. All data points are usable as qualified. Field reagent blanks were only run on the same schedule as the field samples for this project to expedite receipt of validated data. Samples processed for PFAS analysis with the TOP Assay were not validated. Because of the competing oxidants in the samples, it took extended testing to determine the appropriate level of oxidant to perform the assay appropriately. The TOP Assay is not a multi-laboratory-validated method. It is not a standardized method, subjecting the data to National Functional Guidelines, and did not meet project objectives; therefore, it was not performed. The Data Validation Summary Reports are provided in **Attachments 4 and 5**.

Conclusions

The PFOA/PFOS Lifetime Health Advisory level was exceeded in five drinking water samples collected off-Base; four single-family residences and one community supply well that serves up to 20 residents and one on-Base groundwater monitoring well located in the former industrial waste disposal area. The residents, including one real estate office, associated with the drinking water exceedances are being provided bottled drinking water until a suitable long-term solution is identified through the EE/CA process (CH2M, 2020). Delivery of bottled water commenced in March 2018. The parcels with exceedances and those adjacent to them are being incorporated into the biannual drinking water sampling program for Ault Field and OLF Coupeville. Because PFAS was detected at concentrations exceeding the Lifetime Health Advisory level in both on- and off-Base wells, further

investigation of the PFAS source and migration pathways is warranted. Additional investigation is planned as part of a future PFAS RI for Area 6.

The primary conclusions of the Area 6 investigation are summarized as follows:

- Sampling of on-Base monitoring wells and GETR influent and effluent confirmed the presence of PFAS in the shallow aquifer underlying Area 6. Detection of PFOS, PFOA, and PFBS are generally coincident with the footprint of the VOC and 1,4-dioxane groundwater plumes (that is, along the western Area 6 boundary). Low-level concentrations of PFOA were detected in one shallow aquifer well along the eastern Area 6 boundary and in one intermediate aquifer well.
- The concentrations and spatial distribution of vinyl chloride and 1,4-dioxane in groundwater monitoring wells are consistent with the footprint of the VOC and 1,4-dioxane groundwater plumes based on data collected as part of the long-term monitoring program for Area 6.
- PFOA and/or PFOS were detected in 10 private, off-Base shallow aquifer drinking water and/or groundwater wells located southwest of Area 6. PFOA and/or PFOS concentrations detected in private, off-Base wells were greater than the groundwater monitoring well samples, with 5 wells having exceedances of the Lifetime Health Advisory level. PFOA, PFOS, and PFBS were not detected in private, off-Base wells to the west or southeast of Area 6, including the three wells deeper than 200 feet in total depth.
- Low-level concentrations of vinyl chloride and/or 1,4-dioxane were detected in five private, off-Base shallow aquifer drinking water and/or groundwater wells located southwest of Area 6. Detections of vinyl chloride and/or 1,4-dioxane were coincident with wells having exceedances of the PFOA/PFOS Lifetime Health Advisory level. Detected off-Base concentrations of vinyl chloride and 1,4-dioxane were below the PAL for groundwater plume delineation.
- Parcels with exceedances of the Lifetime Health Advisory level and those adjacent are being incorporated into the biannual drinking water sampling program.
- Additional investigation of PFAS source(s) and transport pathways will be conducted during a future RI for the site.

References

CH2M HILL, Inc. (CH2M). 2016. *Technical Memorandum – Results of Desktop Evaluation to Verify Off-Base Drinking Water Sources*. September.

CH2M. 2017a. *Sampling and Analysis Plan, Site Inspection of Per- and Polyfluoroalkyl Substances and Additional Characterization of 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water for Remedial Design Refinement, Area 6, Ault Field, Naval Air Station Whidbey Island, Oak Harbor, Washington*. November.

CH2M. 2017b. *Sampling and Analysis Plan Investigation of Per- and Polyfluoroalkyl Substances in Drinking Water Ault Field and Outlying Landing Field Coupeville*. November.

CH2M. 2018. *Site Inspection of Per- and Polyfluoroalkyl Substances and Additional Characterization of 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water for Remedial Design Refinement, Area 6, Ault Field, Naval Air Station Whidbey Island, Oak Harbor, Washington*. July.

CH2M. 2020. *Engineering Evaluation/Cost Analysis Long-term Solutions for Ault Field and Area 6 Drinking Water, Naval Air Station Whidbey Island, Oak Harbor, Washington*. Draft.

CTI-URS JV LLC (CTI-URS). 2017. *30 Percent Basis of Design Report for Southern and Western GETR System Remedial Designs Area 6, Whidbey Island Naval Air Station Oak Harbor, Washington, Oak Harbor, Washington*. February.

CTI-URS. 2018. *90 Percent Basis of Design Report for Southern Groundwater Extraction, Treatment, and Recharge (GETR) System Remedial Design Area 6, Whidbey Island Naval Air Station Oak Harbor, Washington*. Draft. October.

Department of the Navy (Navy). 2014. *Perfluorinated Compounds (PFCs) – An Emerging Environmental Issue*. 21 October.

Navy. 2016a. *Perfluorinated Compounds (PFCs) Drinking Water System Testing Requirement*. 14 June.

Navy. 2016b. *Perfluorinated Compounds/Perfluoroalkyl Substances (PFC/PFAS) – Identification of Potential Areas of Concern*. 20 June.

Department of the Navy, Ecology, and United States Environmental Protection Agency (Navy, Ecology, and USEPA). 1993. *Record of Decision for Operable Unit 1, Naval Air Station Whidbey Island, Oak Harbor, Washington*. Prepared by URS Consultants, Inc. December.

Foster Wheeler Environmental Corporation (Foster). 1997. *Remedial Action Closure Report Volume 1; Construction of Landfill Cap at Area 6; Operable Unit 1; Naval Air Station, Whidbey Island, Washington*. August.

Foster. 2002. *Interim Removal Action Report, Site Characterization and Interim Removal Action at Area 6 Landfill, Site 55; Naval Air Station, Whidbey Island, Washington*. January.

Jones, M.A. 1985. *Occurrence of Groundwater and Potential for Seawater Intrusion, Island County, Washington*. U.S. Geological Survey Water-Resources Investigations Open-File Report 85-4046.

Sapik, D.B., G.C. Bortleson, B.W. Drost, M.A. Jones, and E.A. Drych. 1988. *Groundwater Resources and Simulation of Flow in Aquifers Containing Fresh Water and Sea Water, Island County, Washington*. United States Geological Survey Water Resources Investigations Report 87-4182. p. 67.

Sealaska Environmental Services, LLC (Sealaska). 2015. *Work Plan/Quality Control Plan for Non-Routine Maintenance at NAS Whidbey Island CERCLA Sites. Naval Air Station Whidbey Island, Oak Harbor, Washington*. June.

Sealaska. 2018. *Annual 2017-2018 Groundwater Long-Term Monitoring Report for Operable Unit 1 Area 6 and Operable Unit 5 Area 31. Naval Air Station Whidbey Island, Oak Harbor, Washington*. November.

URS Consultants (URS). 1993. *Remedial Investigation, Operable Unit, 1 Naval Air Station Whidbey Island, Oak Harbor, Washington. Poulsbo, Washington*. June.

URS. 2015. *Data Gap Sampling Results, Area 6, Naval Air Station Whidbey Island. Delivery Order 0055*. June.

URS Group, Inc., a subsidiary of AECOM (URS-AECOM). 2018. *Focused Feasibility Study, Area 6, Naval Air Station Whidbey Island, Oak Harbor, Washington*. Delivery Order 0055. July.

United States Environmental Protection Agency (USEPA). 2013. Integrated Risk Information System. "1,4-Dioxane (CASRN 123-91-1)." https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0326_summary.pdf

USEPA. 2016a. *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)*. EPA 822-R-16-005. Office of Water. May.

USEPA. 2016b. *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS)*. EPA 822-R-16-004. Office of Water. May.

Tables

Table 1. Area 6 Synoptic Groundwater Elevation Survey

*Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
Ault Field, Area 6, Naval Air Station Whidbey Island
Oak Harbor, Washington*

Well Name	Measurement Date	Top of Casing Elevation (feet NAVD88)	Measured Total Depth (feet btoc)	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)
6-I-1	12/4/2017	173.99	179.53	105.34	68.65
6-I-3	12/4/2017	198.62	180.14	124.81	73.81
6-S-2	12/5/2017	183.59	105.45	92.78	90.81
6-S-4	12/4/2017	212.97	143.05	136.22	76.75
6-S-7	12/4/2017	96.92	41.2	8.36	88.56
6-S-8	12/4/2017	163.67	86.13	73.21	90.46
6-S-14	12/4/2017	211.49	164.7	129.88	81.61
6-S-17	12/4/2017	206.09	146.81	127.33	78.76
6-S-19	12/4/2017	219.37	167.74	144.41	74.96
6-S-26	12/4/2017	128.48	76.82	38.38	90.10
6-S-31	12/4/2017	194.94	122.96	108.89	86.05
6-S-44	12/4/2017	UNK	98.23	83.73	UNK
MW-10	12/4/2017	216.21	170.16	136.27	79.94
P-4	12/5/2017	96.71	20.67	3.12	93.59

Notes:

btoc = below top of casing

NAVD88 = North American Vertical Datum of 1988

UNK = unknown

Table 2. Water Quality Parameters - Groundwater Monitoring Wells

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
 Ault Field, Area 6, Naval Air Station Whidbey Island
 Oak Harbor, Washington

Well Name	Sample ID	Sample Date	Sample Time	Static Depth to Water (ft btoc)	Total Volume Purged (mL)	pH	Conductivity (mS/cm)	Temperature (°C)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Comment - internal use
6-DW-38A	WI-A06-DW-38A-0218	2/20/2018	14:45	117.38	2520	7.85	0.963	9.24	1.41	-192	11.9	all parameters stabilized except temperature - variable due to outside temps
6-I-1	WI-A06-6-I-01-1217	12/5/2017	14:41	105.36	4000	8.29	0.325	10.73	8.28	204	2.3	
6-I-3	WI-A06-6-I-03-1217	12/6/2017	10:31	124.92	7500	7.8	0.32	10.07	7.45	-88	0.5	
6-S-1	WI-A06-S-01-0218	2/19/2018	11:50	90.5	6750	7.37	0.484	11.06	6.99	69	0.85	
6-S-2	WI-A06-6-S-02-0218	2/23/2018	11:45	92.58	4030	8.19	0.291	11.19	6.55	220	4.9	
6-S-04	WI-A06-6-S-04	12/11/2017	10:10	135.9	2500	7.14	0.508	9.69	0	-34	7.6	all parameters stabilized except temperature - variable due to outside temps
6-S-05	WI-A06-6-S-05-0218	2/23/2017	10:33	96.46	6600	8.42	0.41	11.49	5.03	228	26.6	
6-S-7	WI-A06-6-S-07-1217	12/7/2017	11:45	8.39	20700	7.49	0.766	10.32	7.26	-125	4.8	
6-S-08	WI-A06-6-S-08-1217	12/12/2017	9:30	73.19	6875	7.04	0.17	9.91	5.62	167	33.5	
6-S-11	WI-A06-6-S-11-0718	7/17/2018	17:30	106.76	6900	6.51	0.671	16.39	0.17	-85	44.8	
6-S-12	WI-A06-6-S-12-0119	1/23/2019	11:15	111.46	4900	6.99	0.818	9.9	3.34	-132	176	
6-S-14	WI-A06-6-S-14-1217	12/8/2017	13:08	129.82	7500	7.69	0.924	11.66	6.44	-84	3.9	
6-S-17	WI-A06-6-S-17-1217	12/6/2017	13:02	127.41	7500	7.57	0.986	13.25	7.32	85	0.9	
6-S-19	WI-A06-6-S-19-1217	12/11/2017	11:50	144.03	3000	7.34	0.789	11.32	0	40	2.7	
6-S-24	WI-A06-6-S-24-0818	8/30/2018	12:20	111.46	7292	7.65	0.617	14.11	6.66	152	9.8	
6-S-26	WI-A06-6-S-26-1217	12/7/2017	13:37	38.44	14000	8.35	0.832	10.31	8.44	-157	11.9	
6-S-27	WI-A06-6-S-27-0218	2/21/2018	11:14	121.75	6250	7.74	0.396	9.59	6.46	168	0.05	
6-S-28	WI-A06-6-S-28-0218	2/21/2018	11:12	121.68	2800	6.7	0.602	9.84	1.04	-146	12.3	
6-S-31	WI-A06-6-S-31-1217	12/11/2017	14:08	108.78	8750	7.88	0.504	9.69	2.01	179	3.7	purged > 1 hr. DO not stabilized
6-S-40	WI-A06-6-S-40-0718	7/18/2018	9:45	90.93	7650	8.12	0.201	16.69	0.67	63	120	
6-S-41	WI-A06-6-S-41-0718	7/18/2018	13:36	100.04	11435	7.68	0.243	18.71	7.9	99	6.63	
6-S-42	WI-A06-6-S-42-0718	7/19/2018	9:40	109.68	10997	6.84	0.715	14.19	1.77	74	85.2	
6-S-43	WI-A06-6-S-43-0718	7/19/2018	13:49	99.13	8060	7.16	0.581	15.4	6.91	32	75.7	Do not stabilized
6-S-44	WI-A06-6-S-44-1217	12/8/2017	10:44	83.72	5000	7.9	0.874	10.46	7.29	268	0	
GTS_Effluent	WI-A06-EFF01-1217	12/5/2017	12:05	NA	NA	7.9	0.854	8.9	23.61	205	25.4	
GTS_Influent	WI-A06-INF01-1217	12/5/2017	12:15	NA	NA	8.02	0.878	10.51	12.61	91	8.1	
MW-01	WI-A06-MW-01-0218	2/21/2018	15:06	79.45	14000	7.75	0.56	9.17	1.54	28	2.83	
MW-3B	WI-A06-MW-3B-0218	2/22/2018	14:55	103.25	4600	7.53	0.793	9.57	2.49	70	0	
MW-06	WI-A06-MW-06-0218	2/16/2018	14:34	112.36	2500	7.38	0.608	10.83	1.83	-44	0	
MW6	WI-A06-MW6-0218	2/22/2018	11:51	112.65	5500	7.12	0.595	11.51	1.29	-109	0	
MW-10	WI-A06-MW-10-1217	12/7/2017	9:42	136.18	5250	7.5	0.641	13.93	6.68	-90	2.4	
MW-13	WI-A06-MW-13-0218	2/20/2018	11:05	105.8	3420	7.29	0.439	10.26	5.69	91	0.07	
P-4	WI-A06-P-4-1217	12/5/2017	10:45	3.12	3785	6.93	0.761	9.05	7.88	-39	>1000	Brown and muddy. No parameters stable.

Note:

- °C = degrees Celsius
- ft btoc = feet below top of casing
- ID = identification
- mg/L = milligram(s) per liter
- mL = milliliter(s)
- mS/cm = milliseimens per centimeter
- mV = millivolt(s)
- NA = not applicable
- NTU = nephelometric turbidity units

Table 3. Analytical Results from Groundwater Monitoring Well and Treatment System

Samples - PFAS

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in

Groundwater and Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	USEPA Lifetime Health Advisory (May 2016)	RSLs Tapwater HQ = 1.0 (November 2018)	6-DW-38A	6-I-01	6-I-03	S-01	6-S-02	6-S-04
Sample ID			WI-A06-6-DW-38A-0218	WI-A06-6-I-01-1217	WI-A06-6-I-03-1217	WI-A06-S-01-0218	WI-A06-6-S-02-0218	WI-A06-6-S-04-1217
Sample Date			2/20/18	12/5/17	12/6/17	2/19/18	2/23/18	12/11/17
Chemical Name								
Semivolatile Organic Compounds (ppt)								
Perfluorobutanesulfonic acid (PFBS)	--	400,000	2.74 J	5.39 U	5.68 U	5.17 U	5.03 J	5 U
Perfluoroheptanoic acid (PFHpA)	--	--	1.7 J	5.39 U	5.68 U	5.17 U	5.25 U	5 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	1.05 J	5.39 U	5.68 U	5.17 U	18	5 U
Perfluorohexanoic Acid (PFHxA)	--	--	15.7	5.4 U	5.7 U	5.2 U	5.25 U	6.84 J
Perfluorononanoic acid (PFNA)	--	--	1.35 J	5.39 U	5.68 U	5.17 U	5.25 U	5 U
Perfluorooctane Sulfonate (PFOS)	70	--	2.77 J	5.39 U	5.68 U	5.17 U	5.25 U	5 U
Perfluorooctanoic acid (PFOA)	70	--	5.98 U	1.09 J	5.68 U	5.17 U	9.64	5 U
PFOA + PFOS	70	--	2.77 J	1.09 J	NA	NA	9.64	NA

Notes:

-- = no screening criteria available

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0

B = Analyte not detected above the level reported in blanks

HA = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

U = The material was analyzed for, but not detected

USEPA = United States Environmental Protection Agency

Table 3. Analytical Results from Groundwater Monitoring Well and Treatment System

Samples - PFAS

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in

Groundwater and Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	USEPA Lifetime Health Advisory (May 2016)	RSLs Tapwater HQ = 1.0 (November 2018)	6-S-05		6-S-07	6-S-08	6-S-11	6-S-12	
Sample ID			WI-A06-6-S-05-0218	WI-A06-6-S-05P-0218	WI-A06-6-S-07-1217	WI-A06-6-S-08-1217	WI-A06-S-11-0718	WI-A06-S-12-0119	WI-A06-S-12P-0119
Sample Date			2/23/18	2/23/18	12/7/17	12/12/17	7/17/18	1/23/19	1/23/19
Chemical Name									
Semivolatile Organic Compounds (ppt)									
Perfluorobutanesulfonic acid (PFBS)	--	400,000	5.12 U	5 U	13	5.04 U	9.31	9.44	9.32 J
Perfluoroheptanoic acid (PFHpA)	--	--	5.12 U	0.654 J	10.3	5.04 U	5.13 J	4.67 U	4.01 J
Perfluorohexanesulfonic acid (PFHxS)	--	--	4.45 J	3.66 J	35	5.04 U	20.1	14.2	12.6
Perfluorohexanoic Acid (PFHxA)	--	--	5.12 U	5 U	40.7	5.04 U	29.9	29.3	27.6
Perfluorononanoic acid (PFNA)	--	--	5.12 U	5 U	5.39 U	5.04 U	4.17 U	4.67 U	4.81 U
Perfluorooctane Sulfonate (PFOS)	70	--	5.12 U	5 U	5.39 U	5.04 U	4.17 U	4.67 U	4.81 U
Perfluorooctanoic acid (PFOA)	70	--	5.12 U	5 U	39.2	5.04 U	43.4	24	22
PFOA + PFOS	70	--	NA	NA	39.2	NA	43.4	24	22

Notes:

-- = no screening criteria available

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0

B = Analyte not detected above the level reported in blanks

HA = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

U = The material was analyzed for, but not detected

USEPA = United States Environmental Protection Agency

Table 3. Analytical Results from Groundwater Monitoring Well and Treatment System

Samples - PFAS

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in

Groundwater and Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	USEPA Lifetime Health Advisory (May 2016)	RSLs Tapwater HQ = 1.0 (November 2018)	6-S-14	6-S-17	6-S-19		6-S-24		6-S-26
Sample ID			WI-A06-6-S-14-1217	WI-A06-6-S-17-1217	WI-A06-6-S-19-1217	WI-A06-6-S-19P-1217	WI-A06-S-24-0818	WI-A06-S-24P-0818	WI-A06-6-S-26-1217
Sample Date			12/8/17	12/6/17	12/11/17	12/11/17	8/30/18	8/30/18	12/7/17
Chemical Name									
Semivolatile Organic Compounds (ppt)									
Perfluorobutanesulfonic acid (PFBS)	--	400,000	10.2	5.25 U	4.22 J	4.15 J	4.23 J	4.68 J	9.28
Perfluoroheptanoic acid (PFHpA)	--	--	3.61 J	5.25 U	1.66 J	1.95 J	4.24 U	4.35 U	13.4
Perfluorohexanesulfonic acid (PFHxS)	--	--	13.8	5.25 U	6.21 J	5.39 J	16.4	13.9	47.8
Perfluorohexanoic Acid (PFHxA)	--	--	25.6	5.25 U	21.8	22.8	12.5	12.2	35.2
Perfluorononanoic acid (PFNA)	--	--	5.25 U	5.25 U	5.17 U	5.21 U	4.24 U	4.35 U	3.71 J
Perfluorooctane Sulfonate (PFOS)	70	--	5.25 U	5.25 U	5.17 U	5.21 U	4.24 U	4.35 U	5.6 J
Perfluorooctanoic acid (PFOA)	70	--	19.6	5.25 U	4.21 J	4.2 J	4.24 U	4.35 U	52.3
PFOA + PFOS	70	--	19.6	NA	4.21 J	4.2 J	NA	NA	57.9

Notes:

-- = no screening criteria available

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0

B = Analyte not detected above the level reported in blanks

HA = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

U = The material was analyzed for, but not detected

USEPA = United States Environmental Protection Agency

Table 3. Analytical Results from Groundwater Monitoring Well and Treatment System

Samples - PFAS

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in

Groundwater and Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	USEPA Lifetime Health Advisory (May 2016)	RSLs Tapwater HQ = 1.0 (November 2018)	6-S-27	6-S-28	6-S-31	6-S-40	6-S-41	6-S-42	
Sample ID			WI-A06-6-S-27-0218	WI-A06-6-S-28-0218	WI-A06-6-S-31-1217	WI-A06-6-S-40-0718	WI-A06-6-S-41-0718	WI-A06-6-S-42-0718	WI-A06-6-S-42P-0718
Sample Date			2/21/18	2/21/18	12/11/17	7/18/18	7/18/18	7/19/18	7/19/18
Chemical Name									
Semivolatile Organic Compounds (ppt)									
Perfluorobutanesulfonic acid (PFBS)	--	400,000	2.27 J	5.17 U	14.3	4.17 U	4.13 U	4.1 U	4.2 U
Perfluoroheptanoic acid (PFHpA)	--	--	12.5	5.17 U	29.3	4.17 U	4.13 U	4.1 U	4.2 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	10.7	5.17 U	41.1	4.17 U	4.13 U	4.1 U	4.2 U
Perfluorohexanoic Acid (PFHxA)	--	--	15.2	5.17 U	58.3	4.17 U	4.13 U	4.1 U	4.2 U
Perfluorononanoic acid (PFNA)	--	--	5.17 U	5.17 U	5.04 U	4.17 U	4.13 U	4.1 U	4.2 U
Perfluorooctane Sulfonate (PFOS)	70	--	2.3 J	1.69 J	1.82 J	4.17 U	4.13 U	4.1 U	4.2 U
Perfluorooctanoic acid (PFOA)	70	--	35.6	5.17 U	53.8	4.17 U	4.13 U	4.1 U	4.2 U
PFOA + PFOS	70	--	37.9	1.69 J	55.6	NA	NA	NA	NA

Notes:

-- = no screening criteria available

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0

B = Analyte not detected above the level reported in blanks

HA = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

U = The material was analyzed for, but not detected

USEPA = United States Environmental Protection Agency

Table 3. Analytical Results from Groundwater Monitoring Well and Treatment System

Samples - PFAS

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in

Groundwater and Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	USEPA Lifetime Health Advisory (May 2016)	RSLs Tapwater HQ = 1.0 (November 2018)	6-S-43	6-S-44	EFF01		INFO1	MW-01
Sample ID			WI-A06-6-S-43-0718	WI-A06-6-S-44-1217	WI-A06-EFF01-1217	WI-A06-EFF01P-1217	WI-A06-INFO1-1217	WI-A06-MW-01-0218
Sample Date			7/19/18	12/8/17	12/5/17	12/5/17	12/5/17	2/21/18
Chemical Name								
Semivolatile Organic Compounds (ppt)								
Perfluorobutanesulfonic acid (PFBS)	--	400,000	4.24 U	10.5	10.5	10	10.6	62.5 J
Perfluoroheptanoic acid (PFHpA)	--	--	4.24 U	13.4	11.8	11.3	11.3	22.3
Perfluorohexanesulfonic acid (PFHxS)	--	--	4.24 U	62.5	43	49.2	45.7	16.6
Perfluorohexanoic Acid (PFHxA)	--	--	9.46	44.7	40.7	37.4	39.5	111
Perfluorononanoic acid (PFNA)	--	--	4.24 U	6.3 J	5.43 U	5.39 U	5.43 U	5.17 U
Perfluorooctane Sulfonate (PFOS)	70	--	4.24 U	5.17 U	5.43 U	5.39 U	5.43 U	5.17 U
Perfluorooctanoic acid (PFOA)	70	--	4.24 U	96.9	35.8	28.6	35.1	5.17 U
PFOA + PFOS	70	--	NA	96.9	35.8	28.6	35.1	NA

Notes:

-- = no screening criteria available

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0

B = Analyte not detected above the level reported in blanks

HA = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

U = The material was analyzed for, but not detected

USEPA = United States Environmental Protection Agency

Table 3. Analytical Results from Groundwater Monitoring Well and Treatment System

Samples - PFAS

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in

Groundwater and Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	USEPA Lifetime Health Advisory (May 2016)	RSLs Tapwater HQ = 1.0 (November 2018)	MW03B	MW-06	MW-10	MW-13	P-4
Sample ID			WI-A06-MW03B-0218	WI-A06-MW-06-0218	WI-A06-MW-10-1217	WI-A06-MW-13-0218	WI-A06-P-4-1217
Sample Date			2/22/18	2/16/18	12/7/17	2/20/18	12/5/17
Chemical Name							
Semivolatile Organic Compounds (ppt)							
Perfluorobutanesulfonic acid (PFBS)	--	400,000	5.25 U	5.3 U	2.3 J	5.12 U	9.73
Perfluoroheptanoic acid (PFHpA)	--	--	5.25 U	5.3 U	5.58 U	5.12 U	11.9
Perfluorohexanesulfonic acid (PFHxS)	--	--	5.25 U	5.3 U	2.24 J	5.12 U	35
Perfluorohexanoic Acid (PFHxA)	--	--	3.55 J	5.3 U	5.44 J	5.12 U	34.3
Perfluorononanoic acid (PFNA)	--	--	5.25 U	5.3 U	5.58 U	5.12 U	1.49 J
Perfluorooctane Sulfonate (PFOS)	70	--	5.25 U	5.3 U	5.58 U	5.12 U	5.25 U
Perfluorooctanoic acid (PFOA)	70	--	5.25 U	5.3 U	5.58 U	5.12 U	58.2
PFOA + PFOS	70	--	NA	NA	NA	NA	58.2

Notes:

-- = no screening criteria available

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0

B = Analyte not detected above the level reported in blanks

HA = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

U = The material was analyzed for, but not detected

USEPA = United States Environmental Protection Agency

Table 4. Analytical Results from Groundwater Monitoring Well and Treatment System Samples - Volatile and Semivolatile Organic Compounds
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
Ault Field, Area 6, Naval Air Station Whidbey Island
Oak Harbor, Washington

Well Name	PAL for Alternate Drinking Water	PAL for Groundwater Plume Delineation	6-DW-38A	S-01		6-S-02	6-S-05		6-S-11	6-S-12	
Sample ID			WI-A06-6-DW-38A-0218	WI-A06-S-01-0218	WI-A06-S-01P-0218	WI-A06-6-S-02-0218	WI-A06-6-S-05-0218	WI-A06-6-S-05P-0218	WI-A06-S-11-0718	WI-A06-S-12-0119	WI-A06-S-12P-0119
Sample Date			2/20/18	2/19/18	2/19/18	2/23/18	2/23/18	2/23/18	7/17/18	1/23/19	1/23/19
Chemical Name											
Volatile Organic Compounds (ppb)											
Vinyl chloride	2 ^a	0.29 ^b	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Semivolatile Organic Compounds (ppb)											
1,4-Dioxane	35 ^c	0.44 ^d	1.7	0.029 U	0.031 U	0.029 U	0.029 U	0.032 U	4.4	3.8 J	3.7

Notes:

^aThe USEPA Federal maximum contaminant level

^bThe MTCA method B cleanup level, modified for an excess cancer risk of 1×10^{-5} .

^cConcentration has been modified for an excess cancer risk of 1×10^{-4} . Integrated Risk Information System (IRIS). "1,4-Dioxane (CASRN 123-91-1)." USEPA (2013)

^dThe MTCA method B cleanup level

Shading indicates detection

Bolded text indicates exceedance of the PAL for groundwater plume delineation

Underlined text indicates exceedance of the PAL for providing an alternate source of drinking water

-- = no screening criteria available

ID = identification

J = Analyte present. Value may or may not be accurate or precise

MCL = Maximum contaminant level

MTCA = Model toxics control act

PAL = project action level

ppb = parts per billion

U = The material was analyzed for, but not

Table 4. Analytical Results from Groundwater Monitoring Well and Treatment System Samples - Volatile and Semivolatile Organic Compounds
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
 Ault Field, Area 6, Naval Air Station Whidbey Island
 Oak Harbor, Washington

Well Name	PAL for Alternate Drinking Water	PAL for Groundwater Plume Delineation	6-S-24		6-S-27	6-S-28	6-S-40	6-S-41	6-S-42		6-S-43
			WI-A06-S-24-0818 8/30/18	WI-A06-S-24P-0818 8/30/18	WI-A06-6-S-27-0218 2/21/18	WI-A06-6-S-28-0218 2/21/18	WI-A06-6-S-40-0718 7/18/18	WI-A06-6-S-41-0718 7/18/18	WI-A06-6-S-42-0718 7/19/18	WI-A06-6-S-42P-0718 7/19/18	WI-A06-6-S-43-0718 7/19/18
Sample ID											
Sample Date											
Chemical Name											
Volatile Organic Compounds (ppb)											
Vinyl chloride	2 ^a	0.29 ^b	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	1.8 J
Semivolatile Organic Compounds (ppb)											
1,4-Dioxane	35 ^c	0.44 ^d	0.17 J	0.16 J	0.029 U	0.029 U	0.047 U	0.047 U	0.2	0.15 J	2.8 J

Notes:

^aThe USEPA Federal maximum contaminant level

^bThe MTCA method B cleanup level, modified for an excess cancer risk of 1×10^{-5} .

^cConcentration has been modified for an excess cancer risk of 1×10^{-4} . Integrated Risk Information System (IRIS). "1,4-Dioxane (CASRN 123-91-1)." USEPA (2013)

^dThe MTCA method B cleanup level

Shading indicates detection

Bolded text indicates exceedance of the PAL for groundwater plume delineation

Underlined text indicates exceedance of the PAL for providing an alternate source of drinking water

-- = no screening criteria available

ID = identification

J = Analyte present. Value may or may not be accurate or precise

MCL = Maximum contaminant level

MTCA = Model toxics control act

PAL = project action level

ppb = parts per billion

U = The material was analyzed for, but not

Table 4. Analytical Results from Groundwater Monitoring Well and Treatment System Samples - Volatile and Semivolatile Organic Compounds
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
 Ault Field, Area 6, Naval Air Station Whidbey Island
 Oak Harbor, Washington

Well Name	PAL for Alternate Drinking Water	PAL for Groundwater Plume Delineation	MW-01	MW-03B	MW-06	MW-13
Sample ID			WI-A06-MW-01-0218	WI-A06-MW03B-0218	WI-A06-MW-06-0218	WI-A06-MW-13-0218
Sample Date			2/21/18	2/22/18	2/16/18	2/20/18
Chemical Name						
Volatile Organic Compounds (ppb)						
Vinyl chloride	2 ^a	0.29 ^b	0.04 U	0.04 U	0.04 U	0.04 U
Semivolatile Organic Compounds (ppb)						
1,4-Dioxane	35 ^c	0.44 ^d	0.028 U	0.03 U	0.029 U	0.031 U

Notes:

^aThe USEPA Federal maximum contaminant level

^bThe MTCA method B cleanup level, modified for an excess cancer risk of 1 x 10⁻⁵.

^cConcentration has been modified for an excess cancer risk of 1 x 10⁻⁴. Integrated Risk Information System (IRIS). "1,4-Dioxane (CASRN 123-91-1)." USEPA (2013)

^dThe MTCA method B cleanup level

Shading indicates detection

Bolded text indicates exceedance of the PAL for groundwater plume delineation

Underlined text indicates exceedance of the PAL for providing an alternate source of drinking water

-- = no screening criteria available

ID = identification

J = Analyte present. Value may or may not be accurate or precise

MCL = Maximum contaminant level

MTCA = Model toxics control act

PAL = project action level

ppb = parts per billion

U = The material was analyzed for, but not

Table 5. Comparison of Standard PFAS and TOP Assay PFAS Analytical Results from Groundwater Monitoring Well and Treatment System Samples
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
 Ault Field, Area 6, Naval Air Station Whidbey Island
 Oak Harbor, Washington

Well Name	USEPA Lifetime Health Advisory (May 2016)	RSLs Tapwater HQ = 1.0 (November 2018)	6-I-01		6-I-03		6-S-04		6-S-07	
			WI-A06-6-I-01-1217 12/5/17	WI-A06-6-I-01-1217-TOP 12/5/17	WI-A06-6-I-03-1217 12/6/17	WI-A06-6-I-03-1217-TOP 12/6/17	WI-A06-6-S-04-1217 12/11/17	WI-A06-6-S-04-1217-TOP 12/11/17	WI-A06-6-S-07-1217 12/7/17	WI-A06-6-S-07-1217-TOP 12/7/17
Semivolatile Organic Compounds (ppt)										
Perfluorobutanesulfonic acid (PFBS)	--	400,000	5.39 U	5.12 U	5.68 U	5.08 U	5 U	5.43 U	13	10.7
Perfluoroheptanoic acid (PFHpA)	--	--	5.39 U	5.12 U	5.68 U	5.08 U	5 U	5.43 U	10.3	10.6
Perfluorohexanesulfonic acid (PFHxS)	--	--	5.39 U	2.6 J	5.68 U	2.2 J	5 U	1.64 JB	35	34.7 B
Perfluorohexanoic Acid (PFHxA)	--	--	5.39 U	5.12 U	5.68 U	5.08 U	6.84 J	8.48 J	40.7	44.6
Perfluorononanoic acid (PFNA)	--	--	5.39 U	5.12 U	5.68 U	5.08 U	5 U	5.43 U	5.39 U	5.25 U
Perfluorooctane Sulfonate (PFOS)	70	--	5.39 U	5.12 U	5.68 U	5.08 U	5 U	5.43 U	5.39 U	5.25 U
Perfluorooctanoic acid (PFOA)	70	--	1.09 J	1.14 JB	5.68 U	5.08 U	5 U	2.84 JB	39.2	39.2 B
PFOA+PFOS	70	--	1.09 J	1.14 JB	NA	NA	NA	2.84 JB	39.2	39.2 B

Notes:

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0

-- = no screening criteria available

B = Analyte not detected above the level reported in blanks

HQ = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

TOP = total oxidizable precursor

U = The material was analyzed for, but not

USEPA = United States Environmental Protection Agency

Table 5. Comparison of Standard PFAS and TOP Assay PFAS Analytical Results from Groundwater Monitoring Well and Treatment System Samples
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
 Ault Field, Area 6, Naval Air Station Whidbey Island
 Oak Harbor, Washington

Well Name	USEPA Lifetime Health Advisory (May 2016)	RSLs Tapwater HQ = 1.0 (November 2018)	6-S-08		6-S-14		6-S-17		6-S-19	
			WI-A06-6-S-08-1217 12/12/17	WI-A06-6-S-08-1217-TOP 12/12/17	WI-A06-6-S-14-1217 12/8/17	WI-A06-6-S-14-1217-TOP 12/8/17	WI-A06-6-S-17-1217 12/6/17	WI-A06-6-S-17-1217-TOP 12/6/17	WI-A06-6-S-19-1217 12/11/17	WI-A06-6-S-19-1217-TOP 12/11/17
Semivolatile Organic Compounds (ppt)										
Perfluorobutanesulfonic acid (PFBS)	--	400,000	5.04 U	5.25 U	10.2	8.99	5.25 U	5.34 U	4.22 J	5.01 J
Perfluoroheptanoic acid (PFHpA)	--	--	5.04 U	5.25 U	3.61 J	3.44 J	5.25 U	5.34 U	1.66 J	5.25 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	5.04 U	5.25 U	13.8	15.3 B	5.25 U	2.64 JB	6.21 J	5.37 JB
Perfluorohexanoic Acid (PFHxA)	--	--	5.04 U	5.25 U	25.6	33.2	5.25 U	2.65 J	21.8	27.1
Perfluorononanoic acid (PFNA)	--	--	5.04 U	5.25 U	5.25 U	5.39 U	5.25 U	5.34 U	5.17 U	5.25 U
Perfluorooctane Sulfonate (PFOS)	70	--	5.04 U	5.25 U	5.25 U	5.39 U	5.25 U	5.34 U	5.17 U	5.25 U
Perfluorooctanoic acid (PFOA)	70	--	5.04 U	5.25 U	19.6	20 B	5.25 U	4.11 JB	4.21 J	7.47 JB
PFOA+PFOS	70	--	NA	NA	19.6	20 B	NA	4.11 JB	4.21 J	7.47 JB

Notes:

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0

-- = no screening criteria available

B = Analyte not detected above the level reported in blanks

HQ = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

TOP = total oxidizable precursor

U = The material was analyzed for, but not

USEPA = United States Environmental Protection Agency

Table 5. Comparison of Standard PFAS and TOP Assay PFAS Analytical Results from Groundwater Monitoring Well and Treatment System Samples
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
 Ault Field, Area 6, Naval Air Station Whidbey Island
 Oak Harbor, Washington

Well Name	USEPA Lifetime Health Advisory (May 2016)	RSLs Tapwater HQ = 1.0 (November 2018)	6-S-19		6-S-26		6-S-31	
			WI-A06-6-S-19P-1217 12/11/17	WI-A06-6-S-19P-1217-TOP 12/11/17	WI-A06-6-S-26-1217 12/7/17	WI-A06-6-S-26-1217-TOP 12/7/17	WI-A06-6-S-31-1217 12/11/17	WI-A06-6-S-31-1217-TOP 12/11/17
Chemical Name								
Semivolatile Organic Compounds (ppt)								
Perfluorobutanesulfonic acid (PFBS)	--	400,000	4.15 J	4.79 J	9.28	9.45	14.3	15.4
Perfluoroheptanoic acid (PFHpA)	--	--	1.95 J	5.25 U	13.4	12.6	29.3	30.5
Perfluorohexanesulfonic acid (PFHxS)	--	--	5.39 J	6.34 JB	47.8	50.2 B	41.1	51.4 B
Perfluorohexanoic Acid (PFHxA)	--	--	22.8	29	35.2	41.3	58.3	71.2
Perfluorononanoic acid (PFNA)	--	--	5.21 U	5.25 U	3.71 J	6.03 J	5.04 U	5.53 U
Perfluorooctane Sulfonate (PFOS)	70	--	5.21 U	5.25 U	5.6 J	10.1	1.82 J	5.53 U
Perfluorooctanoic acid (PFOA)	70	--	4.2 J	8.04 JB	52.3	54.7 B	53.8	55.3 B
PFOA+PFOS	70	--	4.2 J	8.04 JB	57.9	64.8	55.6	55.3 B

Notes:

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0

-- = no screening criteria available

B = Analyte not detected above the level reported in blanks

HQ = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

TOP = total oxidizable precursor

U = The material was analyzed for, but not

USEPA = United States Environmental Protection Agency

Table 5. Comparison of Standard PFAS and TOP Assay PFAS Analytical Results from Groundwater Monitoring Well and Treatment System Samples
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
 Ault Field, Area 6, Naval Air Station Whidbey Island
 Oak Harbor, Washington

Well Name	USEPA Lifetime Health Advisory (May 2016)	RSLs Tapwater HQ = 1.0 (November 2018)	6-S-42				6-S-43		6-S-44	
			WI-A06-6-S-42-0718 7/19/18	WI-A06-6-S-42-0718-TOP 7/19/18	WI-A06-6-S-42P-0718 7/19/18	WI-A06-6-S-42P-0718-TOP 7/19/18	WI-A06-6-S-43-0718 7/19/18	WI-A06-6-S-43-0718-TOP 7/19/18	WI-A06-6-S-44-1217 12/8/17	WI-A06-6-S-44-1217-TOP 12/8/17
Chemical Name										
Semivolatile Organic Compounds (ppt)										
Perfluorobutanesulfonic acid (PFBS)	--	400,000	4.1 U	4.13 U	4.2 U	4.2 U	4.24 U	4.2 U	10.5	11.2
Perfluoroheptanoic acid (PFHpA)	--	--	4.1 U	4.13 U	4.2 U	4.2 U	4.24 U	4.2 U	13.4	12.8
Perfluorohexanesulfonic acid (PFHxS)	--	--	4.1 U	<u>3.51 J</u>	4.2 U	4.2 U	4.24 U	4.2 U	62.5	48.5 B
Perfluorohexanoic Acid (PFHxA)	--	--	4.1 U	4.13 U	4.2 U	4.2 U	9.46	8.35 J	44.7	54.2
Perfluorononanoic acid (PFNA)	--	--	4.1 U	4.13 U	4.2 U	4.2 U	4.24 U	4.2 U	6.3 J	7.39 J
Perfluorooctane Sulfonate (PFOS)	70	--	4.1 U	4.13 U	4.2 U	4.2 U	4.24 U	4.2 U	5.17 U	5.51 J
Perfluorooctanoic acid (PFOA)	70	--	4.1 U	4.13 U	4.2 U	4.2 U	4.24 U	4.2 U	96.9	87.3 B
PFOA+PFOS	70	--	NA	NA	NA	NA	NA	NA	96.9	92.8

Notes:

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0

-- = no screening criteria available

B = Analyte not detected above the level reported in blanks

HQ = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

TOP = total oxidizable precursor

U = The material was analyzed for, but not

USEPA = United States Environmental Protection Agency

Table 5. Comparison of Standard PFAS and TOP Assay PFAS Analytical Results from Groundwater Monitoring Well and Treatment System Samples
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
 Ault Field, Area 6, Naval Air Station Whidbey Island
 Oak Harbor, Washington

Well Name	USEPA Lifetime Health Advisory (May 2016)	RSLs Tapwater HQ = 1.0 (November 2018)	EFF01				INF01	
			WI-A06-EFF01-1217	WI-A06-EFF01-1217-TOP	WI-A06-EFF01P-1217	WI-A06-EFF01P-1217-TOP	WI-A06-INF01-1217	WI-A06-INF01-1217-TOP
Sample ID			12/5/17	12/5/17	12/5/17	12/5/17	12/5/17	12/5/17
Sample Date								
Chemical Name								
Semivolatile Organic Compounds (ppt)								
Perfluorobutanesulfonic acid (PFBS)	--	400,000	10.5	12.3	10	10.9	10.6	12.3
Perfluoroheptanoic acid (PFHpA)	--	--	11.8	14.6	11.3	16	11.3	16.5
Perfluorohexanesulfonic acid (PFHxS)	--	--	43	45.8	49.2	56.7	45.7	50.3
Perfluorohexanoic Acid (PFHxA)	--	--	40.7	49.8	37.4	50.4	39.5	53.7
Perfluorononanoic acid (PFNA)	--	--	5.43 U	5.25 U	5.39 U	5.08 U	5.43 U	5.04 U
Perfluorooctane Sulfonate (PFOS)	70	--	5.43 U	5.25 U	5.39 U	5.08 U	5.43 U	5.04 U
Perfluorooctanoic acid (PFOA)	70	--	35.8	42.7 B	28.6	47.4 B	35.1	44 B
PFOA+PFOS	70	--	35.8	42.7 B	28.6	47.4 B	35.1	44 B

Notes:

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0

-- = no screening criteria available

B = Analyte not detected above the level reported in blanks

HQ = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

TOP = total oxidizable precursor

U = The material was analyzed for, but not

USEPA = United States Environmental Protection Agency

Table 5. Comparison of Standard PFAS and TOP Assay PFAS Analytical Results from Groundwater Monitoring Well and Treatment System Samples
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
 Ault Field, Area 6, Naval Air Station Whidbey Island
 Oak Harbor, Washington

Well Name	USEPA Lifetime Health Advisory (May 2016)	RSLs Tapwater HQ = 1.0 (November 2018)	MW-10		P-4	
			WI-A06-MW-10-1217	WI-A06-MW-10-1217-TOP	WI-A06-P-4-1217	WI-A06-P-4-1217-TOP
Sample ID			12/7/17	12/7/17	12/5/17	12/5/17
Sample Date						
Chemical Name						
Semivolatile Organic Compounds (ppt)						
Perfluorobutanesulfonic acid (PFBS)	--	400,000	2.3 J	2.39 J	9.73	11.6
Perfluoroheptanoic acid (PFHpA)	--	--	5.58 U	5.21 U	11.9	16.2
Perfluorohexanesulfonic acid (PFHxS)	--	--	2.24 J	4.27 JB	35	36.2
Perfluorohexanoic Acid (PFHxA)	--	--	5.44 J	5.56 J	34.3	45.4
Perfluorononanoic acid (PFNA)	--	--	5.58 U	5.21 U	1.49 J	3.31 J
Perfluorooctane Sulfonate (PFOS)	70	--	5.58 U	5.21 U	5.25 U	6.18 J
Perfluorooctanoic acid (PFOA)	70	--	5.58 U	6.31 JB	58.2	64.6 B
PFOA+PFOS	70	--	NA	6.31 JB	58.2	70.8 JB

Notes:

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0

-- = no screening criteria available

B = Analyte not detected above the level reported in blanks

HQ = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

TOP = total oxidizable precursor

U = The material was analyzed for, but not

USEPA = United States Environmental Protection Agency

Table 6. Analytical Results from Private Drinking Water and Groundwater Well Samples - PFAS
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
 Ault Field, Area 6, Naval Air Station Whidbey Island
 Oak Harbor, Washington

Well Name	USEPA Lifetime Health Advisory (May 2016)	RSLs Tapwater HQ = 1.0 (November 2018)	RW01	RW02	RW03	RW04	RW05			RW06	RW07
Sample ID			WI-A06-RW01-0218	WI-A06-RW02-0218	WI-A06-RW03-0218	WI-A06-RW04-0218	WI-A06-RW05-0218	WI-A06-RW05-0818	WI-A06-RW05P-0218	WI-A06-RW06-0218	WI-A06-RW07-0218
Sample Date			2/5/18	2/5/18	2/5/18	2/5/18	2/6/18	8/29/18	2/6/18	2/6/18	2/6/18
Chemical Name											
Semivolatile Organic Compounds (ppt)											
Perfluorobutanesulfonic acid (PFBS)	--	400,000	5.25 U	5.02 U	41.8	37.9	28.9	26.2	28.9	5 U	4.94 U
Perfluoroheptanoic acid (PFHpA)	--	--	5.25 U	5.02 U	19.9	1.52 J	20.2	16.2	21.4	5 U	4.94 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	5.25 U	1.31 J	108	50.6	210	200	232	5 U	4.94 U
Perfluorohexanoic Acid (PFHxA)	--	--	5.25 U	5.02 U	55.7	4.92 U	48.6	37.5	49.8	5 U	4.94 U
Perfluorononanoic acid (PFNA)	--	--	5.25 U	5.02 U	5.08 U	4.92 U	4.98 U	4.98 U	1.67 J	5 U	4.94 U
Perfluorooctane Sulfonate (PFOS)	70	--	5.25 U	5.02 U	7.59 J	2.77 J	64.1	95.3	63.8	5 U	4.94 U
Perfluorooctanoic acid (PFOA)	70	--	5.25 U	5.02 U	27.9	4.15 J	57.7	55.4	55.3	5 U	4.94 U
PFOA + PFOS	70	--	NA	NA	35.5	6.9 J	121.8	150.7	119.1	NA	NA

Notes:

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0

-- = no screening criteria available

HQ = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional screening level

U = The material was analyzed for, but not

USEPA = United States Environmental Protection Agency

Table 6. Analytical Results from Private Drinking Water and Groundwater Well Samples - PFAS
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
 Ault Field, Area 6, Naval Air Station Whidbey Island
 Oak Harbor, Washington

Well Name	USEPA Lifetime Health Advisory (May 2016)	RSLs Tapwater HQ = 1.0 (November 2018)	RW08		RW09	RW10	RW11	RW12	RW13	RW14	RW15
			WI-A06-RW08-0218 2/6/18	WI-A06-RW08-0918 9/27/18	WI-A06-RW09-0218 2/7/18	WI-A06-RW10-0218 2/12/18	WI-A06-RW11-0218 2/12/18	WI-A06-RW12-0218 2/12/18	WI-A06-RW13-0218 2/13/18	WI-A06-RW14-0218 2/14/18	WI-A06-RW15-0218 2/14/18
Semivolatile Organic Compounds (ppt)											
Perfluorobutanesulfonic acid (PFBS)	--	400,000	23	25.9	4.43 U	4.55 U	4.53 U	2.27 J	4.94 U	58	4.9 U
Perfluoroheptanoic acid (PFHpA)	--	--	8.81 J	11.3	4.43 U	4.55 U	4.53 U	4.63 U	4.94 U	16.3	4.9 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	116	103	4.43 U	4.55 U	4.53 U	1.51 J	4.94 U	260	4.9 U
Perfluorohexanoic Acid (PFHxA)	--	--	15.1	18.6	0.829 J	4.55 U	4.53 U	4.63 U	0.676 J	60.5	4.9 U
Perfluorononanoic acid (PFNA)	--	--	2.51 J	3.4 J	4.43 U	4.55 U	4.53 U	4.63 U	4.94 U	5.12 U	4.9 U
Perfluorooctane Sulfonate (PFOS)	70	--	78.2	95.7	4.43 U	4.55 U	4.53 U	4.63 U	4.94 U	7.68 J	4.9 U
Perfluorooctanoic acid (PFOA)	70	--	25.4	31.2	4.43 U	4.55 U	4.53 U	1.03 J	4.94 U	21.8	4.9 U
PFOA + PFOS	70	--	103.6	126.9	NA	NA	NA	1.03 J	NA	29.5	NA

Notes:

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0

-- = no screening criteria available

HQ = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional screening level

U = The material was analyzed for, but not

USEPA = United States Environmental Protection Agency

Table 6. Analytical Results from Private Drinking Water and Groundwater Well Samples - PFAS
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
 Ault Field, Area 6, Naval Air Station Whidbey Island
 Oak Harbor, Washington

Well Name	USEPA Lifetime Health Advisory (May 2016)	RSLs Tapwater HQ = 1.0 (November 2018)	RW16	RW17		RW18			RW19		
			WI-A06-RW16-0218 2/14/18	WI-A06-RW17-0218 2/20/18	WI-A06-RW17P-0218 2/20/18	WI-A06-RW18-0418 4/20/18	WI-A06-RW18-0818 8/29/18	WI-A06-RW18P-0418 4/20/18	WI-A06-RW19-0318 3/28/18	WI-A06-RW19-0818 8/28/18	WI-A06-RW19P-0818 8/28/18
Semivolatile Organic Compounds (ppt)											
Perfluorobutanesulfonic acid (PFBS)	--	400,000	5.04 U	4.5 U	4.51 U	22.6	22	20.5	64.7	64.9	68.2
Perfluoroheptanoic acid (PFHpA)	--	--	5.04 U	4.5 U	4.51 U	9.21 J	11.4	11.3	33.4	37.6	36.5
Perfluorohexanesulfonic acid (PFHxS)	--	--	5.04 U	4.5 U	4.51 U	135	87.5	125	233 J	224	242
Perfluorohexanoic Acid (PFHxA)	--	--	0.906 J	4.5 U	4.51 U	26.1	27.8	29.3	61.8	69.2	67.3
Perfluorononanoic acid (PFNA)	--	--	5.04 U	4.5 U	4.51 U	4.83 U	5.51 U	1.59 J	2.36 J	4.98 U	4.77 U
Perfluorooctane Sulfonate (PFOS)	70	--	5.04 U	4.5 U	4.51 U	44.7	18	43	75.1	73.8	80.1
Perfluorooctanoic acid (PFOA)	70	--	5.04 U	4.5 U	4.51 U	29.1	26.1	30.6	44.7	45.6	48.2
PFOA + PFOS	70	--	NA	NA	NA	73.8	44.1	73.6	119.8	119.4	128.3

Notes:

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0

-- = no screening criteria available

HQ = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional screening level

U = The material was analyzed for, but not

USEPA = United States Environmental Protection Agency

Table 6. Analytical Results from Private Drinking Water and Groundwater Well Samples - PFAS
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
 Ault Field, Area 6, Naval Air Station Whidbey Island
 Oak Harbor, Washington

Well Name	USEPA Lifetime Health Advisory (May 2016)	RSLs Tapwater HQ = 1.0 (November 2018)	RW20		RW21		RW22	
			WI-A06-RW20-0418 4/20/18	WI-A06-RW20-0818 8/30/18	WI-A06-RW21-0818 8/27/18	WI-A06-RW21P-0818 8/27/18	WI-A06-RW22-0419 4/17/19	WI-A06-RW22P-0419 4/17/19
Semivolatile Organic Compounds (ppt)								
Perfluorobutanesulfonic acid (PFBS)	--	400,000	20	18.7	4.81 U	4.86 U	12.8	12.2
Perfluoroheptanoic acid (PFHpA)	--	--	3.33 J	5.17 U	4.81 U	4.86 U	4.96 U	4.86 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	118	119	4.81 U	4.86 U	53.2	47.7
Perfluorohexanoic Acid (PFHxA)	--	--	19.1	17.5	4.81 U	4.86 U	4.96 U	4.86 U
Perfluorononanoic acid (PFNA)	--	--	4.84 U	5.17 U	4.81 U	4.86 U	4.96 U	4.86 U
Perfluorooctane Sulfonate (PFOS)	70	--	30.5	27.8	4.81 U	4.86 U	54.2	53.2
Perfluorooctanoic acid (PFOA)	70	--	43.7	45.3	4.81 U	4.86 U	7.72 J	8.07 J
PFOA + PFOS	70	--	74.2	73.1	NA	NA	61.9	61.3

Notes:

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0

-- = no screening criteria available

HQ = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional screening level

U = The material was analyzed for, but not

USEPA = United States Environmental Protection Agency

Table 7. Analytical Results from Private Drinking Water and Groundwater Well Samples - Volatile and Semivolatile Organic Compounds
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
 Ault Field, Area 6, Naval Air Station Whidbey Island
 Oak Harbor, Washington

Well Name	PAL for Alternate Drinking Water	PAL for Groundwater Plume Delineation	RW01	RW02	RW03	RW04	RW05		RW06
Sample ID			WI-A06-RW01-0218	WI-A06-RW02-0218	WI-A06-RW03-0218	WI-A06-RW04-0218	WI-A06-RW05-0218	WI-A06-RW05P-0218	WI-A06-RW06-0218
Sample Date			2/5/18	2/5/18	2/5/18	2/5/18	2/6/18	2/6/18	2/6/18
Chemical Name									
Volatile Organic Compounds (ppb)									
Vinyl chloride	2 ^a	0.29 ^b	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Semivolatile Organic Compounds (ppb)									
1,4-Dioxane	35 ^c	0.44 ^d	0.029 U	0.029 U	0.081 J	0.029 U	0.053 J	0.055 J	0.03 U

Notes:

^aThe USEPA Federal maximum contaminant level

^bThe MTCA method B cleanup level, modified for an excess cancer risk of 1×10^{-5} .

^cConcentration has been modified for an excess cancer risk of 1×10^{-4} . Integrated Risk Information System (IRIS). "1,4-Dioxane (CASRN 123-91-1)." USEPA (2013)

^dThe MTCA method B cleanup level

Shading indicates detection

Bolded text indicates exceedance of the PAL for groundwater plume delineation

Underlined text indicates exceedance of the PAL for providing an alternate source of drinking water

-- = no screening criteria available

ID = identification

J = Analyte present. Value may or may not be accurate or precise

MCL = Maximum contaminant level

MTCA = Model toxics control act

PAL = project action level

ppb = parts per billion

U = The material was analyzed for, but not

UJ = Analyte not detected, quantitation limit may be inaccurate

Table 7. Analytical Results from Private Drinking Water and Groundwater Well Samples - Volatile and Semivolatile Organic Compounds
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
 Ault Field, Area 6, Naval Air Station Whidbey Island
 Oak Harbor, Washington

Well Name	PAL for Alternate Drinking Water	PAL for Groundwater Plume Delineation	RW07	RW08	RW09	RW10	RW11	RW12	RW13
Sample ID			WI-A06-RW07-0218	WI-A06-RW08-0218	WI-A06-RW09-0218	WI-A06-RW10-0218	WI-A06-RW11-0218	WI-A06-RW12-0218	WI-A06-RW13-0218
Sample Date			2/6/18	2/6/18	2/7/18	2/12/18	2/12/18	2/12/18	2/13/18
Chemical Name									
Volatile Organic Compounds (ppb)									
Vinyl chloride	2 ^a	0.29 ^b	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Semivolatile Organic Compounds (ppb)									
1,4-Dioxane	35 ^c	0.44 ^d	0.029 U	0.26	0.029 UJ	0.03 U	0.029 U	0.029 U	0.028 U

Notes:

^aThe USEPA Federal maximum contaminant level

^bThe MTCA method B cleanup level, modified for an excess cancer risk of 1×10^{-5} .

^cConcentration has been modified for an excess cancer risk of 1×10^{-4} . Integrated Risk Information System (IRIS). "1,4-Dioxane (CASRN 123-91-1)." USEPA (2013)

^dThe MTCA method B cleanup level

Shading indicates detection

Bolded text indicates exceedance of the PAL for groundwater plume delineation

Underlined text indicates exceedance of the PAL for providing an alternate source of drinking water

-- = no screening criteria available

ID = identification

J = Analyte present. Value may or may not be accurate or precise

MCL = Maximum contaminant level

MTCA = Model toxics control act

PAL = project action level

ppb = parts per billion

U = The material was analyzed for, but not

UJ = Analyte not detected, quantitation limit may be inaccurate

Table 7. Analytical Results from Private Drinking Water and Groundwater Well Samples - Volatile and Semivolatile Organic Compounds
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
 Ault Field, Area 6, Naval Air Station Whidbey Island
 Oak Harbor, Washington

Well Name	PAL for Alternate Drinking Water	PAL for Groundwater Plume Delineation	RW14	RW15	RW16	RW17		RW18	
Sample ID			WI-A06-RW14-0218	WI-A06-RW15-0218	WI-A06-RW16-0218	WI-A06-RW17-0218	WI-A06-RW17P-0218	WI-A06-RW18-0418	WI-A06-RW18P-0418
Sample Date			2/14/18	2/14/18	2/14/18	2/20/18	2/20/18	4/20/18	4/20/18
Chemical Name									
Volatile Organic Compounds (ppb)									
Vinyl chloride	2 ^a	0.29 ^b	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.014 J	0.04 U
Semivolatile Organic Compounds (ppb)									
1,4-Dioxane	35 ^c	0.44 ^d	0.029 U	0.029 U	0.029 U	0.03 U	0.031 U	0.1	0.11

Notes:

^aThe USEPA Federal maximum contaminant level

^bThe MTCA method B cleanup level, modified for an excess cancer risk of 1×10^{-5} .

^cConcentration has been modified for an excess cancer risk of 1×10^{-4} . Integrated Risk Information System (IRIS). "1,4-Dioxane (CASRN 123-91-1)." USEPA (2013)

^dThe MTCA method B cleanup level

Shading indicates detection

Bolded text indicates exceedance of the PAL for groundwater plume delineation

Underlined text indicates exceedance of the PAL for providing an alternate source of drinking water

-- = no screening criteria available

ID = identification

J = Analyte present. Value may or may not be accurate or precise

MCL = Maximum contaminant level

MTCA = Model toxics control act

PAL = project action level

ppb = parts per billion

U = The material was analyzed for, but not

UJ = Analyte not detected, quantitation limit may be inaccurate

Table 7. Analytical Results from Private Drinking Water and Groundwater Well Samples - Volatile and Semivolatile Organic Compounds
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water
 Ault Field, Area 6, Naval Air Station Whidbey Island
 Oak Harbor, Washington

Well Name	PAL for Alternate Drinking Water	PAL for Groundwater Plume Delineation	RW19	RW20	RW21		RW22	
Sample ID			WI-A06-RW19-0318	WI-A06-RW20-0418	WI-A06-RW21-0818	WI-A06-RW21P-0818	WI-A06-RW22-0419	WI-A06-RW22P-0419
Sample Date			3/28/18	4/20/18	8/27/18	8/27/18	4/17/19	4/17/19
Chemical Name								
Volatile Organic Compounds (ppb)								
Vinyl chloride	2 ^a	0.29 ^b	0.04 U	0.04 U	0.04 U	0.04 U	0.05 UJ	0.05 UJ
Semivolatile Organic Compounds (ppb)								
1,4-Dioxane	35 ^c	0.44 ^d	0.029 U	0.11	0.051 U	0.051 U	0.047 U	0.048 U

Notes:

^aThe USEPA Federal maximum contaminant level

^bThe MTCA method B cleanup level, modified for an excess cancer risk of 1×10^{-5} .

^cConcentration has been modified for an excess cancer risk of 1×10^{-4} . Integrated Risk Information System (IRIS). "1,4-Dioxane (CASRN 123-91-1)." USEPA (2013)

^dThe MTCA method B cleanup level

Shading indicates detection

Bolded text indicates exceedance of the PAL for groundwater plume delineation

Underlined text indicates exceedance of the PAL for providing an alternate source of drinking water

-- = no screening criteria available

ID = identification

J = Analyte present. Value may or may not be accurate or precise

MCL = Maximum contaminant level

MTCA = Model toxics control act

PAL = project action level

ppb = parts per billion

U = The material was analyzed for, but not

UJ = Analyte not detected, quantitation limit may be inaccurate

Figures



Basemap Data and Imagery Source: Esri

- Legend**
- City
 - Secondary Road
 - Local Connecting Road
 - Important Local Road
 - ▭ Site Boundary
 - ▭ Base Boundary

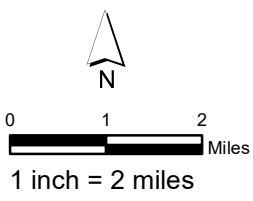


Figure 1
 Base Location Map
 Evaluation of Per- and Polyfluoroalkyl Substances,
 1,4-Dioxane, and Vinyl Chloride in Groundwater and
 Drinking Water, Ault Field, Area 6
 Naval Air Station Whidbey Island
 Oak Harbor, WA
 For Official Use Only



Legend

- Area 6 Boundary (Source: NIRIS)
- Base Boundary (Source: NIRIS)

Note:
GETR - groundwater extraction, treatment, and recharge



0 300 600
Feet

1 in = 600 ft

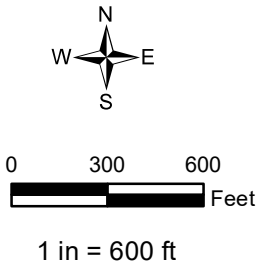
Imagery Source: ©2017, Esri

Figure 2
Area 6 Site Layout and Vicinity
Evaluation of Per- and Polyfluoroalkyl Substances,
1,4-Dioxane, and Vinyl Chloride in Groundwater and
Drinking Water, Ault Field, Area 6
Naval Air Station Whidbey Island
Oak Harbor, Washington



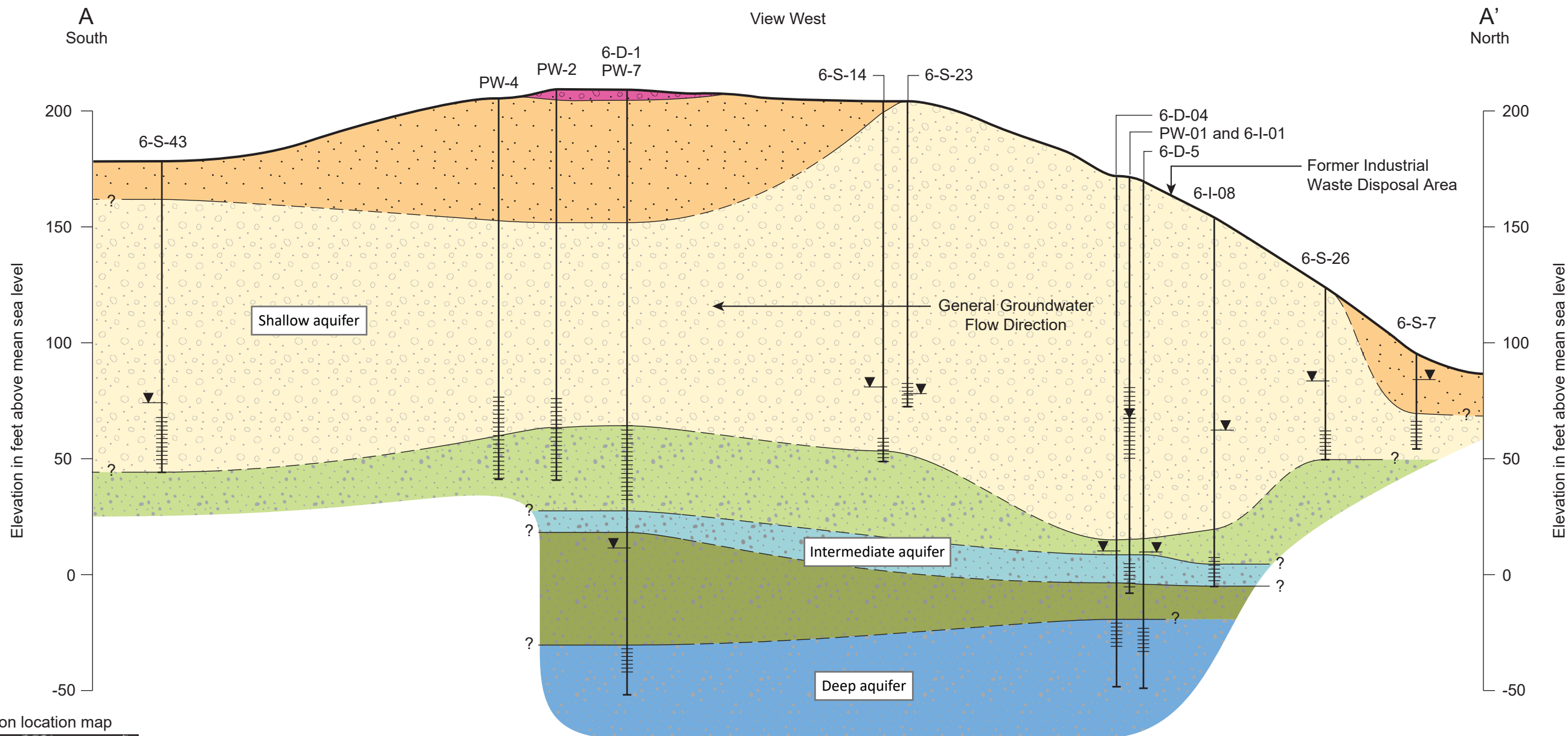
- Legend**
- Shallow Aquifer Well
 - Intermediate Aquifer Well
 - Deep Aquifer Well
 - GETR Well
 - Area 6 Boundary (Source: NIRIS)
 - Base Boundary (Source: NIRIS)

Notes:
 GETR - groundwater extraction, treatment, and recharge
 * Well 6-D-04 has been abandoned but the location is shown for reference.

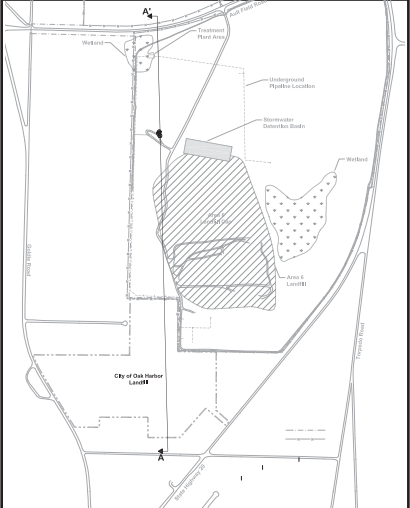


Imagery Source: ©2018, Esri

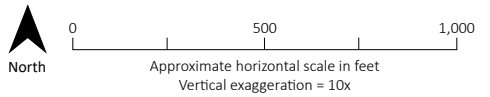
Figure 3
 Area 6 Monitoring Well Location Map
 Evaluation of Per- and Polyfluoroalkyl Substances,
 1,4-Dioxane, and Vinyl Chloride in Groundwater and
 Drinking Water, Ault Field, Area 6
 Naval Air Station Whidbey Island
 Oak Harbor, Washington



Cross-section location map



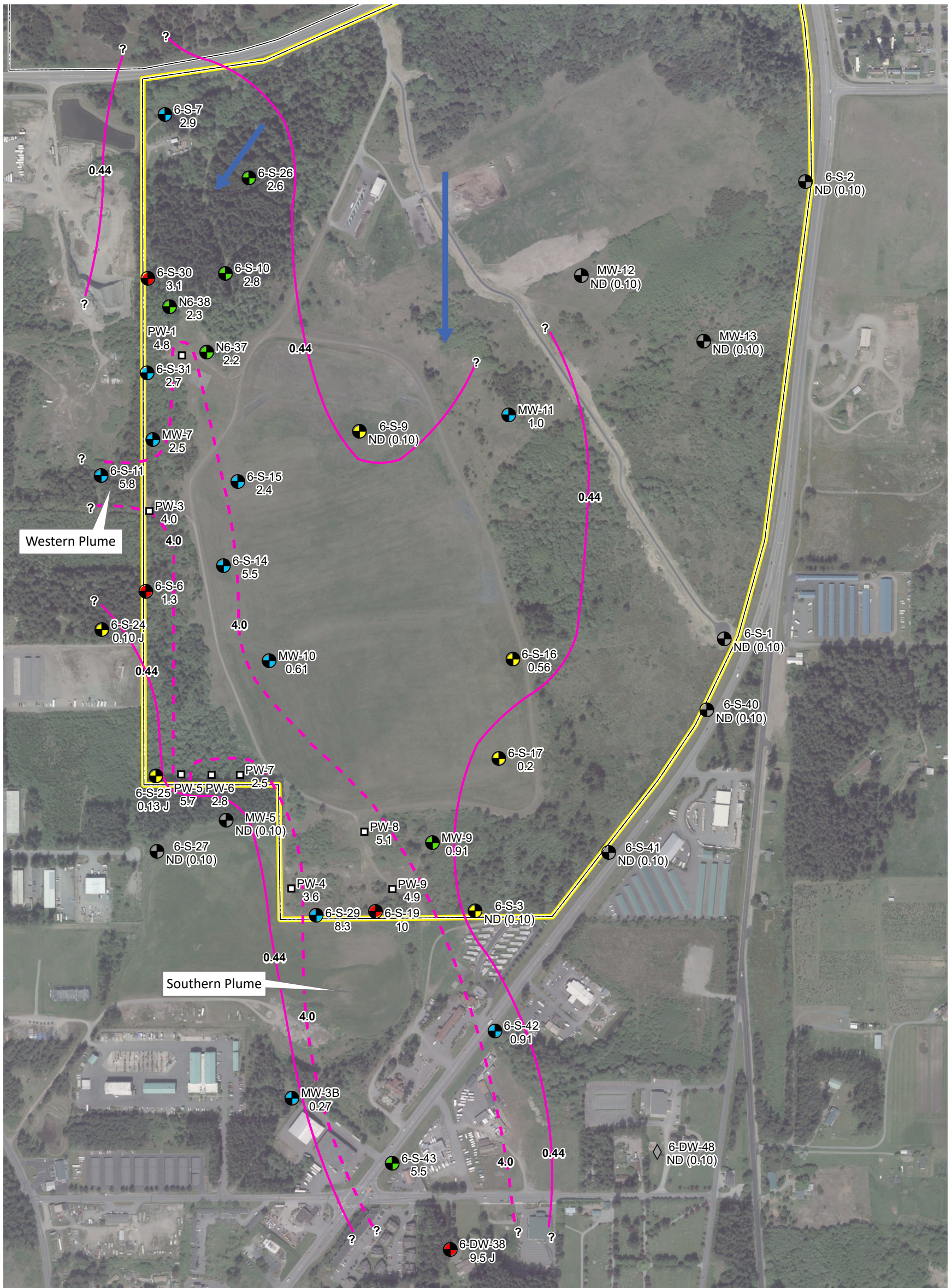
- LEGEND**
- Vashon recessional outwash
 - Vashon till
 - Vashon advance outwash
 - Whidbey #1
 - Whidbey #2
 - Whidbey #3
 - Whidbey #4
 - Groundwater level during drilling
 - Screen interval of well



Note: Figure source: URS-AECOM, 2018.

Figure 4.
Area 6 Lithologic Cross-section
 Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6 Naval Air Station Whidbey Island Oak Harbor, Washington





LEGEND

- 0.44 - Cleanup level contour
- 4.0 - Concentration contour
- - - - - NASWI boundary
- - - - - Area 6 boundary
- ◆ Domestic well
- Production well
- Monitoring well
- Approximate groundwater flow direction in the shallow aquifer

Concentration Trends

- ◆ No detections for all sampling events
- Concentration is decreasing
- Concentration is increasing
- No detections for all the last ten sampling events
- No statistical analysis
- No trend

Notes:

1. Concentrations are shown in micrograms per liter (µg/L).
2. Results are qualified as noted:
 J = Estimated value; the analyte is detected at a concentration below the quantitation limit or the result is qualified as estimated due to a QC outlier.
 ND = Indicates analyte is not detected; the limit of detection is listed in parentheses.
3. Washington State MTCA Method B: 1,4-dioxane is 0.44 µg/L.
4. Statistical analysis performed is the Mann-Kendall non-parametric trend test which requires a minimum of four data points, ideally less than 20% non-detect data, and measures if there is a trend to the data set (up to ten events through February 2018). The test determines if there is a trend and, if so, if it is increasing or decreasing with at least 80% confidence.
5. Figure source: Sealaska, 2018.

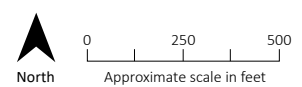
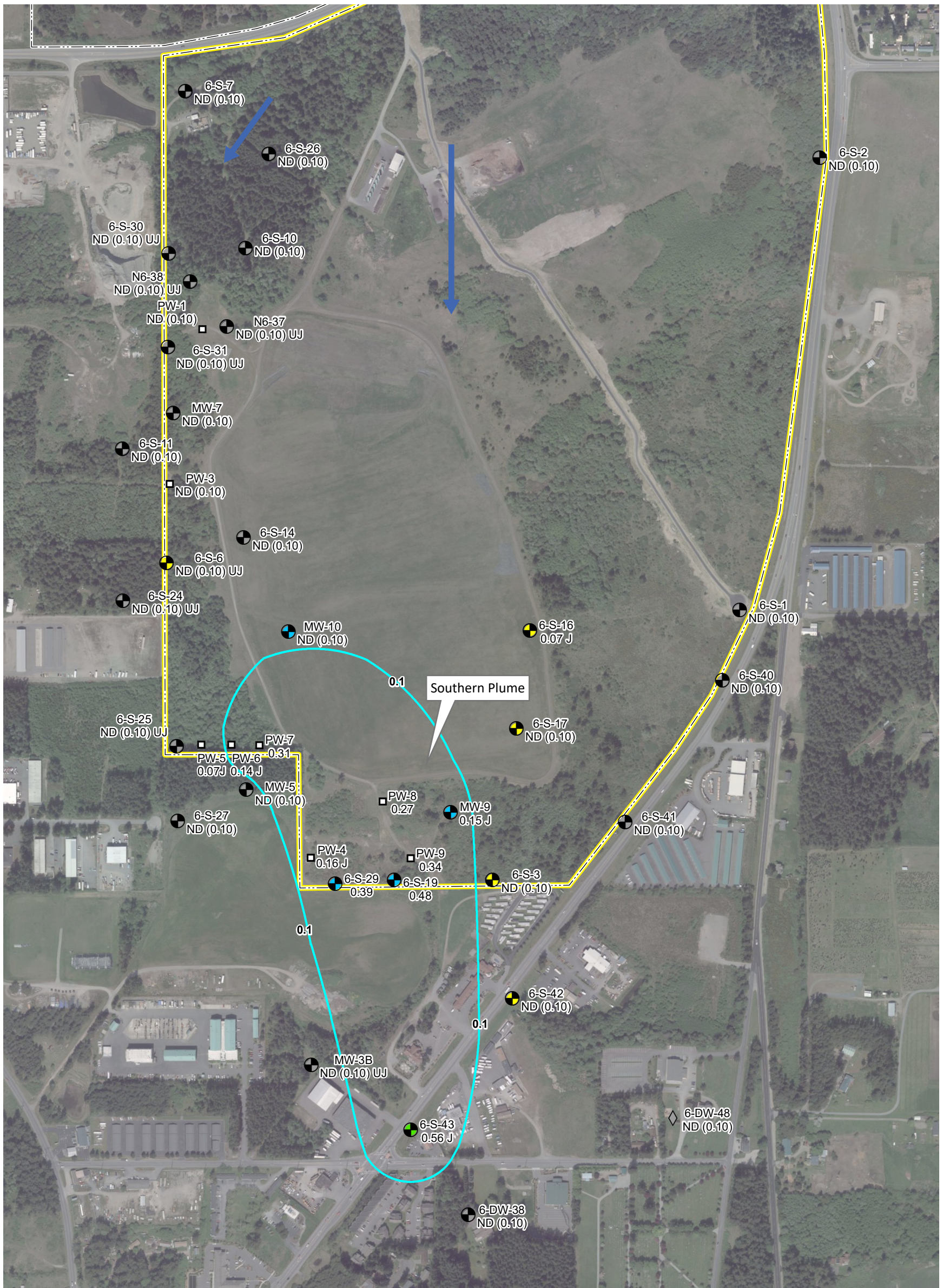


Figure 5.
Area 6 1,4-Dioxane Groundwater Concentrations February 2018

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6 Naval Air Station Whidbey Island Oak Harbor, Washington





LEGEND

- 0.1 Cleanup level contour
- NASWI boundary
- Area 6 boundary
- Domestic well
- Production well
- Monitoring well
- Approximate groundwater flow direction in the shallow aquifer

Concentration Trends

- ◆ No detections for all sampling events
- Concentration is decreasing
- No detections for all the last ten sampling events
- No statistical analysis
- No trend

Notes:

1. Concentrations are shown in micrograms per liter (µg/L).
2. Results are qualified as noted:
 J = Estimated value; the analyte is detected at a concentration below the quantitation limit or the result is qualified as estimated due to a QC outlier.
 ND = Indicates analyte is not detected; the limit of detection is listed in parentheses.
 ND () UJ = Indicates analyte is not detected at an estimated limit of detection, which is listed in parentheses.
3. Compliance level for vinyl chloride is 0.1 µg/L.
4. Statistical analysis performed is the Mann-Kendall non-parametric trend test which requires a minimum of four data points, ideally less than 20% non-detect data, and measures if there is a trend to the data set (up to ten events through February 2018). The test determines if there is a trend and, if so, if it is increasing or decreasing with at least 80% confidence.
5. Well 6-S-11 is screened in the lower portion of the shallow aquifer, therefore results are not utilized for plume contouring.
6. Figure source: Sealaska, 2018.

