

RTN 4-26179

Former Barnstable County Fire Training Academy Site

Barnstable, MA

January 2024

IMMEDIATE RESPONSE ACTION STATUS REPORT & REMEDIAL MONITORING REPORT NO. 66



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Prepared by: BETA GROUP, INC.
Prepared for: Barnstable County

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1.0 INTRODUCTION

BETA Group Inc. (BETA) has prepared this Immediate Response Action (IRA) Status Report and Remedial Monitoring Report (RMR) No. 66 that addresses a release of hazardous materials related to fire-fighting foams and attributed to the former Barnstable County Fire and Rescue Training facility (the FTA or facility) located at 155 South Flint Rock Road in Barnstable, Massachusetts. This document has been prepared on behalf of Barnstable County. It is being submitted to the Massachusetts Department of Environmental Protection (MassDEP) – Bureau of Waste Site Cleanup (BWSC) in response to the detection of elevated concentrations of per- and polyfluoroalkyl substances (PFAS), including perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and other PFAS compounds regulated by MassDEP, in soil and groundwater at the facility and in adjacent areas, in particular to the east and southeast of the facility. This report documents IRA activities at the Site for the period of July 2023 to December 2023. IRA Status and RMR Report No. 66 presents the operational status and performance sampling results for the groundwater pumping and treatment systems at the Site during the reporting period. In addition, this status report describes the activities and results of Site-wide groundwater monitoring conducted in July 2023 and November 2023. A separate report to be submitted to MassDEP will provide an interim update on the on-going Phase II Comprehensive Site Assessment (Phase II CSA) at the Site.

This IRA Status Report and RMR No. 66 is being submitted to MassDEP as an attachment to the BWSC 105 Immediate Response Action (IRA) and BWSC 105A and 105B IRA Remedial Monitoring Report Transmittal Forms. Completed copies of these forms prior to electronic signature are included in **Appendix A**.

As current owner of the FTA, Barnstable County, as represented by the Barnstable County Board of Regional Commissioners, have been named as the Potentially Responsible Party (PRP) for this release. The contact person for the Disposal Site and release is:

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BETA is performing MCP Response Actions on behalf of the Barnstable County Commissioners. The Licensed Site Professional (LSP) overseeing Response Actions for this release is:

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2.0 GENERAL DISPOSAL SITE INFORMATION

2.1 PROPERTY AND SITE DESCRIPTION

The former FTA is located on South Flint Rock Road in the Town of Barnstable. It appears on the United States Geological Survey (USGS) Topographic Quadrangle – Hyannis, Massachusetts. **Figure 1 – Site Location** map, prepared from a portion of the referenced USGS Topographic Quadrangle map shows the general location of the FTA. The FTA is currently zoned for industrial use.

For the purposes of this and future MCP submittals, the property on which the FTA is located will be referred to as the FTA or facility. FTA or facility will also refer to the remaining or former structures, the land, and the former functions of the FTA.

In accordance with the MCP definition, where contamination attributable to the PFAS releases associated with firefighting foams and training on the FTA have come to be located will be referred to as the Disposal Site or Site.

Following the completion of the capping and selected demolition project in November 2021, the 6.2-acre FTA is improved by one primary building, the former fire training building (with former classrooms, administrative offices, and two apparatus bays) and several additional structures including a wood frame former classroom building (now used for storage), two fabric Quonset hut sheds used for storage, a small concrete building housing one groundwater treatment system, a shipping container housing the second groundwater treatment system, and a small concrete block storage shed. Refer to **Figure 2 – Site Plan Detail**. All former live fire training structures and props have been demolished and/or removed from the Site. The FTA is secured by chain link fencing and a locked gate.

The FTA is listed on the Town of Barnstable Assessor's on-line records as Map 313, Lot 007. The FTA had been used for public safety training since the 1950's. The FTA was first constructed on land donated to the Town of Barnstable by the Cobb Trust in 1955. The current owner-of-record is the County of Barnstable, who acquired the facility from the Town of Barnstable in 1983 by deed recorded June 3, 1983, Barnstable Registry of Deeds, Book 3759, Page 39. Utilities servicing the FTA include municipal water, an underground septic system, aboveground electricity, and telecommunications.

The FTA was formerly used for public safety training by fire departments and fire districts from throughout Barnstable County, fire departments outside of Barnstable County, and other public and private institutions. Live fire training using firefighting foams, including aqueous film forming foams (AFFF), was conducted at the FTA for decades by fire districts and departments that used their own foam concentrate brought to the FTA in the apparatus of the organization participating in the training. Foam training exercises at the FTA ceased in 2009 according to FTA officials. Water training activities ceased in June 2019.

Land surrounding the FTA is primarily undeveloped, wooded land within public water supply protection areas. Flintrock Pond occupies approximately 6 acres directly to the west of the FTA. Several public water supply wells and their related facilities are located to the east, southeast, and west of the FTA.

At this time, the preliminary MCP Disposal Site (the Site) associated with RTN 4-26179 comprises the FTA property, the westerly adjacent Flintrock Pond, and a large woodland area to the east and southeast of the FTA. Based on the results to date of the Phase II CSA, it is apparent that the RTN 45-26179 Site most likely extends to the southeast to Airport Way, east of Mary Dunn Road, and south of Mary Dunn Pond. The full extent of the Disposal Site has not been defined at this time.

The southeastern portion of the Site includes land owned by the Town of Barnstable, which is crossed by two electric power transmission lines running presumably within easements. Private industrial properties and related structures are located approximately 500 to 1,000 feet south of the Site. The Barnstable Municipal Airport is located to the west (runway 15 – 33) and south of the Site and the FTA.

The nearest residential properties are located approximately ¼ mile to the north of the Site. Based on 2010 U.S. Census data, the residential population located within a ½ mile radius of the Site is estimated to be less than 150 people. There are no known institutions located within 500 feet of the Site. The municipal well pumping facilities referenced above (not part of the FTA) are not staffed full-time.

2.2 LATITUDE AND LONGITUDE / UNIVERSAL TRANSVERSE MERCATOR'S

The coordinates for the Site are shown below. For simplicity, these coordinates are for the southerly end of the FTA.

<u>Latitude/Longitude</u>	Latitude: 41° 40' 41.53"N Longitude: 70° 17' 7.82"E
<u>UTM Coordinates</u>	Easting: 393,002 Northing: 4,614,847

2.3 MASSDEP METHOD 1 CATEGORIES

2.3.1 GROUND WATER CATEGORY

As noted, the Site is located within a Zone II Public Water Supply Protection Area and a Medium-Yield Sole Source Aquifer. Therefore, MCP Method 1 Ground Water Category 1 (GW-1) applies to the Site. Groundwater at the FTA facility itself is also categorized as Method 1 GW-2 because groundwater has been measured at depths less than 15 feet below grade and an occupied building is located within the FTA facility.

All ground waters within the Commonwealth are considered a potential source of discharge to surface waters and shall be categorized, at a minimum, as Method 1 GW-3. Therefore, the applicable Method 1 Ground Water Categories for the Site are GW-1, GW-2, and GW-3.

2.3.2 SOIL CATEGORY

Soil categorization is based upon the type of human receptor and three potential exposure criteria: frequency of use, intensity of use, and accessibility of soil. The FTA portion of the Site is occupied by a former fire and rescue training facility. Based on the nature of the facility, children are assumed to be "not present." Adults who work at the site as staff members are assumed to be present at "high frequency" based on the MCP definition. However, since training ceased at the FTA, only limited staff are currently assigned to the former FTA – see below. Other County personnel periodically visit the facility, but only reportedly for short periods of time; therefore, their presence is considered to "low frequency." Recent Phase II CSA activities have identified soil near to, but outside of the fenced FTA compound with levels of PFAS 6 compounds above applicable MCP risk standards. This soil is adjacent to South Flint Rock Road or in wooded areas immediately east and south of the FTA fence line. Since these areas are undeveloped but unfenced, children and adults may be present at low frequencies.

Impacted soils have been identified in unpaved areas within the FTA, wooded areas outside the fence, and beneath recently paved areas at depths ranging from near the surface to approximately 15 feet below the ground surface. Therefore, impacted soils at the FTA are considered "accessible" (remaining unpaved areas) and "potentially accessible" (paved areas or deeper soil).

Only groundwater impacts at significant depths below the ground surface have been identified at the remainder of the Site (outside of the FTA or at distances greater than 50 feet from the fence line), which consists of undeveloped or industrial land, a portion of a utility easement, and three unmanned public water supply well stations.

Intensity of use in regard to soil disturbance by adults at the Site may be conservatively considered to be "high" because the area of impact at the FTA could potentially be disturbed during FTA facility

maintenance activities. However, the high use designation described in previous MCP submittals applied primarily to former on-Site training activities, which were of relatively short duration but of high intensity. Current exterior FTA facility activities are only maintenance-related (e.g., lawn mowing) and are similar in terms of duration to previous uses. Maintenance of equipment is performed at the FTA, but that work is conducted inside the remaining main building. Therefore, current maintenance activities are only of low intensity. Intensity of use by children only applies to incidental “use” of the areas on the shoulder of Flint Rock Road near the FTA or to the wooded areas within approximately 50 feet of the fence line. Based on these locations, intensity of use for children would be considered “low.”

Based on all of the factors described above, for current Site uses, soils at the Site are categorized as Soil Category S-2. The applicable Soil Categories for current Site uses have been identified as S-2/GW-1, S-2/GW-2, and S-2/GW-3.

The applicable Soil Categories for unrestricted future Site uses are S-1/GW-1, S-1/GW-2, and S-1/GW-3.

3.0 DISPOSAL SITE HISTORY AND OVERVIEW

The Site has historically been the subject of four MassDEP RTNs: 4-190, 4-11707, 4-20021, and 4-26179. This IRA Status Report and RMR is being submitted for RTN 4-26179 only. The original RTN, 4-190, is being managed separately; closure has been achieved for the remaining two RTNs.

3.1 RELEASE HISTORY AND DESCRIPTION - RTN 4-26179 (PFAS RELEASE)

UCMR3 Drinking Water Testing

In May 2012, USEPA issued their final rule “Revisions to the Unregulated Contaminant Monitoring Rule (UCMR3) for Public Water Systems,” which was a national sampling mandate for “emerging contaminants” in public water supplies. The required sampling list included several PFAS compounds, including but not limited to PFOS and PFOA. In November 2013, samples were collected from the Mary Dunn public water supply wells MD-1, MD-2, and MD-3 (see section 3.4 for additional information on these wells) and analyzed for PFAS.

At the time of the testing, the US EPA Provisional Health Advisory (HA) was 0.20 micrograms per liter (µg/L) for PFOS. Analytical results revealed evidence of PFOS contamination in all three wells sampled. MD-1 and MD-2 were temporarily removed from service. MD-3 was apparently not in use at that time. A treatment system that utilizes granular activated carbon (GAC) was later implemented for MD-1 and MD-2 [July 2015] by the Hyannis Water Supply Division (HWSD) of Barnstable Department of Public Works. In 2016, GAC treatment was also implemented for MD-3. [See below].

In November 2013, Barnstable County personnel also collected soil and groundwater samples from the FTA property, located approximately 1,000 feet west of the Mary Dunn wells, and submitted them for laboratory analysis of PFAS. Groundwater analytical results revealed that FTA groundwater was impacted by PFOS. MassDEP was subsequently notified.

Voluntary Groundwater Pumping and Treatment and Site Assessment

As a voluntary measure, Barnstable County refurbished the former perchlorate pump and treat system located at the FTA to help remediate and contain the PFOS apparently migrating from the facility. The groundwater pumping and treatment system (GWPTS) was re-started using granular activated carbon

(GAC) in the former, re-purposed perchlorate treatment vessels in July 2015. [These vessels were replaced in 2022 due to corrosion.] The system utilizes a groundwater recovery well, PRW-4, located approximately 800 feet southeast of the FTA. The original groundwater treatment system (GWTS) itself is located in a structure on the FTA grounds.

In August 2015, Barnstable County funded a more detailed hydrogeological assessment, continued implementation of the groundwater pump and treat system to capture PFOS upgradient of the Mary Dunn wells, and additional assessment and immediate response actions. The Cape Cod Commission evaluated subsurface soil and groundwater conditions at the FTA facility as part of the assessment activities. The soil results indicated a broad area of PFOS contamination throughout the subsurface. The highest PFOS concentrations were detected near the southwestern corner of the FTA, a location subsequently referred to as the Hot Spot. Groundwater analytical results from the 2015 assessment revealed PFOS contamination ranging from less than 0.070 µg/L (the US EPA HA from 2016 to 2019) to over 4.0 µg/L. The groundwater samples were collected from monitoring wells across the area between the FTA and the Mary Dunn wells. Like the soil results, the highest PFOS concentrations were detected near the southwestern corner of the FTA. PFOS was also detected in soil at the FTA and in surface water and sediment within the adjacent Flintrock Pond.

In May 2016, US EPA revised/lowered its HA for PFAS from 0.20 µg/L of PFOS and PFOA to 0.070 µg/L for either compound or the total of the two. EPA noted that the HA was for drinking water exposures only.

Notice of Responsibility

In response to the lowered HA PFAS concentrations and the assessment conducted at the FTA, on August 4, 2016, MassDEP issued a Notice of Responsibility (NOR) to Barnstable County. As summarized in the NOR, based on the detected PFAS concentrations in soil and groundwater at the FTA and the inferred groundwater flow direction being to the east and southeast (toward the Mary Dunn wells), MassDEP determined that the releases of PFAS from the use of AFFF at the FTA is a source of PFAS detected in the Mary Dunn wells. The NOR required submittal of an Immediate Response Action (IRA) Plan no later than September 15, 2016. MassDEP requested that the Site owner evaluate potential Imminent Hazards relative to downgradient public and private water supply wells. MassDEP indicated that this evaluation should include identification of all nearby public and private water supply wells, review of any existing analytical data for those wells, and sampling and analysis of any nearby wells that have not been sampled for PFAS. MassDEP also stated that the IRA Plan should include measures to prevent, eliminate, and/or abate any hazards associated with the consumption of drinking water impacted by PFAS above the HA level of 0.070 µg/L. MassDEP also required, as part of IRA activities, the reduction of the mass of PFAS at the FTA and the concentrations of PFAS in groundwater migrating from the FTA facility, such as excavating the soil Hot Spot and expanding the existing groundwater treatment system to decrease the mass of PFAS in groundwater.

IRA Plan

On September 27, 2016, on behalf of Barnstable County, the Cape Cod Commission submitted an IRA Plan to MassDEP to address the PFOS/PFOA impacts. The IRA Plan included an evaluation of imminent hazards to downgradient public and private water supplies, a Hot Spot removal plan, and plans for an interim expansion of the existing groundwater pump and treatment system.

The proposed IRA to address the soil Hot Spot was to excavate up to 200 cubic yards from a 400 square foot area for off-Site disposal. The Hot Spot soil was removed in January 2017, reducing the primary source of PFOS contamination leaching into groundwater. However, post-removal grading and settling of the backfill in the Hot Spot area left it prone to infiltration of runoff from the southern portion of the FTA.

Between December 2016 and February 2018, the Cape Cod Commission submitted monthly IRA Status and Remedial Monitoring Reports (RMRs) to MassDEP for the PFAS release. The RMRs addressed the FTA GWPTS, which was recovering and treating approximately 20,000 to 50,000 gallons per day (gpd) of groundwater from well PRW-4 at that time. The Site groundwater pump and treat system was intended to reduce PFAS concentrations in the aquifer before it reached the Mary Dunn municipal wells and treatment systems. Refer to Section 3.2 for additional information.

The Mary Dunn wells are equipped with GAC treatment systems to remove PFAS. The Mary Dunn wells as well as the GAC treatment systems are operated by SUEZ North America under contract with the Hyannis Water Supply Division (HWSD) of the Barnstable Department of Public Works (DPW). The GAC treatment of the Mary Dunn wells is actively preventing a potential Imminent Hazard to the Hyannis community by removing the PFAS compounds from the water supply. A Settlement Agreement between the Town of Barnstable and Barnstable County requires the County to fund a portion of the costs for operating the Mary Dunn wells treatment systems as well as a portion of the capital costs to install the GAC systems. Timely exchange of pumping and performance data related to the treatment of the Mary Dunn well water supplies to verify effectiveness of the IRA is noted in the Settlement Agreement between the parties.

On behalf of Barnstable County, BETA submitted monthly IRA Status reports and RMRs from March 2018 through January 2022. Status reports are now filed on a six-month basis. As detailed in recent IRA Status and RMR reports, including this report, groundwater monitoring data for locations across the Disposal Site confirm that elevated PFAS concentrations are still present in Site groundwater.

Analytical data from select monitoring wells indicate that PFAS concentrations in groundwater sampled in the former Hot Spot area have significantly decreased following the Phase 1 stormwater improvements (repair of the cap under the June 28, 2018 IRA Plan Modification); however, PFAS concentrations in groundwater immediately southeast of the former Hot Spot are increasing significantly. PFAS concentrations remain stable in groundwater sampled from wells east of the FTA; and PFAS concentrations remain elevated in groundwater sampled from within the area southeast of the FTA between the facility and the Mary Dunn wells. See Sections 6.2 and 6.3 for the most recent (July and November 2023) groundwater monitoring data.

3.2 GROUNDWATER PUMP AND TREAT SYSTEMS

MCP response actions were conducted in the early 1990s and 2000s to address first petroleum releases and later the detection of perchlorate. To remediate and control migration from the petroleum and perchlorate releases, in 1998 and 2007, respectively, response actions included the installation, upgrade, and/or renovation of a GWPTS (recovery well and treatment system) at the Site. The 2007 renovation was to treat a perchlorate release detected at the Site. The perchlorate release was abated and closed under the MCP, and the GWPTS was decommissioned.

In July 2015, the decommissioned GWTS was renovated again and re-started to help remediate and contain the PFAS migration from the FTA; see below. The operational GWPTS was later noted in the NOR issued by MassDEP in August 2016 as part of the on-going IRAs. The NOR also requested that Barnstable County install additional recovery wells or increase the groundwater recovery rate to increase PFAS removal; see discussion of GWTS# 2 below. The approximate locations of key components of the GWPTS that are on the FTA are shown on **Figure 2 – Site Plan Detail**. The location of the operating recovery well, PRW-4, and the approximate route of the force mains (two, 2-inch polyethylene pipes) are shown on **Figure 3A – Overall Site Plan**.

Refer to Section 4.1 for additional general information and Sections 5.1 and 5.2 for specific operational and performance monitoring results for this IRA and RMR reporting period.

GWTS # 1

In July 2015, the primary influent/recovery well pump installed in recovery well PRW-4 was repaired, a new variable frequency drive (VFD) unit pump was installed in the treatment system, and all accompanying electrical components were evaluated and repaired. The system was restarted in July 2015 upon the installation of 1500 pounds (lbs.) of aqueous phase GAC (virgin Filtrasorb 400 GAC) into each of the two existing Siemens treatment vessels. The “capture zone” of PRW-4 was reportedly estimated to be 200 ft. at 40 gallons per minute (gpm). Groundwater is pumped from recovery well PRW-4 through two, 2-inch diameter HDPE, eight-hundred-foot force mains to the treatment building on the FTA; see Figures 2 and 3A.

The groundwater was originally discharged from the force mains to an equalization tank, then filtered through a 10-micron bag filter and pumped through two GAC vessels in series. The treated groundwater is discharged by gravity to several large recharge chambers in a north-central location of the FTA, upgradient of the recovery well and approximately cross-gradient of the highest levels of PFAS contamination detected at the FTA property. See Fig. 2 for the location of the recharge basins. As appropriate to prevent breakthrough of the PFAS6 compounds, the GAC is periodically changed out.

In November 2022, the original GAC vessels were taken out of service due to corrosion. They were replaced with rented, new steel vessels.

GWTS # 2

As noted, the NOR also requested that Barnstable County increase the groundwater recovery and treatment rate to increase PFAS removal from the aquifer. In November 2019, a second, supplemental treatment system was installed, designated as GWTS#2, to treat water from the existing recovery well and better use its extraction capacity. One of the two force mains was re-piped and connected via hose and hard piping to GWTS#2. The system is contained in a mobile structure (former shipping container) and is designed to treat PFAS-impacted groundwater by GAC adsorption at a target flow rate of approximately 30 gpm.

From the inception of treatment for PFAS in 2015 through 2021, the spent GAC was collected by the supplier, Calgon Carbon Corp. (Calgon), during the changeout procedure and transported to their facility for thermal regeneration or destruction. For the 2022 and 2023 carbon changeouts, Carbon Filtration Systems (CFS) was the chosen vendor to supply new GAC from a different supplier, changeout the GAC, and transport the spent GAC to the GAC supplier’s facility for thermal regeneration; see section 5.5. As noted above, the FTA GWPTS use virgin, coal-based GAC that has been specified for removal of PFAS compounds. Prior to 2022, the GAC was supplied by Calgon, although it was typically changed out by CFS, as the local vendor. The GAC currently in use is NORIT GAC 400, manufactured by NORIT Americas, Inc. See section 5.5 for updated information.

Currently, Groundwater Treatment Technologies, LLC (GWTT) is contracted by Barnstable County to provide operation and maintenance (O&M) of the GWTS, including but not limited to licensed wastewater operator oversight, bag filter checks and replacements, VFD pump monitoring, GAC vessel backwashing, and GAC replacement oversight. BETA provides oversight and review of system operations and coordination and procurement of GAC changeouts and repairs. Additionally, BETA collects monthly samples for PFAS from both systems to check their treatment performance (See section 5.0) and conducts MCP reporting.

3.3 PHASE I INITIAL SITE INVESTIGATION AND TIER CLASSIFICATION

In May 2018, a Phase I Initial Site Investigation (ISI) Report and Tier Classification Submittal was submitted to MassDEP by BETA (formerly Nover-Armstrong Associates) on behalf of Barnstable County for the RTN 4-26179 release. The Phase I ISI confirmed that the primary contaminant of concern is PFOS and, to a lesser extent, PFOA. Based on the compiled Phase I Initial Site Investigation data, BETA opined in the Phase I report that continuation of the IRA activities and additional assessment and, potentially, additional remedial Response Actions are warranted at the Disposal Site.

A Phase II Comprehensive Site Assessment Conceptual Scope of Work (SOW) was submitted with the Phase I ISI outlining the scope, nature of investigation, and sample programs proposed to characterize the risk of harm posed to health, safety, public welfare, and the environment (for regulatory closure). The Phase II SOW proposed additional remedial and/or response actions such as continued monitoring of the Site groundwater conditions, potential soil removal or modifications to the existing groundwater treatment system to be implemented in the near future. At a later date, MassDEP indicated that a formal Phase II Comprehensive Site Assessment SOW was required to replace the Conceptual SOW.

A Tier Classification was submitted to MassDEP concurrently with the Phase I Report. Based on the need to continue remedial actions as IRAs under the current IRA Plan, and on the continuing need to abate a potential Imminent Hazard condition related to impacts to public water supplies, the RTN 4-26179 release was classified as Tier I.

3.4 ENVIRONMENTAL SETTING AND SENSITIVE RECEPTORS

As shown on the Massachusetts GIS Priority Resources (21E) mapping (**Figure 4**) the Site is located within a Zone II Public Water Supply Protection Area and a Medium-Yield Sole Source Aquifer. The FTA is situated to the west and upgradient of the Mary Dunn public water supply wells 1, 2, and 3 (MD 1, MD-2, and MD-3) under pumping conditions. Mary Dunn Wells 1, 2, and 3, owned by the Town of Barnstable through the Hyannis Water Supply Division (HWSD) of the Barnstable Department of Public Works (DPW), are located within the Disposal Site boundary due to the detections of PFAS in the groundwater at those wells.

There are no known private potable water wells located within the area currently understood to comprise the preliminary Disposal Site.

Mary Dunn Well 3 (MD-3) is located approximately 1,000 feet east of the FTA; it is the nearest public water supply well to the facility. MD-3 reportedly has been pumped at an average rate of 380 to 450 gallons per minute (gpm). Mary Dunn Wells 1 and 2 (MD-1 and MD-2) are located approximately 1,600 feet and 1,700 feet, respectively, southeast of the FTA. These wells have been reported to pump at rates of 400 gpm each. Airport Well 1, also owned by HWSD, is located further to the southeast of the FTA, south of Mary Dunn Pond.

Two other public water supply wells, identified as Barnstable Fire District (BFD) wells BFD-2 and BFD-5, are located to the west and most likely upgradient of the Site. The BFD wells are operated by Barnstable Fire District Water Department.

Based on available USGS and MassGIS topographic data, elevations at the Site are approximately 30 to 50 feet above mean sea level (MSL). Surveyed elevations on the FTA itself range from approximately 32 to 40 feet above MSL, NAD88 datum. The FTA itself is relatively flat, most likely graded for the original construction of the facility, with the exception of the western portion of the facility, which slopes downward to the west towards Flintrock Pond, and northern and southeast quadrants of the FTA that slope downward towards adjacent wooded areas.

Topography of the overall Site can be categorized as generally level with slight to moderate slopes downward to the west and southeast, toward Flintrock Pond and Mary Dunn Pond, respectively. However, this is the general trend of the area. The wooded areas of the Site to the east and southeast of the FTA are characterized by typical, hilly topography of the mid-Cape with its widely varying terrain. The Site is punctuated with small depressions, some intermittently filled with water, typical of post-glacial terrain.

The nearest surface water bodies to the Site are Flintrock Pond and a small, unnamed pond; Flintrock Pond is located west adjacent to the FTA and the unnamed pond is located northeast of the FTA (as depicted in **Figures 2 and 3A**). Flintrock Pond is located within the preliminary MCP Disposal Site Boundary based on the detection of PFAS in sediment and surface water. There are no streams or wetlands located at the Site. Based on Phase II CSA results to date, including testing of sediment and/or water in the unnamed pond and Mary Dunn Pond, they are now considered to be part of the preliminary Disposal Site.

3.5 FLINTROCK POND ASSESSMENTS

Per the *Order of Conditions: Special Conditions of Approval (SE3-5606)*, Item 17, the Town of Barnstable Conservation Commission required “new testing results for PFAS in Flintrock Pond.” Prior to the Phase II Comprehensive Site Assessment, from November 2019 to October 2020, BETA conducted surface water and sediment sampling at Flintrock Pond. Potentially significant concentrations of the total PFA6 compounds (PFOS, PFOA, PFNA, PFHxS, and PFHpA) were documented in the pond sediments and surface water. No MassDEP or US EPA regulatory standards or guidelines for sediment and surface water are available for comparison. However, the surface water PFAS6 concentrations are elevated in comparison to MCP GW-1 risk standards. Similarly, the PFAS6 concentrations in sediment are elevated if compared to current MCP Method 1 soil risk standards. Later compilations of the PFAS data include the sixth PFAS compound regulated under the MCP, Perfluorodecanoic Acid (PFDA).

Concentrations of PFAS6 documented within Flintrock Pond sediments are dominated by the PFOS and PFHxS compounds and vary significantly across the Pond. Refer to the combined IRA Status Report No. 64 and Interim Phase II CSA Status Report, April 2023 submitted to MassDEP for more detailed information on the earlier and Phase II CSA assessments conducted of Flintrock Pond.

3.6 SAMPLING AND ANALYSIS FOR PFAS

Prior to October 2022, BETA submitted all aqueous and/or soil samples to Bureau Veritas Laboratories (BV Labs) (formerly Maxxam Analytical). BV Labs is an accredited laboratory located in Mississauga, Ontario that has performed the PFAS analyses for all samples collected from the Disposal Site since the assessment for PFAS impacts began. Aqueous samples were analyzed for PFAS via USEPA Method 537.1 modified (537.1m) under BV laboratory standard operating procedure CAM SOP 0894. Soil or sediment samples were analyzed for PFAS via BV standard operating procedure CAM SOP 0894 based on the ASTM D7968-17 solvent extraction and Liquid chromatography/dual mass spectrometry (LC/MS/MS) analytical methods. BV Labs reported the concentrations of 23 PFAS compounds from aqueous and soil samples with laboratory detection limits as low as 2.0 ng/L (0.002 µg/L). However, for the purposes of achieving the low laboratory detection limits to compare the results to the MCP GW-1 Standard of 20 ng/L for the monthly performance samples collected from the treatment systems, BV Labs was only able to report 21 PFAS compounds; two of the fluorotelomers were not reported.

In July 2022, BETA, on behalf of the County, solicited quotes from multiple laboratories for new contract pricing for PFAS analyses. Based on the quotes received, the County awarded a contract to Pace Analytical Laboratory of East Longmeadow, MA in September 2022. The current formal name of the laboratory is

Con-test, a Pace Analytical Laboratory; for the purposes of this and subsequent MCP submittals, the laboratory will be referred to as Pace. Since October 2022, Pace has performed the analyses for PFAS of all samples from the FTA Site using their internal SOPs (SOP 454 PFAS for aqueous sample analysis and SOP 466 PFAS for solid sample analysis), which are Isotope Dilution-based methods. Pace reports the concentrations of 34 PFAS compounds from aqueous and solid samples with laboratory detection limits as low as 1.8 ng/L (0.0018 µg/L).

Upon receipt of a laboratory report, BETA reviews the concentration data as well as the laboratory case narrative and quality assurance report. BETA summarizes and tabulates the analytical results of six PFAS compounds (PFOS, PFOA, PFNA, PFHxS, PFHpA, and PFDA) based on the MassDEP MCP PFAS risk standards (December 2019). BETA presents the tabulated data and includes the laboratory analytical reports (or Certificates of Analysis) for the reporting period in the IRA Status and RMR reports; the summary data tables, and laboratory analytical reports are included as attachments to these reports.

3.7 PUBLIC INVOLVEMENT

In January 2019, a petition from a group of residents of Barnstable and Hyannis, MA was received, requesting that the Site be designated a Public Involvement Plan (PIP) Site. In response, Barnstable County designated the Site as a PIP site and began PIP activities in accordance with 310 CMR 40.01404. Notification of the Site Designation and the initial public meeting was provided to all petitioners and the Town of Barnstable officials in writing in February 2019. On May 2, 2019, a public meeting was held, and the Draft Public Involvement Plan (PIP) was presented and distributed. Public comments (as they relate to the response actions implemented for the release of PFAS at the Site and are in accordance with 310 CMR 40.01404) were incorporated into the final Plan, which was finalized on June 27, 2019.