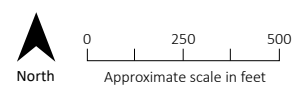
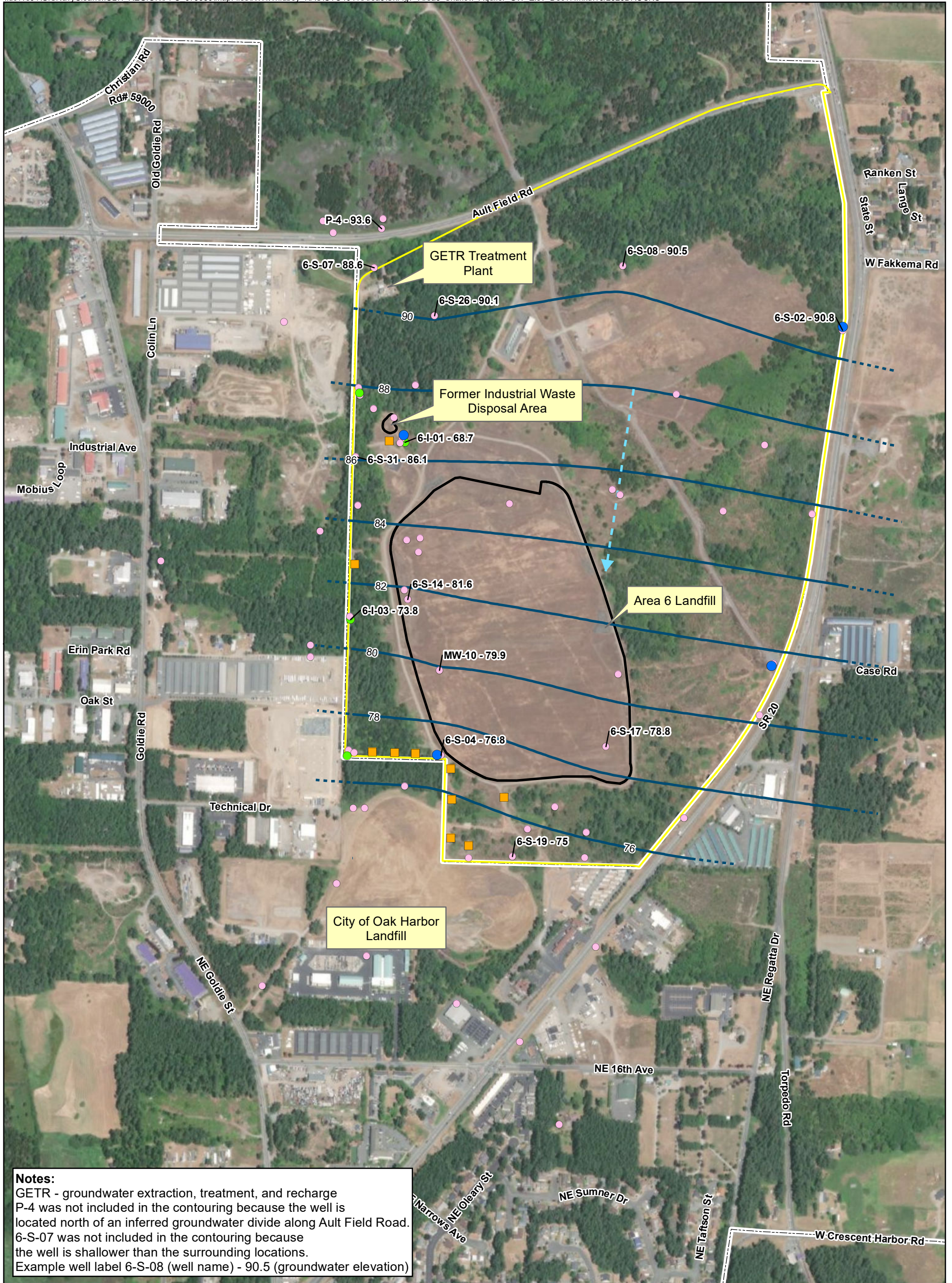


Figure 6.
Area 6 Vinyl Chloride Groundwater Concentrations
February 2018

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6 Naval Air Station Whidbey Island Oak Harbor, Washington





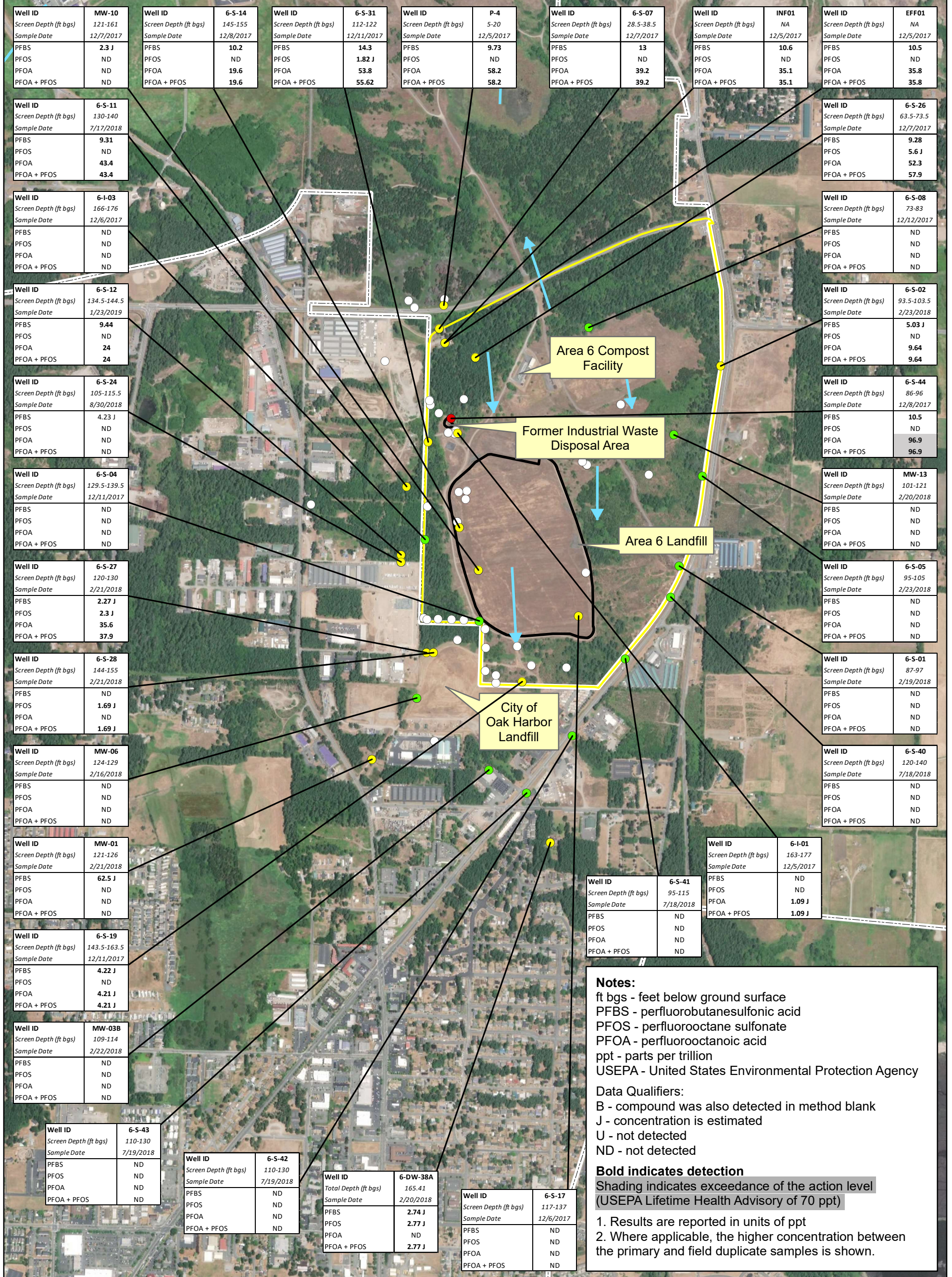
Notes:
 GETR - groundwater extraction, treatment, and recharge
 P-4 was not included in the contouring because the well is located north of an inferred groundwater divide along Ault Field Road.
 6-S-07 was not included in the contouring because the well is shallower than the surrounding locations.
 Example well label 6-S-08 (well name) - 90.5 (groundwater elevation)

Legend

--- (dashed blue line)	Shallow Aquifer Groundwater Elevation Contour - Estimated (feet North American Vertical Datum of 1988)	● (pink circle)	Shallow Aquifer Well
— (solid blue line)	Shallow Aquifer Groundwater Elevation Contour (feet North American Vertical Datum of 1988)	● (green circle)	Intermediate Aquifer Well
→ (blue arrow)	Shallow Aquifer Groundwater Flow Direction	● (blue circle)	Deep Aquifer Well
□ (yellow outline)	Area 6 Boundary (Source: NIRIS)	■ (orange square)	GETR Well
□ (dashed white outline)	Base Boundary (Source: NIRIS)		

0 300 600 Feet
 1 in = 600 ft

Figure 7
 Area 6 Shallow Aquifer Groundwater Elevations;
 December 2017
 Evaluation of Per- and Polyfluoroalkyl Substances,
 1,4-Dioxane, and Vinyl Chloride in Groundwater and
 Drinking Water, Ault Field, Area 6
 Naval Air Station Whidbey Island
 Oak Harbor, Washington
 Imagery Source: ©2018, Esri



Notes:
 ft bgs - feet below ground surface
 PFBS - perfluorobutanesulfonic acid
 PFOS - perfluorooctane sulfonate
 PFOA - perfluorooctanoic acid
 ppt - parts per trillion
 USEPA - United States Environmental Protection Agency

Data Qualifiers:
 B - compound was also detected in method blank
 J - concentration is estimated
 U - not detected
 ND - not detected

Bold indicates detection
 Shading indicates exceedance of the action level
 (USEPA Lifetime Health Advisory of 70 ppt)

1. Results are reported in units of ppt
 2. Where applicable, the higher concentration between the primary and field duplicate samples is shown.

Legend
PFAS Sample Location

- Monitoring Well with Action Level exceedance
- Monitoring Well with no exceedance of Action Level
- No detections of PFOA, PFOS, or PFBS
- Monitoring Well Not Sampled
- ➔ Approximate Flow Direction in the Shallow Aquifer
- ▭ Area 6 Boundary (Source: NIRIS)
- ▭ Base Boundary (Source: NIRIS)

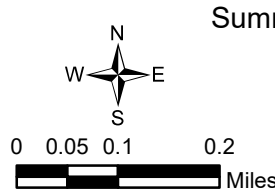


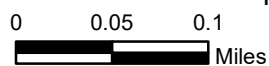
Figure 8
 Summary of PFAS Results from Groundwater Monitoring Wells
 Evaluation of Per- and Polyfluoroalkyl Substances,
 1,4-Dioxane, and Vinyl Chloride in Groundwater and
 Drinking Water, Ault Field, Area 6
 Naval Air Station Whidbey Island
 Oak Harbor, Washington



Legend

Sample Location

- Monitoring Well with Exceedance of the Action Level for Vinyl Chloride and/or 1,4-Dioxane
- Monitoring Well with no Exceedance of Action Level
- No Detections of Vinyl Chloride and/or 1,4-Dioxane
- Monitoring Well Not Sampled
- Approximate Flow Direction in the Shallow Aquifer
- Area 6 Boundary (Source: NIRIS)
- Base Boundary (Source: NIRIS)



1 in = 0.1 mile

Imagery Source: ©2017, Esri

Figure 9
 Summary of Vinyl Chloride and 1,4-Dioxane Results from Groundwater Monitoring Wells
 Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6 Naval Air Station Whidbey Island Oak Harbor, Washington



Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6 Naval Air Station Whidbey Island Oak Harbor, Washington

NOTIFICATION: FIGURE 10 CONTAINS SENSITIVE BUT UNCLASSIFIED INFORMATION WHICH IS PROTECTED BY THE FREEDOM OF INFORMATION ACT

***FOIA Exemption 6 (5 USC 552(b)(6))
Personal Information Affecting an Individual's Privacy***

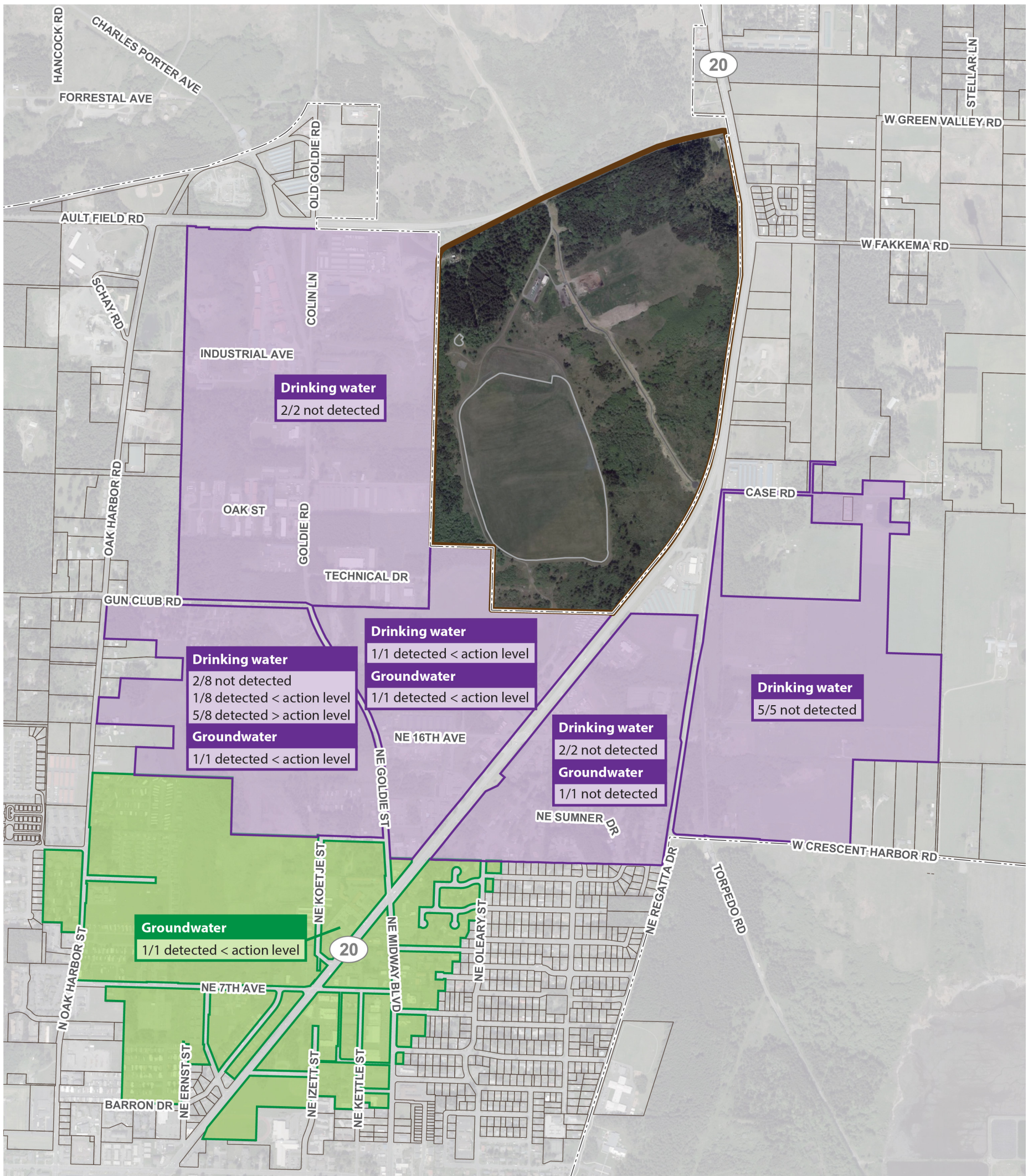
TO REQUEST A COPY OF THE DOCUMENT

PLEASE CONTACT

**Department of the Navy
Freedom of Information Act Office**

<http://www.secnav.navy.mil/foia/Pages/default.aspx>

Distribute to U. S. Government Agencies Only



LEGEND

- Base boundary
- Area 6 boundary
- Phase 1 Sampling Area
- Phase 2 Sampling Area

Notes:

PFOS = perfluorooctane sulfonate
 PFOA = perfluorooctanoic acid
 The action level for PFOS, PFOA, or PFOS + PFOA is the United States Environmental Protection Agency lifetime health advisory level of 70 parts per trillion.

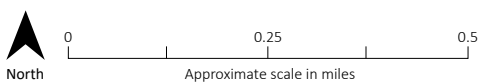


Figure 10A.
Summary of Off-Base Drinking and Groundwater Well PFOS and PFOA Results
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6 Naval Air Station Whidbey Island Oak Harbor, Washington





Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6 Naval Air Station Whidbey Island Oak Harbor, Washington

NOTIFICATION: FIGURE 11 CONTAINS SENSITIVE BUT UNCLASSIFIED INFORMATION WHICH IS PROTECTED BY THE FREEDOM OF INFORMATION ACT

***FOIA Exemption 6 (5 USC 552(b)(6))
Personal Information Affecting an Individual's Privacy***

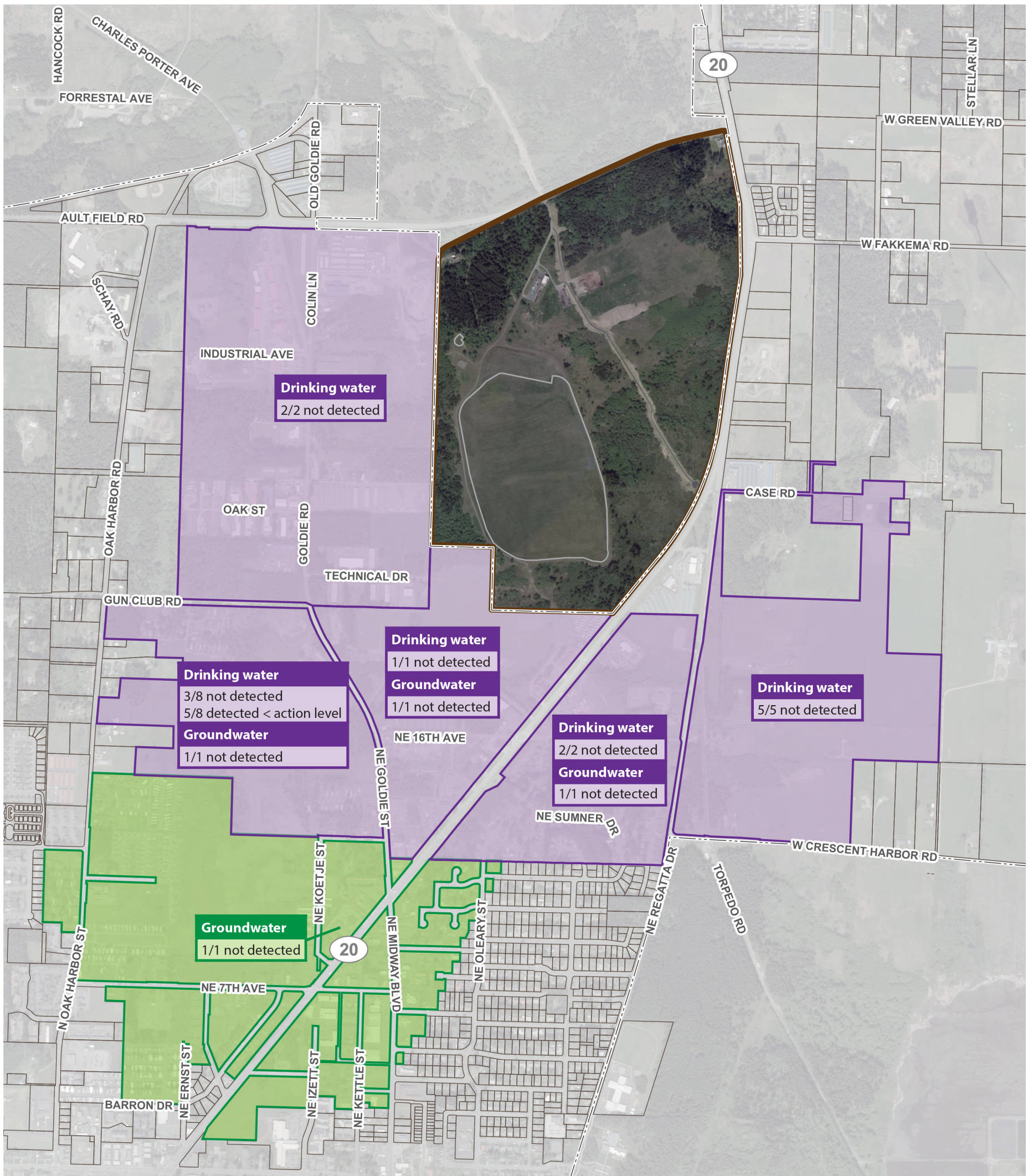
TO REQUEST A COPY OF THE DOCUMENT

PLEASE CONTACT

**Department of the Navy
Freedom of Information Act Office**

<http://www.secnav.navy.mil/foia/Pages/default.aspx>

Distribute to U. S. Government Agencies Only



LEGEND

- Base boundary
- Area 6 boundary
- Phase 1 Sampling Area
- Phase 2 Sampling Area

Note:
The 1,4-dioxane action level for the purposes of decision making regarding active treatment or providing alternate drinking water sources is 35 parts per billion.

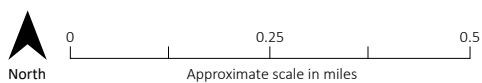


Figure 11A.
Summary of Off-Base Drinking and Groundwater Well 1,4-Dioxane Results
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6 Naval Air Station Whidbey Island Oak Harbor, Washington





Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6 Naval Air Station Whidbey Island Oak Harbor, Washington

NOTIFICATION: FIGURE 12 CONTAINS SENSITIVE BUT UNCLASSIFIED INFORMATION WHICH IS PROTECTED BY THE FREEDOM OF INFORMATION ACT

***FOIA Exemption 6 (5 USC 552(b)(6))
Personal Information Affecting an Individual's Privacy***

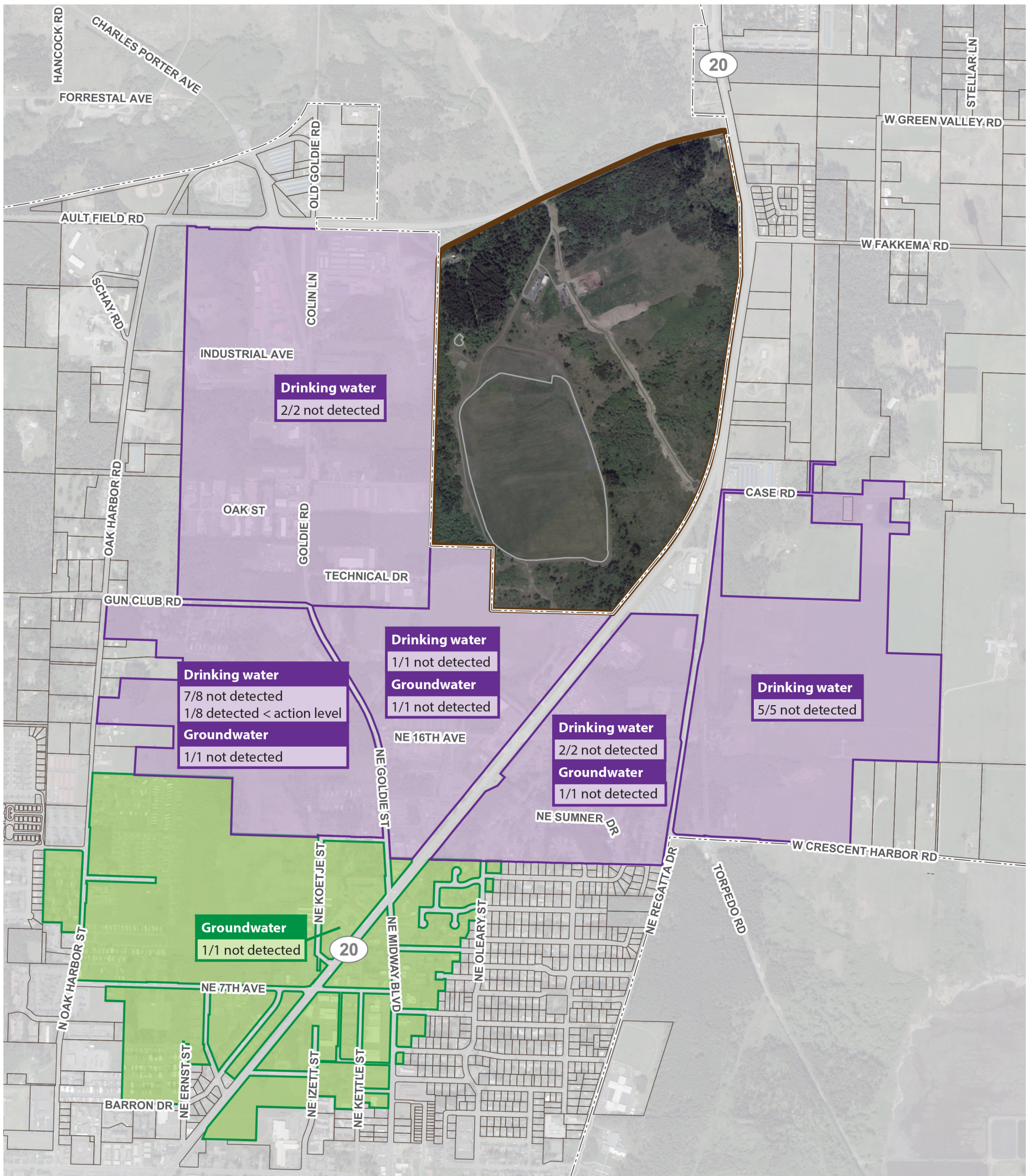
TO REQUEST A COPY OF THE DOCUMENT

PLEASE CONTACT

**Department of the Navy
Freedom of Information Act Office**

<http://www.secnav.navy.mil/foia/Pages/default.aspx>

Distribute to U. S. Government Agencies Only



LEGEND

- Base boundary
- Area 6 boundary
- Phase 1 Sampling Area
- Phase 2 Sampling Area

Note:
The vinyl chloride action level for the purposes of decision making regarding active treatment or providing alternate drinking water sources is 2 parts per billion.

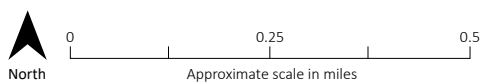


Figure 12A.
Summary of Off-Base Drinking and Groundwater Well Vinyl Chloride Results
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6 Naval Air Station Whidbey Island Oak Harbor, Washington



Attachment 1
Groundwater Monitoring Well and
GETR Sampling Forms

WATER LEVEL DATA SHEET

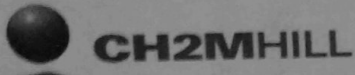
Client: NAVFAC
 Location: Ault Field, Area 6
 Event: Water Level Measurements
 Date: 12/4/17
 Weather: 40°F Partial Sun

Project Number: 695610.05.FLFS
 Sampling Team: D. Butler
 S. Fitzsimmons
 Measuring Device: Solinst - Model 101
 Pinc #04581

FIELD MEASUREMENTS

Time	Location	VOCs ppm	DTW Feet	TD Feet	Odor / Comments
10:25	6-I-1	N/A	105.34	179.53	Used Wasp Spray, J-plug was on
13:42	6-I-3	0.0	124.81	180.14	
14:53	6-S-14	0.0	129.88	164.70	
14:23	6-S-17	0.0	127.33	146.81	TP. exceeds historic - double checked depth
14:10	6-S-19	N/A	144.41	167.74	Used Wasp Spray, J-plug was on
	6-S-2				
15:24	6-S-26	0.0	38.38	76.82	
13:29	6-S-31	0.0	108.89	122.96	
13:57	6-S-4	0.0	136.22	143.05	Crack in topside of casing
13:15	6-S-44	0.0	83.73	98.23	
15:15	6-S-7	0.0	8.36	41.20	
15:55	6-S-8	0.0	73.21	86.13	
14:38	MW-10	0.0	136.27	170.16	
	P-4				

Signature(s):



WATER LEVEL DATA SHEET

Client: NAVFAC
Location: Ault Field, Area 6
Event: Water Level Measurements
Date: 12/5/17
Weather: Clear, 30-40°, calm

Project Number: 695610.05.FI.FS
Sampling Team: D. Butler
S. Fitzsimmons
Measuring Device: Solinst Model 101

FIELD MEASUREMENTS

Time

Location	VOCs ppm	DTW Feet	TD Feet	Odor / Comments
6-I-1				
6-I-3				
6-S-14				
6-S-17				
6-S-19				
07:50 6-S-2	0.0	92.78	105.45	
6-S-26				
6-S-31				
6-S-4				
6-S-44				
6-S-7				
6-S-8				
MW-10				
10:20 P-4	0.0	3.12	20.67	Lock didn't open with well key. Casing wasn't locked, so still able to access. Soft bottom
Signature(s):	David Butler			



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
 Location: Ault Field
 Event: February 2018 Groundwater Sampling
 Date: 2/20/18
 Weather: cloudy, 30", calm

Project Number: 695610.04.FI.FS Page: 1 of 1
 Well ID: WI-AF-~~60~~ ~~W-60~~ G-DW-38A
 Sample ID: WI-AF-~~60~~ W-AOG-G-DW-38A-0218
 Sampling Team: D. Butler
 L. Baumann

Total Depth: 152.73 FT.(BTOC)
 Depth to water: (-) 117.38 FT.(BTOC)
 Water Column: 35.35 FT.
 (x) GAL/FT.
 Well Volume: GAL.
 Total Purge Vol.: 2520 GAL- 60 ml

Measuring Device: Horiba U-53
 Pine # 21363

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

6 in well

Purge Device: Geotech PFC-free
 Bladder Pump #6131

PARAMETER STABILIZATION CRITERIA

Parameter	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	DTW ft BTOC
Criteria	±0.1	±0.01 (if <1) ±0.02 (if >1)	±0.05 (if <1) ±0.2 (if >1)	±0.1	±10	±10 % ≤ 10 NTU	±0.3 (low flow)

FIELD PARAMETERS

Time	Purge Vol. mL (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	DTW ft BTOC	Color / Odor / Comments
1427	0	8.95	0.910	37.83	7.67	-116	15.1	117.49	clear, no odor
1433	720	9.17	0.944	2.43	7.68	-162	14.6	117.49	"
1436	1080	9.52	0.948	2.01	7.81	-179	11.9	117.49	"
1439	1440	9.34	0.956	1.71	7.78	-182	11.9	117.49	"
1442	1800	9.37	0.957	1.59	7.85	-187	12.2	117.49	"
1445	2160	9.22	0.962	1.48	7.82	-189	12.7	117.49	"
1448	2520	9.24	0.963	1.41	7.85	-192	11.9	117.49	"
All params, stable except Temp which is variable due to outside temp. Proceed to sample.									
									DB

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
Method 537 Met	4°C	125 mL unpres poly	2
8260 SIM	HCl	40 mL VOA	3

Observations/Notes: Dedicated tubing, no Teflon lining. Redeployed after sampling. Also collected 8270 SIM (1,4-Dioxane) in 2 IL Ambers;

Pump Start Time: 14:09
 Initial Fill Time(FT; sec): 30
 Initial Discharge Time(DT; sec): 45

Final Fill Time: 30
 Final Discharge Time: 45

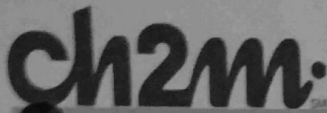
Air Monitoring:	HS	BZ
VOC (ppm)=	0.0	0.0
H2S (ppm)	0.0	0.0
LEL (%)=	0	0
CO (ppm)=	0.0	0.0
O2 (%)=	20.9	20.9

Pump End Time: 15:15
 Purge Rate: 120 mL/min

Pump Depth: 135 ft

Sample Time: 1455

MS/MSD Duplicate ID:
 Signature(s): Daniel Butler



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: Oak Harbor, WA
Event: Area 6 GW Sampling
Date: 12/3/17
Weather: Clear, 40°F, calm

Project Number: 695610.05.FI.F5
Well ID: 6-I-1
Sample ID: WI-A06-101-1217@WI-A06-670
Sampling Team: D. Butler, S. Fitzsimmons

Total Depth: 179.53 FT.(BTOC)
Depth to water: (-) 105.36 FT.(BTOC)
Water Column: 74.17 FT.
(x) 0.653 GAL/FT.
Well Volume: 48.43 GAL.
Total Purge Vol.: 1.5 GAL.

Measuring Device: WLI-Solinst Model 101
Date and Time: 12/3/17 1350

Table with 2 columns: Well Dia. (inches) and Volume (gallons/foot). Rows include 1, 1.25, 2, and 4 inches.

WQ - Florida U-52

Purge Device: Geotech PFC Bladder

SAMPLE DATA

Table with 8 columns: Date, Time, Temp. (°C), Cond. (mS/cm), DO (mg/L), pH (SU), ORP (mV), Turbidity (NTU), Other, Color / Odor / Comments.

FIELD PARAMETERS

Table with 10 columns: Time, Purge Vol. (L), Temp. (°C), Cond. (mS/cm), DO (mg/L), pH (SU), ORP (mV), Turbidity (NTU), Other, DTW (FT. BTOC), Color / Odor / Comments.

Sample information: method, container number, size, and type, preservative used.

Table with 4 columns: Analysis, Preservative, Container requirements, No. of containers.

Observations/Notes:

Pump Start Time: 1355
Pump End Time: 1454
Pump Depth: 170 ft
BTOC

VOC Reading: 0.0 ppm

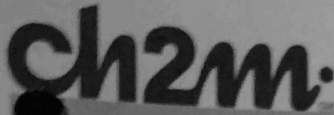
Table with 2 columns: time, Flow Rate. Row 1: 14:11, 150 mL/min.

Sample /Time: 1445

MS/MSD: NA

Duplicate ID No.: NA

Signature(s): David Butler



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
 Location: Oak Harbor
 Event: Area 6
 Date: 12/06/17
 Weather: Partial Sun, High 30°F

Project Number: 695610.05.FI.FS
 Well ID: 6-I-3
 Sample ID: WI-AD6-6-I-03-1217 / - TOP
 Sampling Team: David Butler / SEA
 Shannon Fitzsimmons / RDO

Total Depth: 180.14 FT.(BTOC)
 Depth to water: 124.92 FT.(BTOC)
 Water Column: 55.22 FT.
 (x) 0.653 GAL/FT.
 Well Volume: 36.06 GAL.
 Total Purge Vol.: ~2.5 GAL.

Measuring Device: Horiba C-102928 Model: U-52
 Date and Time: 12/06/17 09:35

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

Purge Device: Geotech PFC-Free Bladder

SAMPLE DATA

Date:	Temp.	Cond.	DO	pH	ORP	Turbidity	Other:	Color / Odor / Comments
12/6/17	°C	mS/cm	mg/L	SU	mV	NTU	DTW	
09:35								
Method: Stabilization	±0.1	±0.01	±0.2	±0.1	±10	N/A	±0.3ft	

FIELD PARAMETERS

Time	Purge Vol. (L) / (GAL)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
initial	07.41	8.97	0.303	9.56	6.10	296	0.7	124.80	clear, no odor
09:46	750	9.79	0.310	8.59	6.85	85	0.4	124.80	" "
09:51	1500	9.91	0.314	8.05	7.16	13	0.5	124.80	" "
09:56	2250	10.04	0.316	7.92	7.35	-11	0.6	124.80	" "
10:01	3000	10.14	0.316	7.82	7.51	-39	0.5	124.80	" "
10:06	3750	10.08	0.316	7.73	7.60	-53	0.6	124.80	" "
10:11	4500	10.02	0.317	7.71	7.68	-62	0.7	124.80	" "
10:16	5250	10.00	0.317	7.80	7.72	-68	0.5	124.80	" "
10:21	6000	10.06	0.318	7.65	7.75	-77	0.8	124.80	" "
10:26	6750	10.07	0.319	7.65	7.79	-81	0.6	124.80	" "
10:31	7500	10.07	0.320	7.45	7.80	-88	0.5	124.80	" "

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
Method 537	4°C	125 mL unpres	2
Method 537 TOP	4°C	125 mL unpres	4

Observations/Notes: Collection Time: 09:43 Purged for >1 hour. Most params. stable, proceed to sample.
 Pump Start Time: 09:12
 Pump End Time:
 Pump Depth: 173 ft btoC
 Sample Time: 10:35
 Duplicate ID No.: NA

MS/MSD: NA
 Signature: David Butler



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
 Location: Oak Harbor, WA
 Event: Area 6 Off Base
 Date: 2-19-18
 Weather: Sun, 30°F

Project Number: 695610205, FI, F1
 Well ID: G-5-1
 Sample ID: WI-A06-5-01-0218
 Sampling Team: L. Beumann
D. Butler

Total Depth: 97.9 FT.(BTOC)
 Depth to water: (-) 90.50 FT.(BTOC)
 Water Column: 7.4 FT.
(X) 0.653 GAL/FT.
 Well Volume: 4.83 GAL.
 Total Purge Vol.: 6.75 GAL. (DD) Liters

Measuring Device: Horiba
 Date and Time: 2/19/18

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

Purge Device: Geotech PFC-Free Bladder #6(3)

250 *ml/min*

SAMPLE DATA								
Date:	Temp.	Cond.	DO	pH	ORP	Turbidity	Other:	Color / Odor / Comments
Time:	°C	mS/cm	mg/L	SU	mV	NTU		
2-19-18								
1125								
Method:	± .1	± .01	± .2	± .1	± 10			

FIELD PARAMETERS									
Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
1132	0.75	11.64	0.461	10.91	6.20	137	4.97	90.49	
1135	1.5	11.29	0.480	8.59	6.82	107	4.51	90.50	
1139	2.25	11.22	0.484	7.91	7.06	92	4.35	90.46	
1141	4	11.22	0.484	7.62	7.24	79	3.09	90.46	
1144	4.75	11.18	0.486	7.28	7.30	75	2.5	90.50	
1147	5.5	11.16	0.485	7.06	7.31	72	2.61	90.49	
1150	6.75	11.06	0.484	6.99	7.37	69	.85	90.48	

Sample information: method, container number, size, and type, preservative used.			
Analysis	Preservative	Container requirements	No. of containers
8260 SIM			
8270 SIM			

Observations/Notes: Non-Teflon Lined dedicated Tubing

Pump Start Time: 1125 VOC Reading: Normal in BZ
 Pump End Time: 1220
 Pump Depth: 96 ft bToc Final DTW = 90.44 ft bToc

Sample /Time: 1200 *etc*

MS/MSD WI-A06-5-01-MS/MSD Duplicate ID No.: WI-A06-5-01P-0218 at 1210

Signature(s): Douglas Butler



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: NASWI Area 6
Event: Area 6 Off-base Sampling
Date: 2-23-18
Weather: Snowy, low 30's

Project Number: 695610.05.FI.FS
Well ID: 6-5-2
Sample ID: WI-A06-6-5-02-0218
Sampling Team: B. Baumann, E. Cutler

Total Depth: 104 FT.(BTOC)
Depth to water: (-) 92.58 FT.(BTOC)
Water Column: FT.
Well Volume: GAL/FT.
Total Purge Vol.: GAL.

Measuring Device: Horiba 53
Geotech Bladder Pump

Table with 2 columns: Well Dia. (inches) and Volume (gallons/foot). Rows include 1, 1.25, 2, and 4 inch diameters.

PARAMETER STABILIZATION CRITERIA

Table with 8 columns: Parameter, Temp. °C, Cond. mS/cm, DO mg/L, pH SU, ORP mV, Turbidity NTU, DTW ft BTOC. Includes criteria values for each parameter.

FIELD PARAMETERS

Table with 10 columns: Time, Purge Vol. (gals) (L), Temp. °C, Cond. mS/cm, DO mg/L, pH SU, ORP mV, Turbidity NTU, DTW ft BTOC, Color / Odor / Comments. Contains multiple rows of field data.

Sample information: method, container number, size, and type, preservative used.

Table with 4 columns: Analysis, Preservative, Container requirements, No. of containers.

Observations/Notes: Lots of fumes coming from passing cars/trucks

Pump Start Time: 1312
Initial Fill Time(FT; sec): 10
Initial Discharge Time(DT; sec): 15

Final Fill Time: 15
Final Discharge Time: 22

Purge Rate: 200

Air Monitoring:
VOC (ppm)= 0.2
H2S (ppm) 0
LEL (%)= 0
CO (ppm)= 0
O2 (%)= 21.3

Pump Depth: 98.5 ft below

Sample /Time:

MS/MSD Duplicate ID:
Signature(s):



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
 Location: Oak Harbor, WA
 Event: Area 6, GW Sampling
 Date: 12-11-17
 Weather: Calm, Low: 30°F High: 49°F
 Total Depth: 143.05 FT.(BOC)
 Depth to water: (-)135.90 FT.(BOC)
 Water Column: 7.15 FT.
 Well Volume: (x) 0.653 GAL/FT.
 Total Purge Vol.: 4.67 GAL.
 Purge Device: Geotech PFC-Free Bladder Pump #5882

Project Number: 695610.05.FI.FS
 Well ID: 6-S-04
 Sample ID: WI-A06-6-S-04
 Sampling Team: Shannon Fitzsimmons / RDD
David Butler / SEA

Measuring Device: Horiba U-500 ^{PINE} ID-27447
 Date and Time: 12-11-17, 08:20

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA									
Date:	Temp.	Cond.	DO	pH	ORP	Turbidity	Other:	Color / Odor / Comments	
Time:	°C	mS/cm	mg/L	SU	mV	NTU	_____	_____	
12-11-17									
08:20									
Method: <u>Stabilization</u>	<u>± 0.1</u>	<u>± 0.01</u>	<u>± 0.05</u>	<u>± 0.1</u>	<u>± 10</u>	<u>N/A</u>	<u>-</u>	<u>-</u>	

FIELD PARAMETERS									
Time	Purge Vol. (gals) mls	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW ft bto c	Color / Odor / Comments
09:45	initial	8.48	0.489	0.00	6.77	267	4.6	135.90	Clear, no odor
09:50	500	9.33	0.490	3.00	7.08	116	7.5	135.90	" "
09:55	1000	9.59	0.500	0.00	7.13	5	10.0	135.90	" "
10:00	1500	9.57	0.511	0.00	7.05	-29	10.4	135.90	" "
10:05	2000	9.86	0.509	0.00	7.15	-38	8.7	135.90	" "
10:10	2500	9.69	0.508	0.00	7.14	-34	7.6	135.90	" "

Sample information: method, container number, size, and type, preservative used.			
Method	Analysis	Preservative	No. of containers
Method 537		4°C	2
Method 537 TOP		4°C	4

Observations/Notes: Had difficulty pulling up water, most likely due to less head pressure.

time	Flow Rate (mL/min)
09:50	100

Pump Start Time: 09:00
 Pump End Time: 10:21
 Pump Depth: 139.5 ft bto c
 Sample Time: 10:15
 VOC Reading: 0.0 ppm
 - Collected Sample without temp. stabilized. All other parameters met criteria.

MS/MSD: N/A Duplicate ID No.: N/A
 Signature: [Handwritten Signature]



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
 Location: NASWI Area 6
 Event: Area 6 Off-base Sampling
 Date: 2-23-17
 Weather: Cloudy, low 30's, Some wind

Project Number: 695610.05.FI.FS Page: 1 of
 Well ID: G-5-05
 Sample ID: WI-A06-G-5-05-0218
 Sampling Team: E. Cutler, L. Baumann

Total Depth: 106 FT.(BTOC)
 Depth to water: (-) 96.46 FT.(BTOC)
 Water Column: FT.
 (x) GAL/FT.
 Well Volume: GAL.
 Total Purge Vol.: GAL.

Measuring Device: Horiba S3
 Geotech Bladder Pump

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

Purge Device: Geo central Pro Bladder pump G-102/21

PARAMETER STABILIZATION CRITERIA

Parameter	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	DTW ft BTOC
Criteria	±0.1	±0.01 (if <1) ±0.02 (if >1)	±0.05 (if <1) ±0.2 (if >1)	±0.1	±10	±10 % ≤ 10 NTU	±0.3 (low flow)

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	DTW ft BTOC	Color / Odor / Comments
1015	3.0	10.96	0.423	8.63	7.67	230	58.3	96.46	Lt. Brn. Sed.
1017	3.4	11.24	0.416	5.97	7.87	227	59.8	"	"
1019	3.8	11.40	0.414	5.69	7.99	227	51.1	"	"
1021	4.2	11.20	0.414	5.42	8.19	224	45.0	96.47	"
1023	4.6	11.48	0.413	5.16	8.14	228	40.1	96.46	"
1025	5.0	11.36	0.412	5.19	8.29	224	37.6	"	"
1027	5.4	11.51	0.412	5.10	8.26	228	37.2	"	"
1029	5.8	11.38	0.412	5.12	8.39	226	28.8	"	"
1031	6.2	11.56	0.409	4.98	8.39	226	26.5	"	"
1033	6.6	11.49	0.410	5.03	8.42	228	26.6	"	"
Stabilized									

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers

Observations/Notes:

Pump Start Time: 0955
 Initial Fill Time(FT; sec): 5
 Initial Discharge Time(DT; sec): 15

Final Fill Time: 20
 Final Discharge Time: 15

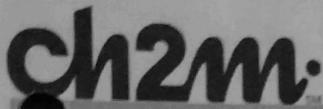
Purge Rate: 200 gal/min

Air Monitoring:
 VOC (ppm)=
 H2S (ppm)
 LEL (%)=
 CO (ppm)=
 O2 (%)=

Pump Depth: 100'

Sample /Time: 1035

MS/MSD Duplicate ID:
 Signature(s):



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: Oak Harbor, WA
Event: Area 6 GW Sampling
Date: 12-07-17
Weather: Clear, 30°F, Calm

Project Number: 095610.05.FI.F5
Well ID: 6-5-7
Sample ID: WI-A06-6-5-07-1217/-TOP/-MS/-SD
Sampling Team: D. Butler, S. Fitzsimmons

Total Depth: 41.20 FT.(BTOC)
Depth to water: (1) 8.39 FT.(BTOC)
Water Column: 32.81 FT.
(x) 0.653 GAL/FT.
Well Volume: 21.45 GAL.
Total Purge Vol.: ~8.5 GAL.

Measuring Device: Horiba U-52 C102928
Date and Time: 12/07/17 10:50

Table with 2 columns: Well Dia. (inches) and Volume (gallons/foot). Rows include 1, 1.25, 2, and 4 inch diameters.

Purge Device: Geotech PFC-Free Bladder

SAMPLE DATA

Table with 9 columns: Date, Time, Temp, Cond, DO, pH, ORP, Turbidity, Other, Color/Odor/Comments. Row 1: 12-07-17, 10:50, 10.55, 0.752, 20.01, 7.28, -94, 2.3, 8.45, Clear, No odor.

FIELD PARAMETERS

Table with 10 columns: Time, Purge Vol., Temp, Cond, DO, pH, ORP, Turbidity, Other, Color/Odor/Comments. Multiple rows showing data from 10:55 to 11:45.

Sample information: method, container number, size, and type, preservative used.

Table with 4 columns: Analysis, Preservative, Container requirements, No. of containers. Rows for Method 537 and Method 537 TOP.

Observations/Notes: Pump stopped a few times during purge due to bad connection with DC plug.
Pump Start Time: 10:50
Pump End Time: 11:56
Pump Depth: 35 ft btoC
VOC Reading: 0.0 ppm

Table with 2 columns: time, Flow Rate. Row: 10:55 / 450 mL/min

Sample Time: 1150
MS/MSD WI-A06-6-5-07-1217/-MS/-SD Duplicate ID No.: NA

Signature(s): David Butler



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: Oak Harbor, WA
Event: Area 6, GW Sampling
Date: 12-12-17
Weather: Calm, Sunny 38°F

Project Number: 695610.05.FI.FS
Well ID: 6-S-08
Sample ID: WI-A06-6-S-08-1217/-TOP
Sampling Team: Shannon Fitzsimmons/RDD
David Butler/SEA

Total Depth: 86.13 FT.(BTOC)
Depth to water: (-) 73.14 FT.(BTOC)
Water Column: 12.94 FT.
(x) 0.653 GAL/FT.
Well Volume: 8.45 GAL.
Total Purge Vol.: ~3 GAL.

Measuring Device: Horiba U-S00 1D-27447
Date and Time: 12-12-17 0840

Purge Device: Gcotech. PFC-free Bladder Pump #5882

Table with 2 columns: Well Dia. (inches) and Volume (gallons/foot). Rows include 1, 1.25, 2, and 4 inch diameters.

SAMPLE DATA

Table with 9 columns: Date, Temp., Cond., DO, pH, ORP, Turbidity, Other, Color / Odor / Comments. Includes handwritten values for 12-12-17 at 0846.

FIELD PARAMETERS

Table with 10 columns: Time, Purge Vol., Temp., Cond., DO, pH, ORP, Turbidity, Other, Color / Odor / Comments. Includes handwritten data for times 09:05 to 09:30.

No odor

Sample information: method, container number, size, and type, preservative used.

Table with 4 columns: Analysis, Preservative, Container requirements, No. of containers. Includes handwritten entries for Method 537.

Observations/Notes:

Pump Start Time: 08:57
Pump End Time: 09:38
Pump Depth: 80 ft btoe

VOC Reading: 0.0 ppm

Table with 2 columns: Time, Flow Rate (mL/min). Includes handwritten entry for 09:06 at 275.

Sample Time: 09:35

MS/MSD: NA Duplicate ID No.: NA

Signature(s): [Handwritten signature]



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: NASWI Ault Field
Point: Area 6 Groundwater Sampling
Date: 7/17/18
Weather: sunny, clear, ~70°F

Project Number: 695610.05.FI.FS
Page: 1 of 1
Well ID: 6-S-11
Sample ID: WAF-W1-A6-S-0718
Sampling Team: G. Gardner, K. Remmen

Total Depth: 142.19 FT.(BTOC)
Depth to water: (-) 106.76 FT.(BTOC)
Water Column: 35.43 FT.
(x) 0.653 GAL/FT.
Well Volume: 23.14 GAL.
Total Purge Vol.: 11.1 GAL. liters

Measuring Device: Solinst WLI
Horiba U-53

Table with 4 columns: Well Dia. (inches), Volume (gallons/foot), Well Dia. (inches), Volume (gallons/foot). Rows show data for well diameters 1, 1.25, 2, and 4 inches.

Purge Device: GeoTech PFC-Free Bladder Pump S/N: 1529

PARAMETER STABILIZATION CRITERIA

Table with 8 columns: Parameter, Temp. °C, Cond. mS/cm, DO mg/L, pH SU, ORP mV, Turbidity NTU, DTW ft BTOC. Row shows criteria values for each parameter.

FIELD PARAMETERS

Table with 10 columns: Time, Purge Vol. (gals) ml, Temp. °C, Cond. mS/cm, DO mg/L, pH SU, ORP mV, Turbidity NTU, DTW ft BTOC, Color / Odor / Comments. Contains multiple rows of sampling data.

Sample information: method, container number, size, and type, preservative used.

Table with 4 columns: Analysis, Preservative, Container requirements, No. of containers. Lists analysis types like PFAS, VOC, and SVOC with their respective container and preservative requirements.

Observations/Notes: flow rate ~100 ml/min. Stopped pumping at 1612.

Pump Start Time: 16:09
Initial Fill Time (sec): 13.75
Initial Discharge Time (sec): 36.7
Final Fill Time: 23
Final Discharge Time: 40

Air Monitoring:
VOC (ppm)= 0.0
H2S (ppm)
LEL (%)=
CO (ppm)=
O2 (%)=

Pump Depth: 137.5 ft btoc

Sample Time: 1735

MS/MSD Duplicate ID:
Signature(s): [Handwritten Signature]



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: NASWI Ault Field
Site: Area 6 Groundwater Sampling
Date: 1/23/2019
Weather: Cloudy, some rain ~50°F

Project Number: 695610.05.FI.FS Page: 1 of 1
Well ID: 6-5-12
Sample ID: W1-ACG-5-12-0119
Sampling Team: G. Gardner, K. Remmen, E. Storkerson

Total Depth: 145.5 FT.(BTOC)
Depth to water: 111.46 FT.(BTOC)
Water Column: 34.04 FT.
Well Volume: 0.635 GAL/FT.
Total Purge Vol.: 21.6154 GAL.

Measuring Device: Solinst WLI
Horiba U-53

Purge Device: GeoTech PFC-Free Bladder Pump S/N: 1529

Table with 4 columns: Well Dia. (inches), Volume (gallons/foot), Well Dia. (inches), Volume (gallons/foot). Rows for diameters 1, 1.25, 2, 4.

PARAMETER STABILIZATION CRITERIA

Table with 8 columns: Parameter, Temp. °C, Cond. mS/cm, DO mg/L, pH SU, ORP mV, Turbidity NTU, DTW ft BTOC. Includes criteria values for each parameter.

FIELD PARAMETERS

Table with 10 columns: Time, Purge Vol. (gals), Temp. °C, Cond. mS/cm, DO mg/L, pH SU, ORP mV, Turbidity NTU, DTW ft BTOC, Color / Odor / Comments. Contains multiple rows of sampling data.

Sample information: method, container number, size, and type, preservative used.

Table with 4 columns: Analysis, Preservative, Container requirements, No. of containers. Lists PFAS, VOC, and SVOC analysis details.

Observations/Notes:

Pump Start Time: 08:34
Initial Fill Time (sec): 14
Initial Discharge Time (sec): 35

Final Fill Time: 15
Final Discharge Time: 43

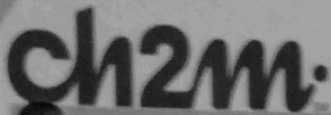
Air Monitoring:
VOC (ppm)= 0.0
H2S (ppm)
LEL (%)= all clear
CO (ppm)=
O2 (%)=

Pump Depth: 140' btoC

Sample Time: 1200

MS/MSD W1-ACG-5-12-0119-MS/MSD
Signature(s): G. Gardner

Duplicate ID: W1-ACG-5-12P-0119 @ 1230



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
 Location: Oak Harbor, WA
 Event: Area 6 GW Sampling
 Date: 12/8/17
 Weather: Clear, 40%, calm

Project Number: 645010.05, FI, FS
 Well ID: 6-5-14
 Sample ID: WI-A06-6-5-14-1217
 Sampling Team: D. Butler/SEA
 S. Fitzsimons/ROD

Total Depth: 164.70 FT.(BTOC)
 Depth to water: 1129.82 FT.(BTOC)
 Water Column: 34.88 FT.
 (x) 0.653 GALIFT.
 Well Volume: 22.78 GAL
 Total Purge Vol.: ~2.5 GAL

Measuring Device: Horiba 452 (102928)
 Date and Time: 12/8/17 1130

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

Purge Device: Geotech PFC-Free Bladder Pump

SAMPLE DATA

Date:	Temp.	Cond.	DO	pH	ORP	Turbidity	Other:	Color / Odor / Comments
Time:	°C	mS/cm	mg/L	SU	mV	NTU		
12/8/17								
1130								
Method: Sub, 12/17/17	±0.1	±0.01	±0.2	±0.1	±10	NA		

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: ^{DTW} ft btoc	Color / Odor / Comments
12:18	initial	10.80	0.934	15.85	7.83	41	12.7	129.81	Clear, No odor
12:23	750	11.29	0.932	11.38	7.67	-87	8.8	129.80	" "
12:28	1500	11.50	0.925	10.08	7.68	-89	8.9	129.80	" "
12:33	2250	11.44	0.925	8.87	7.69	-88	8.6	129.80	" "
12:38	3000	11.80	0.925	7.63	7.70	-89	8.4	129.80	" "
12:43	3750	11.89	0.924	7.32	7.67	-86	7.1	129.80	" "
12:48	4500	12.12	0.924	7.01	7.68	-85	5.7	129.80	" "
12:53	5250	12.19	0.924	6.83	7.67	-85	4.9	129.80	" "
12:58	6000	11.81	0.919	6.79	7.68	-85	4.5	129.80	" "
13:03	6750	11.62	0.921	6.60	7.69	-85	4.1	129.80	" "
13:08	7500	11.66	0.924	6.44	7.69	-84	3.9	129.80	" "

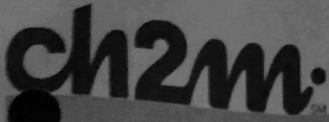
Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
Method 537	4°C	125 ml unpres	2
Method 537 TOP	4°C	125 ml unpres	4

Observations/Notes: Air Tubing had up b/n air line and water line. Applied APZ tape, pressure lower than goal, 30 psi, but might need to cut line.

Pump Start Time: 12:03
 Pump End Time: 13:17
 Pump Depth: 156 ft btoc
 VOC Reading: 0.0 ppb
 Time | Flow rate (mL/min)
 12:20 | 150 mL/min

Sample / Time: 13:10
 MS/MSD: NA
 Signature(s): David Butler
 Duplicate ID No.: NA



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: Oak Harbor
Event: Area 6 GW Sampling
Date: 12/6/17
Weather: Clear, 40's, calm

Project Number: 645610.05.FI.F5
Well ID: 6-5-17
Sample ID: WI-A06-6-5-17-1217 / -TOP
Sampling Team: D. Butler, S. Fitzsimmons

Total Depth: 146.81 FT.(BTCC)
Depth to water: (-)127.41 FT.(BTCC)
Water Column: 19.4 FT.
(x)0.653 GAL/FT.
Well Volume: 12.67 GAL.
Total Purge Vol.: ~2.5 GAL.

Measuring Device: Horiba U-52 (102928)
Date and Time: 12/6/17 11:40

Purge Device: Geotech PFC-Free Bladder #5882

Table with 2 columns: Well Dia. (inches) and Volume (gallons/foot). Rows include 1, 1.25, 2, and 4 inch diameters.

SAMPLE DATA

Table with 10 columns: Date, Time, Temp, Cond, DO, pH, ORP, Turbidity, Other, Color/Odor/Comments. Includes handwritten values for 12/6/17 at 11:40.

FIELD PARAMETERS

Table with 10 columns: Time, Purge Vol, Temp, Cond, DO, pH, ORP, Turbidity, Other, Color/Odor/Comments. Shows a series of readings from 12:12 to 13:02.

Sample information: method, container number, size, and type, preservative used.

Table with 4 columns: Analysis, Preservative, Container requirements, No. of containers. Lists Method 537 and Method 537 TOP.

Observations/Notes: All params stable except DO (which is close) and purged >1hr, proceed to sample.

Pump Start Time: 11:55
Pump End Time: 13:10
Pump Depth: 136ft btoc

VOC Reading: 0.0 ppm

Table with 2 columns: Time and Flow Rate. Shows 12:15 and 150 mL/min.

Sample Time: 13:05

MS/MSD: NA Duplicate ID No.: NA

Signature: David Butler



GROUNDWATER SAMPLING DATA SHEET

Client: NAVAC
 Location: Oak Harbor, WA
 Event: Area 6, GW Sampling
 Date: 12-11-17
 Weather: Calm, Partial Sun, Low: 30°F High: 49°F
 Total Depth: 167.74 FT. (BTOC)
 Depth to water: (-) 144.03 FT. (BTOC)
 Water Column: 23.71 FT.
(x) 0.653 GAL/FT.
 Well Volume: 15.48 GAL.
 Total Purge Vol.: ~7 GAL.
 Purge Device: Geotech PFC-Free Bladder Pump #5882

Project Number: 695610.05.FI.FS
 Well ID: 6-5-19
 Sample ID: WI-A06-6-S-19-1217/WI-A06-6-S-19R-1
 Sampling Team: Shannon Fitzsimmons / RDD
David Butler / SEA
 Measuring Device: Horiba U-500 ID-27447 PINE
 Date and Time: 12-11-17 11:00

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA								
Date:	Temp.	Cond.	DO	pH	ORP	Turbidity	Other: _____	Color / Odor / Comments
Time:	°C	mS/cm	mg/L	SU	mV	NTU		
12-11-17								
11:00								
Method: <u>STP Stabilization</u>	± 0.1	± 0.01	± 0.05	± 0.1	± 10	N/A	—	—

FIELD PARAMETERS									
Time	Purge Vol. (gals/mL)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: <u>DTW</u>	Color / Odor / Comments
								<u>± BTOC</u>	
11:30	initial	8.95	0.796	6.09	7.31	88	5.0	144.03	Clear. No odor
11:35	750	10.41	0.792	0.00	7.33	55	2.9	144.03	" "
11:40	1500	10.82	0.792	0.00	7.26	48	3.3	144.03	" "
11:45	2250	11.17	0.790	0.00	7.32	43	2.6	144.03	" "
11:50	3000	11.32	0.789	0.00	7.34	40	2.7	144.03	" "

Sample information: method, container number, size, and type, preservative used.			
Analysis	Preservative	Container requirements	No. of containers
Method 537	4°C	125 mL unpres. poly	2
Method 537 TOP	4°C	125 mL unpres. poly	4

Observations/Notes: Tubing kept breaking, might need to heat up in the future so it's less brittle

Pump Start Time: 11:08 VOC Reading: 0.0 ppm

Pump End Time: 12:07

Pump Depth: 156 ft btoc

Sample Time: 11:55

MS/MSD: N/A Duplicate ID No.: WI-A06-6-S-19-1217

Signature(s): [Signature]

time | Flow Rate
 11:33 | 150 mL/min

All parameters stable except temperature, which is increasing. Horiba is in sunlight. Collected Sample Jhyrbys.



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
 Location: NASWI Area 6
 Event: off-base GW sampling
 Date: 8/30/18
 Weather: overcast, ~65°F, calm

Project Number: 695610.05.FI.FS
 Well ID: 6-S-24
 Sample ID: W1-A06-S-24-0818
 Sampling Team: Krystle Remmen
Shannon Fitzsimmons

Total Depth: 119.3 FT.(BTOC) - based on orig. construction
 Measuring Device: 200' water level meter, unknown brand
 Depth to water: (-) 111.46 FT.(BTOC)
 Date and Time: 8/30/18 11:00
 Water Column: 7.84 FT.
 Well Volume: (X) 0.653 GAL/FT.
 Total Purge Vol.: 5.119 GAL.
5.326 GAL. (20.162 L)

Purge Device: Geotech PFC-free bladder pump

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA								
Date:	Temp.	Cond.	DO	pH	ORP	Turbidity	Other:	Color / Odor / Comments
Time:	°C	mS/cm	mg/L	SU	mV	NTU		
Method: <u>Honbu u-SZ</u>								

FIELD PARAMETERS									
Time	Purge Vol. (gals) mL	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: <u>DTW ft btoe</u>	Color / Odor / Comments
1153	2839.05	18.43	0.547	7.51	8.24	125	49.9	111.69	tan/brown, no odor
1200	3992	15.67	0.612	7.57	7.74	129	44.9	111.67	slightly tan
1202	4322	14.73	0.621	6.80	7.65	139	13.3	111.68	
1205	4817	14.65	0.620	6.94	7.63	141	17.0	111.68	clear
1208	5312	14.31	0.617	7.33	7.63	146	11.9	" "	
1211	5807	14.19	0.619	6.52	7.62	149	11.2	" "	
1214	6302	14.17	0.618	6.30	7.61	150	12.3	" "	
1217	6797	14.13	0.617	6.59	7.63	151	11.8	" "	
1220	7292	14.11	0.617	6.66	7.65	152	9.8	" "	

Sample information: method, container number, size, and type, preservative used.			
Analysis	Preservative	Container requirements	No. of containers -
PFAS (List of 14) - EPA 537 mod	N/A	125-ml poly	2
8260 SIM - vinyl chloride	HCl	40-ml VOA	3
8270 SIM - 1,4-dioxane	N/A	1-L Amber glass	2

Observations/Notes:

Pump Start Time: 11:29 VOC Reading: 0.0 ppm

Pump Depth: 117.0 ft btoe stop ~ 1338

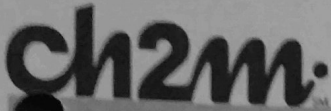
Sample /Time: W1-A06-S-24-0818 12:25

MS/MSD W1-A06-S-24-0818-M3 / MSD Duplicate ID No.: W1-A06-S-24P-0818

Signature(s): [Signature]

initial flow rate: $250 \text{ mL} / 89 \text{ sec} = 2.8 \text{ mL/sec} = 168.5 \text{ mL/min}$ or $\sim 170 \text{ mL/min}$
 $240 \text{ mL} / 87 \text{ sec} = 2.75 \text{ " " } = 165.5 \text{ mL/min}$ or $\sim 165 \text{ mL/min}$

each sample



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
 Location: Oak Harbor, WA
 Event: Area 6, GW Sampling
 Date: 12-07-17
 Weather: Clear, 30°F, calm

Project Number: 695610.05.FI.FS
 Well ID: 6-5-26
 Sample ID: WI-A06-6-S-26-1217/-TOP
 Sampling Team: D. Butler / SEA
 Shannon Fitzsimmons / RDD

Total Depth: 76.82 FT.(BTOC)
 Depth to water: 638.44 FT.(BTOC)
 Water Column: 38.38 FT.
 (10.653 GAL/FT.)
 Well Volume: 25.06 GAL.
 Total Purge Vol.: ~5 GAL.

Measuring Device: Horiba U-52 C-102928
 Date and Time: 12/07/17 13:00

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

Purge Device: Geotech PFC-Free Bladder

SAMPLE DATA

Date: 12-07-17	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: _____	Color / Odor / Comments
Time: 13:02								
Method: Stabilization	±0.1	±0.01	±0.2	±0.1	±10	N/A		

FIELD PARAMETERS

Time	Purge Volume (gals/mL)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW ± btoC	Color / Odor / Comments
13:02	initial	9.54	0.819	18.37	8.01	-108	29.0	38.46	Clear, slightly murky
13:07	2000	10.29	0.830	11.63	8.29	-150	24.8	38.46	" "
13:12	4000	10.30	0.831	10.49	8.30	-152	23.0	38.50	" "
13:17	4800	10.28	0.831	9.39	8.32	-154	15.8	38.50	clear, no odor
13:22	8000	10.30	0.831	8.74	8.34	-155	15.6	38.50	" "
13:27	10000	10.31	0.832	8.54	8.34	-155	14.9	38.50	" "
13:32	12000	10.35	0.832	8.46	8.35	-157	13.3	38.50	" "
13:37	14000	10.31	0.832	8.44	8.35	-157	11.9	38.50	" "
All params stable, proceed to sample									

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
Method 537	4°C	125 mL unpres. poly	2
Method 537 TDP	4°C	125 mL unpres. poly	4

Observations/Notes:

Pump Start Time: 12:56
 Pump End Time: 13:43
 Pump Depth: 71 ft btoC

VOC Reading: 0.0 ppm

time	Flow Rate
13:03	400 mL/min

Sample Time: 1340

MS/MSD NA Duplicate ID No.: NA

Signature(s): David Butler



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: Ault Field
Event: February 2018 Groundwater Sampling
Date: 2/21/18
Weather: cloudy, 30°, calm

Project Number: 695610.04 FI.FS
Page: 1 of 1
Well ID: WI-AF-01 6-5-27
Sample ID: WI-AF-01 WS-A06-6-5-27-0218
Sampling Team: D. Butler, L. Baumann, S. Fitzsimmons

Total Depth: 134.30 FT.(BTOC)
Depth to water: (-) 121.75 FT.(BTOC)
Water Column: 12.55 FT.
(x) 0.653 GAL/FT.
Well Volume: ~8.20 GAL.
Total Purge Vol.: 6250 GAL- 0.9 ml

Measuring Device: Horiba U-53 Lot#: 14259
Solinst Model 102 Lot #: A00212

Purge Device: geocontrol PRO Lot # 4164
Bladder Pump #6109

Table with 2 columns: Well Dia. (inches) and Volume (gallons/foot). Rows include 1, 1.25, 2, and 4 inches.

PARAMETER STABILIZATION CRITERIA table with columns: Parameter, Temp. °C, Cond. mS/cm, DO mg/L, pH SU, ORP mV, Turbidity NTU, DTW ft BTOC, Criteria.

FIELD PARAMETERS table with columns: Time, Purge Vol. mL (gals), Temp. °C, Cond. mS/cm, DO mg/L, pH SU, ORP mV, Turbidity NTU, DTW ft BTOC, Color / Odor / Comments.

Sample information table with columns: Analysis, Preservative, Container requirements, No. of containers.

Observations/Notes: - Had dedicated tubing, not Pbn lining; -10:24: Horiba died while reading parameters. Changed batteries.
Pump Start Time: 10:00
Initial Fill Time(FT; sec): 13
Initial Discharge Time(DT; sec): 30
Pressure - 75 psi ~
Pump End Time: 11:34
Purge Rate: 125 mL/min.
Pump Depth: 131 ft btoc
Sample /Time: 11:15
MS/MSD N/A
Signature(s): [Signature] Duplicate ID: N/A

Air Monitoring table with columns: HS, BZ. Rows include VOC (ppm), H2S (ppm), LEL (%), CO (ppm), O2 (%).



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
 Location: Ault Field
 Event: February 2018 Groundwater Sampling
 Date: 2/21/18
 Weather: cloudy, 30", calm

Project Number: 695610.04.FI.FS Page: 1 of 1
 Well ID: WI-AF-06 6-5-28
 Sample ID: WI-AF-06 WI-A06-6-5-28-0218
 Sampling Team: D. Butler, L. Baumann, S. Fitzsimmons

Total Depth: 157.10 FT.(BTOC)
 Depth to water: (1)121.68 FT.(BTOC)
 Water Column: 35.42 FT.
 (x) 0.653 GAL/FT.
 Well Volume: 23.13 GAL.
 Total Purge Vol.: 2.8 GAL. ~~0.6~~ Liters

Measuring Device: Horiba 4-53
 Pipe # 21367

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

Purge Device: Geotech PFC-Free Bladder pump # 6131

PARAMETER STABILIZATION CRITERIA

Parameter	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	DTW ft BTOC
Criteria	±0.1	±0.01 (if <1) ±0.02 (if >1)	±0.05 (if <1) ±0.2 (if >1)	±0.1	±10	±10 % ≤ 10 NTU	±0.3 (low flow)

FIELD PARAMETERS

Time	Purge Vol. L (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	DTW ft BTOC	Color / Odor / Comments
1044	initial	8.64	0.582	2.59	5.86	-35	15.1	121.68	Slight yellow color, no odor
1048	400	9.21	0.589	1.86	6.33	-99	13.1	121.68	"
1052	800	9.60	0.596	1.64	6.45	-117	12.8	121.60	"
1056	1.2	9.54	0.597	1.4	6.49	-123	11.9	121.70	"
10100	1.6	9.59	0.598	1.22	6.61	-134	11.4	121.70	"
1104	2.0	9.77	0.601	1.13	6.67	-142	11.4	121.70	"
1108	2.4	9.85	0.602	1.11	6.69	-144	11.4	121.70	"
1112	2.8	9.84	0.602	1.04	6.70	-146	12.3	121.70	"

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
8260514/8270514 Method 537	HCl / 4°C 4°C	40ml VOA / 1L Amber 125 mL Poly	3 / 2 2

Observations/Notes: No dedicated tubing in well.

Pump Start Time: 1025
 Initial Fill Time(FT; sec): 30
 Initial Discharge Time(DT; sec): 60

Pump End Time: 1145
 Pump Depth: 150 ft btoe

Sample /Time: 1115

MS/MSD: NA Duplicate ID: NA

Signature(s): David Butler

Air Monitoring: HS BZ
 VOC (ppm)= 0.0 0.0
 H2S (ppm) 0 0
 LEL (%)= 0 0
 CO (ppm)= 0 0
 O2 (%)= 20.9 20.9

Final Fill Time: 30
 Final Discharge Time: 60
 Purge Rate: 100 mL/min



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
 Location: Osk Harbor, WA
 Event: Area 6, GW Sampling
 Date: 12-11-17
 Weather: Calm, Sunny Low: 30°F
 Total Depth: 122.96 FT. (BTOC) High: 49°F
 Depth to water: (-) 108.78 FT. (BTOC)
 Water Column: 14.18 FT.
 Well Volume: (x) 0.653 GAL/FT.
 Total Purge Vol.: 9.26 GAL.
 Purge Device: Geotech PFC-free Bladder Pump #5882

Project Number: 695610.05.FI.FS
 Well ID: 6-5-31
 Sample ID: WI-A06-6-5-31-1217
 Sampling Team: Shannon Fitzsimmons/RDD
 David Butler/SEA

Measuring Device: Horiba U-500 PINE ID-27447
 Date and Time: 12-11-17 12:55

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA									
Date:	Temp.	Cond.	DO	pH	ORP	Turbidity	Other:	Color / Odor / Comments	
Time:	°C	mS/cm	mg/L	SU	mV	NTU			
12-11-17									
12:55									
Method: Stabilization	±0.1	±0.01	±0.25	±0.1	±10	N/A			

FIELD PARAMETERS									
Time	Purge Vol. (gals) mL	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW ft btoC	Color / Odor / Comments
13:18	initial	10.75	0.492	6.33	7.95	156	7.9	108.81	Clear, No odor
13:22	875	10.48	0.495	3.40	7.85	155	8.2	108.80	" "
	1750	10.15	0.499	3.10	7.91	157	7.9	108.80	" "
	2625	10.11	0.501	2.62	7.89	161	7.6	108.80	" "
13:38	3500	10.07	0.500	2.50	7.90	162	8.0	108.80	" "
13:43	4375	9.93	0.501	2.25	7.87	169	6.9	108.80	" "
13:48	5250	9.87	0.503	1.49	7.91	167	6.6	108.80	" "
13:53	6125	9.79	0.502	2.29	7.88	169	5.9	108.80	" "
13:58	7000	9.77	0.503	2.01	7.82	170	4.2	108.80	" "
14:03	7875	9.73	0.504	2.35	7.87	174	3.2	108.80	" "
14:08	8750	9.69	0.504	2.01	7.88	179	3.7	108.80	" "

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
Method 537	4°C	125mL unpres. poly	2
Method 537 TOP	4°C	125mL unpres. poly	4

Observations/Notes: Purged for >1hr, proceed to sample.
 Pump Start Time: 13:05
 Pump End Time: 14:15
 Pump Depth: 118 ft + btoC
 Sample Time: 14:10
 VOC Reading: 0.0 ppm
 time / Flow Rate (mL/min)
 13:20 / 175
 MS/MSD N/A Duplicate ID No.: N/A
 Signature(s): *[Signature]*



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: NASWI Ault Field
Point: Area 6 Groundwater Sampling
Date: 7/18/18
Weather: overcast, ~65°F

Project Number: 695610.05.FI.FS
Well ID: 6-S-40
Sample ID: WI-AF-WI-A06-6-S-40-0718
Sampling Team: G. Gardner, K. Remmen

Page: 1 of 2

Total Depth: 138.8 FT.(BTOC)
Depth to water: (-) 90.93 FT.(BTOC)
Water Column: 47.87 FT.
(x) 0.163 GAL/FT.
Well Volume: 7.8 GAL. or 29.52
Total Purge Vol.: 4.35 GAL. or 16.5 L

Measuring Device: Solinst WLI
Horiba U-53

Table with 4 columns: Well Dia. (inches), Volume (gallons/foot), Well Dia. (inches), Volume (gallons/foot). Rows for diameters 1, 1.25, 2, 4.

Purge Device: GeoTech PFC-Free Bladder Pump S/N: 1529

PARAMETER STABILIZATION CRITERIA

Table with 8 columns: Parameter, Temp. °C, Cond. mS/cm, DO mg/L, pH SU, ORP mV, Turbidity NTU, DTW ft BTOC. Includes criteria values for each parameter.

FIELD PARAMETERS

Table with 10 columns: Time, Purge Vol. mL (gals), Temp. °C, Cond. mS/cm, DO mg/L, pH SU, ORP mV, Turbidity NTU, DTW ft BTOC, Color / Odor / Comments. Contains multiple rows of sampling data.

Sample information: method, container number, size, and type, preservative used.

Table with 4 columns: Analysis, Preservative, Container requirements, No. of containers. Lists analysis types like PFAS, VOC, SVOC and their respective container needs.

Observations/Notes: ~128 mL/min flow rate, 640 mL per 5 min. interval.

Pump Start Time: 0830
Initial Fill Time (sec): 13
Initial Discharge Time (sec): 35

Final Fill Time: 13
Final Discharge Time: 35

Air Monitoring:
VOC (ppm)=0.00
H2S (ppm)
LEL (%)=
CO (ppm)=
O2 (%)=

Pump Depth: 130' BTOC

Sample Time:

Table with 2 columns: MS/MSD, Duplicate ID: Includes a signature line.



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: NASWI Ault Field
Site: Area 6 Groundwater Sampling
Date: 7/18/18
Weather: sunny / partly cloudy, ~65°F

Project Number: 695610.05.FI.FS
Well ID: 6-5-40
Sample ID: WAF-W1-A06-6-5-40-0718
Sampling Team: G. Gardner, K. Remmen

Total Depth: 138.8 FT.(BTOC)
Depth to water: (-) 90.93 FT.(BTOC)
Water Column: 47.87 FT.
Well Volume: 7.8 GAL. or 29.5L
Total Purge Vol.: 4.35 GAL. or 16.5L
Purge Device: GeoTech PFC-Free Bladder Pump S/N: 1529

Measuring Device: Solinst WLI
Horiba U-53

Table with 4 columns: Well Dia. (inches), Volume (gallons/foot), Well Dia. (inches), Volume (gallons/foot). Rows show data for diameters 1, 1.25, 2, and 4 inches.

PARAMETER STABILIZATION CRITERIA table with 8 columns: Parameter, Temp. °C, Cond. mS/cm, DO mg/L, pH SU, ORP mV, Turbidity NTU, DTW ft BTOC. Includes criteria values for each parameter.

FIELD PARAMETERS table with 10 columns: Time, Purge Vol. mL (gals), Temp. °C, Cond. mS/cm, DO mg/L, pH SU, ORP mV, Turbidity NTU, DTW ft BTOC, Color / Odor / Comments. Contains multiple rows of sampling data.

Sample information: method, container number, size, and type, preservative used.

Table with 4 columns: Analysis, Preservative, Container requirements, No. of containers. Lists analysis types like PFAS, VOC, SVOC and their respective container needs.

Observations/Notes: ~128 mL/min flow rate

Pump Start Time: 0830
Initial Fill Time (sec): 13
Initial Discharge Time (sec): 35

Final Fill Time: 13
Final Discharge Time: 35

Air Monitoring:
VOC (ppm)= 0.0
H2S (ppm)
LEL (%)=
CO (ppm)=
O2 (%)=

Pump Depth: 130 ft btoe

Sample Time: 1017

MS/MSD Duplicate ID:
Signature(s): [Handwritten Signature]



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: NASWI Ault Field
Site: Area 6 Groundwater Sampling
Date: 7/18/18
Weather: Sunny/partly cloudy

Project Number: 695610.05.FI.FS
Well ID: 6-S-41
Sample ID: WI-AF- WI-A06-6-S-41-0718
Sampling Team: G. Gardner, K. Remmen

Total Depth: 114.77 FT.(BTOC)
Depth to water: (-) 100.04 FT.(BTOC)
Water Column: 14.73 FT.
Well Volume: 2.40 GAL. or 9L
Total Purge Vol.: 4.9 GAL. or 18.63L

Measuring Device: Solinst WLI
Horiba U-53

Purge Device: GeoTech PFC-Free Bladder Pump S/N: 1529

Table with 4 columns: Well Dia. (inches), Volume (gallons/foot), Well Dia. (inches), Volume (gallons/foot). Rows show data for well diameters 1, 1.25, 2, and 4 inches.

PARAMETER STABILIZATION CRITERIA

Table with 8 columns: Parameter, Temp. °C, Cond. mS/cm, DO mg/L, pH SU, ORP mV, Turbidity NTU, DTW ft BTOC. Row 1 shows criteria values for each parameter.

FIELD PARAMETERS

Table with 10 columns: Time, Purge Vol. mL (gals), Temp. °C, Cond. mS/cm, DO mg/L, pH SU, ORP mV, Turbidity NTU, DTW ft BTOC, Color / Odor / Comments. Contains multiple rows of field data.

Sample information: method, container number, size, and type, preservative used.

Table with 4 columns: Analysis, Preservative, Container requirements, No. of containers. Lists analysis types like PFAS, VOC, and SVOC with their respective container needs.

Observations/Notes: ~240 mL/min flow rate at start

Pump Start Time: 12:45
Initial Fill Time (sec): 11
Initial Discharge Time (sec): 30
Final Fill Time: 11
Final Discharge Time: 30

Air Monitoring:
VOC (ppm)= 0.0
H2S (ppm)
LEL (%)=
CO (ppm)=
O2 (%)=

Pump Depth: 110.2 110.16 ft btoc

Sample Time: 1350

MS/MSD Duplicate ID:
Signature(s): [Handwritten Signature]



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
 Location: NASWI Ault Field
 Point: Area 6 Groundwater Sampling
 Date: 7/18/18
 Weather: sunny / partly cloudy ~

Project Number: 695610.05.FI.FS Page: 2 of 2
 Well ID: 6-5-41
 Sample ID: WIAF- WI-A06-6-5-41-0718
 Sampling Team: G. Gardner, K. Remmen

Total Depth: 114.77 FT.(BTOC)
 Depth to water: (-) 100.04 FT.(BTOC)
 Water Column: 14.73 FT.
 Well Volume: (x) 0.163 GAL/FT.
 Total Purge Vol.: 2.40 GAL. or 9 L
 4.9 GAL. or 18.63 L

Measuring Device: Solinst WLI
 Horiba U-53

Well Dia. (inches)	Volume (gallons/foot)	Well Dia. (inches)	Volume (gallons/foot)
1	0.041	6	1.469
1.25	0.064		
2	0.163		
4	0.653		

Purge Device: GeoTech PFC-Free Bladder Pump S/N: 1529

PARAMETER STABILIZATION CRITERIA							
Parameter	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	DTW ft BTOC
Criteria	±0.1	±0.01 (if <1) ±0.02 (if >1)	±0.05 (if <1) ±0.2 (if >1)	±0.1	±10	±10 % or ≤ 10 NTU	±0.5 (low flow)

FIELD PARAMETERS									
Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	DTW ft BTOC	Color / Odor / Comments
1339	12110	16.99	0.253	7.77	7.68	104	4.89	100.05	
1342	12785	16.93	0.257	7.79	7.72	106	3.25		

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
PFAS	None	125-mL HDPE	2
PFAS TOP Assay	None	125-mL HDPE	4
VOC	HCl	40-mL VOA	3
SVOC	None	1-L Amber Glass	2

Observations/Notes: ~225 mL / min flow rate.

Pump Start Time: 12:45
 Initial Fill Time (sec): 11
 Initial Discharge Time (sec): 30

Final Fill Time: 11
 Final Discharge Time: 30

Air Monitoring:
 VOC (ppm)= 0.0
 H2S (ppm)
 LEL (%)=
 CO (ppm)=
 O2 (%)=

Pump Depth: 110.16 ft btoC

Sample Time: 1350

MS/MSD Duplicate ID:
 Signature(s): *[Signature]*



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
 Location: NASWI Ault Field
 Point: Area 6 Groundwater Sampling
 Date: 7/19/18
 Weather: overcast, NNW breeze, ~59°F

Project Number: 695610.05.FI.FS Page: 1 of 1
 Well ID: 6-S-42
 Sample ID: WIAF-W1-A06-6-S-42-0718
 Sampling Team: G. Gardner, K. Remmen

Total Depth: 129.89 FT.(BTOC)
 Depth to water: (-) 109.68 FT.(BTOC)
 Water Column: 20.21 FT.
 (x) 0.163 GAL/FT.
 Well Volume: 3.29 GAL. or 12.45 L
 Total Purge Vol.: 6.6 GAL. or 24.9 L
 Purge Device: GeoTech PFC-Free Bladder Pump S/N: 1529

Measuring Device: Solinst WLI
 Horiba U-53

Well Dia. (inches)	Volume (gallons/foot)	Well Dia. (inches)	Volume (gallons/foot)
1	0.041	6	1.469
1.25	0.064		
2	0.163		
4	0.653		

PARAMETER STABILIZATION CRITERIA

Parameter	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	DTW ft BTOC
Criteria	±0.1	±0.01 (if <1) ±0.02 (if >1)	±0.05 (if <1) ±0.2 (if >1)	±0.1	±10	±10 % or ≤ 10 NTU	±0.5 (low flow)

FIELD PARAMETERS

Time	Purge Vol. mL (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	DTW ft BTOC	Color / Odor / Comments
0855	~1892	15.67	0.383	3.29	3.64	326	247	110.75 KR	cloudy, no odor
0900	2927	15.30	0.531	3.03	4.61	252	244	109.75	
0905	3962	14.45	0.661	2.06	6.74	79	207	109.8	
0910	4997	14.44	0.694	2.96	7.01	90	182	109.8	
0915	5997	14.26	0.698	2.74	6.81	75	166	109.8	~200 ml/min flow
0920	6997	14.30	0.702	2.68	7.23	75	150	109.8	
0925	7997	14.48	0.699	7.06	7.26	74	121	109.8	
0930	8997	14.29	0.710	2.26	6.83	80	108	109.8	
0933	9597	14.26	0.712	1.96	6.88	76	107	109.8	
0936	10197	14.25	0.714	1.82	6.84	76	95.7	109.8	
0940	10997	14.19	0.715	1.77	6.84	74	85.2	109.8	

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
PFAS	None	125-mL HDPE	2
PFAS TOP Assay	None	125-mL HDPE	4
VOC	HCl	40-mL VOA	3
SVOC	None	1-L Amber Glass	2

Observations/Notes: ~207 ml/min flow rate

Pump Start Time: 0835
 Initial Fill Time (sec): 12
 Initial Discharge Time (sec): 32

Final Fill Time: 18
 Final Discharge Time: 30

Air Monitoring:
 VOC (ppm)= 1.7 in BZ; can't get
 H2S (ppm) accurate reading in
 LEL (%)= WH due to insecticide.
 CO (ppm)=
 O2 (%)= @ 0815 : 0.1 ppm in BZ
 @ 1000 : 0.2 ppm at pump
 discharge and BZ

Pump Depth: 120.2 ft btoc

Sample Time: 0945 - native; 0955 - duplicate

MS/MSD Duplicate ID: W1-A06-6-S-42P-0718
 Signature(s): *[Signature]*



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: NASWI Ault Field
Point: Area 6 Groundwater Sampling
Date: 7/19/18
Weather: overcast, ~65°F

Project Number: 695610.05.FI.FS
Well ID: WI-6-5-43
Sample ID: WI-AF-WI-A06-6-5-43-0718
Sampling Team: G. Gardner, K. Remmen

Total Depth: 130.29 FT.(BTOC)
Depth to water: (-) 99.13 FT.(BTOC)
Water Column: 31.16 FT.
Well Volume: (x) 0.163 GAL/FT.
Total Purge Vol.: 5.08 GAL. or 19.23 L
Purge Device: GeoTech PFC-Free Bladder Pump S/N: 1529

Measuring Device: Solinst WLI
Horiba U-53

Table with 4 columns: Well Dia. (inches), Volume (gallons/foot), Well Dia. (inches), Volume (gallons/foot). Rows for diameters 1, 1.25, 2, 4.