3.7.1 PUBLIC COMMENT DRAFT PHASE II COMPREHENSIVE SITE ASSESSMENT SCOPE OF WORK

As noted earlier, MassDEP indicated that a formal Phase II Comprehensive Site Assessment (CSA) SOW was required for the RTN 4-26179 PFAS Release Site. On July 16, 2021, a Public Comment Draft Phase II Comprehensive Site Assessment (CSA) Scope of Work was submitted via eDEP and made available for public comment. The Draft Phase II CSA SOW described the comprehensive assessment activities proposed to meet the Phase II objectives at 310 CMR 40.0833. A Public Information Meeting was held virtually on August 18, 2021. Public comments were accepted on the Draft Phase II CSA SOW until August 26, 2021. Several sets of public comments were received. The significantly revised and expanded final Phase II CSA SOW was submitted to MassDEP on March 23, 2022. The public comments received on the Draft Phase II CSA Scope of Work were addressed and incorporated into the final Phase II CSA Scope of Work, as appropriate and feasible.

On June 9, 2022, a virtual public meeting was held to present the final Phase II CAS SOW and how it was going to be implemented, to provide an update on the capping and demolition project of the former FTA, and to provide an update of the groundwater conditions across the site. Questions and comments were taken at the end of the meeting.

3.7.2 PUBLIC INVOLVEMENT – PROJECT UPDATES

On July 27, 2023, a virtual public meeting was conducted by Barnstable County officials, assisted by BETA, to provide overall project updates and to update the public on the progress of the Final Phase II CAS work and findings to date. Questions and comments were taken at the end of the meeting.

On January 30, 2023, a virtual public meeting was conducted by Barnstable County officials, assisted by BETA, to provide overall project updates and to update the public on the progress of the Final Phase II CAS work and findings to date. Questions and comments were taken at the end of the meeting.

4.0 PREVIOUSLY COMPLETED IRA ACTIVITIES

Since the submittal of the IRA Plan in September 2016, remedial response actions and assessment activities have continued to address the PFAS impacts at the Site.

This section summarizes previously completed and continuing IRA response actions at the Site. Details regarding these IRA response actions can be found in previous IRA Status submittals. Details of IRA activities during the current reporting period are presented in Section 5.0.

4.1 CONTINUING OPERATION & MAINTENANCE OF GWTS

4.1.1 –GROUNDWATER RECOVERY AND TREATMENT FOR PFAS – BACKGROUND

As noted previously, Barnstable County and the Cape Cod Commission implemented response actions to refurbish and re-start a decommissioned groundwater pump and treatment system at the Site in 2015. Details regarding the refurbishment and initial operation of this pump and treatment system were included in the September 2016 IRA Plan. Cape Cod Commission oversaw and documented the GWPTS performance on behalf of Barnstable County from July 2015 through February 2018. The Cape Cod Commission also conducted groundwater monitoring and oversaw operation and maintenance of the recovery well, PRW-4. The refurbished treatment system remains in operation, although it has experienced unscheduled shutdowns due to equipment breakdowns. Following the mobilization and start-up of a second groundwater treatment system in November 2019 (see Section 4.1.3), the system refurbished in 2015 has been referred to as GWTS #1, or the primary system in MCP filings.

Monthly performance monitoring samples have been collected since GWTS #1 startup in July 2015, from the influent (PRW-4), midpoint, and effluent sample locations. Since November 2019, performance samples have been collected monthly from both GWTS # 1 and GWTS #2.

Periodic monitoring of the GWTS systems is required to maintain system operation including flow rate monitoring, twice weekly changes of the bag filters, checks of the transfer pumps and VFD, regular backwashing of the carbon vessels, minor repairs, as well as oversight of carbon exchanges, force mains cleanouts, and replacement of the recovery well pumps. This work is currently performed by a wastewater treatment system operator, Groundwater Treatment and Technology (GWTT), under contract to the County. Since November 2019, GWTT maintains and operates both GWTS#1 and GWTS#2 systems.

Periodic maintenance of the recovery well and pump is conducted by well driller contractors in an attempt to maintain the groundwater pumping rate from the well, which is impacted by build-up of iron fouling on and within the pump, piping and well casing itself.

Change-outs of the GAC in one or more vessels within the two GWTS systems is conducted by specialty contractors or GAC suppliers as coordinated and directed by BETA, on behalf of the County, based on the laboratory results of the monthly system performance samples. GWTT and/or BETA oversee the GAC changeouts.

IRA activities related to the operation and maintenance of the GWPT systems conducted during previous IRA reporting periods have been described in detail in previously submitted IRA Status Reports and RMRs. Refer to those submittals for complete information. The previously submitted documents are available on the MassDEP Sites Database; refer to the following link to access these reports.

<https://eeonline.eea.state.ma.us/portal#!/wastesite/4-0026179>.

On behalf of Barnstable County, BETA submitted monthly IRA remedial monitoring reports and status reports between March 2018 and January 2022. Since January 2022 IRA RMRs and Status Reports have been submitted every six months. These submittals have included operations information, summaries of PFAS analytical data for the monthly system samples, and the respective laboratory analytical reports. As noted previously, the laboratory reports for monthly GWTS performance monitoring provide the results for 21 to 34 PFAS compounds (depending on laboratory) in order to allow for lower laboratory reporting limits.

4.1.2 HEALTH ADVISORIES AND REGULATORY STANDARDS USED FOR COMPARISON

During the initial years of the GWPTS operation (July 2015 through June 2018), the USEPA Health Advisories (HA) for two PFAS chemicals, Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS), were used for comparison to the analytical results of GWPTS performance samples. The HA (revised downward to 0.070 µg/L in July 2016) applied to each compound individually or for the total concentration of the two (PFOS and PFOA). Subsequently, MassDEP adopted the USEPA HA temporarily.

On June 11, 2018, MassDEP's Office of Research and Standards (ORS) issued an updated ORS Guideline/HA that applied to the individual concentrations, or the total summed of five PFAS chemicals: PFOS, PFOA, Perfluorononanoic Acid (PFNA), Perfluorohexanesulfonic Acid (PFHxS), and Perfluoroheptanoic Acid (PFHpA). From June 11, 2018 to December 2019, individual concentrations of any of these five compounds or the total concentrations of all were compared to the MassDEP ORS HA of 0.070 µg/L.

On April 19, 2019, MassDEP released the Public Comment Draft of proposed revisions to the MCP, which included proposed Method 1 groundwater risk standards for the five PFAS compounds, plus an additional PFAS compound, Perfluorodecanoic Acid (PFDA). A Method 1 GW-1 risk standard of 0.020 µg/L was proposed for the individual concentrations of any of these six compounds or the total concentrations of all six.

In December 2019, MassDEP published final MCP Method 1 risk standards for the six PFAS compounds listed in the Public Comment Draft: PFOS, PFOA, PFNA, PFHxS, PFHpA, and PFDA, collectively termed the PFAS6 compounds, with an effective implementation date of December 27, 2019. The current MCP PFAS risk standards for groundwater include the PFAS6 compounds of concern listed above. The current GW-1 numerical risk standard for each compound or for the total of the PFAS6 is 0.020 µg/L¹. From May 2019 through the current reporting period, tabulated treatment system analytical results have been compared to the six regulated PFAS compounds. These MCP risk standards are included in all relevant tables in the monthly and quarterly monitoring reports.

On June 15, 2022, the US EPA released updated drinking water HAs for four PFAS compounds; these HAs are significantly lower than previous HAs. EPA published two updated Interim HAs: for PFOA = 0.004 ng/l (0.004 parts per trillion) and for PFOS = 0.02 ng/l. EPA also published two Final Health Advisories, one for GenX chemicals = 10 ng/l and the second Final Health Advisory for perfluorobutane sulfonate (PFBS - 2,000 ng/l. According to the EPA Fact Sheet accompanying the release of these HAs:

“Drinking water health advisories provide information on contaminants that can cause human health effects and are known or anticipated to occur in drinking water. EPA's health advisories are non-

¹ Concentrations of PFAS are presented in the data tables of this report in nanograms per liter (ng/L), also referred to as parts per trillion (ppt) and are reported by the laboratory in those units. However, the published MCP Method GW-1 numerical risk standards for PFAS compounds (PFOS, PFOA, PFNA, PFHpA, PFHxS, and PFDA) are presented in micrograms per liter (µg/L), also referred to as parts per billion (ppb). In the relevant sections of this report, results are shown in both units.

enforceable and non-regulatory and provide technical information to states agencies and other public health officials on health effects, analytical methods, and treatment technologies associated with drinking water contamination.

EPA's lifetime health advisories identify levels to protect all people, including sensitive populations and life stages, from adverse health effects resulting from exposure throughout their lives to these PFAS in drinking water. The health advisory levels were calculated to offer a margin of protection against adverse health effects. EPA's lifetime health advisories also take into account other potential sources of exposure to these PFAS beyond drinking water (for example, food, air, consumer products, etc.), which provides an additional layer of protection."

On March 14, 2023, US EPA announced proposed National Primary Drinking Water Regulation (NPDWR) for six PFAS compounds: PFOA, PFOS, PFNA, hexafluoropropylene oxide dimer acid (HFPO-DA, commonly known as GenX chemicals), PFHxS, and PFBS. The proposed Maximum Contaminant Levels (MCLs), which would become enforceable standards, are:

- PFOA – 4 ng/l,
- PFOS – 4 ng/l,
- for PFNA, PFHxS, PFBS and HFPO-DA a Hazard Index of 1.0 (unitless.)

These proposed MCLs are not enforceable standards until they become finalized. EPA projected finalizing the regulations by the end of 2023. At the time of finalization of this status report, the proposed EPA MCLs had not been finalized.

For MCP purposes the current MassDEP / MCP groundwater risk standards apply. Except where noted (due to older data), total PFAS concentrations reported and discussed in this report are the sum of concentrations of the PFAS6 compounds included in the final MCP risk standards of December 27, 2019.

4.1.3 IMPLEMENTATION OF GROUNDWATER TREATMENT SYSTEM NO. 2

In November 2019, the County procured (rented) and started a second treatment system, GWTS #2, in an effort to increase the treatment capacity of groundwater available hydraulically from PRW-4. As a result, groundwater conveyed from PRW-4 was split and re-piped to both GWTS #1 and GWTS #2. Therefore, although there are two treatment systems, they both treat water from one source, recovery well PRW-4. Collectively, the recovery well and the two treatment systems are referred to as the groundwater pump and treatment systems (GWPTS).

4.2 HOT SPOT SOIL REMOVAL

Barnstable County and the Cape Cod Commission oversaw the excavation of 200 cubic yards of PFAS impacted soils from the former "Hot Spot" area (an approximately 400 square-foot area) for off-Site disposal in January 2017. Details regarding the Hot Spot soil removal were included in the January 2017 IRA Status Report.

4.3 HOT SPOT AREA CAPPING

From December 2018 through February 2019, Barnstable County implemented the regrading and temporary capping of the southwest corner of the FTA, including the former Hot Spot area, with related stormwater controls, termed the Phase I Stormwater Management Improvements/IRA Plan Modification. Additional details regarding the Phase I Stormwater Management Improvements were included in the February 2019 Reporting Period IRA Status No. 27 Report.

4.4 SITE WIDE CAPPING AND SELECT BUILDING DEMOLITION

In response to a directive from MassDEP, an IRA Plan Modification was finalized in December 2019 for Sitewide capping and stormwater improvements. In 2020 to 2021, final design was completed for capping of the majority of the former Fire Training Academy and the demolition of former live-fire training buildings and all training props at the Site. The plans were submitted for approval to the Town of Barnstable via a Notice of Intent in February 2020. Final design approval and an Order of Conditions was obtained in November 2020 and January 2021 respectively. IRA Plan Modification No. 3 was also finalized in June 2021 to formalize the inclusion of selected building demolition into the project.

The County received public bids for the project in April 2021. The capping project was awarded in July 2021. Construction began in August 2021 and was substantially completed by November 2021. The former live fire training buildings, other fire training props, and features were demolished and disposed of off-Site. Approximately 650 tons of PFAS contaminated demolition debris and materials associated with these structures were transported to and disposed at the US Ecology / Wayne Disposal, Inc. disposal facility in Belleville, MI in September 2021. Approximately 59,000 square feet (SF) of unpaved portions of the FTA were capped with 3.5-inches of hot mix asphalt pavement following installation of a stormwater management system and regrading of the facility. Additional details, photographic documentation of the completed cap, and waste disposal documentation were provided in IRA Status Report No. 60 for the November 2021 reporting period.

5.0 IRA ACTIVITIES JANUARY 2023 TO JUNE 2023 – GROUNDWATER PUMPING AND TREATMENT

5.1 CURRENT OPERATION & MAINTENANCE OF GWTS SYSTEMS

During the July to December 2023 reporting period, the primary treatment system (GWTS #1) and secondary system (GWTS #2) were in operation approximately 179 days. During the current reporting period, both treatment systems underwent a brief scheduled shutdown in order to conduct recovery well PRW-4 maintenance and force main cleaning from August 29, 2023, to August 31, 2023. The systems were shut down on December 15, 2023, and December 18, 2023, to allow pump out of accumulated iron sediment in the equalization tanks (see section 5.6 for details). The systems were returned to operation once the tanks were pumped out. Therefore, the systems were shut down for less than a day.

Lastly, the systems were shut down on December 29, 2023, while a carbon changeout was performed. The system remained off-line for the remainder of December 2023 and was re-started on January 2, 2024. See section 5.5 for details. The recovery well and both treatment systems did not incur any unscheduled shutdowns during this reporting period.

Between July and December 2023, GWTS #1 and GWTS#2 were sampled 6 times, once per month.

5.2 REMEDIAL MONITORING REPORT – GWTS #1

5.2.1 GWTS #1 SYSTEM MONITORING RESULTS

As noted, system samples were collected from the Influent (PRW-4), Midpoint, and Effluent ports monthly – on July 13, 2023, August 22, 2023, September 9, 2023, October 12, 2023, November 21, 2023, and December 21, 2023. Samples were submitted to PACE for the laboratory analysis of Total PFAS via their internal SOP 454 PFAS, isotope dilution-based method for aqueous sample analysis. Pace reports the

concentrations of 34 PFAS compounds from aqueous samples with laboratory detection limits as low as 1.8 ng/L (0.0018 µg/L). Details are presented in the laboratory reports.

Refer to the attached **Table 1A**, for a summary of the GWTS #1 PFAS analytical data. The complete laboratory reports are included in **Appendix B**.

Influent / PRW-4 Data

Recovery well PRW-4 is the source of the Influent groundwater. The individual concentrations of the six Massachusetts regulated PFAS (PFAS6) compounds in the Influent (PRW-4) samples for each monthly sampling round are listed on Table 1A.

The sum of the six Massachusetts regulated PFAS (PFAS6) concentrations in the Influent (PRW-4) samples for each monthly sampling round were:

- 630 ng/L - July 13, 2023
- 499 ng/L - August 22, 2023
- 760 ng/L - September 8, 2023
- 533 ng/L - October 12, 2023
- 477 ng/L - November 21, 2023
- 487 ng/L - December 21, 2023

The monthly totals are well above the GW-1 risk standards. During the July to December 2023 reporting periods, five of the six regulated PFAS compounds (PFOS, PFOA, PFNA, PFHxS and PFHpA) were detected in the Influent/PRW-04 samples at concentrations exceeding the MCP GW-1 risk standard (20 ng/L/0.020 µg/l); PFDA was detected at concentrations below the MCP GW-1 standard.

Based on the splitting of flow from PRW-4 to both groundwater treatment systems, the Influent analytical results apply to GWTS #2, as well as GWTS #1. **Figure 5**, attached, depicts the concentration trends observed in groundwater at the extraction well PRW-4, as measured as the Influent to the groundwater treatment systems. **Figure 5** depicts the sum of PFAS 6 concentrations in the Influent to the system. Due to the nature of the laboratory data reported from 2015 until December 2019, versions of this graph in previous status reports depicted the total concentration of the PFOS and PFOA compounds only. Following a downward trend from December 2020 through July 2021, the total PFAS6 concentrations in the Influent/PRW-4 samples have been relatively consistent in the range of approximately 400 to 800 ng/L.

Midpoint Data

In the July and August 2023 reporting periods, the PFAS6 compounds were not detected above laboratory reporting limits. In the September 2023 through December 2023 reporting periods PFOS was detected in the Midpoint samples at concentrations above the MCP GW-1 risk standard (20 ng/L/0.020 µg/l) (therefore, the sum of the PFAS 6 also exceeded the risk standard). PFOA, PFHxS, PHNA, and/or PFHpA were detected in the Midpoint samples at concentrations above the laboratory reporting limit but below the MCP GW-1 risk standard (20 ng/L/0.020 µg/l). PFDA was below laboratory reporting limits in the July to December 2023 report period.

The sum of the PFAS6 compounds in the monthly Midpoint samples were:

- BRL - July 13, 2023
- BRL - August 22, 2023
- 46.7 ng/L - September 8, 2023
- 66.5 ng/L - October 12, 2023

- 72.2 ng/L - November 21, 2023
- 66.7 ng/L – December 21, 2023

The MCP GW1 exceedances November and December 2023 are indicative of breakthrough and the need for the changeout of carbon within the system. Following the receipt of the November system sampling results, the process to contract for a changeout of the GAC was begun. As discussed in section 5.5, BETA oversaw a changeout of the carbon in both vessels in December 2023.

Effluent Data

The September 2023 sampling round showed a detectable concentration of PFOS in the effluent sample, the concentration was detected about laboratory reporting limits but below the MCP GW-1 risk standard (20 ng/L/0.020 µg/l). The remaining five PFAS compounds were not detected above laboratory reporting limits. In the July, August, October, November, and December 2023 reporting periods, the PFAS6 compounds were not detected above the laboratory reporting limits in the monthly Effluent samples. Refer to Table 1A for details. Refer to **Appendix B** for the complete laboratory reports which includes the concentrations of the remaining unregulated PFAS compounds as well as the laboratory RDLs and MDLs.

Due to the relatively high concentrations of PFAS6 entering the lag GAC vessel over an extended period, the overall time since the GAC had been changed out in the lag vessel, and the fixed costs for GAC changeout, the decision was made to contract for complete changeout of the GAC, i.e., replacement of the GAC in both the lead and lag vessels of GWTS #1.

5.2.2 GWTS #1 OPERATIONAL DETAILS

The attached **Table 2A** presents a monthly summary of the GWTS #1 performance data. In order to provide clearer, summarized operational data for the treatment systems, the format and information presented in Table 2A has been revised and streamlined in comparison to the operational data tables presented in previous IRA Status Reports (and RMRs). In addition, Table 2A presents summary data only for the current reporting period. For reference purposes, the version of Table 2A - Summary of Operating and Maintenance Data from the previous IRA Status Report and RMR is included in **Appendix C**.

GWTS #1 was operational for 179 days in the July through December 2023 reporting period. As part of operation and maintenance, the system was shut down on August 29, 2023 through August 31, 2023 for recovery well pump maintenance and force main cleaning. See section 5.7 for details.

The system was also shut down for a short time on December 15, 2023 and again on December 18, 2023 in order to have the sediment in the equalization tanks vacuumed out and disposed of by Clean Harbors. The system was restarted later each day. See section 5.6 for details.

Lastly, the system was shut down on December 29, 2023, while a carbon changeout was performed. The system remained off-line for the remainder of December 2023 and was re-started on January 2, 2024. See section 5.5 for details.

Estimated Influent Flow Rates

The combined estimated instantaneous Influent flow rates are calculated by Groundwater Technologies personnel by timing the rise of groundwater in the GWTS #1 Equalization Tank with both force mains discharging to it; these readings are recorded on treatment system logs. However, during normal operation, the flow from one force main is diverted directly to GWTS #2. Therefore, during the normal mode of operation, with the flow from each force main flowing to only one system, it is assumed that roughly 50% of the instantaneous influent rate stated above actually flows to GWTS #1 for treatment. Those values are shown on **Table 2A** in the Average Estimated Instantaneous Flow Rate – Influent column in gallons per minute (GPM). The average estimate instantaneous flow rate for GWTS #1 ranged from 2.8

GPM (July and August 2023) to 17.3 GPM (September 2023). The low end of this range of flow rates is historically low and was most likely affected by iron fouling built up in the recovery well and / or force main piping prior to the well pump and force main cleaning performed at the end of August. See section 5.7 for details.

Groundwater Volume Treated and Average Flow Rate

For the July 2023 to December 2023 reporting periods, the overall (average) system flow rates and gallons of groundwater treated are based on the Effluent flow meter/totalizer readings reported for system #1. The monthly total gallons of groundwater treated during the July 2023 to December 2023 report period, ranged from approximately 0.13 million gallons (July 2023) to 0.77 million gallons (September 2023) with monthly average effluent flow rates that ranged from of 2.9 gpm to 18 gpm. The total gallons treated by GWTS #1 for the July to December 2023 reporting period was approximately 2.4 million gallons. These results indicate substantial variability in the monthly total volumes treated and average Effluent/treatment flow rate. In addition, the low end of the range of treatment volumes and average flow rates is historically low. In the months of July and August 2023, the average flow rate and total net gallons were the lowest. This is most likely attributable to iron sludge build-up in the recovery well and the force mains. BETA oversaw the cleaning of the PRW-4 well pump and force mains at the end of August 2023. After the recovery well and force main maintenance both values raised substantially in September and October 2023. The average flow rate and net gallons treated decreased in November 2023 and December 2023, indicating that well maintenance may need to be conducted again.

Based on the approximate gallons treated and total concentrations of PFAS6 in each month's Influent sample, a total of approximately 5.5 grams of PFAS6 were estimated to have been removed from the groundwater by GWTS #1 during the July to December 2023 reporting period. Results for each month are provided on **Table 2A**.

5.3 REMEDIAL MONITORING REPORT – GWTS #2

5.3.1 GWTS # 2 MONITORING RESULTS

BETA collected performance samples from GWTS #2 system on July 13, 2023, August 22, 2023, September 9, 2023, October 12, 2023, November 21, 2023, and December 21, 2023. Samples collected from the Midpoint and Effluent ports were submitted to Pace for the laboratory analysis of Total PFAS via their internal SOP 454 PFAS, isotope dilution-based method for aqueous sample analysis. As noted above, recovery well PRW-4 is the source of the Influent groundwater to both groundwater treatment systems. Therefore, the Influent analytical results for GWTS #1, discussed in Section 5.2.1, apply to GWTS #2, as well.

The attached **Table 1B** summarizes the GWTS #2 PFAS analytical data. The complete laboratory report is attached in **Appendix B**.

As previously mentioned, the tabulated treatment system analytical results from GWTS #2 are reported and compared to the PFAS6 compounds and their respective MCP Method 1 GW-1 Standards; see discussion in Section 5.2.1 above.

Midpoint Data

In the July, August, and October 2023 reporting periods, the PFAS6 compounds were not detected above laboratory reporting limits. In the September 2023 monthly system sample PFOS and PFHxS were detected by the laboratory in the Midpoint sample at levels below MCP GW-1 standards, and the remaining compounds were below laboratory reporting limits. In the November 2023 system Midpoint sample, PFOS

was detected at a concentration exceeding the MCP GW-1 risk standard, PFOA, PFHxS, and PFHpA were detected at concentrations above the laboratory reporting limits but below MCP GW-1 standards, and the remaining compounds were below laboratory reporting limits. In the December 2023 system sample, PFOS, PFOA, PFHxS, and PFHpA were detected at concentrations exceeding the MCP GW-1 standards, and PFNA and PFDA were detected at concentrations below MCP GW-1 standards.

The sum of the PFAS6 compounds in the July to December 2023 monthly Midpoint samples were:

- BRL - July 13, 2023
- BRL - August 22, 2023
- 11.2 ng/L - September 8, 2023
- BRL ng/L - October 12, 2023
- 41.2 ng/L - November 21, 2023
- 399.5 ng/L – December 21, 2023

The MCP GW1 exceedances November and December 2023 are indicative of breakthrough and the need for the changeout of carbon within the system. Following the receipt of the November system sampling results, the process to contract for a changeout of the GAC was begun. The December 2023 Midpoint sample total PFAS6 concentration indicates nearly complete PFAS compound breakthrough of the GAC in the lead vessel of GWTS #2. The November and December Midpoint results indicate a continued flow of groundwater with significantly elevated PFAS concentrations being pumped into the lag GAC vessel. Similar to GWTS #1, the decision was made to contract for complete changeout of the GAC, i.e., replacement of the GAC in both the lead and lag vessels of GWTS #2. As discussed in section 5.5, BETA oversaw a changeout of the carbon in both vessels in December 2023.

Effluent Data

The September 2023 sampling round showed a detectable concentration of PFOS, PFOA, PFHxS, and PFHpA in the effluent sample, the concentration was detected about laboratory reporting limits but below the MCP GW-1 risk standard (20 ng/L/0.020 µg/l). The remaining two PFAS compounds were not detected above laboratory reporting limits. In the July, August, October, November, and December 2023 reporting periods, the PFAS6 compounds were not detected above the laboratory reporting limits in the monthly Effluent samples. Refer to Table 1A for details. Refer to **Appendix B** for the complete laboratory reports which includes the concentrations of the remaining unregulated PFAS compounds as well as the laboratory RDLs and MDLs.

5.3.1.1 GWTS #2 OPERATIONAL DETAILS

The attached **Table 2B** presents a monthly summary of the GWTS #2 performance data. GWTS #2 was operational for 179 days in the July through December 2023 reporting period. As part of operation and maintenance, the system was shut down on August 29, 2023, through August 31, 2023, for recovery well pump maintenance and force main cleaning. See section 5.7 for details.

The system was also shut down for a short time on December 15, 2023, and again on December 18, 2023 in order to have the sediment in the equalization tanks vacuumed out and disposed of by Clean Harbors. The system was restarted later each day. See section 5.6 for details.

Lastly, the system was shut down on December 29, 2023, while a carbon changeout was performed. The system remained off-line for the remainder of December 2023 and was re-started on January 2, 2024. See section 5.5 for details.

Similar to the note in section 5.2.2 regarding Table 2A, the format and information presented in Table 2B for GWTS #2 has been revised and streamlined in comparison to the operational data tables presented in

previous IRA Status Reports (and RMRs). In addition, **Table 2B** presents summary data only for the current reporting period. For reference purposes, the version of Table 2B Summary of Operating and Maintenance Data from the previous IRA Status Report and RMR is included in **Appendix C**.

Estimated Influent Flow Rates

As described in previous sections, during the normal mode of operation, with the flow from each force main flowing to only one system, it is assumed that roughly 50% of the instantaneous influent rates discussed above for GWTS #1 *actually* flow to GWTS #2 for treatment. Based on that assumption, for the July to December 2023 reporting periods, the calculated Average Estimated Instantaneous Flow Rates for GWTS #2 ranged from approximately 2.8 GPM (July and August 2023) to 17.3 GPM (September 2023). The low end of this range of flow rates is historically low and was most likely affected by iron fouling built up in the recovery well and / or force main piping prior to the well pump and force main cleaning performed at the end of August. See section 5.7 for details.

Groundwater Volume Treated and Average Flow Rate

The overall (average) system flow rate and gallons of groundwater treated were based on the Effluent Flow Rate/net totalizer readings reported for the system by the GWTT; approximately 2.1 million gallons of groundwater were estimated to be treated during the operational time for GWTS #2 for this reporting period, with approximate Average Effluent Flow Rates ranging from 1.6 gpm (August 2023) to 15.5 gpm (September 2023).

Similarly, to GWTS #1, these results indicate substantial variability in the monthly total volumes treated and average Effluent/treatment flow rate. In addition, the low end of the range of treatment volumes and average flow rates is historically low. In the months of July and August 2023, the average flow rate and total net gallons were the lowest. This is most likely attributable to iron sludge build-up in the recovery well and the force mains. BETA oversaw the cleaning of the PRW-4 well pump and force mains at the end of August 2023. After the recovery well and force main maintenance both values increased substantially in September and October 2023. However, the average flow rate and net gallons treated decreased in November 2023 and December 2023.

Based on approximately 2.1 million gallons treated, approximately 4.8 grams of PFAS6 were estimated to have been removed from the groundwater by GWTS #2 during this operational reporting period.

5.4 REMEDIAL MONITORING REPORT SUMMARY

During the July to December 2023 reporting period, treatment systems GWTS #1 and GWTS #2 were in operation for 179 days. The overall (average) system flow rate and gallons of groundwater treated, based on the available Effluent flow totalizer readings for both systems, was approximately 4.5 million gallons.

Figure 5 depicts the concentration trends observed in groundwater at the extraction well PRW-4, as measured as the Influent to the groundwater treatment systems. Following a spike in concentrations in mid-2019, PFAS6 concentrations have generally decreased, or have remained relatively stable at PRW-4. Following a downward trend from December 2020 through July 2021, the total PFAS6 concentrations in the Influent/PRW-4 samples have been relatively consistent in the range of approximately 300 to 700 ng/L. The detected concentrations in the Influent samples remain elevated relative to the GW-1 risk standards.

The completed BWSC 105 Immediate Response Action (IRA) and BWSC 105A and 105B IRA Remedial Monitoring Report Transmittal Forms, except for electronic signature, are included in **Appendix A**.

5.5 CARBON CHANGEOUT

On December 29, 2023, both systems were shut down for changeout of the granular activated carbon (GAC) within both system's carbon vessels. Carbon Filtration Systems (CFS) was contracted by the County to supply virgin GAC, complete removal of the spent GAC in the four (4) separate carbon steel vessels, transfer of 1,500 pounds of new GAC into each vessel, transportation of new and spent GAC, and regeneration or disposal of the spent GAC. CFS vacuumed the spent GAC out of the 4 on-site vessels on December 29, 2023. GWTT was on-site to oversee the carbon changeout and to hydrate the new carbon added to the vessels and GWTT. Both systems remained off-line during this reporting period, and were re-started January 2, 2024.

5.6 WASTEWATER DISPOSAL

During operation and maintenance of the groundwater treatment systems, wastewater is generated during various processes. Due to high iron content of the groundwater the GAC vessels are periodically backwashed into temporary storage tanks (1,200-gallon tank, four, 250-gallon totes and a large roll-off settling tank, added in April 2023) located outside of GWTS #1. The majority of the backwash water is decanted after settling for a substantial time period: it is pumped back into GWTS #1 for proper treatment via the GAC.

Also, as part of system maintenance, the recovery well and force mains develop significant iron fouling and are cleaned periodically. As discussed in section 5.7, the recovery well and force main cleaning was performed in August 2023. At that time, acidified groundwater was pumped into the force mains. The acidified water with entrained and dissolved solids was later pumped from the force mains but diverted from the GWTS and discharged into the temporary storage tanks. The wastewater in the temporary storage tanks was neutralized using food grade soda ash or sodium hydroxide. Contractual and supply chain issues resulted in a long time period between the pipe cleaning and management of the stored wastewater; during that time no backwash storage capacity was available.