PARAMETER STABILIZATION CRITERIA

Table with 8 columns: Parameter, Temp. °C, Cond. mS/cm, DO mg/L, pH SU, ORP mV, Turbidity NTU, DTW ft BTOC. Includes criteria values for each parameter.

FIELD PARAMETERS

Table with 10 columns: Time, Purge Vol. mL (gals), Temp. °C, Cond. mS/cm, DO mg/L, pH SU, ORP mV, Turbidity NTU, DTW ft BTOC, Color / Odor / Comments. Contains multiple rows of sampling data.

Sample information: method, container number, size, and type, preservative used.

Table with 4 columns: Analysis, Preservative, Container requirements, No. of containers. Lists analysis types like PFAS, VOC, and SVOC.

Observations/Notes: ~220 ml (min flow)

Pump Start Time: 1305
Initial Fill Time (sec): 12
Initial Discharge Time (sec): 32

Final Fill Time:
Final Discharge Time:

Air Monitoring:
VOC (ppm)= 0.9 ppm
H2S (ppm)
LEL (%)=
CO (ppm)=
O2 (%)=

Pump Depth: 120.0 ft btoc

Sample Time: 1405 - parent ; 1410 - MS/MSD

MS/MSD WI-A06-6-5-43-0718-MS Duplicate ID: WI-A06-6-5-43-0718-MSD

Signature(s): [Handwritten signature]



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: NASWI Ault Field
Ant: Area 6 Groundwater Sampling
Date: 7/19/18
Weather: overcast, ~65°F

Project Number: 695610.05.FI.FS
Well ID: 6-S-43
Sample ID: WLAf-W1-A06-6-S-43-0718
Sampling Team: G. Gardner, K. Remmen

Total Depth: 130.29 FT.(BTOC)
Depth to water: (-) 99.13 FT.(BTOC)
Water Column: 31.16 FT.
Well Volume: 5.08 GAL. or 19.23L
Total Purge Vol.: 7.24 GAL. or 27.42L
Purge Device: GeoTech PFC-Free Bladder Pump S/N: 1529

Measuring Device: Solinst WLI
Horiba U-53

Table with 4 columns: Well Dia. (inches), Volume (gallons/foot), Well Dia. (inches), Volume (gallons/foot). Rows show data for diameters 1, 1.25, 2, and 4 inches.

PARAMETER STABILIZATION CRITERIA table with columns: Parameter, Temp. °C, Cond. mS/cm, DO mg/L, pH SU, ORP mV, Turbidity NTU, DTW ft BTOC, Criteria.

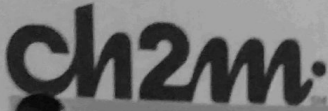
FIELD PARAMETERS table with columns: Time, Purge Vol. mL (gals), Temp. °C, Cond. mS/cm, DO mg/L, pH SU, ORP mV, Turbidity NTU, DTW ft BTOC, Color / Odor / Comments.

Sample information: method, container number, size, and type, preservative used. Table with columns: Analysis, Preservative, Container requirements, No. of containers.

Observations/Notes: ~220 ml/min flow
Pump Start Time: 1305
Initial Fill Time (sec): 12
Initial Discharge Time (sec): 32
Final Fill Time: 10
Final Discharge Time: 30
Pump Depth: 120.0 ft btoe

Air Monitoring:
VOC (ppm)= 0.9
H2S (ppm)
LEL (%)=
CO (ppm)=
O2 (%)=

Sample Time: 1405 -parent, 1410 -MS/MSD
MS/MSD W1-A06-6-S-43-0718-MS Duplicate ID: W1-A06-6-S-46-0718 MSD
Signature(s): [Signature]



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
 Location: Oak Harbor, WA
 Event: Area 6 G-W Sampling
 Date: 12/8/07
 Weather: Clear, 30°, cal m

Project Number: 695010.05, F.I.F.S
 Well ID: G-5-44
 Sample ID: WIA06-G-5-44-1217
 Sampling Team: D. Butler
 S. Fitzsimmons

Total Depth: 98.23 FT.(BTOC)
 Depth to water: (-)83.72 FT.(BTOC)
 Water Column: 14.51 FT.
 (x)0.653 GAL/FT.
 Well Volume: 9.48 GAL.
 Total Purge Vol.: ~2.5 GAL.

Measuring Device: Horiba U-52 (102928)
 Date and Time: 12/8/07 0808

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

Purge Device: Geotech PFC-Free Bladder

SAMPLE DATA

Date:	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other:	Color / Odor / Comments
12/8/07								
Time: 0808								
Method: Stabilization	±0.1	±0.0	±0.2	±0.1	±10	NA	-	-

FIELD PARAMETERS

Time	Purge Vol. mL (gallons)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: ^{DTW} ft htoe	Color / Odor / Comments
10:24	initial	4.75	0.870	8.46	6.32	283	0.0	83.76	clear, no odor
10:29	1500	10.54	0.874	7.59	7.61	275	0.0	83.76	" "
10:34	3000	10.44	0.874	7.44	7.81	272	0.0	83.72	" "
10:39	4500	10.47	0.874	7.34	7.87	270	0.0	83.72	" "
10:44	5000	10.46	0.874	7.29	7.90	268	0.0	83.72	" "

All params stable, proceed to sample

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
Method 537	4°C	125 mL unpres	2
Method 537 TOP	4°C	125 mL unpres	4

Observations/Notes: Halt pump at 0846, get water, waiting for Horiba to cal. Start purge at 1022.

Pump Start Time: 0840
 Pump End Time: 1051
 Pump Depth: 94 ft htoe

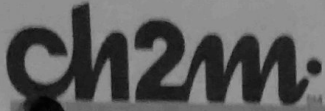
VOC Reading: 0.0 ppm

Flow Rate	
Time	mL/min
1024	300

Sample Time: 1050

MS/MSD: NA Duplicate ID No.: NA

Signature(s): David Butler



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC Project Number: 695610.05.FI.F5
 Location: ~~GTS Effluent~~ Oak Harbor Well ID: GTS Effluent
 Event: Area 6 Sample ID: WI-A06-EFF01-1217 / -TOP
 Date: 12/5/17 Sampling Team: D. Butler
 Weather: Clear, 40^{ss}, calm S. Fitzsimmons

Total Depth: NA FT.(BTOC)
 Depth to water: (-) NA FT.(BTOC)
 Water Column: NA FT.
 (x) NA GAL/FT.
 Well Volume: NA GAL.
 Total Purge Vol.: NA GAL.
 Purge Device: GTS

Measuring Device: Horiba U-52
 Date and Time: 12/5/17 1205

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

DB

SAMPLE DATA

Date:	Temp.	Cond.	DO	pH	ORP	Turbidity	Other: _____	Color / Odor / Comments
Time:	°C	mS/cm	mg/L	SU	mV	NTU		
Method:								

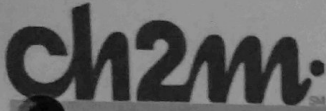
FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: _____	Color / Odor / Comments
1205	NA	8.90	0.854	23.61	7.90	205	25.4		

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
Method 537	4°C	2 125 mL unpres	2
Method 537 TOP	4°C	4 125 mL unpres	4

Observations/Notes: Collected field dup at 1210
 Pump Start Time: ~~DB~~ VOC Reading: ~~DB~~
 Pump Depth: NA
 Sample /Time: 1210
 MS/MSD: NA Duplicate ID No.: WI-A06-EFF01P-1217 / -TOP
 Signature(s): David Belle



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: Oak Harbor, WA
Event: Area 6 GW Sampling
Date: 12/15/17
Weather: Clear, 40's, calm

Project Number: 695610.05.FI.F5
Well ID: GTS Influent
Sample ID: WI-A06-INF01-1217 1-TOP
Sampling Team: D. Butler, S. Fitzsimmons

Total Depth: NA FT.(BTOC)
Depth to water: (-) FT.(BTOC)
Water Column: (x) FT.
Well Volume: GAL/FT.
Total Purge Vol.: GAL.

Measuring Device: Horiba U-52
Date and Time: 12/15/17

Table with 2 columns: Well Dia. (inches) and Volume (gallons/foot). Rows: 1 (0.041), 1.25 (0.064), 2 (0.163), 4 (0.653)

Purge Device: GTS

SAMPLE DATA

Table with 9 columns: Date, Time, Temp. (C), Cond. (mS/cm), DO (mg/L), pH (SU), ORP (mV), Turbidity (NTU), Other, Color / Odor / Comments

FIELD PARAMETERS

Table with 10 columns: Time, Purge Vol. (gals), Temp. (C), Cond. (mS/cm), DO (mg/L), pH (SU), ORP (mV), Turbidity (NTU), Other, Color / Odor / Comments. Row 1: 12:15, NA, 10.51, 0.878, 12.61, 8.02, 91, 8.1

Sample information: method, container number, size, and type, preservative used.

Table with 4 columns: Analysis, Preservative, Container requirements, No. of containers. Row 1: Method 537, 4C, 125 mL unpres poly, 2

Observations/Notes:

Pump Start Time: NA VOC Reading: 0.0 ppm (breathing zone)
Pump Depth: NA

Sample Time: 12:15

MS/MSD: NA Duplicate ID No.: NA

Signature(s): David Butler



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
 Location: Oak Harbor, WA
 Event: Area 6 Off-base
 Date: 2/21/18
 Weather: cloudy, 20°, flurries

Project Number: 095610, 09, FI, F5
 Well ID: MW-01
 Sample ID: WI-AP6-MW-01-0218
 Sampling Team: D. Butler
Li Baumann

Total Depth: 126.25 FT. (BTOC)
 Depth to water: (-)79.45 FT. (BTOC)
 Water Column: 46.8 FT.
(x) 0.163 GAL/FT.
 Well Volume: 7.63 GAL.
 Total Purge Vol.: mL GAL.

Measuring Device: Horiba U-53
 Date and Time: Pine #

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

Purge Device: Geotech PFC-Free Bladder Pump # 6131

SAMPLE DATA								
Date:	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: <u>DTW</u> <u># inter</u>	Color / Odor / Comments
Method:	<u>±0.1</u>	<u>30.01 < 1</u> <u>±0.2 > 1</u>	<u>±0.05 < 1</u> <u>±0.2 > 1</u>	<u>±0.1</u>	<u>±10</u>	<u>±10% or</u> <u>≤10</u>	<u>±0.3</u>	<u> </u>

FIELD PARAMETERS									
Time	Purge Vol. mL (gals) <input checked="" type="checkbox"/>	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: <u>DTW</u>	Color / Odor / Comments
1442	initial	7.82	0.568	3.80	6.99	64	10.6	80.54	
1445	1.75	8.67	.555	2.8	7.47	48	6.9	80.65	
1448	3.50	8.71	.559	2.54	7.59	43	6.51	80.60	
1451	4.75	8.95	.558	2.31	7.67	39	4.79	80.63	
1454	7.0	9.15	.557	2.06	7.70	37	4.55	80.75	
1457	8.75	8.95	.559	1.91	7.74	34	3.93	80.73	
1500	10.5	9.26	.558	1.73	7.73	33	3.29	80.7	
1503	12.25	9.05	.562	1.64	7.78	29	3.16	80.8	
1506	14.00	9.17	.560	1.57	7.75	28	2.83	80.75	
Parameters Stabilized, Sample									

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
8260 SDM	HCl	40 mL VOA's	3
8270 SDM	4°C	1L Amber	2
537 Med	4°C	125 mL poly	2

Observations/Notes: 2 in well, not labeled, but only well in area and TD close to specs when accounting for stickup.
 Pump Start Time: 1425
 Pump End Time: 1526
 Pump Depth: 123 ft b/c
 VOC Reading: Normal in B2 & H5
 Flow rate = 175 mL/min
 Final DTW = 80.81

Sample / Time: 1510 Duplicate ID No.: NA
 MS/MSD: NA
 Signature(s): Daniel Bull



GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
 Location: NASWI Area 6
 Event: Area 6 Off-base Sampling
 Date: 2-22-18
 Weather: Sunny 34°F

Project Number: 695610.05.FI.FS Page: 1 of 1
 Well ID: MW-3B
 Sample ID: WI-A06-MW-3B-0218
 Sampling Team: K. Baumann, E. Cutler

Total Depth: _____ FT.(BTOC)
 Depth to water: (-) 103.25 FT.(BTOC)
 Water Column: _____ FT.
 (x) _____ GAL/FT.
 Well Volume: _____ GAL.
 Total Purge Vol.: _____ GAL.

Measuring Device: Horiba-53
 Geotech Bladder Pump

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

Purge Device: geo control Pro Bladder pump

PARAMETER STABILIZATION CRITERIA

Parameter	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	DTW ft BTOC
Criteria	±0.1	±0.01 (if <1) ±0.02 (if >1)	±0.05 (if <1) ±0.2 (if >1)	±0.1	±10	±10 % ≤ 10 NTU	±0.3 (low flow)

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	DTW ft BTOC	Color / Odor / Comments
1437	1.0	8.66	0.692	5.27	7.41	83	0.0	103.25	Ø
1440	1.6	9.08	0.740	4.26	7.46	82	0.0	103.25	Ø
1443	2.2	9.39	0.771	3.54	7.50	78	0.0	103.25	Ø
1446	2.8	9.49	0.785	3.02	7.50	76	0.0	"	Ø
1449	3.4	9.79	0.792	2.67	7.51	73	0.0	"	Ø
1452	4.0	9.62	0.792	2.61	7.52	72	0.0	"	Ø
1455	4.6	9.57	0.793	2.49	7.53	70	0.0	"	Ø

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers

Observations/Notes:

Pump Start Time:
 Initial Fill Time(FT; sec):
 Initial Discharge Time(DT; sec):

Final Fill Time:
 Final Discharge Time:
 Purge Rate: 200 ml/min

Air Monitoring:
 VOC (ppm)=
 H2S (ppm)
 LEL (%)=
 CO (ppm)=
 O2 (%)=

Pump Depth:
 Sample /Time:
 MS/MSD Duplicate ID:
 Signature(s):

Attachment 2
Drinking Water and Private
Groundwater Well Sampling Forms



Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6 Naval Air Station Whidbey Island Oak Harbor, Washington

NOTIFICATION: ATTACHMENT 2 CONTAINS SENSITIVE BUT UNCLASSIFIED INFORMATION WHICH IS PROTECTED BY THE FREEDOM OF INFORMATION ACT

***FOIA Exemption 6 (5 USC 552(b)(6))
Personal Information Affecting an Individual's Privacy***

TO REQUEST A COPY OF THE DOCUMENT

PLEASE CONTACT

**Department of the Navy
Freedom of Information Act Office**

<http://www.secnav.navy.mil/foia/Pages/default.aspx>

Distribute to U. S. Government Agencies Only

Attachment 3
Chain of Custody

Drinking Water

Chain of Custody Record

Client Information		Sampler Katie Rabe		Lab PM Allen, Kristine D		Carrier Tracking No(s)		COC No 580-27629-9102.1	
Client Contact Tiffany Hill		Phone 503 408 443		E-Mail kristine.allen@testamericainc.com				Page Page 1 of 6	
Company CH2M Hill, Inc.				Analysis Requested				Job #	
Address 1100 NE Circle Boulevard Suite 300		Due Date Requested:							
City Corvallis		TAT Requested (days): STANDARD 10 DAY						A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA	
State Zip OR, 97330		PO # 10006-7-108336						M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	
Email tiffany.hill@ch2m.com		WO #						Other:	
Project Name CLEAN CTO-4041 NAS Whidbey Island		Project # 58011747							
Site AREA 6		SSOW#							

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Water, Soil, Sediment, Air, Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MOD/DOD (Yes or No)	Analysis Requested										Total Number of Containers	Special Instructions/Note:	
							8260C_SIM_DOD5 - (MOD) Copy Analytes	8270D_SIMDOD5AK - (MOD) Copy Analytes											
WI-A06-RW01-0218	2/5/18	15:06	G	Water	N	X	A	N										5	
WI-A06-RW02-0218	2/5/18	15:38	G	Water	N		3	2										5	
WI-A06-RW03-0218	2/5/18	16:11	G	Water	N		3	2										5	
WI-A06-RW04-0218	2/5/18	16:50	G	Water	N		3	2										5	
WI-A06-RW05-0218	2/6/18	10:08	G	Water	N		3											3	
WI-A06-RW05P-0218	2/6/18	10:08	G	Water	N		3											3	
WI-A06-RW06-0218	2/6/18	10:56	G	Water	N		3											3	
WI-A06-RW07-0218	2/6/18	14:05	G	Water	N		3											3	
WI-A06-RW08-0218	2/6/18	18:02	G	Water	N		3											3	
WI-A06-TB01-0218	2/5/18	08:00	G	Water	N		3											3	
				Water															

Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months				
Deliverable Requested. I, II, III, IV, Other (specify)					Special Instructions/QC Requirements				

Empty Kit Relinquished by	Date	Time	Method of Shipment
Relinquished by K. Rabe	2/7/18	13:00	CH2M
Relinquished by	Date/Time	Company	Received by
Relinquished by	Date/Time	Company	Received by
Relinquished by	Date/Time	Company	Received by

Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
--	-------------------	---

Chain of Custody Record

Client Information		Sampler <i>Katie Rabe</i>		Lab PM Allen, Kristine D		Carrier Tracking No(s)		COC No 580-27629-9102.2						
Client Contact Tiffany Hill		Phone 503 410 8443		E-Mail kristine.allen@testamericainc.com				Page Page 2 of 6						
Company CH2M Hill, Inc.				Analysis Requested						Job #				
Address 1100 NE Circle Boulevard Suite 300		Due Date Requested:								Preservation Codes:				
City Corvallis		TAT Requested (days): <i>10 day</i>		A - HCL	M - Hexane	B - NaOH	N - None	C - Zn Acetate	O - AsNaO2					
State/Zip OR, 97330		PO # 10006-7-108336		D - Nitric Acid	P - Na2O4S	E - NaHSO4	Q - Na2SO3	F - MeOH	R - Na2S2O3					
Phone		WO #		G - Amchlor	S - H2SO4	H - Ascorbic Acid	T - TSP Dodecahydrate	I - Ice	U - Acetone					
Email tiffany.hill@ch2m.com		Project # 58011747		J - DI Water	V - MCAA	K - EDTA	W - pH 4-5	L - EDA	Z - other (specify)					
Project Name CLEAN CTO-4041 NAS Whidbey Island		SSOW#		Other:	Total Number of Containers									
Site <i>AREA 6</i>														
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)						Matrix (Water, Soil, Organics/Oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260C_SIM_DOD5 - (MOD) Copy Analytes	8270D_SIMDOD5AK - (MOD) Copy Analytes
				Preservation Code:						X	X	A	N	
<i>W1-A06-RW05-0218</i>		<i>2/6/18</i>	<i>10:08</i>	<i>G</i>						Water	<i>N</i>		<i>2</i>	
<i>W1-A06-RW05P-0218</i>		<i>2/6/18</i>	<i>10:08</i>	<i>G</i>						Water	<i>N</i>		<i>2</i>	
<i>W1-A06-RW06-0218</i>		<i>2/6/18</i>	<i>10:56</i>	<i>G</i>						Water	<i>N</i>		<i>2</i>	
<i>W1-A06-RW07-0218</i>		<i>2/6/18</i>	<i>14:05</i>	<i>G</i>						Water	<i>N</i>		<i>2</i>	
<i>W1-A06-RW08-0218</i>		<i>2/6/18</i>	<i>18:02</i>	<i>G</i>						Water	<i>N</i>		<i>2</i>	
										Water				
					Water									
					Water									
					Water									
					Water									
					Water									

Possible Hazard Identification

Non-Hazard
 Flammable
 Skin Irritant
 Poison B
 Unknown
 Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client
 Disposal By Lab
 Archive For _____ Months

Special Instructions/QC Requirements

Deliverable Requested: I, II, III, IV, Other (specify)		Date	Time	Method of Shipment
Empty Kit Relinquished by		Date/Time	Company	Received by
Relinquished by <i>K. Rabe</i>		<i>2/8/18</i>	<i>13:00</i>	<i>CH2M</i>
Relinquished by		Date/Time	Company	Received by
Relinquished by		Date/Time	Company	Received by
Relinquished by		Date/Time	Company	Received by

Cooler Temperature(s) °C and Other Remarks

Custody Seals Intact Custody Seal No. _____

Yes No



CHAIN OF CUSTODY

For Laboratory Use Only

Work Order #: _____ Temp: _____ °C

Storage ID: _____ Storage Secured: Yes No

Project ID: CLEAN CTD-4041 PO#: 10006-7-108336 Sampler: K. RABE/CH2M
WHIDBEY ISLAND (name)

TAT Standard: 21 days
 (check one): Rush (surcharge may apply)
 14 days 7 days Specify 10

Invoice to: Name TIFFANY HILL Company CH2M HILL Address 1100 NE CIRCLE BLVD 300 City CORVALLIS State OR Ph# 97330 Fax# _____

Relinquished by (printed name and signature) Katie Rabe Date 2/7/18 Time 1300 Received by (printed name and signature) _____ Date _____ Time _____

SHIP TO: Vista Analytical Laboratory
 1104 Windfield Way
 El Dorado Hills, CA 95762
 (916) 673-1520 * Fax (916) 673-0106

Method of Shipment: _____
 Tracking No.: _____

ATTN: _____

Add Analysis(es) Requested			Mod. EPA Method 537	EPA Method 537 (DW only)
Quantity	Type	Matrix		
			PFOA/PFOS	UCMR3 PFAS List 6
			537 List: 14	Full List of 28
			Other: Please List Below	

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	PFOA/PFOS	UCMR3 PFAS List 6	537 List: 14	Full List of 28	Other: Please List Below	PFOA/PFOS	UCMR3 PFAS List 6	PFAS List: 14	Comments
WI-AD6-RW01-0218	2/5/18	15:06		2	P	DW									TZ
WI-AD6-FB01-0218	2/5/18	15:07		2	P	DW									
WI-AD6-RW02-0218	2/5/18	15:38		2	P	DW									
WI-AD6-FB02-0218	2/5/18	15:39		2	P	DW									
WI-AD6-RW03-0218	2/5/18	16:11		2	P	DW									
WI-AD6-FB03-0218	2/5/18	16:12		2	P	DW									
WI-AD6-RW04-0218	2/5/18	16:50		2	P	DW									
WI-AD6-FB04-0218	2/5/18	16:51		2	P	DW									
WI-AD6-RW05-0218	2/6/18	10:08		2	P	DW									
WI-AD6-FB05-0218	2/6/18	10:08		2	P	DW									

Special Instructions/Comments: _____

SEND DOCUMENTATION AND RESULTS TO:

Name: TIFFANY HILL
 Company: CH2M
 Address: 1100 NE CIRCLE, BLVD 300
 City: CORVALLIS State: OR Zip: 97330
 Phone: _____ Fax: _____
 Email: tiffany.hill@ch2m.com

Container Types: P= HDPE, PJ= HDPE Jar
 O = Other: _____

Bottle Preservation Type: T = Thiosulfate,
 TZ = Trizma: _____

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,
 SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _____



CHAIN OF CUSTODY

For Laboratory Use Only

Work Order #: _____ Temp: _____ °C

Storage ID: _____ Storage Secured: Yes No

Project ID: CLEAN CTO-4041 PO#: 10006-7-108336 Sampler: K. Rabe / CH2M
Whidbey Island (name)

TAT Standard: 21 days
(check one): Rush (surcharge may apply)
 14 days 7 days **Specify: 10**

Invoice to: Name Tiffany Hill Company CH2M HILL Address 1100 NE CIRCLE BLVD 300 City CORVALLIS State OR Ph# 97330 Fax# _____

Relinquished by (printed name and signature) KATIE RABE Date 2/7/18 Time 1300 Received by (printed name and signature) _____ Date _____ Time _____

Sample ID	Date	Time	Location/Sample Description	Add Analysis(es) Requested							Comments		
				Quantity	Type	Matrix	PFOA/PFOS	UCMR3 PFAS List: 8	537 List: 14	Full List of 26		Other: Please List Below	
W1-A06-RW06-0218	2/6/18	1056		2	P	DW							TZ
W1-A06-RW05P-0218	2/6/18	1008		2	P	DW							TZ
W1-A06-FB06-0218	2/6/18	1056		2	P	DW							TZ
W1-A06-RW07-0218	2/6/18	1405		2	P	DW							TZ
W1-A06-FB07-0218	2/6/18	1405		2	P	DW							TZ
W1-A06-RW08-0218	2/6/18	1802		2	P	DW							TZ
W1-A06-FB08-0218	2/6/18	1802		2	P	DW							TZ

Special Instructions/Comments: _____

SEND DOCUMENTATION AND RESULTS TO:

Name: TIFFANY HILL
Company: CH2M
Address: 1100 NE CIRCLE, BLVD 300
City: CORVALLIS State: OR Zip: 97330
Phone: _____ Fax: _____
Email: tiffany.hill@ch2m.com

Container Types: P= HDPE, PJ= HDPE Jar
O = Other: _____

Bottle Preservation Type: T = Thiosulfate,
(TZ) = Trizma: _____

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,
SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _____

TestAmerica Seattle

5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

Loc: 580
75081

Chain of Custody Record

COOLER 1/2

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: <u>KATIE RABE/CH2M</u>	Lab PM: Allen, Kristine D	Carrier Tracking No(s):	COG No: 580-27629-9102.5
Client Contact: Tiffany Hill	Phone: <u>503.410.8443</u>	E-Mail: kristine.allen@testamericainc.com		Page: Page 5 of 6
Company: CH2M Hill, Inc.	Analysis Requested			Job #:

Address: 1100 NE Circle Boulevard Suite 300	Due Date Requested:	Field Filtered Sample (Yes or No) <input type="checkbox"/> Perform MS/MSD (Yes or No) <input type="checkbox"/> 8260C_SIM_DODS - (MOD) Copy Analytes <input type="checkbox"/> 8270D_SIMDOD5AK - (MOD) Copy Analytes <input type="checkbox"/>	Total Number of Containers	Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify)
City: Corvallis	TAT Requested (days): <u>10 DAY</u>			
State, Zip: OR, 97330	PO #: 10006-7-108336			
Phone:	WO #:			
Email: tiffany.hill@ch2m.com	Project #: 58011747			
Project Name: CLEAN CTO-4041 NAS Whidbey Island	SSOW#:			
Site:				

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oi, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260C_SIM_DODS - (MOD) Copy Analytes	8270D_SIMDOD5AK - (MOD) Copy Analytes	Total Number of Containers	Special Instructions/Note:
					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	A	N		
W1-A06-RW09-0218	2/7/18	13:26	G	Water			3	2	5	
W1-A06-RW09-0218-MS	2/7/18	13:26	G	Water			3	2	5	
W1-A06-RW09-0218-MSD	2/7/18	13:26	G	Water			3	2	5	
W1-A06-TB02-0218	2/7/18	08:00	G	Water			3		3	
W1-A06-RW10-0218	2/12/18	10:09	G	Water			3		3	
W1-A06-RW11-0218	2/12/18	13:09	G	Water			3		3	
W1-A06-RW12-0218	2/12/18	14:53	G	Water			3		3	
				Water						
				Water						
				Water						
				Water						

Therm. ID A2 Cor 0.7 Unc 0.2
 Cooler Dsc: Lrg Green
 Wet/Packs Packing: Bubble

Possible Hazard Identification	<input checked="" type="checkbox"/> Non-Hazard	<input type="checkbox"/> Flammable	<input type="checkbox"/> Skin Irritant	<input type="checkbox"/> Poison B	<input type="checkbox"/> Unknown	<input type="checkbox"/> Radiological	Sample Disposal (A fee may be assessed if s)	<input type="checkbox"/> Return To Client	<input checked="" type="checkbox"/> Disposal By Lab	Therm ID <u>A2</u>	Custody Seal: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
---------------------------------------	--	------------------------------------	--	-----------------------------------	----------------------------------	---------------------------------------	--	---	---	--------------------	---

Deliverable Requested: I, II, III, IV, Other (specify) _____ Special Instructions/QC Requirements: _____

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
----------------------------	-------	-------	---------------------

Relinquished by: <u>KATIE RABE</u>	Date/Time: <u>2/13/18 11:00</u>	Company: <u>CH2M</u>	Received by: <u>B Hall</u>	Date/Time: <u>2/14/18 0955</u>	Company: <u>SRATA</u>
------------------------------------	---------------------------------	----------------------	----------------------------	--------------------------------	-----------------------

Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
------------------	------------	----------	--------------	------------	----------

Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.:	Temperature(s) °C and Other Remarks:	Therm. ID <u>A2</u> Cor <u>0.7</u> Unc <u>1.0</u>
---	-------------------	--------------------------------------	---



Wet/Packs Packing: Bubble 02/22/2018
 Custody Seal: Yes No

Chain of Custody Record

COOLER 2 / 2

Client Information		Sampler: KATIE RABE/CH2M		Lab PM: Allen, Kristine D		Carrier Tracking No(s):		COC No: 580-27629-9102.4	
Client Contact: Tiffany Hill		Phone: 503 410 8443		E-Mail: kristine.allen@testamericainc.com				Page: Page 4 of 6	
Company: CH2M Hill, Inc.								Job #:	
Address: 1100 NE Circle Boulevard Suite 300		Due Date Requested:		Field Filtered Sample (Yes or No) <input type="checkbox"/> <input checked="" type="checkbox"/> Perform MS/MSD (Yes or No) <input type="checkbox"/> <input checked="" type="checkbox"/> 8260C_SIM_D005 - (MOD) Copy Analytes <input type="checkbox"/> <input checked="" type="checkbox"/> 8270D_SIMD005AK - (MOD) Copy Analytes <input type="checkbox"/> <input checked="" type="checkbox"/>		Total Number of Containers		Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify)	
City: Corvallis		TAT Requested (days): 10 DAY							
State, Zip: OR, 97330		PO #: 10006-7-108336							
Phone:		WO #:							
Email: tiffany.hill@ch2m.com		Project #:							
Project Name: CLEAN CTO-4041 NAS Whidbey Island		SSOW#:							
Site:									
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Preservation Code		Special Instructions/Note:	
WI-A06-RW10-0218		2/12/18	10:09	G	Water	A	N	2	
WI-A06-RW11-0218		2/12/18	13:09	G	Water			2	
WI-A06-RW12-0218		2/12/18	14:53	G	Water			2	
					Water				
					Water				
					Water				
					Water				
					Water				
					Water				
					Water				
					Water				
					Water				
Possible Hazard Identification					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)				
<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological					<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months				
Deliverable Requested: I, II, III, IV, Other (specify)					Special Instructions/QC Requirements:				
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:			
Relinquished by: KATIE RABE		Date/Time: 2/13/18 11:00		Company: CH2M		Received by:		Date/Time:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:	
Custody Seals Intact: Δ Yes Δ No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:					

TestAmerica Seattle

5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

Loc: 580
75081

Chain of Custody Record

COOLER 1/2

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Client Information
 Client Contact: Tiffany Hill
 Company: CH2M Hill, Inc.
 Address: 1100 NE Circle Boulevard Suite 300
 City: Corvallis
 State, Zip: OR, 97330
 Phone: [blank]
 Email: tiffany.hill@ch2m.com
 Project Name: CLEAN CTO-4041 NAS Whidbey Island
 Site: [blank]

Sampler: KATIE RABE/LH2M
 Lab PM: Allen, Kristine D
 Carrier Tracking No(s): [blank]
 Phone: 503.410.8443
 E-Mail: kristine.allen@testamericainc.com
 COC No: 580-27629-9102.5
 Page: Page 5 of 6
 Job #: [blank]

Analysis Requested

Field Filtered Sample (Yes or No)	Perform MS/MSO (Yes or No)	8260C_SIM_D0D5 - (MOD) Copy Analytes	8270D_SIMD0D5AK - (MOD) Copy Analytes	Other
		A	N	

Preservation Codes:
 A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Special Instructions/Note:
 Therm. ID A2 Cor 0.7 Unc 0.2
 Cooler Dsc: Lrg Green
Wet/Packs Packing: Bubble
 Custody Seal: Yes No

Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological

Sample Disposal (A fee may be assessed if)
 Return To Client Disposal By Lab Archive For _____

Empty Kit Relinquished by: [blank] **Date:** [blank] **Time:** [blank] **Method of Shipment:** [blank]

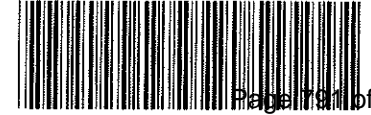
Relinquished by: KATIE RABE JL RABE **Date/Time:** 2/13/18 11:00 **Company:** CH2M **Received by:** [signature] **Date/Time:** 2/14/18 0955 **Company:** SKA TA

Relinquished by: [blank] **Date/Time:** [blank] **Company:** [blank] **Received by:** [blank] **Date/Time:** [blank] **Company:** [blank]

Relinquished by: [blank] **Date/Time:** [blank] **Company:** [blank] **Received by:** [blank] **Date/Time:** [blank] **Company:** [blank]

Custody Seals Intact: Yes No **Custody Seal No.:** [blank]

Temperature(s) °C and Other Remarks:
 Therm. ID A2 Cor 0.7 Unc 1.0
 Cooler Dsc: Lrg Blue
Wet/Packs Packing: Bubble 02/22/2018
 Custody Seal: Yes No



CHAIN OF CUSTODY

For Laboratory Use Only

Work Order #: 1800307

Temp: 2.0 °C

Storage ID: WR-2

Storage Secured: Yes No

Project ID: CTO-4041 CLEAN WHIDBEY ISLAND PO#: 10006-7-108336 Sampler: KATIE RABE
(name)

TAT Standard: 21 days
(check one): Rush (surcharge may apply)
 14 days 7 days Specify 10

Invoice to: Name TIFFANY HILL Company CH2M Hill Address 1100 NE CIRCLE BLVD, SUITE 300 CORVALLIS OR 97330 City CORVALLIS State OR Ph# 97330 Fax# 97330

Relinquished by (printed name and signature) KATIE RABE Date 2/13/18 Time 11:00 Received by (printed name and signature) Ashweeni Prakash Date 02/14/18 Time 10:19

Relinquished by (printed name and signature) KATIE RABE Date 2/13/18 Time 11:00 Received by (printed name and signature) Ashweeni Prakash Date 02/14/18 Time 10:19

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
(916) 673-1520 * Fax (916) 673-0106

Method of Shipment:
FedEx

Tracking No.: _____

Add Analysis(es) Requested

Container(s)

Mod. EPA Method 537

EPA Method 537(DW only)

ATTN: _____

Sample ID	Date	Time	Location/Sample Description	Quantity		Matrix	Add Analysis(es) Requested					Comments		
				Type	Matrix		PFOA/PFOS	UCMR3 PFAS List:6	537 List: 14	Full List of 28	Other: Please List Below		PFOA/PFOS	UCMR3 PFAS List:6
W1-ADW-RW09-0218	2/7/18	13:26		2	P	DW							2	
W1-ADW-RW09-0218-M	2/7/18	13:24		2	P	DW							2	
W1-ADW-RW09-0218-M	2/7/18	13:26		2	P	DW							2	
W1-ADW-FB09-0218	2/7/18	13:26 ^{13:27}		2	P	DW							2	
W1-ADW-RW10-0218	2/12/18	10:09		2	P	DW							2	
W1-ADW-FB10-0218	2/12/18	10:10		2	P	DW							2	
W1-ADW-RW11-0218	2/12/18	13:09		2	P	DW							2	
W1-ADW-FB11-0218	2/12/18	13:10		2	P	DW							2	
W1-ADW-RW12-0218	2/12/18	14:53		2	P	DW							2	
W1-ADW-FB12-0218	2/12/18	14:54		2	P	DW							2	

Special Instructions/Comments: _____

SEND DOCUMENTATION AND RESULTS TO:

Name: TIFFANY HILL
Company: CH2M
Address: 1100 NE CIRCLE BLVD STE. 300
City: CORVALLIS State: OR Zip: 97330
Phone: _____ Fax: _____
Email: tiffany.hill@ch2m.com

Container Types: P= HDPE, PJ= HDPE Jar
O = Other: _____

Bottle Preservation Type: T = Thiosulfate,
TZ = Trizma: _____

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,
SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _____

TestAmerica Seattle
 5755 8th Street East
 Tacoma, WA 98424
 Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record

Client Information		Sampler: <u>KATIE RABE</u>	Lab PM: Allen, Kristine D	Carrier Tracking No(s):	COC No: 580-27629-9102.6								
Client Contact: Tiffany Hill		Phone: <u>503.410.8443</u>	E-Mail: kristine.allen@testamericainc.com		Page: <u>Page 6 of 6</u> PAGE 1/1								
Company: CH2M Hill, Inc.		Analysis Requested			Job #:								
Address: 1100 NE Circle Boulevard Suite 300		Due Date Requested:	Loc: 580 75176										
City: Corvallis		TAT Requested (days): <u>10 DAYS</u>											
State, Zip: OR, 97330		PO #: 10006-7-108336											
Phone:		WO #:											
Email: tiffany.hill@ch2m.com		Project #: 58011747											
Project Name: CLEAN CTO-4041 NAS Whidbey Island		SSOW#:	Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify)										
Site:													
Sample Identification	Sample Date	Sample Time				Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSB (Yes or No)	8260C_SIM_DOD5 - (MOD) Copy Analytes	8270D_SIMDOD5AK - (MOD) Copy Analytes	Total Number of containers	Special Instructions/Note:
X	X	X				X	X	X	X	X	X	X	X
X	X	X				X	X	X	X	X	X	X	X
<u>WI-A06-RW13-0218</u>	<u>2/13/18</u>	<u>1551</u>	<u>G</u>	<u>Water</u>	<u>N</u>	<u>M</u>	<u>3</u>	<u>2</u>	<u>5</u>				
<u>WI-A06-RW14-0218</u>	<u>2/14/18</u>	<u>925</u>	<u>G</u>	<u>Water</u>	<u>N</u>	<u>N</u>	<u>3</u>	<u>2</u>	<u>5</u>				
<u>WI-A06-RW15-0218</u>	<u>2/14/18</u>	<u>1003</u>	<u>G</u>	<u>Water</u>	<u>N</u>	<u>N</u>	<u>3</u>	<u>2</u>	<u>5</u>				
<u>WI-A06-RW16-0218</u>	<u>2/14/18</u>	<u>1104</u>	<u>G</u>	<u>Water</u>	<u>N</u>	<u>N</u>	<u>3</u>	<u>2</u>	<u>5</u>				
<u>WI-A06-TB03-0218</u>	<u>2/13/18</u>	<u>0800</u>	<u>G</u>	<u>WATER</u>	<u>N</u>	<u>N</u>	<u>3</u>	<u>2</u>	<u>3</u>				

Therm. ID 5 Corob. UN06
 Cooler Dsc: Ly Blue
 Wat/Packs Packing: Bub
 FPO Custody Seal: Yes No

580-75176 Chain of Custody

Possible Hazard Identification				Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)			
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological				<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
Deliverable Requested: I, II, III, IV, Other (specify)				Special Instructions/QC Requirements:			
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:	
Relinquished by: <u>Katie Rabe</u>		Date/Time: <u>2/15/18 9:00</u>		Company: <u>CH2M</u>		Received by: <u>Kang Heib</u>	
Relinquished by:		Date/Time:		Company:		Received by:	
Relinquished by:		Date/Time:		Company:		Received by:	
Custody Seals Intact: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:			



CHAIN OF CUSTODY

For Laboratory Use Only
 Work Order #: 1800377 Temp: 0.5 °C
 Storage ID: WR-7 Storage Secured: Yes No

Project ID: CTO-4041 CLEAN WHIDBEY ISLAND PO#: 10006-7-108336 Sampler: KATE RABE (name)

TAT Standard: 21 days
 (check one): Rush (surcharge may apply)
 14 days 7 days Specify: 10 DAY

Invoice to: Name TIFFANY HILL Company CH2M HILL Address 1100 NE CIRCLE BLVD, SUITE 300 City CORVALLIS State OR Ph# 97330 Fax#

Relinquished by (printed name and signature) Kate Rabe Date 2/15/18 Time 0900 Received by (printed name and signature) B. Benedict Beth Briant Date 02/16/18 Time 0913

SHIP TO: Vista Analytical Laboratory
 1104 Windfield Way
 El Dorado Hills, CA 95762
 (916) 673-1520 * Fax (916) 673-0106

Method of Shipment: _____
 Tracking No.: _____

ATTN: _____

Sample ID	Date	Time	Location/Sample Description	Add Analysis(es) Requested										Comments								
				Quantity	Type	Matrix	PFDA/ PFOS	UCMR3 PFAS List#6	537 List: 14	Full List of 28	Other, Please List Below	Mod. EPA Method 537	EPA Method 537(DW only)									
WI-A06-RW13-0218	2/13/18	1551		2	P	DW																
WI-A06-FB13-0218	2/13/18	1552		2	P	DW																
WI-A06-RW14-0218	2/14/18	9:25		2	P	DW																
WI-A06-FB14-0218	2/14/18	9:26		2	P	DW																
WI-A06-RW15-0218	2/14/18	10:03		2	P	DW																
WI-A06-FB15-0218	2/14/18	10:04		2	P	DW																
WI-A06-RW16-0218	2/14/18	11:04		2	P	DW																
WI-A06-FB16-0218	2/14/18	11:05		2	P	DW																

Special Instructions/Comments: _____

SEND DOCUMENTATION AND RESULTS TO:

Name: TIFFANY HILL
 Company: CH2M HILL
 Address: 1100 NE CIRCLE BLVD, SUITE 300
 City: CORVALLIS State: OR Zip: 97330
 Phone: _____ Fax: _____
 Email: tiffany.hill@ch2m.com

Container Types: P = HDPE, PJ = HDPE Jar
 O = Other: _____

Bottle Preservation Type: T = Thiosulfate, TZ = Trizma: _____

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _____

Chain of Custody Record

Tacoma, WA 98424-1317
phone 253.922.2310 fax 253.922.5047

Regulatory Program: DW NPDES RCRA Other:

TestAmerica Laboratories, Inc.

Client Contact		Project Manager: Heather Perry		Site Contact: David Butler		Date: 2/22/2018		COC No: AREA6_TA_20180222	
CH2M		Tel/Fax: (530) 229-3276		Lab Contact: Kris Allen		Carrier: Fed Ex		1 of 2 Pages	
1100 112th Ave NE Suite 500		Analysis Turnaround Time							
Bellevue, WA 98004		<input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below _____ <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day							
(425) 453-5005 Phone		Filtered Sample (Y/N) Perform MS / MSD (Y/N) 8260SIM 8270SIM Therm. ID <u>A2</u> Cor <u>1.7</u> Unc <u>1.7</u> Cooler Dsc: <u>Lg Blue</u> Wet/Packs Packing: <u>bub</u> Custody Seal: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>							
425-468-3100 FAX									
Project Name: NASWI									
Site: Area 6 Off-base									
P O # 695610.05.FI.FS		Job / SDG No.: _____ Sample Specific Notes: _____ MS/MSD on 8270SIM only MS/MSD on 8270SIM only							

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	8260SIM	8270SIM
TripBlank	2/19/2018	07:00	G	W	2	N	N	X	
WI-A06-EB01-021918	2/19/2018	16:45	G	W	5	N	N	X	X
WI-A06-MW-13-0218	2/20/2018	11:10	G	W	5	N	Y	X	X
WI-A06-MW-13-0218-MS	2/20/2018	11:10	G	W	2	N	Y		X
WI-A06-MW-13-0218-MSD	2/20/2018	11:10	G	W	2	N	Y		X
WI-A06-RW17-0218	2/20/2018	13:40	G	W	5	N	N	X	X
WI-A06-RW17P-0218	2/20/2018	13:45	G	W	5	N	N	X	X
WI-A06-6-DW-38A-0218	2/20/2018	14:55	G	W	5	N	N	X	X
WI-A06-6-S-27-0218	2/21/2018	11:15	G	W	5	N	N	X	X
WI-A06-6-S-28-0218	2/21/2018	11:15	G	W	5	N	N	X	X
WI-A06-FB01-022118	2/21/2018	15:00	G	W	5	N	N	X	X
WI-A06-MW-01-0218	2/21/2018	15:10	G	W	5	N	N	X	X

Therm. ID A2 Cor 1.7 Unc 1.7
 Cooler Dsc: Lg Blue
 Wet/Packs Packing: bub
 Custody Seal: Yes No

Therm. ID A2 Cor 1.1 Unc 2.0
 Cooler Dsc: Lg Blue
 Wet/Packs Packing: bub
 Custody Seal: Yes No

Therm. ID A2 Cor 0.1 Unc 0.0
 Cooler Dsc: Lg Green
 Wet/Packs Packing: Bub
 Custody Seal: Yes No

FPO

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

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

Non-Hazard Flammable Skin Irritant Poison B Unknown

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

Return to Client Disposal by Lab Archive for _____ Months

Special Instructions/QC Requirements & Comments: Send results to Tiffany Hill/CH2M (tiffany.hill@ch2m.com)

Custody Seals Intact: Yes No

Custody Seal No.: _____ Cooler Temp. (°C) Obs'd: _____ Cor'd: _____ Therm ID No.: _____

Relinquished by: <u>Eric Cutler</u>	Company: <u>CH2M</u>	Date/Time: <u>2-22-18 0845</u>	Received by: <u>[Signature]</u>	Company: <u>USEA</u>	Date/Time: <u>2-23-18 0955</u>
Relinquished by: _____	Company: _____	Date/Time: _____	Received by: _____	Company: _____	Date/Time: _____
Relinquished by: _____	Company: _____	Date/Time: _____	Received in Laboratory by: _____	Company: _____	Date/Time: _____





CHAIN OF CUSTODY

For Laboratory Use Only
 Work Order #: 1800361 Temp: 0.0 °C
 Storage ID: WR-2 Storage Secured: Yes No

Project ID: NASWI Area 6 PO#: 695610.05; FI, FS Sampler: David Butler
 (name)

TAT Standard: 21 days
 (check one): Rush (surcharge may apply)
 14 days 7 days Specify: _____

Invoice to: Name Heather Perry Company CH2M Address 2525 Airpark Drive City Redding State CA Ph# 530-229-3276 Fax# _____

Relinquished by (printed name and signature) Eriz Cutler Date 2-22-18 Time 0900 Received by (printed name and signature) B. Benedict Beth Benedict Date 02/23/18 Time 0939

SHIP TO: Vista Analytical Laboratory
 1104 Windfield Way
 El Dorado Hills, CA 95762
 (916) 673-1520 * Fax (916) 673-0106
 ATTN: Sample Receiving

Method of Shipment: Fed Ex
 Tracking No.: _____

Sample ID	Date	Time	Location/Sample Description	Add Analysis(es) Requested		Mod. EPA Method 537	EPA Method 537 (DW only)	Comments						
				Container(s)	Quantity									
				Quantity	Type	Matrix	PFOA/PFOS	UCMR3 PFAS List 8	537 List: 14	Full List of 26 Other: Please List Below	PFOA/PFOS	UCMR3 PFAS List 6	PFAS List: 14	
WI-A06-5-01-0218	2/19/18	1200	Area 6	2	P	AQ		X						(A,B)
WI-A06-5-01P-0218	2/19/18	1210		2	P	AQ		X						(A,B)
WI-A06-5-01-0218-MS	2/19/18	1200		2	P	AQ		X					MS	(A,B)
WI-A06-5-01-0218-MSD	2/19/18	1200		2	P	AQ		X					MSD	(A,B)
WI-A06-FB01-021918	2/19/18	1300		2	P	AQ		X						(A,B)
WI-A06-EB01-021918	2/19/18	1645		2	P	AQ		X						
WI-A06-MW-13-0218	2/20/18	1110		2	P	AQ		X						
WI-A06-FB01-022018	2/20/18	1025		2	P	AQ		X						
* WI-A06-RW17-0218	2/20/18	1340		2	P	DW							X	

Special Instructions/Comments:
* WO 1800362

SEND DOCUMENTATION AND RESULTS TO:

Name: Tiffany Hill
 Company: CH2M
 Address: 1100 NE Circle Blvd Suite 300
 City: Corvallis State: OR Zip: 97330
 Phone: 541-768-3109 Fax: _____
 Email: tiffany.hill@ch2m.com

Container Types: P= HDPE, PJ= HDPE Jar
 Bottle Preservation Type: T = Thiosulfate, Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, O = Other: _____
 SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _____



CHAIN OF CUSTODY

For Laboratory Use Only
 Work Order #: 1800361 Temp: 0.0 °C
 Storage ID: WR-2 Storage Secured: Yes No

Project ID: NASWI Area 6 PO#: 695610.05.FI.F5 Sampler: David Butler
 (name)

TAT Standard: 21 days
 (check one): Rush (surcharge may apply) 14 days 7 days Specify: _____

Invoice to: Name Heather Perry Company CH2M Address 2525 Airpark Drive City Redding State CA Ph# 530-229-3276 Fax# _____

Relinquished by (printed name and signature) Eric Cuthbert Date 2-22-18 Time 0900 Received by (printed name and signature) B Benedict Date 02/23/18 Time 0940

SHIP TO: Vista Analytical Laboratory
 1104 Windfield Way
 El Dorado Hills, CA 95762
 (916) 673-1520 * Fax (916) 673-0106

ATTN: Sample Receiving

Method of Shipment: Fed Ex
 Tracking No.: _____

Add Analysis(es) Requested		Container(s)		Mod. EPA Method 537		EPA Method 537(DW only)	
Quantity	Type	Matrix	PFAS List 6	PFAS List 14	Full List of 26	OWT: Please List Below	Comments

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	PFAS List 6	PFAS List 14	Full List of 26	OWT: Please List Below	Comments
* WI-A06-RWTP-0218	2/20/18	1345	Area 6	2	P	DW					
* WI-A06-FB02-022018	2/20/18	1350		1	P	DW					
WI-A06-6 Bin 35A 0218	2/20/18	1455		2	P	AQ					
WI-A06-FB01-022018	2/20/18	1700		2	P	AQ					
WI-A06-G-5-27-0218	2/21/18	1115		2	P	AQ					
WI-A06-G-5-28-0218	2/21/18	1115		2	P	AQ					
WI-A06-FB01-022118	2/21/18	1500		2	P	AQ					
WI-A06-MW-01-0218	2/21/18	1510		2	P	AQ					
WI-A06-EB01-022118	2/21/18	1650		2	P	AQ					

Special Instructions/Comments: _____
* WO 1800362

SEND DOCUMENTATION AND RESULTS TO:

Name: Tiffany Hill
 Company: CH2M
 Address: 1100 NE Circle Blvd Suite 300
 City: Cornwall State: OR Zip: 97330
 Phone: 541-268-3109 Fax: _____
 Email: tiffany.hill@ch2m.com

Container Types: P= HDPE, PJ= HDPE Jar
 O = Other: _____

Bottle Preservation Type: T = Thiosulfate,
 TZ = Trizma: _____

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,
 SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _____

TestAmerica Seattle
 5755 8th Street East
 Tacoma, WA 98424
 Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING

Client Information Client Contact: Tiffany Hill Company: CH2M Hill, Inc. Address: 1100 NE Circle Boulevard Suite 300 City: Corvallis State, Zip: OR, 97330 Phone: 541-768-3109 Email: tiffany.hill@ch2m.com Project Name: CLEAN CTO-4041 NAS Whidbey Island Site:		Sampler: Eric Cutler/CH2M Lab PM: Allen, Kristine D E-Mail: kristine.allen@testamericainc.com Carrier Tracking No(s):		COC No: 580-28143-9294.1 Page: Page 1 of 1 Job #:	
Due Date Requested: TAT Requested (days):		Analysis Requested 4290C_SIM_D005 - Vinyl Chloride 8278D_SIMD005 - 1,4 Dioxane 353.2 - Nitrogen, Nitrate-Nitrite 2329B Alkalinity 6016C_D005 - Dissolved (Al, Ca, Fe, Mg, Mn, K, Sr) 350.1 - Nitrogen, Ammonia 8698A_Diss - Organic Carbon, Dissolved (DOC) SUBTRACT - UV-254 2540C_25400 TDS, TSS 300.0_280 Chloride, Sulfate, Fluoride 385.1 Ortho Phosphate			
Sample Identification Sample Date Sample Time Sample Type (C=comp, G=grab) Matrix (W=water, S=sediment, O=other, BT=Therm, An=Air)		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Ammonia H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)			
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/QC Requirements:			
Empty Kit Relinquished by:		Date:		Time:	
Relinquished by: Garrit Gardner		Date/Time: 4/20/2018 12:30		Company: CH2M/Jacobs	
Relinquished by:		Date/Time:		Company:	
Relinquished by:		Date/Time:		Company:	
Relinquished by:		Date/Time:		Company:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:	

changed to RW18 to avoid duplicate ID with EMHP sample from 3/28/28



CHAIN OF CUSTODY

For Laboratory Use Only
 Work Order #: _____ Temp: _____ °C
 Storage ID: _____ Storage Secured: Yes No

Project ID: CTO-4041
695610.06.FI.FS
 PO#: 10006-7-108295 Sampler: E. Cutler / G. Gardner
 (name)

Invoice to: Name Tiffany Hill Company CH2M Address 1100 NE Circle Blvd Suite 300 City Corvallis State OR Ph# 541-768-3100 Fax# _____
 Relinquished by (printed name and signature) _____ Date _____ Time _____ Received by (printed name and signature) _____ Date _____ Time _____

Relinquished by (printed name and signature) Eric Cutler Date 4-20-18 Time 1230 Received by (printed name and signature) _____ Date _____ Time _____

SHIP TO: Vista Analytical Lab
 1104 Windfield Way
 El Dorado Hills, CA
 (916) 673-1523 * Fax
 ATTN: Martha Ma...

changed to RW18
to avoid duplicate
ID with EMHP
sample from
3/28/28

Sample ID	Date	Time	Location/Sample Description	Add Analysis(es) Requested										Comments		
				Quantity	Type	Matrix	PCOM PFS	UCMES PFS LUGS	S37 LUG: 14	Full LUG of 28	Other: Please List Below	Mod. EPA Method 537	EPA Method 537(DW only)			
<u>W1-A06-RW19-0418</u>	<u>4/20/18</u>	<u>10:27</u>	<u>DW</u>		<u>Z</u>	<u>P</u>	<u>DW</u>									<u>TZ Preserved</u>
<u>W1-A06-RW19P-0418</u>		<u>10:30</u>														
<u>W1-A06-FB19-0418</u>		<u>10:30</u>	<u>H0:27</u>													
<u>W1-A06-RW20-0418</u>		<u>10:10</u>														
<u>W1-A06-FB20-0418</u>		<u>10:10</u>														

Special Instructions/Comments: _____

SEND DOCUMENTATION AND RESULTS TO:
 Name: See "invoice to"
 Company: _____
 Address: _____
 City: _____ State: _____ Zip: _____
 Phone: _____ Fax: _____
 Email: _____

Container Types: P= HDPE, PJ= HDPE Jar
 Bottle Preservation Type: T = Thiosulfate, TZ = Trizma: _____
 Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, SO = Sol, WW = Wastewater, B = Blood/Serum, O = Other: _____

Chain of Custody Record

Client Information		Sampler <i>G. Gardner, E. Cutler</i>		Lab PM Allen, Kristine D		Carrier Tracking Note(s)		COC No 580-28143-9294 1			
Client Contact Tiffany Hill		Phone <i>602-769-7302</i>		E-Mail kristine.allen@testamericainc.com				Page Page 1 of 1			
Company CH2M Hill, Inc		Address 1100 NE Circle Boulevard Suite 300		Due Date Requested:		Analysis Requested		Job #			
City Corvallis		State Zip OR, 97330		TAT Requested (days): <i>10 days</i>		PO # 10006-7-108336 WO # Project # 08011747 SOW#		Preservation Codes:			
Phone <i>757-671-6278</i>		Email tiffany.hill@ch2m.com		Project Name CLEAN CTO-4041 NAS Whidbey Island				A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4.5 Z - other (specify)	
Site <i>NAS Whidbey Island</i>		Field Filtered Sample (Yes or No)		Matrix (W=water, S=solid, O=soil, T=tissue, A=air)				8256C_SIL_0005 - Vinyl Chloride 8278D_SHM0005 - 1,4 Dioxane 353.2 - Nitrogen, Nitrate-Nitrite 2226B Alkalinity 5018C_0005 - Dissolved (Al, Ca, Fe, Mg, Mn, K, Sr) 350.1 - Nitrogen, Ammonia 9060A_Diss - Organic Carbon, Dissolved (DOC) SUBCONTRACT - UV-254 2546C_2546D TDS, TSS 300.0_28D Chloride, Sulfate, Fluoride 305.1 Ortho Phosphate <i>6010C - Total Metals</i>		Other: Special Instructions/Note:	
Sample Identification		Sample Date		Sample Time				Sample Type (C=comp, G=grab)		Total Number of Containers	
						Preservation Code:					
<i>WI-A06-RW19-0318</i>		<i>3/28/18</i>		<i>13:25</i>		<i>G W</i>		<i>4</i>			
<i>WI-A06-RW19-0318-MS</i>				<i>13:25</i>				<i>4</i>			
<i>WI-A06-RW19-0318-MSD</i>				<i>13:25</i>				<i>4</i>			
<i>WI-A06-TB01-032818</i>				<i>13:20</i>				<i>3</i>			
<i>WI-CV-1RW90-0318</i>		<i>3/30/18</i>		<i>12:15</i>		<i>G W</i>		<i>9</i>			
<i>WI-CV-1RW90-0318-MS</i>								<i>2</i>			
<i>WI-CV-1RW90-0318-MSD</i>								<i>2</i>			
<i>WI-CV-1RW90P-0318</i>				<i>12:20</i>				<i>2</i>			
Possible Hazard Identification					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)						
<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological					<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months						
Deliverable Requested: I, II, III, IV, Other (specify)					Special Instructions/QC Requirements						
Empty Kit Relinquished by			Date		Time		Method of Shipment				
Relinquished by <i>Gerrit Gardner</i>			Date/Time <i>4/2/2018 09:00</i>		Company <i>CH2M</i>		Received by		Company		
Relinquished by			Date/Time		Company		Received by		Company		
Relinquished by			Date/Time		Company		Received by		Company		
Custody Seals Intact: A Yes A No		Custody Seal No.:			Cooler Temperature(s) °C and Other Remarks						

EXACT COPY OF THE ORIGINAL
INIT PPB 04/04/18



CHAIN OF CUSTODY

1800600

For Laboratory Use Only
Work Order #: 1800595 Temp: 2.2 °C
Storage ID: WR-2 Storage Secured: Yes No

Project ID: CTO-4041 NAVY CLEAN PO#: 10006-7-108295 Sampler: B. Prentice, E. Cutler, G. Gardner
(name)

TAT Standard: 21 days
(check one): Rush (surcharge may apply)
 14 days 7 days Specify: 10 days

Invoice to: Name Rebecca Maco Company CH2M Hill/Jacobs Address 1100 112th Ave. NE City Bellevue State WA
Relinquished by (printed name and signature) Gerrit Gardner Date 4/2/2018 Time 09:00 Received by (printed name and signature) Marissa Sparks Date 04/03/18 Time 1015

Relinquished by (printed name and signature) Gerrit Gardner Date 4/2/2018 Time 09:00 Received by (printed name and signature) Marissa Sparks Date 04/03/18 Time 1015

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
(916) 673-1520 * Fax (916) 673-0106
ATTN: Martha Majer
Method of Shipment: FedEx
Tracking No.: _____

Add Analysis(es) Requested				Mod. EPA Method 537				EPA Method 537(DW only)		Comments
Quantity	Type	Matrix	PFOA/PFOS	UCMR3 PFAS List: 6	537 List: 14	Full List of 26	Other: Please List Below	PFOA/PFOS	UCMR3 PFAS List: 6	
2	P	DW							X	

Sample ID	Date	Time	Location/Sample Description
*WI-AF-3RW41-0318	3/24/18	09:30	DW
*WI-AF-3RW41P-0318		09:35	
*WI-AF-3FB41-0318		09:31	
*WI-AF-1RW12-0318		09:55	
*WI-AF-1FB12-0318		09:56	
*WI-CV-1RW37-0318	3/27/18	08:10	
*WI-CV-1FB37-0318		08:10	
WI-A06-RW19-0318	3/28/18	13:25	
WI-A06-RW19-0318-MS		13:25	
WI-A06-RW19-0318-MSD		13:25	

Special Instructions/Comments:
WO # 1800595

SEND DOCUMENTATION AND RESULTS TO:

Name: Liffany Hill
Company: CH2M Hill/Jacobs
Address: 1100 NE Circle Blvd
City: Corvallis State: OR Zip: 97330
Phone: 757-671-6278 Fax: _____
Email: _____

Container Types: P= HDPE, PJ= HDPE Jar
Bottle Preservation Type: T = Thiosulfate, TZ = Trizma:
Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

EXACT COPY OF THE ORIGINAL
INIT PAB 04/04/18



CHAIN OF CUSTODY

See Page 1

1800600

For Laboratory Use Only
Work Order #: 1800595 *PAB* Temp: 2.2 °C
Storage ID: WR-2 Storage Secured: Yes No

Project ID: _____ PO#: _____ Sampler: _____ (name)

TAT Standard: 21 days
(check one): Rush (surcharge may apply)
 14 days 7 days Specify: _____

Invoice to: Name _____ Company _____ Address _____ City _____ State _____ Ph# _____ Fax# _____

Relinquished by (printed name and signature) <i>*</i>	Date	Time	Received by (printed name and signature) <i>Marissa Sparks - US Sparks</i>	Date <i>04/03/18</i>	Time <i>1015</i>
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
(916) 673-1520 * Fax (916) 673-0106

Method of Shipment: _____

Add Analysis(es) Requested

Container(s)

Tracking No.: _____

Quantity	Type	Matrix	P/DW P/OS	U/MR3 PFAS List:6	5/7 List: 14	Full List of 26	Other: Please List Below	P/DW P/OS	U/MR3 PFAS List:6	PFAS List: 14	EPA Method 537(DW only)
----------	------	--------	-----------	-------------------	--------------	-----------------	--------------------------	-----------	-------------------	---------------	-------------------------

Mod. EPA Method 537

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	P/DW P/OS	U/MR3 PFAS List:6	5/7 List: 14	Full List of 26	Other: Please List Below	P/DW P/OS	U/MR3 PFAS List:6	PFAS List: 14	EPA Method 537(DW only)	Comments
<u>WI-A06-RWI-FB14-0319</u>	<u>3/28/18</u>	<u>13:25</u>	<u>DW</u>	<u>2</u>	<u>P</u>	<u>DW</u>										
<i>*WI-AF-1RW40-0318</i>		<i>14:05</i>														
<i>*WI-AF-1FB40-0318</i>		<i>14:05</i>														
<i>*WI-CV-1RW40-0318</i>	<i>3/30/18</i>	<i>12:15</i>														
<i>*WI-CV-1FB40-0318</i>	<i>3/30/18</i>	<i>12:15</i>														

Special Instructions/Comments: * WO: 1800595

** see "relinquished" signature on page 1 COC*
was 04/03/18

SEND DOCUMENTATION AND RESULTS TO:

Name: _____
Company: _____
Address: _____
City: _____ State: _____ Zip: _____
Phone: _____ Fax: _____
Email: _____

Container Types: P= HDPE, PJ= HDPE Jar

Bottle Preservation Type: T = Thiosulfate,

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,

O = Other: _____

TZ = Trizma: _____

SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _____

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Seattle
5755 8th Street E.
Tacoma, WA 98424
Tel. 253-922-2310
Fax 253-922-5047
www.testamericainc.com

Rush
 Short Hold

**Chain of
Custody Record**

CTO-4041

Client **Jacobs (CH2M)** Client Contact **Tiffany Hill** Date **8/27/18** Chain of Custody Number **36979**
Address **1100 112th Ave. NE Suite 500** Telephone Number (Area Code)/Fax Number **541-768-3109** Lab Number _____
City **Seattle** State **WA** Zip Code **98004** Sampler **S. Fitzsimmons** Lab Contact **K. Allen** Page **1** of **1**

Project Name and Location (State) **Navy CLEAN NASWI Area 6 DN** Billing Contact **Tiffany Hill** Analysis (Attach list if more space is needed)
Contract/Purchase Order/Quote No. **10006-7-108336** Matrix _____ Containers & Preservatives _____

Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix				Containers & Preservatives						Special Instructions/ Conditions of Receipt		
			Air	Aqueous	Sed.	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH			
WI - A06 - RW21 - 0818	8/27/18	11:20	X				X			X			X	X	
WI - A06 - RW21P-0818	8/27/18	11:20	X				X			X			X	X	
WI - A06 - RW21 - 0818MS	8/27/18	11:20	X				X			X			X	X	
WI - A06 - RW21 - 0818MSD	8/27/18	11:20	X				X			X			X	X	
WI - A06 - TBD - 082718	8/27/18	4:20 7:00	X							X			X	X	

Cooler Yes No Cooler Temp: _____ Possible Hazard Identification Non-Hazard Flammable Skin Irritant Poison B Unknown Sample Disposal Disposal By Lab Return To Client Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days) 24 Hours 48 Hours 5 Days 10 Days 15 Days Other _____ QC Requirements (Specify) _____

1. Relinquished By <i>Shannon Fitzsimmons</i> Sign/Print Shannon Fitzsimmons Date 08/27/18 Time 14:45	1. Received By Sign/Print _____ Date _____ Time _____
2. Relinquished By Sign/Print _____ Date _____ Time _____	2. Received By Sign/Print _____ Date _____ Time _____
3. Relinquished By Sign/Print _____ Date _____ Time _____	3. Received By Sign/Print _____ Date _____ Time _____

Comments _____



CHAIN OF CUSTODY

OTO 4041

For Laboratory Use Only
 Work Order #: _____ Temp: _____ °C
 Storage ID: _____ Storage Secured: Yes No

Project ID: Navy CLEAN - NASWI A6/CV DW PO#: 10006-7-10834-²⁹⁵KR Sampler: S. Fitzsimmons
 (name)

TAT Standard: 21 days
 (check one): Rush (surcharge may apply)
 14 days 7 days Specify: 10 days

Invoice to: Name Tiffany Hill Company Jacobs (CH2M) Address 1100 112th Ave NE Suite 500 City Belleme State WA Ph# 541-768-3109 Fax#
 Relinquished by (printed name and signature) _____ Date _____ Time _____ Received by (printed name and signature) _____ Date _____ Time _____

Relinquished by (printed name and signature) _____ Date _____ Time _____ Received by (printed name and signature) _____ Date _____ Time _____

SHIP TO: Vista Analytical Laboratory
 1104 Windfield Way
 El Dorado Hills, CA 95762
 Ph: (916) 673-1520; Fax: (916) 673-0106
 Method of Shipment: _____
 Tracking No.: _____
 Add Analysis(es) Requested: _____
 Container(s): _____
 PFAS Isotope Dilution
 USEPA Method 537
 PFAS List: 14
 PFAS List: 6
 PFAS List: 8
 PFAS List: 9
 PFAS List: 10
 PFAS List: 11
 PFAS List: 12
 PFAS List: 13
 PFAS List: 15
 PFAS List: 16
 PFAS List: 17
 PFAS List: 18
 PFAS List: 19
 PFAS List: 20
 PFAS List: 21
 PFAS List: 22
 PFAS List: 23
 PFAS List: 24
 PFAS List: 25
 PFAS List: 26
 PFAS List: 27
 PFAS List: 28
 PFAS List: 29
 PFAS List: 30
 PFAS List: 31
 PFAS List: 32
 PFAS List: 33
 PFAS List: 34
 PFAS List: 35
 PFAS List: 36
 PFAS List: 37
 PFAS List: 38
 PFAS List: 39
 PFAS List: 40
 PFAS List: 41
 PFAS List: 42
 PFAS List: 43
 PFAS List: 44
 PFAS List: 45
 PFAS List: 46
 PFAS List: 47
 PFAS List: 48
 PFAS List: 49
 PFAS List: 50
 PFAS List: 51
 PFAS List: 52
 PFAS List: 53
 PFAS List: 54
 PFAS List: 55
 PFAS List: 56
 PFAS List: 57
 PFAS List: 58
 PFAS List: 59
 PFAS List: 60
 PFAS List: 61
 PFAS List: 62
 PFAS List: 63
 PFAS List: 64
 PFAS List: 65
 PFAS List: 66
 PFAS List: 67
 PFAS List: 68
 PFAS List: 69
 PFAS List: 70
 PFAS List: 71
 PFAS List: 72
 PFAS List: 73
 PFAS List: 74
 PFAS List: 75
 PFAS List: 76
 PFAS List: 77
 PFAS List: 78
 PFAS List: 79
 PFAS List: 80
 PFAS List: 81
 PFAS List: 82
 PFAS List: 83
 PFAS List: 84
 PFAS List: 85
 PFAS List: 86
 PFAS List: 87
 PFAS List: 88
 PFAS List: 89
 PFAS List: 90
 PFAS List: 91
 PFAS List: 92
 PFAS List: 93
 PFAS List: 94
 PFAS List: 95
 PFAS List: 96
 PFAS List: 97
 PFAS List: 98
 PFAS List: 99
 PFAS List: 100
 Other: Please List Below

Sample ID	Date	Time	Location/Sample Description	Quantity	Matrix	Analysis	Container	PFAS Isotope Dilution	USEPA Method 537	Comments
WI-A06-RW21-0818	8/27/18	11:20	RW-21	2	P	AQ			X	TZ
WI-A06-RW21P-0818	8/27/18	11:20	RW-21	2	P	AQ			X	TZ
WI-A06-RW21-0818MS	8/27/18	11:20	RW-21	2	P	AQ			X	TZ
WI-A06-RW21-0818MSD	8/27/18	11:20	RW-21	2	P	AQ			X	TZ
WI-A06-FB01-082718	8/27/18	11:20	RW-21	2	P	AQ			X	TZ
WI-A06-RW19-0818	8/28/18	9:30	RW-19	2	P	AQ			X	TZ
WI-A06-RW19P-0818	8/28/18	9:30	RW-19	2	P	AQ			X	TZ
WI-A06-RW19-0818MS	8/28/18	9:30	RW-19	2	P	AQ			X	TZ
WI-A06-RW19-0818MSD	8/28/18	9:30	RW-19	2	P	AQ			X	TZ
WI-A06-FB19-0818	8/28/18	9:30	RW-19	2	P	AQ			X	TZ

Special Instructions/Comments: _____
 Name: _____
 Company: _____
 Address: _____
 City: _____ State: _____ Zip: _____
 Phone: _____ Fax: _____
 Email: _____

Container Types: P= HDPE, PJ= HDPE Jar
 Bottle Preservation Type: T = Thiosulfate, TZ = Trizma
 Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

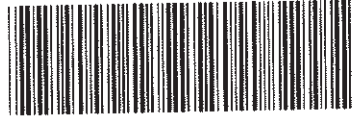
Eurofins TestAmerica, Seattle

5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-6047

Chain of Custody Record

Loc: 580
85578

eurofins Environment Testing
TestAmerica

Client Information				Sampler: M. ENDO, A. VOGT		Lab PM: Allen, Kristine D		Carrier:																	
Client Contact: Tiffany Hill				Phone:		E-Mail: kristine.allen@testamericainc.com		COC No: 580-33293-10858.1																	
Company: CH2M Hill, Inc.				Analysis Requested						Page: Page 1 of 1															
Address: 1100 NE Circle Boulevard Suite 300										Due Date Requested:		Job #:													
City: Corvallis				TAT Requested (days): 7		Preservation Codes: A - HCL M - Hexane		Barcode:  580-85578 Chain of Custody																	
State, Zip: OR, 97330				PO #: 10006-7-108336		WO #:		L - EDA Z - other (specify)																	
Email: tiffany.hill@ch2m.com				Project Name: CLEAN CTO-4041 NAS Whidbey Island		Site: AREA 6 - Coachman		Other:																	
<div style="border: 1px solid red; padding: 5px; display: inline-block; color: blue; font-weight: bold;"> Sample IDs corrected to RW22 by laboratory </div>				Sample ID		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=water, S=solid, O=waste/foil, BT=Tissue, A=Air)		Field Filtered Sample (Yes or No)		Performs ICP/MSD (Yes or No)		8260C_SIM_D0D5 - Vinyl Chloride		8270D_SIMD0D5AK - 1,4-Dioxane		Total Number of containers		Special Instructions/Note:	
				Preservation Code:		A		N																	
W1-A06-EB01-041719		4/17/19		1830		G		Water		No		No		X		X						3			
W1-A06-S-12-0419		4/17/19		1635		G		Water		No		No		X		X						3			
W1-A06-S-12-0419		4/17/19		1635		G		Water		No		No		X		X						3			
W1-A06-S-12P-0419		4/17/19		1735		G		Water		No		No		X		X						3			
W1-A06-TB01-041719		4/17/19		1300		G		Water		No		No		X								3			
Therm. ID: 5		Cor: 1.0		Unc: 1.1																					
Cooler Dsc: LB		Packing: B-b		FedEx: F.O.																					
Cust. Seal: Yes <input checked="" type="checkbox"/> No		Blue Ice: <input checked="" type="checkbox"/> Dry, None		Other:																					
Possible Hazard Identification				<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological				Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)				<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months													
Deliverable Requested: I, II, III, IV, Other (specify)				Special Instructions/QC Requirements:																					
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:																			
Relinquished by: Aaron Vogt		Date/Time: 04/18/19 13:17		Company: CH2M Jacobs		Received by: [Signature]		Date/Time: 4-19-19 0800		Company: TABes															
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:															
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:															
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:				Cooler Temperature(s) °C and Other Remarks:																			



CHAIN OF CUSTODY

For Laboratory Use Only

Work Order #: 1900794 Temp: 0.1 °C
Storage ID: WR-2 Storage Secured: Yes No

Project ID: NASVI DRINKING WATER PO#: 10006-7-108346 Sampler: M. ENDO, A. VOGT
(name)

TAT Standard: 21 days
(check one): Rush (surcharge may apply)
 14 days 7 days Specify: _____

Invoice to: Name Tiffany Hill Company CH2M (Jacobs) Address 1100 NE Circle Blvd. City Corvallis State OR Ph# 541-768-3109 Fax# _____

Relinquished by (printed name and signature) Aaron Vogt Date 04/18/19 Time 12:18 Received by (printed name and signature) B. Benedict Date 04/19/19 Time 07:24

Sample IDs corrected to RW22 by laboratory

ATTN: Sample Receiving

Method of Shipment: _____

Tracking No.: _____

Add Analysis(es) Requested

Container(s)

Mod. EPA Method 537

EPA Method 537 (DW only)

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	Add Analysis(es) Requested				Comments	
							PFOA/PFOS	UCMR3 PFAS List 6	537 List 14	Full List of 26 Other: Please List Below		
W1-A06-S-12-0419	4/17/19	1635	AREA 6 - COACHMAN	2	0	DW					X	
W1-A06-S-12-0419-AS	4/17/19	1635	Area 6 - Coachman	2	0	DW					X	
W1-A06-S-12-0419-AS	4/17/19	1635	Area 6 - Coachman	2	0	DW					X	
W1-A06-S-12P-0419	4/17/19	1735	Area 6 - Coachman	2	0	DW					X	
W1-A06-FB01-041719	4/17/19	1645	Area 6 - Coachman	2	0	DW					X	
W1-A06-EB01-041719	4/17/19	1830	Area 6 - Coachman	2	0	DW					X	

Special Instructions/Comments: _____

SEND DOCUMENTATION AND RESULTS TO:

Name: _____
Company: _____
Address: _____
City: _____ State: _____ Zip: _____
Phone: _____ Fax: _____
Email: _____

Container Types: P= HDPE, PJ= HDPE Jar
O = Other: Polypropylene

Bottle Preservation Type: T = Thiosulfate,
TZ = Trizma: _____

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,
SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _____

>>> Select a Laboratory <<<

Chain of Custody Record

#N/A
#N/A Savannah
#N/A
#N/A

Regulatory Program: DW NPDES RCRA Other:

TestAmerica Laboratories, Inc.