Iron sediment had also built up (settled) at the bottom of the equalization tanks located within each treatment system building during normal equalization storage of the incoming groundwater. The build-up of iron sediment at the bottom of the equalization tanks, and lack of storage space within the temporary water storage tanks, caused GWTT to not be able to regularly backwash the carbon vessels. The lack of backwashing may have been a contributing factor to PFAS breakthrough in the midpoint sampling location in GWTS #1 (section 5.2). In September 2023, BETA and the county solicited new quotes for management of the wastewater. Based on quotes received, Clean Harbors Environmental Services (CHES) of Norwell, MA was contracted by the County to pump out, transport and dispose of the wastewater for both wastewater management events.

In September 2023, BETA submitted a volume-weighted, composite sample, taken from the equalization tanks and temporary storage tanks, for pre-characterization to support proper disposal of wastewater and sediments. The sample was submitted to ESS Laboratory of Cranston, RI, for volatile organic compounds (VOC), RCRA8 Metals, Pesticides, Herbicide, Sulfide, energy content (in British Thermal Units (BTU), Total Suspended Solids (TSS), and pH., Detectable concentrations of a number of VOC compounds, and total metals were reported in the composite sample. The complete laboratory report is included in **Appendix F**. PFAS concentrations in the wastewater were assumed to be equal to those documented in BETA's monthly Influent results submitted to Pace.

On December 15, 2023, CHES, under GWTT oversight, utilized a vacuum truck to remove the wastewater and sediments from the exterior totes associated with the treatment system. CHES returned on December

18, 2023, under GWTT oversight, utilized a vacuum truck to remove the wastewater and sediments from the equalization tanks associated with the two treatment systems. Approximately 3,000 gallons of wastewater were removed from the property and transported to the CHES licensed disposal/management facility in Braintree, MA. Copies of the manifests and other waste disposal documentation, including the completed BWSC 112 Bill of Lading, Part 2, is included in Appendix F. CHES took custody of the remediation wastewater at their TSD facility in Braintree, MA. However, according to the CHES proposal for the wastewater management, submitted to BETA and the County, the final disposition of the wastewater was to be at the CHES Hazardous/nonhazardous waste incinerator in El Dorado, AR.

During the December 15, 2023, and December 18, 2023, pump outs, the systems were temporarily shut down for a short time and restarted later the same day.

5.7 RECOVERY WELL MAINTANENCE

As part of system maintenance, the recovery well and force mains to the treatment buildings need periodic cleaning. Desmond Well Drilling Inc. (Desmond) of Orleans, MA, was contracted by the Barnstable County to provide recovery well development services of PRW-4. On August 29, 2023, Desmond mobilized to PRW-4 where the well was predeveloped by pumping and surging to remove material that accumulated in the well. The well pump was removed for cleaning and inspection, then returned to the well. A liquid descaler containing muriatic acid was added to the well and then discharged to the surface. Additional descaler was then added to the well and the acidified groundwater was pumped through the force mains. When it reached GWTS #1, the pump was shut down and the treatment allowed to sit for approximately 48 hrs. On August 31, 2023, Desmond returned to the site and used a closed loop of the 2 force mains to circulate the treated water through the force mains, then discharge the liquid and entrained solids into the temporary storage tanks on Site. Municipal water was then circulated through the force main loop, then used to purge the force mains. Purge water was also discharged to the temporary storage tanks. The work was observed by BETA. On that date, approximately 15 pounds of powdered sodium hydroxide was dissolved and then added to the liquids in the various storage tanks roughly proportionally to raise the pH. pH measurements of the stored liquids indicated a range of approximately 4.0 to 9.0 SUs. The system was restarted on August 31, 2023 after the purging of the lines.

5.8 SETTLING TANK

On April 6th, 2023, GWTT delivered a roll-off settling tank to the FTA and placed the tank at the exterior of the treatment system buildings. The roll-off is a temporary rental to provide increased capacity for back washing the GAC vessels. The approximately 5,000-gallon steel settling tank allows more area and volume for settling of iron sediments and allows GWTT to backwash the systems more efficiently and frequently. Once sediment has settled from the groundwater, the water is pumped back through the GAC vessels.

6.0 IRA ACTIVITIES – QUARTERLY GROUNDWATER MONITORING AND GUAGING

6.1 QUARTERLY & ANNUAL GROUNDWATER MONITORING - GENERAL

Groundwater monitoring related to the PFAS Release on Site have been ongoing since November 2013. BETA, formerly Nover-Armstrong Associates, has conducted groundwater monitoring activities since June 2018 as an Immediate Response Action (IRA).

Since 2019, IRA Site-wide groundwater monitoring has been conducted on a quarterly and annual basis. Groundwater monitoring is based on a MassDEP-approved sampling plan that includes sampling twelve

(12) monitoring wells during three quarterly sampling events (Jan./Feb., April, and July) and sampling an additional eight (8) wells (total of twenty (20)) during the annual sampling round in November. During the July 2023 quarterly monitoring round, additional monitoring wells were sampled as part of Phase II CSA activities to provide groundwater data at newly installed groundwater monitoring points. During the November 2023 annual monitoring round, an additional six (6) monitoring wells were sampled as part of Phase II CSA activities to provide additional groundwater data in close proximity to the FTA as well as in areas near Mary Dunn Road and Mary Dunn Pond.

The quarterly groundwater analytical results for the July and November 2023 sampling events are discussed below. Please note that the July 2023 quarterly groundwater monitoring results were previously summarized in the Interim Phase II CSA Status Report No. 2 submitted to MassDEP in September 2023.

6.2 JULY 2023 QUARTERLY SAMPLING

6.2.1 GENERAL

BETA conducted the July 2023 quarterly groundwater monitoring event over two days, July 25 and 26, 2023, based on the MassDEP approved sampling plan.

A total of twelve (12) monitoring wells were sampled during the July 2023 monitoring event. They included PFW-1, PFW-2, PFW-5, OW-8A, MW-12S, MW-22, PC-39, PC-39D, PC-1, PC-6A, PC-16D, PC-30, and PC-28. The abovementioned monitoring wells are distributed across the FTA and downgradient areas to monitor the current extent of the PFAS plume. **Figure 2** and **Figure 3B** depict the sampling locations. The analytical results and trends of the data from the July 2023 sampling round are discussed in section 6.2.2 with overall conclusions discussed in Section 6.4. The results discussion is loosely organized according to the general locations of the subject monitoring wells within the Disposal Site and in relationship to the FTA itself.

Monitoring wells located within the immediate vicinity of the FTA property were gauged prior to sampling in order to calculate groundwater elevations and evaluate flow patterns. See Section 6.5.

Groundwater samples were collected in accordance with EPA low-flow groundwater sampling procedures. Groundwater quality parameters were collected and allowed to stabilize prior to sample collection. Each groundwater sample was submitted for laboratory analysis of total PFAS by Pace using an isotope dilution method via their internal SOP 454, PFAS for aqueous sample analysis.

In addition, two equipment blank (EB) samples were collected from the water level meters during each monitoring event to assess current decontamination practices and potential cross contamination between monitoring wells. Each EB sample was submitted to Pace for PFAS analysis via SOP 454. The analyses did not identify detectable concentration of PFAS6. Matrix spike / matrix spike duplicate (MD/MSD) were also collected at the request of the laboratory from PC-39. Refer to Appendix D for further details.

6.2.2 ANALYTICAL RESULTS

The PFAS analytical data for the July 2023 sampling round are summarized primarily in **Table 3**. PFAS analytical data for the Phase II CSA monitoring wells sampled during the July 2023 sampling round are summarized in **Table 5**. Copies of the laboratory reports/certificates of analysis for the July 2023 sampling event is included in Appendix D. As previously discussed, effective December 27, 2019, MCP groundwater risk standards for 6 PFAS compounds, (PFOS, PFOA, PFHpA, PFNA, PFHxS, and PFDA) apply to the Site with

a GW-1 risk standard of 20 ng/l for the total and/or any single compound. Therefore, **Table 3** and **Table 5** present the analytical results for the PFAS6 compounds and the sum of their concentrations and shows the comparison of those results to the current MCP GW-1 risk standards. The laboratory report in Appendix D present all analytical results for all reported PFAS compounds, including quality control samples, and lists the laboratory detection and reporting limits. For reference purposes, historic PFAS groundwater analytical data, i.e., for monitoring wells that have not been sampled for several years, are included in **Table 3B**, included in **Appendix C**.

Figures 6 through **9**, attached and discussed below, are graphical presentations of total (sum of) PFAS6 concentrations for selected monitoring wells in representative locations across the Disposal Site. Although these graphical depictions of the PFAS trends are discussed below for July 2023, the figures also include the relevant data points for the November 2023 sampling round discussed in Section 6.3. It should be noted that the graphs depict discrete periodic sampling events at varying intervals from initial sampling in April 2015 and at quarterly intervals (typically) since January 2019. In addition, due to the range of PFAS concentrations, the graphs have different scales on the vertical axes for PFAS concentrations.

FTA Property Monitoring Wells

July 2023 quarterly analytical results for PFW-2 and PFW-1 revealed PFAS6 concentrations of 4,532 ng/L and 19,002 ng/L, respectively. Both the July 2023 concentrations at PFW-2 and at PFW-1 have increased since the April 2023 monitoring event and continue the trend of increasing PFAS6 concentrations in this area. The increases in PFAS6 concentrations at PFW-2 are primarily due to PFOS increasing from 1,100 ng/L in April 2023 to 3,300 ng/L in July 2023. At PFW-1, PFOS remained stable but very high at 15,000 ng/L while PFHxS increased from 910 ng/L in April 2023 to 2,500 ng/L in July 2023, as depicted in **Figure 6**. Evaluation of the groundwater trends in this area of the Site and potential causes is on-going. Evaluation of the groundwater trends in this area of the Site and potential causes is on-going. BETA's preliminary hypothesis is that the in-situ activated carbon application performed following the removal of the Hot Spot soils may have achieved its adsorption capacity and may be de-sorbing; this hypothesis has not been validated.

The July 2023 groundwater monitoring results continue to show PFAS6 concentrations that are above Method 1 GW-1 Risk Standards at PFW-5 and OW-8A. Similar to the trends observed at PFW-1 and PFW-2, July 2023 PFAS6 concentrations at PFW-5 increased to 3,225 ng/L from 1,600 ng/L in April 2023. The July 2023 PFAS6 results end the decreasing trend in PFAS6 concentrations since November 2022. Conversely, OW-8A analytical results from July 2023 revealed a significant decrease in PFAS6 compared to recent monitoring events in January 2023 and April 2023. The July 2023 PFAS6 results identified as PFAS6 concentration of 198 ng/L at OW-8 compared to 1,720 ng/L in April 2023. As shown on **Figure 7**, the recent trends at OW-8A are similar to historical results that show concentration spikes followed by large decreases in the following events. Causes of the varying and/or increasing PFAS6 concentrations at OW-8 are unknown.

Downgradient Area East of FTA Towards Mary Dunn Well No. 3

Figure 8 depicts the concentration trends observed in groundwater at monitoring wells MW-12S and MW-22, which are located east of the FTA along a northerly line towards Mary Dunn Well No. 3. July 25, 2023, PFAS6 analytical results at MW-12S and MW-22 were 2,243 ng/L and 216 ng/L, respectively. The July 2023 MW-12S analytical results end the decreasing trend of PFAS6 concentrations seen in 2023 and are similar

to 2022 results. Groundwater at MW-22S, approximately 225 feet northeast of MW-12S and 450 east of the FTA, continues to exhibit PFAS6 concentrations that are significantly lower than those at MW-12S. Similar to the trends observed in January 2023 and April 2023, PFAS6 concentrations have been shown to be steadily increasing since the February 2023. However, the recent PFAS6 concentrations identified in 2023 are significantly lower than those detected from 2019 to 2022.

Downgradient Areas East and Southeast of FTA Towards Recovery Well PRW-4

The downgradient monitoring wells PC-1 and PC-6A, located between the FTA and the recovery well (PRW-4) or in the vicinity of PRW-4, were selected for quarterly sampling based on previous results and to evaluate current conditions within the main PFAS plume.

PC-1 analytical results for July 25, 2023, identified a PFAS6 concentration of 829 ng/L which is comparable to recent historical PFAS6 concentrations at this location. Starting in January 2021, PFAS6 concentrations have stabilized between 829 ng/L and 1,487 ng/L with the exception of the November 2022 and January 2023 results – see Table 3. This represents a continued trend of lower PFAS6 concentrations when compared to historical results prior to asphalt cap construction in October 2021.

PC-6A is located approximately 750 feet southeast of the FTA and most likely cross-gradient of recovery well PRW-4. Analytical results for July 25, 2023, identified a PFAS6 concentration of 575 ng/L which is comparable to the April 2023 results. As depicted on **Figure 9A**, PFAS6 concentrations have been trending downward during recent groundwater monitoring events.

Downgradient Areas South and Southeast of the FTA

PC-39 is located approximately 430 feet south, southeast of the FTA property line and to the north of 180 Airport Way. July 2023 analytical results identified a PFAS6 concentration of 64.5 ng/L which continues the trend of significantly lower PFAS6 concentrations since February 2020. PC-39D, a newly installed, deep monitoring well located adjacent to PC-39, identified a comparable PFAS6 concentration of 45.5 ng/L in July 2023 as detailed in the Interim Phase II CSA Update Report No. 3. The initial deep groundwater analytical results in this confirm previous conclusions that PC-39 may be located near the southwestern edge of PFAS plume originating from the FTA.

Downgradient of Recovery Well PRW-4

PC-16D is located 175 feet southeast of recovery well PRW-4 and 875 feet southeast of the FTA. The July 2023 analytical results identified a PFAS6 concentration of 571 ng/L, a notable decrease from the April 2023 results, but similar to PFAS6 concentrations detected in November 2021, January 2022, and February 2023. The cause of the fluctuations in PFAS6 concentrations observed in the past sampling events since May 2021 is unknown, but may be related to fluctuations in the pumping rate of recovery well PRW-4. The February 2023 and July 2023 results have returned to typical levels found during historical sampling events from July 2021 to April 2022.

PC-28 is located greater than 500 feet east, southeast, and downgradient of recovery well PRW-4. PFAS6 was detected at 303.8 ng/L during the July 2023 sampling round. As depicted on **Figure 9C**, over the past two sampling rounds PFAS6 concentrations have continued to decrease compared to the November 2022 and February 2023 results. Similar to PC-16D, PFAS6 concentrations have fluctuated over a wide range since early 2021.

Monitoring well PC-30 is located approximately 170 feet east - southeast and downgradient of recovery well PRW-4. Following the sudden increase in PFAS6 concentrations in January 2023, the April 2023 and July 2023 results have decreased to concentrations comparable to historical results from 2021-2022. The July 2023 results continue the trend of decreasing PFAS6 concentrations followed by a concentration spike, as shown on **Figure 9D** for results up to and including April 2023.

6.3 NOVEMBER 2023 QUARTERLY AND PHASE II CSA GROUNDWATER MONITORING RESULTS

6.3.1 GENERAL

Groundwater monitoring activities were conducted from November 1, 2023 to November 3, 2023. In total, twenty-four (24) monitoring wells were sampled during this period. They included HSW-6, PFW-1, PFW-2, PFW-5, MW-3S, MW-304, MW-311, MW-12S, MW-15D, MW-22, MW-35I, PC-1, PC-6A, PC-11, PC-14, PC-16D, PC-29, PC-30, PC-34S, PC-36S, PC-37, PC-38, HW-1S, and HW-1D. PC-1 was later resampled on November 21, 2023 due the original sample being lost during transit to the laboratory. The selected annual monitoring wells are distributed across the FTA and downgradient areas in an attempt to monitor the current extent of the PFAS plume. **Figure 2 and Figure 3B** depicts the sampling locations. The analytical results and trends of the data are discussed in the following subsections. The results discussion is loosely organized according to the general locations of the subject monitoring wells.

Groundwater samples were collected in accordance with EPA low-flow groundwater sampling procedures with dedicated tubing. Groundwater quality parameters were collected and allowed to stabilize prior to sample collection. Each groundwater sample was submitted for laboratory analysis of total PFAS by Pace using an isotope dilution method via their internal SOP 454, PFAS for aqueous sample analysis.

In addition, two equipment blank (EB) samples were collected from the water level meters during each monitoring event to assess current decontamination practices and potential cross contamination between monitoring wells. Each EB sample was submitted to Pace for PFAS analysis via SOP 454. The analyses did not identify detectable concentration of PFAS6. Refer to **Appendix D** for further details.

6.3.2 ANALYTICAL RESULTS

The long-term groundwater PFAS analytical data for the November 2023 sampling round are summarized on **Table 3**. Analytical results for MW-300 and MW-400 series monitoring wells installed as part of Phase II CSA activities are summarized on **Table 5**. Both tables present the analytical results for the PFAS6 compounds and the sum of their concentrations with comparison of those results to the current MCP GW-1 risk standards. Pace Laboratory report no. 2K1079 and report number 23K2978 in **Appendix D** presents all analytical results for all reported PFAS compounds for the November 2023 annual sampling, including quality control samples, and lists the laboratory detection and reporting limits.

FTA Property Monitoring Wells – PC-37, HSW-6, PFW-1 and PFW-5

The November 2023 analytical results revealed PFAS6 concentrations of 148.1 ng/L at PC-37, 1,499 ng/L at PFW-5, 4,184 ng/L at HSW-6 and 21,955 ng/L at PFW-1. Similar to historical results, the highest PFAS6 groundwater concentrations are found within and immediately downgradient of the former Hot Spot area

as represented by the recent HSW-6 and PFW-1 analytical results. These data show a continuing trend of increasing PFAS6 concentrations to similar levels found shortly after the Hot Spot removal in 2017. Comparison of the November 2023 results to the November 2022 results revealed a 62% increase in PFAS6 concentrations at HSW-6 and a 164% increase at PFW-1. The increase in PFAS6 concentrations during this time period are primarily related to increases in PFOS concentrations. Evaluation of the groundwater trends in this area of the Site and potential causes is on-going. As noted in Sections 6.2.2, BETA's preliminary hypothesis is that the in-situ activated carbon application performed following the removal of the Hot Spot soils may have achieved its adsorption capacity and/or may be de-sorbing; this hypothesis has not been validated.

PFAS6 concentrations at PFW-5, located in the northwest quadrant of the FTA facility, decreased compared to the most recent sampling round in July 2023. However, they are similar to historical results found from 2021-2023, which show relatively stable concentrations, with intermittent sudden increases. The intermittent increases found at this location do not appear to be temporally or seasonally related.

PC-37 was sampled in November 2023 to support the on-going Phase II CSA. PC-37 is located near Flintrock Pond in the northwest corner of the FTA. There is limited historical groundwater data for PC-37. The previous sampling event conducted by others in 2017 identified a PFAS6 concentration of 45 ng/L (PFOS only). However, it should be noted that this PFAS6 concentration only comprised PFOS and PFOA (non-detected) which were regulated by MassDEP at that time. Additionally, 2017 laboratory reporting limits were above current MCP GW-1 Standards. Therefore, the remaining four PFAS6 compounds may have been present in low, but not insignificant concentrations. Based on the factors above and the similar PFOS concentration found in 2023, PFAS6 concentrations in groundwater in this area are believed to be similar to historical results.

PC-37 is in an area generally presumed to be upgradient of known historic activities at the FTA that may have resulted in PFAS contamination. However, definitive information on historic Site FTA operations is scant. Therefore, the PFAS6 concentrations in groundwater at PC-37 may indicate impacts from a source upgradient of the FTA or local impacts within the FTA. However, the recent evaluations of seasonal groundwater flow patterns around Flintrock Pond (see the Phase II CSA Interim Update No. 3) indicate complex and varying flow conditions around the pond. These indicate that Flintrock Pond may also be contributing to groundwater impacts in the PC-37 area.

Downgradient Areas Immediately East and Southeast of the FTA – MW-3S, MW-311 & PC-36 Couplet

MW-3S analytical results revealed a PFAS6 concentration of 4,285 ng/L, a significant increase compared to the previous January 2023 sampling round. The November 2023 PFAS6 concentration is higher than historical concentrations starting in 2021 with the exception of the November 2022 sampling round. The recent and historical PFAS6 concentration fluctuations are primarily related to increases and decreases in PFOS concentrations.

PFAS6 was detected at 8,527 ng/L at MW-311, located approximately 100 feet east of PFW-1. Similar to the PFW-1 November 2023 analytical results, PFAS6 concentrations at MW-311 have more than doubled since the previous sampling round. The elevated PFAS6 concentrations at this location provide further evidence of a spike in the PFAS6 plume close to the southeast corner of the FTA. As noted previously, the in-situ activated carbon application performed following the removal of the Hot Spot soils may have achieved its adsorption capacity and/or may be de-sorbing.

PC-36S and PC-36D analytical results revealed PFAS6 concentrations of 310 ng/L and 743 ng/L, respectively. Both results are significantly lower than the previous sampling rounds and continue the long-term trend of decreasing PFAS6 concentrations at these locations. However, it should be noted that limited groundwater sampling has been conducted at these wells historically. The results also indicate the significantly elevated PFAS6 concentrations downgradient of the former Hot Spot likely have not impacted this location and may be migrating further north or south around the PC-36 couplet. Groundwater monitoring will continue to be conducted at other downgradient monitoring wells such as PC-1 and PC-39 to assess for further migration of the PFAS6 plume in this area.

Downgradient Area to the Northeast and East of FTA Towards Mary Dunn Well No. 3 – MW-304, MW-12S, MW-22, MW-15D and MW-35I

MW-304 analytical results identified a PFAS6 concentration of 390.4 ng/L during the November 2023 sampling round. PFHxS was detected at 160 ng/L and comprised the bulk of the PFAS6, which is unusual for the FTA. This result is higher than the previous sampling round in February 2023. MW-304 analytical results may be considered a good representation of the PFAS6 plume that is migrating east from the northern portion of the FTA.

MW-12S and MW-22 have been routinely sampled during quarterly sampling events since October 2019. **Figure 8** depicts the concentration trends observed in groundwater at monitoring wells MW-12S and MW-22 since that time. November 2023 analytical results revealed PFAS6 concentrations of 1,444 ng/L at MW-12S and 250 ng/L at MW-22. The MW-12S PFAS6 concentrations decreased since the previous sampling round in July 2023, but are comparable to earlier 2023 results. MW-22, located approximately 225 feet northeast of MW-12S and 450 east of the FTA, continues to exhibit slight increases PFAS6 concentrations for four consecutive sampling rounds. However, PFAS6 concentrations are significantly lower than those at MW-12S. Overall, monitoring results from MW-12S and MW-22 continue to be lower than historical results prior to site-wide capping activities at the FTA.

MW-15D is located approximately 160 feet to the east, northeast of MW-22 and is not typically sampled during quarterly sampling events. It should be noted that MW-15 is a monitoring well couplet consisting of a shallow and deep well. It was BETA's intention to sample both well as part of the couplet. However, MW-15S was dry and no sample could be obtained. MW-15D analytical results identified a PFAS6 concentration of 64.2 ng/L during the November 2023 sampling round. Similar to MW-22, PFAS6 concentrations at MW-15D are substantially lower than those at upgradient MW-12S. Please note that well construction logs for the MW-15 monitoring well couplet are not available. Therefore, well screen depth and other features are unknown at this location.

MW-35I is located approximately 250 feet southeast of MW-15D and 80 feet west of the MD#3 production well. MW-35I analytical results revealed PFAS6 at 34 ng/L, which is slightly lower than the previous sampling round in January 2022. However, prior to January 2022 PFAS6 had not been detected above Method 1 GW-1 Standards during BETA's quarterly groundwater sampling events. The increases in PFAS6 concentrations at this location may be a result of several factors such as the pumping rates of the MD#3 production well. It should be noted that BETA has not received documentation regarding pumping rates or PFAS analytical results for MD#3 for 2023.

Downgradient Areas East and Southeast of FTA Towards Recovery Well PRW-4 – PC-1, PC-11 and PC-6A

The downgradient monitoring wells PC-1, PC-11 and PC-6A located between the FTA and the recovery well (PRW-4) or in the vicinity of PRW-4 were selected for quarterly sampling based on previous results and to evaluate current conditions within the main PFAS plume.

PC-1 analytical results revealed a PFAS6 concentration of 639.1 ng/L during the November 2023 sampling round. This result is a slight decrease from the July 2023 sampling round and generally lower than historical results, although PFAS6 concentrations have varied over a large range: 2,660 ng/l on 02.19.2020 to 264 ng/l on 02.01.2023. Overall, the 2023 sampling rounds continue the trend of decreasing PFAS6 concentration at PC-1 since late 2021.

PC-11 is located approximately 220 feet east of PC-1 and upgradient of recovery well PRW-4. **Figure 9B** depicts the concentrations trends observed in groundwater at PC-11. Historically, PFAS6 concentrations at this location have had moderately higher concentrations compared to PC-1. November 2023 analytical results for PC-11 identified a PFAS6 concentration of 1,292 ng/L which is the lowest concentration detected at this well since groundwater monitoring for PFAS began in 2015 . Historical analytical results from 2021 to July 2023 ranged from 2,105 ng/L up to 3,415 ng/L.

PC-6A is located 220 feet south of PC-11 and most likely cross-gradient of recovery well PRW-4. **Figure 9A** depicts the concentrations trends observed in groundwater at PC-6A. Analytical results identified a PFAS6 concentration of 476 ng/L and continues the trend of decreasing PFAS6 concentrations since April 2022.

Downgradient Areas South and Southeast of the FTA – PC-34S and PC-38

Groundwater at PC 34S, located approximately 200 feet south of the FTA and directly east of Flintrock Pond, was found to have a PFAS6 concentration of 1,233 ng/L during the November 2023 sampling round. The November 2023 analytical results are lower than those of the previous sampling round (January 2023), but are consistent with historical results at this location.

The source of the elevated PFAS levels at PC-34S is not clear at this time. It is well south of the area that Phase II CSA soil assessment identified as being impacted by elevated PFAS6 concentrations in soil; PFAS6 soil concentrations greater than S-1/GW-1 have only been identified up to 50 feet south of the FTA fence line. The hydrogeologic assessment conducted to date indicate that groundwater flow is typically east from Flintrock Pond towards PC-34, not south from the south end (and highly impacted portion) of the FTA. However, Flintrock Pond surface water sampling from 2020 through August 2022 identified PFAS6 concentrations approximately 50% lower than the recent PFAS6 concentrations at PC-34S. This may indicate Flintrock Pond surface water and sediment are not the only contributor to PFAS6 concentrations at this location and that groundwater migration may be periodically south from the FTA. Additional investigation of the potentially complex interactions between the PFAS-contaminated sediment and water in the pond and underlying and downgradient groundwater is warranted.

PC-38 is located approximately 800 feet southeast of the FTA and south of PC-1. November 2023 analytical results identified PFAS6 at 3.5 ng/L (PFOS only). PFAS6 concentrations at this location have not exceeded Method 1 GW-1 Risk Standards during BETA's quarterly groundwater sampling rounds. It should be noted that in earlier MCP submittals for the FTA PFAS release Site, PC-38 was considered to be the farthest downgradient monitoring well in the southeast direction. However, the Phase II expanded groundwater assessment conducted to date via groundwater screening and installation of several widely-spaced sets

of new or existing monitoring wells now indicate significant concentrations of PFAS6 are present in groundwater farther east and southeast of PC-38 extending to east of Mary Dunn Road and south and southeast of Mary Dunn Pond. See additional discussion in Section 6.5.

Downgradient of Recovery Well PRW-4 – PC-16D, PC-30, PC-14 and PC-29

PC-16D is located 175 feet southeast of recovery well PRW-4 and 875 feet southeast of the FTA. Analytical results identified PFAS6 at 287 ng/L during the November 2023 sampling round. These results are consistent with other sampling rounds in 2023 with the exception of the April 2023. The higher PFAS6 concentrations found during the April 2023 and late 2022 are likely related to poor recovery well performance.

Figure 9D depicts PFAS6 concentration trends in monitoring well PC-30, located approximately 170 feet east - southeast and downgradient of recovery well PRW-4 and 100 feet south of PC-16D. PC-30 analytical results from the recent sampling round identified PFAS6 at 1,119 ng/L. PFAS6 concentrations at PC-30 have generally been trending down from 2020 to 2022. However, the 2023 PFAS6 concentrations now indicate an increasing trend.

PC-14 is located approximately 500 feet east of recovery well PRW-4 and has been sampled on an annual basis since 2021. PFAS6 analytical results since that time have ranged between 549 ng/L in November 2023 up to 1,074 ng/L in November 2022.

PC-29 was sampled during the November 2023 sampling round instead of PC-28 to provide additional coverage further southeast of the FTA and closer to the MD#1 production well. Analytical results revealed a PFAS6 concentration of 2.1 ng/L (PFHxS only). It should be noted that PC-29 is a shallow well and is not representative of potential PFAS6 concentrations deeper into the aquifer.

MD#2 & Mary Dunn Pond Area – HW-1S & HW-1D

HW-1S and HW-1D are located approximately 275 feet east, northeast of MD#2 near the north bank of Mary Dunn Pond. HW-1D groundwater analytical results identified a PFAS6 concentration of 29 ng/L during the November 2023 sampling round. The November 2023 analytical results show a slight decrease in PFAS6 concentrations compared to the previous November 2022 sampling round. However, PFAS6 concentrations at this location from October 2019 to November 2021 were below laboratory detection limits.

HW-1S analytical results did not identify PFAS6 above laboratory reporting limits. No other non-PFAS6 compounds were detected.

6.4 2023 QUARTERLY GROUNDWATER MONITORING RESULTS - CONCLUSIONS

Based on a review of the analytical results compiled in Table 3 for the July 2023 and November 2023 quarterly groundwater sampling events and Phase II CSA findings reported in the Interim Phase II CSA Status Report No. 3, the following general conclusions regarding the PFAS6 groundwater plume can be made:

- A. PFAS6 concentrations in groundwater continue to be detected above Method 1 GW-1 Risk Standards in almost all monitoring wells sampled on a quarterly schedule in 2023 and in the

majority of the newly installed Phase II CSA monitoring wells. In general, PFAS6 concentrations have been increasing in areas immediately downgradient of the FTA and are stable to decreasing in areas within the central and eastern portions of the plume.