Client Contact: Project Manager: Tiffany Hill Site Contact: T. Hill Date: 8/29/18
Your Company Name here: Jacobs (CH2M) Tel/Fax: 541-768-3109 Lab Contact: K. Allen Carrier: FedEx COC No: 18082901

Address: 1100 112th Ave NE Suite 500 Analysis Turnaround Time
City/State/Zip: Bellevue, WA 98004 CALENDAR DAYS WORKING DAYS
(xxx) xxx-xxxx Phone: 541-768-3109 TAT if different from Below: 10 days
(xxx) xxx-xxxx FAX

Project Name: Navy CLEAN-NASWI A6 Off Base DW 2 weeks
Site: Area 6 1 week
PO# 10006-7-107257 2 days
 1 day

Sampler: S. Fitzsimmons
For Lab Use Only:
Walk-in Client:
Lab Sampling:

Job / SDG No.:

Sample Identification

Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Sample Specific Notes
WI-A06-RW05-0818	8/29/18 1100	G	Aq.	1	N	X	
WI-A06-RW18-0818	8/29/18 1325	G	Aq.	1	N	X	

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

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

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

Special Instructions/QC Requirements & Comments:

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

Relinquished by: Krystle Remmen	Company: Jacobs	Date/Time: 8/29/18 1400	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:



CHAIN OF CUSTODY

For Laboratory Use Only
 Work Order #: 1802843 Temp: 1.8 °C
 Storage ID: WR-2 Storage Secured: Yes No

Project ID: Navy CLEAN NASM AB Off-Base DW PO#: 10006-7-108295 Sampler: Shannon Fitzsimmons
long-term solutions (name)

TAT Standard: 21 days
 (check one): Rush (surcharge may apply)
 14 days 7 days Specify: 10 days

Invoice to: Name Tiffany Hill Company Jacobs Address 1100 112th Ave NE Suite 500 City Bellevue State WA Ph# 541-768-3109 Fax#

Relinquished by (printed name and signature) Krystle Remmen Date 8/31/18 Time 10:30
 Received by (printed name and signature) [Signature] Date 9/1/18 Time 09:40

Sample ID	Date	Time	Location/Sample Description	Add Analysis(es) Requested								Comments			
				Quantity	Type	Matrix	List of 21	List of 21 w/isomers	List of 24	List of 24 w/isomers	List of 28		Other: Please List Below		
WI-A06-RW05-0818	8/29/18	1100	RW-05	2	P	DW								X	TZ
WI-A06-FB05-0818	8/29/18	1105	RW-05	2	P	AQ								X	TZ
WI-A06-RW18-0318	8/29/18	1325	RW-18	2	P	DW								X	TZ
WI-A06-FB18-0818	8/29/18	1330	RW-18	2	P	AQ								X	TZ
WI-A06-RW20-0818	8/30/18	900	RW-20	2	P	DW								X	TZ
WI-A06-FB20-0818	8/30/18	900	RW-20	2	P	AQ								X	TZ

SHIP TO: Vista Analytical Laboratory
 1104 Windfield Way
 El Dorado Hills, CA 95762
 Ph: (916) 673-1520; Fax: (916) 673-0106
 Method of Shipment: FedEx
 Tracking No.: _____
 ATTN: Martha Maier

SEND DOCUMENTATION AND RESULTS TO:

Name: _____
 Company: _____
 Address: _____
 City: _____ State: _____ Zip: _____
 Phone: _____ Fax: _____
 Email: _____

Container Types: P= HDPE, PJ= HDPE Jar
 Bottle Preservation Type: T = Thiosulfate, TZ = Trizma
 Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:



CHAIN OF CUSTODY

For Laboratory Use Only
 Work Order #: 1803198 Temp: 3.7 °C
 Storage ID: WR-2 Storage Secured: Yes No

Project ID: NASWI CLEAN CTO-4041 PO#: 10006-7-108295 Sampler: G. Gardner
 (name)

TAT Standard: 21 days
 (check one): Rush (surcharge may apply)
 14 days 7 days Specify: _____

Invoice to: Name Tiffany Hill Company CH2M Jacobs Address 1100 NE Circle Blvd. City Corvallis State OR Ph# 757-671-6278 Fax# _____

Relinquished by (printed name and signature) Gerrit Gardner Date 10/1/18 Time 0920 Received by (printed name and signature) B. Benedict Date 10/2/18 Time 0922
 Relinquished by (printed name and signature) _____ Date _____ Time _____ Received by (printed name and signature) _____ Date _____ Time _____

SHIP TO: Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 (916) 673-1520 * Fax (916) 673-0106				Method of Shipment: <u>FedEx</u>		Add Analysis(es) Requested		Container(s)		Mod. EPA Method 537		EPA Method 537 (DW only)		Comments	
ATTN: <u>Martha Maier</u>				Tracking No.: _____		Quantity	Type	Matrix	PFOS/PFOS	UCMR3 PFAS List 6	537 List 14	Full List of 26 Other: Please List Below	PFOS/PFOS		UCMR3 PFAS List 6
Sample ID	Date	Time	Location/Sample Description												
WI-CV-1RW40-0918	9/24/18	1010	DW	2	P	DW									
WI-CV-1FB40-0918		1010													
WI-CV-1RW72-0918		1242													
WI-CV-1RW72A-0918		1247													
WI-CV-1FB72-0918		1242													
WI-CV-2RW02-0918		1357													
WI-CV-2FB02-0918		1357													
WI-CV-1RW90-0918		1631													
WI-CV-1FB90-0918		1631													
WI-A06-RW08-0918	9/27/18	1240													

Special Instructions/Comments: _____

SEND DOCUMENTATION AND RESULTS TO:

Name: _____
 Company: _____
 Address: _____
 City: _____ State: _____ Zip: _____
 Phone: _____ Fax: _____
 Email: _____

Container Types: P= HDPE, PJ= HDPE Jar Bottle Preservation Type: T = Thiosulfate, Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, O = Other: _____ TZ = Trizma: _____ SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _____



CHAIN OF CUSTODY

For Laboratory Use Only
 Work Order #: 1803198 Temp: 3.7 °C
 Storage ID: WR-2 Storage Secured: Yes No

Project ID: _____ PO#: _____ Sampler: _____ (name)

TAT Standard: 21 days
 (check one): Rush (surcharge may apply)
 14 days 7 days Specify: _____

Invoice to: Name _____ Company _____ Address _____ City _____ State _____ Ph# _____ Fax# _____

Relinquished by (printed name and signature) _____ Date _____ Time _____ Received by (printed name and signature) B. Benedict Date 10/2/18 Time 0922

Relinquished by (printed name and signature) _____ Date _____ Time _____ Received by (printed name and signature) _____ Date _____ Time _____

SHIP TO: Vista Analytical Laboratory
 1104 Windfield Way
 El Dorado Hills, CA 95762
 (916) 673-1520 * Fax (916) 673-0106

Method of Shipment: _____

Add Analysis(es) Requested

Container(s)

Tracking No.: _____

Mod. EPA Method 537
 EPA Method 537 (DW only)

ATTN: _____

Sample ID	Date	Time	Location/Sample Description	Add Analysis(es) Requested										Comments									
				Quantity	Type	Matrix	PFAS/PFOS	UCR3 PFAS List: 6	537 List: 14	Full List of 26 Below	Other: Please List	PFAS/PFOS	UCR3 PFAS List: 6		PFAS List: 14								
Wt-A06-FB08-0918	9/27/18	1240	DW	2	P	DW																	
Wt-AF-3RW4P-0918	9/28/18	0909	↓	↓	↓	↓																	
Wt-AF-3RW4P-0918	↓	0914	↓	↓	↓	↓																	
Wt-AF-3EB4L-0918	↓	0909	↓	↓	↓	↓																	

Special Instructions/Comments: _____

SEND DOCUMENTATION AND RESULTS TO:

Name: _____
 Company: _____
 Address: _____
 City: _____ State: _____ Zip: _____
 Phone: _____ Fax: _____
 Email: _____

Container Types: P= HDPE, PJ= HDPE Jar
 O = Other: _____

Bottle Preservation Type: T = Thiosulfate,
 TZ = Trizma: _____

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,
 SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _____

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Seattle
5755 8th Street E.
Tacoma, WA 98424
Tel. 253-922-2310
Fax 253-922-5047
www.testamericainc.com

Rush
 Short Hold

**Chain of
Custody Record**

CTO-4041

Client: Jacobs (CH2M) Client Contact: Tiffany Hill Date: 8/28/18 Chain of Custody Number: 36980
Address: 1100 112th Ave NE Suite 500 Telephone Number (Area Code)/Fax Number: (541) 768-3109 Lab Number: _____
City: Belleveue State: WA Zip Code: _____ Billing Contact: Tiffany Hill Page: 1 of 1

Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix				Containers & Preservatives						Analysis (Attach list if more space is needed)	Special Instructions/ Conditions of Receipt	
			Air	Aqueous	Sed.	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH			
WI-A06-RW19P-0818	8/28/18	930	X				X								
WI-A06-RW19-0818	8/28/18	930	X				X								
WI-A06-RW19-0818-MS	8/28/18	930	X				X								
WI-A06-RW19-0818-MSD	8/28/18	930	X				X								

Cooler: Yes No Cooler Temp: _____ Possible Hazard Identification: Non-Hazard Flammable Skin Irritant Poison B Unknown Return To Client Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days): 24 Hours 48 Hours 5 Days 10 Days 15 Days Other _____ QC Requirements (Specify)

1. Relinquished By: <u>Shannon Fitzsimmons</u> Sign/Print	Date: <u>08/28/18</u>	Time: <u>11:10</u>	1. Received By: _____ Sign/Print	Date: _____	Time: _____
2. Relinquished By: _____ Sign/Print	Date: _____	Time: _____	2. Received By: _____ Sign/Print	Date: _____	Time: _____
3. Relinquished By: _____ Sign/Print	Date: _____	Time: _____	3. Received By: _____ Sign/Print	Date: _____	Time: _____

Comments: _____



CHAIN OF CUSTODY

C/O 4041

For Laboratory Use Only
 Work Order #: _____ Temp: _____ °C
 Storage ID: _____ Storage Secured: Yes No

Project ID: Navy CLEAN - NASWI A6/CV DW PO#: 10006-7-10834-²⁹⁵KR Sampler: S. Fitzsimmons
 (name)

TAT Standard: 21 days
 (check one): Rush (surcharge may apply)
 14 days 7 days Specify: 10 days

Invoice to: Name Tiffany Hill Company Jacobs (CH2M) Address 1100 112th Ave NE Suite 500 City Belleme State WA Ph# 541-768-3109 Fax#
 Relinquished by (printed name and signature) _____ Date _____ Time _____ Received by (printed name and signature) _____ Date _____ Time _____

Relinquished by (printed name and signature) _____ Date _____ Time _____ Received by (printed name and signature) _____ Date _____ Time _____

Sample ID	Date	Time	Location/Sample Description	Add Analysis(es) Requested		PFAS Isotope Dilution	USEPA Method 537	Comments
				Quantity	Type			
WI-A06-RW21-0818	8/27/18	11:20	RW-21	2	P AQ		X	TZ
WI-A06-RW21P-0818	8/27/18	11:20	RW-21	2	P AQ		X	TZ
WI-A06-RW21-0818MS	8/27/18	11:20	RW-21	2	P AQ		X	TZ
WI-A06-RW21-0818MSD	8/27/18	11:20	RW-21	2	P AQ		X	TZ
WI-A06-FB01-082718	8/27/18	11:20	RW-21	2	P AQ		X	TZ
WI-A06-RW19-0818	8/28/18	9:30	RW-19	2	P AQ		X	TZ
WI-A06-RW19P-0818	8/28/18	9:30	RW-19	2	P AQ		X	TZ
WI-A06-RW19-0818MS	8/28/18	9:30	RW-19	2	P AQ		X	TZ
WI-A06-RW19-0818MSD	8/28/18	9:30	RW-19	2	P AQ		X	TZ
WI-A06-FB19-0818	8/28/18	9:30	RW-19	2	P AQ		X	TZ

SHIP TO: Vista Analytical Laboratory
 1104 Windfield Way
 El Dorado Hills, CA 95762
 Ph: (916) 673-1520; Fax: (916) 673-0106
 Method of Shipment: _____
 Tracking No.: _____
 ATTN: _____

SEND DOCUMENTATION AND RESULTS TO:

Name: _____
 Company: _____
 Address: _____
 City: _____ State: _____ Zip: _____
 Phone: _____ Fax: _____
 Email: _____

Container Types: P= HDPE, PJ= HDPE Jar
 Bottle Preservation Type: T = Thiosulfate, TZ = Trizma:
 Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Seattle
5755 8th Street E.
Tacoma, WA 98424
Tel. 253-922-2310
Fax 253-922-5047
www.testamericainc.com

Rush
 Short Hold

**Chain of
Custody Record**

Client <i>James</i>		Client Contact <i>Tiffany Hill</i>		Date <i>8/28/18</i>	Chain of Custody Number 36977
Address <i>1111 1st Ave SE Suite 300</i>		Telephone Number (Area Code)/Fax Number <i>(509) 768 3104</i>		Lab Number	Page <u>1</u> of <u>1</u>

City <i>Spokane</i>	State <i>WA</i>	Zip Code	Sampler <i>S Fitzsimmons</i>	Lab Contact <i>K. Allen</i>	Analysis (Attach list if more space is needed)	Special Instructions/ Conditions of Receipt
Project Name and Location (State) <i>1111 1st Ave SE Suite 300 Spokane, WA</i>			Billing Contact <i>Tiffany Hill</i>			

Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix				Containers & Preservatives							Analysis				Special Instructions/ Conditions of Receipt						
			Air	Aqueous	Sed.	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	50/50/50/0	50/0/0	50/0.2	30/5/1	350.1		50/50/0/0/0	50/50/0/0/0/0				
WT-150-2019-0513	8/28/18	130		X			X	X	X					X	X	X	X	X	X	X	X	X	RF 1-7 bottles, request 1-10 Extraction for PCB, metals + DOC	
WT-150-2019-0513	8/28/18	130		X			X	X	X					X	X	X	X	X	X	X	X	X		
WT-150-2019-0513-MS	8/28/18	130		X			X	X	X					X	X	X	X	X	X	X	X	X		
WT-150-2019-0513-MSD	8/28/18	130		X			X	X	X					X	X	X	X	X	X	X	X	X		

Cooler <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Cooler Temp: _____	Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown	Sample Disposal <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months	(A fee may be assessed if samples are retained longer than 1 month)
--	--	---	---

Turn Around Time Required (business days) <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input type="checkbox"/> 5 Days <input checked="" type="checkbox"/> 10 Days <input type="checkbox"/> 15 Days <input type="checkbox"/> Other _____	QC Requirements (Specify)
--	---------------------------

1. Relinquished By Sign/Print <i>Shannon Fitzsimmons</i>	Date <i>8/28/18</i>	Time <i>12:30</i>	1. Received By Sign/Print	Date	Time
2. Relinquished By Sign/Print	Date	Time	2. Received By Sign/Print	Date	Time
3. Relinquished By Sign/Print	Date	Time	3. Received By Sign/Print	Date	Time

Comments

Monitoring Well

				2x 125mL	4x 125mL		Number of Containers	COMMENTS	
Project Name				Preservatives:	Filtered:				Holding Time:
Location NASWI, Oak Harbor, Washingt									
Project Number 695610.05.FI.FS									
Project Manager Heather Perry									
Sample Manager Tiffany Hill (541) 908-3794				NA	NA	7	7		
Task Order				PFAS (14 analyte list)	PFAS (14 analyte list) TOP				
Project WHIDBEY ISLAND									
Turnaround Time 7 Days									
Shipping Date: 12/12/2017									
COC Number: VAL-121217									
DATE	TIME	Matrix							
WI-A06-6-S-04-1217	12/11/2017	10:15	Water	X			2		
WI-A06-6-S-04-1217-TOP	12/11/2017	10:15	Water		X		4		
WI-A06-6-S-19-1217	12/11/2017	11:55	Water	X			2		
WI-A06-6-S-19-1217-TOP	12/11/2017	11:55	Water		X		4		
WI-A06-6-S-19P-1217	12/11/2017	11:55	Water	X			2		
WI-A06-6-S-19P-1217-TOP	12/11/2017	11:55	Water		X		4		
WI-A06-6-S-31-1217	12/11/2017	14:10	Water	X			2		
WI-A06-6-S-31-1217-TOP	12/11/2017	14:10	Water		X		4		
WI-A06-EB07-121117	12/11/2017	14:45	Water	X			2		
WI-A06-EB07-121117-TOP	12/11/2017	14:45	Water		X		4		
WI-A06-6-S-08-1217	12/12/2017	9:35	Water	X			2		
WI-A06-6-S-08-1217-TOP	12/12/2017	9:35	Water		X		4		
WI-A06-EB08-121217	12/12/2017	10:25	Water	X			2		
WI-A06-EB08-121217-TOP	12/12/2017	10:25	Water		X		4		

Signatures Approved by _____ Sampled by _____ Relinquished by _____ Received by _____ Relinquished by _____ Received by _____		Date/Time _____ _____ _____ _____ _____		Shipping Details Method of Shipment: FedEx On Ice: yes / no Airbill No: 788879280083 Lab Name: Vista Analytical Laboratory Lab Phone: (916) 673-1520		ATTN: Sample Custody and Martha Maier		Special Instructions: Report Copy to Heather.Perry@CH2M.com (530) 229-3276 x33276	
--	--	---	--	--	--	---	--	---	--

Project Name Location NASWI, Oak Harbor, Washing Project Number 695610.05.FI.FS Project Manager Heather Perry Sample Manager Tiffany Hill (541) 908-3794 Task Order Project WHIDBEY ISLAND Turnaround Time 7 Days Shipping Date: 12/12/2017 COC Number: VAL-121217	Container: 2x 125mL	4x 125mL		Number of Containers		
	Preservatives:	≤ 6°C				≤ 6°C
	Filtered:	NA				NA
	Holding Time:	7				7
DATE TIME Matrix	PFAS (14 analyte list)	PFAS (14 analyte list) TOP				
TOTAL NUMBER OF CONTAINERS				42	COMMENTS	

	Signatures	Date/Time	Shipping Details	ATTN:	Special Instructions:
Approved by _____ Sampled by _____ Relinquished by _____ Received by _____ Relinquished by _____ Received by _____			Method of Shipment: FedEx On Ice: yes / no Airbill No: 788879280083 Lab Name: Vista Analytical Laboratory Lab Phone: (916) 673-1520	Sample Custody and Martha Maier	Report Copy to Heather.Perry@CH2M.com (530) 229-3276 x33276

				2x 125mL	4x 125mL		Number of Containers	COMMENTS	
Project Name				Preservatives:	Filtered:				Holding Time:
Location NASWI, Oak Harbor, Washingt									
Project Number 695610.05.FI.FS									
Project Manager Heather Perry									
Sample Manager Tiffany Hill (541) 908-3794				NA	NA	7	7		
Task Order				PFAS (14 analyte list)	PFAS (14 analyte list) TOP				
Project WHIDBEY ISLAND									
Turnaround Time 7 Days									
Shipping Date: 12/6/2017									
COC Number: VAL-120617									
DATE	TIME	Matrix							
WI-A06-6-I-01-1217	12/5/2017	14:45	Water	X			2		
WI-A06-6-I-01-1217-TOP	12/5/2017	14:45	Water		X		4		
WI-A06-EB01-120517	12/5/2017	8:40	Water	X			2		
WI-A06-EB01-120517-TOP	12/5/2017	8:40	Water		X		4		
WI-A06-EB02-120517	12/5/2017	16:20	Water	X			2		
WI-A06-EB02-120517-TOP	12/5/2017	16:20	Water		X		4		
WI-A06-EFF01-1217	12/5/2017	12:10	Water	X			2		
WI-A06-EFF01-1217-TOP	12/5/2017	12:10	Water		X		4		
WI-A06-EFF01P-1217	12/5/2017	12:10	Water	X			2		
WI-A06-EFF01P-1217-TOP	12/5/2017	12:10	Water		X		4		
WI-A06-INF01-1217	12/5/2017	12:15	Water	X			2		
WI-A06-INF01-1217-TOP	12/5/2017	12:15	Water		X		4		
WI-A06-P-4-1217	12/5/2017	10:50	Water	X			2		
WI-A06-P-4-1217-TOP	12/5/2017	10:50	Water		X		4		

Signatures		Date/Time	Shipping Details		ATTN: Sample Custody and Martha Maier	Special Instructions:
Approved by	_____	_____	Method of Shipment: FedEx			Report Copy to Heather.Perry@CH2M.com (530) 229-3276 x33276
Sampled by	_____	_____	On Ice: yes / no			
Relinquished by	_____	_____	Airbill No:			
Received by	_____	_____	Lab Name: Vista Analytical Laboratory			
Relinquished by	_____	_____	Lab Phone: (916) 673-1520			
Received by	_____	_____				

Project Name Location NASWI, Oak Harbor, Washingt Project Number 695610.05.FI.FS Project Manager Heather Perry Sample Manager Tiffany Hill (541) 908-3794 Task Order Project WHIDBEY ISLAND Turnaround Time 7 Days Shipping Date: 12/6/2017 COC Number: VAL-120617				Container: 2x 125mL 4x 125mL	Preservatives: Filtered: NA NA Holding Time: 7 7	PFAS (14 analyte list) PFAS (14 analyte list) TOP	Number of Containers	COMMENTS
DATE TIME Matrix								
WI-A06-6-I-03-1217	12/6/2017	10:35	Water	X		2		
WI-A06-6-I-03-1217-TOP	12/6/2017	10:35	Water		X	4		
TOTAL NUMBER OF CONTAINERS						48		

Approved by _____ Sampled by _____ Relinquished by _____ Received by _____ Relinquished by _____ Received by _____	Signatures	Date/Time	Shipping Details Method of Shipment: FedEx On Ice: yes / no Airbill No: Lab Name: Vista Analytical Laboratory Lab Phone: (916) 673-1520	ATTN: Sample Custody and Martha Maier	Special Instructions: Report Copy to Heather.Perry@CH2M.com (530) 229-3276 x33276
---	-------------------	------------------	--	---	---

				2x 125mL ≤ 6°C	4x 125mL ≤ 6°C		Number of Containers	COMMENTS
Project Name	Location	Project Number	Project Manager	Preservatives:	Filtered:	Holding Time:		
Project Name Location NASWI, Oak Harbor, Washingt Project Number 695610.05.FI.FS Project Manager Heather Perry Sample Manager Tiffany Hill (541) 908-3794 Task Order Project WHIDBEY ISLAND Turnaround Time 7 Days Shipping Date: 12/8/2017 COC Number: VAL-120817								
DATE	TIME	Matrix		PFAS (14 analyte list)	PFAS (14 analyte list) TOP			
WI-A06-6-S-17-1217	12/6/2017	13:05	Water	X			2	
WI-A06-6-S-17-1217-TOP	12/6/2017	13:05	Water		X		4	
WI-A06-EB03-120617	12/6/2017	15:20	Water	X			2	
WI-A06-EB03-120617-TOP	12/6/2017	15:20	Water		X		4	
WI-A06-6-S-07-1217	12/7/2017	11:50	Water	X			2	
WI-A06-6-S-07-1217-MS	12/7/2017	11:50	Water	X			2	
WI-A06-6-S-07-1217-MS-TOP	12/7/2017	11:50	Water		X		4	
WI-A06-6-S-07-1217-SD	12/7/2017	11:50	Water	X			2	
WI-A06-6-S-07-1217-SD-TOP	12/7/2017	11:50	Water		X		4	
WI-A06-6-S-07-1217-TOP	12/7/2017	11:50	Water		X		4	
WI-A06-6-S-26-1217	12/7/2017	13:40	Water	X			2	
WI-A06-6-S-26-1217-TOP	12/7/2017	13:40	Water		X		4	
WI-A06-EB04-120717	12/7/2017	13:50	Water	X			2	
WI-A06-EB04-120717-TOP	12/7/2017	13:50	Water		X		4	

Signatures Approved by _____ Sampled by _____ Relinquished by _____ Received by _____ Relinquished by _____ Received by _____		Date/Time _____ _____ _____ _____ _____		Shipping Details Method of Shipment: FedEx On Ice: yes / no Airbill No: Lab Name: Vista Analytical Laboratory Lab Phone: (916) 673-1520		ATTN: Sample Custody and Martha Maier		Special Instructions: Report Copy to Heather.Perry@CH2M.com (530) 229-3276 x33276	
--	--	---	--	---	--	--	--	---	--

Project Name Location NASWI, Oak Harbor, Washingt Project Number 695610.05.FI.FS Project Manager Heather Perry Sample Manager Tiffany Hill (541) 908-3794 Task Order Project WHIDBEY ISLAND Turnaround Time 7 Days Shipping Date: 12/8/2017 COC Number: VAL-120817				Container:		Preservatives:	Filtered:	Holding Time:	Matrix	Number of Containers	COMMENTS
				2x 125mL ≤ 6°C	4x 125mL ≤ 6°C						
						PFAS (14 analyte list)					
						PFAS (14 analyte list) TOP					
WI-A06-EB05-120717	12/7/2017	14:30	Water	X				2			
WI-A06-EB05-120717-TOP	12/7/2017	14:30	Water					4			
WI-A06-FB01-120717	12/7/2017	14:45	Water	X				2			
WI-A06-FB01-120717-TOP	12/7/2017	14:45	Water					4			
WI-A06-MW-10-1217	12/7/2017	9:45	Water	X				2			
WI-A06-MW-10-1217-TOP	12/7/2017	9:45	Water					4			
WI-A06-6-S-14-1217	12/8/2017	13:10	Water	X				2			
WI-A06-6-S-14-1217-TOP	12/8/2017	13:10	Water					4			
WI-A06-6-S-44-1217	12/8/2017	10:50	Water	X				2			
WI-A06-6-S-44-1217-TOP	12/8/2017	10:50	Water					4			
WI-A06-EB06-120817	12/8/2017	14:00	Water	X				2			
WI-A06-EB06-120817-TOP	12/8/2017	14:00	Water					4			
TOTAL NUMBER OF CONTAINERS								78			

Approved by _____ Sampled by _____ Relinquished by _____ Received by _____ Relinquished by _____ Received by _____	Signatures Date/Time	Shipping Details Method of Shipment: FedEx On Ice: yes / no Airbill No: Lab Name: Vista Analytical Laboratory Lab Phone: (916) 673-1520	ATTN: Sample Custody and Martha Maier	Special Instructions: Report Copy to Heather.Perry@CH2M.com (530) 229-3276 x33276
---	---	---	--	--

Chain of Custody Record

Tacoma, WA 98424-1317
phone 253.922.2310 fax 253.922.5047

Regulatory Program: DW NPDES RCRA Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Heather Perry	Site Contact: David Butler	Date: 2/22/2018	COC No: AREA6_TA_20180222
CH2M	Tel/Fax: (530) 229-3276	Lab Contact: Kris Allen	Carrier: Fed Ex	1 of 2 Pages
1100 112th Ave NE Suite 500 Bellevue, WA 98004 (425) 453-5005 Phone 425-468-3100 FAX	Analysis Turnaround Time			Sampler: David Butler
Project Name: NASWI	<input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS			For Lab Use Only:
Site: Area 6 Off-base	TAT if different from Below _____			Walk-in Client:
P O # 695610.05.FI.FS	<input type="checkbox"/> 2 weeks			Lab Sampling:
	<input type="checkbox"/> 1 week			
	<input type="checkbox"/> 2 days			
	<input type="checkbox"/> 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	8260SIM	8270SIM	Notes
TripBlank	2/19/2018	07:00	G	W	2	N	N	X		Therm. ID <u>A2</u> Cor <u>1.7</u> Unc <u>1.7</u>
WI-A06-EB01-021918	2/19/2018	16:45	G	W	5	N	N	X	X	Cooler Dsc: <u>Ly Blue</u>
WI-A06-MW-13-0218	2/20/2018	11:10	G	W	5	N	Y	X	X	Wet/Packs Packing: <u>bub</u>
WI-A06-MW-13-0218-MS	2/20/2018	11:10	G	W	2	N	Y		X	Custody Seal: Yes <input checked="" type="checkbox"/> No
WI-A06-MW-13-0218-MSD	2/20/2018	11:10	G	W	2	N	Y		X	Therm. ID <u>A2</u> Cor <u>1.1</u> Unc <u>2.0</u>
WI-A06-RW17-0218	2/20/2018	13:40	G	W	5	N	N	X	X	Cooler Dsc: <u>Ly Blue</u>
WI-A06-RW17P-0218	2/20/2018	13:45	G	W	5	N	N	X	X	Wet/Packs Packing: <u>bub</u>
WI-A06-6-DW-38A-0218	2/20/2018	14:55	G	W	5	N	N	X	X	Custody Seal: Yes <input checked="" type="checkbox"/> No
WI-A06-6-S-27-0218	2/21/2018	11:15	G	W	5	N	N	X	X	Therm. ID <u>A2</u> Cor <u>0.1</u> Unc <u>0.0</u>
WI-A06-6-S-28-0218	2/21/2018	11:15	G	W	5	N	N	X	X	Cooler Dsc: <u>Ly Green</u>
WI-A06-FB01-022118	2/21/2018	15:00	G	W	5	N	N	X	X	Wet/Packs Packing: <u>BuP</u>
WI-A06-MW-01-0218	2/21/2018	15:10	G	W	5	N	N	X	X	Custody Seal: Yes <input checked="" type="checkbox"/> No

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

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

Non-Hazard Flammable Skin Irritant Poison B Unknown

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

Special Instructions/QC Requirements & Comments: Send results to Tiffany Hill/CH2M (tiffany.hill@ch2m.com)

Custody Seals Intact: Yes No

Custody Seal No.: _____ Cooler Temp. (°C): Obs'd: _____ Cor'd: _____ Therm ID No.: _____

Relinquished by: <u>Eric Cutler</u>	Company: <u>CH2M</u>	Date/Time: <u>2-22-18 0845</u>	Received by: <u>Kim [Signature]</u>	Company: <u>TRSea</u>	Date/Time: <u>2-23-18 0955</u>
Relinquished by: _____	Company: _____	Date/Time: _____	Received by: _____	Company: _____	Date/Time: _____
Relinquished by: _____	Company: _____	Date/Time: _____	Received in Laboratory by: _____	Company: _____	Date/Time: _____



580-75281 Chain of Custody

Tacoma, WA 98424-1317
phone 253.922.2310 fax 253.922.5047

Regulatory Program: DW NPDES RCRA Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Heather Perry	Site Contact: David Butler	Date: 2/22/2018	COC No: AREA6_TA_20180222
CH2M 1100 112th Ave NE Suite 500 Bellevue, WA 98004 (425) 453-5005 Phone 425-468-3100 FAX	Tel/Fax: (530) 229-3276	Lab Contact: Kris Allen	Carrier: Fed Ex	2 of 2 Pages
Project Name: NASWI	Analysis Turnaround Time		Sampler: David Butler	
Site: Area 6 Off-base	<input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS	TAT if different from Below		For Lab Use Only:
P O # 695610.05.FI.FS	<input type="checkbox"/> 2 weeks			Walk-in Client:
	<input type="checkbox"/> 1 week			Lab Sampling:
	<input type="checkbox"/> 2 days			Job / SDG No.:
	<input type="checkbox"/> 1 day			Sample Specific Notes:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	8260S/M	8270S/M												
WI-A06-EB01-022118	2/21/2018	16:50	G	W	5	N	N	X	X												

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

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

Non-Hazard Flammable Skin Irritant Poison B Unknown

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

Special Instructions/QC Requirements & Comments: Send results to Tiffany Hill/CH2M (tiffany.hill@ch2m.com)

Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.:	Cooler Temp. (°C): Obs'd: _____	Corr'd: _____	Therm ID No.: _____
Relinquished by: <i>Eric Cutler</i>	Company: <i>CH2M</i>	Date/Time: <i>2-22-18 0945</i>	Received by: <i>[Signature]</i>	Company: <i>TACE</i>
Relinquished by:	Company:	Date/Time:	Received by:	Company:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:



CHAIN OF CUSTODY

For Laboratory Use Only
 Work Order #: 1800361 Temp: 0.0 °C
 Storage ID: WR-2 Storage Secured: Yes No

Project ID: NASWI Area 6 PO#: 695610.05.FI.F5 Sampler: David Butler
 (name)

TAT Standard: 21 days
 (check one): Rush (surcharge may apply)
 14 days 7 days Specify: _____

Invoice to: Name Heather Perry Company CH2M Address 2525 Airpark Drive City Redding State CA Ph# 530-229-3276 Fax# _____

Relinquished by (printed name and signature) Eriz Cutler Date 2-22-18 Time 0900 Received by (printed name and signature) B. Benedict Date 02/23/18 Time 0939
 Relinquished by (printed name and signature) _____ Date _____ Time _____ Received by (printed name and signature) _____ Date _____ Time _____

SHIP TO: Vista Analytical Laboratory
 1104 Windfield Way
 El Dorado Hills, CA 95762
 (916) 673-1520 * Fax (916) 673-0106

Method of Shipment: Fed Ex

Add Analysis(es) Requested

Container(s)

Tracking No.: _____

Mod. EPA Method 537

EPA Method 537(DW only)

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	Add Analysis(es) Requested					Comments	
							PFOA/PFOS	UCMR3 PFAS List 8	537 List: 14	Full List of 26 Other: Please List Below	PFOA/PFOS		UCMR3 PFAS List 6
WI-A06-5-01-0218	2/19/18	1200	Area 6	2	P	AQ		X					(A,B)
WI-A06-5-01P-0218	2/19/18	1210		2	P	AQ		X					(A,B)
WI-A06-5-01-0218-MS	2/19/18	1200		2	P	AQ		X				MS	(A,B)
WI-A06-5-01-0218-MSD	2/19/18	1200		2	P	AQ		X				MSD	(A,B)
WI-A06-FB01-021918	2/19/18	1300		2	P	AQ		X				(A,B)	
WI-A06-EB01-021918	2/19/18	1645		2	P	AQ		X					
WI-A06-MW-13-0218	2/20/18	1110		2	P	AQ		X					
WI-A06-FB01-022018	2/20/18	1125		2	P	AQ		X					(A,B)
* WI-A06-RW17-0218	2/20/18	1340		2	P	DW						X	

Special Instructions/Comments: _____

SEND DOCUMENTATION AND RESULTS TO:

Name: Tiffany Hill
 Company: CH2M
 Address: 1100 NE Circle Blvd Suite 300
 City: Corvallis State: OR Zip: 97330
 Phone: 541-768-3109 Fax: _____
 Email: tiffany.hill@ch2m.com

Container Types: P= HDPE, PJ= HDPE Jar
 O = Other: _____

Bottle Preservation Type: T = Thiosulfate,
 TZ = Trizma: _____

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,
 SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _____



CHAIN OF CUSTODY

For Laboratory Use Only
 Work Order #: 1800361 Temp: 0.0 °C
 Storage ID: WR-2 Storage Secured: Yes No

Project ID: NASWI Area 6 PO#: 695610.05.FI.F5 Sampler: David Butler
 (name)

TAT Standard: 21 days
 (check one): Rush (surcharge may apply)
 14 days 7 days Specify: _____

Invoice to: Name Heather Perry Company CH2M Address 2525 Airpark Drive City Redding State CA Ph# 530-229-3276 Fax# _____

Relinquished by (printed name and signature) Eric Cuthbert Date 2-22-18 Time 0900 Received by (printed name and signature) B Benedict Date 02/23/18 Time 0940
 Relinquished by (printed name and signature) _____ Date _____ Time _____ Received by (printed name and signature) _____ Date _____ Time _____

SHIP TO: Vista Analytical Laboratory
 1104 Windfield Way
 El Dorado Hills, CA 95762
 (916) 673-1520 * Fax (916) 673-0106
 ATTN: Sample Receiving

Method of Shipment: Fed Ex
 Tracking No.: _____
 Add Analysis(es) Requested: _____
 Container(s): _____
 Mod. EPA Method 537
 EPA Method 537(DW only)

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	PFOA/PFOS	UCMR3 PFAS List 6	337 List 14	Full List of 28	Other: Please List Below	PFOA/PFOS	UCMR3 PFAS List 6	PFAS List 14	Comments
* WI-A06-RWTP-0218	2/20/18	1345	Area 6	2	P	DW									
* WI-A06-FB02-022018	2/20/18	1350		1	P	DW									
WI-A06-6-DW-38A-0218	2/20/18	1455		2	P	AQ									
WI-A06-FB01-022018	2/20/18	1700		2	P	AQ									
WI-A06-G-5-27-0218	2/21/18	1115		2	P	AQ									
WI-A06-G-5-28-0218	2/21/18	1115		2	P	AQ									
WI-A06-FB01-022118	2/21/18	1500		2	P	AQ									
WI-A06-MW-01-0218	2/21/18	1510		2	P	AQ									
WI-A06-EB01-022118	2/21/18	1650		2	P	AQ									

Special Instructions/Comments:
* WO 1800362

SEND DOCUMENTATION AND RESULTS TO:
 Name: Tiffany Hill
 Company: CH2M
 Address: 1100 NE Circle Blvd Suite 300
 City: Cornwall State: OR Zip: 97330
 Phone: 541-268-3109 Fax: _____
 Email: tiffany.hill@ch2m.com

Container Types: P= HDPE, PJ= HDPE Jar
 Bottle Preservation Type: T = Thiosulfate, Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, O = Other; TZ = Trizma: _____
 SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _____

Loc: 580
75202

TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information		Sampler: J. Ulrich		Lab PM: Allen, Kristine D		Carrier Tracking No(s):		COC No:																																								
Client Contact: Tiffany Hill		Phone:		E-Mail: kristine.allen@testamericainc.com				Page: Page 1 of 1																																								
Company: CH2M Hill, Inc.		Due Date Requested:		Analysis Requested				Job #:																																								
Address: 1100 NE Circle Boulevard Suite 300		TAT Requested (days): 10 Days		<table border="1" style="width:100%; border-collapse: collapse; font-size: 8px;"> <tr> <th>Matrix - Soil</th> <th>Metals - Soil</th> <th>8250C Volatiles - Soil</th> <th>8270D SemiVolatiles, Soil</th> <th>8012A Total Cyanide, Soil</th> <th>8034 - Sulfide, Total, Soil</th> <th>8045D - Comoxivity as pH</th> <th>1020A Ignifability, Soil</th> <th>Moisture</th> <th>8260C Volatiles - Soil Trip Blank</th> <th rowspan="4" style="writing-mode: vertical-rl; transform: rotate(180deg);">Total Number of Containers</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		Matrix - Soil	Metals - Soil	8250C Volatiles - Soil	8270D SemiVolatiles, Soil	8012A Total Cyanide, Soil	8034 - Sulfide, Total, Soil	8045D - Comoxivity as pH	1020A Ignifability, Soil	Moisture	8260C Volatiles - Soil Trip Blank	Total Number of Containers																															Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2SO3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify)	
Matrix - Soil	Metals - Soil	8250C Volatiles - Soil	8270D SemiVolatiles, Soil			8012A Total Cyanide, Soil	8034 - Sulfide, Total, Soil	8045D - Comoxivity as pH	1020A Ignifability, Soil	Moisture	8260C Volatiles - Soil Trip Blank	Total Number of Containers																																				
City: Corvallis		Project #: 58011747		Other:																																												
State, Zip: OR, 97330		SSOW#:																																														
Phone:																																																
Email: tiffany.hill@ch2m.com																																																
Project Name: CLEAN CTO-4041 NAS Whidbey Island																																																
Site:																																																
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=soil/sediment, A=air)	Preservation Code					Special Instructions/Note:																																					
						X	X	N	F	N		N	N	N	N	N	N	F																														
WI-A06-TB01-021618		2/16/18	0800	G	S																																											
WI-A06-TB01-021618		2/16/18	0800	G	W	N													3 only																													
WI-A06-MW-06-0218		2/16/18	1440	G	W	N																																										
WI-A06-MW-06-0218 EBD1-021618		2/16/18	1630	G	W	N																																										
WI-A06-5-01-0218		2/19/18	1200	G	W	N																																										
WI-A06-5-01P-0218		2/19/18	1210	G	W	N																																										
WI-A06-5-01-0218-M5		2/19/18	1200	G	W	N																																										
WI-A06-5-01-0218-M5D		2/19/18	1200	G	W	N																																										



Therm. ID: AR Cor 0.0°C Unc 0.9°
 Cooler Disc: 4 Blue
 Wet/Packs Packing: bubble
 FedEx Custody Seal: Yes/No



CHAIN OF CUSTODY

For Laboratory Use Only
 Work Order #: 1800339 Temp: 2.5 °C
 Storage ID: WR-2 Storage Secured: Yes No

Project ID: 695610.05.FI.FS PO#: CTD-4041 Sampler: J. Ulrich
 (name)

TAT Standard: 21 days
 (check one): Rush (surcharge may apply)
 14 days 7 days Specify: 10 DAYS

Invoice to: Name REBECCA MACO CH2M Company CH2M Address 1100 112th AVE Ste 500 City Belleme State WA Ph# (425) 698-9394 Fax#

Relinquished by (printed name and signature) David Butler David Butler Date 2/19/18 Time 1500 Received by (printed name and signature) Marissa Sparks US Sparks Date 02/20/18 Time 0915

SHIP TO: Vista Analytical Laboratory
 1104 Windfield Way
 El Dorado Hills, CA 95762
 (916) 673-1520 * Fax (916) 673-0106
 ATTN: _____
 Method of Shipment: FedEx
 Tracking No.: _____

Sample ID	Date	Time	Location/Sample Description	Add Analysis(es) Requested										Comments			
				Quantity	Type	Matrix	PFOM/PFOS	UCMR3 PFAS List: 6	537 List: 14	Full List of 26	Other: Please List Below	Mod. EPA Method 537	EPA Method 537(DW only)				
WI-AD6-MW-06-0218	2/16/18	1440		2	P	Aq			2								
WI-AD6-FB01-021618	2/16/18	1445		2	P	Aq			2								
WI-AD6-FB01-021618	2/16/18	1630		2	P	Aq			2								
WI-AD6-5-01-0218	2/19/18	1200		2	P	Aq			2								
WI-AD6-5-01-0218	2/19/18	1210		2	P	Aq			2								
WI-AD6-5-01-0218-M3	2/19/18	1200		2	P	Aq			2								
WI-AD6-5-01-0218-M3D	2/19/18	1200		2	P	Aq			2								
WI-AD6-FB01-021918	2/19/18	1300		2	P	Aq			2								

Special Instructions/Comments: _____

SEND DOCUMENTATION AND RESULTS TO:

Name: TIFFANY HILL
 Company: CH2M
 Address: 1100 NE CIRCLE BLVD STE. 300
 City: Corvallis State: OR Zip: 97330
 Phone: (541) 768-3109 Fax: _____
 Email: Tiffany.hill@ch2m.com

Container Types: P= HDPE, PJ= HDPE Jar
 Bottle Preservation Type: T = Thiosulfate, TZ = Trizma:
 Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

TestAmerica Seattle

5755 8th Street East

Tacoma, WA 98424-1317
phone 253.922.2310 fax 253.922.5047

Chain of Custody Record

75341

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: DW NPDES RCRA Other:

Client Contact		Project Manager: Tiffany Hill			Site Contact: Eric Cutler			Date: 2-26-2018			COC No:			
CH2M Hill Inc.		Tel/Fax:			Lab Contact: Kris Allen			Carrier:			2 of 2 COCs			
1100 112th Ave NE, Suite 500		Analysis Turnaround Time			Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	SVOC (8270SIM): 1-4 dioxane only	VOC (82602IM): vinyl chloride only				Sampler:		
Bellevue, WA 98004		<input checked="" type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS											For Lab Use Only:	
(425) 453-5000 Phone		TAT if different from Below _ 10 days _____											Walk-in Client:	
FAX		<input type="checkbox"/> 2 weeks											Lab Sampling:	
Project Name: CLEAN CTO-4041 NAS Whidbey Island		<input checked="" type="checkbox"/> 1 week											Job / SDG No.:	
Site: Area 6 off-Base Groundwater		<input type="checkbox"/> 2 days												
P O # 10006-7-108336		<input type="checkbox"/> 1 day												
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	SVOC (8270SIM): 1-4 dioxane only	VOC (82602IM): vinyl chloride only	Sample Specific Notes:			
-1	WI-A06-EB01-022218	2/22/2018	1550	G	W	3	N	N	3					
	WI-A06-MW03B-0218	2/22/2018	1500	G	W	3	N	N	3					
-3	WI-A06-EB01-022318	2/23/2018	1500	G	W	3	N	N	3					
	WI-A06-6-S-02-0218	2/23/2018	1355	G	W	3	N	N	3					
-5	WI-A06-6-S-05-0218	2/23/2018	1035	G	W	3	N	N	3					
	WI-A06-6-S-05P-0218	2/23/2018	1035	G	W	5	N	N	2 3					
-7	Trip Blank	2/22/2018	0700	G	W	2	N	N	2					
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other 2														
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.							Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)							
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown							<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months							
Special Instructions/QC Requirements & Comments:														
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:			Cooler Temp. (°C): Obs'd: _____ Corr'd: _____			Therm ID No.:						
Relinquished by: Eric Cutler		Company: CH2M			Date/Time: 2-26-18, 1130			Received by:			Company: _____ Date/Time: _____			
Relinquished by:		Company:			Date/Time:			Received by:			Company: _____ Date/Time: _____			
Relinquished by:		Company:			Date/Time:			Received in Laboratory by: <i>[Signature]</i>			Company: <i>SLC TA</i> Date/Time: <i>2/27/18 0925</i>			



TestAmerica Seattle

5755 8th Street East

Tacoma, WA 98424-1317
phone 253.922.2310 fax 253.922.5047

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: DW NPDES RCRA Other:

75341

Client Contact		Project Manager: Tiffany Hill				Site Contact: Eric Cutler				Date: 2-26-2018				COC No: _____															
CH2M Hill Inc. 1100 112th Ave NE, Suite 500 Bellevue, WA 98004 (425) 453-5000 Phone FAX		Tel/Fax:				Lab Contact: Kris Allen				Carrier:				____ 1 ____ of ____ 2 ____ COCs															
Project Name: CLEAN CTO-4041 NAS Whidbey Island Site: Area 6 off-Base Groundwater P O # 10006-7-108336		Analysis Turnaround Time <input checked="" type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below ____ 10 days _____ <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day				Filtered Sample (Y/N) Perform MS / MSD (Y / N) SVOC (8270SIM): 1-4 dioxane only								Sampler: For Lab Use Only: Walk-in Client: Lab Sampling: Job / SDG No.:															
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix													# of Cont.	Sample Specific Notes:										
-1	WI-A06-EB01-022218	2/22/2018	1550	G	W													2	N	N	2								
	WI-A06-MW03B-0218	2/22/2018	1500	G	W													2	N	N	2								
-3	WI-A06-EB01-022318	2/23/2018	1500	G	W													2	N	N	2	Therm. ID <u>A2</u> Cor <u>3.6</u> Unc <u>4.5</u> Cooler Dsc: <u>Log Blue</u> Wet/Packs Packing: <u>Bubble</u> Fed <u>P.O</u> Custody Seal: Yes <input checked="" type="checkbox"/> No							
	WI-A06-6-S-02-0218	2/23/2018	1355	G	W													2	N	N	2								
-5	WI-A06-6-S-05-0218	2/23/2018	1035	G	W													2	N	N	2	Therm. ID <u>A2</u> Cor <u>3.1</u> Unc <u>4.0</u> Cooler Dsc: <u>Log Blue</u> Wet/Packs Packing: <u>Bubble</u> Fed <u>P.O</u> Custody Seal: Yes <input checked="" type="checkbox"/> No							
Preservation Used: 1= Ice, 2= HCl, 3= H2SO4, 4=HNO3, 5=NaOH, 6= Other <u>1</u>																													
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample. <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown																		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months											
Special Instructions/QC Requirements & Comments:																													
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:				Cooler Temp. (°C): Obs'd: _____ Corr'd: _____				Therm ID No.:																			
Relinquished by: Eric Cutler		Company: CH2M		Date/Time: 2-26-18, 1130		Received by:				Company:		Date/Time:																	
Relinquished by:		Company:		Date/Time:		Received by:				Company:		Date/Time:																	
Relinquished by:		Company:		Date/Time:		Received in Laboratory by: <u>B. Stull</u>				Company: <u>SEA TA</u>		Date/Time: <u>2/27/18 0925</u>																	



Submit by Email*

FOR LABORATORY USE ONLY

Laboratory Project ID: 1800367

Temp: 3.2 °C

Storage ID: WR-2

Storage Secured: Yes No

CHAIN OF CUSTODY RECORD

Project I.D.: 1095610.05.FI.ES P.O. #: CTO-4041 Sampler: E Cutter

TAT: (Check One)
Standard 21 days
Rush (surcharge may apply)
 14 days 7 days Specify:

Invoice to: Name: Rebecca Maco Company: CH2M Address: 1100 112th Ave Ste 500 City: Bellevue State: WA Zip: 98004 Ph#: (425) 698-9794 Fax #:

Relinquished by: (Printed Name and Signature) Eric Cutter Date: 2-26-18 Time: 1200 Received by: (Signature and Printed Name) B. Benedict Date: 02/27/18 Time: 1245 Via email

See "Sample Log-in Checklist" for additional sample information

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
(916) 673-1520 • Fax (916) 673-0106
Method of Shipment: Fed Ex
Tracking No.:

SHIP TO:				Method of Shipment:		Add Analysis(es) Requested																
ATTN:				Tracking No.:		Container(s)																
Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	537 List: 14	200000000	200000000	200000000	200000000	200000000	200000000	200000000	200000000	200000000	200000000	200000000	200000000	200000000		
* WI-A06-EP1-02218	2-22-18	1550		2	P	AQ	2															
WI-A06-MW07-0218	2-22-18	1500		2	P	AQ	2															
WI-A06-EP1-02218	2-22-18	1500		2	P	AR	2															
WI-A06-6-6-5-02-0218	2-23-18	1355		2	P	AQ	2															
WI-A06-6-5-05-0218	2-23-18	1035		2	P	AQ	2															
WI-A06-6-5-07-0218	2-23-18	1035		2	P	AQ	2															
WI-A06-F801-022318	2-23-18	1500		2	P	AQ	2															
WI-A06-EP1-022318	2-23-18	1500		2	P	AQ	2															

Special Instructions/Comments:

* used label id 2/27/18 43015

SEND DOCUMENTATION AND RESULTS TO:

Name: Tiffany Hill
Company: CH2M
Address: 1100 NE Circle Blvd Ste 300
City: Corvallis State: OR Zip: 97330
Phone: (541) 762-3109 Fax:
Email: Tiffany.Hill@ch2m.com

Container Types: A = 1 Liter Amber G = Glass Jar
P = PUF, T = MM5 Train, O = Other

*Bottle Preservative Type: T = Thiosulfate
 O = Other

Matrix Types: DW = Drinking Water, EF = Effluent, PP = Pulp/Paper,
SD = Sediment, SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum
O = Other

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Seattle
5755 8th Street E.
Tacoma, WA 98424
Tel. 253-922-2310
Fax 253-922-5047
www.testamericainc.com

- Rush
- Short Hold

Chain of Custody Record

Client Jacobs (CH2M Hill) Client Contact Tiffany Hill Date 7/20/18 Chain of Custody Number 37684
 Address 1100 NE Circle Blvd Ste. 300 Telephone Number (Area Code)/Fax Number (541) 908-3794 Lab Number _____ Page 1 of 2
 City Corvallis State OR Zip Code 97330 Sampler G. Gardner Lab Contact Kris Allen Analysis (Attach list if more space is needed)

Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix				Containers & Preservatives						Special Instructions/ Conditions of Receipt					
			Air	Aqueous	Sed.	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH						
W1-A06-S-0718	7/17/18	1735	X															
W1-A06-S-11-0718	7/17/18	1735	X				X			X						X	X	vinyl chloride and 1,4-dioxane only
W1-A06-6-S-40-0718	7/18/18	1017	X				X			X						X	X	" "
W1-A06-EB04-071818	7/18/18	1550	X				X			X						X	X	" "
W1-A06-6-S-41-0718	7/18/18	1350	X				X			X						X	X	" "
W1-A06-6-S-42-0718	7/19/18	0945	X				X			X						X	X	" "
W1-A06-6-S-42P-0718	7/19/18	0955	X				X			X						X	X	" "
W1-A06-EB05-071918	7/19/18	1615	X				X			X						X	X	" "
W1-A06-6-S-43-0718	7/19/18	1405	X				X			X						X	X	" "
W1-A06-6-S-43-0718-MS	7/19/18	1410	X				X			X						X	X	" "
W1-A06-6-S-43-0718-MSD	7/19/18	1410	X				X			X						X	X	" "
Trip Blank 01	7/16/18	1200	X							X						X		" "

Cooler Yes No Cooler Temp: _____ Possible Hazard Identification Non-Hazard Flammable Skin Irritant Poison B Unknown Sample Disposal Disposal By Lab Return To Client Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days) 24 Hours 48 Hours 5 Days 10 Days 15 Days Other 7 days QC Requirements (Specify)

1. Relinquished By Sign/Print <u>Gerrit Gardner</u>	Date <u>7/20/18</u>	Time <u>1000</u>	1. Received By Sign/Print	Date	Time
2. Relinquished By Sign/Print	Date	Time	2. Received By Sign/Print	Date	Time
3. Relinquished By Sign/Print	Date	Time	3. Received By Sign/Print	Date	Time

Comments _____

Client Jacobs (CH2M HILL)		Client Contact Tiffany Hill		Date 7/20/18	Chain of Custody Number 37685
Address 1100 NE Circle Blvd. Ste. 300		Telephone Number (Area Code)/Fax Number (541) 908-3794		Lab Number	

City Corvallis	State OR	Zip Code 97330	Sampler G. Gardner K. Remmen	Lab Contact Kris Allen	Analysis (Attach list if more space is needed)
Project Name and Location (State) CLEAN 9000 CTO-4041 NAS Whidbey Island			Billing Contact		

Contract/Purchase Order/Quote No. 10006-7-108336			Matrix	Containers & Preservatives	Special Instructions/ Conditions of Receipt
--	--	--	--------	----------------------------	--

Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix				Containers & Preservatives						8260SIM vinyl chloride	82705SIM 14-dioxane			
			Air	Aqueous	Sed.	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH					
Trip Blank 02	7/16/18	1200		X													
Trip Blank 03	7/16/18	1200		X													

Cooler <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Cooler Temp: _____	Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown	Sample Disposal <input type="checkbox"/> Return To Client <input type="checkbox"/> Archive For _____ Months	<input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Disposal By Lab	(A fee may be assessed if samples are retained longer than 1 month)
--	--	--	--	---

Turn Around Time Required (business days) <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input type="checkbox"/> 5 Days <input type="checkbox"/> 10 Days <input type="checkbox"/> 15 Days <input checked="" type="checkbox"/> Other 7 days	QC Requirements (Specify)
--	---------------------------

1. Relinquished By Sign/Print Gerrit Gardner [Signature]	Date 7/20/18	Time 1000	1. Received By Sign/Print	Date	Time
2. Relinquished By Sign/Print	Date	Time	2. Received By Sign/Print	Date	Time
3. Relinquished By Sign/Print	Date	Time	3. Received By Sign/Print	Date	Time

Comments



CHAIN OF CUSTODY

For Laboratory Use Only

Work Order #: _____ Temp: _____ °C

Storage ID: _____ Storage Secured: Yes No

Project ID: NASW Area 6 CTO: 4041 PO#: 101000479 Sampler: Gerrit Gardner
(name)

TAT Standard: 21 days
(check one): Rush (surcharge may apply)
 14 days 7 days Specify: _____

Invoice to: Name <u>Tiffany Hill</u>	Company <u>Jacobs</u>	Address <u>1100 NE Circle Blvd Ste. 300 Corvallis</u>	City <u>OR</u>	State <u>OR</u>	Ph# <u>541-902-3794</u>	Fax#
Relinquished by (printed name and signature) <u>Gerrit Gardner</u>	Date <u>7/20/2018</u>	Time <u>09:00</u>	Received by (printed name and signature)	Date	Time	
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time	

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
(916) 673-1520 * Fax (916) 673-0106

Method of Shipment: FedEx

Tracking No.: _____

ATTN: Martha Maier

Add Analysis(es) Requested

Container(s)

Mod EPA Method 837

EPA Method 537 (DW only)

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	PFOS/PFOA	UCMR3 PFAS List 6	337 List 14	Full List of 26	Other: Please List Below	PFOS/PFOA	UCMR3 PFAS List 6	PFAS List 14	Comments
W1-A06-S-0718	7/17/18	1735	6-S-11	2	P	AQ		<input checked="" type="checkbox"/>							KDR
W1-A06-FB01-0718															KDR
W1-A06-S-0718	7/17/18	1735	6-S-11	2	P	AQ		<input checked="" type="checkbox"/>							KDR
W1-A06-FB01-071718	7/17/18	1735		2	P	AQ		<input checked="" type="checkbox"/>							
W1-A06-S-11-0718	7/17/18	1735	6-S-11	2	P	AQ		<input checked="" type="checkbox"/>							
W1-A06-G-S-40-0718	7/18/18	1017	6-S-40	2	P	AQ		<input checked="" type="checkbox"/>							
W1-A06-FB02-071818	7/18/18	1017		2	P	AQ		<input checked="" type="checkbox"/>							
W1-A06-EB01-071718	7/17/18	1715	tubing	2	P	AQ		<input checked="" type="checkbox"/>							
W1-A06-EB02-071718	7/17/18	1725	bladder	2	P	AQ		<input checked="" type="checkbox"/>							
W1-A06-EB03-071718	7/17/18	1830	pump	2	P	AQ		<input checked="" type="checkbox"/>							

Special Instructions/Comments: _____

SEND DOCUMENTATION AND RESULTS TO:

Name: _____

Company: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

Email: _____

Container Types: P= HDPE, PJ= HDPE Jar
O = Other: _____

Bottle Preservation Type: T = Thiosulfate,
TZ = Trizma: _____

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,
SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _____



CHAIN OF CUSTODY

For Laboratory Use Only

Work Order #: _____ Temp: _____ °C

Storage ID: _____ Storage Secured: Yes No

Project ID: _____ PO#: _____ Sampler: _____ (name)

TAT Standard: 21 days

(check one): Rush (surcharge may apply)

14 days 7 days Specify: _____

Invoice to: Name _____ Company _____ Address _____ City _____ State _____ Ph# _____ Fax# _____

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
(916) 673-1520 * Fax (916) 673-0106

Method of Shipment: _____

ATTN: _____ Tracking No.: _____

Add Analysis(es) Requested			Mod. EPA Method 537	EPA Method 537(DW only)						
Container(s)										
Quantity	Type	Matrix	PFOA/ PFOS	UCMR3 PFAS List: 8	537 List: 14	Full List of 28	Other: Please List Below	PFOA/ PFOS	UCMR3 PFAS List: 8	PFAS List: 14

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	PFOA/ PFOS	UCMR3 PFAS List: 8	537 List: 14	Full List of 28	Other: Please List Below	PFOA/ PFOS	UCMR3 PFAS List: 8	PFAS List: 14	Comments
W1-A06-EB04-071818	7/18/18	1550	pump	2	P	AQ			X						
W1-A06-6-S-41-0718	7/18/18	1350	6-S-41 *	2	P	AQ			X						
W1-A06-6-S-42-0718	7/19/18		6-S-42	4	P	AQ			X		w/ TOP assay				2 bottles for 537 List: 14 w/ TOP assay KPR
W1-A06-6-S-42-0718	7/19/18	0945	6-S-42	6	P	AQ			X		w/ TOP assay				4 bottles for 537 List: 14 w/ TOP assay
W1-A06-6-S-42P-0718	7/19/18	0955	6-S-42 duplicate	6	P	AQ			X		w/ TOP assay				4 bottles for 537 List: 14 w/ TOP assay
W1-A06-FB03-071918	7/19/18	0955		2	P	AQ			X		** KPR				
W1-A06-EB05-071918	7/19/18	1615	pump	2	P	AQ			X						
W1-A06-6-S-43-0718	7/19/18	1405	6-S-43	6	P	AQ			X		w/ TOP assay				4 bottles for 537 List: 14 w/ TOP assay
W1-A06-6-S-43-0718-MS	7/19/18	1410	6-S-43	6	P	AQ			X		w/ TOP assay				4 bottles for 537 List: 14 w/ TOP assay
W1-A06-6-S-43-0718-MSD	7/19/18	1410	6-S-43	6	P	AQ			X		w/ TOP assay				4 bottles for 537 List: 14 w/ TOP assay

Special Instructions/Comments: _____

SEND DOCUMENTATION AND RESULTS TO:

Name: _____

Company: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

Email: _____

Container Types: P= HDPE, PJ= HDPE Jar
O = Other: _____

Bottle Preservation Type: T = Thiosulfate, TZ = Trizma: _____

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _____

TestAmerica Seattle
5755 8th Street East

Chain of Custody Record

Loc: 580
80030

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Tacoma, WA 98424-1317
phone 253.922.2310 fax 253.922.5047

CTO 4041

Regulatory Program: DW NPDES RCRA Other:

TestAmerica Laboratories, Inc.

Client Contact		Project Manager: Tiffany Hill		Site Contact:		Date: 8/30/18		COC No: 18083003	
Jacobs (CH2M)		Tel/Fax: 541-768-3109		Lab Contact: Kris Allen		Carrier: FedEx		1 of 1 COCs	
1100 112th Ave. NE, Suite 500		Analysis Turnaround Time						Sampler: Krystle Remmen	
Bellevue, WA 98004		<input type="checkbox"/> CALENDAR DAYS <input checked="" type="checkbox"/> WORKING DAYS						For Lab Use Only:	
(541) 768-3109 Phone		TAT if different from Below 10 days						Walk-in Client:	
(xxx) xxx-xxxx FAX		<input type="checkbox"/> 2 weeks						Lab Sampling:	
Project Name: Navy CLEAN - NASWI Area 6 Off-Base GW		<input type="checkbox"/> 1 week							
Site: Area 6		<input type="checkbox"/> 2 days							
P O # 10006-7-108336		<input type="checkbox"/> 1 day							



580-80030 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	8260SIM (vinyl chloride only)	8270SIM (1,4-dioxane only)	Sample Specific Notes:
WI-A06-S-24-0818	8/30/2018	1225	G	W	5	N	N	3	2	
WI-A06-EB01-083018	8/30/2018	1455	G	W	5	N	N	3	2	
WI-A06-TB02-083018	8/30/2018	700	G	W	3	N	N	3		
WI-A06-S-24P-0818	8/30/18	1225	G	W	5	N	N	3	2	
WI-A06-S-24-0818-MS	8/30/18	1225	G	W	5	N	N	3	2	
WI-A06-S-24-0818-MSD	8/30/18	1225	G	W	5	N	N	3	2	
WI-A06-EB02-083018	8/30/18	1515	G	W	5	N	N	3	2	

Therm. ID: 5 Cor: 0.5 Unc: 0.5
Cooler Dsc: Ly Blue FedEx: PO
Packing: Box UPS:
Cust. Seal: YK No Lab Cour:
 Packs/Dry Ice/None Other:

Therm. ID: 5 Cor: 0.1 Unc: 0.1
Cooler Dsc: Ly Blue FedEx: PO
Packing: Box UPS:
Cust. Seal: YK No Lab Cour:
 Packs/Dry Ice/None Other:

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

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

Non-Hazard Flammable Skin Irritant Poison B Unknown

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

Return to Client Disposal by Lab Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.:	Cooler Temp. (°C): Obs'd: _____	Corr'd: _____	Therm ID No.: _____
Relinquished by: <u>J. Remmen</u> Krystle Remmen	Company: <u>Jacobs</u>	Date/Time: <u>8/31/18 1030</u>	Received by: <u>Kris Allen</u>	Company: <u>Jacobs</u>
Relinquished by:	Company:	Date/Time:	Received by:	Company:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:



CHAIN OF CUSTODY

For Laboratory Use Only
 Work Order #: 1802844 Temp: 1.8 °C
 Storage ID: WR-2 Storage Secured: Yes No

Project ID: Navy CLEAN NASM AG Off-Base GW PO#: 10006-7-108346 Sampler: Krystle Remmen
 (name)

TAT Standard: 21 days
 (check one): Rush (surcharge may apply)
 14 days 7 days Specify: 10 days

Invoice to: Name Tiffany Hill Company Jacobs Address 1100 112th Ave. NE, Suite 500 City Bellevue State WA Ph# 541-768-3109 Fax#
 Relinquished by (printed name and signature) Krystle Remmen Date 8/31/18 Time 1030 Received by (printed name and signature) [Signature] Date 9/11/18 Time 09:40
 Relinquished by (printed name and signature) _____ Date _____ Time _____ Received by (printed name and signature) _____ Date _____ Time _____

SHIP TO: Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 Ph: (916) 673-1520; Fax: (916) 673-0106				Add Analysis(es) Requested										Comments		
Method of Shipment: <u>Fed Ex</u>				Container(s)										USEPA Method 537		
ATTN: <u>Martha Maier</u>				Tracking No.:												
Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	List of 21	List of 21 w/isomers	List of 24	List of 24 w/isomers	List of 28	Other: Please List Below	PFOA/PFOS	UCMR3 PFAS List 6	PFAS List 14	
W1-A06-S-24-0818	8/30/18	1225	6-S-24	2	P	AQ									X	
W1-A06-FB02-083018	8/30/18	1225	6-S-24	2	P	AQ									X	
W1-A06-EB01-083018	8/30/18	1455	pump	2	P	AQ									X	
W1-A06-S-24P-0818	8/30/18	1225	6-S-24	2	P	AQ									X	
W1-A06-S-24-0818-MS	8/30/18	1225	6-S-24	2	P	AQ									X	
W1-A06-S-24-0818-MSD	8/30/18	1225	6-S-24	2	P	AQ									X	
W1-A06-EB02-083018	8/30/18	1515	tubing	2	P	AQ									X	

Special Instructions/Comments:

SEND DOCUMENTATION AND RESULTS TO:

Name: _____
 Company: _____
 Address: _____
 City: _____ State: _____ Zip: _____
 Phone: _____ Fax: _____
 Email: _____

Container Types: P= HDPE, PJ= HDPE Jar
 O = Other: _____

Bottle Preservation Type: T = Thiosulfate,
 TZ = Trizma: _____

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,
 SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _____

Client Jacobs (CH2M Hill)		Client Contact Tiffany Hill		Date 1/24/2019	Chain of Custody Number 35088
Address 1100 NE Circle Blvd Ste 300		Telephone Number (Area Code)/Fax Number (541) 908-3794		Lab Number 83545	Page 1 of 1

City Corvallis	State OR	Zip Code 97330	Sampler G. Gardner	Lab Contact Kris Allen	Analysis (Attach list if more space is needed)	Special Instructions/ Conditions of Receipt
Project Name and Location (State) NAVY CLEAN CTO 4041 NASWI			Billing Contact			

Contract/Purchase Order/Quote No. **100067-108336**

Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix				Containers & Preservatives						Special Instructions/ Conditions of Receipt		
			Air	Aqueous	Sed.	Soil	Unpres	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH			
-1 W1-A06-5-12-0119	1/23/19	1200		X			2			3					vinyl chloride 1,4-dioxane
-2 W1-A06-5-12P-0119		1230		X			2			3					
-1 W1-A06-5-12-0119-MS		1200		X			2			3					
-1 W1-A06-5-12-0119-MSD		1200		X			2			3					
-3 W1-A06-EB01-012319		1400		X			2			3					
-4 W1 Trip Blank 01		1000		X			2			3					

Therm. ID: IR4 Cor: 5.7. Unc: 5.9.
Cooler Desc: Ly Blue
Packing: but FedEx: PO
Cust. Seal: Yes No
Blue Ice: Wet Dry, None Other: _____



Cooler <input type="checkbox"/> Yes <input type="checkbox"/> No Cooler Temp: _____	Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown	Sample Disposal <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months	(A fee may be assessed if samples are retained longer than 1 month)
---	--	---	---

Turn Around Time Required (business days) <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input type="checkbox"/> 5 Days <input type="checkbox"/> 10 Days <input type="checkbox"/> 15 Days <input type="checkbox"/> Other _____	QC Requirements (Specify)
---	---------------------------

1. Relinquished By Sign/Print Gerrit Gardner	Date 1/24/19	Time 1100	1. Received By Sign/Print Tammy Blankinship	Date 1/25/19	Time 0930
2. Relinquished By Sign/Print	Date	Time	2. Received By Sign/Print	Date	Time
3. Relinquished By Sign/Print	Date	Time	3. Received By Sign/Print	Date	Time

Comments

EXACT COPY OF THE ORIGINAL
INIT KE 1/28/19

P. 1 of 2

KE 1/28/19



CHAIN OF CUSTODY

For Laboratory Use Only
 Work Order #: 1900185 Temp: 1.2 °C
 Storage ID: WR2 Storage Secured: Yes No

1900195

Project ID: Mary Clean CTO: 4041 NASWI PO#: 10006-7-108295 Sampler: G. Gardner/E. Storkerson
 (name)

TAT (check one): Standard: 21 days
 14 days 7 days
 Rush (surcharge may apply) Specify: _____

Invoice to: Name Tiffany Hill Company Jacobs (CH2M Hill) Address 1100 NE Circle Blvd. ste-300 City Corvallis State OR Ph# 757-671-6278 Fax# _____

Relinquished by (printed name and signature) Gerrit Gardner Date 1/24/2019 Time 1030 Received by (printed name and signature) Kim Eirik Date 1/25/19 Time 0915

Sample ID	Date	Time	Location/Sample Description	Add Analysis(es) Requested						PFAS Isotope Dilution	USEPA Method 537	Comments	
				Quantity	Type	Matrix	List of 21	List of 21 w/Isomers	List of 24				List of 24 w/Isomers
* WL-CV-1RW90-EFF201-012219	1/22/19	1430	DW	2	P	DW						X	TZ preserved 7 day TAT!
* WL-CV-1RW90-MID202-012219		1435											
* WL-CV-1RW90-MID201-012219		1440											
* WL-CV-1RW90-MID201-02219-MS		1445											
* WL-CV-1RW90-MID201-012219-MS		1450											
* WL-CV-1RW90-INF201-012219		1455											
* WL-CV-1FB90-012219	1/23/19	1500											
WL-AC6-S-12-0119	1/23/19	1200	AC6			AC6							
WL-AC6-S-12P-0119		1230											
WL-AC6-S-12-0119-MS		1200											

Special Instructions/Comments:
* WO # 1900185

SEND DOCUMENTATION AND RESULTS TO:
 Name: _____
 Company: _____
 Address: _____
 City: _____ State: _____ Zip: _____
 Phone: _____ Fax: _____
 Email: _____

Container Types: P = HDPE, PJ = HDPE Jar
 Bottle Preservation Type: T = Thiosulfate, TZ = Trizma
 Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other



P. 2 of 2

EXACT COPY OF THE ORIGINAL
 INT KE 1 28 19

1900195 KE 1/28/19

CHAIN OF CUSTODY

For Laboratory Use Only
 Work Order #: 1900185 Temp: 1.2 °C
 Storage ID: WD-2 Storage Secured: Yes No

Project ID: _____ PO#: _____ Sampler: _____ (name)

TAT Standard: 21 days
 (check one): Rush (surcharge may apply)
 14 days 7 days Specify: _____

Invoice to: Name _____ Company _____ Address _____ City _____ State _____ Ph# _____ Fax# _____

Relinquished by (printed name and signature) See Page 1 Date _____ Time _____ Received by (printed name and signature) Km Eric Date 1/25/19 Time 0915
 Relinquished by (printed name and signature) _____ Date _____ Time _____ Received by (printed name and signature) _____ Date _____ Time _____

SHIP TO: Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 Ph: (916) 673-1520; Fax: (916) 673-0106				Method of Shipment:		Add Analysis(es) Requested		PFAS Isotope Dilution	USEPA Method 537	Comments						
ATTN: _____				Tracking No.: _____		Container(s)										
Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	PFDA/PFS	UCM/B3 PFAS Lists	PFAS List: 14	
WL-AQG-S-12-0119-MED	1/23/19	1200	AQ	2	P	AQ										
WL-AQG-AQG1-0119	1/23/19	1330	WW	1		WW										
WL-AQG-AQG2-0119		1330	WW			WW										
WL-AQG-EB01-012319		1200	AQ			AQ										
WL-AQG-EB01-012319	1/23/19	1400	AQ			AQ										

Special Instructions/Comments:
* MOVED TO WD # 1900196 FOR CLIENT REQUEST

SEND DOCUMENTATION AND RESULTS TO:
 Name: _____ Company: _____
 Address: _____
 City: _____ State: _____ Zip: _____
 Phone: _____ Fax: _____
 Email: _____

Container Types: P= HDPE, PJ= HDPE Jar Bottle Preservation Type: T = Thiosulfate, Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,
 O = Other: _____ TZ = Trizma: _____ SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _____

Attachment 4
Raw Data and Data Validation Forms for
Groundwater Monitoring Well and
GETR Samples

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 1701943
 Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: May 12, 2018

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-6-S-04-1217	1701943-01	Water
3	WI-A06-6-S-19-1217	1701943-03	Water
5	WI-A06-6-S-19P-1217	1701943-05	Water
7	WI-A06-6-S-31-1217	1701943-07	Water
9	WI-A06-EB07-121117	1701943-09	Water
11	WI-A06-6-S-08-1217	1701943-11	Water
13	WI-A06-EB08-121217	1701943-13	Water

A full data validation was performed on the analytical data for five water samples and two aqueous equipment blank samples collected on December 11-12, 2017 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the EPA Method “Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)”.

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA “Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review,” January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times

- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-EB07-121117	None - ND	-	-	-
WI-A06-EB08-121217	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

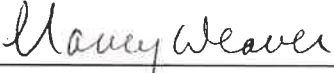
- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

PFCs				
Compound	WI-A06-6-S-19-1217 ng/L	WI-A06-6-S-19P-1217 ng/L	RPD	Qualifier
PFBS	4.22	4.15	2%	None
PFHxA	21.8	22.8	4%	
PFHpA	1.66	1.95	16%	
PFHxS	6.21	5.39	14%	
PFOA	4.21	4.20	0%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: 
Nancy Weaver
Senior Chemist

Dated: 5/15/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-6-S-04-1217

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701943-01	Column:	BEH C18
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	11-Dec-17 10:15	Date Received:	13-Dec-17 09:28		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.79	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFHxA	6.84	2.18	5.00	8.00	J	B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFHpA	ND	0.591	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFHxS	ND	0.947	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFOA	ND	0.651	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFOS	ND	0.807	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFNA	ND	0.810	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFDA	ND	1.49	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
MeFOSAA	ND	1.65	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFUnA	ND	1.05	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
EtFOSAA	ND	1.37	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFDoA	ND	0.792	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFTrDA	ND	0.494	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFTeDA	ND	0.755	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	121	50 - 150		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
13C2-PFHxA	IS	121	50 - 150		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
13C4-PFHpA	IS	120	50 - 150		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
18O2-PFHxS	IS	125	50 - 150		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
13C2-PFOA	IS	126	50 - 150		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
13C8-PFOS	IS	113	50 - 150		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
13C5-PFNA	IS	99.4	50 - 150		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
13C2-PFDA	IS	145	50 - 150		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
d3-MeFOSAA	IS	116	50 - 150		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
13C2-PFUnA	IS	104	50 - 150		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
d5-EtFOSAA	IS	122	50 - 150		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
13C2-PFDoA	IS	87.3	50 - 150		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
13C2-PFTeDA	IS	94.3	50 - 150		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL - Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

NW 51.2/18

Sample ID: WI-A06-6-S-19-1217

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701943-03	Column:	BEH C18
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	11-Dec-17 11:55	Date Received:	13-Dec-17 09:28		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	4.22	1.85	5.17	8.29	J	B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFHxA	21.8	2.26	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFHpA	1.66	0.612	5.17	8.29	J	B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFHxS	6.21	0.981	5.17	8.29	J	B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFOA	4.21	0.675	5.17	8.29	J	B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFOS	ND	0.836	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFNA	ND	0.839	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFDA	ND	1.54	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
MeFOSAA	ND	1.71	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFUnA	ND	1.09	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
EtFOSAA	ND	1.42	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFDaA	ND	0.821	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFTrDA	ND	0.512	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFTeDA	ND	0.782	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	123	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
13C2-PFHxA	IS	126	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
13C4-PFHpA	IS	113	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
18O2-PFHxS	IS	120	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
13C2-PFOA	IS	107	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
13C8-PFOS	IS	122	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
13C5-PFNA	IS	121	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
13C2-PFDA	IS	109	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
d3-MeFOSAA	IS	112	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
13C2-PFUnA	IS	120	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
d5-EtFOSAA	IS	109	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
13C2-PFDaA	IS	90.5	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
13C2-PFTeDA	IS	94.5	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

msl.21.8

Sample ID: WI-A06-6-S-19P-1217

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701943-05	Column:	BEH C18
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	11-Dec-17 11:55	Date Received:	13-Dec-17 09:28		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	4.15	1.87	5.21	8.34	J	B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFHxA	22.8	2.27	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFHpA	1.95	0.616	5.21	8.34	J	B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFHxS	5.39	0.987	5.21	8.34	J	B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFOA	4.20	0.678	5.21	8.34	J	B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFOS	ND	0.841	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFNA	ND	0.844	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFDA	ND	1.55	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
MeFOSAA	ND	1.72	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFUnA	ND	1.09	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
EtFOSAA	ND	1.43	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFDoA	ND	0.825	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFTTrDA	ND	0.515	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFTeDA	ND	0.787	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	125	50 - 150		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
13C2-PFHxA	IS	114	50 - 150		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
13C4-PFHpA	IS	118	50 - 150		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
18O2-PFHxS	IS	101	50 - 150		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
13C2-PFOA	IS	118	50 - 150		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
13C8-PFOS	IS	122	50 - 150		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
13C5-PFNA	IS	124	50 - 150		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
13C2-PFDA	IS	107	50 - 150		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
d3-MeFOSAA	IS	118	50 - 150		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
13C2-PFUnA	IS	119	50 - 150		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
d5-EtFOSAA	IS	115	50 - 150		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
13C2-PFDoA	IS	93.9	50 - 150		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
13C2-PFTeDA	IS	98.4	50 - 150		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

new sticks

Sample ID: WI-A06-6-S-31-1217

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701943-07	Column:	BEH C18
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	11-Dec-17 14:10	Date Received:	13-Dec-17 09:28		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	14.3	1.80	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
PFHxA	58.3	2.20	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
PFHpA	29.3	0.595	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
PFHxS	41.1	0.954	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
PFOA	53.8	0.656	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
PFOS	1.82	0.813	5.04	8.06	J	B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
PFNA	ND	0.816	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
PFDA	ND	1.50	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
MeFOSAA	ND	1.66	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
PFUnA	ND	1.06	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
EtFOSAA	ND	1.38	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
PFDoA	ND	0.798	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
PFTTrDA	ND	0.498	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
PFTeDA	ND	0.761	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	133	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
13C2-PFHxA	IS	119	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
13C4-PFHpA	IS	118	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
18O2-PFHxS	IS	137	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
13C2-PFOA	IS	114	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
13C8-PFOS	IS	123	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
13C5-PFNA	IS	117	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
13C2-PFDA	IS	133	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
d3-MeFOSAA	IS	107	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
13C2-PFUnA	IS	129	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
d5-EtFOSAA	IS	122	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
13C2-PFDoA	IS	71.9	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
13C2-PFTeDA	IS	91.6	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

hw 5/12/18

Sample ID: WI-A06-EB07-121117

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701943-09	Column:	BEH C18
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	11-Dec-17 14:45	Date Received:	13-Dec-17 09:28		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.86	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFHxA	ND	2.26	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFHpA	ND	0.613	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFHxS	ND	0.982	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFOA	ND	0.675	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFOS	ND	0.837	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFNA	ND	0.840	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFDA	ND	1.54	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
MeFOSAA	ND	1.71	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFUnA	ND	1.09	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
EtFOSAA	ND	1.42	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFDoA	ND	0.821	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFTTrDA	ND	0.512	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFTeDA	ND	0.783	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	142	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
13C2-PFHxA	IS	118	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
13C4-PFHpA	IS	118	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
18O2-PFHxS	IS	124	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
13C2-PFOA	IS	106	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
13C8-PFOS	IS	116	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
13C5-PFNA	IS	114	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
13C2-PFDA	IS	117	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
d3-MeFOSAA	IS	128	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
13C2-PFUnA	IS	108	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
d5-EtFOSAA	IS	129	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
13C2-PFDoA	IS	87.9	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
13C2-PFTeDA	IS	85.4	50 - 150		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1

DL - Detection Limit LOD - Limit of Detection LCL-UCL - Lower control limit - upper control limit When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
 LOQ - Limit of quantitation Results reported to the DL. Only the linear isomer is reported for all other analytes.

MSL. 21.8

Sample ID: WI-A06-6-S-08-1217

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701943-11	Column:	BEH C18
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	12-Dec-17 09:35	Date Received:	13-Dec-17 09:28		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.81	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
PFHxA	ND	2.21	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
PFHpA	ND	0.598	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
PFHxS	ND	0.958	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
PFOA	ND	0.659	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
PFOS	ND	0.816	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
PFNA	ND	0.820	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
PFDA	ND	1.51	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
MeFOSAA	ND	1.67	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
PFUnA	ND	1.06	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
EtFOSAA	ND	1.39	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
PFDoA	ND	0.801	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
PFTeDA	ND	0.500	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
PFTeDA	ND	0.764	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	135	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
13C2-PFHxA	IS	115	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
13C4-PFHpA	IS	122	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
18O2-PFHxS	IS	120	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
13C2-PFOA	IS	88.2	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
13C8-PFOS	IS	112	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
13C5-PFNA	IS	92.1	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
13C2-PFDA	IS	83.9	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
d3-MeFOSAA	IS	104	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
13C2-PFUnA	IS	98.7	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
d5-EtFOSAA	IS	100	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
13C2-PFDoA	IS	81.9	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
13C2-PFTeDA	IS	75.5	50 - 150		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

ms/218

Sample ID: WI-A06-EB08-121217

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701943-13	Column:	BEH C18
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	12-Dec-17 10:25	Date Received:	13-Dec-17 09:28		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.83	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFHxA	ND	2.22	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFHpA	ND	0.603	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFHxS	ND	0.966	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFOA	ND	0.664	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFOS	ND	0.823	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFNA	ND	0.826	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFDA	ND	1.52	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
MeFOSAA	ND	1.68	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFUnA	ND	1.07	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
EtFOSAA	ND	1.40	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFDoA	ND	0.808	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFTeDA	ND	0.504	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFTeDA	ND	0.770	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	110	50 - 150		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
13C2-PFHxA	IS	112	50 - 150		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
13C4-PFHpA	IS	112	50 - 150		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
18O2-PFHxS	IS	109	50 - 150		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
13C2-PFOA	IS	121	50 - 150		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
13C8-PFOS	IS	118	50 - 150		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
13C5-PFNA	IS	90.5	50 - 150		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
13C2-PFDA	IS	78.8	50 - 150		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
d3-MeFOSAA	IS	80.5	50 - 150		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
13C2-PFUnA	IS	77.9	50 - 150		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
d5-EtFOSAA	IS	66.0	50 - 150		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
13C2-PFDoA	IS	84.1	50 - 150		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
13C2-PFTeDA	IS	89.7	50 - 150		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

new 5/12/18

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 1701882
Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
Date: May 12, 2018

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-6-I-01-1217	1701882-01	Water
3	WI-A06-EB01-120517	1701882-03	Water
5	WI-A06-EB02-120517	1701882-05	Water
7	WI-A06-EFF01-1217	1701882-07	Water
9	WI-A06-EFF01P-1217	1701882-09	Water
11	WI-A06-INF01-1217	1701882-11	Water
13	WI-A06-P-4-1217	1701882-13	Water
15	WI-A06-6-I-03-1217	1701882-15	Water

A full data validation was performed on the analytical data for six water samples and two aqueous equipment blank samples collected on December 5-6, 2017 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the EPA Method “Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)”.

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA “Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review,” January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation

- Holding times
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-EB01-120517	None - ND	-	-	-
WI-A06-EB02-120517	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

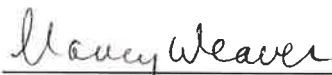
- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

PFCs				
Compound	WI-A06-EFF01-1217 ng/L	WI-A06-EFF01p-1217 ng/L	RPD	Qualifier
PFBS	10.5	10.0	5%	None
PFHxA	40.7	37.4	8%	
PFHpA	11.8	11.3	4%	
PFHxS	43.0	49.2	13%	
PFOA	35.8	28.6	22%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: 
Nancy Weaver
Senior Chemist

Dated: 5/15/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-6-I-01-1217

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701882-01	Column:	BEH C18
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	05-Dec-17 14:45	Date Received:	07-Dec-17 09:23		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.93	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
PFHxA	ND	2.36	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
PFHpA	ND	0.639	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
PFHxS	ND	1.02	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
PFOA	1.09	0.703	5.39	8.64	J	B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
PFOS	ND	0.872	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
PFNA	ND	0.875	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
PFDA	ND	1.61	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
MeFOSAA	ND	1.78	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
PFUnA	ND	1.13	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
EtFOSAA	ND	1.48	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
PFDoA	ND	0.856	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
PFTeDA	ND	0.534	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
PFTeDA	ND	0.816	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	115	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
13C2-PFHxA	IS	109	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
13C4-PFHpA	IS	112	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
18O2-PFHxS	IS	92.4	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
13C2-PFOA	IS	112	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
13C8-PFOS	IS	112	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
13C5-PFNA	IS	109	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
13C2-PFDA	IS	98.0	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
d3-MeFOSAA	IS	114	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
13C2-PFUnA	IS	97.8	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
d5-EtFOSAA	IS	125	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
13C2-PFDoA	IS	105	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
13C2-PFTeDA	IS	96.0	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

mw 5/12/18

Sample ID: W1-A06-EB01-120517							Modified EPA Method 537				
Client Data				Laboratory Data							
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701882-03	Column:	BEH C18				
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	05-Dec-17 08:40	Date Received:	07-Dec-17 09:23						
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	1.94	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
PFHxA	ND	2.37	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
PFHpA	ND	0.642	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
PFHxS	ND	1.03	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
PFOA	ND	0.707	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
PFOS	ND	0.876	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
PFNA	ND	0.879	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
PFDA	ND	1.62	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
MeFOSAA	ND	1.79	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
PFUnA	ND	1.14	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
EtFOSAA	ND	1.49	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
PFDoA	ND	0.860	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
PFTeDA	ND	0.536	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
PFTeDA	ND	0.820	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C3-PFBS	IS	105	50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
13C2-PFHxA	IS	108	50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
13C4-PFHpA	IS	119	50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
18O2-PFHxS	IS	121	50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
13C2-PFOA	IS	116	50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
13C8-PFOS	IS	93.0	50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
13C5-PFNA	IS	111	50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
13C2-PFDA	IS	89.7	50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
d3-MeFOSAA	IS	116	50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
13C2-PFUnA	IS	85.5	50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
d5-EtFOSAA	IS	118	50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
13C2-PFDoA	IS	108	50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	
13C2-PFTeDA	IS	110	50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1	

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL - Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

rev 51.21.8

Sample ID: WI-A06-EB02-120517

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701882-05	Column:	BEH C18
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	05-Dec-17 16:20	Date Received:	07-Dec-17 09:23		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.89	5.25	8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFHxA	ND	2.30	5.25	8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFHpA	ND	0.623	5.25	8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFHxS	ND	0.999	5.25	8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFOA	ND	0.687	5.25	8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFOS	ND	0.851	5.25	8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFNA	ND	0.854	5.25	8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFDA	ND	1.57	5.25	8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
MeFOSAA	ND	1.74	5.25	8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFUnA	ND	1.11	5.25	8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
EtFOSAA	ND	1.44	5.25	8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFDoA	ND	0.835	5.25	8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFTrDA	ND	0.521	5.25	8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFTeDA	ND	0.796	5.25	8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	117	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
13C2-PFHxA	IS	109	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
13C4-PFHpA	IS	116	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
18O2-PFHxS	IS	109	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
13C2-PFOA	IS	114	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
13C8-PFOS	IS	89.2	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
13C5-PFNA	IS	93.1	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
13C2-PFDA	IS	92.8	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
d3-MeFOSAA	IS	70.7	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
13C2-PFUnA	IS	69.0	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
d5-EtFOSAA	IS	86.0	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
13C2-PFDoA	IS	74.3	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
13C2-PFTeDA	IS	73.1	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

1701882

Sample ID: WI-A06-EFF01-1217

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701882-07	Column:	BEH C18
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	05-Dec-17 12:10	Date Received:	07-Dec-17 09:23		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	10.5	1.94	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFHxA	40.7	2.36	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFHpA	11.8	0.640	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFHxS	43.0	1.03	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFOA	35.8	0.705	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFOS	ND	0.874	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFNA	ND	0.877	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFDA	ND	1.61	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
MeFOSAA	ND	1.79	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFUnA	ND	1.14	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
EtFOSAA	ND	1.48	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFDoA	ND	0.858	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFTrDA	ND	0.535	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFTeDA	ND	0.818	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	98.2	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
13C2-PFHxA	IS	98.6	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
13C4-PFHpA	IS	98.9	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
18O2-PFHxS	IS	121	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
13C2-PFOA	IS	109	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
13C8-PFOS	IS	105	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
13C5-PFNA	IS	103	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
13C2-PFDA	IS	92.2	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
d3-MeFOSAA	IS	101	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
13C2-PFUnA	IS	92.5	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
d5-EtFOSAA	IS	103	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
13C2-PFDoA	IS	115	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
13C2-PFTeDA	IS	90.4	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL - Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

www.51.21.8

Sample ID: WI-A06-EFF01P-1217						Modified EPA Method 537					
Client Data					Laboratory Data						
Name:	CH2M Hill		Matrix:	Water		Lab Sample:	1701882-09		Column:	BEH C18	
Project:	WHIDBEY ISLAND / 695610.05.FI.FS		Date Collected:	05-Dec-17 12:10		Date Received:	07-Dec-17 09:23				
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	10.0	1.93	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFHxA	37.4	2.35	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFHpA	11.3	0.637	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFHxS	49.2	1.02	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFOA	28.6	0.702	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFOS	ND	0.870	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFNA	ND	0.873	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFDA	ND	1.61	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
MeFOSAA	ND	1.78	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFUnA	ND	1.13	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
EtFOSAA	ND	1.48	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFDoA	ND	0.854	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFTeDA	ND	0.533	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFTeDA	ND	0.814	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C3-PFBS	IS	92.4	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1		
13C2-PFHxA	IS	104	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1		
13C4-PFHpA	IS	93.4	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1		
18O2-PFHxS	IS	102	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1		
13C2-PFOA	IS	130	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1		
13C8-PFOS	IS	94.2	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1		
13C5-PFNA	IS	88.4	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1		
13C2-PFDA	IS	77.1	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1		
d3-MeFOSAA	IS	103	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1		
13C2-PFUnA	IS	110	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1		
d5-EtFOSAA	IS	97.4	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1		
13C2-PFDoA	IS	126	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1		
13C2-PFTeDA	IS	116	50 - 150		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1		

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

new sl. 21.8

Sample ID: WI-A06-INF01-1217						Modified EPA Method 537				
Client Data				Laboratory Data						
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701882-11	Column:	BEH C18			
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	05-Dec-17 12:15	Date Received:	07-Dec-17 09:23					
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	10.6	1.95	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFHxA	39.5	2.38	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFHpA	11.3	0.645	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFHxS	45.7	1.03	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFOA	35.1	0.710	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFOS	ND	0.880	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFNA	ND	0.884	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFDA	ND	1.63	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
MeFOSAA	ND	1.80	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFUnA	ND	1.15	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
EtFOSAA	ND	1.49	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFDoA	ND	0.864	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFTeDA	ND	0.539	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFTeDA	ND	0.824	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C3-PFBS	IS	102	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1	
13C2-PFHxA	IS	103	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1	
13C4-PFHpA	IS	112	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1	
18O2-PFHxS	IS	112	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1	
13C2-PFOA	IS	104	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1	
13C8-PFOS	IS	91.6	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1	
13C5-PFNA	IS	82.7	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1	
13C2-PFDA	IS	104	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1	
d3-MeFOSAA	IS	96.0	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1	
13C2-PFUnA	IS	115	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1	
d5-EtFOSAA	IS	90.7	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1	
13C2-PFDoA	IS	113	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1	
13C2-PFTeDA	IS	115	50 - 150		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1	

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL- Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

NW 51.26.8

Sample ID: WI-A06-P-4-1217						Modified EPA Method 537						
Client Data					Laboratory Data							
Name:	CH2M Hill		Matrix:	Water		Lab Sample:	1701882-13		Column:	BEH C18		
Project:	WHIDBEY ISLAND / 695610.05.FIFS		Date Collected:	05-Dec-17 10:50		Date Received:	07-Dec-17 09:23					
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
PFBS	9.73	1.88	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1		
PFHxA	34.3	2.29	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1		
PFHpA	11.9	0.622	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1		
PFHxS	35.0	0.996	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1		
PFOA	58.2	0.685	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1		
PFOS	ND	0.849	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1		
PFNA	1.49	0.852	5.25	8.42	J	B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1		
PFDA	ND	1.57	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1		
MeFOSAA	ND	1.74	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1		
PFUnA	ND	1.10	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1		
EtFOSAA	ND	1.44	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1		
PFDoA	ND	0.833	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1		
PFTTrDA	ND	0.520	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1		
PFTeDA	ND	0.794	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1		
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution			
13C3-PFBS	IS	107	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1			
13C2-PFHxA	IS	111	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1			
13C4-PFHpA	IS	101	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1			
18O2-PFHxS	IS	109	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1			
13C2-PFOA	IS	111	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1			
13C8-PFOS	IS	118	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1			
13C5-PFNA	IS	89.7	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1			
13C2-PFDA	IS	127	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1			
d3-MeFOSAA	IS	97.4	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1			
13C2-PFUnA	IS	75.0	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1			
d5-EtFOSAA	IS	90.4	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1			
13C2-PFDoA	IS	95.5	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1			
13C2-PFTeDA	IS	85.8	50 - 150		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1			

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

mw sk 12/18

Sample ID: WI-A06-6-I-03-1217						Modified EPA Method 537					
Client Data					Laboratory Data						
Name:	CH2M Hill		Matrix:	Water		Lab Sample:	1701882-15		Column:	BEH C18	
Project:	WHIDBEY ISLAND / 695610.05.FI.FS		Date Collected:	06-Dec-17 10:35		Date Received:	07-Dec-17 09:23				
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	2.04	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
PFHxA	ND	2.48	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
PFHpA	ND	0.673	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
PFHxS	ND	1.08	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
PFOA	ND	0.741	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
PFOS	ND	0.919	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
PFNA	ND	0.922	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
PFDA	ND	1.70	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
MeFOSAA	ND	1.88	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
PFUnA	ND	1.20	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
EtFOSAA	ND	1.56	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
PFDoA	ND	0.902	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
PFTeDA	ND	0.563	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
PFTeDA	ND	0.860	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C3-PFBS	IS	105	50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
13C2-PFHxA	IS	98.7	50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
13C4-PFHpA	IS	97.8	50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
18O2-PFHxS	IS	132	50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
13C2-PFOA	IS	102	50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
13C8-PFOS	IS	114	50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
13C5-PFNA	IS	85.8	50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
13C2-PFDA	IS	97.6	50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
d3-MeFOSAA	IS	101	50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
13C2-PFUnA	IS	80.0	50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
d5-EtFOSAA	IS	84.0	50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
13C2-PFDoA	IS	75.3	50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	
13C2-PFTeDA	IS	84.0	50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1	

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

see 51.2.6.8

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 1701911
 Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: May 12, 2018

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-6-S-17-1217	1701911-01	Water
3	WI-A06-EB03-120617	1701911-03	Water
5	WI-A06-6-S-07-1217	1701911-05	Water
5MS	WI-A06-6-S-07-1217MS	1701911-05MS	Water
5MSD	WI-A06-6-S-07-1217MSD	1701911-05MSD	Water
7	WI-A06-6-S-26-1217	1701911-07	Water
9	WI-A06-EB04-120717	1701911-09	Water
11	WI-A06-EB05-120717	1701911-11	Water
13	WI-A06-FB01-120717	1701911-13	Water
15	WI-A06-MW-10-1217	1701911-15	Water
17	WI-A06-6-S-14-1217	1701911-17	Water
19	WI-A06-6-S-44-1217	1701911-19	Water
21	WI-A06-EB06-120817	1701911-21	Water

A full data validation was performed on the analytical data for six water samples, four aqueous equipment blank samples, and one aqueous field blank sample collected on December 6-8, 2017 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)".

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks exhibited the following contamination.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
B7L0145-BLK1	PFOA	0.716	U	1, 9, 15

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-EB03-120617	None - ND	-	-	-
WI-A06-EB04-120717	None - ND	-	-	-
WI-A06-EB05-120717	None - ND	-	-	-
WI-A06-FB01-120717	None - ND	-	-	-
WI-A06-EB06-120817	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

MS/MSD Sample	Compound	MS %R/MSD %R/RPD	Qualifier	Affected Samples
5	PFTeDA	OK/151%/41.5	None	Sample ND

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

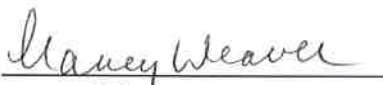
Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: 
Nancy Weaver
Senior Chemist

Dated: 5/15/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-6-S-17-1217

Modified EPA Method 537

Client Data					Laboratory Data				
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701911-01	Column:	BEH C18		
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	06-Dec-17 13:05	Date Received:	09-Dec-17 10:05				

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.88	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFHxA	ND	2.29	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFHpA	ND	0.620	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFHxS	ND	0.994	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFOA	5.25 1.82 u	0.683	5.25	8.39	J.B	B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFOS	ND	0.847	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFNA	ND	0.850	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFDA	ND	1.56	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
MeFOSAA	ND	1.73	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFUnA	ND	1.10	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
EtFOSAA	ND	1.44	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFDoA	ND	0.831	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFTrDA	ND	0.518	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFTeDA	ND	0.792	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1

MBL

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	87.3	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
13C2-PFHxA	IS	93.9	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
13C4-PFHpA	IS	95.0	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
18O2-PFHxS	IS	98.6	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
13C2-PFOA	IS	83.4	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
13C8-PFOS	IS	78.6	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
13C5-PFNA	IS	80.1	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
13C2-PFDA	IS	74.4	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
d3-MeFOSAA	IS	85.8	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
13C2-PFUnA	IS	97.0	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
d5-EtFOSAA	IS	83.9	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
13C2-PFDoA	IS	138	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
13C2-PFTeDA	IS	118	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1

DL - Detection Limit LOD - Limit of Detection LCL-UCL - Lower control limit - upper control limit When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
 LOQ - Limit of quantitation Results reported to the DL. Only the linear isomer is reported for all other analytes.

new SL 2/18

Sample ID: WI-A06-EB03-120617

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701911-03	Column:	BEH C18
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	06-Dec-17 15:20	Date Received:	09-Dec-17 10:05		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.91	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFHxA	ND	2.33	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFHpA	ND	0.631	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFHxS	ND	1.01	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFOA	ND	0.695	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFOS	ND	0.862	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFNA	ND	0.865	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFDA	ND	1.59	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
MeFOSAA	ND	1.76	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFUnA	ND	1.12	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
EtFOSAA	ND	1.46	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFDoA	ND	0.846	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFTeDA	ND	0.528	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFTeDA	ND	0.806	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	84.3	50 - 150		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
13C2-PFHxA	IS	90.2	50 - 150		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
13C4-PFHpA	IS	101	50 - 150		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
18O2-PFHxS	IS	89.1	50 - 150		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
13C2-PFOA	IS	102	50 - 150		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
13C8-PFOS	IS	67.0	50 - 150		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
13C5-PFNA	IS	83.2	50 - 150		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
13C2-PFDA	IS	68.4	50 - 150		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
d3-MeFOSAA	IS	69.2	50 - 150		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
13C2-PFUnA	IS	67.0	50 - 150		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
d5-EtFOSAA	IS	71.0	50 - 150		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
13C2-PFDoA	IS	76.1	50 - 150		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
13C2-PFTeDA	IS	77.6	50 - 150		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

51.2/1.8

Sample ID: WI-A06-6-S-07-1217 **Modified EPA Method 537**

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701911-05	Column:	BEH C18
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	07-Dec-17 11:50	Date Received:	09-Dec-17 10:05		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	13.0	1.92	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFHxA	40.7	2.34	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFHpA	10.3	0.634	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFHxS	35.0	1.02	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFOA	39.2	0.699	5.39	8.59	B	B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFOS	ND	0.866	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFNA	ND	0.870	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFDA	ND	1.60	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
MeFOSAA	ND	1.77	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFUnA	ND	1.13	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
EtFOSAA	ND	1.47	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFDoA	ND	0.850	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFTeDA	ND	0.530	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFTeDA	ND	0.811	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	97.3	50 - 150		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
13C2-PFHxA	IS	93.3	50 - 150		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
13C4-PFHpA	IS	92.1	50 - 150		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
18O2-PFHxS	IS	97.1	50 - 150		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
13C2-PFOA	IS	92.0	50 - 150		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
13C8-PFOS	IS	101	50 - 150		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
13C5-PFNA	IS	85.1	50 - 150		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
13C2-PFDA	IS	87.8	50 - 150		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
d3-MeFOSAA	IS	89.7	50 - 150		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
13C2-PFUnA	IS	84.1	50 - 150		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
d5-EtFOSAA	IS	74.8	50 - 150		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
13C2-PFDoA	IS	96.1	50 - 150		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
13C2-PFTeDA	IS	99.9	50 - 150		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1

DL - Detection Limit LOD - Limit of Detection LCL-UCL- Lower control limit - upper control limit When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
 LOQ - Limit of quantitation Results reported to the DL. Only the linear isomer is reported for all other analytes.

NW 5/12/18

Sample ID: WI-A06-6-S-26-1217 Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701911-07	Column:	BEH C18
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	07-Dec-17 13:40	Date Received:	09-Dec-17 10:05		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	9.28	1.86	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFHxA	35.2	2.27	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFHpA	13.4	0.616	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFHxS	47.8	0.987	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFOA	52.3	0.678	5.21	8.33	B	B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFOS	5.60	0.841	5.21	8.33	J	B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFNA	3.71	0.844	5.21	8.33	J	B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFDA	ND	1.55	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
MeFOSAA	ND	1.72	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFUnA	ND	1.09	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
EtFOSAA	ND	1.43	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFDoA	ND	0.825	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFTeDA	ND	0.515	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFTeDA	ND	0.787	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	102	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
13C2-PFHxA	IS	99.2	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
13C4-PFHpA	IS	98.5	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
18O2-PFHxS	IS	109	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
13C2-PFOA	IS	116	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
13C8-PFOS	IS	77.9	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
13C5-PFNA	IS	112	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
13C2-PFDA	IS	69.3	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
d3-MeFOSAA	IS	58.6	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
13C2-PFUnA	IS	71.1	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
d5-EtFOSAA	IS	61.1	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
13C2-PFDoA	IS	83.8	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
13C2-PFTeDA	IS	71.7	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

new slides

Sample ID: WI-A06-EB04-120717

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701911-09	Column:	BEH C18
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	07-Dec-17 13:50	Date Received:	09-Dec-17 10:05		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.96	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFHxA	ND	2.38	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFHpA	ND	0.646	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFHxS	ND	1.03	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFOA	5.48 1.75 U	0.711	5.48	8.74	LB	B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFOS	ND	0.882	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFNA	ND	0.885	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFDA	ND	1.63	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
MeFOSAA	ND	1.80	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFUnA	ND	1.15	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
EtFOSAA	ND	1.50	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFDoA	ND	0.865	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFTeDA	ND	0.540	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFTeDA	ND	0.825	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1

MBL

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	79.4	50 - 150		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
13C2-PFHxA	IS	66.9	50 - 150		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
13C4-PFHpA	IS	70.5	50 - 150		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
18O2-PFHxS	IS	62.6	50 - 150		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
13C2-PFOA	IS	74.2	50 - 150		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
13C8-PFOS	IS	69.5	50 - 150		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
13C5-PFNA	IS	56.3	50 - 150		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
13C2-PFDA	IS	56.4	50 - 150		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
d3-MeFOSAA	IS	60.6	50 - 150		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
13C2-PFUnA	IS	66.3	50 - 150		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
d5-EtFOSAA	IS	53.4	50 - 150		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
13C2-PFDoA	IS	88.7	50 - 150		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
13C2-PFTeDA	IS	71.4	50 - 150		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

new 8/12/18

Sample ID: WI-A06-EB05-120717

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701911-11	Column:	BEH C18
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	07-Dec-17 14:30	Date Received:	09-Dec-17 10:05		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.85	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
PFHxA	ND	2.26	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
PFHpA	ND	0.612	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
PFHxS	ND	0.980	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
PFOA	ND	0.674	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
PFOS	ND	0.835	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
PFNA	ND	0.838	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
PFDA	ND	1.54	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
MeFOSAA	ND	1.71	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
PFUnA	ND	1.09	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
EtFOSAA	ND	1.42	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
PFDoA	ND	0.820	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
PFTeDA	ND	0.511	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
PFTeDA	ND	0.781	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	97.2	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
13C2-PFHxA	IS	95.8	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
13C4-PFHpA	IS	98.5	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
18O2-PFHxS	IS	103	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
13C2-PFOA	IS	96.4	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
13C8-PFOS	IS	82.3	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
13C5-PFNA	IS	76.7	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
13C2-PFDA	IS	75.1	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
d3-MeFOSAA	IS	57.8	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
13C2-PFUnA	IS	61.5	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
d5-EtFOSAA	IS	59.1	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
13C2-PFDoA	IS	76.2	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
13C2-PFTeDA	IS	68.1	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results: reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

see 81,21,8

Sample ID: WI-A06-FB01-120717					Modified EPA Method 537						
Client Data				Laboratory Data							
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701911-13	Column:	BEH C18				
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	07-Dec-17 14:45	Date Received:	09-Dec-17 10:05						
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	1.88	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1	
PFHxA	ND	2.29	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1	
PFHpA	ND	0.620	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1	
PFHxS	ND	0.993	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1	
PFOA	ND	0.683	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1	
PFOS	ND	0.846	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1	
PFNA	ND	0.849	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1	
PFDA	ND	1.56	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1	
MeFOSAA	ND	1.73	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1	
PFUnA	ND	1.10	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1	
EtFOSAA	ND	1.44	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1	
PFDoA	ND	0.830	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1	
PFTeDA	ND	0.518	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1	
PFTeDA	ND	0.792	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1	
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C3-PFBS	IS	97.2	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1		
13C2-PFHxA	IS	86.4	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1		
13C4-PFHpA	IS	99.1	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1		
18O2-PFHxS	IS	98.6	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1		
13C2-PFOA	IS	93.9	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1		
13C8-PFOS	IS	70.5	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1		
13C5-PFNA	IS	83.1	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1		
13C2-PFDA	IS	72.5	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1		
d3-MeFOSAA	IS	91.5	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1		
13C2-PFUnA	IS	89.2	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1		
d5-EtFOSAA	IS	96.6	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1		
13C2-PFDoA	IS	98.6	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1		
13C2-PFTeDA	IS	81.5	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1		

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL - Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

5/21/8

Sample ID: WI-A06-MW-10-1217						Modified EPA Method 537					
Client Data					Laboratory Data						
Name:	CH2M Hill		Matrix:	Water		Lab Sample:	1701911-15		Column:	BEH C18	
Project:	WHIDBEY ISLAND / 695610.05.FI.FS		Date Collected:	07-Dec-17 09:45		Date Received:	09-Dec-17 10:05				
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	2.30	2.00	5.58	8.92	J	B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1	
PFHxA	5.44	2.43	5.58	8.92	J	B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1	
PFHpA	ND	0.659	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1	
PFHxS	2.24	1.06	5.58	8.92	J	B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1	
PFOA	3.60 5.58	0.726	5.58	8.92	LB	B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1	
PFOS	ND	0.900	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1	
PFNA	ND	0.903	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1	
PFDA	ND	1.66	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1	
MeFOSAA	ND	1.84	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1	
PFUnA	ND	1.17	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1	
EtFOSAA	ND	1.53	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1	
PFDoA	ND	0.883	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1	
PFTrDA	ND	0.551	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1	
PFTeDA	ND	0.842	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1	
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C3-PFBS	IS	90.1	50 - 150		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1		
13C2-PFHxA	IS	88.3	50 - 150		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1		
13C4-PFHpA	IS	87.2	50 - 150		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1		
18O2-PFHxS	IS	88.1	50 - 150		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1		
13C2-PFOA	IS	89.2	50 - 150		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1		
13C8-PFOS	IS	79.6	50 - 150		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1		
13C5-PFNA	IS	79.6	50 - 150		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1		
13C2-PFDA	IS	78.3	50 - 150		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1		
d3-MeFOSAA	IS	81.2	50 - 150		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1		
13C2-PFUnA	IS	94.5	50 - 150		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1		
d5-EtFOSAA	IS	85.9	50 - 150		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1		
13C2-PFDoA	IS	73.3	50 - 150		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1		
13C2-PFTeDA	IS	83.3	50 - 150		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1		

MBL

new 8/12/18

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: WI-A06-6-S-14-1217

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701911-17	Column:	BEH C18
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	08-Dec-17 13:10	Date Received:	09-Dec-17 10:05		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	10.2	1.88	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
PFHxA	25.6	2.29	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
PFHpA	3.61	0.621	5.25	8.41	J	B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
PFHxS	13.8	0.996	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
PFOA	19.6	0.685	5.25	8.41	B	B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
PFOS	ND	0.849	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
PFNA	ND	0.852	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
PFDA	ND	1.57	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
MeFOSAA	ND	1.74	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
PFUnA	ND	1.10	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
EtFOSAA	ND	1.44	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
PFDoA	ND	0.833	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
PFTeDA	ND	0.519	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
PFTeDA	ND	0.794	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	90.3	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
13C2-PFHxA	IS	88.0	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
13C4-PFHpA	IS	93.9	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
18O2-PFHxS	IS	103	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
13C2-PFOA	IS	111	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
13C8-PFOS	IS	75.9	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
13C5-PFNA	IS	86.5	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
13C2-PFDA	IS	80.8	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
d3-MeFOSAA	IS	94.9	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
13C2-PFUnA	IS	86.3	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
d5-EtFOSAA	IS	107	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
13C2-PFDoA	IS	115	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
13C2-PFTeDA	IS	103	50 - 150		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

1701911-1217

Sample ID: WI-A06-6-S-44-1217 Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701911-19	Column:	BEH C18
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	08-Dec-17 10:50	Date Received:	09-Dec-17 10:05		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	10.5	1.84	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
PFHxA	44.7	2.25	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
PFHpA	13.4	0.609	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
PFHxS	62.5	0.976	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
PFOA	96.9	0.671	5.17	8.24	B	B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
PFOS	ND	0.832	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
PFNA	6.30	0.835	5.17	8.24	J	B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
PFDA	ND	1.54	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
MeFOSAA	ND	1.70	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
PFUnA	ND	1.08	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
EtFOSAA	ND	1.41	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
PFDoA	ND	0.816	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
PFTeDA	ND	0.509	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
PFTeDA	ND	0.778	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	95.8	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
13C2-PFHxA	IS	92.3	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
13C4-PFHpA	IS	93.5	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
18O2-PFHxS	IS	96.4	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
13C2-PFOA	IS	94.3	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
13C8-PFOS	IS	93.1	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
13C5-PFNA	IS	90.1	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
13C2-PFDA	IS	69.7	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
d3-MeFOSAA	IS	69.1	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
13C2-PFUnA	IS	84.2	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
d5-EtFOSAA	IS	68.4	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
13C2-PFDoA	IS	82.7	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
13C2-PFTeDA	IS	95.7	50 - 150		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

1701911-19

Sample ID: WI-A06-EB06-120817						Modified EPA Method 537					
Client Data					Laboratory Data						
Name:	CH2M Hill	Matrix:	Water	Lab Sample:	1701911-21	Column:	BEH C18				
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Collected:	08-Dec-17 14:00	Date Received:	09-Dec-17 10:05						
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	1.87	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1	
PFHxA	ND	2.28	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1	
PFHpA	ND	0.618	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1	
PFHxS	ND	0.990	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1	
PFOA	ND	0.681	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1	
PFOS	ND	0.844	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1	
PFNA	ND	0.847	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1	
PFDA	ND	1.56	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1	
MeFOSAA	ND	1.73	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1	
PFUnA	ND	1.10	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1	
EtFOSAA	ND	1.43	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1	
PFDoA	ND	0.828	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1	
PFTrDA	ND	0.517	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1	
PFTeDA	ND	0.790	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1	
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C3-PFBS	IS	95.1	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1		
13C2-PFHxA	IS	94.2	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1		
13C4-PFHpA	IS	87.8	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1		
18O2-PFHxS	IS	85.3	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1		
13C2-PFOA	IS	84.0	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1		
13C8-PFOS	IS	98.4	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1		
13C5-PFNA	IS	78.2	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1		
13C2-PFDA	IS	69.7	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1		
d3-MeFOSAA	IS	67.7	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1		
13C2-PFUnA	IS	70.0	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1		
d5-EtFOSAA	IS	55.1	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1		
13C2-PFDoA	IS	82.6	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1		
13C2-PFTeDA	IS	83.7	50 - 150		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1		

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

new 8/12/18

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 580-75281-1
 Laboratory: Test America Laboratories, Tacoma, Washington
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: May 14, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1*	WI-A06-TB01-021918	580-75281-1	Water
2	WI-A06-EB01-021918	580-75281-2	Water
3	WI-A06-MW-13-0218	580-75281-3	Water
3MS†	WI-A06-MW-13-0218MS	580-75281-3MS	Water
3MSD†	WI-A06-MW-13-0218MSD	580-75281-3MSD	Water
4	WI-A06-RW17-0218	580-75281-4	Water
5	WI-A06-RW17P-0218	580-75281-5	Water
6	WI-A06-DW-38A-0218	580-75281-6	Water
7	WI-A06-6-S-27-0218	580-75281-7	Water
8	WI-A06-6-S-28-0218	580-75281-8	Water
9	WI-A06-FB01-022218	580-75281-9	Water
10	WI-A06-MW-01-0218	580-75281-10	Water
11	WI-A06-EB01-0218	580-75281-11	Water

* - VOC only † - SVOC only

A full data validation was performed on the analytical data for seven water samples, two aqueous equipment blank samples, one aqueous field blank sample, and one aqueous trip blank sample collected on February 19-21, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

VOC (Vinyl Chloride)
 SVOC (1,4-Dioxane)

Method References

USEPA SW-846 Method 8260C SIM
 USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA “Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review,” January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

- All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-TB01-021918	None - ND	-	-	-
WI-A06-EB01-021918	None - ND	-	-	-
WI-A06-FB01-022118	None - ND	-	-	-
WI-A06-EB01-0218	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate recoveries.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below.

Compound	WI-A06-RW17-0218 ug/L	WI-A06-RW17P-0218 ug/L	RPD	Qualifier
Vinyl Chloride	ND	ND	-	-

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-021918	None - ND	-	-	-
WI-A06-FB01-022118	None - ND	-	-	-
WI-A06-EB01-0218	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

MS/MSD Sample ID	Compound	MS %R/MSD %R/ RPD	Qualifier	Affected Samples
3	1,4-Dioxane	OK/OK/33	None	For RPD Alone

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below.

Compound	WI-A06-RW17-0218 ug/L	WI-A06-RW17P-0218 ug/L	RPD	Qualifier
1,4-Dioxane	ND	ND	-	-

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:  Dated: 5/15/18
Nancy Weaver
Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-TB01-021918

Lab Sample ID: 580-75281-1

Date Sampled: 02/19/2018 0700

Client Matrix: Water

Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-268193	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	030118_08.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/01/2018 1533			Final Weight/Volume:	5 mL
Prep Date:	03/01/2018 1533				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	96		80 - 141
Dibromofluoromethane (Surr)	100	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-EB01-021918

2

Lab Sample ID: 580-75281-2

Date Sampled: 02/19/2018 1645

Client Matrix: Water

Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-268193	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 030118_09.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 03/01/2018 1556		Final Weight/Volume: 5 mL
Prep Date: 03/01/2018 1556		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	98		80 - 141
Dibromofluoromethane (Surr)	99	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-MW-13-0218

3

Lab Sample ID: 580-75281-3

Date Sampled: 02/20/2018 1110

Client Matrix: Water

Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-268193	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	030118_10.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/01/2018 1620			Final Weight/Volume:	5 mL
Prep Date:	03/01/2018 1620				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	98		80 - 141
Dibromofluoromethane (Surr)	100	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-RW17-0218

Lab Sample ID: 580-75281-4

Client Matrix: Water

Date Sampled: 02/20/2018 1340

Date Received: 02/23/2018 0955

4

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-268193	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	030118_11.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/01/2018 1644			Final Weight/Volume:	5 mL
Prep Date:	03/01/2018 1644				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	97		80 - 141
Dibromofluoromethane (Surr)	100	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

5

Client Sample ID: WI-A06-RW17P-0218

Lab Sample ID: 580-75281-5

Date Sampled: 02/20/2018 1345

Client Matrix: Water

Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-268193	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	030118_12.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/01/2018 1708			Final Weight/Volume:	5 mL
Prep Date:	03/01/2018 1708				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50
Surrogate	%Rec	Qualifier	Acceptance Limits	
Trifluorotoluene (Surr)	97		80 - 141	
Dibromofluoromethane (Surr)	100	M	77 - 118	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-DW-38A-0218

6

Lab Sample ID: 580-75281-6
Client Matrix: Water

Date Sampled: 02/20/2018 1455
Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Analysis Batch: 580-268193 Instrument ID: TAC036
Prep Method: 5030B Prep Batch: N/A Lab File ID: 030118_13.D
Dilution: 1.0 Initial Weight/Volume: 5 mL
Analysis Date: 03/01/2018 1731 Final Weight/Volume: 5 mL
Prep Date: 03/01/2018 1731

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	98		80 - 141
Dibromofluoromethane (Surr)	101	<i>N</i>	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-6-S-27-0218

7

Lab Sample ID: 580-75281-7

Date Sampled: 02/21/2018 1115

Client Matrix: Water

Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-268193	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	030118_14.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/01/2018 1755			Final Weight/Volume:	5 mL
Prep Date:	03/01/2018 1755				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	97		80 - 141
Dibromofluoromethane (Surr)	100	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06--6-S-28-0218

8

Lab Sample ID: 580-75281-8

Date Sampled: 02/21/2018 1115

Client Matrix: Water

Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-268193	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	030118_15.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/01/2018 1818			Final Weight/Volume:	5 mL
Prep Date:	03/01/2018 1818				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	98		80 - 141
Dibromofluoromethane (Surr)	98	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-FB01-022118

9

Lab Sample ID: 580-75281-9

Date Sampled: 02/21/2018 1500

Client Matrix: Water

Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-268193	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 030118_16.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 03/01/2018 1842		Final Weight/Volume: 5 mL
Prep Date: 03/01/2018 1842		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	96		80 - 141
Dibromofluoromethane (Surr)	99	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-MW-01-0218

10

Lab Sample ID: 580-75281-10

Date Sampled: 02/21/2018 1510

Client Matrix: Water

Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-268193	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 030118_17.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 03/01/2018 1906		Final Weight/Volume: 5 mL
Prep Date: 03/01/2018 1906		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	99		80 - 141
Dibromofluoromethane (Surr)	99	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-EB01-0218

Lab Sample ID: 580-75281-11

Client Matrix: Water

Date Sampled: 02/21/2018 1650

Date Received: 02/23/2018 0955

||

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-268193	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	030118_18.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/01/2018 1929			Final Weight/Volume:	5 mL
Prep Date:	03/01/2018 1929				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	98		80 - 141
Dibromofluoromethane (Surr)	101	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-EB01-021918

2

Lab Sample ID: 580-75281-2

Date Sampled: 02/19/2018 1645

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268070	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-267977	Lab File ID:	022728a006.D
Dilution:	1.0			Initial Weight/Volume:	979 mL
Analysis Date:	02/27/2018 1650			Final Weight/Volume:	2 mL
Prep Date:	02/26/2018 1348			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.031	U	0.011	0.10

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	90		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-MW-13-0218

3

Lab Sample ID: 580-75281-3

Date Sampled: 02/20/2018 1110

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268070	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-267977	Lab File ID:	022728a007.D
Dilution:	1.0			Initial Weight/Volume:	977.2 mL
Analysis Date:	02/27/2018 1712			Final Weight/Volume:	2 mL
Prep Date:	02/26/2018 1348			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.031	U	0.011	0.10

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	70		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-RW17-0218

4

Lab Sample ID: 580-75281-4

Date Sampled: 02/20/2018 1340

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM	Analysis Batch: 580-268070	Instrument ID: TAC050
Prep Method: 3520C	Prep Batch: 580-267977	Lab File ID: 022728a010.D
Dilution: 1.0		Initial Weight/Volume: 1003.5 mL
Analysis Date: 02/27/2018 1819		Final Weight/Volume: 2 mL
Prep Date: 02/26/2018 1348		Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.030	U	0.011	0.10

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	92		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

5

Client Sample ID: WI-A06-RW17P-0218

Lab Sample ID: 580-75281-5

Date Sampled: 02/20/2018 1345

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268070	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-267977	Lab File ID:	022728a011.D
Dilution:	1.0			Initial Weight/Volume:	969.4 mL
Analysis Date:	02/27/2018 1841			Final Weight/Volume:	2 mL
Prep Date:	02/26/2018 1348			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.031	U	0.011	0.10

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	100		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-DW-38A-0218

6

Lab Sample ID: 580-75281-6

Date Sampled: 02/20/2018 1455

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM	Analysis Batch: 580-268070	Instrument ID: TAC050
Prep Method: 3520C	Prep Batch: 580-267977	Lab File ID: 022728a012.D
Dilution: 1.0		Initial Weight/Volume: 994.9 mL
Analysis Date: 02/27/2018 1903		Final Weight/Volume: 2 mL
Prep Date: 02/26/2018 1348		Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	1.7		0.011	0.10
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	96		53 - 106	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-6-S-27-0218

7

Lab Sample ID: 580-75281-7

Date Sampled: 02/21/2018 1115

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268070	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-267977	Lab File ID:	022728a013.D
Dilution:	1.0			Initial Weight/Volume:	1032.1 mL
Analysis Date:	02/27/2018 1925			Final Weight/Volume:	2 mL
Prep Date:	02/26/2018 1348			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.011	0.097

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	91		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

8

Client Sample ID: WI-A06--6-S-28-0218

Lab Sample ID: 580-75281-8

Date Sampled: 02/21/2018 1115

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268070	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-267977	Lab File ID:	022728a014.D
Dilution:	1.0			Initial Weight/Volume:	1035.9 mL
Analysis Date:	02/27/2018 1947			Final Weight/Volume:	2 mL
Prep Date:	02/26/2018 1348			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.011	0.097

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	78		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-FB01-022118

9

Lab Sample ID: 580-75281-9

Date Sampled: 02/21/2018 1500

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268070	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-267977	Lab File ID:	022728a015.D
Dilution:	1.0			Initial Weight/Volume:	989.4 mL
Analysis Date:	02/27/2018 2009			Final Weight/Volume:	2 mL
Prep Date:	02/26/2018 1348			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.030	U	0.011	0.10
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	98		53 - 106	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-MW-01-0218

10

Lab Sample ID: 580-75281-10

Date Sampled: 02/21/2018 1510

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268070	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-267977	Lab File ID:	022728a016.D
Dilution:	1.0			Initial Weight/Volume:	1054.7 mL
Analysis Date:	02/27/2018 2031			Final Weight/Volume:	2 mL
Prep Date:	02/26/2018 1348			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.028	U	0.010	0.095
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	98		53 - 106	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-EB01-0218

||

Lab Sample ID: 580-75281-11

Date Sampled: 02/21/2018 1650

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM	Analysis Batch: 580-268070	Instrument ID: TAC050
Prep Method: 3520C	Prep Batch: 580-267977	Lab File ID: 022728a017.D
Dilution: 1.0		Initial Weight/Volume: 992.8 mL
Analysis Date: 02/27/2018 2053		Final Weight/Volume: 2 mL
Prep Date: 02/26/2018 1348		Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.030	U	0.011	0.10
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	88		53 - 106	

ms 5/24/18

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 1800361
 Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: May 12, 2018

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-EB01-021918	1800361-01	Water
2	WI-A06-MW-13-0218	1800361-02	Water
3	WI-A06-FB01-022018	1800361-03	Water
4	WI-A06-6-DW-38A-0218	1800361-04	Water
5	WI-A06-EB01-022018	1800361-05	Water
6	WI-A06-6-S-27-0218	1800361-06	Water
7	WI-A06-6-S-28-0218	1800361-07	Water
8	WI-A06-FB01-022118	1800361-08	Water
9	WI-A06-MW-01-0218	1800361-09	Water
10	WI-A06-EB01-022118	1800361-10	Water

A full data validation was performed on the analytical data for five water samples, three aqueous equipment blank samples, and two aqueous field blank samples collected on February 19-21, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the EPA Method “Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)”.

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA “Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review,” January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days except for the following.

EDS Sample	Date Sampled	Date Extracted	# of Days	Qualifier
All Samples*	02/19/18-02/21/18	03/17/18	24-26	UJ

* - Due to an oversight, the initial extraction did not contain PFDoA, therefore, all samples were re-extracted outside of holding times for this compound and qualified as estimated (UJ).

GC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-EB01-021918	None - ND	-	-	-
WI-A06-EB01-022018	PFOA	1.32	U	4
WI-A06-EB01-022118	PFOA	0.931	U	9
WI-A06-FB01-022018	None - ND	-	-	-
WI-A06-FB01-022118	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria except for the following.

EDS Sample	Internal Standard	%R	Qualifier
9	13C3-PFBS	163%	J

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

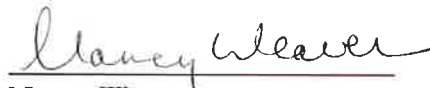
- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:


Nancy Weaver
Senior Chemist

Dated: 5/15/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-EB01-021918

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800361-01	Column:	BEH C18
Project:	NASWI Area 6	Date Collected:	19-Feb-18 16:45	Date Received:	23-Feb-18 09:35		
Location:	AREA 6						

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.92	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFHxA	ND	2.34	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFHpA	ND	0.635	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFHxS	ND	1.02	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFOA	ND	0.700	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFOS	ND	0.867	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFNA	ND	0.871	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFDA	ND	1.60	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
MeFOSAA	ND	1.77	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFUnA	ND	1.13	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
EtFOSAA	ND	1.47	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFDoA	ND <i>uJ</i>	0.849	5.34	8.57		B8C0101	17-Mar-18	0.117 L	17-Mar-18 20:54	1 <i>HT</i>
PFTTrDA	ND	0.531	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFTeDA	ND	0.811	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	98.5	50 - 150		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
13C2-PFHxA	IS	96.2	50 - 150		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
13C4-PFHpA	IS	94.0	50 - 150		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
18O2-PFHxS	IS	99.0	50 - 150		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
13C2-PFOA	IS	84.3	50 - 150		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
13C8-PFOS	IS	83.9	50 - 150		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
13C5-PFNA	IS	75.0	50 - 150		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
13C2-PFDA	IS	71.3	50 - 150		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
d3-MeFOSAA	IS	77.4	50 - 150		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
13C2-PFUnA	IS	75.5	50 - 150		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
d5-EtFOSAA	IS	69.3	50 - 150		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
13C2-PFDoA	IS	65.7	50 - 150		B8C0101	17-Mar-18	0.117 L	17-Mar-18 20:54	1
13C2-PFTeDA	IS	110	50 - 150		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

ms 5/2/18

Sample ID: WI-A06-MW-13-0218

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800361-02	Column:	BEH C18
Project:	NASWI Area 6	Date Collected:	20-Feb-18 11:10	Date Received:	23-Feb-18 09:35		
Location:	AREA 6						

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.84	5.12	8.21		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
PFHxA	ND	2.24	5.12	8.21		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
PFHpA	ND	0.606	5.12	8.21		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
PFHxS	ND	0.972	5.12	8.21		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
PFOA	ND	0.668	5.12	8.21		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
PFOS	ND	0.828	5.12	8.21		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
PFNA	ND	0.831	5.12	8.21		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
PFDA	ND	1.53	5.12	8.21		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
MeFOSAA	ND	1.69	5.12	8.21		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
PFUnA	ND	1.08	5.12	8.21		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
EtFOSAA	ND	1.41	5.12	8.21		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
PFDoA	ND u	0.832	5.25	8.40		B8C0101	17-Mar-18	0.119 L	17-Mar-18 21:06	1
PFTTrDA	ND	0.507	5.12	8.21		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
PFTeDA	ND	0.775	5.12	8.21		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1

HT

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	106	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
13C2-PFHxA	IS	89.1	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
13C4-PFHpA	IS	87.4	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
18O2-PFHxS	IS	92.2	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
13C2-PFOA	IS	95.7	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
13C8-PFOS	IS	110	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
13C5-PFNA	IS	81.1	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
13C2-PFDA	IS	83.1	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
d3-MeFOSAA	IS	81.9	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
13C2-PFUnA	IS	87.3	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
d5-EtFOSAA	IS	92.0	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1
13C2-PFDoA	IS	85.1	50 - 150		B8C0101	17-Mar-18	0.119 L	17-Mar-18 21:06	1
13C2-PFTeDA	IS	103	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:19	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

NW 5/12/18

Sample ID: WI-A06-FB01-022018

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800361-03	Column:	BEH C18
Project:	NASWI Area 6	Date Collected:	20-Feb-18 11:25	Date Received:	23-Feb-18 09:35		
Location:	AREA 6						

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.84	5.12	8.20		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
PFHxA	ND	2.24	5.12	8.20		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
PFHpA	ND	0.606	5.12	8.20		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
PFHxS	ND	0.971	5.12	8.20		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
PFOA	ND	0.667	5.12	8.20		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
PFOS	ND	0.827	5.12	8.20		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
PFNA	ND	0.830	5.12	8.20		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
PFDA	ND	1.53	5.12	8.20		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
MeFOSAA	ND	1.69	5.12	8.20		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
PFUnA	ND	1.08	5.12	8.20		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
EtFOSAA	ND	1.40	5.12	8.20		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
PFDoA	ND uJ	0.805	5.08	8.13		B8C0101	17-Mar-18	0.123 L	17-Mar-18 21:17	1
PFTeDA	ND	0.506	5.12	8.20		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
PFTeDA	ND	0.774	5.12	8.20		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1

HT

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	101	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
13C2-PFHxA	IS	95.9	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
13C4-PFHpA	IS	93.9	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
18O2-PFHxS	IS	94.6	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
13C2-PFOA	IS	93.2	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
13C8-PFOS	IS	89.6	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
13C5-PFNA	IS	87.8	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
13C2-PFDA	IS	79.7	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
d3-MeFOSAA	IS	66.5	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
13C2-PFUnA	IS	63.4	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
d5-EtFOSAA	IS	62.1	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1
13C2-PFDoA	IS	74.5	50 - 150		B8C0101	17-Mar-18	0.123 L	17-Mar-18 21:17	1
13C2-PFTeDA	IS	78.2	50 - 150		B8B0163	28-Feb-18	0.122 L	08-Mar-18 11:31	1

DL - Detection Limit LOD - Limit of Detection LCL-UCL - Lower control limit - upper control limit When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
 LOQ - Limit of quantitation Results reported to the DL. Only the linear isomer is reported for all other analytes.

new SI, 2/18

Sample ID: WI-A06-6-DW-38A-0218

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800361-04	Column:	BEH C18
Project:	NASWI Area 6	Date Collected:	20-Feb-18 14:55	Date Received:	23-Feb-18 09:35		
Location:	AREA 6						

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	2.74	1.87	5.21	8.36	J	B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
PFHxA	15.7	2.28	5.21	8.36		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
PFHpA	1.70	0.617	5.21	8.36	J	B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
PFHxS	1.05	0.989	5.21	8.36	J	B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
PFOA	5.98 <i>u</i>	0.680	5.21	8.36	<i>✓</i>	B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
PFOS	2.77	0.843	5.21	8.36	J	B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
PFNA	1.35	0.846	5.21	8.36	J	B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
PFDA	ND	1.56	5.21	8.36		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
MeFOSAA	ND	1.72	5.21	8.36		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
PFUnA	ND	1.10	5.21	8.36		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
EtFOSAA	ND	1.43	5.21	8.36		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
PFDoA	<i>ND u J</i>	0.832	5.25	8.41		B8C0101	17-Mar-18	0.119 L	17-Mar-18 21:29	1
PFTTrDA	ND	0.516	5.21	8.36		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
PFTeDA	ND	0.789	5.21	8.36		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1

EBC

HT

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	106	50 - 150		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
13C2-PFHxA	IS	102	50 - 150		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
13C4-PFHpA	IS	104	50 - 150		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
18O2-PFHxS	IS	93.2	50 - 150		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
13C2-PFOA	IS	81.2	50 - 150		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
13C8-PFOS	IS	83.9	50 - 150		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
13C5-PFNA	IS	81.5	50 - 150		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
13C2-PFDA	IS	83.4	50 - 150		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
d3-MeFOSAA	IS	90.8	50 - 150		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
13C2-PFUnA	IS	94.9	50 - 150		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
d5-EtFOSAA	IS	93.5	50 - 150		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
13C2-PFDoA	IS	90.4	50 - 150		B8C0101	17-Mar-18	0.119 L	17-Mar-18 21:29	1
13C2-PFTeDA	IS	105	50 - 150		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

مر 5/2/18

Sample ID: WI-A06-EB01-022018

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800361-05	Column:	BEH C18
Project:	NASWI Area 6	Date Collected:	20-Feb-18 17:00	Date Received:	23-Feb-18 09:35		
Location:	AREA 6						

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.85	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFHxA	ND	2.25	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFHpA	ND	0.611	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFHxS	ND	0.979	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFOA	1.32	0.673	5.17	8.27	J	B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFOS	ND	0.834	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFNA	ND	0.837	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFDA	ND	1.54	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
MeFOSAA	ND	1.71	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFUnA	ND	1.09	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
EtFOSAA	ND	1.42	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFDoA	ND wJ	0.825	5.21	8.33		B8C0101	17-Mar-18	0.120 L	17-Mar-18 21:40	HT
PFTTrDA	ND	0.510	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFTeDA	ND	0.780	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	97.5	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
13C2-PFHxA	IS	97.2	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
13C4-PFHpA	IS	90.9	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
18O2-PFHxS	IS	95.2	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
13C2-PFOA	IS	80.1	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
13C8-PFOS	IS	88.5	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
13C5-PFNA	IS	71.6	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
13C2-PFDA	IS	60.4	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
d3-MeFOSAA	IS	58.3	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
13C2-PFUnA	IS	61.6	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
d5-EtFOSAA	IS	62.1	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
13C2-PFDoA	IS	59.7	50 - 150		B8C0101	17-Mar-18	0.120 L	17-Mar-18 21:40	1
13C2-PFTeDA	IS	101	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

new 5/12/18

Sample ID: WI-A06-6-S-27-0218

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800361-06	Column:	BEH C18
Project:	NASWI Area 6	Date Collected:	21-Feb-18 11:15	Date Received:	23-Feb-18 09:35		
Location:	AREA 6						

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	2.27	1.84	5.17	8.24	J	B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFHxA	15.2	2.25	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFHpA	12.5	0.609	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFHxS	10.7	0.976	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFOA	35.6	0.671	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFOS	2.30	0.832	5.17	8.24	J	B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFNA	ND	0.835	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFDA	ND	1.54	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
MeFOSAA	ND	1.70	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFUnA	ND	1.08	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
EtFOSAA	ND	1.41	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFDoA	ND uJ	0.854	5.39	8.63		B8C0101	17-Mar-18	0.116 L	17-Mar-18 21:51	1
PFTTrDA	ND	0.509	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFTeDA	ND	0.778	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	106	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
13C2-PFHxA	IS	92.4	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
13C4-PFHpA	IS	95.5	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
18O2-PFHxS	IS	96.7	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
13C2-PFOA	IS	84.0	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
13C8-PFOS	IS	108	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
13C5-PFNA	IS	75.9	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
13C2-PFDA	IS	75.5	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
d3-MeFOSAA	IS	82.0	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
13C2-PFUnA	IS	78.3	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
d5-EtFOSAA	IS	89.2	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
13C2-PFDoA	IS	70.9	50 - 150		B8C0101	17-Mar-18	0.116 L	17-Mar-18 21:51	1
13C2-PFTeDA	IS	90.9	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

rw 5/12/18

Sample ID: WI-A06-6-S-28-0218

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800361-07	Column:	BEH C18
Project:	NASWI Area 6	Date Collected:	21-Feb-18 11:15	Date Received:	23-Feb-18 09:35		
Location:	AREA 6						

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.85	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFHxA	ND	2.26	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFHpA	ND	0.611	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFHxS	ND	0.980	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFOA	ND	0.673	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFOS	1.69	0.835	5.17	8.28	J	B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFNA	ND	0.838	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFDA	ND	1.54	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
MeFOSAA	ND	1.71	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFUnA	ND	1.09	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
EtFOSAA	ND	1.42	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFDoA	ND wJ	0.902	5.68	9.11		B8C0101	17-Mar-18	0.110 L	17-Mar-18 22:03	1
PFTTrDA	ND	0.511	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFTeDA	ND	0.781	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1

HT

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	96.1	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
13C2-PFHxA	IS	86.0	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
13C4-PFHpA	IS	95.6	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
18O2-PFHxS	IS	81.5	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
13C2-PFOA	IS	83.4	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
13C8-PFOS	IS	81.1	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
13C5-PFNA	IS	74.4	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
13C2-PFDA	IS	75.4	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
d3-MeFOSAA	IS	83.1	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
13C2-PFUnA	IS	90.5	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
d5-EtFOSAA	IS	86.6	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
13C2-PFDoA	IS	77.6	50 - 150		B8C0101	17-Mar-18	0.110 L	17-Mar-18 22:03	1
13C2-PFTeDA	IS	96.4	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Nw sl. 2.1.8

Sample ID: WI-A06-FB01-022118

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800361-08	Column:	BEH C18
Project:	NASWI Area 6	Date Collected:	21-Feb-18 15:00	Date Received:	23-Feb-18 09:35		
Location:	AREA 6						

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.90	5.30	8.49		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
PFHxA	ND	2.31	5.30	8.49		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
PFHpA	ND	0.627	5.30	8.49		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
PFHxS	ND	1.01	5.30	8.49		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
PFOA	ND	0.691	5.30	8.49		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
PFOS	ND	0.856	5.30	8.49		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
PFNA	ND	0.860	5.30	8.49		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
PFDA	ND	1.58	5.30	8.49		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
MeFOSAA	ND	1.75	5.30	8.49		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
PFUnA	ND	1.11	5.30	8.49		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
EtFOSAA	ND	1.45	5.30	8.49		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
PFDoA	ND <i>uj</i>	0.822	5.17	8.30		B8C0101	17-Mar-18	0.121 L	17-Mar-18 22:14	1 <i>HT</i>
PFTTrDA	ND	0.524	5.30	8.49		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
PFTeDA	ND	0.801	5.30	8.49		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	101	50 - 150		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
13C2-PFHxA	IS	94.7	50 - 150		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
13C4-PFHpA	IS	89.8	50 - 150		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
18O2-PFHxS	IS	90.1	50 - 150		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
13C2-PFOA	IS	81.7	50 - 150		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
13C8-PFOS	IS	82.9	50 - 150		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
13C5-PFNA	IS	88.6	50 - 150		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
13C2-PFDA	IS	64.5	50 - 150		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
d3-MeFOSAA	IS	74.3	50 - 150		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
13C2-PFUnA	IS	71.1	50 - 150		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
d5-EtFOSAA	IS	71.4	50 - 150		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1
13C2-PFDoA	IS	59.3	50 - 150		B8C0101	17-Mar-18	0.121 L	17-Mar-18 22:14	1
13C2-PFTeDA	IS	60.5	50 - 150		B8B0163	28-Feb-18	0.118 L	13-Mar-18 02:36	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

new 5/12/18

Sample ID: WI-A06-MW-01-0218

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800361-09	Column:	BEH C18
Project:	NASWI Area 6	Date Collected:	21-Feb-18 15:10	Date Received:	23-Feb-18 09:35		
Location:	AREA 6						

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	62.5 <i>J</i>	1.85	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1	<i>ISH</i>
PFHxA	111	2.26	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1	
PFHpA	22.3	0.612	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1	
PFHxS	16.6	0.981	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1	
PFOA	6.09 <i>u</i>	0.675	5.17	8.29	<i>J</i>	B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1	<i>EBL</i>
PFOS	ND	0.836	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1	
PFNA	ND	0.839	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1	
PFDA	ND	1.54	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1	
MeFOSAA	ND	1.71	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1	
PFUnA	ND	1.09	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1	
EtFOSAA	ND	1.42	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1	
PFDoA	ND <i>u J</i>	0.836	5.30	8.45		B8C0101	17-Mar-18	0.118 L	17-Mar-18 22:26	1	<i>HT</i>
PFTrDA	ND	0.512	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1	
PFTeDA	ND	0.782	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1	

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	163	50 - 150	<i>H</i>	B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1
13C2-PFHxA	IS	93.9	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1
13C4-PFHpA	IS	106	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1
18O2-PFHxS	IS	89.9	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1
13C2-PFOA	IS	94.1	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1
13C8-PFOS	IS	89.5	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1
13C5-PFNA	IS	83.0	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1
13C2-PFDA	IS	75.2	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1
d3-MeFOSAA	IS	84.5	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1
13C2-PFUnA	IS	77.7	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1
d5-EtFOSAA	IS	94.7	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1
13C2-PFDoA	IS	68.2	50 - 150		B8C0101	17-Mar-18	0.118 L	17-Mar-18 22:26	1
13C2-PFTeDA	IS	94.5	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

51,21,8

Sample ID: WI-A06-EB01-022118

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800361-10	Column:	BEH C18
Project:	NASWI Area 6	Date Collected:	21-Feb-18 16:50	Date Received:	23-Feb-18 09:35		
Location:	AREA 6						

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.84	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
PFHxA	ND	2.24	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
PFHpA	ND	0.608	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
PFHxS	ND	0.975	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
PFOA	0.931	0.670	5.17	8.23	J	B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
PFOS	ND	0.831	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
PFNA	ND	0.834	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
PFDA	ND	1.53	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
MeFOSAA	ND	1.70	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
PFUnA	ND	1.08	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
EtFOSAA	ND	1.41	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
PFDoA	ND <i>uJ</i>	0.838	5.30	8.47		B8C0101	17-Mar-18	0.118 L	17-Mar-18 22:37	1 <i>HT</i>
PFTeDA	ND	0.508	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
PFTeDA	ND	0.777	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	101	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
13C2-PFHxA	IS	95.4	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
13C4-PFHpA	IS	99.9	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
18O2-PFHxS	IS	93.7	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
13C2-PFOA	IS	96.8	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
13C8-PFOS	IS	99.7	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
13C5-PFNA	IS	86.9	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
13C2-PFDA	IS	85.5	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
d3-MeFOSAA	IS	70.9	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
13C2-PFUnA	IS	63.7	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
d5-EtFOSAA	IS	70.5	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
13C2-PFDoA	IS	70.6	50 - 150		B8C0101	17-Mar-18	0.118 L	17-Mar-18 22:37	1
13C2-PFTeDA	IS	70.5	50 - 150		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

new sl. 2.1.8

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 580-75202-1
 Laboratory: Test America Laboratories, Tacoma, Washington
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: May 14, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1*	WI-A06-TB01-021618	580-75202-1	Water
2	WI-A06-MW-06-0218	580-75202-2	Water
3	WI-A06-EB01-021618	580-75202-3	Water
4	WI-A06-S-01-0218	580-75202-4	Water
4MS*	WI-A06-S-01-0218MS	580-75202-4MS	Water
4MSD*	WI-A06-S-01-0218MSD	580-75202-4MSD	Water
5	WI-A06-S-01P-0218	580-75202-5	Water

* - VOC only

A full data validation was performed on the analytical data for three water samples, one aqueous equipment blank sample, and one aqueous trip blank sample collected on February 16-19, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

VOC (Vinyl Chloride)
 SVOC (1,4-Dioxane)

Method References

USEPA SW-846 Method 8260C SIM
 USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

- All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-TB01-021618	None - ND	-	-	-
WI-A06-EB01-021618	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate recoveries.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below.

Compound	WI-A06-S-01-0218 ug/L	WI-A06-S-01P-0218 ug/L	RPD	Qualifier
Vinyl Chloride	ND	ND	-	-

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC samples were not analyzed.

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R) except for the following.

Sample ID	Surrogate	%R	Qualifier
2	2-Fluorophenol	107%	None - Sample ND
3	2-Fluorophenol	107%	None - Sample ND

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below.

Compound	WI-A06-S-01-0218 ug/L	WI-A06-S-01P-0218 ug/L	RPD	Qualifier
1,4-Dioxane	ND	ND	-	-

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:  Dated: 5/15/18
Nancy Weaver
Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75202-1

Client Sample ID: **W1-A06-TB01-021618**

Lab Sample ID: 580-75202-1

Date Sampled: 02/16/2018 0800

Client Matrix: Water

Date Received: 02/20/2018 0950

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-267774	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	022118_08.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	02/21/2018 1602			Final Weight/Volume:	5 mL
Prep Date:	02/21/2018 1602				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U M	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	97		80 - 141
Dibromofluoromethane (Surr)	98	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75202-1

2

Client Sample ID: W1-A06-MW-06-0218

Lab Sample ID: 580-75202-2

Date Sampled: 02/16/2018 1440

Client Matrix: Water

Date Received: 02/20/2018 0950

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-267774	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 022118_09.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 02/21/2018 1626		Final Weight/Volume: 5 mL
Prep Date: 02/21/2018 1626		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U M	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	97		80 - 141
Dibromofluoromethane (Surr)	98	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75202-1

Client Sample ID: W1-A06-EB01-021618

3

Lab Sample ID: 580-75202-3

Date Sampled: 02/16/2018 1630

Client Matrix: Water

Date Received: 02/20/2018 0950

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-267774	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 022118_10.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 02/21/2018 1649		Final Weight/Volume: 5 mL
Prep Date: 02/21/2018 1649		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	96		80 - 141
Dibromofluoromethane (Surr)	98	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75202-1

Client Sample ID: W1-A06-S-01-0218

4

Lab Sample ID: 580-75202-4

Date Sampled: 02/19/2018 1200

Client Matrix: Water

Date Received: 02/20/2018 0950

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-267774	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 022118_11.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 02/21/2018 1713		Final Weight/Volume: 5 mL
Prep Date: 02/21/2018 1713		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U M	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	97		80 - 141
Dibromofluoromethane (Surr)	98	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75202-1

Client Sample ID: W1-A06-S-01P-0218

5

Lab Sample ID: 580-75202-5

Date Sampled: 02/19/2018 1210

Client Matrix: Water

Date Received: 02/20/2018 0950

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-267774	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 022118_14.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 02/21/2018 1823		Final Weight/Volume: 5 mL
Prep Date: 02/21/2018 1823		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U M	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	97		80 - 141
Dibromofluoromethane (Surr)	98	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75202-1

Client Sample ID: W1-A06-MW-06-0218

Lab Sample ID: 580-75202-2

Client Matrix: Water

Date Sampled: 02/16/2018 1440

Date Received: 02/20/2018 0950

n

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268210	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-267832	Lab File ID:	030118a020.D
Dilution:	1.0			Initial Weight/Volume:	1017.6 mL
Analysis Date:	03/01/2018 2252			Final Weight/Volume:	2 mL
Prep Date:	02/22/2018 1441			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U ✓	0.011	0.098
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	107	✓	53 - 106	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75202-1

Client Sample ID: W1-A06-EB01-021618

3

Lab Sample ID: 580-75202-3

Date Sampled: 02/16/2018 1630

Client Matrix: Water

Date Received: 02/20/2018 0950

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM	Analysis Batch: 580-268210	Instrument ID: TAC050
Prep Method: 3520C	Prep Batch: 580-267832	Lab File ID: 030118a021.D
Dilution: 1.0		Initial Weight/Volume: 934.2 mL
Analysis Date: 03/01/2018 2314		Final Weight/Volume: 2 mL
Prep Date: 02/22/2018 1441		Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.032	U J	0.012	0.11

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	107	P	53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75202-1

Client Sample ID: W1-A06-S-01-0218

4

Lab Sample ID: 580-75202-4

Date Sampled: 02/19/2018 1200

Client Matrix: Water

Date Received: 02/20/2018 0950

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268210	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-267832	Lab File ID:	030118a022.D
Dilution:	1.0			Initial Weight/Volume:	1047.6 mL
Analysis Date:	03/01/2018 2336			Final Weight/Volume:	2 mL
Prep Date:	02/22/2018 1441			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.011	0.095

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	98		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75202-1

Client Sample ID: W1-A06-S-01P-0218

5

Lab Sample ID: 580-75202-5

Date Sampled: 02/19/2018 1210

Client Matrix: Water

Date Received: 02/20/2018 0950

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268210	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-267832	Lab File ID:	030118a023.D
Dilution:	1.0			Initial Weight/Volume:	982.2 mL
Analysis Date:	03/01/2018 2358			Final Weight/Volume:	2 mL
Prep Date:	02/22/2018 1441			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.031	U	0.011	0.10
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	95		53 - 106	

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 1800339
 Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: May 12, 2018

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-MW-06-0218	1800339-01	Water
2	WI-A06-FB01-021618	1800339-02	Water
3	WI-A06-EB01-021618	1800339-03	Water
4	WI-A06-S-01-0218	1800339-04	Water
4MS	WI-A06-S-01-0218MS	1800339-04MS	Water
4MSD	WI-A06-S-01-0218MSD	1800339-04MSD	Water
5	WI-A06-S-01P-0218	1800339-05	Water
6	WI-A06-FB01-021918	1800339-06	Water

A full data validation was performed on the analytical data for three water samples, one aqueous equipment blank sample, and two aqueous field blanks sample collected on February 16-19, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the EPA Method “Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)”.

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA “Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review,” January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation

- Holding times
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks exhibited the following contamination.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
B8B0129-BLK1	PFHxS	1.76	U	1, 2, 3, 4, 5

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB01-021618	None - ND	-	-	-
WI-A06-EB01-021618	None - ND	-	-	-
WI-A06-FB01-021918	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R) except for the following.

LCS ID	Compound	%R	Qualifier	Affected Samples
B8B1029-BS1	MeFOSAA	133%	None	All Associated ND

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria except for the following.

EDS Sample	Internal Standard	%R	Qualifier
6	d3-MeFOSAA	49.5%	UJ

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	PFCs		RPD	Qualifier
	WI-A06-S-01-0218 ng/L	WI-A06-S-01P-0218 ng/L		
None	ND	ND	-	-

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver
Nancy Weaver
Senior Chemist

Dated: 5/15/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-EB01-021618						Modified EPA Method 537					
Client Data					Laboratory Data						
Name:	CH2M Hill	Matrix:	Aqueous		Lab Sample:	1800339-03	Column:	BEH C18			
Project:	695610.05.FI.FS	Date Collected:	16-Feb-18 16:30		Date Received:	20-Feb-18 09:04					
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	1.85	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFHxA	ND	2.25	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFHxA	ND	0.609	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFHxS	5.17 1.74	0.977	5.17	8.25	J, B	B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFOA	ND	0.671	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFOS	ND	0.832	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFNA	ND	0.835	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFDA	ND	1.54	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
MeFOSAA	ND	1.70	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFUnA	ND	1.08	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
EtFOSAA	ND	1.41	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFDoA	ND	0.817	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFTTrDA	ND	0.509	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFTeDA	ND	0.779	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C3-PFBS	IS	117	50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
13C2-PFHxA	IS	87.8	50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
13C4-PFHxA	IS	96.5	50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
18O2-PFHxS	IS	83.9	50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
13C2-PFOA	IS	80.6	50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
13C8-PFOS	IS	72.6	50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
13C5-PFNA	IS	64.8	50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
13C2-PFDA	IS	68.6	50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
d3-MeFOSAA	IS	74.9	50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
13C2-PFUnA	IS	81.2	50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
d5-EtFOSAA	IS	78.7	50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
13C2-PFDoA	IS	76.3	50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
13C2-PFTeDA	IS	72.4	50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

new 5/12/18

Sample ID: WI-A06-MW-06-0218

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800339-01	Column:	BEH C18
Project:	695610.05.FI.FS	Date Collected:	16-Feb-18 14:40	Date Received:	20-Feb-18 09:04		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.89	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
PFHxA	ND	2.30	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
PFHpA	ND	0.624	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
PFHxS	5.30 3.70 u	0.999	5.30	8.44	L.B	B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
PFOA	ND	0.687	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
PFOS	ND	0.852	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
PFNA	ND	0.855	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
PFDA	ND	1.57	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
MeFOSAA	ND	1.74	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
PFOA	ND	1.11	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
EtFOSAA	ND	1.45	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
PFDoA	ND	0.836	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
PFTTrDA	ND	0.521	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
PFTeDA	ND	0.797	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1

MBL

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	107	50 - 150		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
13C2-PFHxA	IS	82.4	50 - 150		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
13C4-PFHpA	IS	89.1	50 - 150		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
18O2-PFHxS	IS	71.8	50 - 150		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
13C2-PFOA	IS	78.9	50 - 150		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
13C8-PFOS	IS	86.1	50 - 150		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
13C5-PFNA	IS	73.2	50 - 150		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
13C2-PFDA	IS	77.8	50 - 150		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
d3-MeFOSAA	IS	84.4	50 - 150		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
13C2-PFOA	IS	82.6	50 - 150		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
d5-EtFOSAA	IS	85.6	50 - 150		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
13C2-PFDoA	IS	96.8	50 - 150		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
13C2-PFTeDA	IS	93.1	50 - 150		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL- Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

new 5/12/18

Sample ID: WI-A06-FB01-021618 Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800339-02	Column:	BEH C18
Project:	695610.05.FI.FS	Date Collected:	16-Feb-18 14:45	Date Received:	20-Feb-18 09:04		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.84	5.12	8.22		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
PFHxA	ND	2.24	5.12	8.22		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
PFHpA	ND	0.607	5.12	8.22		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
PFHxS	5.12 1.89 u	0.973	5.12	8.22	J, B	B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
PFOA	ND	0.669	5.12	8.22		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
PFOS	ND	0.829	5.12	8.22		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
PFNA	ND	0.832	5.12	8.22		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
PFDA	ND	1.53	5.12	8.22		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
MeFOSAA	ND	1.70	5.12	8.22		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
PFUnA	ND	1.08	5.12	8.22		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
EtFOSAA	ND	1.41	5.12	8.22		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
PFDoA	ND	0.814	5.12	8.22		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
PFTTrDA	ND	0.508	5.12	8.22		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
PFTeDA	ND	0.776	5.12	8.22		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1

MBL

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	105	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
13C2-PFHxA	IS	90.7	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
13C4-PFHpA	IS	94.6	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
18O2-PFHxS	IS	78.9	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
13C2-PFOA	IS	81.4	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
13C8-PFOS	IS	74.2	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
13C5-PFNA	IS	71.3	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
13C2-PFDA	IS	65.4	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
d3-MeFOSAA	IS	58.4	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
13C2-PFUnA	IS	73.4	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
d5-EtFOSAA	IS	75.6	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
13C2-PFDoA	IS	58.4	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1
13C2-PFTeDA	IS	71.7	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:12	1

DL - Detection Limit LOD - Limit of Detection LCL-UCL- Lower control limit - upper control limit When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
 LOQ - Limit of quantitation Results reported to the DL. Only the linear isomer is reported for all other analytes.

new 5.12 6.18

Sample ID: WI-A06-S-01-0218

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800339-04	Column:	BEH C18
Project:	695610.05.FI.FS	Date Collected:	19-Feb-18 12:00	Date Received:	20-Feb-18 09:04		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.84	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFHxA	ND	2.24	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFHpA	ND	0.608	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFHxS	5.17 1.71 u	0.975	5.17	8.24	LB	B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFOA	ND	0.670	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFOS	ND	0.831	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFNA	ND	0.834	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFDA	ND	1.53	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
MeFOSAA	ND	1.70	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFUnA	ND	1.08	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
EtFOSAA	ND	1.41	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFDoA	ND	0.815	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFTTrDA	ND	0.509	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFTeDA	ND	0.777	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1

MBL

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	107	50 - 150		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
13C2-PFHxA	IS	89.5	50 - 150		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
13C4-PFHpA	IS	82.8	50 - 150		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
18O2-PFHxS	IS	80.7	50 - 150		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
13C2-PFOA	IS	77.0	50 - 150		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
13C8-PFOS	IS	70.6	50 - 150		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
13C5-PFNA	IS	82.0	50 - 150		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
13C2-PFDA	IS	68.7	50 - 150		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
d3-MeFOSAA	IS	75.4	50 - 150		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
13C2-PFUnA	IS	80.9	50 - 150		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
d5-EtFOSAA	IS	92.3	50 - 150		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
13C2-PFDoA	IS	78.6	50 - 150		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
13C2-PFTeDA	IS	87.3	50 - 150		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

new sl 2/18

Sample ID: WI-A06-S-01P-0218

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800339-05	Column:	BEH C18
Project:	695610.05.FI.FS	Date Collected:	19-Feb-18 12:10	Date Received:	20-Feb-18 09:04		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.84	5.12	8.21		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
PFHxA	ND	2.24	5.12	8.21		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
PFHpA	ND	0.606	5.12	8.21		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
PFHxS	5.12 2.14 u	0.972	5.12	8.21	LB	B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
PFOA	ND	0.668	5.12	8.21		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
PFOS	ND	0.828	5.12	8.21		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
PFNA	ND	0.831	5.12	8.21		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
PFDA	ND	1.53	5.12	8.21		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
MeFOSAA	ND	1.69	5.12	8.21		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
PFUnA	ND	1.08	5.12	8.21		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
EtFOSAA	ND	1.41	5.12	8.21		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
PFDoA	ND	0.813	5.12	8.21		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
PFTrDA	ND	0.507	5.12	8.21		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
PFTeDA	ND	0.775	5.12	8.21		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1

MSL

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	127	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
13C2-PFHxA	IS	97.2	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
13C4-PFHpA	IS	115	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
18O2-PFHxS	IS	95.5	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
13C2-PFOA	IS	89.4	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
13C8-PFOS	IS	85.1	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
13C5-PFNA	IS	79.2	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
13C2-PFDA	IS	70.5	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
d3-MeFOSAA	IS	68.3	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
13C2-PFUnA	IS	80.8	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
d5-EtFOSAA	IS	77.0	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
13C2-PFDoA	IS	72.0	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1
13C2-PFTeDA	IS	102	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:46	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

سليز 5.12

Sample ID: WI-A06-FB01-021918

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800339-06	Column:	BEH C18
Project:	695610.05.FI.FS	Date Collected:	19-Feb-18 13:00	Date Received:	20-Feb-18 09:04		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.83	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFHxA	ND	2.23	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFHpA	ND	0.604	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFHxS	ND	0.969	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFOA	ND	0.666	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFOS	ND	0.825	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFNA	ND	0.828	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFDA	ND	1.52	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
MeFOSAA	ND <i>uJ</i>	1.69	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1 <i>ISL</i>
PFUnA	ND	1.07	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
EtFOSAA	ND	1.40	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFDoA	ND	0.810	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFTTrDA	ND	0.505	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFTeDA	ND	0.772	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	98.1	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
13C2-PFHxA	IS	84.2	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
13C4-PFHpA	IS	81.1	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
18O2-PFHxS	IS	84.3	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
13C2-PFOA	IS	82.5	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
13C8-PFOS	IS	85.8	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
13C5-PFNA	IS	70.3	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
13C2-PFDA	IS	57.4	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
d3-MeFOSAA	IS	49.5	50 - 150	<i>H</i>	B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
13C2-PFUnA	IS	52.1	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
d5-EtFOSAA	IS	60.0	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
13C2-PFDoA	IS	67.3	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
13C2-PFTeDA	IS	74.0	50 - 150		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

new sl. 2/18

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 580-75341-1
Laboratory: Test America Laboratories, Tacoma, Washington
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
Date: May 14, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-EB01-022218	580-75341-1	Water
2	WI-A06-MW03B-0218	580-75341-2	Water
3	WI-A06-EB01-022318	580-75341-3	Water
4	WI-A06-6-S-02-0218	580-75341-4	Water
5	WI-A06-6-S-05-0218	580-75341-5	Water
6	WI-A06-6-S-05P-0218	580-75341-6	Water
7*	WI-A06-TB01-022218	580-75341-7	Water

* - VOC only

A full data validation was performed on the analytical data for four water samples, two aqueous equipment blank samples, and one aqueous trip blank sample collected on February 22-23, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

VOC (Vinyl Chloride)
SVOC (1,4-Dioxane)

Method References

USEPA SW-846 Method 8260C SIM
USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

- All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-022218	None - ND	-	-	-
WI-A06-EB01-022318	None - ND	-	-	-
WI-A06-TB01-022218	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate recoveries.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below.

Compound	WI-A06-6-S-05-0218 ug/L	WI-A06-6-S-05P-0218 ug/L	RPD	Qualifier
None	ND	ND	-	-

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-022218	None - ND	-	-	-
WI-A06-EB01-022318	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

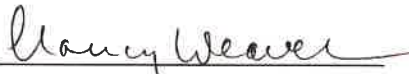
- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below.

Compound	WI-A06-6-S-05-0218 ug/L	WI-A06-6-S-05P-0218 ug/L	RPD	Qualifier
None	ND	ND	-	-

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:  Dated: 5/15/18
Nancy Weaver
Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75341-1

Client Sample ID: WI-A06-EB01-022218

Lab Sample ID: 580-75341-1

Date Sampled: 02/22/2018 1550

Client Matrix: Water

Date Received: 02/27/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-268193	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	030118_19.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/01/2018 1953			Final Weight/Volume:	5 mL
Prep Date:	03/01/2018 1953				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	97		80 - 141
Dibromofluoromethane (Surr)	100	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75341-1

Client Sample ID: WI-A06-MW03B-0218

2

Lab Sample ID: 580-75341-2

Date Sampled: 02/22/2018 1500

Client Matrix: Water

Date Received: 02/27/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-268193	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 030118_20.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 03/01/2018 2017		Final Weight/Volume: 5 mL
Prep Date: 03/01/2018 2017		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50
Surrogate	%Rec	Qualifier	Acceptance Limits	
Trifluorotoluene (Surr)	98		80 - 141	
Dibromofluoromethane (Surr)	100	M	77 - 118	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75341-1

Client Sample ID: WI-A06-EB01-022318

3

Lab Sample ID: 580-75341-3

Date Sampled: 02/23/2018 1500

Client Matrix: Water

Date Received: 02/27/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-268193	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	030118_21.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/01/2018 2040			Final Weight/Volume:	5 mL
Prep Date:	03/01/2018 2040				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	97		80 - 141
Dibromofluoromethane (Surr)	99	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75341-1

Client Sample ID: WI-A06-6-S-02-0218

4

Lab Sample ID: 580-75341-4

Date Sampled: 02/23/2018 1355

Client Matrix: Water

Date Received: 02/27/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-268193	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	030118_22.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/01/2018 2104			Final Weight/Volume:	5 mL
Prep Date:	03/01/2018 2104				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50
Surrogate	%Rec	Qualifier	Acceptance Limits	
Trifluorotoluene (Surr)	98		80 - 141	
Dibromofluoromethane (Surr)	100	M	77 - 118	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75341-1

5

Client Sample ID: WI-A06-6-S-05-0218

Lab Sample ID: 580-75341-5

Date Sampled: 02/23/2018 1035

Client Matrix: Water

Date Received: 02/27/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-268193	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 030118_23.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 03/01/2018 2128		Final Weight/Volume: 5 mL
Prep Date: 03/01/2018 2128		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50
Surrogate	%Rec	Qualifier	Acceptance Limits	
Trifluorotoluene (Surr)	98		80 - 141	
Dibromofluoromethane (Surr)	99	M	77 - 118	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75341-1

Client Sample ID: WI-A06-6-S-05P-0218

Lab Sample ID: 580-75341-6

Client Matrix: Water

Date Sampled: 02/23/2018 1035

Date Received: 02/27/2018 0925

b

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-268193	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 030118_24.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 03/01/2018 2151		Final Weight/Volume: 5 mL
Prep Date: 03/01/2018 2151		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50
Surrogate	%Rec	Qualifier	Acceptance Limits	
Trifluorotoluene (Surr)	97		80 - 141	
Dibromofluoromethane (Surr)	101	M	77 - 118	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75341-1

Client Sample ID: WI-A06-TB01-022218

Lab Sample ID: 580-75341-7

Client Matrix: Water

Date Sampled: 02/22/2018 0700

Date Received: 02/27/2018 0925

7

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-268193	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 030118_25.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 03/01/2018 2215		Final Weight/Volume: 5 mL
Prep Date: 03/01/2018 2215		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50
Surrogate	%Rec	Qualifier	Acceptance Limits	
Trifluorotoluene (Surr)	97		80 - 141	
Dibromofluoromethane (Surr)	102	M	77 - 118	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75341-1

Client Sample ID: WI-A06-EB01-022218

Lab Sample ID: 580-75341-1

Date Sampled: 02/22/2018 1550

Client Matrix: Water

Date Received: 02/27/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268210	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-268061	Lab File ID:	030118a010.D
Dilution:	1.0			Initial Weight/Volume:	1027.6 mL
Analysis Date:	03/01/2018 1910			Final Weight/Volume:	2 mL
Prep Date:	02/27/2018 1425			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.011	0.097
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	94		53 - 106	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75341-1

Client Sample ID: WI-A06-MW03B-0218

2

Lab Sample ID: 580-75341-2

Date Sampled: 02/22/2018 1500

Client Matrix: Water

Date Received: 02/27/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268210	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-268061	Lab File ID:	030118a011.D
Dilution:	1.0			Initial Weight/Volume:	1009.9 mL
Analysis Date:	03/01/2018 1932			Final Weight/Volume:	2 mL
Prep Date:	02/27/2018 1425			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.030	U	0.011	0.099

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	95		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75341-1

3

Client Sample ID: WI-A06-EB01-022318

Lab Sample ID: 580-75341-3

Date Sampled: 02/23/2018 1500

Client Matrix: Water

Date Received: 02/27/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268210	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-268061	Lab File ID:	030118a012.D
Dilution:	1.0			Initial Weight/Volume:	1040.2 mL
Analysis Date:	03/01/2018 1955			Final Weight/Volume:	2 mL
Prep Date:	02/27/2018 1425			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.011	0.096

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	87		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75341-1

4

Client Sample ID: WI-A06-6-S-02-0218

Lab Sample ID: 580-75341-4

Date Sampled: 02/23/2018 1355

Client Matrix: Water

Date Received: 02/27/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM	Analysis Batch: 580-268210	Instrument ID: TAC050
Prep Method: 3520C	Prep Batch: 580-268061	Lab File ID: 030118a013.D
Dilution: 1.0		Initial Weight/Volume: 1022.9 mL
Analysis Date: 03/01/2018 2017		Final Weight/Volume: 2 mL
Prep Date: 02/27/2018 1425		Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.011	0.098

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	87		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75341-1

5

Client Sample ID: WI-A06-6-S-05-0218

Lab Sample ID: 580-75341-5

Date Sampled: 02/23/2018 1035

Client Matrix: Water

Date Received: 02/27/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268210	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-268061	Lab File ID:	030118a014.D
Dilution:	1.0			Initial Weight/Volume:	1030.3 mL
Analysis Date:	03/01/2018 2039			Final Weight/Volume:	2 mL
Prep Date:	02/27/2018 1425			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.011	0.097
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	94		53 - 106	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75341-1

Client Sample ID: WI-A06-6-S-05P-0218

6

Lab Sample ID: 580-75341-6

Date Sampled: 02/23/2018 1035

Client Matrix: Water

Date Received: 02/27/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268210	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-268061	Lab File ID:	030118a015.D
Dilution:	1.0			Initial Weight/Volume:	943.5 mL
Analysis Date:	03/01/2018 2101			Final Weight/Volume:	2 mL
Prep Date:	02/27/2018 1425			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.032	U	0.012	0.11
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	89		53 - 106	

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 1800367
Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
Date: May 12, 2018

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-EB01-0218	1800367-01	Water
2	WI-A06-MW03B-0218	1800367-02	Water
3	WI-A06-FB01-022218	1800367-02	Water
4	WI-A06-S-02-0218	1800367-03	Water
5	WI-A06-6-S-05-0218	1800367-04	Water
6	WI-A06-6-S-05P-0218	1800367-05	Water
7	WI-A06-FB01-022318	1800367-06	Water
8	WI-A06-EB01-022318	1800367-07	Water

A full data validation was performed on the analytical data for four water samples, two aqueous equipment blank samples, and two aqueous field blank samples collected on February 22-23, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)".