- B. The highest concentrations within the PFAS contaminant plume are in the southeast corner of the FTA (at PFW-1) and in close proximity to that part of the FTA. The causes of the on-going increasing PFAS6 concentrations trend in this area are unknown but may be related to the Hot Spot area conditions. High PFAS6 concentrations have also been detected to the south of and in close proximity to the FTA and Flintrock Pond.
- C. Elevated PFAS6 concentrations continue to be detected east and southeast (downgradient) of the recovery well PRW-4. Quarterly groundwater results from the second half of 2023 have shown PFAS6 concentrations decreasing to comparable levels found from late 2021 to early 2022.
- D. Quarterly groundwater monitoring and Phase II CSA findings to date have not fully defined the PFAS6 plume that is most likely attributable to historic training activities at the FTA. Groundwater analytical results show at this time that the significant PFAS6 plume (groundwater concentrations greater than GW-1 risk standards) extends from the FTA (and most likely below Flintrock Pond) east to Mary Dunn Pond and the immediately surrounding area Mary Dunn Pond. The currently identified northern and southern extents of the PFAS6 plume are likely near South Flint Rock Road on the north to the intersection of Airport Way and Mary Dunn Road on the south.
- E. PFAS6 concentrations detected at deep monitoring wells within the eastern portion of PFAS6 plume are higher than those found at shallow monitoring wells. The vertical flow vector of groundwater is believed to be limited by a lower permeability/finer grained soil strata encountered around 50 to 55 feet below the ground surface in most areas of the Site.
- F. The approximate southwestern edge of the plume originating from the FTA has not been fully defined but is likely located near PC-39/PC-39D. Further conclusions are complicated by the large gap between PC-39/PC-39D and the MW-403 couplet on Airport Way where PFAS6 has been detected above Method 1 GW-1 Standards. Additional investigation has not been conducted in this gap in favor of other areas due to difficulties obtaining access for drilling on private properties north of Airport Way and west of Mary Dunn Road.
- G. Phase II expanded groundwater assessment conducted to date via groundwater screening and installation of several widely spaced sets of new monitoring wells now indicates significant concentrations of PFAS6 are present in groundwater to the east of Mary Dunn Road and south and southeast of Mary Dunn Pond. As reported in Phase II CSA Interim Status Reports Nos. 1 and 2, groundwater screening indicated potentially significant PFAS6 impacts south to the northern end of Airport Way and southeast to several locations south and southeast of Mary Dunn Pond. To date, confirmatory groundwater sampling via new monitoring wells has only been conducted west and close to Mary Dunn Rd. via the MW-401 well couplet, approximately 150 feet east of Mary Dunn Road via the MW-404 well couplet, and to the south along Airport Way via the MW-403 well couplet. The analytical results for MW-401S/D and MW-403S/D were discussed in Interim Status Report No. 2 and are shown on tables included with the Interim Phase II CSA Status Report No. 3. The analytical results for MW-404S/D are also shown on those tables. As noted, deeper groundwater exhibited elevated PFAS6 concentrations; shallow groundwater at these

locations exhibit lower to very low PFAS6 concentrations with the exception of MW-403S/D where the pattern is reversed. Further complicating interpretation of the results is the apparent presence of a different profile of the PFAS6 compounds in the MW-403S/D samples as compared to groundwater at locations farther northeast, i.e., at MW-401D and MW-404D, as well as numerous groundwater screening samples collected east of MW-403S/D.

6.5 SITE-WIDE GROUNDWATER GAUGING AND ELEVATION SURVEY

As part of the groundwater sampling protocol, BETA gauged depth to groundwater in the monitoring wells to be sampled during the quarterly rounds prior to low flow purging. These readings are only recorded on the field logs.

For the purposes of Site-wide groundwater depth evaluation and documentation BETA developed a comprehensive list of representative monitoring wells for regular gauging including the majority of monitoring wells located on and within 100 feet of the FTA and selected monitoring wells across the entire well field east and southeast of the FTA. The monitoring wells selected for quarterly gauging are listed on **Table 4 Groundwater Gauging and Elevation Data – 2021 – 2023**, attached, with gauging and elevation data for gauging event. As noted, BETA gauged depth to groundwater contemporaneously in the selected representative monitoring wells on that date. **Table 4** presents a tabulated summary of the seasonal groundwater elevation data from 2021 to 2023 for selected monitoring points across the Disposal Site.

In addition, as part of the Phase II CSA, BETA contemporaneously gauged the selected representative monitoring wells plus new Phase II CSA monitoring wells located west of Flintrock Pond and in other locations across the Site and numerous monitoring wells associated with groundwater assessment at and in the vicinity of the Cape Cod Gateway Airport site, November 29, 2023. **Table 4** includes some of the data collected. At this time, measuring point elevations are not yet available for all gauging locations. **Table 4** also includes gauging data for recent gauging in August 2023. In addition, a more accurate survey of key monitoring points was conducted and updated well elevations are included on **Table 4**. All of these updated and expanded data will provide updated groundwater elevations for contouring and to support increased understanding of groundwater flow directions.

Groundwater flow has historically been inferred to be to the south-southeasterly from the former FTA. A review of the tabulated data indicates a general continuation of the historic patterns. The results of gauging from selected dates are depicted in an updated groundwater contour maps presented in the Interim Phase II CSA Status Report No. 3.

7.0 IRA EVALUATION

In accordance with the MCP, this section presents evaluations of potential IRA conditions at the Site.

7.1 ASSESSMENT FOR SUBSTANTIAL RELEASE MIGRATION (SRM)

Due to the groundwater data indicating that PFAS has migrated more than 200 feet downgradient and has been detected in a public water supply well and surface water body, the Site meets the criteria for a Condition of Substantial Release Migration (SRM), as defined by 310 CMR 40.0006.

7.2 IDENTIFICATION OF CRITICAL EXPOSURE PATHWAYS (CEP)

No Critical Exposure Pathways, as defined by 310 CMR 40.0006, currently exist at the Disposal Site.

The original IRA Plan for the RTN 4-26179 Disposal Site included the results of the evaluation of potential private drinking water wells within the potential long-range plume of the Site down to the Maher Wells. The IRA Plan stated that there were no known private wells between the FTA and the Mary Dunn Wells, Mary Dunn Pond or the Airport. In addition, the IRA Plan noted that a review of parcel water supply data indicated that there were no private wells in the areas downgradient to the Maher Wells or south and southeast of the Maher Wells to Mill Creek.

In July 2023, MassDEP requested that supplemental and updated investigation be performed to confirm the presence or absence of private drinking water wells in the same potential downgradient areas plus areas east and southeast of the Airport extending into the Town of Yarmouth. In cooperation with Yarmouth, BETA and the county initiated the supplemental investigation. However, based on information provided by Yarmouth and MassDEP in meetings with local residents, there are no known private, potable drinking water wells in these areas. Therefore, this work has been suspended at this time.

7.3 IMMINENT HAZARD (IH) EVALUATION

Based on the concentrations of PFOS exceeding the USEPA HA level in the Mary Dunn wells in 2013, the Cape Cod Commission identified the presence of an Imminent Hazard (IH) condition pursuant to 310 CMR 40.0321(2)(c). Raw groundwater produced by the Mary Dunn wells contains PFAS 6 concentrations in excess of Massachusetts Maximum Contaminant Levels (MMCL) for public drinking water supplies. GAC treatment of the Mary Dunn wells was subsequently implemented by the Hyannis Water Supply Division (HWSD) of the Barnstable Public Works Department.

The GAC treatment of the Mary Dunn Wells is assumed to be actively preventing a potential Imminent Hazard to the Hyannis community by removing the PFAS6 compounds from the water supply. Monitoring the PFAS treatment of the output of the Mary Dunn Wells is the responsibility of the HWSD. The Mary Dunn wells are monitored on a regular basis to ensure that exposure to humans is less than the USEPA HA, the MassDEP MCP GW-1 standards effective on December 27, 2019 and the final MMCL standard. MassDEP finalized the MMCLs for PFAS in January 2021; the final MMCL for PFAS in drinking water is 20 ng/l and applies to the sum or individual concentrations of the 6 regulated PFAS compounds.

7.4 ASSESSMENT OF NEED FOR IMMEDIATE RESPONSE ACTIONS (IRA)

The operation of the on-Site groundwater pumping and treatment system to reduce PFAS concentrations downgradient of the FTA will continue as an IRA. Continuation of assessment IRAs is warranted but limited to quarterly monitoring of the groundwater at the Site. Comprehensive assessment of Site conditions has transitioned to the Phase II CSA. The Site-wide assessment is proceeding under the Phase II Comprehensive Site Assessment (CSA) Scope of Work (SOW) submitted to MassDEP on March 23, 2022. Additional technologies to treat / remove PFAS from soil and groundwater at the FTA will be evaluated at a later time as part of the MCP Phase III evaluation of remedial alternatives.

In addition, planned expansion of groundwater extraction and treatment, as mandated by MassDEP, was described conceptually in the final December 2019 IRA Plan Modification. The final design and implementation of that component of the IRA Plan Modification is currently being evaluated in terms of feasibility of implementation as an IRA and potential overlap and duplication with MCP Phase III and Phase IV (remedy implementation) work to be conducted immediately following the completion of the Phase II CSA.

8.0 PUBLIC NOTIFICATIONS

A copy of the public notification letter regarding the IRA activities conducted during the current reporting period sent to officials of the Town of Barnstable in accordance with MCP 310 CMR 40.1403(3) (a) requirements is included as **Appendix E**. Per the Public Involvement Plan for the Site, email and written notifications regarding the submittal of this IRA Status Report and RMR No. 66 to MassDEP and the availability of the report for review on the MassDEP Searchable Sites database portal, the County webpage, and at the Site repository (Hyannis Public Library) will be sent to those listed on the PIP Mailing List.

TABLES

Table 1A - Summary of Groundwater Pump and Treatment System Total PFAS6 Analytical Data - GWTS #1
Barnstable County Fire and Rescue Training Academy
155 Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	INFLUENT (PRW-4)						MIDPOINT						EFFLUENT					
USEPA Method 537.1m or PACE SOP 454	PFOS (ng/L)	PFOA (ng/L)	PFNA (ng/L)	PFHxS (ng/L)	PFHpA (ng/L)	PFDA (ng/L)	PFOS (ng/L)	PFOA (ng/L)	PFNA (ng/L)	PFHxS (ng/L)	PFHpA (ng/L)	PFDA (ng/L)	PFOS (ng/L)	PFOA (ng/L)	PFNA (ng/L)	PFHxS (ng/L)	PFHpA (ng/L)	PFDA (ng/L)
MCP Method 1 GW-1 Standard ³	20 ng/L						20 ng/L						20 ng/L					
SAMPLE DATE																		
4/1/2015	760	60	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A
7/17/2015	5600	460	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A
8/4/2015	5900	550	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A
9/30/2015	17000	840	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A
10/15/2015	9900	560	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<9.4)	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A	9.4	BRL (<5.8)	-- ^A	-- ^A	-- ^A	-- ^A
11/12/2015	9000	BRL (<2000)	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<3.3)		-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A
1/6/2016	7600	260	-- ^A	-- ^A	-- ^A	-- ^A	120	75	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A
1/21/2016	5200	160	-- ^A	-- ^A	-- ^A	-- ^A	270	16	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A
2/3/2016	3500	140	-- ^A	-- ^A	-- ^A	-- ^A	540	26	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A
2/17/2016	4500	140	-- ^A	-- ^A	-- ^A	-- ^A	520	24	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A
3/8/2016	3700	140	-- ^A	-- ^A	-- ^A	-- ^A	420	19	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<3.3)	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A
3/23/2016	5000	150	-- ^A	-- ^A	-- ^A	-- ^A	650	39	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<3.3)	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A
4/14/2016	4800	140	-- ^A	-- ^A	-- ^A	-- ^A	610	26	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<3.3)	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A
4/28/2016	6300	BRL (<200)	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<20)	BRL (<20)	-- ^A	-- ^A	-- ^A	-- ^A
5/12/2016	6800	BRL (<200)	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<20)	BRL (<20)	-- ^A	-- ^A	-- ^A	-- ^A
5/25/2016	6900	BRL (<210)	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<3.3)	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A
6/16/2016	7800	160	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<3.3)	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A
7/6/2016	7600	270	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A	10	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A
8/11/2016	13000	160	-- ^A	-- ^A	-- ^A	-- ^A	1600	54	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<3.3)	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A
Carbon change conducted after sample collection on 08/11/16.																		
8/18/2016	9500	210	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<3.3)	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<3.3)	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A
9/8/2016	9500	190	-- ^A	-- ^A	-- ^A	-- ^A	8.5	5.3	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<3.3)	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A
9/8/2016	9500	190	-- ^A	-- ^A	-- ^A	-- ^A	8.5	5.3	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<3.3)	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A
10/6/2016	17000	250	-- ^A	-- ^A	-- ^A	-- ^A	110	8.3	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<3.3)	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A
10/20/2016	7200	130	-- ^A	-- ^A	-- ^A	-- ^A	1000	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<3.3)	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A
11/3/2016	7900	110	-- ^A	-- ^A	-- ^A	-- ^A	13.8	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<3.3)	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A
11/17/2016	5400	99	-- ^A	-- ^A	-- ^A	-- ^A	1200	NA	-- ^A	-- ^A	-- ^A	-- ^A	17	NA	-- ^A	-- ^A	-- ^A	-- ^A
12/1/2016	5300	100	-- ^A	-- ^A	-- ^A	-- ^A	400	14	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A
12/14/2016	5700	95	-- ^A	-- ^A	-- ^A	-- ^A	82	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A	8.1	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A
1/4/2017	4900	95	-- ^A	-- ^A	-- ^A	-- ^A	360	15	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<3.3)	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A
2/16/2017	2800	88	-- ^A	-- ^A	-- ^A	-- ^A	1000	39	-- ^A	-- ^A	-- ^A	-- ^A	25	BRL (<5.3)	-- ^A	-- ^A	-- ^A	-- ^A
3/1/2017	3700	120	-- ^A	-- ^A	-- ^A	-- ^A	1400	47	-- ^A	-- ^A	-- ^A	-- ^A	150	6.5	-- ^A	-- ^A	-- ^A	-- ^A
3/23/2017	3800	87	-- ^A	-- ^A	-- ^A	-- ^A	2000	71	-- ^A	-- ^A	-- ^A	-- ^A	160	9.5	-- ^A	-- ^A	-- ^A	-- ^A
5/3/2017	2400	86	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<2.6)	BRL (<4.6)	-- ^A	-- ^A	-- ^A	-- ^A
Carbon change conducted on 04/13/17.																		
4/19/2017	3200	110	-- ^A	-- ^A	-- ^A	-- ^A	160	BRL (<4.6)	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<2.6)	BRL (<4.6)	-- ^A	-- ^A	-- ^A	-- ^A
5/18/2017	3000	110	-- ^A	-- ^A	-- ^A	-- ^A	570	32	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<2.6)	BRL (<4.6)	-- ^A	-- ^A	-- ^A	-- ^A
6/1/2017	3200	110	-- ^A	-- ^A	-- ^A	-- ^A	730	33	-- ^A	-- ^A	-- ^A	-- ^A	4.1	BRL (<4.6)	-- ^A	-- ^A	-- ^A	-- ^A
6/27/2017	2600	99	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A	210	15	-- ^A	-- ^A	-- ^A	-- ^A
7/18/2017	3500	97	-- ^A	-- ^A	-- ^A	-- ^A	2300	72	-- ^A	-- ^A	-- ^A	-- ^A	49	25	-- ^A	-- ^A	-- ^A	-- ^A
Carbon change conducted on 8/09/17																		