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation

- Holding times
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days except for the following.

EDS Sample	Date Sampled	Date Extracted	# of Days	Qualifier
All Samples*	02/22/18-02/23/18	03/17/18	22-23	UJ

* - Due to an oversight, the initial extraction did not contain PFDoA, therefore, all samples were re-extracted outside of holding times for this compound and qualified as estimated (UJ).

GC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-EB01-0218	None - ND	-	-	-
WI-A06-FB01-022218	None - ND	-	-	-
WI-A06-EB01-022318	None - ND	-	-	-
WI-A06-FB01-022318	PFOS	1.48	None	All Associated ND

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria except for the following.

EDS Sample	Internal Standard	%R	Qualifier
2	13C2-PFTeDA	14.6%	UJ
3	13C2-PFTeDA	23.3%	UJ
4	13C2-PFTeDA	11.7%	UJ
6	13C2-PFTeDA	31.9%	UJ
7	13C2-PFTeDA	39.8%	UJ
8	13C2-PFTeDA	17.5%	UJ

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

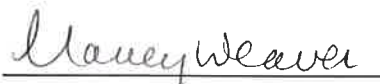
- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	PFCs		RPD	Qualifier
	WI-A06-6-S-05-0218 ng/L	WI-A06-6-S-05P-0218 ng/L		
PFHpA	5.12U	0.654	NC	None
PFHxS	4.45	3.66	19%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: 
Nancy Weaver
Senior Chemist

Dated: 5/15/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-EB01-0218

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800367-01	Column:	BEH C18
Project:	695610.05.FI.FS	Date Collected:	22-Feb-18 15:50	Date Received:	27-Feb-18 09:40		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.82	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFHxA	ND	2.21	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFHpA	ND	0.600	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFHxS	ND	0.962	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFOA	ND	0.661	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFOS	ND	0.819	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFNA	ND	0.822	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFDA	ND	1.51	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
MeFOSAA	ND	1.68	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFUnA	ND	1.07	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
EtFOSAA	ND	1.39	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFDoA	ND <i>u j</i>	0.823	5.21	8.31		B8C0101	17-Mar-18	0.120 L	17-Mar-18 22:49	1
PFTTrDA	ND	0.502	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFTeDA	ND	0.767	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1

HT

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	100	50 - 150		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
13C2-PFHxA	IS	91.7	50 - 150		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
13C4-PFHpA	IS	90.1	50 - 150		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
18O2-PFHxS	IS	91.1	50 - 150		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
13C2-PFOA	IS	89.6	50 - 150		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
13C8-PFOS	IS	86.2	50 - 150		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
13C5-PFNA	IS	76.1	50 - 150		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
13C2-PFDA	IS	72.2	50 - 150		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
d3-MeFOSAA	IS	85.4	50 - 150		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
13C2-PFUnA	IS	87.6	50 - 150		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
d5-EtFOSAA	IS	80.1	50 - 150		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
13C2-PFDoA	IS	62.0	50 - 150		B8C0101	17-Mar-18	0.120 L	17-Mar-18 22:49	1
13C2-PFTeDA	IS	64.9	50 - 150		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

W 51.218

Sample ID: WI-A06-MW03B-0218						Modified EPA Method 537					
Client Data					Laboratory Data						
Name:	CH2M Hill	Matrix:	Aqueous		Lab Sample:	1800367-02	Column:	BEH C18			
Project:	695610.05.FI.FS	Date Collected:	22-Feb-18 15:00		Date Received:	27-Feb-18 09:40					
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	1.88	5.25	8.39		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
PFHxA	3.55	2.29	5.25	8.39	J	B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
PFHpA	ND	0.620	5.25	8.39		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
PFHxS	ND	0.993	5.25	8.39		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
PFOA	ND	0.683	5.25	8.39		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
PFOS	ND	0.846	5.25	8.39		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
PFNA	ND	0.849	5.25	8.39		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
PFDA	ND	1.56	5.25	8.39		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
MeFOSAA	ND	1.73	5.25	8.39		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
PFUnA	ND	1.10	5.25	8.39		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
EtFOSAA	ND	1.44	5.25	8.39		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
PFDoA	ND <i>WJ</i>	0.822	5.21	8.30		B8C0101	17-Mar-18	0.120 L	17-Mar-18 23:00	1 <i>HT</i>	
PFTTrDA	ND	0.518	5.25	8.39		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
PFTeDA	ND <i>WJ</i>	0.792	5.25	8.39		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1 <i>ISL</i>	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C3-PFBS	IS	93.1	50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
13C2-PFHxA	IS	89.4	50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
13C4-PFHpA	IS	91.1	50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
18O2-PFHxS	IS	83.6	50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
13C2-PFOA	IS	82.1	50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
13C8-PFOS	IS	103	50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
13C5-PFNA	IS	86.1	50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
13C2-PFDA	IS	88.4	50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
d3-MeFOSAA	IS	68.6	50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
13C2-PFUnA	IS	73.4	50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
d5-EtFOSAA	IS	64.2	50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	
13C2-PFDoA	IS	69.8	50 - 150			B8C0101	17-Mar-18	0.120 L	17-Mar-18 23:00	1	
13C2-PFTeDA	IS	14.6	50 - 150		<i>H</i>	B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1	

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

21.21.8

Sample ID: WI-A06-FB01-022218

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800367-03	Column:	BEH C18
Project:	695610.05.FI.FS	Date Collected:	22-Feb-18 15:00	Date Received:	27-Feb-18 09:40		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.81	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
PFHxA	ND	2.20	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
PFHpA	ND	0.596	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
PFHxS	ND	0.955	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
PFOA	ND	0.656	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
PFOS	ND	0.814	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
PFNA	ND	0.817	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
PFDA	ND	1.50	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
MeFOSAA	ND	1.66	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
PFUnA	ND	1.06	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
EtFOSAA	ND	1.38	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
PFDoA	ND uJ	0.847	5.34	8.56		B8C0101	17-Mar-18	0.117 L	17-Mar-18 23:12	1
PFTTrDA	ND	0.498	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
PFTeDA	ND uJ	0.761	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1

HT
ISC

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	103	50 - 150		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
13C2-PFHxA	IS	96.6	50 - 150		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
13C4-PFHpA	IS	97.5	50 - 150		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
18O2-PFHxS	IS	90.8	50 - 150		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
13C2-PFOA	IS	83.3	50 - 150		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
13C8-PFOS	IS	85.1	50 - 150		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
13C5-PFNA	IS	79.9	50 - 150		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
13C2-PFDA	IS	79.8	50 - 150		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
d3-MeFOSAA	IS	73.4	50 - 150		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
13C2-PFUnA	IS	67.0	50 - 150		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
d5-EtFOSAA	IS	69.8	50 - 150		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
13C2-PFDoA	IS	69.0	50 - 150		B8C0101	17-Mar-18	0.117 L	17-Mar-18 23:12	1
13C2-PFTeDA	IS	23.3	50 - 150	✓	B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

see 5/12/18

Sample ID: WI-A06-S-02-0218 Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800367-04	Column:	BEH C18
Project:	695610.05.FI.FS	Date Collected:	23-Feb-18 13:55	Date Received:	27-Feb-18 09:40		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	5.03	1.88	5.25	8.41	J	B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
PFHxA	ND	2.29	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
PFHpA	ND	0.621	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
PFHxS	18.0	0.995	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
PFOA	9.64	0.684	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
PFOS	ND	0.848	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
PFNA	ND	0.851	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
PFDA	ND	1.57	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
MeFOSAA	ND	1.73	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
PFUnA	ND	1.10	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
EtFOSAA	ND	1.44	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
PFDoA	ND UJ	0.835	5.25	8.44		B8C0101	17-Mar-18	0.119 L	17-Mar-18 23:23	1
PFTTrDA	ND	0.519	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
PFTeDA	ND UJ	0.793	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1

HT
ISC

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	102	50 - 150		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
13C2-PFHxA	IS	97.1	50 - 150		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
13C4-PFHpA	IS	93.1	50 - 150		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
18O2-PFHxS	IS	87.8	50 - 150		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
13C2-PFOA	IS	82.8	50 - 150		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
13C8-PFOS	IS	115	50 - 150		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
13C5-PFNA	IS	76.0	50 - 150		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
13C2-PFDA	IS	82.3	50 - 150		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
d3-MeFOSAA	IS	98.2	50 - 150		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
13C2-PFUnA	IS	69.8	50 - 150		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
d5-EtFOSAA	IS	94.5	50 - 150		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
13C2-PFDoA	IS	72.9	50 - 150		B8C0101	17-Mar-18	0.119 L	17-Mar-18 23:23	1
13C2-PFTeDA	IS	11.7	50 - 150		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1

DL - Detection Limit LOD - Limit of Detection LCL-UCL - Lower control limit - upper control limit When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
 LOQ - Limit of quantitation Results reported to the DL. Only the linear isomer is reported for all other analytes.

NW 5/12/18

Sample ID: WI-A06-6-S-05-0218

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800367-05	Column:	BEH C18
Project:	695610.05.FI.FS	Date Collected:	23-Feb-18 10:35	Date Received:	27-Feb-18 09:40		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.83	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFHxA	ND	2.23	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFHpA	ND	0.604	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFHxS	4.45	0.967	5.12	8.17	J	B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFOA	ND	0.665	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFOS	ND	0.824	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFNA	ND	0.827	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFDA	ND	1.52	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
MeFOSAA	ND	1.69	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFUnA	ND	1.07	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
EtFOSAA	ND	1.40	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFDoA	ND <i>HT</i>	0.820	5.17	8.29		B8C0101	17-Mar-18	0.121 L	17-Mar-18 23:35	1
PFTTrDA	ND	0.505	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFTeDA	ND	0.771	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	89.1	50 - 150		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
13C2-PFHxA	IS	93.1	50 - 150		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
13C4-PFHpA	IS	91.9	50 - 150		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
18O2-PFHxS	IS	83.2	50 - 150		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
13C2-PFOA	IS	96.4	50 - 150		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
13C8-PFOS	IS	91.1	50 - 150		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
13C5-PFNA	IS	81.0	50 - 150		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
13C2-PFDA	IS	77.6	50 - 150		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
d3-MeFOSAA	IS	74.1	50 - 150		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
13C2-PFUnA	IS	73.4	50 - 150		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
d5-EtFOSAA	IS	72.2	50 - 150		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
13C2-PFDoA	IS	59.2	50 - 150		B8C0101	17-Mar-18	0.121 L	17-Mar-18 23:35	1
13C2-PFTeDA	IS	71.5	50 - 150		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Handwritten note: 5.12/1.8

Sample ID: WI-A06-6-S-05P-0218

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800367-06	Column:	BEH C18
Project:	695610.05.FI.FS	Date Collected:	23-Feb-18 10:35	Date Received:	27-Feb-18 09:40		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	1.79	5.00	7.98		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
PFHxA	ND	2.17	5.00	7.98		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
PFHpA	0.654	0.589	5.00	7.98	J	B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
PFHxS	3.66	0.945	5.00	7.98	J	B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
PFOA	ND	0.649	5.00	7.98		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
PFOS	ND	0.805	5.00	7.98		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
PFNA	ND	0.808	5.00	7.98		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
PFDA	ND	1.49	5.00	7.98		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
MeFOSAA	ND	1.65	5.00	7.98		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
PFUnA	ND	1.05	5.00	7.98		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
EtFOSAA	ND	1.37	5.00	7.98		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
PFDoA	ND <i>uJ</i>	0.840	5.30	8.48		B8C0101	17-Mar-18	0.118 L	17-Mar-18 23:46	1 <i>HT</i>
PFTTrDA	ND	0.493	5.00	7.98		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
PFTeDA	ND <i>uJ</i>	0.753	5.00	7.98		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1 <i>JSL</i>

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	99.9	50 - 150		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
13C2-PFHxA	IS	93.1	50 - 150		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
13C4-PFHpA	IS	93.3	50 - 150		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
18O2-PFHxS	IS	101	50 - 150		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
13C2-PFOA	IS	81.8	50 - 150		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
13C8-PFOS	IS	89.4	50 - 150		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
13C5-PFNA	IS	75.1	50 - 150		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
13C2-PFDA	IS	69.4	50 - 150		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
d3-MeFOSAA	IS	66.2	50 - 150		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
13C2-PFUnA	IS	59.4	50 - 150		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
d5-EtFOSAA	IS	62.2	50 - 150		B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1
13C2-PFDoA	IS	67.4	50 - 150		B8C0101	17-Mar-18	0.118 L	17-Mar-18 23:46	1
13C2-PFTeDA	IS	31.9	50 - 150	<i>HT</i>	B8C0006	01-Mar-18	0.125 L	08-Mar-18 15:13	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

new sliz 1.8

Sample ID: WI-A06-FB01-022318						Modified EPA Method 537					
Client Data					Laboratory Data						
Name:	CH2M Hill	Matrix:	Aqueous		Lab Sample:	1800367-07	Column:	BEH C18			
Project:	695610.05.FI.FS	Date Collected:	23-Feb-18 15:00		Date Received:	27-Feb-18 09:40					
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	1.83	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
PFHxA	ND	2.23	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
PFHpA	ND	0.606	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
PFHxS	ND	0.971	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
PFOA	ND	0.667	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
PFOS	1.48	0.827	5.12	8.20	J	B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
PFNA	ND	0.830	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
PFDA	ND	1.53	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
MeFOSAA	ND	1.69	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
PFUnA	ND	1.08	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
EtFOSAA	ND	1.40	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
PFDoA	ND UJ	0.842	5.30	8.51		B8C0101	17-Mar-18	0.118 L	17-Mar-18 23:58	1 HT	
PFTTrDA	ND	0.506	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
PFTeDA	ND UJ	0.774	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1 ISL	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C3-PFBS	IS	105	50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
13C2-PFHxA	IS	92.5	50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
13C4-PFHpA	IS	103	50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
18O2-PFHxS	IS	89.4	50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
13C2-PFOA	IS	75.3	50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
13C8-PFOS	IS	84.9	50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
13C5-PFNA	IS	70.4	50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
13C2-PFDA	IS	65.8	50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
d3-MeFOSAA	IS	63.6	50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
13C2-PFUnA	IS	55.2	50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
d5-EtFOSAA	IS	66.7	50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	
13C2-PFDoA	IS	84.2	50 - 150			B8C0101	17-Mar-18	0.118 L	17-Mar-18 23:58	1	
13C2-PFTeDA	IS	39.8	50 - 150		H	B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1	

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit

Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

سور 5/2/18

Sample ID: WI-A06-EB01-022318							Modified EPA Method 537				
Client Data				Laboratory Data							
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1800367-08	Column:	BEH C18				
Project:	695610.05.FI.FS	Date Collected:	23-Feb-18 15:00	Date Received:	27-Feb-18 09:40						
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	1.81	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
PFHxA	ND	2.20	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
PFHpA	ND	0.597	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
PFHxS	ND	0.956	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
PFOA	ND	0.657	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
PFOS	ND	0.815	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
PFNA	ND	0.818	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
PFDA	ND	1.50	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
MeFOSAA	ND	1.67	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
PFUnA	ND	1.06	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
EtFOSAA	ND	1.38	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
PFDoA	ND NJ	0.818	5.17	8.26		B8C0101	17-Mar-18	0.121 L	18-Mar-18 00:09	1 HT	
PFTeDA	ND	0.499	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
PFTeDA	ND NJ	0.762	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1 JSL	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C3-PFBS	IS	97.1	50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
13C2-PFHxA	IS	94.8	50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
13C4-PFHpA	IS	93.6	50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
18O2-PFHxS	IS	106	50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
13C2-PFOA	IS	87.0	50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
13C8-PFOS	IS	89.9	50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
13C5-PFNA	IS	79.2	50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
13C2-PFDA	IS	73.0	50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
d3-MeFOSAA	IS	58.1	50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
13C2-PFUnA	IS	54.4	50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
d5-EtFOSAA	IS	60.4	50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	
13C2-PFDoA	IS	67.3	50 - 150			B8C0101	17-Mar-18	0.121 L	18-Mar-18 00:09	1	
13C2-PFTeDA	IS	17.5	50 - 150		H	B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1	

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitationLCL-UCL- Lower control limit - upper control limit
Results reported to the DL.When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

www.sli218

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 580-79031-1
 Laboratory: Test America Laboratories, Tacoma, Washington
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: October 28, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-S-11-0718	580-79031-1	Water
2	WI-A06-6-S-40-0718	580-79031-2	Water
3	WI-A06-EB04-071818	580-79031-3	Water
4	WI-A06-6-S-41-0718	580-79031-4	Water
5	WI-A06-6-S-42-0718	580-79031-5	Water
6	WI-A06-6-S-42P-0718	580-79031-6	Water
7	WI-A06-EB05-071918	580-79031-7	Water
8	WI-A06-S-43-0718	580-79031-8	Water
8MS	WI-A06-S-43-0718MS	580-79031-8MS	Water
8MSD	WI-A06-S-43-0718MSD	580-79031-8MSD	Water
9*	WI-A06-TB01-0718	580-79031-9	Water
10*	WI-A06-TB02-0718	580-79031-10	Water
11*	WI-A06-TB03-0718	580-79031-11	Water

* - VOC only

A full data validation was performed on the analytical data for six water samples, two aqueous equipment blank samples and three aqueous trip blanks sample collected on July 16-19, 2018 by CH2M HILL at the NAS Whidbey Island site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

VOC (Vinyl Chloride)
 SVOC (1,4-Dioxane)

Method References

USEPA SW-846 Method 8260C SIM
 USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data is acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

- All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB04-071818	None - ND	-	-	-
WI-A06-EB05-071918	None - ND	-	-	-
WI-A06-TB01-0718	None - ND	-	-	-
WI-A06-TB02-0718	None - ND	-	-	-
WI-A06-TB03-0718	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate recoveries.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

MS/MSD Sample	Compound	MS %R/MSD %R/RPD	Qualifier	Affected Samples
8	Vinyl Chloride	175%/OK/26	J	8

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	WI-A06-6-S-42-0718 ug/L	WI-A06-6-S-42P-0718 ug/L	RPD	Qualifier
None	ND	ND	-	-

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB04-071818	None - ND	-	-	-
WI-A06-EB05-071918	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

MS/MSD Sample	Compound	MS %R/MSD %R/RPD	Qualifier	Affected Samples
8	1,4-Dioxane	OK/OK/27	None	For RPD Alone

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	WI-A06-6-S-42-0718 ug/L	WI-A06-6-S-42P-0718 ug/L	RPD	Qualifier
1,4-Dioxane	0.20	0.15	29%	None

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver
Nancy Weaver
Senior Chemist

Dated: 10/29/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: WI-A06-S-11-0718 Lab Sample ID: 580-79031-1
 Matrix: Water Lab File ID: 073018_11.D
 Analysis Method: 8260C SIM Date Collected: 07/17/2018 17:35
 Sample wt/vol: 5 (mL) Date Analyzed: 07/30/2018 14:26
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 280375 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U M	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	100		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

2

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: WI-A06-6-S-40-0718 Lab Sample ID: 580-79031-2
 Matrix: Water Lab File ID: 073018_12.D
 Analysis Method: 8260C SIM Date Collected: 07/18/2018 10:17
 Sample wt/vol: 5(mL) Date Analyzed: 07/30/2018 14:49
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 280375 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	UM	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	101		80-120

NW. 10/27/18

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

3

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: WI-A06-EB04-071818 Lab Sample ID: 580-79031-3
 Matrix: Water Lab File ID: 073018_13.D
 Analysis Method: 8260C SIM Date Collected: 07/18/2018 15:50
 Sample wt/vol: 5 (mL) Date Analyzed: 07/30/2018 15:12
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 280375 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	101		80-120

280375

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

4

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: WI-A06-6-S-41-0718 Lab Sample ID: 580-79031-4
 Matrix: Water Lab File ID: 073018_14.D
 Analysis Method: 8260C SIM Date Collected: 07/18/2018 13:50
 Sample wt/vol: 5 (mL) Date Analyzed: 07/30/2018 15:35
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 280375 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U M	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	99		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

5

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: WI-A06-6-S-42-0718 Lab Sample ID: 580-79031-5
 Matrix: Water Lab File ID: 073018_15.D
 Analysis Method: 8260C SIM Date Collected: 07/19/2018 09:45
 Sample wt/vol: 5 (mL) Date Analyzed: 07/30/2018 15:58
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 280375 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	101		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

6

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: WI-A06-6-S-42P-0718 Lab Sample ID: 580-79031-6
 Matrix: Water Lab File ID: 073018_16.D
 Analysis Method: 8260C SIM Date Collected: 07/19/2018 09:55
 Sample wt/vol: 5 (mL) Date Analyzed: 07/30/2018 16:22
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 280375 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	102		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

7

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: WI-A06-EB05-071918 Lab Sample ID: 580-79031-7
 Matrix: Water Lab File ID: 073018_17.D
 Analysis Method: 8260C SIM Date Collected: 07/19/2018 16:15
 Sample wt/vol: 5(mL) Date Analyzed: 07/30/2018 16:45
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 280375 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	102		80-120
1868-53-7	Dibromofluoromethane (Surr)	102		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

8

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: WI-A06-S-43-0718 Lab Sample ID: 580-79031-8
 Matrix: Water Lab File ID: 073018_18.D
 Analysis Method: 8260C SIM Date Collected: 07/19/2018 14:05
 Sample wt/vol: 5(mL) Date Analyzed: 07/30/2018 17:08
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 280375 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	1.8	✓	0.50	0.019

MSH

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	103		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

9

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: W1-A06-TB01-0718 Lab Sample ID: 580-79031-9
 Matrix: Water Lab File ID: 073018_08.D
 Analysis Method: 8260C SIM Date Collected: 07/16/2018 12:00
 Sample wt/vol: 5 (mL) Date Analyzed: 07/30/2018 13:16
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 280375 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	102		80-120
1868-53-7	Dibromofluoromethane (Surr)	99		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

16

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: W1-A06-TB02-0718 Lab Sample ID: 580-79031-10
 Matrix: Water Lab File ID: 073018_09.D
 Analysis Method: 8260C SIM Date Collected: 07/16/2018 12:00
 Sample wt/vol: 5 (mL) Date Analyzed: 07/30/2018 13:40
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 280375 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	102		80-120
1868-53-7	Dibromofluoromethane (Surr)	100		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

11

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: WI-A06-TB03-0718 Lab Sample ID: 580-79031-11
 Matrix: Water Lab File ID: 073018_10.D
 Analysis Method: 8260C SIM Date Collected: 07/16/2018 12:00
 Sample wt/vol: 5 (mL) Date Analyzed: 07/30/2018 14:03
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 280375 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U M	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	99		80-120

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: WI-A06-S-11-0718 Lab Sample ID: 580-79031-1
 Matrix: Water Lab File ID: 072718a007.D
 Analysis Method: 8270D SIM Date Collected: 07/17/2018 17:35
 Extract. Method: 3520C Date Extracted: 07/24/2018 14:40
 Sample wt/vol: 1029.2 (mL) Date Analyzed: 07/27/2018 18:14
 Con. Extract Vol.: 2 (mL) Dilution Factor: 1
 Injection Volume: 1 (uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 280257 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	4.4	0	0.19	0.035

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	84		53-106

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

2

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: WI-A06-6-S-40-0718 Lab Sample ID: 580-79031-2
 Matrix: Water Lab File ID: 072718a008.D
 Analysis Method: 8270D SIM Date Collected: 07/18/2018 10:17
 Extract. Method: 3520C Date Extracted: 07/24/2018 14:40
 Sample wt/vol: 1054.3 (mL) Date Analyzed: 07/27/2018 18:40
 Con. Extract Vol.: 2 (mL) Dilution Factor: 1
 Injection Volume: 1 (uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 280257 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.047	U M	0.19	0.034

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	76		53-106

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

3

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: WI-A06-EB04-071818 Lab Sample ID: 580-79031-3
 Matrix: Water Lab File ID: 072718a009.D
 Analysis Method: 8270D SIM Date Collected: 07/18/2018 15:50
 Extract. Method: 3520C Date Extracted: 07/24/2018 14:40
 Sample wt/vol: 1015.5 (mL) Date Analyzed: 07/27/2018 19:06
 Con. Extract Vol.: 2 (mL) Dilution Factor: 1
 Injection Volume: 1 (uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 280257 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.049	U H	0.20	0.035

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	80		53-106

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

4

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: WI-A06-6-S-41-0718 Lab Sample ID: 580-79031-4
 Matrix: Water Lab File ID: 072718a010.D
 Analysis Method: 8270D SIM Date Collected: 07/18/2018 13:50
 Extract. Method: 3520C Date Extracted: 07/24/2018 14:40
 Sample wt/vol: 1057(mL) Date Analyzed: 07/27/2018 19:32
 Con. Extract Vol.: 2(mL) Dilution Factor: 1
 Injection Volume: 1(uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 280257 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.047	U Q	0.19	0.034

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	70		53-106

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

5

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: WI-A06-6-S-42-0718 Lab Sample ID: 580-79031-5
 Matrix: Water Lab File ID: 072718a011.D
 Analysis Method: 8270D SIM Date Collected: 07/19/2018 09:45
 Extract. Method: 3520C Date Extracted: 07/24/2018 14:40
 Sample wt/vol: 1056(mL) Date Analyzed: 07/27/2018 19:58
 Con. Extract Vol.: 2(mL) Dilution Factor: 1
 Injection Volume: 1(uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 280257 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.20	/	0.19	0.034

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	87		53-106

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

6

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: WI-A06-6-S-42P-0718 Lab Sample ID: 580-79031-6
 Matrix: Water Lab File ID: 072718a012.D
 Analysis Method: 8270D SIM Date Collected: 07/19/2018 09:55
 Extract. Method: 3520C Date Extracted: 07/24/2018 14:40
 Sample wt/vol: 1019.5 (mL) Date Analyzed: 07/27/2018 20:24
 Con. Extract Vol.: 2 (mL) Dilution Factor: 1
 Injection Volume: 1 (uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 280257 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.15	J	0.20	0.035

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	73		53-106

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

7

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: WI-A06-EB05-071918 Lab Sample ID: 580-79031-7
 Matrix: Water Lab File ID: 072718a013.D
 Analysis Method: 8270D SIM Date Collected: 07/19/2018 16:15
 Extract. Method: 3520C Date Extracted: 07/24/2018 14:40
 Sample wt/vol: 1047.9(mL) Date Analyzed: 07/27/2018 20:50
 Con. Extract Vol.: 2(mL) Dilution Factor: 1
 Injection Volume: 1(uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 280257 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.048	U Q	0.19	0.034

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	72		53-106

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

8

Lab Name: TestAmerica Seattle Job No.: 580-79031-1
 SDG No.: _____
 Client Sample ID: WI-A06-S-43-0718 Lab Sample ID: 580-79031-8
 Matrix: Water Lab File ID: 072718a014.D
 Analysis Method: 8270D SIM Date Collected: 07/19/2018 14:05
 Extract. Method: 3520C Date Extracted: 07/24/2018 14:40
 Sample wt/vol: 1054.4 (mL) Date Analyzed: 07/27/2018 21:16
 Con. Extract Vol.: 2 (mL) Dilution Factor: 1
 Injection Volume: 1 (uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 280257 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	2.8	J	0.19	0.034

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	73		53-106

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 1801866
 Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: October 26, 2018

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-FB01-071718	1801866-01	Water
2	WI-A06-S-11-0718	1801866-02	Water
3	WI-A06-6-S-40-0718	1801866-03	Water
4	WI-A06-FB02-071818	1801866-04	Water
5	WI-A06-EB01-071718	1801866-05	Water
6	WI-A06-EB02-071718	1801866-06	Water
7	WI-A06-EB03-071718	1801866-07	Water
8	WI-A06-EB04-071818	1801866-08	Water
9	WI-A06-6-S-41-0718	1801866-09	Water
10	WI-A06-6-S-42-0718	1801866-10	Water
11	WI-A06-6-S-42P-0718	1801866-11	Water
12	WI-A06-FB03-071918	1801866-12	Water
13	WI-A06-EB05-071918	1801866-13	Water
14	WI-A06-6-S-43-0718	1801866-14	Water
14MS	WI-A06-6-S-43-0718MS	1801866-14MS	Water
14MSD	WI-A06-6-S-43-0718MSD	1801866-14MSD	Water

A full data validation was performed on the analytical data for six water samples, five aqueous equipment blank samples, and three aqueous field blank samples collected on July 17-19, 2018 by CH2M Hill at the NAS Whidbey Island site in Washington. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)".

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537, Revision 1.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA “Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review,” January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB01-071718	None - ND	-	-	-
WI-A06-FB02-071818	None - ND	-	-	-
WI-A06-EB01-071718	None - ND	-	-	-
WI-A06-EB02-071718	None - ND	-	-	-
WI-A06-EB03-071718	None - ND	-	-	-
WI-A06-EB04-071818	None - ND	-	-	-
WI-A06-FB03-071918	None - ND	-	-	-
WI-A06-EB05-071918	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Laboratory Control Samples (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

PFCs				
Compound	WI-A06-6-S-42-0718 ng/L	WI-A06-6-S-42P-0718 ng/L	RPD	Qualifier
None	ND	ND	-	-

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: *Nancy Weaver*
Nancy Weaver
Senior Chemist

Dated: 10/29/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-FB01-071718 **PFAS Isotope Dilution Method**

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1801866-01	Column:	BEH C18
Project:	NASWI Area 6/ CTO-4041	Date Collected:	17-Jul-18 17:35	Date Received:	21-Jul-18 09:16		

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
PFHxA	307-24-4	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
PFHpA	375-85-9	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
PFHxS	355-46-4	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
PFOA	335-67-1	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
PFNA	375-95-1	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
PFOS	1763-23-1	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
PFDA	335-76-2	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
MeFOSAA	2355-31-9	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
EtFOSAA	2991-50-6	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
PFUnA	2058-94-8	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
PFDaA	307-55-1	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
PFTrDA	72629-94-8	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
PFTeDA	376-06-7	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	111	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
13C2-PFHxA	IS	88.3	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
13C4-PFHpA	IS	93.3	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
18O2-PFHxS	IS	91.5	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
13C2-PFOA	IS	88.1	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
13C5-PFNA	IS	82.0	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
13C8-PFOS	IS	87.1	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
13C2-PFDA	IS	64.8	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
d3-MeFOSAA	IS	73.5	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
d5-EtFOSAA	IS	55.7	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
13C2-PFUnA	IS	59.9	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
13C2-PFDaA	IS	62.2	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1
13C2-PFTeDA	IS	82.3	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

NW 10/26/18

Sample ID: WI-A06-S-11-0718

PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1801866-02	Column:	BEH C18
Project:	NASWI Area 6/ CTO-4041	Date Collected:	17-Jul-18 17:35	Date Received:	21-Jul-18 09:16		
Location:	6-S-11						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	9.31	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
PFHxA	307-24-4	29.9	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
PFHpA	375-85-9	5.13	2.84	4.17	8.30	J	B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
PFHxS	355-46-4	20.1	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
PFOA	335-67-1	43.4	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
PFNA	375-95-1	ND	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
PFOS	1763-23-1	ND	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
PFDA	335-76-2	ND	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
MeFOSAA	2355-31-9	ND	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
EtFOSAA	2991-50-6	ND	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
PFOA	2058-94-8	ND	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
PFDoA	307-55-1	ND	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
PFTTrDA	72629-94-8	ND	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
PFTeDA	376-06-7	ND	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	112	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
13C2-PFHxA	IS	95.2	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
13C4-PFHpA	IS	86.6	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
18O2-PFHxS	IS	111	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
13C2-PFOA	IS	85.5	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
13C5-PFNA	IS	93.5	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
13C8-PFOS	IS	93.8	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
13C2-PFDA	IS	88.0	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
d3-MeFOSAA	IS	73.5	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
d5-EtFOSAA	IS	85.9	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
13C2-PFOA	IS	79.5	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
13C2-PFDoA	IS	94.5	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1
13C2-PFTeDA	IS	95.7	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

new 10/26/18

Sample ID: WI-A06-6-S-40-0718

PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1801866-03	Column:	BEH C18
Project:	NASWI Area 6/ CTO-4041	Date Collected:	18-Jul-18 10:17	Date Received:	21-Jul-18 09:16		
Location:	6-S-40						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFHxA	307-24-4	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFHpA	375-85-9	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFHxS	355-46-4	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFOA	335-67-1	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFNA	375-95-1	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFOS	1763-23-1	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFDA	335-76-2	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
MeFOSAA	2355-31-9	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
EtFOSAA	2991-50-6	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFUnA	2058-94-8	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFDoA	307-55-1	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFTTrDA	72629-94-8	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFTeDA	376-06-7	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	109	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
13C2-PFHxA	IS	90.4	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
13C4-PFHpA	IS	85.9	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
18O2-PFHxS	IS	101	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
13C2-PFOA	IS	89.3	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
13C5-PFNA	IS	85.8	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
13C8-PFOS	IS	102	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
13C2-PFDA	IS	68.1	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
d3-MeFOSAA	IS	79.1	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
d5-EtFOSAA	IS	77.6	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
13C2-PFUnA	IS	73.0	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
13C2-PFDoA	IS	84.5	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
13C2-PFTeDA	IS	96.0	50 - 150		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

WI-012618

Sample ID: WI-A06-FB02-071818

PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1801866-04	Column:	BEH C18
Project:	NASWI Area 6/ CTO-4041	Date Collected:	18-Jul-18 10:17	Date Received:	21-Jul-18 09:16		

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
PFHxA	307-24-4	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
PFHpA	375-85-9	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
PFHxS	355-46-4	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
PFOA	335-67-1	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
PFNA	375-95-1	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
PFOS	1763-23-1	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
PFDA	335-76-2	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
MeFOSAA	2355-31-9	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
EtFOSAA	2991-50-6	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
PFUnA	2058-94-8	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
PFDaA	307-55-1	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
PFTrDA	72629-94-8	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
PFTeDA	376-06-7	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	101	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
13C2-PFHxA	IS	96.0	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
13C4-PFHpA	IS	90.0	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
18O2-PFHxS	IS	106	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
13C2-PFOA	IS	87.8	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
13C5-PFNA	IS	78.9	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
13C8-PFOS	IS	103	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
13C2-PFDA	IS	66.1	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
d3-MeFOSAA	IS	75.7	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
d5-EtFOSAA	IS	77.1	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
13C2-PFUnA	IS	65.5	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
13C2-PFDaA	IS	74.0	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
13C2-PFTeDA	IS	92.2	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

WI101261.8

Sample ID: WI-A06-EB01-071718

PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1801866-05	Column:	BEH C18
Project:	NASWI Area 6/ CTO-4041	Date Collected:	17-Jul-18 17:15	Date Received:	21-Jul-18 09:16		
Location:	Tubing						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFHxA	307-24-4	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFHpA	375-85-9	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFHxS	355-46-4	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFOA	335-67-1	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFNA	375-95-1	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFOS	1763-23-1	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFDA	335-76-2	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
MeFOSAA	2355-31-9	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
EtFOSAA	2991-50-6	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFUnA	2058-94-8	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFDaA	307-55-1	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFTrDA	72629-94-8	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFTeDA	376-06-7	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	95.6	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
13C2-PFHxA	IS	89.2	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
13C4-PFHpA	IS	83.4	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
18O2-PFHxS	IS	96.3	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
13C2-PFOA	IS	85.7	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
13C5-PFNA	IS	77.3	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
13C8-PFOS	IS	97.1	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
13C2-PFDA	IS	74.4	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
d3-MeFOSAA	IS	60.1	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
d5-EtFOSAA	IS	74.9	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
13C2-PFUnA	IS	73.4	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
13C2-PFDaA	IS	73.8	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
13C2-PFTeDA	IS	78.8	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

new 10/26/18

Sample ID: WI-A06-EB02-071718

PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1801866-06	Column:	BEH C18
Project:	NASWI Area 6/ CTO-4041	Date Collected:	17-Jul-18 17:25	Date Received:	21-Jul-18 09:16		
Location:	Bladder						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
PFHxA	307-24-4	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
PFHpA	375-85-9	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
PFHxS	355-46-4	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
PFOA	335-67-1	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
PFNA	375-95-1	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
PFOS	1763-23-1	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
PFDA	335-76-2	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
MeFOSAA	2355-31-9	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
EtFOSAA	2991-50-6	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
PFUnA	2058-94-8	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
PFDaA	307-55-1	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
PFTrDA	72629-94-8	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
PFTeDA	376-06-7	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	112	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
13C2-PFHxA	IS	95.4	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
13C4-PFHpA	IS	93.4	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
18O2-PFHxS	IS	98.8	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
13C2-PFOA	IS	89.4	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
13C5-PFNA	IS	68.3	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
13C8-PFOS	IS	84.5	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
13C2-PFDA	IS	73.0	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
d3-MeFOSAA	IS	88.8	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
d5-EtFOSAA	IS	86.7	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
13C2-PFUnA	IS	73.3	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
13C2-PFDaA	IS	75.9	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1
13C2-PFTeDA	IS	99.2	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

new 10/26/18

Sample ID: WI-A06-EB03-071718 **PFAS Isotope Dilution Method**

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1801866-07	Column:	BEH C18
Project:	NASWI Area 6/ CTO-4041	Date Collected:	17-Jul-18 18:30	Date Received:	21-Jul-18 09:16		
Location:	Pump						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
PFHxA	307-24-4	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
PFHpA	375-85-9	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
PFHxS	355-46-4	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
PFOA	335-67-1	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
PFNA	375-95-1	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
PFOS	1763-23-1	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
PFDA	335-76-2	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
MeFOSAA	2355-31-9	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
EtFOSAA	2991-50-6	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
PFUnA	2058-94-8	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
PFDaA	307-55-1	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
PFTrDA	72629-94-8	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
PFTeDA	376-06-7	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	103	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
13C2-PFHxA	IS	88.4	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
13C4-PFHpA	IS	86.0	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
18O2-PFHxS	IS	109	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
13C2-PFOA	IS	93.8	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
13C5-PFNA	IS	89.0	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
13C8-PFOS	IS	99.8	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
13C2-PFDA	IS	74.0	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
d3-MeFOSAA	IS	73.9	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
d5-EtFOSAA	IS	85.4	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
13C2-PFUnA	IS	75.7	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
13C2-PFDaA	IS	68.2	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
13C2-PFTeDA	IS	90.5	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

nw.01261.18

Sample ID: WI-A06-EB04-071818

PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1801866-08	Column:	BEH C18
Project:	NASWI Area 6/ CTO-4041	Date Collected:	18-Jul-18 15:50	Date Received:	21-Jul-18 09:16		
Location:	Pump						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFHxA	307-24-4	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFHpA	375-85-9	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFHxS	355-46-4	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFOA	335-67-1	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFNA	375-95-1	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFOS	1763-23-1	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFDA	335-76-2	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
MeFOSAA	2355-31-9	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
EtFOSAA	2991-50-6	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFOA	2058-94-8	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFDoA	307-55-1	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFTTrDA	72629-94-8	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFTeDA	376-06-7	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	128	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
13C2-PFHxA	IS	90.5	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
13C4-PFHpA	IS	94.9	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
18O2-PFHxS	IS	93.2	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
13C2-PFOA	IS	91.0	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
13C5-PFNA	IS	82.0	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
13C8-PFOS	IS	113	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
13C2-PFDA	IS	78.1	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
d3-MeFOSAA	IS	70.7	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
d5-EtFOSAA	IS	72.8	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
13C2-PFUnA	IS	65.5	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
13C2-PFDoA	IS	68.1	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
13C2-PFTeDA	IS	77.0	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

new 10/26/18

Sample ID: WI-A06-6-S-41-0718

PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1801866-09	Column:	BEH C18
Project:	NASWI Area 6/ CTO-4041	Date Collected:	18-Jul-18 13:50	Date Received:	21-Jul-18 09:16		
Location:	6-S-41						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.83	4.13	8.25		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
PFHxA	307-24-4	ND	2.83	4.13	8.25		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
PFHpA	375-85-9	ND	2.83	4.13	8.25		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
PFHxS	355-46-4	ND	2.83	4.13	8.25		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
PFOA	335-67-1	ND	2.83	4.13	8.25		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
PFNA	375-95-1	ND	2.83	4.13	8.25		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
PFOS	1763-23-1	ND	2.83	4.13	8.25		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
PFDA	335-76-2	ND	2.83	4.13	8.25		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
MeFOSAA	2355-31-9	ND	2.83	4.13	8.25		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
EtFOSAA	2991-50-6	ND	2.83	4.13	8.25		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
PFUnA	2058-94-8	ND	2.83	4.13	8.25		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
PFDoA	307-55-1	ND	2.83	4.13	8.25		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
PFTrDA	72629-94-8	ND	2.83	4.13	8.25		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
PFTeDA	376-06-7	ND	2.83	4.13	8.25		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	125	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
13C2-PFHxA	IS	93.0	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
13C4-PFHpA	IS	99.0	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
18O2-PFHxS	IS	97.3	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
13C2-PFOA	IS	90.2	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
13C5-PFNA	IS	91.4	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
13C8-PFOS	IS	94.2	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
13C2-PFDA	IS	78.1	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
d3-MeFOSAA	IS	76.2	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
d5-EtFOSAA	IS	67.8	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
13C2-PFUnA	IS	81.0	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
13C2-PFDoA	IS	89.1	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
13C2-PFTeDA	IS	99.2	50 - 150		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

WI-A06-6-S-41-0718

Sample ID: WI-A06-6-S-42-0718

PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1801866-10	Column:	BEH C18
Project:	NASWI Area 6/ CTO-4041	Date Collected:	19-Jul-18 09:45	Date Received:	21-Jul-18 09:16		
Location:	6-S-42						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFHxA	307-24-4	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFHpA	375-85-9	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFHxS	355-46-4	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFOA	335-67-1	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFNA	375-95-1	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFOS	1763-23-1	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFDA	335-76-2	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
MeFOSAA	2355-31-9	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
EtFOSAA	2991-50-6	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFUnA	2058-94-8	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFDoA	307-55-1	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFTrDA	72629-94-8	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFTeDA	376-06-7	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	126	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
13C2-PFHxA	IS	102	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
13C4-PFHpA	IS	101	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
18O2-PFHxS	IS	103	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
13C2-PFOA	IS	83.0	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
13C5-PFNA	IS	78.0	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
13C8-PFOS	IS	121	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
13C2-PFDA	IS	74.2	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
d3-MeFOSAA	IS	79.6	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
d5-EtFOSAA	IS	94.5	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
13C2-PFUnA	IS	77.0	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
13C2-PFDoA	IS	91.7	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
13C2-PFTeDA	IS	109	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

WI012618

Sample ID: WI-A06-6-S-42P-0718

PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1801866-11	Column:	BEH C18
Project:	NASWI Area 6/ CTO-4041	Date Collected:	19-Jul-18 09:55	Date Received:	21-Jul-18 09:16		
Location:	6-S-42 Duplicate						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFHxA	307-24-4	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFHpA	375-85-9	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFHxS	355-46-4	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFOA	335-67-1	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFNA	375-95-1	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFOS	1763-23-1	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFDA	335-76-2	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
MeFOSAA	2355-31-9	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
EtFOSAA	2991-50-6	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFUnA	2058-94-8	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFDoA	307-55-1	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFTrDA	72629-94-8	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFTeDA	376-06-7	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	112	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
13C2-PFHxA	IS	91.6	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
13C4-PFHpA	IS	92.7	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
18O2-PFHxS	IS	100	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
13C2-PFOA	IS	83.4	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
13C5-PFNA	IS	86.5	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
13C8-PFOS	IS	91.5	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
13C2-PFDA	IS	79.2	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
d3-MeFOSAA	IS	92.6	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
d5-EtFOSAA	IS	90.0	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
13C2-PFUnA	IS	78.5	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
13C2-PFDoA	IS	70.6	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
13C2-PFTeDA	IS	94.4	50 - 150		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

wwi.01/26/18

Sample ID: WI-A06-FB03-071918						PFAS Isotope Dilution Method						
Client Data					Laboratory Data							
Name:	CH2M Hill		Matrix:	Aqueous		Lab Sample:	1801866-12		Column:	BEH C18		
Project:	NASWI Area 6/ CTO-4041		Date Collected:	19-Jul-18 09:55		Date Received:	21-Jul-18 09:16					
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	375-73-5	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1	
PFHxA	307-24-4	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1	
PFHpA	375-85-9	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1	
PFHxS	355-46-4	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1	
PFOA	335-67-1	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1	
PFNA	375-95-1	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1	
PFOS	1763-23-1	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1	
PFDA	335-76-2	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1	
MeFOSAA	2355-31-9	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1	
EtFOSAA	2991-50-6	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1	
PFUnA	2058-94-8	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1	
PFDaA	307-55-1	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1	
PFTrDA	72629-94-8	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1	
PFTeDA	376-06-7	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C3-PFBS	IS	127	50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1		
13C2-PFHxA	IS	100	50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1		
13C4-PFHpA	IS	101	50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1		
18O2-PFHxS	IS	95.1	50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1		
13C2-PFOA	IS	95.8	50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1		
13C5-PFNA	IS	79.1	50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1		
13C8-PFOS	IS	91.0	50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1		
13C2-PFDA	IS	65.1	50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1		
d3-MeFOSAA	IS	78.2	50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1		
d5-EtFOSAA	IS	61.6	50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1		
13C2-PFUnA	IS	59.7	50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1		
13C2-PFDaA	IS	73.7	50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1		
13C2-PFTeDA	IS	87.3	50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1		

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

revised 26/18

Sample ID: WI-A06-EB05-071918

PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1801866-13	Column:	BEH C18
Project:	NASWI Area 6/ CTO-4041	Date Collected:	19-Jul-18 16:15	Date Received:	21-Jul-18 09:16		
Location:	Pump						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
PFHxA	307-24-4	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
PFHpA	375-85-9	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
PFHxS	355-46-4	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
PFOA	335-67-1	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
PFNA	375-95-1	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
PFOS	1763-23-1	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
PFDA	335-76-2	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
MeFOSAA	2355-31-9	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
EtFOSAA	2991-50-6	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
PFUnA	2058-94-8	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
PFDaA	307-55-1	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
PFTTrDA	72629-94-8	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
PFTeDA	376-06-7	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	102	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
13C2-PFHxA	IS	89.1	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
13C4-PFHpA	IS	87.6	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
18O2-PFHxS	IS	81.0	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
13C2-PFOA	IS	84.4	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
13C5-PFNA	IS	88.1	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
13C8-PFOS	IS	99.5	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
13C2-PFDA	IS	70.3	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
d3-MeFOSAA	IS	59.5	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
d5-EtFOSAA	IS	90.2	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
13C2-PFUnA	IS	73.3	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
13C2-PFDaA	IS	66.3	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
13C2-PFTeDA	IS	102	50 - 150		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

new 10/26/18

Sample ID: WI-A06-6-S-43-0718 **PFAS Isotope Dilution Method**

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1801866-14	Column:	BEH C18
Project:	NASWI Area 6/ CTO-4041	Date Collected:	19-Jul-18 14:05	Date Received:	21-Jul-18 09:16		
Location:	6-S-43						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFHxA	307-24-4	9.46	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFHpA	375-85-9	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFHxS	355-46-4	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFOA	335-67-1	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFNA	375-95-1	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFOS	1763-23-1	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFDA	335-76-2	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
MeFOSAA	2355-31-9	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
EtFOSAA	2991-50-6	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFUnA	2058-94-8	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFDaA	307-55-1	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFTTrDA	72629-94-8	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFTeDA	376-06-7	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	119	50 - 150		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
13C2-PFHxA	IS	89.2	50 - 150		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
13C4-PFHpA	IS	98.3	50 - 150		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
18O2-PFHxS	IS	88.1	50 - 150		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
13C2-PFOA	IS	90.1	50 - 150		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
13C5-PFNA	IS	80.1	50 - 150		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
13C8-PFOS	IS	98.0	50 - 150		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
13C2-PFDA	IS	68.9	50 - 150		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
d3-MeFOSAA	IS	96.9	50 - 150		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
d5-EtFOSAA	IS	98.5	50 - 150		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
13C2-PFUnA	IS	84.8	50 - 150		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
13C2-PFDaA	IS	83.3	50 - 150		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
13C2-PFTeDA	IS	101	50 - 150		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

rev 10/26/18

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 580-80030-1
 Laboratory: Test America Laboratories, Tacoma, Washington
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: October 28, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-S-24-0818	580-80030-1	Water
1MS	WI-A06-S-24-0818MS	580-80030-1MS	Water
1MSD	WI-A06-S-24-0818MSD	580-80030-1MSD	Water
2	WI-A06-EB01-083018	580-80030-2	Water
3*	WI-A06-TB02-083018	580-80030-3	Water
4	WI-A06-S-24P-0818	580-80030-4	Water
5	WI-A06-EB02-083018	580-80030-5	Water

* - VOC only

A full data validation was performed on the analytical data for two water samples, two aqueous equipment blank samples and one aqueous trip blank sample collected on August 30, 2018 by CH2M HILL at the NAS Whidbey Island site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

VOC (Vinyl Chloride)
 SVOC (1,4-Dioxane)

Method References

USEPA SW-846 Method 8260C SIM
 USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

- All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-083018	None - ND	-	-	-
WI-A06-TB02-083018	None - ND	-	-	-
WI-A06-EB02-083018	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate recoveries.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	WI-A06-S-24-0818 ug/L	WI-A06-S-24P-0818 ug/L	RPD	Qualifier
None	ND	ND	-	-

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-083018	None - ND	-	-	-
WI-A06-EB02-083018	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	WI-A06-S-24-0818 ug/L	WI-A06-S-24P-0818 ug/L	RPD	Qualifier
1,4-Dioxane	0.17	0.16	6%	None

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 10/29/18
Nancy Weaver
Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle Job No.: 580-80030-1
 SDG No.: _____
 Client Sample ID: W1-A06-S-24-0818 Lab Sample ID: 580-80030-1
 Matrix: Water Lab File ID: 090618_030.D
 Analysis Method: 8260C SIM Date Collected: 08/30/2018 12:25
 Sample wt/vol: 5(mL) Date Analyzed: 09/07/2018 01:08
 Soil Aliquot Vol: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 283410 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	116		80-120
1868-53-7	Dibromofluoromethane (Surr)	104		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

2

Lab Name: TestAmerica Seattle Job No.: 580-80030-1
 SDG No.: _____
 Client Sample ID: W1-A06-EB01-083018 Lab Sample ID: 580-80030-2
 Matrix: Water Lab File ID: 090618_033.D
 Analysis Method: 8260C SIM Date Collected: 08/30/2018 14:55
 Sample wt/vol: 5(mL) Date Analyzed: 09/07/2018 02:17
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 283410 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	118		80-120
1868-53-7	Dibromofluoromethane (Surr)	104		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

3

Lab Name: TestAmerica Seattle Job No.: 580-80030-1
 SDG No.: _____
 Client Sample ID: WI-AO6-TB02-083018 Lab Sample ID: 580-80030-3
 Matrix: Water Lab File ID: 090618_034.D
 Analysis Method: 8260C SIM Date Collected: 08/30/2018 07:00
 Sample wt/vol: 5 (mL) Date Analyzed: 09/07/2018 02:40
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 283410 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	103		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

4

Lab Name: TestAmerica Seattle Job No.: 580-80030-1
 SDG No.: _____
 Client Sample ID: W1-A06-S-24P-0818 Lab Sample ID: 580-80030-4
 Matrix: Water Lab File ID: 090618_035.D
 Analysis Method: 8260C SIM Date Collected: 08/30/2018 12:25
 Sample wt/vol: 5 (mL) Date Analyzed: 09/07/2018 03:03
 Soil Aliquot Vol: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 283410 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	117		80-120
1868-53-7	Dibromofluoromethane (Surr)	106		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

5

Lab Name: TestAmerica Seattle Job No.: 580-80030-1
 SDG No.: _____
 Client Sample ID: W1-A06-EB02-083018 Lab Sample ID: 580-80030-5
 Matrix: Water Lab File ID: 090618_036.D
 Analysis Method: 8260C SIM Date Collected: 08/30/2018 15:15
 Sample wt/vol: 5 (mL) Date Analyzed: 09/07/2018 03:26
 Soil Aliquot Vol: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 283410 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	104		80-120
1868-53-7	Dibromofluoromethane (Surr)	110		80-120

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle Job No.: 580-80030-1
 SDG No.: _____
 Client Sample ID: W1-A06-S-24-0818 Lab Sample ID: 580-80030-1
 Matrix: Water Lab File ID: 0914B007.D
 Analysis Method: 8270D SIM Date Collected: 08/30/2018 12:25
 Extract. Method: 3520C Date Extracted: 09/05/2018 13:04
 Sample wt/vol: 1046.4 (mL) Date Analyzed: 09/14/2018 20:43
 Con. Extract Vol.: 2 (mL) Dilution Factor: 1
 Injection Volume: 1 (uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 284029 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.17	J	0.19	0.034

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	64		53-106

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

2

Lab Name: TestAmerica Seattle Job No.: 580-80030-1
 SDG No.: _____
 Client Sample ID: W1-A06-EB01-083018 Lab Sample ID: 580-80030-2
 Matrix: Water Lab File ID: 0914B010.D
 Analysis Method: 8270D SIM Date Collected: 08/30/2018 14:55
 Extract. Method: 3520C Date Extracted: 09/05/2018 13:04
 Sample wt/vol: 955.6(mL) Date Analyzed: 09/14/2018 21:57
 Con. Extract Vol.: 2(mL) Dilution Factor: 1
 Injection Volume: 1(uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 284029 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.052	U	0.21	0.038

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	56		53-106

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

4

Lab Name: TestAmerica Seattle Job No.: 580-80030-1
 SDG No.: _____
 Client Sample ID: W1-A06-S-24P-0818 Lab Sample ID: 580-80030-4
 Matrix: Water Lab File ID: 0914B011.D
 Analysis Method: 8270D SIM Date Collected: 08/30/2018 12:25
 Extract. Method: 3520C Date Extracted: 09/05/2018 13:04
 Sample wt/vol: 1015.6(mL) Date Analyzed: 09/14/2018 22:22
 Con. Extract Vol.: 2(mL) Dilution Factor: 1
 Injection Volume: 1(uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 284029 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.16	J	0.20	0.035

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	63		53-106

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

5

Lab Name: TestAmerica Seattle Job No.: 580-80030-1
 SDG No.: _____
 Client Sample ID: W1-A06-EB02-083018 Lab Sample ID: 580-80030-5
 Matrix: Water Lab File ID: 0914B012.D
 Analysis Method: 8270D SIM Date Collected: 08/30/2018 15:15
 Extract. Method: 3520C Date Extracted: 09/05/2018 13:04
 Sample wt/vol: 1014.7 (mL) Date Analyzed: 09/14/2018 22:46
 Con. Extract Vol.: 2 (mL) Dilution Factor: 1
 Injection Volume: 1 (uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 284029 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.049	U	0.20	0.035

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	72		53-106

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 1802844
 Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: October 26, 2018

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-S-24-0818	1802844-01	Water
1MS	WI-A06-S-24-0818MS	1802844-01MS	Water
1MSD	WI-A06-S-24-0818MSD	1802844-01MSD	Water
2	WI-A06-FB02-083018	1802844-02	Water
3	WI-A06-EB01-083018	1802844-03	Water
4	WI-A06-S-24P-0818	1802844-04	Water
5	WI-A06-EB02-083018	1802844-05	Water

A full data validation was performed on the analytical data for two water samples, two aqueous equipment blank samples, and one aqueous field blank sample collected on August 30, 2018 by CH2M Hill at the NAS Whidbey Island site in Washington. The samples were analyzed under the EPA Method “Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)”.

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537, Revision 1.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA “Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review,” January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times

- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB02-083018	None - ND	-	-	-
WI-A06-EB01-083018	None - ND	-	-	-
WI-A06-EB02-083018	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Laboratory Control Samples (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

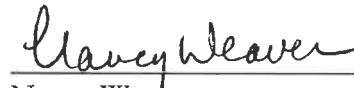
Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

PFCs				
Compound	WI-A06-S-24-0718 ng/L	WI-A06-S-24P-0718 ng/L	RPD	Qualifier
PFBS	4.23	4.68	10%	None
PFHxA	12.5	12.2	2%	
PFHxS	16.4	13.9	17%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:



Nancy Weaver
Senior Chemist

Dated: 10/29/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-S-24-0818

PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1802844-01	Column:	BEH C18
Project:	Navy CLEAN NASWI A6 Off-Base GW	Date Collected:	30-Aug-18 12:25	Date Received:	01-Sep-18 09:40		
Location:	6-S-24						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	4.23	2.90	4.24	8.47	J	B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
PFHxA	307-24-4	12.5	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
PFHpA	375-85-9	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
PFHxS	355-46-4	16.4	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
PFOA	335-67-1	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
PFNA	375-95-1	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
PFOS	1763-23-1	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
PFDA	335-76-2	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
MeFOSAA	2355-31-9	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
EtFOSAA	2991-50-6	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
PFUnA	2058-94-8	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
PFDoA	307-55-1	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
PFTrDA	72629-94-8	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
PFTeDA	376-06-7	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	100	50 - 150		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
13C2-PFHxA	IS	93.9	50 - 150		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
13C4-PFHpA	IS	93.5	50 - 150		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
18O2-PFHxS	IS	98.2	50 - 150		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
13C2-PFOA	IS	89.5	50 - 150		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
13C5-PFNA	IS	85.7	50 - 150		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
13C8-PFOS	IS	96.6	50 - 150		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
13C2-PFDA	IS	75.9	50 - 150		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
d3-MeFOSAA	IS	93.1	50 - 150		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
d5-EtFOSAA	IS	92.0	50 - 150		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
13C2-PFUnA	IS	75.6	50 - 150		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
13C2-PFDoA	IS	80.6	50 - 150		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
13C2-PFTeDA	IS	99.9	50 - 150		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

new 10/26/18

Sample ID: WI-A06-FB02-083018

PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1802844-02	Column:	BEH C18
Project:	Navy CLEAN NASWI A6 Off-Base GW	Date Collected:	30-Aug-18 12:25	Date Received:	01-Sep-18 09:40		
Location:	6-S-24						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
PFHxA	307-24-4	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
PFHpA	375-85-9	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
PFHxS	355-46-4	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
PFOA	335-67-1	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
PFNA	375-95-1	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
PFOS	1763-23-1	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
PFDA	335-76-2	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
MeFOSAA	2355-31-9	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
EtFOSAA	2991-50-6	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
PFUnA	2058-94-8	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
PFDaA	307-55-1	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
PFTTrDA	72629-94-8	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
PFTeDA	376-06-7	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	95.3	50 - 150		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
13C2-PFHxA	IS	94.1	50 - 150		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
13C4-PFHpA	IS	93.6	50 - 150		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
18O2-PFHxS	IS	97.9	50 - 150		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
13C2-PFOA	IS	89.5	50 - 150		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
13C5-PFNA	IS	82.9	50 - 150		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
13C8-PFOS	IS	94.5	50 - 150		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
13C2-PFDA	IS	71.0	50 - 150		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
d3-MeFOSAA	IS	75.9	50 - 150		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
d5-EtFOSAA	IS	79.5	50 - 150		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
13C2-PFUnA	IS	69.5	50 - 150		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
13C2-PFDaA	IS	75.5	50 - 150		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
13C2-PFTeDA	IS	93.5	50 - 150		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

mw 10/26/18

Sample ID: WI-A06-EB01-083018							PFAS Isotope Dilution Method				
Client Data				Laboratory Data							
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1802844-03	Column:	BEH C18				
Project:	Navy CLEAN NASWI A6 Off-Base GW	Date Collected:	30-Aug-18 14:55	Date Received:	01-Sep-18 09:40						
Location:	pump										
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
PFHxA	307-24-4	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
PFHpA	375-85-9	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
PFHxS	355-46-4	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
PFOA	335-67-1	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
PFNA	375-95-1	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
PFOS	1763-23-1	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
PFDA	335-76-2	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
MeFOSAA	2355-31-9	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
EtFOSAA	2991-50-6	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
PFUnA	2058-94-8	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
PFDoA	307-55-1	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
PFTTrDA	72629-94-8	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
PFTeDA	376-06-7	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C3-PFBS	IS	98.8	50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1	
13C2-PFHxA	IS	96.5	50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1	
13C4-PFHpA	IS	97.4	50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1	
18O2-PFHxS	IS	97.1	50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1	
13C2-PFOA	IS	90.2	50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1	
13C5-PFNA	IS	81.9	50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1	
13C8-PFOS	IS	98.3	50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1	
13C2-PFDA	IS	73.0	50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1	
d3-MeFOSAA	IS	77.9	50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1	
d5-EtFOSAA	IS	75.7	50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1	
13C2-PFUnA	IS	70.7	50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1	
13C2-PFDoA	IS	73.0	50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1	
13C2-PFTeDA	IS	81.8	50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1	

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

NI 10/26/18

Sample ID: WI-A06-S-24P-0818

PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1802844-04	Column:	BEH C18
Project:	Navy CLEAN NASWI A6 Off-Base GW	Date Collected:	30-Aug-18 12:25	Date Received:	01-Sep-18 09:40		
Location:	6-S-24						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	4.68	2.97	4.35	8.69	J	B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
PFHxA	307-24-4	12.2	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
PFHpA	375-85-9	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
PFHxS	355-46-4	13.9	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
PFOA	335-67-1	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
PFNA	375-95-1	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
PFOS	1763-23-1	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
PFDA	335-76-2	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
MeFOSAA	2355-31-9	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
EtFOSAA	2991-50-6	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
PFUnA	2058-94-8	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
PFDoA	307-55-1	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
PFTTrDA	72629-94-8	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
PFTeDA	376-06-7	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	95.5	50 - 150		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
13C2-PFHxA	IS	93.5	50 - 150		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
13C4-PFHpA	IS	91.1	50 - 150		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
18O2-PFHxS	IS	100	50 - 150		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
13C2-PFOA	IS	90.8	50 - 150		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
13C5-PFNA	IS	87.9	50 - 150		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
13C8-PFOS	IS	99.6	50 - 150		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
13C2-PFDA	IS	74.8	50 - 150		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
d3-MeFOSAA	IS	85.8	50 - 150		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
d5-EtFOSAA	IS	83.0	50 - 150		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
13C2-PFUnA	IS	75.4	50 - 150		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
13C2-PFDoA	IS	83.3	50 - 150		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
13C2-PFTeDA	IS	101	50 - 150		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

new 10/26/18

Sample ID: WI-A06-EB02-083018						PFAS Isotope Dilution Method						
Client Data					Laboratory Data							
Name:	CH2M Hill		Matrix:	Aqueous		Lab Sample:	1802844-05		Column:	BEH C18		
Project:	Navy CLEAN NASWI A6 Off-Base GW		Date Collected:	30-Aug-18 15:15		Date Received:	01-Sep-18 09:40					
Location:	tubing											
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	375-73-5	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1	
PFHxA	307-24-4	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1	
PFHpA	375-85-9	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1	
PFHxS	355-46-4	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1	
PFOA	335-67-1	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1	
PFNA	375-95-1	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1	
PFOS	1763-23-1	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1	
PFDA	335-76-2	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1	
MeFOSAA	2355-31-9	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1	
EtFOSAA	2991-50-6	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1	
PFUnA	2058-94-8	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1	
PFDoA	307-55-1	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1	
PFTTrDA	72629-94-8	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1	
PFTeDA	376-06-7	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C3-PFBS	IS	92.2	50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1		
13C2-PFHxA	IS	90.4	50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1		
13C4-PFHpA	IS	89.2	50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1		
18O2-PFHxS	IS	91.4	50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1		
13C2-PFOA	IS	86.7	50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1		
13C5-PFNA	IS	83.1	50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1		
13C8-PFOS	IS	92.9	50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1		
13C2-PFDA	IS	76.2	50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1		
d3-MeFOSAA	IS	90.3	50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1		
d5-EtFOSAA	IS	88.3	50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1		
13C2-PFUnA	IS	75.6	50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1		
13C2-PFDoA	IS	81.4	50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1		
13C2-PFTeDA	IS	95.6	50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1		

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

WI1026118

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 580-83545-1
 Laboratory: Test America Laboratories, Tacoma, Washington
 Site: NAS Whidbey Island, Area 06, CTO-4041, Washington
 Date: February 26, 2019

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-S-12-0119	580-83545-1	Water
1MS	WI-A06-S-12-0119MS	580-83545-1MS	Water
1MSD	WI-A06-S-12-0119MSD	580-83545-1MSD	Water
2	WI-A06-S-12P-0119	580-83545-2	Water
3	WI-A06-EB01-012319	580-83545-3	Water
4*	TRIP BLANK 01	580-83545-4	Water

* - VOC only

A full data validation was performed on the analytical data for two water samples, one aqueous equipment blank sample, and one aqueous trip blank sample collected on January 23, 2019 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

VOC (Vinyl Chloride)
 SVOC (1,4-Dioxane)

Method References

USEPA SW-846 Method 8260C SIM
 USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation

- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data is acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

- All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-012319	None - ND	-	-	-
TRIP BLANK 01	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate recoveries.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

MS/MSD Sample ID	Compound	MS %R/MSD %R/RPD	Qualifier	Affected Samples
1	Vinyl Chloride	OK/OK/69	None	For RPD Alone

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below.

Compound	WI-A06-S-12-0119 ug/L	WI-A06-S-12P-0119 ug/L	RPD	Qualifier
Vinyl Chloride	ND	ND	-	-

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-012319	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

MS/MSD Sample ID	Compound	MS %R/MSD %R/RPD	Qualifier	Affected Samples
1	1,4-Dioxane	22%/OK/OK	J	1

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below.

Compound	WI-A06-S-12-0119 ug/L	WI-A06-S-12P-0119 ug/L	RPD	Qualifier
1,4-Dioxane	3.8	3.7	3%	None

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver
Nancy Weaver
Senior Chemist

Dated: 2/26/19

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle Job No.: 580-83545-1
 SDG No.: _____
 Client Sample ID: WI-A06-S-12-0119 Lab Sample ID: 580-83545-1
 Matrix: Water Lab File ID: 012819_011.D
 Analysis Method: 8260C SIM Date Collected: 01/23/2019 12:00
 Sample wt/vol: 5(mL) Date Analyzed: 01/28/2019 13:24
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 293736 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U /	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	105		80-120
1868-53-7	Dibromofluoromethane (Surr)	93		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

2

Lab Name: TestAmerica Seattle Job No.: 580-83545-1
 SDG No.: _____
 Client Sample ID: WI-A06-S-12P-0119 Lab Sample ID: 580-83545-2
 Matrix: Water Lab File ID: 012819_014.D
 Analysis Method: 8260C SIM Date Collected: 01/23/2019 12:30
 Sample wt/vol: 5 (mL) Date Analyzed: 01/28/2019 15:05
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 293736 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	93		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

3

Lab Name: TestAmerica Seattle Job No.: 580-83545-1
 SDG No.: _____
 Client Sample ID: WI-A06-EB01-012319 Lab Sample ID: 580-83545-3
 Matrix: Water Lab File ID: 012819_015.D
 Analysis Method: 8260C SIM Date Collected: 01/23/2019 14:00
 Sample wt/vol: 5 (mL) Date Analyzed: 01/28/2019 15:29
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 293736 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	100		80-120
1868-53-7	Dibromofluoromethane (Surr)	94		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

4

Lab Name: TestAmerica Seattle Job No.: 580-83545-1
 SDG No.: _____
 Client Sample ID: Trip Blank 01 Lab Sample ID: 580-83545-4
 Matrix: Water Lab File ID: 012819_022.D
 Analysis Method: 8260C SIM Date Collected: 01/23/2019 10:00
 Sample wt/vol: 5 (mL) Date Analyzed: 01/28/2019 15:52
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 293736 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	99		80-120
1868-53-7	Dibromofluoromethane (Surr)	99		80-120

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle Job No.: 580-83545-1
 SDG No.: _____
 Client Sample ID: WI-A06-S-12-0119 Lab Sample ID: 580-83545-1
 Matrix: Water Lab File ID: 013019ADEC012.D
 Analysis Method: 8270D SIM Date Collected: 01/23/2019 12:00
 Extract. Method: 3520C Date Extracted: 01/28/2019 09:27
 Sample wt/vol: 1046.5 (mL) Date Analyzed: 01/30/2019 17:02
 Con. Extract Vol.: 2 (mL) Dilution Factor: 1
 Injection Volume: 1 (uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 293938 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	3.8	<u>115</u>	0.19	0.034

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	74		53-106

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

2

Lab Name: TestAmerica Seattle Job No.: 580-83545-1
 SDG No.: _____
 Client Sample ID: WI-A06-S-12P-0119 Lab Sample ID: 580-83545-2
 Matrix: Water Lab File ID: 013019ADEC015.D
 Analysis Method: 8270D SIM Date Collected: 01/23/2019 12:30
 Extract. Method: 3520C Date Extracted: 01/28/2019 09:27
 Sample wt/vol: 1039.6(mL) Date Analyzed: 01/30/2019 18:08
 Con. Extract Vol.: 2(mL) Dilution Factor: 1
 Injection Volume: 1(uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 293938 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	3.7	0	0.19	0.035

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	79		53-106

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

3

Lab Name: TestAmerica Seattle Job No.: 580-83545-1
 SDG No.: _____
 Client Sample ID: WI-A06-EB01-012319 Lab Sample ID: 580-83545-3
 Matrix: Water Lab File ID: 013019ADEC016.D
 Analysis Method: 8270D SIM Date Collected: 01/23/2019 14:00
 Extract. Method: 3520C Date Extracted: 01/28/2019 09:27
 Sample wt/vol: 1025.8 (mL) Date Analyzed: 01/30/2019 18:30
 Con. Extract Vol.: 2 (mL) Dilution Factor: 1
 Injection Volume: 1 (uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 293938 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.049	U M Q	0.19	0.035

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	74		53-106

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 1900195
 Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
 Site: NAS Whidbey Island, Area 06, CTO-4041, Washington
 Date: February 26, 2019

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-S-12-0119	1900195-01	Water
1MS	WI-A06-S-12-0119MS	1900195-01MS	Water
1MSD	WI-A06-S-12-0119MSD	1900195-01MSD	Water
2	WI-A06-S-12P-0119	1900195-02	Water
3	WI-A06-FB01-012319	1900195-03	Water
4	WI-A06-EB01-012319	1900195-04	Water

A full data validation was performed on the analytical data for two water samples, one aqueous field blank sample and one equipment blank sample collected on January 23, 2019 by CH2M Hill at the NAS Whidbey Island site in Washington. The samples were analyzed under the EPA Method “Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)”.

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537, Revision 1.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA “Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review,” January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times

- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data is acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-EB01-012319	None - ND	ND	-	-
WI-A06-FB01-012319	None - ND	ND	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Laboratory Control Samples (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met except the following. The ion ratios were outside the 70 - 130% QC limits for PFBS and PFHpA in EDS sample #2. Both compounds were qualified estimated (I).

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	PFCs		RPD	Qualifier
	WI-A06-S-12-0119 ng/L	WI-A06-S-12P-0119 ng/L		
PFBS	9.44	9.32	1%	None
PFHxA	29.3	27.6	6%	
PFHpA	ND	4.01	NC	
PFHxS	14.2	12.6	12%	
PFOA	24.0	22.0	9%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: *Nancy Weaver*
Nancy Weaver
Senior Chemist

Dated: 2/26/19

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-S-12-0119

PFAS Isotope Dilution Method

Client Data					Laboratory Data						
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1900195-01	Column:	BEH C18				
Project:	Navy Clean CTO: 4041 NASWI	Date Collected:	23-Jan-19 12:00	Date Received:	25-Jan-19 09:15						
Location:	AQ										

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	9.44	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
PFHxA	307-24-4	29.3	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
PFHpA	375-85-9	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
PFHxS	355-46-4	14.2	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
PFOA	335-67-1	24.0	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
PFNA	375-95-1	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
PFOS	1763-23-1	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
PFDA	335-76-2	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
MeFOSAA	2355-31-9	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
EtFOSAA	2991-50-6	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
PFUnA	2058-94-8	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
PFDoA	307-55-1	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
PFTTrDA	72629-94-8	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
PFTeDA	376-06-7	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	90.5	50 - 150		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
13C2-PFHxA	IS	85.3	50 - 150		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
13C4-PFHpA	IS	85.7	50 - 150		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
18O2-PFHxS	IS	95.0	50 - 150		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
13C2-PFOA	IS	88.1	50 - 150		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
13C5-PFNA	IS	81.1	50 - 150		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
13C8-PFOS	IS	77.6	50 - 150		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
13C2-PFDA	IS	68.9	50 - 150		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
d3-MeFOSAA	IS	66.7	50 - 150		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
d5-EtFOSAA	IS	70.3	50 - 150		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
13C2-PFUnA	IS	69.6	50 - 150		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
13C2-PFDoA	IS	67.3	50 - 150		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1
13C2-PFTeDA	IS	77.7	50 - 150		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

NW 2/23/19

Sample ID: WI-A06-S-12P-0119						PFAS Isotope Dilution Method					
Client Data					Laboratory Data						
Name:	CH2M Hill	Matrix:	Aqueous		Lab Sample:	1900195-02	Column:	BEH C18			
Project:	Navy Clean CTO: 4041 NASWI	Date Collected:	23-Jan-19 12:30		Date Received:	25-Jan-19 09:15					
Location:	AQ										
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	9.32 <i>J</i>	3.29	4.81	9.61	LQ	B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFHxA	307-24-4	27.6	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFHpA	375-85-9	4.01 <i>J</i>	3.29	4.81	9.61	LQ	B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFHxS	355-46-4	12.6	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFOA	335-67-1	22.0	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFNA	375-95-1	ND	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFOS	1763-23-1	ND	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFDA	335-76-2	ND	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
MeFOSAA	2355-31-9	ND	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
EtFOSAA	2991-50-6	ND	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFUnA	2058-94-8	ND	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFDaA	307-55-1	ND	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFTTrDA	72629-94-8	ND	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFTeDA	376-06-7	ND	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C3-PFBS	IS	95.0	50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1	
13C2-PFHxA	IS	91.0	50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1	
13C4-PFHpA	IS	88.3	50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1	
18O2-PFHxS	IS	92.3	50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1	
13C2-PFOA	IS	87.8	50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1	
13C5-PFNA	IS	81.7	50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1	
13C8-PFOS	IS	80.8	50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1	
13C2-PFDA	IS	79.7	50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1	
d3-MeFOSAA	IS	74.2	50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1	
d5-EtFOSAA	IS	67.2	50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1	
13C2-PFUnA	IS	74.4	50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1	
13C2-PFDaA	IS	71.1	50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1	
13C2-PFTeDA	IS	53.2	50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1	

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes

NW 2123/19

Sample ID: WI-A06-FB01-012319						PFAS Isotope Dilution Method						
Client Data					Laboratory Data							
Name:	CH2M Hill		Matrix:	Aqueous		Lab Sample:	1900195-03		Column:	BEH C18		
Project:	Navy Clean CTO: 4041 NASWI		Date Collected:	23-Jan-19 12:00		Date Received:	25-Jan-19 09:15					
Location:	WW											
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	375-73-5	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFHxA	307-24-4	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFHpA	375-85-9	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFHxS	355-46-4	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFOA	335-67-1	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFNA	375-95-1	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFOS	1763-23-1	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFDA	335-76-2	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
MeFOSAA	2355-31-9	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
EtFOSAA	2991-50-6	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFUnA	2058-94-8	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFDoA	307-55-1	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFTTrDA	72629-94-8	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFTeDA	376-06-7	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C3-PFBS	IS	95.4	50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1		
13C2-PFHxA	IS	93.3	50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1		
13C4-PFHpA	IS	90.6	50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1		
18O2-PFHxS	IS	91.6	50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1		
13C2-PFOA	IS	93.0	50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1		
13C5-PFNA	IS	77.2	50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1		
13C8-PFOS	IS	98.8	50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1		
13C2-PFDA	IS	75.5	50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1		
d3-MeFOSAA	IS	76.9	50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1		
d5-EtFOSAA	IS	79.7	50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1		
13C2-PFUnA	IS	72.2	50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1		
13C2-PFDoA	IS	70.7	50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1		
13C2-PFTeDA	IS	87.0	50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1		

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

NW 2/23/19

Sample ID: WI-A06-EB01-012319						PFAS Isotope Dilution Method						
Client Data					Laboratory Data							
Name:	CH2M Hill		Matrix:	Aqueous		Lab Sample:	1900195-04		Column:	BEH C18		
Project:	Navy Clean CTO: 4041 NASWI		Date Collected:	23-Jan-19 14:00		Date Received:	25-Jan-19 09:15					
Location:	WW											
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	375-73-5	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1	
PFHxA	307-24-4	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1	
PFHpA	375-85-9	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1	
PFHxS	355-46-4	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1	
PFOA	335-67-1	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1	
PFNA	375-95-1	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1	
PFOS	1763-23-1	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1	
PFDA	335-76-2	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1	
MeFOSAA	2355-31-9	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1	
EtFOSAA	2991-50-6	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1	
PFUnA	2058-94-8	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1	
PFDoA	307-55-1	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1	
PFTTrDA	72629-94-8	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1	
PFTeDA	376-06-7	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C3-PFBS	IS	93.8	50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1		
13C2-PFHxA	IS	90.8	50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1		
13C4-PFHpA	IS	91.4	50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1		
18O2-PFHxS	IS	91.2	50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1		
13C2-PFOA	IS	83.7	50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1		
13C5-PFNA	IS	84.5	50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1		
13C8-PFOS	IS	101	50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1		
13C2-PFDA	IS	84.8	50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1		
d3-MeFOSAA	IS	81.8	50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1		
d5-EtFOSAA	IS	83.9	50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1		
13C2-PFUnA	IS	81.4	50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1		
13C2-PFDoA	IS	83.3	50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1		
13C2-PFTeDA	IS	89.8	50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1		

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

new 2/23/19

Attachment 5
Raw Data and Data Validation Forms for
Drinking Water and Private Groundwater
Well Samples

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 580-74975-1
 Laboratory: Test America Laboratories, Tacoma, Washington
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: May 14, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW01-0218	580-74975-1	Water
2	WI-A06-RW02-0218	580-74975-2	Water
3	WI-A06-RW03-0218	580-74975-3	Water
4	WI-A06-RW04-0218	580-74975-4	Water
5*	WI-A06-RW05-0218	580-74975-5	Water
6*	WI-A06-RW05P-0218	580-74975-6	Water
7*	WI-A06-RW06-0218	580-74975-7	Water
8*	WI-A06-RW07-0218	580-74975-8	Water
9*	WI-A06-RW08-0218	580-74975-9	Water
10*	WI-A06-TB01-0218	580-74975-10	Water

* - VOC only

A full data validation was performed on the analytical data for nine water samples and one aqueous trip blank sample collected on February 5-6, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

VOC (Vinyl Chloride)
 SVOC (1,4-Dioxane)

Method References

USEPA SW-846 Method 8260C SIM
 USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

- All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-TB01-0218	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate recoveries.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

VOC				
Compound	WI-A06-RW05-0218 ug/L	WI-A06-RW05P-0218 ug/L	RPD	Qualifier
None	ND	ND	-	-

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC samples were not analyzed.

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not analyzed.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Nancy Weaver
Nancy Weaver
Senior Chemist

Dated: 5/15/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

Client Sample ID: W1-A06-RW01-0218

Lab Sample ID: 580-74975-1

Date Sampled: 02/05/2018 1506

Client Matrix: Water

Date Received: 02/08/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-267202	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	021318_08.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	02/13/2018 1238			Final Weight/Volume:	5 mL
Prep Date:	02/13/2018 1238				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	100		80 - 141
Dibromofluoromethane (Surr)	101	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

2

Client Sample ID: W1-A06-RW02-0218

Lab Sample ID: 580-74975-2

Date Sampled: 02/05/2018 1538

Client Matrix: Water

Date Received: 02/08/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-267202	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	021318_09.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	02/13/2018 1301			Final Weight/Volume:	5 mL
Prep Date:	02/13/2018 1301				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	UM	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	99		80 - 141
Dibromofluoromethane (Surr)	100	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

Client Sample ID: W1-A06-RW03-0218

3

Lab Sample ID: 580-74975-3

Date Sampled: 02/05/2018 1611

Client Matrix: Water

Date Received: 02/08/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-267202	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	021318_10.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	02/13/2018 1325			Final Weight/Volume:	5 mL
Prep Date:	02/13/2018 1325				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	100		80 - 141
Dibromofluoromethane (Surr)	102	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

Client Sample ID: W1-A06-RW04-0218

4

Lab Sample ID: 580-74975-4

Date Sampled: 02/05/2018 1650

Client Matrix: Water

Date Received: 02/08/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-267202	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 021318_11.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 02/13/2018 1349		Final Weight/Volume: 5 mL
Prep Date: 02/13/2018 1349		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50
Surrogate	%Rec	Qualifier	Acceptance Limits	
Trifluorotoluene (Surr)	100		80 - 141	
Dibromofluoromethane (Surr)	101	M	77 - 118	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

Client Sample ID: W1-A06-RW05-0218

5

Lab Sample ID: 580-74975-5

Date Sampled: 02/06/2018 1008

Client Matrix: Water

Date Received: 02/08/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-267202	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 021318_12.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 02/13/2018 1413		Final Weight/Volume: 5 mL
Prep Date: 02/13/2018 1413		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	100		80 - 141
Dibromofluoromethane (Surr)	102	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

Client Sample ID: W1-A06-RW05P-0218

6

Lab Sample ID: 580-74975-6

Date Sampled: 02/06/2018 1008

Client Matrix: Water

Date Received: 02/08/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-267202	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	021318_13.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	02/13/2018 1436			Final Weight/Volume:	5 mL
Prep Date:	02/13/2018 1436				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	98		80 - 141
Dibromofluoromethane (Surr)	101	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

7

Client Sample ID: W1-A06-RW06-0218

Lab Sample ID: 580-74975-7

Date Sampled: 02/06/2018 1056

Client Matrix: Water

Date Received: 02/08/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-267202	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 021318_14.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 02/13/2018 1500		Final Weight/Volume: 5 mL
Prep Date: 02/13/2018 1500		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	97		80 - 141
Dibromofluoromethane (Surr)	102	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

8

Client Sample ID: W1-A06-RW07-0218

Lab Sample ID: 580-74975-8

Date Sampled: 02/06/2018 1405

Client Matrix: Water

Date Received: 02/08/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-267202	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 021318_15.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 02/13/2018 1524		Final Weight/Volume: 5 mL
Prep Date: 02/13/2018 1524		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	99		80 - 141
Dibromofluoromethane (Surr)	102	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

Client Sample ID: W1-A06-RW08-0218

9

Lab Sample ID: 580-74975-9

Date Sampled: 02/06/2018 1802

Client Matrix: Water

Date Received: 02/08/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-267202	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	021318_16.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	02/13/2018 1548			Final Weight/Volume:	5 mL
Prep Date:	02/13/2018 1548				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	100		80 - 141
Dibromofluoromethane (Surr)	104	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

10

Client Sample ID: W1-A06-TB01-0218

Lab Sample ID: 580-74975-10

Date Sampled: 02/05/2018 0800

Client Matrix: Water

Date Received: 02/08/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-267202	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 021318_17.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 02/13/2018 1611		Final Weight/Volume: 5 mL
Prep Date: 02/13/2018 1611		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	99		80 - 141
Dibromofluoromethane (Surr)	102	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

Client Sample ID: W1-A06-RW01-0218

Lab Sample ID: 580-74975-1

Date Sampled: 02/05/2018 1506

Client Matrix: Water

Date Received: 02/08/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-267316	Instrument ID:	TAC051
Prep Method:	3520C	Prep Batch:	580-267129	Lab File ID:	0214B012.D
Dilution:	1.0			Initial Weight/Volume:	1036.5 mL
Analysis Date:	02/14/2018 1842			Final Weight/Volume:	2 mL
Prep Date:	02/12/2018 1053			Injection Volume:	2 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.011	0.096

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	75		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

2

Client Sample ID: W1-A06-RW02-0218

Lab Sample ID: 580-74975-2

Date Sampled: 02/05/2018 1538

Client Matrix: Water

Date Received: 02/08/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-267316	Instrument ID:	TAC051
Prep Method:	3520C	Prep Batch:	580-267129	Lab File ID:	0214B013.D
Dilution:	1.0			Initial Weight/Volume:	1029.9 mL
Analysis Date:	02/14/2018 1907			Final Weight/Volume:	2 mL
Prep Date:	02/12/2018 1053			Injection Volume:	2 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.011	0.097

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	86		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

3

Client Sample ID: W1-A06-RW03-0218

Lab Sample ID: 580-74975-3

Date Sampled: 02/05/2018 1611

Client Matrix: Water

Date Received: 02/08/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-267316	Instrument ID:	TAC051
Prep Method:	3520C	Prep Batch:	580-267129	Lab File ID:	0214B014.D
Dilution:	1.0			Initial Weight/Volume:	1030.2 mL
Analysis Date:	02/14/2018 1932			Final Weight/Volume:	2 mL
Prep Date:	02/12/2018 1053			Injection Volume:	2 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.081	JM	0.011	0.097

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	74		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

Client Sample ID: **W1-A06-RW04-0218**

4

Lab Sample ID: 580-74975-4

Date Sampled: 02/05/2018 1650

Client Matrix: Water

Date Received: 02/08/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM	Analysis Batch: 580-267316	Instrument ID: TAC051
Prep Method: 3520C	Prep Batch: 580-267129	Lab File ID: 0214B015.D
Dilution: 1.0		Initial Weight/Volume: 1025.4 mL
Analysis Date: 02/14/2018 1957		Final Weight/Volume: 2 mL
Prep Date: 02/12/2018 1053		Injection Volume: 2 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.011	0.098
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	78		53 - 106	

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 1800274
 Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: May 12, 2018

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW01-0218	1800274-01	Water
2	WI-A06-FB01-0218	1800274-02	Water
3	WI-A06-RW02-0218	1800274-03	Water
4	WI-A06-FB02-0218	1800274-04	Water
5	WI-A06-RW03-0218	1800274-05	Water
6	WI-A06-FB03-0218	1800274-06	Water
7	WI-A06-RW04-0218	1800274-07	Water
8	WI-A06-FB04-0218	1800274-08	Water
9	WI-A06-RW05-0218	1800274-09	Water
10	WI-A06-FB05-0218	1800274-10	Water
11	WI-A06-RW06-0218	1800274-11	Water
12	WI-A06-RW05P-0218	1800274-12	Water
13	WI-A06-FB06-0218	1800274-13	Water
14	WI-A06-RW07-0218	1800274-14	Water
15	WI-A06-FB07-0218	1800274-15	Water
16	WI-A06-RW08-0218	1800274-16	Water
17	WI-A06-FB08-0218	1800274-17	Water

A full data validation was performed on the analytical data for nine water samples and eight aqueous field blanks sample collected on February 5-6, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the EPA Method “Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)”.

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA “Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review,” January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks exhibited the following contamination.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
B8B0104-BLK1	PFHxA	0.685	U	1, 3, 6, 7, 10, 13, 15

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB01-0218	None - ND	-	-	-
WI-A06-FB02-0218	None - ND	-	-	-
WI-A06-FB03-0218	None - ND	-	-	-
WI-A06-FB04-0218	None - ND	-	-	-
WI-A06-FB05-0218	None - ND	-	-	-
WI-A06-FB06-0218	None - ND	-	-	-
WI-A06-FB07-0218	None - ND	-	-	-
WI-A06-FB08-0218	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria except for the following.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- EDS Samples 9 and 12 were analyzed at a 2X dilution for PFHxS due to high concentrations. The reporting limits were adjusted accordingly. No action was taken.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	PFCs			Qualifier
	WI-A06-RW05-0218 ng/L	WI-A06-RW05P-0218 ng/L	RPD	
PFBS	28.9	28.9	0%	None
PFHxA	48.6	49.8	2%	
PFHpA	20.2	21.4	6%	
PFHxS	210	232	10%	
PFOA	57.7	55.3	4%	
PFNA	4.98U	1.67	NC	
PFOS	64.1	63.8	0%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 5/15/18
Nancy Weaver
Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-RW01-0218 EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800274-01	Column:	BEH C18
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Collected:	05-Feb-18 15:06	Date Received:	08-Feb-18 09:03		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	0.466	5.25	10.5		B8B0104	16-Feb-18	0.238 L	23-Feb-18 17:00	1
PFHxA	5.25 0.813 u	0.698	5.25	10.5	LB	B8B0104	16-Feb-18	0.238 L	23-Feb-18 17:00	1
PFHpA	ND	0.561	5.25	10.5		B8B0104	16-Feb-18	0.238 L	23-Feb-18 17:00	1
PFHxS	ND	0.437	5.25	10.5		B8B0104	16-Feb-18	0.238 L	23-Feb-18 17:00	1
PFOA	ND	1.14	5.25	10.5		B8B0104	16-Feb-18	0.238 L	23-Feb-18 17:00	1
PFNA	ND	1.52	5.25	10.5		B8B0104	16-Feb-18	0.238 L	23-Feb-18 17:00	1
PFOS	ND	1.09	5.25	10.5		B8B0104	16-Feb-18	0.238 L	23-Feb-18 17:00	1
PFDA	ND	1.35	5.25	10.5		B8B0104	16-Feb-18	0.238 L	23-Feb-18 17:00	1
MeFOSAA	ND	3.20	5.25	10.5		B8B0104	16-Feb-18	0.238 L	23-Feb-18 17:00	1
EtFOSAA	ND	2.03	5.25	10.5		B8B0104	16-Feb-18	0.238 L	23-Feb-18 17:00	1
PFUnA	ND	0.268	5.25	10.5		B8B0104	16-Feb-18	0.238 L	23-Feb-18 17:00	1
PFDoA	ND	1.00	5.25	10.5		B8B0104	16-Feb-18	0.238 L	23-Feb-18 17:00	1
PFTTrDA	ND	0.992	5.25	10.5		B8B0104	16-Feb-18	0.238 L	23-Feb-18 17:00	1
PFTeDA	ND	0.818	5.25	10.5		B8B0104	16-Feb-18	0.238 L	23-Feb-18 17:00	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	97.4	70 - 130			B8B0104	16-Feb-18	0.238 L	23-Feb-18 17:00	1
13C2-PFDA	SURR	88.3	70 - 130			B8B0104	16-Feb-18	0.238 L	23-Feb-18 17:00	1
d5-EtFOSAA	SURR	102	70 - 130			B8B0104	16-Feb-18	0.238 L	23-Feb-18 17:00	1

DL - Detection Limit LOD - Limit of Detection LCL-UCL - Lower control limit - upper control limit When reported, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes.
 LOQ - Limit of quantitation Results reported to the DL.

new 5/12/18

Sample ID: WI-A06-FB01-0218						EPA Method 537					
Client Data					Laboratory Data						
Name:	CH2M Hill	Matrix:	Drinking Water		Lab Sample:	1800274-02	Column:	BEH C18			
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Collected:	05-Feb-18 15:07		Date Received:	08-Feb-18 09:03					
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	0.435	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFHxA	ND	0.651	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFHpA	ND	0.523	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFHxS	ND	0.408	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFOA	ND	1.06	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFNA	ND	1.41	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFOS	ND	1.02	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFDA	ND	1.26	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
MeFOSAA	ND	2.99	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
EtFOSAA	ND	1.90	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFUnA	ND	0.250	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFDoA	ND	0.935	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFTTrDA	ND	0.926	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFTeDA	ND	0.763	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C2-PFHxA	SURR	101	70 - 130		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1		
13C2-PFDA	SURR	98.0	70 - 130		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1		
d5-EtFOSAA	SURR	109	70 - 130		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1		

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL- Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

per 5/12/18

Sample ID: WI-A06-RW02-0218						EPA Method 537				
Client Data				Laboratory Data						
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800274-03	Column:	BEH C18			
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Collected:	05-Feb-18 15:38	Date Received:	08-Feb-18 09:03					
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	0.445	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1
PFHxA	5.02 0.929 u	0.666	5.02	10.1	J, B	B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1
PFHpA	ND	0.536	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1
PFHxS	1.31	0.417	5.02	10.1	J	B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1
PFOA	ND	1.09	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1
PFNA	ND	1.45	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1
PFOS	ND	1.05	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1
PFDA	ND	1.29	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1
MeFOSAA	ND	3.06	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1
EtFOSAA	ND	1.94	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1
PFUnA	ND	0.256	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1
PFDoA	ND	0.957	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1
PFTTrDA	ND	0.948	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1
PFTeDA	ND	0.781	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	101	70 - 130			B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1
13C2-PFDA	SURR	89.3	70 - 130			B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1
d5-EtFOSAA	SURR	90.7	70 - 130			B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL- Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

new 5/21/8

Sample ID: WI-A06-FB02-0218						EPA Method 537					
Client Data					Laboratory Data						
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800274-04	Column:	BEH C18				
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Collected:	05-Feb-18 15:39	Date Received:	08-Feb-18 09:03						
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	0.449	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFHxA	ND	0.672	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFHpA	ND	0.540	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFHxS	ND	0.420	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFOA	ND	1.09	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFNA	ND	1.46	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFOS	ND	1.05	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFDA	ND	1.30	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
MeFOSAA	ND	3.08	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
EtFOSAA	ND	1.96	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFUnA	ND	0.258	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFDoA	ND	0.965	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFTTrDA	ND	0.955	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFTeDA	ND	0.787	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C2-PFHxA	SURR	94.2	70 - 130		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1		
13C2-PFDA	SURR	89.1	70 - 130		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1		
d5-EtFOSAA	SURR	96.7	70 - 130		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1		

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

05/21/18

Sample ID: WI-A06-RW03-0218							EPA Method 537				
Client Data					Laboratory Data						
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800274-05	Column:	BEH C18				
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Collected:	05-Feb-18 16:11	Date Received:	08-Feb-18 09:03						
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	41.8	0.450	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1	
PFHxA	55.7	0.674	5.08	10.2	B	B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1	
PFHpA	19.9	0.542	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1	
PFHxS	108	0.422	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1	
PFOA	27.9	1.10	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1	
PFNA	ND	1.46	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1	
PFOS	7.59	1.06	5.08	10.2	J	B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1	
PFDA	ND	1.30	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1	
MeFOSAA	ND	3.09	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1	
EtFOSAA	ND	1.96	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1	
PFUnA	ND	0.259	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1	
PFDoA	ND	0.968	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1	
PFTTrDA	ND	0.959	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1	
PFTeDA	ND	0.790	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	109	70 - 130			B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1	
13C2-PFDA	SURR	86.7	70 - 130			B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1	
d5-EtFOSAA	SURR	105	70 - 130			B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1	

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

180274-05

Sample ID: WI-A06-FB03-0218 **EPA Method 537**

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800274-06	Column:	BEH C18
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Collected:	05-Feb-18 16:12	Date Received:	08-Feb-18 09:03		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	0.435	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFHxA	4.92 0.739 u	0.652	4.92	9.83	1, B	B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFHpA	ND	0.524	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFHxS	ND	0.408	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFOA	ND	1.06	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFNA	ND	1.42	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFOS	ND	1.02	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFDA	ND	1.26	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
MeFOSAA	ND	2.99	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
EtFOSAA	ND	1.90	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFUnA	ND	0.251	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFDoA	ND	0.935	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFTTrDA	ND	0.927	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFTeDA	ND	0.764	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1

MBL

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	102	70 - 130		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
13C2-PFDA	SURR	85.8	70 - 130		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
d5-EtFOSAA	SURR	94.8	70 - 130		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1

DL - Detection Limit LOD - Limit of Detection LCL-UC/L- Lower control limit - upper control limit When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
 LOQ - Limit of quantitation Results reported to the DL. Only the linear isomer is reported for all other analytes.

mw sl. 2/18

Sample ID: WI-A06-RW04-0218 EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800274-07	Column:	BEH C18
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Collected:	05-Feb-18 16:50	Date Received:	08-Feb-18 09:03		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	37.9	0.436	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1
PFHxA	4.92 3.80 u	0.653	4.92	9.85	J, B	B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1
PFHpA	1.52	0.525	4.92	9.85	J	B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1
PFHxS	50.6	0.409	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1
PFOA	4.15	1.06	4.92	9.85	J	B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1
PFNA	ND	1.42	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1
PFOS	2.77	1.02	4.92	9.85	J	B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1
PFDA	ND	1.26	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1
MeFOSAA	ND	3.00	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1
EtFOSAA	ND	1.90	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1
PFUnA	ND	0.251	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1
PFDoA	ND	0.938	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1
PFTTrDA	ND	0.929	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1
PFTeDA	ND	0.766	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	93.0	70 - 130			B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1
13C2-PFDA	SURR	77.5	70 - 130			B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1
d5-EtFOSAA	SURR	83.9	70 - 130			B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1

MBL

DL - Detection Limit LOD - Limit of Detection LCL-UCL- Lower control limit - upper control limit When reported, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes.
 LOQ - Limit of quantitation Results reported to the DL.

سیر 180274

Sample ID: WI-A06-FB04-0218						EPA Method 537					
Client Data					Laboratory Data						
Name:	CH2M Hill		Matrix:	Drinking Water		Lab Sample:	1800274-08		Column:	BEH C18	
Project:	CLEAN CTO-4041 WHIDBEY ISLAND		Date Collected:	05-Feb-18 16:51		Date Received:	08-Feb-18 09:03				
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	0.447	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1	
PFHxA	ND	0.668	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1	
PFHpA	ND	0.537	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1	
PFHxS	ND	0.418	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1	
PFOA	ND	1.09	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1	
PFNA	ND	1.45	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1	
PFOS	ND	1.05	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1	
PFDA	ND	1.29	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1	
MeFOSAA	ND	3.06	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1	
EtFOSAA	ND	1.95	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1	
PFUnA	ND	0.257	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1	
PFDoA	ND	0.960	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1	
PFTTrDA	ND	0.951	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1	
PFTeDA	ND	0.783	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1	
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C2-PFHxA	SURR	85.1	70 - 130		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1		
13C2-PFDA	SURR	78.1	70 - 130		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1		
d5-EtFOSAA	SURR	85.5	70 - 130		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1		

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL- Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

new SI. 2.6.8

Sample ID: WI-A06-RW05-0218						EPA Method 537					
Client Data					Laboratory Data						
Name:	CH2M Hill	Matrix:	Drinking Water			Lab Sample:	1800274-09	Column:	BEH C18		
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Collected:	06-Feb-18 10:08			Date Received:	08-Feb-18 09:03				
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	28.9	0.442	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1	
PFHxA	48.6	0.662	4.98	9.98	B	B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1	
PFHpA	20.2	0.532	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1	
PFHxS	210	0.828	9.96	20.0	B	B8B0104	16-Feb-18	0.251 L	26-Feb-18 11:08	2	
PFOA	57.7	1.08	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1	
PFNA	ND	1.44	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1	
PFOS	64.1	1.04	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1	
PFDA	ND	1.28	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1	
MeFOSAA	ND	3.03	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1	
EtFOSAA	ND	1.93	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1	
PFUnA	ND	0.254	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1	
PFDoA	ND	0.950	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1	
PFTTrDA	ND	0.941	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1	
PFTeDA	ND	0.775	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
I3C2-PFHxA	SURR	95.4	70 - 130			B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1	
I3C2-PFDA	SURR	84.5	70 - 130			B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1	
d5-EtFOSAA	SURR	88.4	70 - 130			B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1	

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL- Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

new sl. 2/18

Sample ID: WI-A06-FB05-0218 **EPA Method 537**

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800274-10	Column:	BEH C18
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Collected:	06-Feb-18 10:08	Date Received:	08-Feb-18 09:03		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	0.469	5.30	10.6		B8B0104	16-Feb-18	0.236 L	23-Feb-18 19:29	1
PFHxA	5.30 0.710 u	0.702	5.30	10.6	LB	B8B0104	16-Feb-18	0.236 L	23-Feb-18 19:29	1
PFHpA	ND	0.564	5.30	10.6		B8B0104	16-Feb-18	0.236 L	23-Feb-18 19:29	1
PFHxS	ND	0.439	5.30	10.6		B8B0104	16-Feb-18	0.236 L	23-Feb-18 19:29	1
PFOA	ND	1.14	5.30	10.6		B8B0104	16-Feb-18	0.236 L	23-Feb-18 19:29	1
PFNA	ND	1.52	5.30	10.6		B8B0104	16-Feb-18	0.236 L	23-Feb-18 19:29	1
PFOS	ND	1.10	5.30	10.6		B8B0104	16-Feb-18	0.236 L	23-Feb-18 19:29	1
PFDA	ND	1.36	5.30	10.6		B8B0104	16-Feb-18	0.236 L	23-Feb-18 19:29	1
MeFOSAA	ND	3.22	5.30	10.6		B8B0104	16-Feb-18	0.236 L	23-Feb-18 19:29	1
EtFOSAA	ND	2.04	5.30	10.6		B8B0104	16-Feb-18	0.236 L	23-Feb-18 19:29	1
PFUnA	ND	0.270	5.30	10.6		B8B0104	16-Feb-18	0.236 L	23-Feb-18 19:29	1
PFDoA	ND	1.01	5.30	10.6		B8B0104	16-Feb-18	0.236 L	23-Feb-18 19:29	1
PFTTrDA	ND	0.999	5.30	10.6		B8B0104	16-Feb-18	0.236 L	23-Feb-18 19:29	1
PFTeDA	ND	0.823	5.30	10.6		B8B0104	16-Feb-18	0.236 L	23-Feb-18 19:29	1

MBC

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	91.8	70 - 130		B8B0104	16-Feb-18	0.236 L	23-Feb-18 19:29	1
13C2-PFDA	SURR	75.3	70 - 130		B8B0104	16-Feb-18	0.236 L	23-Feb-18 19:29	1
d5-EtFOSAA	SURR	89.8	70 - 130		B8B0104	16-Feb-18	0.236 L	23-Feb-18 19:29	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

عدد 5/2/18

Sample ID: WI-A06-RW06-0218

EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800274-11	Column:	BEH C18
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Collected:	06-Feb-18 10:56	Date Received:	08-Feb-18 09:03		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	0.442	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1
PFHxA	ND	0.662	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1
PFHpA	ND	0.532	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1
PFHxS	ND	0.414	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1
PFOA	ND	1.08	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1
PFNA	ND	1.44	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1
PFOS	ND	1.04	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1
PFDA	ND	1.28	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1
MeFOSAA	ND	3.03	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1
EtFOSAA	ND	1.93	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1
PFUnA	ND	0.255	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1
PFDoA	ND	0.950	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1
PFTTrDA	ND	0.941	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1
PFTeDA	ND	0.776	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	94.2	70 - 130		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1	
13C2-PFDA	SURR	70.6	70 - 130		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1	
d5-EtFOSAA	SURR	112	70 - 130		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1	

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL - Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

LOQ - Limit of quantitation

Results reported to the DL.

see 5/12/18

Sample ID: WI-A06-RW05P-0218							EPA Method 537				
Client Data				Laboratory Data							
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800274-12	Column:	BEH C18				
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Collected:	06-Feb-18 10:08	Date Received:	08-Feb-18 09:03						
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	28.9	0.444	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1	
PFHxA	49.8	0.665	5.02	10.0	B	B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1	
PFHpA	21.4	0.534	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1	
PFHxS	232	0.832	10.0	20.0	D	B8B0104	16-Feb-18	0.249 L	26-Feb-18 11:20	2	
PFOA	55.3	1.08	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1	
PFNA	1.67	1.44	5.02	10.0	J	B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1	
PFOS	63.8	1.04	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1	
PFDA	ND	1.28	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1	
MeFOSAA	ND	3.05	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1	
EtFOSAA	ND	1.93	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1	
PFUnA	ND	0.256	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1	
PFDoA	ND	0.954	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1	
PFTTrDA	ND	0.945	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1	
PFTeDA	ND	0.779	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	97.3	70 - 130			B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1	
13C2-PFDA	SURR	86.1	70 - 130			B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1	
d5-EtFOSAA	SURR	97.5	70 - 130			B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1	

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL- Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

see 5/2/18

Sample ID: WI-A06-FB06-0218						EPA Method 537				
Client Data					Laboratory Data					
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800274-13	Column:	BEH C18			
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Collected:	06-Feb-18 10:56	Date Received:	08-Feb-18 09:03					
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	0.444	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1
PFHxA	0.770 <i>5.02</i>	0.665	5.02	10.0	L, B	B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1
PFHpA	ND	0.534	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1
PFHxS	ND	0.416	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1
PFOA	ND	1.08	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1
PFNA	ND	1.44	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1
PFOS	ND	1.04	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1
PFDA	ND	1.28	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1
MeFOSAA	ND	3.05	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1
EtFOSAA	ND	1.94	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1
PFUnA	ND	0.256	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1
PFDoA	ND	0.955	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1
PFTTrDA	ND	0.946	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1
PFTeDA	ND	0.779	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	104	70 - 130			B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1
13C2-PFDA	SURR	90.2	70 - 130			B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1
d5-EtFOSAA	SURR	106	70 - 130			B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

new sl. 2/18

Sample ID: WI-A06-RW07-0218

EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800274-14	Column:	BEH C18
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Collected:	06-Feb-18 14:05	Date Received:	08-Feb-18 09:03		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	0.438	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFHxA	ND	0.655	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFHpA	ND	0.527	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFHxS	ND	0.410	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFOA	ND	1.07	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFNA	ND	1.42	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFOS	ND	1.03	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFDA	ND	1.26	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
MeFOSAA	ND	3.00	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
EtFOSAA	ND	1.91	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFUnA	ND	0.252	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFDoA	ND	0.941	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFTTrDA	ND	0.932	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFTeDA	ND	0.768	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	104	70 - 130		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1	
13C2-PFDA	SURR	86.2	70 - 130		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1	
d5-EtFOSAA	SURR	91.0	70 - 130		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1	

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL - Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

see 5/12/18

Sample ID: WI-A06-FB07-0218

EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800274-15	Column:	BEH C18
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Collected:	06-Feb-18 14:05	Date Received:	08-Feb-18 09:03		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	0.428	4.84	9.67		B8B0104	16-Feb-18	0.258 L	23-Feb-18 20:31	1
PFHxA	4.84 0.677 u	0.641	4.84	9.67	LB	B8B0104	16-Feb-18	0.258 L	23-Feb-18 20:31	1
PFHpA	ND	0.516	4.84	9.67		B8B0104	16-Feb-18	0.258 L	23-Feb-18 20:31	1
PFHxS	ND	0.401	4.84	9.67		B8B0104	16-Feb-18	0.258 L	23-Feb-18 20:31	1
PFOA	ND	1.04	4.84	9.67		B8B0104	16-Feb-18	0.258 L	23-Feb-18 20:31	1
PFNA	ND	1.39	4.84	9.67		B8B0104	16-Feb-18	0.258 L	23-Feb-18 20:31	1
PFOS	ND	1.01	4.84	9.67		B8B0104	16-Feb-18	0.258 L	23-Feb-18 20:31	1
PFDA	ND	1.24	4.84	9.67		B8B0104	16-Feb-18	0.258 L	23-Feb-18 20:31	1
MeFOSAA	ND	2.94	4.84	9.67		B8B0104	16-Feb-18	0.258 L	23-Feb-18 20:31	1
EtFOSAA	ND	1.87	4.84	9.67		B8B0104	16-Feb-18	0.258 L	23-Feb-18 20:31	1
PFUnA	ND	0.247	4.84	9.67		B8B0104	16-Feb-18	0.258 L	23-Feb-18 20:31	1
PFDoA	ND	0.921	4.84	9.67		B8B0104	16-Feb-18	0.258 L	23-Feb-18 20:31	1
PFTTrDA	ND	0.912	4.84	9.67		B8B0104	16-Feb-18	0.258 L	23-Feb-18 20:31	1
PFTeDA	ND	0.752	4.84	9.67		B8B0104	16-Feb-18	0.258 L	23-Feb-18 20:31	1
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	95.8	70 - 130		B8B0104	16-Feb-18	0.258 L	23-Feb-18 20:31	1	
13C2-PFDA	SURR	82.9	70 - 130		B8B0104	16-Feb-18	0.258 L	23-Feb-18 20:31	1	
d5-EtFOSAA	SURR	111	70 - 130		B8B0104	16-Feb-18	0.258 L	23-Feb-18 20:31	1	

MBL

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL- Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

مر 5/2/18

Sample ID: WI-A06-RW08-0218 **EPA Method 537**

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800274-16	Column:	BEH C18
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Collected:	06-Feb-18 18:02	Date Received:	08-Feb-18 09:03		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	23.0	0.445	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFHxA	15.1	0.666	5.02	10.0	B	B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFHpA	8.81	0.535	5.02	10.0	J	B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFHxS	116	0.417	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFOA	25.4	1.08	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFNA	2.51	1.45	5.02	10.0	J	B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFOS	78.2	1.04	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFDA	ND	1.29	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
MeFOSAA	ND	3.05	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
EtFOSAA	ND	1.94	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFUnA	ND	0.256	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFDoA	ND	0.956	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFTTrDA	ND	0.947	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFTeDA	ND	0.781	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	92.4	70 - 130		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
13C2-PFDA	SURR	74.4	70 - 130		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
d5-EtFOSAA	SURR	80.7	70 - 130		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL- Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

سفر 5/2/18

Sample ID: WI-A06-FB08-0218					EPA Method 537					
Client Data				Laboratory Data						
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800274-17	Column:	BEH C18			
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Collected:	06-Feb-18 18:02	Date Received:	08-Feb-18 09:03					
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	0.441	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFHxA	ND	0.661	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFHpA	ND	0.531	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFHxS	ND	0.414	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFOA	ND	1.08	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFNA	ND	1.43	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFOS	ND	1.04	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFDA	ND	1.28	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
MeFOSAA	ND	3.03	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
EtFOSAA	ND	1.92	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFUnA	ND	0.254	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFDoA	ND	0.949	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFTTrDA	ND	0.940	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFTeDA	ND	0.774	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	96.4	70 - 130		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1	
13C2-PFDA	SURR	80.8	70 - 130		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1	
d5-EtFOSAA	SURR	93.4	70 - 130		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1	

DL - Detection Limit

LOD - Limit of Detection

LCL-UC'L- Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

see sl. 2/18

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 580-75018-1
Laboratory: Test America Laboratories, Tacoma, Washington
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
Date: May 14, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW05-0218	580-75018-1	Water
2	WI-A06-RW05P-0218	580-75018-2	Water
3	WI-A06-RW06-0218	580-75018-3	Water
4	WI-A06-RW07-0218	580-75018-4	Water
5	WI-A06-RW08-0218	580-75018-5	Water

A full data validation was performed on the analytical data for five water samples collected on February 6, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

SVOC (1,4-Dioxane)

Method References

USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries

- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC samples were not analyzed.

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

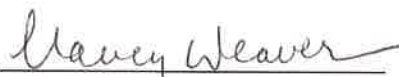
- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	SVOC		RPD	Qualifier
	WI-A06-RW05-0218 ug/L	WI-A06-RW05P-0218 ug/L		
1,4-Dioxane	0.053	0.055	4%	None

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: 
Nancy Weaver
Senior Chemist

Dated: 5/15/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75018-1

Client Sample ID: W1-A06-RW05-0218

Lab Sample ID: 580-75018-1

Date Sampled: 02/06/2018 1008

Client Matrix: Water

Date Received: 02/09/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-267316	Instrument ID:	TAC051
Prep Method:	3520C	Prep Batch:	580-267129	Lab File ID:	0214B016.D
Dilution:	1.0			Initial Weight/Volume:	1023.4 mL
Analysis Date:	02/14/2018 2021			Final Weight/Volume:	2 mL
Prep Date:	02/12/2018 1053			Injection Volume:	2 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.053	JM	0.011	0.098

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	85		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75018-1

Client Sample ID: W1-A06-RW05P-0218

2

Lab Sample ID: 580-75018-2

Date Sampled: 02/06/2018 1008

Client Matrix: Water

Date Received: 02/09/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-267316	Instrument ID:	TAC051
Prep Method:	3520C	Prep Batch:	580-267129	Lab File ID:	0214B017.D
Dilution:	1.0			Initial Weight/Volume:	1025.7 mL
Analysis Date:	02/14/2018 2046			Final Weight/Volume:	2 mL
Prep Date:	02/12/2018 1053			Injection Volume:	2 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.055	JM	0.011	0.097

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	75		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75018-1

Client Sample ID: W1-A06-RW06-0218

3

Lab Sample ID: 580-75018-3

Date Sampled: 02/06/2018 1056

Client Matrix: Water

Date Received: 02/09/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-267316	Instrument ID:	TAC051
Prep Method:	3520C	Prep Batch:	580-267129	Lab File ID:	0214B018.D
Dilution:	1.0			Initial Weight/Volume:	1000.6 mL
Analysis Date:	02/14/2018 2110			Final Weight/Volume:	2 mL
Prep Date:	02/12/2018 1053			Injection Volume:	2 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.030	U	0.011	0.10

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	80		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75018-1

Client Sample ID: W1-A06-RW07-0218

4

Lab Sample ID: 580-75018-4

Date Sampled: 02/06/2018 1405

Client Matrix: Water

Date Received: 02/09/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-267316	Instrument ID:	TAC051
Prep Method:	3520C	Prep Batch:	580-267129	Lab File ID:	0214B019.D
Dilution:	1.0			Initial Weight/Volume:	1020.2 mL
Analysis Date:	02/14/2018 2135			Final Weight/Volume:	2 mL
Prep Date:	02/12/2018 1053			Injection Volume:	2 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.011	0.098

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	81		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75018-1

5

Client Sample ID: W1-A06-RW08-0218

Lab Sample ID: 580-75018-5

Date Sampled: 02/06/2018 1802

Client Matrix: Water

Date Received: 02/09/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM	Analysis Batch: 580-267316	Instrument ID: TAC051
Prep Method: 3520C	Prep Batch: 580-267129	Lab File ID: 0214B020.D
Dilution: 1.0		Initial Weight/Volume: 989.4 mL
Analysis Date: 02/14/2018 2159		Final Weight/Volume: 2 mL
Prep Date: 02/12/2018 1053		Injection Volume: 2 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.26	M	0.011	0.10
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	88		53 - 106	

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 580-75081-1
 Laboratory: Test America Laboratories, Tacoma, Washington
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: May 14, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW09-0218	580-75081-1	Water
1MS	WI-A06-RW09-0218MS	580-75081-1MS	Water
1MSD	WI-A06-RW09-0218MSD	580-75081-1MSD	Water
1RE†	WI-A06-RW09-0218RE	580-75081-1RE	Water
1REMS†	WI-A06-RW09-0218MSRE	580-75081-1MSRE	Water
1REMSD†	WI-A06-RW09-0218MSDRE	580-75081-1MSDRE	Water
2*	WI-A06-TB02-0218	580-75081-2	Water
3	WI-A06-RW10-0218	580-75081-3	Water
4	WI-A06-RW11-0218	580-75081-4	Water
5	WI-A06-RW12-0218	580-75081-5	Water

* - VOC only † - SVOC only

A full data validation was performed on the analytical data for four water samples and one aqueous trip blank sample collected on February 7-12, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

VOC (Vinyl Chloride)
 SVOC (1,4-Dioxane)

Method References

USEPA SW-846 Method 8260C SIM
 USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

- All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-TB02-0218	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate recoveries.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

MS/MSD Sample	Compound	MS %R/MSD %R/RPD	Qualifier	Affected Samples
1	Vinyl Chloride	OK/OK/47	None	For RPD Alone

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days except for EDS Sample 1RE. This sample was re-extracted outside of holding times and qualified as estimated (UJ).

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC samples were not analyzed.

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

MS/MSD Sample	Compound	MS %R/MSD %R/RPD	Qualifier	Affected Samples
1	1,4-Dioxane	0%/0%/NC	UJ	1

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- EDS Sample 1 was analyzed for MS/MSD although the laboratory inadvertently did not spike the sample. The sample was re-extracted outside of holding times and reanalyzed. The original analysis result should be used for reporting purposes.

Field Duplicate Sample Precision

- Field duplicate samples were not analyzed.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 5/15/18
Nancy Weaver
Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75081-1

Client Sample ID: W1-A06-RW09-0218

Lab Sample ID: 580-75081-1

Date Sampled: 02/07/2018 1326

Client Matrix: Water

Date Received: 02/14/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-267464	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	021618_08.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	02/16/2018 1300			Final Weight/Volume:	5 mL
Prep Date:	02/16/2018 1300				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U ✓	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	97		80 - 141
Dibromofluoromethane (Surr)	96	M ✓	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75081-1

2

Client Sample ID: W1-A06-TB02-0218

Lab Sample ID: 580-75081-2

Date Sampled: 02/07/2018 0800

Client Matrix: Water

Date Received: 02/14/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-267464	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	021618_11.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	02/16/2018 1411			Final Weight/Volume:	5 mL
Prep Date:	02/16/2018 1411				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U M	0.013	0.50
Surrogate	%Rec	Qualifier	Acceptance Limits	
Trifluorotoluene (Surr)	98		80 - 141	
Dibromofluoromethane (Surr)	96	M	77 - 118	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75081-1

Client Sample ID: W1-A06-RW10-0218

3

Lab Sample ID: 580-75081-3

Date Sampled: 02/12/2018 1009

Client Matrix: Water

Date Received: 02/14/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-267464	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	021618_12.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	02/16/2018 1434			Final Weight/Volume:	5 mL
Prep Date:	02/16/2018 1434				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	98		80 - 141
Dibromofluoromethane (Surr)	97	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75081-1

Client Sample ID: W1-A06-RW11-0218

4

Lab Sample ID: 580-75081-4

Date Sampled: 02/12/2018 1309

Client Matrix: Water

Date Received: 02/14/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-267464	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	021618_13.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	02/16/2018 1458			Final Weight/Volume:	5 mL
Prep Date:	02/16/2018 1458				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	97		80 - 141
Dibromofluoromethane (Surr)	96	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75081-1

Client Sample ID: W1-A06-RW12-0218

5

Lab Sample ID: 580-75081-5

Date Sampled: 02/12/2018 1453

Client Matrix: Water

Date Received: 02/14/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-267464	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 021618_14.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 02/16/2018 1521		Final Weight/Volume: 5 mL
Prep Date: 02/16/2018 1521		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	95		80 - 141
Dibromofluoromethane (Surr)	96	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75081-1

Client Sample ID: W1-A06-RW09-0218

Lab Sample ID: 580-75081-1

Date Sampled: 02/07/2018 1326

Client Matrix: Water

Date Received: 02/14/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-267403	Instrument ID:	TAC051
Prep Method:	3520C	Prep Batch:	580-267314	Lab File ID:	0215B006.D
Dilution:	1.0			Initial Weight/Volume:	1039.6 mL
Analysis Date:	02/15/2018 1651			Final Weight/Volume:	2 mL
Prep Date:	02/14/2018 1241			Injection Volume:	2 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029 <i>UJ</i>	UJM	0.011	0.096 <i>MSL</i>
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	83	Q	53 - 106	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75081-1

Client Sample ID: W1-A06-RW09-0218

IRE

Lab Sample ID: 580-75081-1

Date Sampled: 02/07/2018 1326

Client Matrix: Water

Date Received: 02/14/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

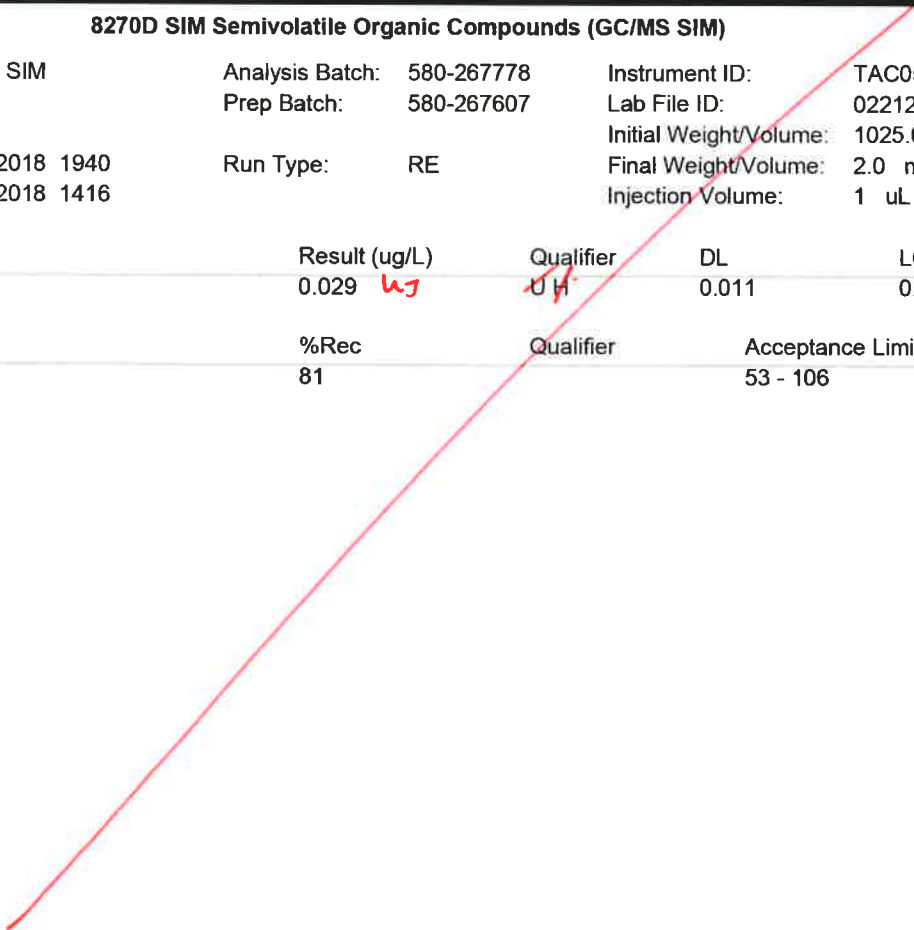
Analysis Method: 8270D SIM	Analysis Batch: 580-267778	Instrument ID: TAC050
Prep Method: 3520C	Prep Batch: 580-267607	Lab File ID: 022128a011.D
Dilution: 1.0		Initial Weight/Volume: 1025.6 mL
Analysis Date: 02/21/2018 1940	Run Type: RE	Final Weight/Volume: 2.0 mL
Prep Date: 02/19/2018 1416		Injection Volume: 1 uL

Use original

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029 <i>WJ</i>	<i>UH</i>	0.011	0.098

HT

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	81		53 - 106



Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75081-1

Client Sample ID: W1-A06-RW10-0218

Lab Sample ID: 580-75081-3

Client Matrix: Water

Date Sampled: 02/12/2018 1009

Date Received: 02/14/2018 0955

3

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-267403	Instrument ID:	TAC051
Prep Method:	3520C	Prep Batch:	580-267314	Lab File ID:	0215B009.D
Dilution:	1.0			Initial Weight/Volume:	1010.7 mL
Analysis Date:	02/15/2018 1805			Final Weight/Volume:	2 mL
Prep Date:	02/14/2018 1241			Injection Volume:	2 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.030	U	0.011	0.099
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	85	∅	53 - 106	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75081-1

Client Sample ID: W1-A06-RW11-0218

Lab Sample ID: 580-75081-4

Client Matrix: Water

Date Sampled: 02/12/2018 1309

Date Received: 02/14/2018 0955

4

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-267403	Instrument ID:	TAC051
Prep Method:	3520C	Prep Batch:	580-267314	Lab File ID:	0215B010.D
Dilution:	1.0			Initial Weight/Volume:	1023 mL
Analysis Date:	02/15/2018 1829			Final Weight/Volume:	2 mL
Prep Date:	02/14/2018 1241			Injection Volume:	2 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.011	0.098

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	75	Q	53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75081-1

5

Client Sample ID: W1-A06-RW12-0218

Lab Sample ID: 580-75081-5

Date Sampled: 02/12/2018 1453

Client Matrix: Water

Date Received: 02/14/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-267403	Instrument ID:	TAC051
Prep Method:	3520C	Prep Batch:	580-267314	Lab File ID:	0215B011.D
Dilution:	1.0			Initial Weight/Volume:	1044.3 mL
Analysis Date:	02/15/2018 1854			Final Weight/Volume:	2 mL
Prep Date:	02/14/2018 1241			Injection Volume:	2 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.011	0.096

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	84	Q	53 - 106

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 1800307
 Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: May 12, 2018

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW09-0218	1800307-01	Water
1MS	WI-A06-RW09-0218MS	1800307-01MS	Water
1MSD	WI-A06-RW09-0218MSD	1800307-01MSD	Water
2	WI-A06-FB09-0218	1800307-02	Water
3	WI-A06-RW10-0218	1800307-03	Water
4	WI-A06-FB10-0218	1800307-04	Water
5	WI-A06-RW11-0218	1800307-05	Water
6	WI-A06-FB11-0218	1800307-06	Water
7	WI-A06-RW12-0218	1800307-07	Water
8	WI-A06-FB12-0218	1800307-08	Water

A full data validation was performed on the analytical data for four water samples and four aqueous field blanks sample collected on February 7-12, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the EPA Method “Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)”.

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA “Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review,” January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB09-0218	None - ND	-	-	-
WI-A06-FB10-0218	PFHxA	0.687	None	All Associated ND
WI-A06-FB11-0218	PFHxA	0.814	U	7
WI-A06-FB12-0218	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria except for the following.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 5/15/18
Nancy Weaver
Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-RW09-0218						EPA Method 537						
Client Data					Laboratory Data							
Name:	CH2M Hill		Matrix:	Drinking Water		Lab Sample:	1800307-01		Column:	BEH C18		
Project:	CTO-4041 CLEAN WHIDBEY ISLAND		Date Collected:	07-Feb-18 13:26		Date Received:	14-Feb-18 10:10					
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
PFBS	ND	0.393	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1		
PFHxA	0.829	0.588	4.43	8.87	J	B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1		
PFHpA	ND	0.473	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1		
PFHxS	ND	0.368	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1		
PFOA	ND	0.958	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1		
PFNA	ND	1.28	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1		
PFOS	ND	0.922	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1		
PFDA	ND	1.13	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1		
MeFOSAA	ND	2.70	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1		
EtFOSAA	ND	1.71	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1		
PFUnA	ND	0.226	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1		
PFDoA	ND	0.844	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1		
PFTTrDA	ND	0.836	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1		
PFTeDA	ND	0.689	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1		
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C2-PFHxA	SURR	120	70 - 130			B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1		
13C2-PFDA	SURR	110	70 - 130			B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1		
d5-EtFOSAA	SURR	117	70 - 130			B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1		

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL - Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

MW 51.21.8

Sample ID: WI-A06-FB09-0218						EPA Method 537					
Client Data					Laboratory Data						
Name:	CH2M Hill		Matrix:	Drinking Water		Lab Sample:	1800307-02		Column:	BEH C18	
Project:	CTO-4041 CLEAN WHIDBEY ISLAND		Date Collected:	07-Feb-18 13:27		Date Received:	14-Feb-18 10:10				
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	0.413	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1	
PFHxA	ND	0.618	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1	
PFHpA	ND	0.496	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1	
PFHxS	ND	0.387	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1	
PFOA	ND	1.01	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1	
PFNA	ND	1.34	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1	
PFOS	ND	0.969	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1	
PFDA	ND	1.19	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1	
MeFOSAA	ND	2.83	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1	
EtFOSAA	ND	1.80	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1	
PFUnA	ND	0.238	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1	
PFDoA	ND	0.887	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1	
PFTTrDA	ND	0.878	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1	
PFTeDA	ND	0.724	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	102	70 - 130			B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1	
13C2-PFDA	SURR	89.3	70 - 130			B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1	
d5-EtFOSAA	SURR	104	70 - 130			B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1	

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

سید 5/2/18

Sample ID: WI-A06-RW10-0218							EPA Method 537				
Client Data				Laboratory Data							
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800307-03	Column:	BEH C18				
Project:	CTO-4041 CLEAN WHIDBEY ISLAND	Date Collected:	12-Feb-18 10:09	Date Received:	14-Feb-18 10:10						
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	0.403	4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1	
PFHxA	ND	0.603	4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1	
PFHpA	ND	0.485	4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1	
PFHxS	ND	0.378	4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1	
PFOA	ND	0.983	4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1	
PFNA	ND	1.31	4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1	
PFOS	ND	0.947	4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1	
PFDA	ND	1.16	4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1	
MeFOSAA	ND	2.77	4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1	
EtFOSAA	ND	1.76	4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1	
PFUnA	ND	0.232	4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1	
PFDoA	ND	0.866	4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1	
PFTTrDA	ND	0.858	4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1	
PFTeDA	ND	0.707	4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	88.1	70 - 130			B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1	
13C2-PFDA	SURR	72.1	70 - 130			B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1	
d5-EtFOSAA	SURR	89.9	70 - 130			B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1	

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL - Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

new size 1.8

Sample ID: WI-A06-FB10-0218							EPA Method 537				
Client Data					Laboratory Data						
Name:	CH2M Hill		Matrix:	Drinking Water		Lab Sample:	1800307-04		Column:	BEH C18	
Project:	CTO-4041 CLEAN WHIDBEY ISLAND		Date Collected:	12-Feb-18 10:10		Date Received:	14-Feb-18 10:10				
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	0.410	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1	
PFHxA	0.687	0.613	4.63	9.25	J	B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1	
PFHpA	ND	0.493	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1	
PFHxS	ND	0.384	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1	
PFOA	ND	0.999	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1	
PFNA	ND	1.33	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1	
PFOS	ND	0.962	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1	
PFDA	ND	1.18	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1	
MeFOSAA	ND	2.81	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1	
EtFOSAA	ND	1.78	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1	
PFUnA	ND	0.236	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1	
PFDoA	ND	0.880	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1	
PFTTrDA	ND	0.872	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1	
PFTeDA	ND	0.718	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1	
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C2-PFHxA	SURR	101	70 - 130		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1		
13C2-PFDA	SURR	85.3	70 - 130		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1		
d5-EtFOSAA	SURR	106	70 - 130		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1		

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

aw Sl. 26.8

Sample ID: WI-A06-RW11-0218

EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800307-05	Column:	BEH C18
Project:	CTO-4041 CLEAN WHIDBEY ISLAND	Date Collected:	12-Feb-18 13:09	Date Received:	14-Feb-18 10:10		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	0.402	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFHxA	ND	0.602	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFHpA	ND	0.484	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFHxS	ND	0.377	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFOA	ND	0.980	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFNA	ND	1.31	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFOS	ND	0.944	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFDA	ND	1.16	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
MeFOSAA	ND	2.76	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
EtFOSAA	ND	1.75	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFUnA	ND	0.231	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFDoA	ND	0.864	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFTTrDA	ND	0.856	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFTeDA	ND	0.705	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	96.3	70 - 130		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1	
13C2-PFDA	SURR	78.5	70 - 130		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1	
d5-EtFOSAA	SURR	97.2	70 - 130		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1	

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL - Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

rw sh 2.18

Sample ID: WI-A06-FB11-0218							EPA Method 537				
Client Data				Laboratory Data							
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800307-06	Column:	BEH C18				
Project:	CTO-4041 CLEAN WHIDBEY ISLAND	Date Collected:	12-Feb-18 13:10	Date Received:	14-Feb-18 10:10						
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	0.429	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1	
PFHxA	0.814	0.641	4.84	9.67	J	B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1	
PFHpA	ND	0.516	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1	
PFHxS	ND	0.401	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1	
PFOA	ND	1.04	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1	
PFNA	ND	1.39	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1	
PFOS	ND	1.01	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1	
PFDA	ND	1.24	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1	
MeFOSAA	ND	2.94	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1	
EtFOSAA	ND	1.87	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1	
PFUnA	ND	0.247	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1	
PFDoA	ND	0.921	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1	
PFTTrDA	ND	0.912	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1	
PFTeDA	ND	0.752	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1	
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C2-PFHxA	SURR	105	70 - 130		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1		
13C2-PFDA	SURR	92.1	70 - 130		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1		
d5-EtFOSAA	SURR	109	70 - 130		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1		

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL - Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

nw slr 1.8

Sample ID: WI-A06-RW12-0218							EPA Method 537					
Client Data					Laboratory Data							
Name:	CH2M Hill		Matrix:	Drinking Water		Lab Sample:	1800307-07		Column:	BEH C18		
Project:	CTO-4041 CLEAN WHIDBEY ISLAND		Date Collected:	12-Feb-18 14:53		Date Received:	14-Feb-18 10:10					
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
PFBS	2.27	0.410	4.63	9.25	J	B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1		
PFHxA	4.63 2.76 u	0.613	4.63	9.25	J	B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1	FBL	
PFHpA	ND	0.493	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1		
PFHxS	1.51	0.384	4.63	9.25	J	B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1		
PFOA	1.03	0.999	4.63	9.25	J	B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1		
PFNA	ND	1.33	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1		
PFOS	ND	0.962	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1		
PFDA	ND	1.18	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1		
MeFOSAA	ND	2.81	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1		
EtFOSAA	ND	1.79	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1		
PFOA	ND	0.236	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1		
PFDoA	ND	0.881	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1		
PFTTrDA	ND	0.872	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1		
PFTeDA	ND	0.719	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1		
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution			
13C2-PFHxA	SURR	102	70 - 130		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1			
13C2-PFDA	SURR	83.9	70 - 130		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1			
d5-EtFOSAA	SURR	99.0	70 - 130		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1			

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL - Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

see 5/12/18

Sample ID: WI-A06-FB12-0218 **EPA Method 537**

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800307-08	Column:	BEH C18
Project:	CTO-4041 CLEAN WHIDBEY ISLAND	Date Collected:	12-Feb-18 14:54	Date Received:	14-Feb-18 10:10		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	0.414	4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
PFHxA	ND	0.619	4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
PFHpA	ND	0.498	4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
PFHxS	ND	0.388	4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
PFOA	ND	1.01	4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
PFNA	ND	1.35	4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
PFOS	ND	0.971	4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
PFDA	ND	1.20	4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
MeFOSAA	ND	2.84	4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
EtFOSAA	ND	1.80	4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
PFUnA	ND	0.238	4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
PFDoA	ND	0.889	4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
PFTTrDA	ND	0.881	4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
PFTeDA	ND	0.726	4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	96.7	70 - 130		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1	
13C2-PFDA	SURR	89.4	70 - 130		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1	
d5-EtFOSAA	SURR	92.8	70 - 130		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1	

DL - Detection Limit LOD - Limit of Detection LCL-UCL- Lower control limit - upper control limit When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
 LOQ - Limit of quantitation Results reported to the DL. Only the linear isomer is reported for all other analytes.

ww 5/12/18

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 580-75176-1
 Laboratory: Test America Laboratories, Tacoma, Washington
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: May 14, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW13-0218	580-75176-1	Water
2	WI-A06-RW14-0218	580-75176-2	Water
3	WI-A06-RW15-0218	580-75176-3	Water
4	WI-A06-RW16-0218	580-75176-4	Water
5*	WI-A06-TB03-0218	580-75176-5	Water

* - VOC only

A full data validation was performed on the analytical data for four water samples and one aqueous trip blank sample collected on February 13-14, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

VOC (Vinyl Chloride)
 SVOC (1,4-Dioxane)

Method References

USEPA SW-846 Method 8260C SIM
 USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning

- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

- All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-TB03-0218	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate recoveries.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC samples were not analyzed.

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not analyzed.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Nancy Weaver
Nancy Weaver
Senior Chemist

Dated: 5/15/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75176-1

Client Sample ID: W1-A06-RW13-0218

Lab Sample ID: 580-75176-1

Date Sampled: 02/13/2018 1551

Client Matrix: Water

Date Received: 02/16/2018 0935

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-267637	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	022018_08.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	02/20/2018 1215			Final Weight/Volume:	5 mL
Prep Date:	02/20/2018 1215				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	97		80 - 141
Dibromofluoromethane (Surr)	97	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75176-1

Client Sample ID: W1-A06-RW14-0218

Lab Sample ID: 580-75176-2

Client Matrix: Water

Date Sampled: 02/14/2018 0925

Date Received: 02/16/2018 0935

2

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-267637	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 022018_09.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 02/20/2018 1238		Final Weight/Volume: 5 mL
Prep Date: 02/20/2018 1238		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U M	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	97		80 - 141
Dibromofluoromethane (Surr)	98	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75176-1

Client Sample ID: W1-A06-RW15-0218

3

Lab Sample ID: 580-75176-3

Date Sampled: 02/14/2018 1003

Client Matrix: Water

Date Received: 02/16/2018 0935

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-267637	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 022018_10.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 02/20/2018 1302		Final Weight/Volume: 5 mL
Prep Date: 02/20/2018 1302		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U M	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	97		80 - 141
Dibromofluoromethane (Surr)	98	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75176-1

4

Client Sample ID: W1-A06-RW16-0218

Lab Sample ID: 580-75176-4

Date Sampled: 02/14/2018 1104

Client Matrix: Water

Date Received: 02/16/2018 0935

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-267637	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	022018_11.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	02/20/2018 1325			Final Weight/Volume:	5 mL
Prep Date:	02/20/2018 1325				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	95		80 - 141
Dibromofluoromethane (Surr)	99	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75176-1

5

Client Sample ID: W1-A06-TB03-0218

Lab Sample ID: 580-75176-5

Date Sampled: 02/13/2018 0800

Client Matrix: Water

Date Received: 02/16/2018 0935

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-267637	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	022018_12.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	02/20/2018 1349			Final Weight/Volume:	5 mL
Prep Date:	02/20/2018 1349				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	98		80 - 141
Dibromofluoromethane (Surr)	98	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75176-1

Client Sample ID: **W1-A06-RW13-0218**

Lab Sample ID: 580-75176-1

Date Sampled: 02/13/2018 1551

Client Matrix: Water

Date Received: 02/16/2018 0935

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-267778	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-267607	Lab File ID:	022128a014.D
Dilution:	1.0			Initial Weight/Volume:	1053.3 mL
Analysis Date:	02/21/2018 2047			Final Weight/Volume:	2.0 mL
Prep Date:	02/19/2018 1416			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.028	U	0.010	0.095
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	84		53 - 106	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75176-1

Client Sample ID: W1-A06-RW14-0218

Lab Sample ID: 580-75176-2

Date Sampled: 02/14/2018 0925

Client Matrix: Water

Date Received: 02/16/2018 0935

2

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM	Analysis Batch: 580-267778	Instrument ID: TAC050
Prep Method: 3520C	Prep Batch: 580-267607	Lab File ID: 022128a015.D
Dilution: 1.0		Initial Weight/Volume: 1047.9 mL
Analysis Date: 02/21/2018 2109		Final Weight/Volume: 2.0 mL
Prep Date: 02/19/2018 1416		Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.010	0.095

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	83		53 - 106

rw 5/14/18

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75176-1

Client Sample ID: W1-A06-RW15-0218

Lab Sample ID: 580-75176-3

Client Matrix: Water

Date Sampled: 02/14/2018 1003

Date Received: 02/16/2018 0935

3

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM	Analysis Batch: 580-267778	Instrument ID: TAC050
Prep Method: 3520C	Prep Batch: 580-267607	Lab File ID: 022128a016.D
Dilution: 1.0		Initial Weight/Volume: 1042.2 mL
Analysis Date: 02/21/2018 2131		Final Weight/Volume: 2.0 mL
Prep Date: 02/19/2018 1416		Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.011	0.096

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	87		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75176-1

Client Sample ID: **W1-A06-RW16-0218**

4

Lab Sample ID: 580-75176-4

Date Sampled: 02/14/2018 1104

Client Matrix: Water

Date Received: 02/16/2018 0935

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM	Analysis Batch: 580-267778	Instrument ID: TAC050
Prep Method: 3520C	Prep Batch: 580-267607	Lab File ID: 022128a017.D
Dilution: 1.0		Initial Weight/Volume: 1047 mL
Analysis Date: 02/21/2018 2153		Final Weight/Volume: 2.0 mL
Prep Date: 02/19/2018 1416		Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.011	0.096
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	85		53 - 106	

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 1800322
 Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: May 12, 2018

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW13-0218	1800322-01	Water
2	WI-A06-FB13-0218	1800322-02	Water
3	WI-A06-RW14-0218	1800322-03	Water
4	WI-A06-FB14-0218	1800322-04	Water
5	WI-A06-RW15-0218	1800322-05	Water
6	WI-A06-FB15-0218	1800322-06	Water
7	WI-A06-RW16-0218	1800322-07	Water
8	WI-A06-FB16-0218	1800322-08	Water

A full data validation was performed on the analytical data for four water samples and four aqueous field blanks sample collected on February 13-14, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the EPA Method “Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)”.

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA “Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review,” January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation

- Holding times
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB13-0218	None - ND	-	-	-
WI-A06-FB14-0218	PFHxA	0.665	None	All Associated >10X
WI-A06-FB15-0218	None - ND	-	-	-
WI-A06-FB16-0218	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria except for the following.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- EDS Sample 3 was analyzed at a 5X dilution due to high concentrations of target compounds. The reporting limits were adjusted accordingly. No action was required.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 5/15/18
Nancy Weaver
Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-RW13-0218						EPA Method 537					
Client Data					Laboratory Data						
Name:	CH2M Hill		Matrix:	Drinking Water		Lab Sample:	1800322-01		Column:	BEH C18	
Project:	CTO-4041 Clean Whidbey Island		Date Collected:	13-Feb-18 15:51		Date Received:	16-Feb-18 09:02				
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	0.437	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1	
PFHxA	0.676	0.654	4.94	9.87	J	B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1	
PFHpA	ND	0.526	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1	
PFHxS	ND	0.410	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1	
PFOA	ND	1.07	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1	
PFNA	ND	1.42	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1	
PFOS	ND	1.03	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1	
PFDA	ND	1.26	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1	
MeFOSAA	ND	3.00	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1	
EtFOSAA	ND	1.90	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1	
PFUnA	ND	0.252	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1	
PFDoA	ND	0.940	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1	
PFTTrDA	ND	0.931	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1	
PFTeDA	ND	0.767	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	108	70 - 130			B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1	
13C2-PFDA	SURR	83.0	70 - 130			B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1	
d5-EtFOSAA	SURR	79.1	70 - 130			B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1	

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

new 5/12/18

Sample ID: WI-A06-FB13-0218							EPA Method 537				
Client Data				Laboratory Data							
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800322-02	Column:	BEH C18				
Project:	CTO-4041 Clean Whidbey Island	Date Collected:	13-Feb-18 15:52	Date Received:	16-Feb-18 09:02						
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	0.437	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1	
PFHxA	ND	0.654	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1	
PFHpA	ND	0.526	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1	
PFHxS	ND	0.410	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1	
PFOA	ND	1.07	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1	
PFNA	ND	1.42	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1	
PFOS	ND	1.03	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1	
PFDA	ND	1.26	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1	
MeFOSAA	ND	3.00	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1	
EtFOSAA	ND	1.90	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1	
PFUnA	ND	0.252	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1	
PFDoA	ND	0.940	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1	
PFTTrDA	ND	0.931	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1	
PFTeDA	ND	0.767	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1	
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C2-PFHxA	SURR	91.2	70 - 130		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1		
13C2-PFDA	SURR	81.5	70 - 130		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1		
d5-EtFOSAA	SURR	102	70 - 130		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1		

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL - Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

مدر 51.21.8

Sample ID: WI-A06-RW14-0218							EPA Method 537				
Client Data				Laboratory Data							
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800322-03	Column:	BEH C18				
Project:	CTO-4041 Clean Whidbey Island	Date Collected:	14-Feb-18 09:25	Date Received:	16-Feb-18 09:02						
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	58.0	0.453	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1	
PFHxA	60.5	0.679	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1	
PFHpA	16.3	0.546	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1	
PFHxS	260	2.12	25.6	51.2	✓	B8B0124	20-Feb-18	0.244 L	28-Feb-18 11:33	5	
PFOA	21.8	1.11	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1	
PFNA	ND	1.47	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1	
PFOS	7.68	1.06	5.12	10.2	J	B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1	
PFDA	ND	1.31	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1	
MeFOSAA	ND	3.11	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1	
EtFOSAA	ND	1.98	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1	
PFUnA	ND	0.261	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1	
PFDoA	ND	0.974	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1	
PFTTrDA	ND	0.965	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1	
PFTeDA	ND	0.795	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	89.4	70 - 130			B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1	
13C2-PFDA	SURR	71.9	70 - 130			B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1	
d5-EtFOSAA	SURR	88.9	70 - 130			B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1	

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

new Sl. 21.8

Sample ID: WI-A06-FB14-0218						EPA Method 537					
Client Data					Laboratory Data						
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800322-04	Column:	BEH C18				
Project:	CTO-4041 Clean Whidbey Island	Date Collected:	14-Feb-18 09:26	Date Received:	16-Feb-18 09:02						
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	0.428	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1	
PFHxA	0.665	0.641	4.83	9.67	J	B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1	
PFHpA	ND	0.515	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1	
PFHxS	ND	0.401	4.83	9.67		B8B0124	20-Feb-18	0.259 L	01-Mar-18 16:48	1	
PFOA	ND	1.04	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1	
PFNA	ND	1.39	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1	
PFOS	ND	1.01	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1	
PFDA	ND	1.24	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1	
MeFOSAA	ND	2.94	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1	
EtFOSAA	ND	1.87	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1	
PFUnA	ND	0.247	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1	
PFDoA	ND	0.920	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1	
PFTTrDA	ND	0.912	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1	
PFTeDA	ND	0.751	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	98.2	70 - 130			B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1	
13C2-PFDA	SURR	76.6	70 - 130			B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1	
d5-EtFOSAA	SURR	79.6	70 - 130			B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1	

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL - Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

new SI.2.18

Sample ID: WI-A06-RW15-0218							EPA Method 537				
Client Data				Laboratory Data							
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800322-05	Column:	BEH C18				
Project:	CTO-4041 Clean Whidbey Island	Date Collected:	14-Feb-18 10:03	Date Received:	16-Feb-18 09:02						
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	0.435	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1	
PFHxA	ND	0.650	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1	
PFHpA	ND	0.523	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1	
PFHxS	ND	0.407	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1	
PFOA	ND	1.06	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1	
PFNA	ND	1.41	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1	
PFOS	ND	1.02	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1	
PFDA	ND	1.26	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1	
MeFOSAA	ND	2.98	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1	
EtFOSAA	ND	1.89	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1	
PFUnA	ND	0.250	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1	
PFDoA	ND	0.934	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1	
PFTTrDA	ND	0.925	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1	
PFTeDA	ND	0.762	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	98.0	70 - 130			B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1	
13C2-PFDA	SURR	90.0	70 - 130			B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1	
d5-EtFOSAA	SURR	85.0	70 - 130			B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1	

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL - Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

see 5/12/18

Sample ID: WI-A06-FB15-0218

EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800322-06	Column:	BEH C18
Project:	CTO-4041 Clean Whidbey Island	Date Collected:	14-Feb-18 10:04	Date Received:	16-Feb-18 09:02		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	0.435	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFHxA	ND	0.651	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFHpA	ND	0.523	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFHxS	ND	0.407	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFOA	ND	1.06	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFNA	ND	1.41	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFOS	ND	1.02	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFDA	ND	1.26	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
MeFOSAA	ND	2.98	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
EtFOSAA	ND	1.89	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFUnA	ND	0.250	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFDoA	ND	0.934	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFTTrDA	ND	0.926	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFTeDA	ND	0.763	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	98.4	70 - 130			B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
13C2-PFDA	SURR	89.7	70 - 130			B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
d5-EtFOSAA	SURR	103	70 - 130			B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

see slide 18

Sample ID: WI-A06-RW16-0218							EPA Method 537				
Client Data					Laboratory Data						
Name:	CH2M Hill		Matrix:	Drinking Water		Lab Sample:	1800322-07	Column:	BEH C18		
Project:	CTO-4041 Clean Whidbey Island		Date Collected:	14-Feb-18 11:04		Date Received:	16-Feb-18 09:02				
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	0.446	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1	
PFHxA	0.906	0.668	5.04	10.1	J	B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1	
PFHpA	ND	0.537	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1	
PFHxS	ND	0.418	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1	
PFOA	ND	1.09	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1	
PFNA	ND	1.45	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1	
PFOS	ND	1.05	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1	
PFDA	ND	1.29	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1	
MeFOSAA	ND	3.06	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1	
EtFOSAA	ND	1.94	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1	
PFUnA	ND	0.257	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1	
PFDoA	ND	0.958	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1	
PFTTrDA	ND	0.949	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1	
PFTeDA	ND	0.782	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	95.7	70 - 130			B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1	
13C2-PFDA	SURR	81.7	70 - 130			B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1	
d5-EtFOSAA	SURR	84.9	70 - 130			B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1	

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL - Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL

Only the linear isomer is reported for all other analytes.

1.2 / 1.8

Sample ID: WI-A06-FB16-0218 **EPA Method 537**

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800322-08	Column:	BEH C18
Project:	CTO-4041 Clean Whidbey Island	Date Collected:	14-Feb-18 11:05	Date Received:	16-Feb-18 09:02		

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	0.431	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFHxA	ND	0.644	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFHpA	ND	0.518	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFHxS	ND	0.403	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFOA	ND	1.05	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFNA	ND	1.40	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFOS	ND	1.01	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFDA	ND	1.24	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
MeFOSAA	ND	2.96	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
EtFOSAA	ND	1.88	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFUnA	ND	0.248	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFDoA	ND	0.925	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFTTrDA	ND	0.917	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFTeDA	ND	0.755	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	106	70 - 130		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1	
13C2-PFDA	SURR	85.9	70 - 130		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1	
d5-EtFOSAA	SURR	86.2	70 - 130		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1	

DL - Detection Limit LOD - Limit of Detection LCL-UCL - Lower control limit - upper control limit When reported, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes.
 LOQ - Limit of quantitation Results reported to the DL.

see sheet 8

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 580-75281-1
 Laboratory: Test America Laboratories, Tacoma, Washington
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: May 14, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1*	WI-A06-TB01-021918	580-75281-1	Water
2	WI-A06-EB01-021918	580-75281-2	Water
3	WI-A06-MW-13-0218	580-75281-3	Water
3MS†	WI-A06-MW-13-0218MS	580-75281-3MS	Water
3MSD†	WI-A06-MW-13-0218MSD	580-75281-3MSD	Water
4	WI-A06-RW17-0218	580-75281-4	Water
5	WI-A06-RW17P-0218	580-75281-5	Water
6	WI-A06-DW-38A-0218	580-75281-6	Water
7	WI-A06-6-S-27-0218	580-75281-7	Water
8	WI-A06-6-S-28-0218	580-75281-8	Water
9	WI-A06-FB01-022218	580-75281-9	Water
10	WI-A06-MW-01-0218	580-75281-10	Water
11	WI-A06-EB01-0218	580-75281-11	Water

* - VOC only † - SVOC only

A full data validation was performed on the analytical data for seven water samples, two aqueous equipment blank samples, one aqueous field blank sample, and one aqueous trip blank sample collected on February 19-21, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

VOC (Vinyl Chloride)
 SVOC (1,4-Dioxane)

Method References

USEPA SW-846 Method 8260C SIM
 USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA “Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review,” January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

- All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-TB01-021918	None - ND	-	-	-
WI-A06-EB01-021918	None - ND	-	-	-
WI-A06-FB01-022118	None - ND	-	-	-
WI-A06-EB01-0218	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate recoveries.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below.

Compound	WI-A06-RW17-0218 ug/L	WI-A06-RW17P-0218 ug/L	RPD	Qualifier
Vinyl Chloride	ND	ND	-	-

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-021918	None - ND	-	-	-
WI-A06-FB01-022118	None - ND	-	-	-
WI-A06-EB01-0218	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

MS/MSD Sample ID	Compound	MS %R/MSD %R/ RPD	Qualifier	Affected Samples
3	1,4-Dioxane	OK/OK/33	None	For RPD Alone

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below.

Compound	WI-A06-RW17-0218 ug/L	WI-A06-RW17P-0218 ug/L	RPD	Qualifier
1,4-Dioxane	ND	ND	-	-

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:  Dated: 5/15/18
Nancy Weaver
Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-TB01-021918

Lab Sample ID: 580-75281-1

Date Sampled: 02/19/2018 0700

Client Matrix: Water

Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-268193	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	030118_08.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/01/2018 1533			Final Weight/Volume:	5 mL
Prep Date:	03/01/2018 1533				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	96		80 - 141
Dibromofluoromethane (Surr)	100	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-EB01-021918

Lab Sample ID: 580-75281-2

Client Matrix: Water

Date Sampled: 02/19/2018 1645

Date Received: 02/23/2018 0955

2

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-268193	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 030118_09.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 03/01/2018 1556		Final Weight/Volume: 5 mL
Prep Date: 03/01/2018 1556		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	98		80 - 141
Dibromofluoromethane (Surr)	99	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-MW-13-0218

3

Lab Sample ID: 580-75281-3

Date Sampled: 02/20/2018 1110

Client Matrix: Water

Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-268193	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	030118_10.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/01/2018 1620			Final Weight/Volume:	5 mL
Prep Date:	03/01/2018 1620				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	98		80 - 141
Dibromofluoromethane (Surr)	100	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-RW17-0218

Lab Sample ID: 580-75281-4

Client Matrix: Water

Date Sampled: 02/20/2018 1340

Date Received: 02/23/2018 0955

4

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-268193	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	030118_11.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/01/2018 1644			Final Weight/Volume:	5 mL
Prep Date:	03/01/2018 1644				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	97		80 - 141
Dibromofluoromethane (Surr)	100	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

5

Client Sample ID: WI-A06-RW17P-0218

Lab Sample ID: 580-75281-5

Date Sampled: 02/20/2018 1345

Client Matrix: Water

Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-268193	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	030118_12.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/01/2018 1708			Final Weight/Volume:	5 mL
Prep Date:	03/01/2018 1708				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	97		80 - 141
Dibromofluoromethane (Surr)	100	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-DW-38A-0218

6

Lab Sample ID: 580-75281-6
Client Matrix: Water

Date Sampled: 02/20/2018 1455
Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-268193	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	030118_13.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/01/2018 1731			Final Weight/Volume:	5 mL
Prep Date:	03/01/2018 1731				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	98		80 - 141
Dibromofluoromethane (Surr)	101	<i>N</i>	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-6-S-27-0218

7

Lab Sample ID: 580-75281-7

Date Sampled: 02/21/2018 1115

Client Matrix: Water

Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Analysis Batch: 580-268193 Instrument ID: TAC036
Prep Method: 5030B Prep Batch: N/A Lab File ID: 030118_14.D
Dilution: 1.0 Initial Weight/Volume: 5 mL
Analysis Date: 03/01/2018 1755 Final Weight/Volume: 5 mL
Prep Date: 03/01/2018 1755

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	97		80 - 141
Dibromofluoromethane (Surr)	100	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06--6-S-28-0218

8

Lab Sample ID: 580-75281-8

Date Sampled: 02/21/2018 1115

Client Matrix: Water

Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-268193	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 030118_15.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 03/01/2018 1818		Final Weight/Volume: 5 mL
Prep Date: 03/01/2018 1818		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	98		80 - 141
Dibromofluoromethane (Surr)	98	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-FB01-022118

9

Lab Sample ID: 580-75281-9

Date Sampled: 02/21/2018 1500

Client Matrix: Water

Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-268193	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 030118_16.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 03/01/2018 1842		Final Weight/Volume: 5 mL
Prep Date: 03/01/2018 1842		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	96		80 - 141
Dibromofluoromethane (Surr)	99	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-MW-01-0218

10

Lab Sample ID: 580-75281-10

Date Sampled: 02/21/2018 1510

Client Matrix: Water

Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-268193	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 030118_17.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 03/01/2018 1906		Final Weight/Volume: 5 mL
Prep Date: 03/01/2018 1906		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	99		80 - 141
Dibromofluoromethane (Surr)	99	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-EB01-0218

Lab Sample ID: 580-75281-11

Client Matrix: Water

Date Sampled: 02/21/2018 1650

Date Received: 02/23/2018 0955

||

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-268193	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	030118_18.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/01/2018 1929			Final Weight/Volume:	5 mL
Prep Date:	03/01/2018 1929				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	98		80 - 141
Dibromofluoromethane (Surr)	101	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-EB01-021918

2

Lab Sample ID: 580-75281-2

Date Sampled: 02/19/2018 1645

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268070	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-267977	Lab File ID:	022728a006.D
Dilution:	1.0			Initial Weight/Volume:	979 mL
Analysis Date:	02/27/2018 1650			Final Weight/Volume:	2 mL
Prep Date:	02/26/2018 1348			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.031	U	0.011	0.10

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	90		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-MW-13-0218

3

Lab Sample ID: 580-75281-3

Date Sampled: 02/20/2018 1110

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM	Analysis Batch: 580-268070	Instrument ID: TAC050
Prep Method: 3520C	Prep Batch: 580-267977	Lab File ID: 022728a007.D
Dilution: 1.0		Initial Weight/Volume: 977.2 mL
Analysis Date: 02/27/2018 1712		Final Weight/Volume: 2 mL
Prep Date: 02/26/2018 1348		Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.031	U ↓	0.011	0.10

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	70		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-RW17-0218

4

Lab Sample ID: 580-75281-4

Date Sampled: 02/20/2018 1340

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268070	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-267977	Lab File ID:	022728a010.D
Dilution:	1.0			Initial Weight/Volume:	1003.5 mL
Analysis Date:	02/27/2018 1819			Final Weight/Volume:	2 mL
Prep Date:	02/26/2018 1348			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.030	U	0.011	0.10

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	92		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

5

Client Sample ID: WI-A06-RW17P-0218

Lab Sample ID: 580-75281-5

Date Sampled: 02/20/2018 1345

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268070	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-267977	Lab File ID:	022728a011.D
Dilution:	1.0			Initial Weight/Volume:	969.4 mL
Analysis Date:	02/27/2018 1841			Final Weight/Volume:	2 mL
Prep Date:	02/26/2018 1348			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.031	U	0.011	0.10

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	100		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-DW-38A-0218

6

Lab Sample ID: 580-75281-6

Date Sampled: 02/20/2018 1455

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM	Analysis Batch: 580-268070	Instrument ID: TAC050
Prep Method: 3520C	Prep Batch: 580-267977	Lab File ID: 022728a012.D
Dilution: 1.0		Initial Weight/Volume: 994.9 mL
Analysis Date: 02/27/2018 1903		Final Weight/Volume: 2 mL
Prep Date: 02/26/2018 1348		Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	1.7		0.011	0.10

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	96		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-6-S-27-0218

7

Lab Sample ID: 580-75281-7

Date Sampled: 02/21/2018 1115

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268070	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-267977	Lab File ID:	022728a013.D
Dilution:	1.0			Initial Weight/Volume:	1032.1 mL
Analysis Date:	02/27/2018 1925			Final Weight/Volume:	2 mL
Prep Date:	02/26/2018 1348			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.011	0.097

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	91		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

8

Client Sample ID: WI-A06--6-S-28-0218

Lab Sample ID: 580-75281-8

Date Sampled: 02/21/2018 1115

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268070	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-267977	Lab File ID:	022728a014.D
Dilution:	1.0			Initial Weight/Volume:	1035.9 mL
Analysis Date:	02/27/2018 1947			Final Weight/Volume:	2 mL
Prep Date:	02/26/2018 1348			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.011	0.097

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	78		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-FB01-022118

9

Lab Sample ID: 580-75281-9

Date Sampled: 02/21/2018 1500

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268070	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-267977	Lab File ID:	022728a015.D
Dilution:	1.0			Initial Weight/Volume:	989.4 mL
Analysis Date:	02/27/2018 2009			Final Weight/Volume:	2 mL
Prep Date:	02/26/2018 1348			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.030	U	0.011	0.10
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	98		53 - 106	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-MW-01-0218

10

Lab Sample ID: 580-75281-10

Date Sampled: 02/21/2018 1510

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-268070	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-267977	Lab File ID:	022728a016.D
Dilution:	1.0			Initial Weight/Volume:	1054.7 mL
Analysis Date:	02/27/2018 2031			Final Weight/Volume:	2 mL
Prep Date:	02/26/2018 1348			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.028	U	0.010	0.095

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	98		53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID: WI-A06-EB01-0218

||

Lab Sample ID: 580-75281-11

Date Sampled: 02/21/2018 1650

Client Matrix: Water

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM	Analysis Batch: 580-268070	Instrument ID: TAC050
Prep Method: 3520C	Prep Batch: 580-267977	Lab File ID: 022728a017.D
Dilution: 1.0		Initial Weight/Volume: 992.8 mL
Analysis Date: 02/27/2018 2053		Final Weight/Volume: 2 mL
Prep Date: 02/26/2018 1348		Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.030	U	0.011	0.10
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	88		53 - 106	

ms 5/24/18

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 1800362
Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
Date: May 12, 2018

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW17-0218	1800362-01	Water
2	WI-A06-RW17P-0218	1800362-02	Water
3	WI-A06-FB02-022018	1800362-03	Water

A full data validation was performed on the analytical data for two water samples and one aqueous field blank sample collected on February 20, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)".

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination

- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB02-022018	PFHxA	0.689	None	All ND

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

PFCs				
Compound	WI-A06-RW17-0218 ng/L	WI-A06-RW17P-0218 ng/L	RPD	Qualifier
None	ND	ND	-	-

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: *Nancy Weaver* Dated: 5/15/18
 Nancy Weaver
 Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-RW17-0218						EPA Method 537					
Client Data					Laboratory Data						
Name:	CH2M Hill	Matrix:	Drinking Water			Lab Sample:	1800362-01	Column:	BEH C18		
Project:	NASWI Area 6	Date Collected:	20-Feb-18 13:40			Date Received:	23-Feb-18 09:35				
Location:	AREA 6										
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	0.398	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1	
PFHxA	ND	0.596	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1	
PFHpA	ND	0.479	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1	
PFHxS	ND	0.373	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1	
PFOA	ND	0.971	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1	
PFNA	ND	1.29	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1	
PFOS	ND	0.935	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1	
PFDA	ND	1.15	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1	
MeFOSAA	ND	2.73	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1	
EtFOSAA	ND	1.74	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1	
PFUnA	ND	0.229	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1	
PFDoA	ND	0.856	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1	
PFTTrDA	ND	0.848	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1	
PFTeDA	ND	0.699	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1	
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C2-PFHxA	SURR	96.9	70 - 130		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1		
13C2-PFDA	SURR	84.3	70 - 130		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1		
d5-EtFOSAA	SURR	101	70 - 130		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1		

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

nw 5/12/18

Sample ID: WI-A06-RW17P-0218					EPA Method 537						
Client Data					Laboratory Data						
Name:	CH2M Hill	Matrix:	Drinking Water		Lab Sample:	1800362-02	Column:	BEH C18			
Project:	NASWI Area 6	Date Collected:	20-Feb-18 13:45		Date Received:	23-Feb-18 09:35					
Location:	AREA 6										
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	0.400	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1	
PFHxA	ND	0.598	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1	
PFHpA	ND	0.481	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1	
PFHxS	ND	0.374	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1	
PFOA	ND	0.974	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1	
PFNA	ND	1.30	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1	
PFOS	ND	0.938	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1	
PFDA	ND	1.15	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1	
MeFOSAA	ND	2.74	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1	
EtFOSAA	ND	1.74	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1	
PFUnA	ND	0.230	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1	
PFDoA	ND	0.859	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1	
PFTTrDA	ND	0.851	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1	
PFTeDA	ND	0.701	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	88.1	70 - 130			B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1	
13C2-PFDA	SURR	77.3	70 - 130			B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1	
d5-EtFOSAA	SURR	99.7	70 - 130			B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1	

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

21.2.18

Sample ID: WI-A06-FB02-022018							EPA Method 537				
Client Data				Laboratory Data							
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800362-03	Column:	BEH C18				
Project:	NASWI Area 6	Date Collected:	20-Feb-18 13:50	Date Received:	23-Feb-18 09:35						
Location:	AREA 6										
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	0.415	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFHxA	0.689	0.621	4.68	9.37	J	B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFHpA	ND	0.500	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFHxS	ND	0.389	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFOA	ND	1.01	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFNA	ND	1.35	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFOS	ND	0.975	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFDA	ND	1.20	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
MeFOSAA	ND	2.85	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
EtFOSAA	ND	1.81	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFUnA	ND	0.239	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFDoA	ND	0.892	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFTTrDA	ND	0.884	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFTeDA	ND	0.728	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	93.1	70 - 130			B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
13C2-PFDA	SURR	86.2	70 - 130			B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
d5-EtFOSAA	SURR	89.1	70 - 130			B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

5/12/18

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 580-76760-1
Laboratory: Test America Laboratories, Tacoma, Washington
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
Date: June 4, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW18-0418	580-76760-1	Water
2	WI-A06-RW18P-0418	580-76760-2	Water
3	WI-A06-RW20-0418	580-76760-3	Water
4*	WI-A06-TB01-042018	580-76760-4	Water

* - VOC only

A full data validation was performed on the analytical data for three water samples and one aqueous trip blank sample collected on April 20, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

VOC (Vinyl Chloride)
SVOC (1,4-Dioxane)

Method References

USEPA SW-846 Method 8260C SIM
USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries

- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

- All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-TB01-042018	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate recoveries.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below.

Compound	WI-A06-RW18-0418 ug/L	WI-A06-RW18P-0418 ug/L	RPD	Qualifier
Vinyl Chloride	0.014	0.040U	NC	None

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC samples were not analyzed.

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	WI-A06-RW18-0418 ug/L	WI-A06-RW18P-0418 ug/L	RPD	Qualifier
1,4-Dioxane	0.10	0.11	10%	None

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 6/5/18
Nancy Weaver
Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-76760-1

Client Sample ID: WI-A06-RW18-0418

Lab Sample ID: 580-76760-1

Date Sampled: 04/20/2018 1027

Client Matrix: Water

Date Received: 04/21/2018 0930

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-272188	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	042518_08.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	04/25/2018 1105			Final Weight/Volume:	5 mL
Prep Date:	04/25/2018 1105				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.014	J	0.013	0.50
Surrogate	%Rec	Qualifier	Acceptance Limits	
Trifluorotoluene (Surr)	100		80 - 141	
Dibromofluoromethane (Surr)	97	M	77 - 118	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-76760-1

2

Client Sample ID: WI-A06-RW18P-0418

Lab Sample ID: 580-76760-2

Date Sampled: 04/20/2018 1030

Client Matrix: Water

Date Received: 04/21/2018 0930

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-272188	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	042518_09.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	04/25/2018 1129			Final Weight/Volume:	5 mL
Prep Date:	04/25/2018 1129				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	UM	0.013	0.50
Surrogate	%Rec	Qualifier	Acceptance Limits	
Trifluorotoluene (Surr)	101		80 - 141	
Dibromofluoromethane (Surr)	99	M	77 - 118	

RW 614118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-76760-1

3

Client Sample ID: WI-A06-RW20-0418

Lab Sample ID: 580-76760-3

Date Sampled: 04/20/2018 1010

Client Matrix: Water

Date Received: 04/21/2018 0930

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-272188	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	042518_10.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	04/25/2018 1152			Final Weight/Volume:	5 mL
Prep Date:	04/25/2018 1152				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U M	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	101		80 - 141
Dibromofluoromethane (Surr)	97	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-76760-1

4

Client Sample ID: WI-A06-TB01-042018

Lab Sample ID: 580-76760-4

Date Sampled: 04/20/2018 1000

Client Matrix: Water

Date Received: 04/21/2018 0930

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-272188	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	042518_11.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	04/25/2018 1215			Final Weight/Volume:	5 mL
Prep Date:	04/25/2018 1215				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U M	0.013	0.50
Surrogate	%Rec	Qualifier	Acceptance Limits	
Trifluorotoluene (Surr)	101		80 - 141	
Dibromofluoromethane (Surr)	99	M	77 - 118	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-76760-1

Client Sample ID: WI-A06-RW18-0418

Lab Sample ID: 580-76760-1

Date Sampled: 04/20/2018 1027

Client Matrix: Water

Date Received: 04/21/2018 0930

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM	Analysis Batch: 580-272379	Instrument ID: TAC050
Prep Method: 3520C	Prep Batch: 580-272131	Lab File ID: 042618a024.D
Dilution: 1.0		Initial Weight/Volume: 1016.3 mL
Analysis Date: 04/27/2018 0032		Final Weight/Volume: 2 mL
Prep Date: 04/24/2018 1408		Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.10	M	0.011	0.098
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	77	M	53 - 106	

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-76760-1

2

Client Sample ID: WI-A06-RW18P-0418

Lab Sample ID: 580-76760-2

Date Sampled: 04/20/2018 1030

Client Matrix: Water

Date Received: 04/21/2018 0930

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM	Analysis Batch: 580-272379	Instrument ID: TAC050
Prep Method: 3520C	Prep Batch: 580-272131	Lab File ID: 042618a025.D
Dilution: 1.0		Initial Weight/Volume: 997.8 mL
Analysis Date: 04/27/2018 0054		Final Weight/Volume: 2 mL
Prep Date: 04/24/2018 1408		Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.11	M	0.011	0.10

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	81	M	53 - 106

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-76760-1

3

Client Sample ID: WI-A06-RW20-0418

Lab Sample ID: 580-76760-3

Date Sampled: 04/20/2018 1010

Client Matrix: Water

Date Received: 04/21/2018 0930

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-272379	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-272131	Lab File ID:	042618a026.D
Dilution:	1.0			Initial Weight/Volume:	1034.1 mL
Analysis Date:	04/27/2018 0117			Final Weight/Volume:	2 mL
Prep Date:	04/24/2018 1408			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.11	M	0.011	0.097

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	74	M	53 - 106

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 1800728
Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
Date: June 4, 2018

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW18-0418	1800728-01	Water
2	WI-A06-RW18P-0418	1800728-02	Water
3	WI-A06-FB18-0418	1800728-03	Water
4	WI-A06-RW20-0418	1800728-04	Water
5	WI-A06-FB20-0418	1800728-05	Water

A full data validation was performed on the analytical data for three water samples and two aqueous field blank samples collected on April 20, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the EPA Method “Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)”.

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537 Rev 1.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA “Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review,” January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning

- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB18-0418	None - ND	-	-	-
WI-A06-FB20-0418	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria except for the following.

EDS Sample ID	Compound	%R	Qualifier	Affected Samples
1	d5-EtFOSAA	68.7%	UJ	Associated Compounds

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

PFCs				
Compound	WI-A06-RW18-0418 ng/L	WI-A06-RW18P-0418 ng/L	RPD	Qualifier
PFBS	22.6	20.5	10%	None
PFHxA	26.1	29.3	12%	
PFHpA	9.21	11.3	20%	
PFHxS	135	125	8%	
PFOA	29.1	30.6	5%	
PFNA	ND	1.59	NC	
PFOS	44.7	43.0	4%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver
Nancy Weaver
Senior Chemist

Dated: 6/5/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-RW18-0418 **EPA Method 537**

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800728-01	Column:	BEH C18
Project:	CTO-4041 695610.06.FLFS	Date Collected:	20-Apr-18 10:27	Date Received:	21-Apr-18 09:38		
Location:	DW						

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	22.6	0.428	4.83	9.67		B8D0148	27-Apr-18	0.259 L	03-May-18 00:55	1
PFHxA	26.1	0.842	4.83	9.67		B8D0148	27-Apr-18	0.259 L	03-May-18 00:55	1
PFHpA	9.21	0.515	4.83	9.67	J	B8D0148	27-Apr-18	0.259 L	03-May-18 00:55	1
PFHxS	135	0.401	4.83	9.67		B8D0148	27-Apr-18	0.259 L	03-May-18 00:55	1
PFOA	29.1	1.04	4.83	9.67		B8D0148	27-Apr-18	0.259 L	03-May-18 00:55	1
PFNA	ND	1.39	4.83	9.67		B8D0148	27-Apr-18	0.259 L	03-May-18 00:55	1
PFOS	44.7	1.01	4.83	9.67		B8D0148	27-Apr-18	0.259 L	03-May-18 00:55	1
PFDA	ND	1.24	4.83	9.67		B8D0148	27-Apr-18	0.259 L	03-May-18 00:55	1
MeFOSAA	ND	2.94	4.83	9.67		B8D0148	27-Apr-18	0.259 L	03-May-18 00:55	1
EtFOSAA	ND 1.87	1.87	4.83	9.67		B8D0148	27-Apr-18	0.259 L	03-May-18 00:55	1
PFUnA	ND	0.247	4.83	9.67		B8D0148	27-Apr-18	0.259 L	03-May-18 00:55	1
PFDoA	ND	0.921	4.83	9.67		B8D0148	27-Apr-18	0.259 L	03-May-18 00:55	1
PFTTrDA	ND	0.912	4.83	9.67		B8D0148	27-Apr-18	0.259 L	03-May-18 00:55	1
PFTeDA	ND	0.751	4.83	9.67		B8D0148	27-Apr-18	0.259 L	03-May-18 00:55	1
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	87.9	70 - 130		B8D0148	27-Apr-18	0.259 L	03-May-18 00:55	1	
13C2-PFDA	SURR	86.8	70 - 130		B8D0148	27-Apr-18	0.259 L	03-May-18 00:55	1	
d5-EtFOSAA	SURR	68.7	70 - 130	H	B8D0148	27-Apr-18	0.259 L	03-May-18 00:55	1	

DL - Detection Limit LOD - Limit of Detection LCL-UCL- Lower control limit - upper control limit When reported, PFHxS, PFOA and PFOS include both linear and branched isomers
 LOQ - Limit of quantitation Results reported to the DL. Only the linear isomer is reported for all other analytes

nw614118

Sample ID: WI-A06-RW18P-0418										EPA Method 537		
Client Data					Laboratory Data							
Name:	CH2M Hill			Matrix:	Drinking Water		Lab Sample:	1800728-02		Column:	BEH C18	
Project:	CTO-4041 695610.06.FLFS			Date Collected:	20-Apr-18 10:30		Date Received:	21-Apr-18 09:38				
Location:	DW											
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
PFBS	20.5	0.431	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1		
PFHxA	29.3	0.847	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1		
PFHpA	11.3	0.518	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1		
PFHxS	125	0.404	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1		
PFOA	30.6	1.05	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1		
PFNA	1.59	1.40	4.86	9.73	J	B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1		
PFOS	43.0	1.01	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1		
PFDA	ND	1.24	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1		
MeFOSAA	ND	2.96	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1		
EtFOSAA	ND	1.88	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1		
PFUnA	ND	0.248	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1		
PFDoA	ND	0.926	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1		
PFTTrDA	ND	0.917	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1		
PFTeDA	ND	0.756	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1		
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution			
13C2-PFHxA	SURR	111	70 - 130		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1			
13C2-PFDA	SURR	98.6	70 - 130		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1			
d5-EtFOSAA	SURR	76.2	70 - 130		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1			

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitationLCL-UCL - Lower control limit - upper control limit
Results reported to the DLWhen reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

NW 14.8

Sample ID: WI-A06-FB18-0418					EPA Method 537						
Client Data					Laboratory Data						
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800728-03	Column:	BEH C18				
Project:	CTO-4041 695610.06.FLFS	Date Collected:	20-Apr-18 10:27	Date Received:	21-Apr-18 09:38						
Location:	DW										
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	ND	0.415	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1	
PFHxA	ND	0.815	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1	
PFHpA	ND	0.499	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1	
PFHxS	ND	0.388	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1	
PFOA	ND	1.01	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1	
PFNA	ND	1.35	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1	
PFOS	ND	0.974	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1	
PFDA	ND	1.20	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1	
MeFOSAA	ND	2.85	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1	
EtFOSAA	ND	1.81	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1	
PFUnA	ND	0.239	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1	
PFDoA	ND	0.891	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1	
PFTTrDA	ND	0.883	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1	
PFTeDA	ND	0.727	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1	
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C2-PFHxA	SURR	97.0	70 - 130		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1		
13C2-PFDA	SURR	101	70 - 130		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1		
d5-EtFOSAA	SURR	82.9	70 - 130		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1		

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

new 6141.8

Sample ID: WI-A06-RW20-0418					EPA Method 537						
Client Data					Laboratory Data						
Name:	CH2M Hill	Matrix:	Drinking Water		Lab Sample:	1800728-04	Column:	BEH C18			
Project:	CTO-4041 695610.06.FLFS	Date Collected:	20-Apr-18 10:10		Date Received:	21-Apr-18 09:38					
Location:	DW										
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	20.0	0.429	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1	
PFHxA	19.1	0.843	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1	
PFHpA	3.33	0.516	4.84	9.68	J	B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1	
PFHxS	118	0.402	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1	
PFOA	43.7	1.05	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1	
PFNA	ND	1.39	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1	
PFOS	30.5	1.01	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1	
PFDA	ND	1.24	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1	
MeFOSAA	ND	2.94	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1	
EtFOSAA	ND	1.87	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1	
PFUnA	ND	0.247	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1	
PFDoA	ND	0.922	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1	
PFTTrDA	ND	0.913	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1	
PFTeDA	ND	0.752	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	91.9	70 - 130			B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1	
13C2-PFDA	SURR	101	70 - 130			B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1	
d5-EtFOSAA	SURR	82.3	70 - 130			B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1	

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL- Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

new 6/4/18

Sample ID: W1-A06-FB20-0418						EPA Method 537				
Client Data					Laboratory Data					
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800728-05	Column:	BEH C18			
Project:	CTO-4041 695610.06.FLFS	Date Collected:	20-Apr-18 10:10	Date Received:	21-Apr-18 09:38					
Location:	DW									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	0.412	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFHxA	ND	0.811	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFHpA	ND	0.496	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFHxS	ND	0.386	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFOA	ND	1.01	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFNA	ND	1.34	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFOS	ND	0.968	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFDA	ND	1.19	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
MeFOSAA	ND	2.83	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
EtFOSAA	ND	1.80	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFUnA	ND	0.237	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFDoA	ND	0.886	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFTrDA	ND	0.878	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFTeDA	ND	0.723	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	96.0	70 - 130		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1	
13C2-PFDA	SURR	83.4	70 - 130		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1	
d5-EtFOSAA	SURR	87.9	70 - 130		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1	

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL - Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

new 6/4/18

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 580-76250-1
Laboratory: Test America Laboratories, Tacoma, Washington
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
Date: June 4, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW19-0318	580-76250-1	Water
1MS	WI-A06-RW19-0318MS	580-76250-1MS	Water
1MSD	WI-A06-RW19-0318MSD	580-76250-1MSD	Water
2*	WI-A06-TB01-032818	580-76250-2	Water

* - VOC only

A full data validation was performed on the analytical data for one water sample and one aqueous trip blank sample collected on March 28, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

VOC (Vinyl Chloride)
SVOC (1,4-Dioxane)

Method References

USEPA SW-846 Method 8260C SIM
USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries

- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

- All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-TB01-032818	Vinyl Chloride	0.018	U	1

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate recoveries.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD sample exhibited acceptable percent recoveries (%R) and RPD values.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC samples were not analyzed.

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD sample exhibited acceptable percent recoveries (%R) and RPD values.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver
Nancy Weaver
Senior Chemist

Dated: 6/5/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-76250-1

Client Sample ID: WI-A06-RW19-0318

Lab Sample ID: 580-76250-1

Date Sampled: 03/28/2018 1325

Client Matrix: Water

Date Received: 04/03/2018 0945

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM	Analysis Batch: 580-270777	Instrument ID: TAC036
Prep Method: 5030B	Prep Batch: N/A	Lab File ID: 040518_08.D
Dilution: 1.0		Initial Weight/Volume: 5 mL
Analysis Date: 04/05/2018 1824		Final Weight/Volume: 5 mL
Prep Date: 04/05/2018 1824		

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040 0.019 u	M	0.013	0.50 TBL

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	101		80 - 141
Dibromofluoromethane (Surr)	100	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-76250-1

Client Sample ID: WI-A06-TB01-032818

Lab Sample ID: 580-76250-2

Date Sampled: 03/28/2018 1320

Client Matrix: Water

Date Received: 04/03/2018 0945

2

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	580-270777	Instrument ID:	TAC036
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	040518_11.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	04/05/2018 1935			Final Weight/Volume:	5 mL
Prep Date:	04/05/2018 1935				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.018	JM	0.013	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Trifluorotoluene (Surr)	101		80 - 141
Dibromofluoromethane (Surr)	99	M	77 - 118

Analytical Data

Client: CH2M Hill, Inc.

Job Number: 580-76250-1

Client Sample ID: WI-A06-RW19-0318

Lab Sample ID: 580-76250-1

Date Sampled: 03/28/2018 1325

Client Matrix: Water

Date Received: 04/03/2018 0945

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-270894	Instrument ID:	TAC050
Prep Method:	3520C	Prep Batch:	580-270601	Lab File ID:	040818a007.D
Dilution:	1.0			Initial Weight/Volume:	1023.1 mL
Analysis Date:	04/08/2018 1440			Final Weight/Volume:	2 mL
Prep Date:	04/04/2018 1255			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,4-Dioxane	0.029	U	0.011	0.098
Surrogate	%Rec	Qualifier	Acceptance Limits	
2-Fluorophenol	84		53 - 106	

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 1800600
Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
Date: June 4, 2018

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW19-0318	1800600-01	Water
1MS	WI-A06-RW19-0318MS	1800600-01MS	Water
1MSD	WI-A06-RW19-0318MSD	1800600-01MSD	Water
2	WI-A06-FB19-0318	1800600-02	Water

A full data validation was performed on the analytical data for one water sample, and one aqueous field blank sample collected on March 28, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the EPA Method “Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)”.

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA “Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review,” January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries

- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB19-0318	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD sample exhibited acceptable percent recoveries (%R) and RPD values except for the following.

EDS Sample ID	Compound	MS %R/MSD %R/RPD	Qualifier
1	PFHxS	OK/151%/53.4	J

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

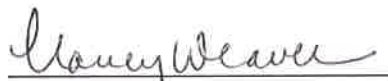
- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:



Nancy Weaver
Senior Chemist

Dated: 6/5/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-RW19-0318						EPA Method 537					
Client Data					Laboratory Data						
Name:	CH2M Hill		Matrix:	Drinking Water		Lab Sample:	1800600-01		Column:	BEH C18	
Project:	CTO-4041, Whidbey Island Area 6		Date Collected:	28-Mar-18 13:25		Date Received:	04-Apr-18 10:07				
Location:	DW										
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	64.7	0.444	5.02	10.0		B8D0033	05-Apr-18	0.249 L	07-Apr-18 21:26	1	
PFHxA	61.8	0.873	5.02	10.0		B8D0033	05-Apr-18	0.249 L	07-Apr-18 21:26	1	
PFHpA	33.4	0.534	5.02	10.0		B8D0033	05-Apr-18	0.249 L	07-Apr-18 21:26	1	
PFHxS	233 <i>J</i>	0.416	5.02	10.0		B8D0033	05-Apr-18	0.249 L	07-Apr-18 21:26	1	
PFOA	44.7	1.08	5.02	10.0		B8D0033	05-Apr-18	0.249 L	07-Apr-18 21:26	1	
PFNA	2.36	1.44	5.02	10.0	<i>J</i>	B8D0033	05-Apr-18	0.249 L	07-Apr-18 21:26	1	
PFOS	75.1	1.04	5.02	10.0		B8D0033	05-Apr-18	0.249 L	07-Apr-18 21:26	1	
PFDA	ND	1.28	5.02	10.0		B8D0033	05-Apr-18	0.249 L	07-Apr-18 21:26	1	
MeFOSAA	ND	3.05	5.02	10.0		B8D0033	05-Apr-18	0.249 L	08-Apr-18 19:11	1	
EtFOSAA	ND	1.93	5.02	10.0		B8D0033	05-Apr-18	0.249 L	08-Apr-18 19:11	1	
PFUnA	ND	0.256	5.02	10.0		B8D0033	05-Apr-18	0.249 L	07-Apr-18 21:26	1	
PFDoA	ND	0.954	5.02	10.0		B8D0033	05-Apr-18	0.249 L	07-Apr-18 21:26	1	
PFTTrDA	ND	0.945	5.02	10.0		B8D0033	05-Apr-18	0.249 L	07-Apr-18 21:26	1	
PFTeDA	ND	0.779	5.02	10.0		B8D0033	05-Apr-18	0.249 L	07-Apr-18 21:26	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	102	70 - 130			B8D0033	05-Apr-18	0.249 L	07-Apr-18 21:26	1	
13C2-PFDA	SURR	95.1	70 - 130			B8D0033	05-Apr-18	0.249 L	07-Apr-18 21:26	1	
d5-EtFOSAA	SURR	85.8	70 - 130			B8D0033	05-Apr-18	0.249 L	08-Apr-18 19:11	1	

MSH

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL - Lower control limit - upper control limit
Results reported to the DL

When reported: PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

nw 6/4/18

Sample ID: WI-A06-FB19-0318

EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1800600-02	Column:	BEH C18
Project:	CTO-4041, Whidbey Island Area 6	Date Collected:	28-Mar-18 13:25	Date Received:	04-Apr-18 10:07		
Location:	DW						

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	ND	0.428	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
PFHxA	ND	0.842	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
PFHpA	ND	0.515	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
PFHxS	ND	0.401	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
PFOA	ND	1.04	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
PFNA	ND	1.39	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
PFOS	ND	1.01	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
PFDA	ND	1.24	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
MeFOSAA	ND	2.94	4.83	9.67		B8D0033	05-Apr-18	0.259 L	08-Apr-18 19:22	1
EtFOSAA	ND	1.87	4.83	9.67		B8D0033	05-Apr-18	0.259 L	08-Apr-18 19:22	1
PFUnA	ND	0.247	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
PFDoA	ND	0.921	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
PFTTrDA	ND	0.912	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
PFTeDA	ND	0.751	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	98.1	70 - 130		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1	
13C2-PFDA	SURR	91.7	70 - 130		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1	
d5-EtFOSAA	SURR	98.2	70 - 130		B8D0033	05-Apr-18	0.259 L	08-Apr-18 19:22	1	

DL - Detection Limit

LOD - Limit of Detection

LCL-UCL- Lower control limit - upper control limit

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

LOQ - Limit of quantitation

Results reported to the DL.

Only the linear isomer is reported for all other analytes.

new 4/18

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 580-79924-1
Laboratory: Test America Laboratories, Tacoma, Washington
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
Date: October 28, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW21-0818	580-79924-1	Water
1MS	WI-A06-RW21-0818MS	580-79924-1MS	Water
1MSD	WI-A06-RW21-0818MSD	580-79924-1MSD	Water
2	WI-A06-RW21P-0818	580-79924-2	Water
3*	WI-A06-TB01-082718	580-79924-3	Water

* - VOC only

A full data validation was performed on the analytical data for two water samples and one aqueous trip blank sample collected on August 27, 2018 by CH2M HILL at the NAS Whidbey Island site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

VOC (Vinyl Chloride)
SVOC (1,4-Dioxane)

Method References

USEPA SW-846 Method 8260C SIM
USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning

- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

- All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-TB01-082718	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate recoveries.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

MS/MSD Sample	Compound	MS %R/MSD %R/RPD	Qualifier	Affected Samples
1	Vinyl Chloride	OK/OK/35	None	For RPD Alone

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	WI-A06-RW21-0818 ug/L	WI-A06-RW21P-0818 ug/L	RPD	Qualifier
None	ND	ND	-	-

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC samples were not analyzed.

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

MS/MSD Sample	Compound	MS %R/MSD %R/RPD	Qualifier	Affected Samples
1	1,4-Dioxane	OK/OK/29	None	For RPD Alone

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	WI-A06-RW21-0818 ug/L	WI-A06-RW21P-0818 ug/L	RPD	Qualifier
None	ND	ND	-	-

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 10/29/18
Nancy Weaver
Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle Job No.: 580-79924-1
 SDG No.: _____
 Client Sample ID: WI-A06-RW21-0818 Lab Sample ID: 580-79924-1
 Matrix: Water Lab File ID: 082918_16.D
 Analysis Method: 8260C SIM Date Collected: 08/27/2018 11:20
 Sample wt/vol: 5 (mL) Date Analyzed: 08/29/2018 21:23
 Soil Aliquot Vol: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 282817 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	113		80-120
1868-53-7	Dibromofluoromethane (Surr)	102		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

2

Lab Name: TestAmerica Seattle Job No.: 580-79924-1
 SDG No.: _____
 Client Sample ID: WI-A06-RW21P-0818 Lab Sample ID: 580-79924-2
 Matrix: Water Lab File ID: 082918_19.D
 Analysis Method: 8260C SIM Date Collected: 08/27/2018 11:20
 Sample wt/vol: 5(mL) Date Analyzed: 08/29/2018 22:32
 Soil Aliquot Vol: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 282817 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	113		80-120
1868-53-7	Dibromofluoromethane (Surr)	101		80-120

08/29/18

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

3

Lab Name: TestAmerica Seattle Job No.: 580-79924-1
 SDG No.: _____
 Client Sample ID: WI-A06-TB01-082718 Lab Sample ID: 580-79924-3
 Matrix: Water Lab File ID: 082918_20.D
 Analysis Method: 8260C SIM Date Collected: 08/27/2018 07:00
 Sample wt/vol: 5 (mL) Date Analyzed: 08/29/2018 22:55
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 282817 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	114		80-120
1868-53-7	Dibromofluoromethane (Surr)	104		80-120

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle Job No.: 580-79924-1
 SDG No.: _____
 Client Sample ID: WI-A06-RW21-0818 Lab Sample ID: 580-79924-1
 Matrix: Water Lab File ID: 0914B016.D
 Analysis Method: 8270D SIM Date Collected: 08/27/2018 11:20
 Extract. Method: 3520C Date Extracted: 08/30/2018 15:12
 Sample wt/vol: 982.3(mL) Date Analyzed: 09/15/2018 00:25
 Con. Extract Vol.: 2(mL) Dilution Factor: 1
 Injection Volume: 1(uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 284029 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.051	U /	0.20	0.037

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	62		53-106

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

2

Lab Name: TestAmerica Seattle Job No.: 580-79924-1
 SDG No.: _____
 Client Sample ID: WI-A06-RW21P-0818 Lab Sample ID: 580-79924-2
 Matrix: Water Lab File ID: 0914B019.D
 Analysis Method: 8270D SIM Date Collected: 08/27/2018 11:20
 Extract. Method: 3520C Date Extracted: 08/30/2018 15:12
 Sample wt/vol: 974.5(mL) Date Analyzed: 09/15/2018 01:38
 Con. Extract Vol.: 2(mL) Dilution Factor: 1
 Injection Volume: 1(uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 284029 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.051	U	0.21	0.037

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	56		53-106

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 1802795
 Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: October 26, 2018

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW21-0818	1802795-01	Water
1MS	WI-A06-RW21-0818MS	1802795-01MS	Water
1MSD	WI-A06-RW21-0818MSD	1802795-01MSD	Water
2	WI-A06-RW21P-0818	1802795-02	Water
3	WI-A06-FB21-082718	1802795-03	Water

A full data validation was performed on the analytical data for two water samples and one aqueous field blank sample collected on August 27, 2018 by CH2M Hill at the NAS Whidbey Island site in Washington. The samples were analyzed under the EPA Method “Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)”.

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537, Revision 1.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA “Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review,” January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning

- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB21-082718	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Laboratory Control Samples (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation


- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

PFCs				
Compound	WI-A06-RW21-0818 ng/L	WI-A06-RW21P-0818 ng/L	RPD	Qualifier
None	ND	ND	-	-

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: 
Nancy Weaver
Senior Chemist

Dated: 10/29/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-RW21-0818							EPA Method 537				
Client Data				Laboratory Data							
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1802795-01	Column:	BEH C18				
Project:	Navy Clean NASWI A6/CV DW	Date Collected:	27-Aug-18 11:20	Date Received:	29-Aug-18 09:40						
Location:	RW-21										
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFHxA	307-24-4	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFHpA	375-85-9	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFHxS	355-46-4	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFOA	335-67-1	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFNA	375-95-1	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFOS	1763-23-1	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFDA	335-76-2	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
MeFOSAA	2355-31-9	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
EtFOSAA	2991-50-6	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFUnA	2058-94-8	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFDoA	307-55-1	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFTTrDA	72629-94-8	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFTeDA	376-06-7	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	121	70 - 130			B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1	
13C2-PFDA	SURR	102	70 - 130			B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1	
d5-EtFOSAA	SURR	88.6	70 - 130			B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1	

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

NW10/26/18

Sample ID: WI-A06-RW21P-0818

EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1802795-02	Column:	BEH C18
Project:	Navy Clean NASWI A6/CV DW	Date Collected:	27-Aug-18 11:20	Date Received:	29-Aug-18 09:40		
Location:	RW-21						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.96	4.86	9.74		B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1
PFHxA	307-24-4	ND	2.96	4.86	9.74		B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1
PFHpA	375-85-9	ND	2.96	4.86	9.74		B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1
PFHxS	355-46-4	ND	2.96	4.86	9.74		B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1
PFOA	335-67-1	ND	2.96	4.86	9.74		B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1
PFNA	375-95-1	ND	2.96	4.86	9.74		B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1
PFOS	1763-23-1	ND	2.96	4.86	9.74		B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1
PFDA	335-76-2	ND	2.96	4.86	9.74		B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1
MeFOSAA	2355-31-9	ND	2.96	4.86	9.74		B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1
EtFOSAA	2991-50-6	ND	2.96	4.86	9.74		B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1
PFUnA	2058-94-8	ND	2.96	4.86	9.74		B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1
PFDoA	307-55-1	ND	2.96	4.86	9.74		B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1
PFTTrDA	72629-94-8	ND	2.96	4.86	9.74		B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1
PFTeDA	376-06-7	ND	2.96	4.86	9.74		B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	108	70 - 130			B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1	
13C2-PFDA	SURR	85.9	70 - 130			B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1	
d5-EtFOSAA	SURR	83.8	70 - 130			B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1	

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

new 10/26/18

Sample ID: WI-A06-FB21-082718

EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1802795-03	Column:	BEH C18
Project:	Navy Clean NASWI A6/CV DW	Date Collected:	27-Aug-18 11:20	Date Received:	29-Aug-18 09:40		
Location:	RW-21						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
PFHxA	307-24-4	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
PFHpA	375-85-9	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
PFHxS	355-46-4	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
PFOA	335-67-1	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
PFNA	375-95-1	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
PFOS	1763-23-1	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
PFDA	335-76-2	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
MeFOSAA	2355-31-9	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
EtFOSAA	2991-50-6	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
PFUnA	2058-94-8	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
PFDoA	307-55-1	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
PFTTrDA	72629-94-8	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
PFTeDA	376-06-7	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	101	70 - 130			B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1	
13C2-PFDA	SURR	89.9	70 - 130			B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1	
d5-EtFOSAA	SURR	81.8	70 - 130			B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1	

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

NEW 10/26/18

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 580-85553-1
Laboratory: Eurofins Test America Laboratories, Tacoma, Washington
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
Date: May 31, 2019

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW22-0419	580-85553-1	Water
1MS	WI-A06-RW22-0419MS	580-85553-1MS	Water
1MSD	WI-A06-RW22-0419MSD	580-85553-1MSD	Water
2	WI-A06-RW22P-0419	580-85553-2	Water

A full data validation was performed on the analytical data for two water samples collected on April 17, 2019 by CH2M HILL at the NAS Whidbey Island site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

SVOC (1,4-Dioxane)

Method References

USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries

- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-041719	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

MS/MSD Sample	Compound	MS %R/MSD %R/RPD	Qualifier	Affected Samples
1	1,4-Dioxane	OK/OK/37	None	None for RPD Alone

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

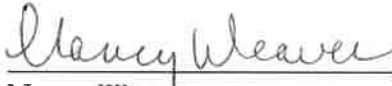
- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	WI-A06-RW22-0419 ug/L	WI-A06-RW22P-0419 ug/L	RPD	Qualifier
None	ND	ND	-	-

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:  Dated: 6/1/19
 Nancy Weaver
 Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

1

Lab Name: Eurofins TestAmerica, Seattle Job No.: 580-85553-1
 SDG No.: _____
 Client Sample ID: WI-A06-RW22-0419 Lab Sample ID: 580-85553-1
 Matrix: Water Lab File ID: adec042419a012.D
 Analysis Method: 8270D SIM Date Collected: 04/17/2019 16:35
 Extract. Method: 3520C Date Extracted: 04/22/2019 13:41
 Sample wt/vol: 1052.8(mL) Date Analyzed: 04/24/2019 14:40
 Con. Extract Vol.: 2(mL) Dilution Factor: 1
 Injection Volume: 1(uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 299286 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.047	U J	0.19	0.034

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	85	M	53-106

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

2

Lab Name: Eurofins TestAmerica, Seattle Job No.: 580-85553-1
 SDG No.: _____
 Client Sample ID: WI-A06-RW22P-0419 Lab Sample ID: 580-85553-2
 Matrix: Water Lab File ID: adec042419a015.D
 Analysis Method: 8270D SIM Date Collected: 04/17/2019 17:35
 Extract. Method: 3520C Date Extracted: 04/22/2019 13:41
 Sample wt/vol: 1047.8(mL) Date Analyzed: 04/24/2019 15:46
 Con. Extract Vol.: 2(mL) Dilution Factor: 1
 Injection Volume: 1(uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 299286 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.048	U	0.19	0.034

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	88	N	53-106

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 580-85578-1
 Laboratory: Eurofins Test America Laboratories, Tacoma, Washington
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: May 31, 2019

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-EB01-041719	580-85578-1	Water
1RE†	WI-A06-EB01-041719RE	580-85578-1RE	Water
2*	WI-A06-RW22-0419	580-85578-2	Water
2MS*	WI-A06-RW22-0419MS	580-85578-2MS	Water
2MSD*	WI-A06-RW22-0419MSD	580-85578-2MSD	Water
3*	WI-A06-RW22P-0419	580-85578-3	Water
4*	WI-A06-TB01-041719	580-85578-4	Water

* - VOC only † - SVOC only

A full data validation was performed on the analytical data for two water samples, one aqueous equipment blank sample and one aqueous trip blank sample collected on April 17, 2019 by CH2M HILL at the NAS Whidbey Island site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

VOC (Vinyl Chloride)
 SVOC (1,4-Dioxane)

Method References

USEPA SW-846 Method 8260C SIM
 USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were rejections of data. This data cannot be used in the decision-making process for this project.

- 1,4-Dioxane was rejected in one reanalysis sample due to grossly exceeded holding times. This result was not used for reporting purposes.

Overall the remaining data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

- All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria except for the following.

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
04/30/19 (1832)	Vinyl Chloride	31.5%	UJ	1, 2, 3, 4

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-041719	None - ND	-	-	-
WI-A06-TB01-041719	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate recoveries.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

MS/MSD Sample	Compound	MS %R/MSD %R/RPD	Qualifier	Affected Samples
1	Vinyl Chloride	OK/OK/20	None	None for RPD Alone

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	WI-A06-RW22-0419 ug/L	WI-A06-RW22P-0419 ug/L	RPD	Qualifier
None	ND	ND	-	-

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days except for the following.

EDS Sample ID	Date Sampled	Date Extracted	# of Days	Qualifier
1RE	04/17/19	05/16/19	29	R

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-041719	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R) except for the following.

EDS Sample ID	Surrogate	%R	Qualifier
1	2-Fluorophenol	849%	None - Sample ND

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R) except for the following.

LCS ID	Compound	%R	Qualifier	Affected Samples
580-299012/2-A	1,4-Dioxane	38%	UJ	1

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

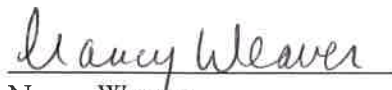
- EDS Sample 1 exhibited surrogate and LCS deficiencies and was re-extracted and reanalyzed. However, the re-extraction was grossly outside of holding times and this result was rejected. The original analysis result should be used for reporting purposes.

Field Duplicate Sample Precision

- Field duplicate samples were not analyzed for SVOC.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:



Nancy Weaver
Senior Chemist

Dated: 6/1/19

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

1

Lab Name: Eurofins TestAmerica, Seattle Job No.: 580-85578-1
 SDG No.: _____
 Client Sample ID: WI-A06-EB01-041719 Lab Sample ID: 580-85578-1
 Matrix: Water Lab File ID: 043019_0022.D
 Analysis Method: 8260C SIM Date Collected: 04/17/2019 18:30
 Sample wt/vol: 5(mL) Date Analyzed: 04/30/2019 19:42
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 299720 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.050	17 uJ	0.50	0.014

CCH

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	102		80-120
1868-53-7	Dibromofluoromethane (Surr)	84		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

2

Lab Name: Eurofins TestAmerica, Seattle Job No.: 580-85578-1
 SDG No.: _____
 Client Sample ID: WI-A06-RW22-0419 Lab Sample ID: 580-85578-2
 Matrix: Water Lab File ID: 043019_0023.D
 Analysis Method: 8260C SIM Date Collected: 04/17/2019 16:35
 Sample wt/vol: 5(mL) Date Analyzed: 04/30/2019 20:05
 Soil Aliquot Vol: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 299720 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.050	<u>1.1 / u</u>	0.50	0.014

ECH

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	100		80-120
1868-53-7	Dibromofluoromethane (Surr)	84		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

3

Lab Name: Eurofins TestAmerica, Seattle Job No.: 580-85578-1
 SDG No.: _____
 Client Sample ID: WI-A06-RW22P-0419 Lab Sample ID: 580-85578-3
 Matrix: Water Lab File ID: 043019_0026.D
 Analysis Method: 8260C SIM Date Collected: 04/17/2019 17:35
 Sample wt/vol: 5(mL) Date Analyzed: 04/30/2019 21:16
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 299720 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.050	<u>1 ug</u>	0.50	0.014

CCH

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	102		80-120
1868-53-7	Dibromofluoromethane (Surr)	84		80-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

4

Lab Name: Eurofins TestAmerica, Seattle Job No.: 580-85578-1
 SDG No.: _____
 Client Sample ID: WI-A06-TB01-041719 Lab Sample ID: 580-85578-4
 Matrix: Water Lab File ID: 043019_0027.D
 Analysis Method: 8260C SIM Date Collected: 04/17/2019 13:00
 Sample wt/vol: 5(mL) Date Analyzed: 04/30/2019 21:39
 Soil Aliquot Vol.: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-VRX ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 299720 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.050	<u>1/ug</u>	0.50	0.014

CUH

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	101		80-120
1868-53-7	Dibromofluoromethane (Surr)	85		80-120

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

1

Lab Name: Eurofins TestAmerica, Seattle Job No.: 580-85578-1
 SDG No.: _____
 Client Sample ID: WI-A06-EB01-041719 Lab Sample ID: 580-85578-1
 Matrix: Water Lab File ID: 050919a006.D
 Analysis Method: 8270D SIM Date Collected: 04/17/2019 18:30
 Extract. Method: 3520C Date Extracted: 04/21/2019 13:54
 Sample wt/vol: 1014.1(mL) Date Analyzed: 05/09/2019 11:59
 Con. Extract Vol.: 2(mL) Dilution Factor: 10
 Injection Volume: 1(uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 300287 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.49	0.0 uj	2.0	0.35

BSL

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	849	/	53-106

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

IRE

Lab Name: Eurofins TestAmerica, Seattle Job No.: 580-85578-1
 SDG No.: _____
 Client Sample ID: WI-A06-EB01-041719 RE Lab Sample ID: 580-85578-1 RE
 Matrix: Water Lab File ID: 052119a007.D
 Analysis Method: 8270D SIM Date Collected: 04/17/2019 18:30
 Extract. Method: 3520C Date Extracted: 05/16/2019 11:15
 Sample wt/vol: 1024.2(mL) Date Analyzed: 05/21/2019 12:33
 Con. Extract Vol.: 2(mL) Dilution Factor: 1
 Injection Volume: 1(uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 301164 Units: ug/L

Use original results

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.049	HT R	0.20	0.035

HT

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	65		53-106

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 1900794
 Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
 Site: NAS Whidbey Island, Area 06, CTO-4041, Washington
 Date: May 31, 2019

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW22-0419	1900794-01	Water
1MS	WI-A06-RW22-0419MS	1900794-01MS	Water
1MSD	WI-A06-RW22-0419MSD	1900794-01MSD	Water
2	WI-A06-RW22P-0419	1900794-02	Water
3	WI-A06-FB01-041719	1900794-03	Water
4	WI-A06-EB01-041719	1900794-04	Water

A full data validation was performed on the analytical data for two water samples, one aqueous field blank sample and one aqueous equipment blank sample collected on April 17, 2019 by CH2M Hill at the NAS Whidbey Island site in Washington. The samples were analyzed under the EPA Method “Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)”.

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537, Revision 1.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA Data Review and Validation Guidelines as follows:

- The USEPA “Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537,” November 2018;
- and the reviewer’s professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning

- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB01-041719	None - ND	-	-	-
WI-A06-EB01-041719	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Laboratory Control Samples (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

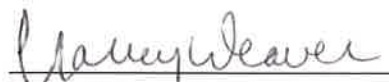
Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	WI-A06-RW22-0419 ng/L	WI-A06-RW22P-0419 ng/L	RPD	Qualifier
PFBS	12.8	12.2	5%	None
PFHxS	53.2	47.4	12%	
PFOA	7.72	8.07	4%	
PFOS	54.2	53.2	2%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:


Nancy Weaver
Senior Chemist

Dated: 6/1/19

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-RW22-0419

EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1900794-01	Column:	BEH C18
Project:	NASWI Drinking Water	Date Collected:	17-Apr-19 16:35	Date Received:	19-Apr-19 07:24		
Location:	Area 6-Coachman						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	12.8	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFHxA	307-24-4	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFHpA	375-85-9	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFHxS	355-46-4	53.2	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFOA	335-67-1	7.72	3.02	4.96	9.93	J	B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFNA	375-95-1	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFOS	1763-23-1	54.2	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFDA	335-76-2	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
MeFOSAA	2355-31-9	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
EtFOSAA	2991-50-6	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFOA	2058-94-8	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFDoA	307-55-1	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFTTrDA	72629-94-8	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFTeDA	376-06-7	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	87.1	70 - 130			B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1	
13C2-PFDA	SURR	86.1	70 - 130			B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1	
d5-EtFOSAA	SURR	78.5	70 - 130			B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1	

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

NW 5/31/19

Sample ID: WI-A06-RW22P-0419
EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1900794-02	Column:	BEH C18
Project:	NASWI Drinking Water	Date Collected:	17-Apr-19 17:35	Date Received:	19-Apr-19 07:24		
Location:	Area 6-Coachman						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	12.2	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFHxA	307-24-4	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFHpA	375-85-9	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFHxS	355-46-4	47.4	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFOA	335-67-1	8.07	2.96	4.86	9.72	J	B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFNA	375-95-1	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFOS	1763-23-1	53.2	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFDA	335-76-2	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
MeFOSAA	2355-31-9	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
EtFOSAA	2991-50-6	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFUnA	2058-94-8	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFDoA	307-55-1	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFTTrDA	72629-94-8	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFTeDA	376-06-7	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	82.9	70 - 130			B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1	
13C2-PFDA	SURR	84.6	70 - 130			B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1	
d5-EtFOSAA	SURR	83.2	70 - 130			B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1	

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

NW 5/31/19

Sample ID: WI-A06-FB01-041719

EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1900794-03	Column:	BEH C18
Project:	NASWI Drinking Water	Date Collected:	17-Apr-19 16:45	Date Received:	19-Apr-19 07:24		
Location:	Area 6-Coachman						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFHxA	307-24-4	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFHpA	375-85-9	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFHxS	355-46-4	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFOA	335-67-1	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFNA	375-95-1	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFOS	1763-23-1	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFDA	335-76-2	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
MeFOSAA	2355-31-9	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
EtFOSAA	2991-50-6	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFUnA	2058-94-8	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFDoA	307-55-1	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFTTrDA	72629-94-8	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFTeDA	376-06-7	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	88.6	70 - 130			B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1	
13C2-PFDA	SURR	91.9	70 - 130			B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1	
d5-EtFOSAA	SURR	88.4	70 - 130			B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1	

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes

NW 5/31/19

Sample ID: WI-A06-EB01-041719							EPA Method 537				
Client Data				Laboratory Data							
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1900794-04	Column:	BEH C18				
Project:	NASWI Drinking Water	Date Collected:	17-Apr-19 18:30	Date Received:	19-Apr-19 07:24						
Location:	Area 6-Coachman										
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFHxA	307-24-4	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFHpA	375-85-9	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFHxS	355-46-4	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFOA	335-67-1	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFNA	375-95-1	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFOS	1763-23-1	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFDA	335-76-2	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
MeFOSAA	2355-31-9	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
EtFOSAA	2991-50-6	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFUnA	2058-94-8	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFDoA	307-55-1	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFTTrDA	72629-94-8	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFTeDA	376-06-7	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	86.8	70 - 130			B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1	
13C2-PFDA	SURR	86.8	70 - 130			B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1	
d5-EtFOSAA	SURR	87.2	70 - 130			B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1	

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

new 5/31/19

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 580-79965-1
 Laboratory: Test America Laboratories, Tacoma, Washington
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: October 28, 2018

Metals			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW05-0818	580-79965-1	Water
1D	WI-A06-RW05-0818	580-79965-1	Water
2	WI-A06-RW18-0818	580-79965-2	Water
2D	WI-A06-RW18-0818	580-79965-2	Water

D - Dissolved Metals

A full data validation was performed on the analytical data for two water samples collected on August 29, 2018 by CH2M HILL at the NAS Whidbey Island site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions"

Specific method references are as follows:

Analysis

Metals (Total Iron)
 Metals (Dissolved)

Method References

USEPA SW-846 Method 6010C
 USEPA SW-846 Method 6010C

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Inorganic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Inorganic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Inorganics

- Holding times and sample preservation
- Inductively Coupled Plasma/Mass Spectrometry (ICP/MS) Tuning
- Initial and continuing calibration verifications

- Method blank and field QC blank contamination
- ICP Interference Check Sample
- Laboratory Control Sample (LCS) recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Duplicate Sample Analysis
- ICP Serial Dilution
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Metals (Total Iron/Dissolved Metals)

Holding Times

- All samples were prepared and analyzed within 180 days for all metals.

ICP/MS Tuning

- Not applicable.

Initial Calibration Verification

- All initial calibration criteria were met.

Continuing Calibration Verification

- All continuing calibration criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC samples were not analyzed for metals.

ICP Interference Check Sample

- The ICP interference check sample exhibited acceptable %R values.

Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)

- The LCS/LCSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Matrix Spike/Matrix Spike Duplicate Analysis

- MS/MSD samples were not analyzed.

Duplicate Sample Analysis

- Duplicate samples were not analyzed.

ICP Serial Dilution

- An ICP serial dilution was not analyzed.

Compound Quantitation

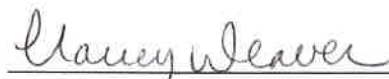
- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:



Nancy Weaver
Senior Chemist

Dated: 10/29/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

1A-IN
 INORGANIC ANALYSIS DATA SHEET
 METALS - TOTAL RECOVERABLE

Client Sample ID: WI-A06-RW05-0818

Lab Sample ID: 580-79965-1

Lab Name: TestAmerica Seattle

Job No.: 580-79965-1

SDG ID.: _____

Matrix: Water

Date Sampled: 08/29/2018 11:00

Reporting Basis: WET

Date Received: 08/30/2018 09:30

CAS No.	Analyte	Result	LOQ	DL	Units	C	Q	DIL	Method
7439-89-6	Iron	0.47	0.50	0.14	mg/L	U		1	6010C

NW10/2018

1A-IN
 INORGANIC ANALYSIS DATA SHEET
 METALS - DISSOLVED

10

Client Sample ID: WI-A06-RW05-0818

Lab Sample ID: 580-79965-1

Lab Name: TestAmerica Seattle

Job No.: 580-79965-1

SDG ID.: _____

Matrix: Water

Date Sampled: 08/29/2018 11:00

Reporting Basis: WET

Date Received: 08/30/2018 09:30

CAS No.	Analyte	Result	LOQ	DL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	0.44	1.5	0.11	mg/L	U		1	6010C
7440-70-2	Calcium	43	1.1	0.16	mg/L			1	6010C
7439-89-6	Iron	0.47	0.50	0.14	mg/L	U		1	6010C
7439-95-4	Magnesium	44	1.1	0.13	mg/L			1	6010C
7439-96-5	Manganese	0.0050	0.020	0.0017	mg/L	J		1	6010C
7440-09-7	Potassium	3.2	3.3	0.41	mg/L	J		1	6010C
7440-21-3	Silicon	17	1.1	0.063	mg/L			1	6010C

W10/28/18

1A-IN
 INORGANIC ANALYSIS DATA SHEET
 METALS - TOTAL RECOVERABLE

2

Client Sample ID: WI-A06-RW18-0818 Lab Sample ID: 580-79965-2
 Lab Name: TestAmerica Seattle Job No.: 580-79965-1
 SDG ID.: _____
 Matrix: Water Date Sampled: 08/29/2018 13:25
 Reporting Basis: WET Date Received: 08/30/2018 09:30

CAS No.	Analyte	Result	LOQ	DL	Units	C	Q	DIL	Method
7439-89-6	Iron	0.49	0.50	0.14	mg/L	J		1	6010C

1A-IN
 INORGANIC ANALYSIS DATA SHEET
 METALS - DISSOLVED

2D

Client Sample ID: WI-A06-RW18-0818

Lab Sample ID: 580-79965-2

Lab Name: TestAmerica Seattle

Job No.: 580-79965-1

SDG ID.: _____

Matrix: Water

Date Sampled: 08/29/2018 13:25

Reporting Basis: WET

Date Received: 08/30/2018 09:30

CAS No.	Analyte	Result	LOQ	DL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	0.44	1.5	0.11	mg/L	U		1	6010C
7440-70-2	Calcium	39	1.1	0.16	mg/L			1	6010C
7439-89-6	Iron	0.47	0.50	0.14	mg/L	U		1	6010C
7439-95-4	Magnesium	45	1.1	0.13	mg/L			1	6010C
7439-96-5	Manganese	0.081	0.020	0.0017	mg/L			1	6010C
7440-09-7	Potassium	3.5	3.3	0.41	mg/L			1	6010C
7440-21-3	Silicon	13	1.1	0.063	mg/L			1	6010C

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 1802843
Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
Date: October 26, 2018

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW05-0818	1802843-01	Water
2	WI-A06-FB05-0818	1802843-02	Water
3	WI-A06-RW18-0818	1802843-03	Water
4	WI-A06-FB18-0818	1802843-04	Water
5	WI-A06-RW20-0818	1802843-05	Water
6	WI-A06-FB20-0818	1802843-06	Water

A full data validation was performed on the analytical data for three water samples and three aqueous field blank samples collected on August 29-30, 2018 by CH2M Hill at the NAS Whidbey Island site in Washington. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)".

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537, Revision 1.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times

- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB05-0818	None - ND	-	-	-
WI-A06-FB18-0818	None - ND	-	-	-
WI-A06-FB20-0818	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Laboratory Control Samples (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation


- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:


Nancy Weaver
Senior Chemist

Dated: 10/29/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-RW05-0818							EPA Method 537					
Client Data					Laboratory Data							
Name:	CH2M Hill		Matrix:	Drinking Water		Lab Sample:	1802843-01		Column:	BEH C18		
Project:	Navy CLEAN NASWI A6 Off-Base DW		Date Collected:	29-Aug-18 11:00		Date Received:	01-Sep-18 09:40					
Location:	RW-05											
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	375-73-5	26.2	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	1	
PFHxA	307-24-4	37.5	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	1	
PFHpA	375-85-9	16.2	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	1	
PFHxS	355-46-4	200	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	1	
PFOA	335-67-1	55.4	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	1	
PFNA	375-95-1	ND	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	1	
PFOS	1763-23-1	95.3	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	1	
PFDA	335-76-2	ND	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	1	
MeFOSAA	2355-31-9	ND	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	1	
EtFOSAA	2991-50-6	ND	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	1	
PFUnA	2058-94-8	ND	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	1	
PFDaA	307-55-1	ND	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	1	
PFTrDA	72629-94-8	ND	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	1	
PFTeDA	376-06-7	ND	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C2-PFHxA	SURR	115	70 - 130			B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	1		
13C2-PFDA	SURR	107	70 - 130			B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	1		
d5-EtFOSAA	SURR	84.5	70 - 130			B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	1		

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

RW 10/26/18

Sample ID: WI-A06-FB05-0818							EPA Method 537					
Client Data					Laboratory Data							
Name:	CH2M Hill	Matrix:	Aqueous		Lab Sample:	1802843-02	Column:	BEH C18				
Project:	Navy CLEAN NASWI A6 Off-Base DW	Date Collected:	29-Aug-18 11:05		Date Received:	01-Sep-18 09:40						
Location:	RW-05											
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	375-73-5	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1	
PFHxA	307-24-4	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1	
PFHpA	375-85-9	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1	
PFHxS	355-46-4	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1	
PFOA	335-67-1	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1	
PFNA	375-95-1	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1	
PFOS	1763-23-1	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1	
PFDA	335-76-2	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1	
MeFOSAA	2355-31-9	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1	
EtFOSAA	2991-50-6	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1	
PFUnA	2058-94-8	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1	
PFDoA	307-55-1	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1	
PFTTrDA	72629-94-8	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1	
PFTeDA	376-06-7	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C2-PFHxA	SURR	108	70 - 130			B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1		
13C2-PFDA	SURR	98.1	70 - 130			B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1		
d5-EtFOSAA	SURR	84.3	70 - 130			B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1		

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

rw 10/26/18

Sample ID: WI-A06-RW18-0818							EPA Method 537				
Client Data				Laboratory Data							
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1802843-03	Column:	BEH C18				
Project:	Navy CLEAN NASWI A6 Off-Base DW	Date Collected:	29-Aug-18 13:25	Date Received:	01-Sep-18 09:40						
Location:	RW-18										
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	22.0	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1
PFHxA	307-24-4	27.8	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1
PFHpA	375-85-9	11.4	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1
PFHxS	355-46-4	87.5	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1
PFOA	335-67-1	26.1	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1
PFNA	375-95-1	ND	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1
PFOS	1763-23-1	18.0	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1
PFDA	335-76-2	ND	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1
MeFOSAA	2355-31-9	ND	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1
EtFOSAA	2991-50-6	ND	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1
PFUnA	2058-94-8	ND	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1
PFDoA	307-55-1	ND	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1
PFTTrDA	72629-94-8	ND	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1
PFTeDA	376-06-7	ND	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	111	70 - 130			B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1	
13C2-PFDA	SURR	103	70 - 130			B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1	
d5-EtFOSAA	SURR	96.4	70 - 130			B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1	

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

WI1012618

Sample ID: WI-A06-FB18-0818							EPA Method 537				
Client Data				Laboratory Data							
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1802843-04	Column:	BEH C18				
Project:	Navy CLEAN NASWI A6 Off-Base DW	Date Collected:	29-Aug-18 13:30	Date Received:	01-Sep-18 09:40						
Location:	RW-18										
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1
PFHxA	307-24-4	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1
PFHpA	375-85-9	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1
PFHxS	355-46-4	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1
PFOA	335-67-1	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1
PFNA	375-95-1	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1
PFOS	1763-23-1	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1
PFDA	335-76-2	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1
MeFOSAA	2355-31-9	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1
EtFOSAA	2991-50-6	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1
PFUnA	2058-94-8	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1
PFDoA	307-55-1	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1
PFTTrDA	72629-94-8	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1
PFTeDA	376-06-7	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	104	70 - 130			B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1	
13C2-PFDA	SURR	106	70 - 130			B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1	
d5-EtFOSAA	SURR	87.9	70 - 130			B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1	

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

rw 10/26/18

Sample ID: WI-A06-RW20-0818

EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1802843-05	Column:	BEH C18
Project:	Navy CLEAN NASWI A6 Off-Base DW	Date Collected:	30-Aug-18 09:00	Date Received:	01-Sep-18 09:40		
Location:	RW-20						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	18.7	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	1
PFHxA	307-24-4	17.5	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	1
PFHpA	375-85-9	ND	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	1
PFHxS	355-46-4	119	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	1
PFOA	335-67-1	45.3	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	1
PFNA	375-95-1	ND	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	1
PFOS	1763-23-1	27.8	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	1
PFDA	335-76-2	ND	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	1
MeFOSAA	2355-31-9	ND	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	1
EtFOSAA	2991-50-6	ND	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	1
PFUnA	2058-94-8	ND	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	1
PFDoA	307-55-1	ND	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	1
PFTTrDA	72629-94-8	ND	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	1
PFTeDA	376-06-7	ND	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	116	70 - 130			B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	1	
13C2-PFDA	SURR	96.2	70 - 130			B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	1	
d5-EtFOSAA	SURR	75.8	70 - 130			B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	1	

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

nw 10/26/18

Sample ID: WI-A06-FB20-0818							EPA Method 537					
Client Data					Laboratory Data							
Name:	CH2M Hill		Matrix:	Aqueous		Lab Sample:	1802843-06		Column:	BEH C18		
Project:	Navy CLEAN NASWI A6 Off-Base DW		Date Collected:	30-Aug-18 09:00		Date Received:	01-Sep-18 09:40					
Location:	RW-20											
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	375-73-5	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1	
PFHxA	307-24-4	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1	
PFHpA	375-85-9	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1	
PFHxS	355-46-4	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1	
PFOA	335-67-1	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1	
PFNA	375-95-1	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1	
PFOS	1763-23-1	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1	
PFDA	335-76-2	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1	
MeFOSAA	2355-31-9	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1	
EtFOSAA	2991-50-6	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1	
PFUnA	2058-94-8	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1	
PFDoA	307-55-1	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1	
PFTTrDA	72629-94-8	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1	
PFTeDA	376-06-7	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1	
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C2-PFHxA	SURR	110	70 - 130			B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1		
13C2-PFDA	SURR	108	70 - 130			B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1		
d5-EtFOSAA	SURR	91.0	70 - 130			B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1		

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

WI 10/26/18

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 580-80659-1
 Laboratory: Test America Laboratories, Tacoma, Washington
 Site: NAS Whidbey Island, Residential Wells, CTO-4041, Washington
 Date: January 29, 2019

Metals			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW08-0918	580-80659-1	Water
1MS	WI-A06-RW08-0918MS	580-80659-1MS	Water
1MSD	WI-A06-RW08-0918MSD	580-80659-1MSD	Water

A full data validation was performed on the analytical data for one water sample collected on September 27, 2018 by CH2MM HILL at the NAS Whidbey Island site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions"

Specific method references are as follows:

Analysis

Metals (Total Iron)
 Metals (Dissolved)

Method References

USEPA SW-846 Method 6010C
 USEPA SW-846 Method 6010C

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Inorganic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Inorganic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Inorganics

- Holding times and sample preservation
- Inductively Coupled Plasma/Mass Spectrometry (ICP/MS) Tuning
- Initial and continuing calibration verifications
- Method blank and field QC blank contamination
- ICP Interference Check Sample

- Laboratory Control Sample (LCS) recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Duplicate Sample Analysis
- ICP Serial Dilution
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data is acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Metals (Total Iron/Dissolved Metals)

Holding Times

- All samples were prepared and analyzed within 180 days for all metals.

ICP/MS Tuning

- Not applicable.

Initial Calibration Verification

- All initial calibration criteria were met.

Continuing Calibration Verification

- All continuing calibration criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC samples were not analyzed for metals.

ICP Interference Check Sample

- The ICP interference check sample exhibited acceptable %R values.

Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)

- The LCS/LCSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Matrix Spike/Matrix Spike Duplicate Analysis

- The MS/MSD samples exhibited acceptable %R and RPD values.

Duplicate Sample Analysis

- The duplicate sample analysis exhibited acceptable RPD values.

ICP Serial Dilution

- ICP serial dilution percent differences (%D) were within acceptance limits except for the following.

ICP SD Sample	Compound	%D	Qualifier	Affected Samples
1	Calcium	22%	J	1
	Magnesium	20%	J	
	Manganese	21%	J	
	Silicon	21%	J	

Compound Quantitation

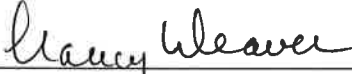
- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:


Nancy Weaver
Senior Chemist

Dated:

11/30/19

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

1A-IN
 INORGANIC ANALYSIS DATA SHEET
 METALS - TOTAL RECOVERABLE

Client Sample ID: W1-A06-RW08-0918

Lab Sample ID: 580-80659-1

Lab Name: TestAmerica Seattle

Job No.: 580-80659-1

SDG ID.: _____

Matrix: Water

Date Sampled: 09/27/2018 12:40

Reporting Basis: WET

Date Received: 09/28/2018 09:30

CAS No.	Analyte	Result	LOQ	DL	Units	C	Q	DIL	Method
7439-89-6	Iron	0.47	0.50	0.14	mg/L	U		1	6010C

1A-IN
 INORGANIC ANALYSIS DATA SHEET
 METALS - DISSOLVED

Client Sample ID: W1-A06-RW08-0918

Lab Sample ID: 580-80659-1

Lab Name: TestAmerica Seattle

Job No.: 580-80659-1

SDG ID.: _____

Matrix: Water

Date Sampled: 09/27/2018 12:40

Reporting Basis: WET

Date Received: 09/28/2018 09:30

CAS No.	Analyte	Result	LOQ	DL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	0.44	1.5	0.11	mg/L	U		1	6010C
7440-70-2	Calcium	36	J 1.1	0.16	mg/L			1	6010C
7439-89-6	Iron	0.47	0.50	0.14	mg/L	U		1	6010C
7439-95-4	Magnesium	45	J 1.1	0.13	mg/L		J	1	6010C
7439-96-5	Manganese	0.22	J 0.020	0.0017	mg/L			1	6010C
7440-09-7	Potassium	3.1	3.3	0.41	mg/L	J		1	6010C
7440-21-3	Silicon	17	J 1.1	0.063	mg/L			1	6010C

SD
SD
SD
SD

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 1803198
 Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
 Site: NAS Whidbey Island, Residential Wells, CTO-4041, Washington
 Date: January 30, 2019

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-CV-1RW40-0918	1803198-01	Water
2	WI-CV-1FB40-0918	1803198-02	Water
3	WI-CV-1RW72-0918	1803198-03	Water
4	WI-CV-1RW72P-0918	1803198-04	Water
5	WI-CV-1FB72-0918	1803198-05	Water
6	WI-CV-2RW02-0918	1803198-06	Water
7	WI-CV-2FB02-0918	1803198-07	Water
8	WI-CV-1RW90-0918	1803198-08	Water
9	WI-CV-1FB90-0918	1803198-09	Water
10	WI-A06-RW08-0918	1803198-10	Water
11	WI-A06-FB08-0918	1803198-11	Water
12	WI-AF-3RW41-0918	1803198-12	Water
13	WI-AF-3RW41P-0918	1803198-13	Water
14	WI-AF-3FB41-0918	1803198-14	Water
15	WI-CV-1RW04-0918	1803198-15	Water
16	WI-CV-1FB04-0918	1803198-16	Water

A full data validation was performed on the analytical data for nine water samples and seven aqueous field blank samples collected on September 24-27, 2018 by CH2M Hill at the NAS Whidbey Island site in Washington. The samples were analyzed under the EPA Method “Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)”.

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537, Revision 1.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA “Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review,” January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-CV-1FB40-0918	None - ND	-	-	-
WI-CV-1FB72-0918	None - ND	-	-	-
WI-CV-2FB02-0918	None - ND	-	-	-
WI-CV-1FB90-0918	None - ND	-	-	-
WI-A06-1FB08-0918	None - ND	-	-	-
WI-AF-3FB41-0918	None - ND	-	-	-
WI-CV-3FB04-0918	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Laboratory Control Samples (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

PFCs				
Compound	WI-CV-1RW72-0918 ng/L	WI-CV-1RW72P-0918 ng/L	RPD	Qualifier
None	ND	ND	-	-

PFCs				
Compound	WI-AF-3RW41-0918 ng/L	WI-AF-3RW41P-0918 ng/L	RPD	Qualifier
PFBS	68.0	60.0	13%	None
PFHxA	18.5	17.7	4%	
PFHpA	4.25	4.01	6%	
PFHxS	48.5	43.4	11%	
PFOA	6.13	5.69	7%	
PFOS	6.75	6.20	8%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver
Nancy Weaver
Senior Chemist

Dated: 1/30/19

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-RW08-0918

EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1803198-10	Column:	BEH C18
Project:	NASWI CLEAN CTO-4041	Date Collected:	27-Sep-18 12:40	Date Received:	02-Oct-18 09:03		
Location:	DW						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	25.9	2.98	4.90	9.79		B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFHxA	307-24-4	18.6	2.98	4.90	9.79		B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFHpA	375-85-9	11.3	2.98	4.90	9.79		B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFHxS	355-46-4	103	2.98	4.90	9.79		B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFOA	335-67-1	31.2	2.98	4.90	9.79		B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFNA	375-95-1	3.40	2.98	4.90	9.79	J	B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFOS	1763-23-1	95.7	2.98	4.90	9.79		B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFDA	335-76-2	ND	2.98	4.90	9.79		B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
MeFOSAA	2355-31-9	ND	2.98	4.90	9.79		B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
EtFOSAA	2991-50-6	ND	2.98	4.90	9.79		B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFUnA	2058-94-8	ND	2.98	4.90	9.79		B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFDoA	307-55-1	ND	2.98	4.90	9.79		B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFTTrDA	72629-94-8	ND	2.98	4.90	9.79		B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFTeDA	376-06-7	ND	2.98	4.90	9.79		B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	122	70 - 130			B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1	
13C2-PFDA	SURR	97.9	70 - 130			B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1	
d5-EtFOSAA	SURR	85.8	70 - 130			B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1	

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

new 130619

Sample ID: WI-A06-FB08-0918							EPA Method 537				
Client Data				Laboratory Data							
Name:	CH2M Hill	Matrix:	Drinking Water	Lab Sample:	1803198-11	Column:	BEH C18				
Project:	NASWI CLEAN CTO-4041	Date Collected:	27-Sep-18 12:40	Date Received:	02-Oct-18 09:03						
Location:	DW										
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
PFHxA	307-24-4	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
PFHpA	375-85-9	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
PFHxS	355-46-4	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
PFOA	335-67-1	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
PFNA	375-95-1	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
PFOS	1763-23-1	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
PFDA	335-76-2	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
MeFOSAA	2355-31-9	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
EtFOSAA	2991-50-6	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
PFUnA	2058-94-8	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
PFDoA	307-55-1	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
PFTTrDA	72629-94-8	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
PFTeDA	376-06-7	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	105	70 - 130			B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1	
13C2-PFDA	SURR	93.6	70 - 130			B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1	
d5-EtFOSAA	SURR	91.7	70 - 130			B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1	

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

new 11/30/19

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 580-79935-1
 Laboratory: Test America Laboratories, Tacoma, Washington
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: October 28, 2018

Metals			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW19-0818	580-79935-1	Water
1MS	WI-A06-RW19-0818MS	580-79935-1MS	Water
1MSD	WI-A06-RW19-0818MSD	580-79935-1MSD	Water
1D	WI-A06-RW19-0818	580-79935-1	Water
1DMS	WI-A06-RW19-0818MS	580-79935-1MS	Water
1DMSD	WI-A06-RW19-0818MSD	580-79935-1MSD	Water
2	WI-A06-RW19P-0818	580-79935-2	Water
2D	WI-A06-RW19P-0818	580-79935-2	Water

D - Dissolved Metals

A full data validation was performed on the analytical data for two water samples collected on August 28, 2018 by CH2M HILL at the NAS Whidbey Island site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions"

Specific method references are as follows:

Analysis

Metals (Total Iron)
 Metals (Dissolved)

Method References

USEPA SW-846 Method 6010C
 USEPA SW-846 Method 6010C

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Inorganic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Inorganic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Inorganics

- Holding times and sample preservation
- Inductively Coupled Plasma/Mass Spectrometry (ICP/MS) Tuning
- Initial and continuing calibration verifications
- Method blank and field QC blank contamination
- ICP Interference Check Sample
- Laboratory Control Sample (LCS) recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Duplicate Sample Analysis
- ICP Serial Dilution
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data is acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Metals (Total Iron/Dissolved Metals)

Holding Times

- All samples were prepared and analyzed within 180 days for all metals.

ICP/MS Tuning

- Not applicable.

Initial Calibration Verification

- All initial calibration criteria were met.

Continuing Calibration Verification

- All continuing calibration criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC samples were not collected.

ICP Interference Check Sample

- The ICP interference check sample exhibited acceptable %R values.

Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)

- The LCS/LCSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Matrix Spike/Matrix Spike Duplicate Analysis

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

MS/MSD Sample	Compound	MS %R/MSD %R/RPD	Qualifier	Affected Samples
1	Calcium	OK/126%/OK	J	1D, 2D

Duplicate Sample Analysis

- Duplicate samples were not analyzed.

ICP Serial Dilution

- An ICP serial dilution was not analyzed.

Compound Quantitation

- All criteria were met.

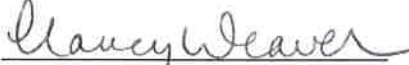
Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Total Iron				
Compound	WI-A06-RW19-0818 mg/L	WI-A06-RW19P-0818 mg/L	RPD	Qualifier
Iron	ND	ND	-	-

Dissolved Metals				
Compound	WI-A06-RW19-0818 mg/L	WI-A06-RW19P-0818 mg/L	RPD	Qualifier
Aluminum	0.44	0.44	0%	None
Calcium	38	36	5%	
Iron	0.47	0.47	0%	
Magnesium	32	31	3%	
Manganese	0.0068	0.0068	0%	
Potassium	2.9	2.7	7%	
Silicon	15	14	7%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: 
Nancy Weaver
Senior Chemist

Dated: 10/29/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS - TOTAL RECOVERABLE

Client Sample ID: W1-A06-RW19-0818

Lab Sample ID: 580-79935-1

Lab Name: TestAmerica Seattle

Job No.: 580-79935-1

SDG ID.: _____

Matrix: Water

Date Sampled: 08/28/2018 09:30

Reporting Basis: WET

Date Received: 08/29/2018 09:50

CAS No.	Analyte	Result	LOQ	DL	Units	C	Q	DIL	Method
7439-89-6	Iron	0.47	0.50	0.14	mg/L	U		1	6010C

1A-IN
 INORGANIC ANALYSIS DATA SHEET
 METALS - TOTAL RECOVERABLE

2

Client Sample ID: W1-A06-RW19P-0818 Lab Sample ID: 580-79935-2
 Lab Name: TestAmerica Seattle Job No.: 580-79935-1
 SDG ID.: _____
 Matrix: Water Date Sampled: 08/28/2018 09:30
 Reporting Basis: WET Date Received: 08/29/2018 09:50

CAS No.	Analyte	Result	LOQ	DL	Units	C	Q	DIL	Method
7439-89-6	Iron	0.47	0.50	0.14	mg/L	U		1	6010C

1A-IN
 INORGANIC ANALYSIS DATA SHEET
 METALS - DISSOLVED

10

Client Sample ID: W1-A06-RW19-0818

Lab Sample ID: 580-79935-1

Lab Name: TestAmerica Seattle

Job No.: 580-79935-1

SDG ID.:

Matrix: Water

Date Sampled: 08/28/2018 09:30

Reporting Basis: WET

Date Received: 08/29/2018 09:50

CAS No.	Analyte	Result	LOQ	DL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	0.44	1.5	0.11	mg/L	U		1	6010C
7440-70-2	Calcium	38	1.1	0.16	mg/L			1	6010C
7439-89-6	Iron	0.47	0.50	0.14	mg/L	U		1	6010C
7439-95-4	Magnesium	32	1.1	0.13	mg/L		J	1	6010C
7439-96-5	Manganese	0.0068	0.020	0.0017	mg/L	U		1	6010C
7440-09-7	Potassium	2.9	3.3	0.41	mg/L	J		1	6010C
7440-21-3	Silicon	15	1.1	0.063	mg/L			1	6010C

MSH

1A-IN
 INORGANIC ANALYSIS DATA SHEET
 METALS - DISSOLVED

2D

Client Sample ID: W1-A06-RW19P-0818

Lab Sample ID: 580-79935-2

Lab Name: TestAmerica Seattle

Job No.: 580-79935-1

SDG ID.: _____

Matrix: Water

Date Sampled: 08/28/2018 09:30

Reporting Basis: WET

Date Received: 08/29/2018 09:50

CAS No.	Analyte	Result	LOQ	DL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	0.44	1.5	0.11	mg/L	U		1	6010C
7440-70-2	Calcium	36	1.1	0.16	mg/L			1	6010C
7439-89-6	Iron	0.47	0.50	0.14	mg/L	U		1	6010C
7439-95-4	Magnesium	31	1.1	0.13	mg/L			1	6010C
7439-96-5	Manganese	0.0068	0.020	0.0017	mg/L	U		1	6010C
7440-09-7	Potassium	2.7	3.3	0.41	mg/L	J		1	6010C
7440-21-3	Silicon	14	1.1	0.063	mg/L			1	6010C

MSH

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 1802770
 Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: October 26, 2018

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
4	WI-A06-RW19-0818	1802770-04	Water
4MS	WI-A06-RW19-0818MS	1802770-04MS	Water
4MSD	WI-A06-RW19-0818MSD	1802770-04MSD	Water
5	WI-A06-RW19P-0818	1802770-05	Water
6	WI-A06-FB19-0818	1802770-06	Water
7	WI-CV-1RW91-0818	1802770-07	Water
7MS	WI-CV-1RW91-0818MS	1802770-07MS	Water
7MSD	WI-CV-1RW91-0818MSD	1802770-07MSD	Water
8	WI-CV-1RW91P-0818	1802770-08	Water
9	WI-CV-1FB91-0818	1802770-09	Water

A full data validation was performed on the analytical data for four water samples and two aqueous field blank samples collected on August 28, 2018 by CH2M Hill at the NAS Whidbey Island site in Washington. The samples were analyzed under the EPA Method “Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)”.

Specific method references are as follows:

Analysis
PFCs

Method References
USEPA Method 537, Revision 1.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA “Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review,” January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB19-0818	None - ND	-	-	-
WI-CV-1FB91-0818	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

MS/MSD Sample	Compound	MS %R/MSD %R/RPD	Qualifier	Affected Samples
4	PFHxA	OK/OK/41.4	None	For RPD Alone
	PFHxS	OK/11.1%/136	None	4X Rule Applies

Laboratory Control Samples (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

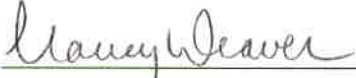
Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

PFCs				
Compound	WI-A06-RW19-0818 ng/L	WI-A06-RW19P-0818 ng/L	RPD	Qualifier
PFBS	64.9	68.2	5%	None
PFHxA	69.2	67.3	3%	
PFHpA	37.6	36.5	3%	
PFHxS	224	242	8%	
PFOA	45.6	48.2	6%	
PFOS	73.8	80.1	8%	

PFCs				
Compound	WI-CV-1RW91-0818 ng/L	WI-CV-1RW91P-0818 ng/L	RPD	Qualifier
None	ND	ND	-	-

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:  Dated: 10/29/18
Nancy Weaver
Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID: WI-A06-RW19-0818

EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1802770-04	Column:	BEH C18
Project:	Navy Clean NASWI A6/CV DW	Date Collected:	28-Aug-18 09:30	Date Received:	29-Aug-18 09:40		
Location:	RW-19						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	64.9	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
PFHxA	307-24-4	69.2	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
PFHpA	375-85-9	37.6	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
PFHxS	355-46-4	224	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
PFOA	335-67-1	45.6	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
PFNA	375-95-1	ND	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
PFOS	1763-23-1	73.8	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
PFDA	335-76-2	ND	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
MeFOSAA	2355-31-9	ND	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
EtFOSAA	2991-50-6	ND	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
PFUnA	2058-94-8	ND	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
PFDoA	307-55-1	ND	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
PFTTrDA	72629-94-8	ND	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
PFTeDA	376-06-7	ND	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	109	70 - 130			B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1	
13C2-PFDA	SURR	99.2	70 - 130			B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1	
d5-EtFOSAA	SURR	82.0	70 - 130			B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1	

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

NW 10/26/18

Sample ID: WI-A06-RW19P-0818

EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1802770-05	Column:	BEH C18
Project:	Navy Clean NASWI A6/CV DW	Date Collected:	28-Aug-18 09:30	Date Received:	29-Aug-18 09:40		
Location:	RW-19						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	68.2	2.90	4.77	9.54		B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1
PFHxA	307-24-4	67.3	2.90	4.77	9.54		B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1
PFHpA	375-85-9	36.5	2.90	4.77	9.54		B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1
PFHxS	355-46-4	242	2.90	4.77	9.54		B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1
PFOA	335-67-1	48.2	2.90	4.77	9.54		B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1
PFNA	375-95-1	ND	2.90	4.77	9.54		B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1
PFOS	1763-23-1	80.1	2.90	4.77	9.54		B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1
PFDA	335-76-2	ND	2.90	4.77	9.54		B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1
MeFOSAA	2355-31-9	ND	2.90	4.77	9.54		B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1
EtFOSAA	2991-50-6	ND	2.90	4.77	9.54		B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1
PFUnA	2058-94-8	ND	2.90	4.77	9.54		B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1
PFDoA	307-55-1	ND	2.90	4.77	9.54		B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1
PFTTrDA	72629-94-8	ND	2.90	4.77	9.54		B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1
PFTeDA	376-06-7	ND	2.90	4.77	9.54		B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	117	70 - 130			B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1	
13C2-PFDA	SURR	91.1	70 - 130			B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1	
d5-EtFOSAA	SURR	81.9	70 - 130			B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1	

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

NW 10/26/18

Sample ID: WI-A06-FB19-0818

EPA Method 537

Client Data				Laboratory Data			
Name:	CH2M Hill	Matrix:	Aqueous	Lab Sample:	1802770-06	Column:	BEH C18
Project:	Navy Clean NASWI A6/CV DW	Date Collected:	28-Aug-18 09:30	Date Received:	29-Aug-18 09:40		
Location:	RW-19						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.92	4.79	9.59		B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	1
PFHxA	307-24-4	ND	2.92	4.79	9.59		B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	1
PFHpA	375-85-9	ND	2.92	4.79	9.59		B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	1
PFHxS	355-46-4	ND	2.92	4.79	9.59		B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	1
PFOA	335-67-1	ND	2.92	4.79	9.59		B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	1
PFNA	375-95-1	ND	2.92	4.79	9.59		B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	1
PFOS	1763-23-1	ND	2.92	4.79	9.59		B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	1
PFDA	335-76-2	ND	2.92	4.79	9.59		B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	1
MeFOSAA	2355-31-9	ND	2.92	4.79	9.59		B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	1
EtFOSAA	2991-50-6	ND	2.92	4.79	9.59		B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	1
PFUnA	2058-94-8	ND	2.92	4.79	9.59		B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	1
PFDoA	307-55-1	ND	2.92	4.79	9.59		B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	1
PFTTrDA	72629-94-8	ND	2.92	4.79	9.59		B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	1
PFTeDA	376-06-7	ND	2.92	4.79	9.59		B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
I3C2-PFHxA	SURR	106	70 - 130			B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	1	
I3C2-PFDA	SURR	87.4	70 - 130			B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	1	
d5-EtFOSAA	SURR	82.0	70 - 130			B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	1	

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

**DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon
 SDG: 580-80029-1
 Laboratory: Test America Laboratories, Tacoma, Washington
 Site: NAS Whidbey Island, Area 6, CTO-4041, Washington
 Date: October 28, 2018

Metals			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW20-0818	580-80029-1	Water
1D	WI-A06-RW20-0818	580-80029-1	Water

D - Dissolved Metals

A full data validation was performed on the analytical data for one water sample collected on August 30, 2018 by CH2M HILL at the NAS Whidbey Island site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions"

Specific method references are as follows:

Analysis

Metals (Total Iron)
 Metals (Dissolved)

Method References

USEPA SW-846 Method 6010C
 USEPA SW-846 Method 6010C

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Inorganic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Inorganic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Inorganics

- Holding times and sample preservation
- Inductively Coupled Plasma/Mass Spectrometry (ICP/MS) Tuning
- Initial and continuing calibration verifications
- Method blank and field QC blank contamination

- ICP Interference Check Sample
- Laboratory Control Sample (LCS) recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Duplicate Sample Analysis
- ICP Serial Dilution
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data are acceptable for the intended purposes. There were no qualifications.

Metals (Total Iron/Dissolved Metals)

Holding Times

- All samples were prepared and analyzed within 180 days for all metals.

ICP/MS Tuning

- Not applicable.

Initial Calibration Verification

- All initial calibration criteria were met.

Continuing Calibration Verification

- All continuing calibration criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC samples were not collected.

ICP Interference Check Sample

- The ICP interference check sample exhibited acceptable %R values.

Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)

- The LCS/LCSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Matrix Spike/Matrix Spike Duplicate Analysis

- MS/MSD samples were not analyzed.

Duplicate Sample Analysis

- Duplicate samples were not analyzed.

ICP Serial Dilution

- An ICP serial dilution was not analyzed.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver
Nancy Weaver
Senior Chemist

Dated: 10/29/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS - TOTAL RECOVERABLE

1

Client Sample ID: WI-A06-RW20-0818

Lab Sample ID: 580-80029-1

Lab Name: TestAmerica Seattle

Job No.: 580-80029-1

SDG ID.: _____

Matrix: Water

Date Sampled: 08/30/2018 09:00

Reporting Basis: WET

Date Received: 09/01/2018 10:10

CAS No.	Analyte	Result	LOQ	DL	Units	C	Q	DIL	Method
7439-89-6	Iron	0.23	0.50	0.14	mg/L	J		1	6010C

1A-IN
 INORGANIC ANALYSIS DATA SHEET
 METALS - DISSOLVED

10

Client Sample ID: WI-A06-RW20-0818

Lab Sample ID: 580-80029-1

Lab Name: TestAmerica Seattle

Job No.: 580-80029-1

SDG ID.: _____

Matrix: Water

Date Sampled: 08/30/2018 09:00

Reporting Basis: WET

Date Received: 09/01/2018 10:10

CAS No.	Analyte	Result	LOQ	DL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	0.44	1.5	0.11	mg/L	U		1	6010C
7440-70-2	Calcium	46	1.1	0.16	mg/L			1	6010C
7439-89-6	Iron	0.47	0.50	0.14	mg/L	U		1	6010C
7439-95-4	Magnesium	42	1.1	0.13	mg/L			1	6010C
7439-96-5	Manganese	0.075	0.020	0.0017	mg/L			1	6010C
7440-09-7	Potassium	3.7	3.3	0.41	mg/L			1	6010C
7440-21-3	Silicon	14	1.1	0.063	mg/L			1	6010C