SAMPLE ID	INFLUENT (PRW-4)						MIDPOINT						EFFLUENT					
USEPA Method 537.1m or PACE SOP 454	PFOS (ng/L)	PFOA (ng/L)	PFNA (ng/L)	PFHxS (ng/L)	PFHpA (ng/L)	PFDA (ng/L)	PFOS (ng/L)	PFOA (ng/L)	PFNA (ng/L)	PFHxS (ng/L)	PFHpA (ng/L)	PFDA (ng/L)	PFOS (ng/L)	PFOA (ng/L)	PFNA (ng/L)	PFHxS (ng/L)	PFHpA (ng/L)	PFDA (ng/L)
MCP Method 1 GW-1 Standard ³	20 ng/L						20 ng/L						20 ng/L					
SAMPLE DATE																		
8/16/2017	3000	110	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<2.3)	BRL (<4.1)	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<2.3)	BRL (<4.1)	-- ^A	-- ^A	-- ^A	-- ^A
8/28/2017	2900	100	-- ^A	-- ^A	-- ^A	-- ^A	27	BRL (<20)	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A
10/2/2017	3200	85	-- ^A	-- ^A	-- ^A	-- ^A	510	25	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<2.6)	BRL (<4.6)	-- ^A	-- ^A	-- ^A	-- ^A
10/12/2017	4500	110	-- ^A	-- ^A	-- ^A	-- ^A	960	29	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<2.6)	BRL (<4.6)	-- ^A	-- ^A	-- ^A	-- ^A
11/9/2017	2400	77	-- ^A	-- ^A	-- ^A	-- ^A	--	--	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<6.0)	BRL (<3.3)	-- ^A	-- ^A	-- ^A	-- ^A
11/20/2017	2000	64	-- ^A	-- ^A	-- ^A	-- ^A	520	15	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<6.0)	BRL (<3.3)	-- ^A	-- ^A	-- ^A	-- ^A
12/7/2017	1600	64	-- ^A	-- ^A	-- ^A	-- ^A	780	34	-- ^A	-- ^A	-- ^A	-- ^A	11	BRL (<3.3)	-- ^A	-- ^A	-- ^A	-- ^A
2/5/2018	2100	27	-- ^A	-- ^A	-- ^A	-- ^A	390	13	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<6.0)	BRL (<3.3)	-- ^A	-- ^A	-- ^A	-- ^A
2/14/2018	2100	30	-- ^A	-- ^A	-- ^A	-- ^A	850	27	-- ^A	-- ^A	-- ^A	-- ^A	11	BRL (<3.3)	-- ^A	-- ^A	-- ^A	-- ^A
System shutdown on 2/14/18 due to transfer pump failure; system restart on 4/9/18.																		
4/9/2018	2,600	79	-- ^A	-- ^A	-- ^A	-- ^A	990	25	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<20)	BRL (<20)	-- ^A	-- ^A	-- ^A	-- ^A
4/13/2018	3100	62	-- ^A	-- ^A	-- ^A	-- ^A	1500	35	-- ^A	-- ^A	-- ^A	-- ^A	30	BRL (<33)	-- ^A	-- ^A	-- ^A	-- ^A
5/9/2018	1800	73	-- ^A	-- ^A	-- ^A	-- ^A	490	26	-- ^A	-- ^A	-- ^A	-- ^A	BRL (<6.0)	BRL (<33)	-- ^A	-- ^A	-- ^A	-- ^A
System shutdown on 5/9/18 after sampling collection due to carbon breakthrough and influent pump alarm fail.																		
Carbon change conducted on 06/05/18; system restarted on 06/07/18.																		
6/14/2018	2800	120	79	540	110	-- ^A	200	9.4	BRL (<8.7)	38	11	-- ^A	BRL (<6.0)	BRL (<3.3)	BRL (<8.7)	BRL (<5.6)	BRL (<7.4)	-- ^A
7/13/2018	2400	100	73	600	90	-- ^A	1100	44	27	24	35	-- ^A	BRL (<20)	BRL (<20)	BRL (<20)	BRL (<20)	BRL (<20)	-- ^A
8/7/2018	2900	95	73	460	86	-- ^A	630	31	22	130	34	-- ^A	27	5.3	BRL (<8.7)	9.1	BRL (<7.4)	-- ^A
9/27/2018	4300	69	50	360	190	-- ^A	3600	69	49	330	65	-- ^A	81	BRL (<3.3)	BRL (<8.7)	14	BRL (<7.4)	-- ^A
Carbon change conducted on 09/28/18; system restarted on 10/01/18.																		
10/30/2018	2800	65	46	320	71	-- ^A	100	6	8.7	16	78	-- ^A	BRL (<6.0)	BRL (<3.3)	BRL (<8.7)	BRL (<5.6)	BRL (<7.4)	-- ^A
11/16/2018	2900	62	50	290	77	-- ^A	460	24	19	94	26	-- ^A	BRL (<6.0)	BRL (<3.3)	BRL (<8.7)	BRL (<5.6)	BRL (<7.4)	-- ^A
12/14/2018	1900	62	49	300	70	-- ^A	1200	40	30	180	45	-- ^A	BRL (<6.0)	BRL (<3.3)	BRL (<8.7)	BRL (<5.6)	BRL (<7.4)	-- ^A
1/10/2019	2400	84	68	410	96	-- ^A	2200	71	54	360	82	-- ^A	21	BRL (<3.3)	BRL (<8.7)	BRL (<5.6)	BRL (<7.4)	-- ^A
Carbon change conducted on 2/4/19; system restarted on 2/5/19.																		
2/15/2019	4600	130	120	550	110	-- ^A	560	14	14	62	14	-- ^A	BRL (<6.0)	BRL (<3.3)	BRL (<8.7)	BRL (<6.2)	BRL (<7.4)	-- ^A
3/11/2019	5600	120	120	520	98	-- ^A	63	BRL (<3.3)	BRL (<4.9)	BRL (<5.6)	BRL (<7.1)	-- ^A	BRL (<6.0)	BRL (<3.3)	BRL (<4.9)	BRL (<5.6)	BRL (<7.1)	-- ^A
Iron sediments pumped out of influent tank and transfer pump associated piping - 3/29/2019. Replaced VFD.																		
4/9/2019	6600	140	180	580	99	-- ^A	400	7.4	9.9	31	BRL (<7.1)	-- ^A	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	-- ^A
5/21/2019	2500	83	59	290	100	8.6	3400	72	69	260	7.8	12	BRL (<12)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)
Carbon change conducted on 06/13/19; system restarted on 06/14/19.																		
6/27/2019	8400	86	120	340	68	26	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)
7/29/2019	9500	78	100	290	72	16	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)
8/22/2019	8300	64	100	260	63	20	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)
9/26/2019	4900	65	82	220	64	21	64	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)
10/30/2019	3800	63	85	230	72	19	51	BRL (<7.4)	BRL (<4.9)	5.9	BRL (<7.1)	BRL (<4.1)	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)
11/12/2019	4200	53	85	200	59	15	120	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)
12/17/2019	1500	43	51	180	54	10	530	16	17	63	22	4.5	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)
Carbon change conducted on 12/23/19; system restarted on 12/26/19.																		
1/17/2020	2200	57	60	220	69	13	11	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)
2/13/2020	3100	74	66	310	92	17	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)
3/3/2020	3300	72	64	300	81	14	7.4	BRL (<0.23)	BRL (<0.48)	BRL (<0.33)	BRL (<0.37)	BRL (<0.18)	0.60	BRL (<0.23)	BRL (<0.48)	BRL (<0.33)	BRL (<0.37)	BRL (<0.18)
4/28/2020	1900	52	42	210	56	42	86	2.7	2.2	10	3.4	0.51	BRL (<0.43)	BRL (<0.23)	BRL (<0.48)	BRL (<0.33)	BRL (<0.37)	BRL (<0.18)
5/21/2020	1800	46	40	200	50	11	110	3.5	2.9	12	3.9	0.8	BRL (<0.43)	BRL (<0.23)	BRL (<0.48)	BRL (<0.33)	BRL (<0.37)	BRL (<0.18)
6/24/2020	1400	41	41	160	49	19	64	3.3	2.7	15	5.4	1.4	3.30	0.94	0.84	0.83	1.2	BRL (<0.64)
7/28/2020	1700	44	43	200	52	12	130	3.4	3	13	3.9	0.96	BRL (<0.43)	BRL (<0.49)	BRL (<0.80)	BRL (<0.53)	BRL (<0.51)	BRL (<0.64)

SAMPLE ID	INFLUENT (PRW-4)						MIDPOINT						EFFLUENT					
USEPA Method 537.1m or PACE SOP 454	PFOS (ng/L)	PFOA (ng/L)	PFNA (ng/L)	PFHxS (ng/L)	PFHpA (ng/L)	PFDA (ng/L)	PFOS (ng/L)	PFOA (ng/L)	PFNA (ng/L)	PFHxS (ng/L)	PFHpA (ng/L)	PFDA (ng/L)	PFOS (ng/L)	PFOA (ng/L)	PFNA (ng/L)	PFHxS (ng/L)	PFHpA (ng/L)	PFDA (ng/L)
MCP Method 1 GW-1 Standard ³	20 ng/L						20 ng/L						20 ng/L					
SAMPLE DATE																		
Carbon change conducted on 08/12/2020; system restarted on 08/14/2020.																		
8/27/2020	1400	42	38	170	48	9	0.92	BRL (<0.49)	BRL (<0.8)	BRL (<0.53)	BRL (<0.51)	BRL (<0.64)	BRL (<0.43)	BRL (<0.49)	BRL (<0.80)	BRL (<0.53)	BRL (<0.51)	BRL (<0.64)
9/23/2020	2000	46	50	200	57	14	BRL (<0.43)	BRL (<0.49)	BRL (<0.80)	BRL (<0.53)	BRL (<0.51)	BRL (<0.64)	BRL (<0.43)	BRL (<0.49)	BRL (<0.80)	BRL (<0.53)	BRL (<0.51)	BRL (<0.64)
10/20/2020	2300	49	50	230	63	15	1.1	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	0.54	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
11/24/2020	2300	59	43	240	71	18	14	1	BRL (<2.0)	2.1	1.3	BRL (<2.0)	10	0.94	BRL (<2.0)	1.9	1.2	BRL (<2.0)
12/21/2020	1400	51	42	200	60	9	220	7.4	5.1	28	9.3	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
1/27/2021	1000	47	36	170	49	7.7	280	13	11	47	15	2.2	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
2/23/2021	2300	67	54	290	80	14	98	7.1	5.9	8.4	3.1	1.6	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
3/12/2021	1100	54	43	210	57	11	370	18	15	69	20	3.2	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
4/21/2021	690	28	25	100	32	7.6	290	14	13	54	17	3.7	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
5/20/2021	970	32	38	130	37	10	560	19	20	72	21	6.2	BRL (<0.43)	BRL (<0.49)	BRL (<0.80)	BRL (<0.53)	BRL (<0.51)	BRL (<0.64)
7/1/2021	680	22	27	90	26	8.2	620	21	25	80	24	7.5	190	6.5	8.0	24	7.9	2.7
Carbon change conducted on 07/06/2021; system restarted on 07/09/2021.																		
7/23/2021	720	26	29	95	30	9.3	50	1.2	1.2	3.2	0.88	BRL (<2.0)	19	BRL (<2.0)	BRL (<2.0)	1.7	BRL (<2.0)	BRL (<2.0)
8/25/2021	570	14	17	79	24	BRL (<3.9)	BRL (<5.7)	BRL (<5.0)	BRL (<5.0)	BRL (<4.4)	BRL (<6.7)	BRL (<3.9)	BRL (<5.7)	BRL (<5.0)	BRL (<5.0)	BRL (<4.4)	BRL (<6.7)	BRL (<3.9)
9/20/2021	480	19	19	90	28	5.1	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
11/2/2021	560	19	21	90	30	6.2	1.5	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
11/17/2021	640	21	22	97	34	6.9	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
12/16/2021	570	19	20	92	30	6.4	200	8.6	8.4	43	15	2.4	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
1/25/2022	600	23	20	110	37	5.5	250	12	9.5	56	21	2.4	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
2/24/2022	610	29	19	130	39	4.1	620	26	17	110	33	3.4	BRL (<0.43)	BRL (<0.49)	BRL (<0.80)	BRL (<0.53)	BRL (<0.51)	BRL (<0.64)
3/22/2022	630	33	22	130	41	4.4	110	7.4	5	24	9.2	1.2	BRL (<0.43)	BRL (<0.49)	BRL (<0.80)	BRL (<0.53)	BRL (<0.51)	BRL (<0.64)
4/21/2022	490	23	20	110	38	4.9	280	13	11	65	22	2.8	BRL (<0.43)	BRL (<0.49)	BRL (<0.80)	BRL (<0.53)	BRL (<0.51)	BRL (<0.64)
5/26/2022	420	23	17	100	36	4.7	17	1.3	0.92	4.2	2.2	BRL (<0.64)	BRL (<0.43)	BRL (<0.49)	BRL (<0.80)	BRL (<0.53)	BRL (<0.51)	BRL (<0.64)
6/21/2022	430	23	19	110	35	4.8	110	7.5	6.1	30	12	1.8	BRL (<0.43)	BRL (<0.49)	BRL (<0.80)	BRL (<0.53)	BRL (<0.51)	BRL (<0.64)
7/27/2022	440	29	18	140	48	4.5	230	20	11	92	34	2.9	BRL (<0.43)	BRL (<0.49)	BRL (<0.80)	BRL (<0.53)	BRL (<0.51)	BRL (<0.64)

SAMPLE ID	INFLUENT (PRW-4)						MIDPOINT						EFFLUENT					
USEPA Method 537.1m or PACE SOP 454	PFOS (ng/L)	PFOA (ng/L)	PFNA (ng/L)	PFHxS (ng/L)	PFHpA (ng/L)	PFDA (ng/L)	PFOS (ng/L)	PFOA (ng/L)	PFNA (ng/L)	PFHxS (ng/L)	PFHpA (ng/L)	PFDA (ng/L)	PFOS (ng/L)	PFOA (ng/L)	PFNA (ng/L)	PFHxS (ng/L)	PFHpA (ng/L)	PFDA (ng/L)
MCP Method 1 GW-1 Standard ³	20 ng/L						20 ng/L						20 ng/L					
SAMPLE DATE																		
Carbon change conducted on 08/17/2022; new vessels installed; system restarted on 08/25/2020.																		
8/30/2022	290	24	13	100	38	3.7	BRL (<0.47)	BRL (<0.41)	BRL (<0.35)	BRL (<0.28)	BRL (<0.28)	BRL (<0.29)	0.6	BRL (<0.41)	BRL (<0.35)	BRL (<0.28)	BRL (<0.28)	BRL (<0.29)
9/20/2022	360	22	15	110	38	3	BRL (<0.47)	BRL (<0.41)	BRL (<0.35)	BRL (<0.28)	BRL (<0.28)	BRL (<0.29)	BRL (<0.47)	BRL (<0.41)	BRL (<0.35)	BRL (<0.28)	BRL (<0.28)	BRL (<0.29)
10/25/2022	350	25	19	120	37	3.9	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)
11/30/2022	410	23	19	110	36	4.1	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)
12/22/2022	520	21	19	110	36	4.1	8.3	BRL (<1.9)	BRL (<1.9)	BRL (<1.9)	BRL (<1.9)	BRL (<1.9)	7.5	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)
1/16/2023	530	20	17	100	33	BRL (<4.1)	13	BRL (<1.9)	BRL (<1.9)	3.1	BRL (<1.9)	BRL (<1.9)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)
2/10/2023	370	21	14	110	39	BRL (<10)	BRL (<10)	BRL (<10)	BRL (<10)	BRL (<10)	BRL (<10)	BRL (<10)	BRL (<10)	BRL (<10)	BRL (<10)	BRL (<10)	BRL (<10)	BRL (<10)
3/13/2023	440	30	18	140	52	3.7	BRL (<2.2)	BRL (<2.2)	BRL (<2.2)	BRL (<2.2)	BRL (<2.2)	BRL (<2.2)	BRL (<2.1)	BRL (<2.1)	BRL (<2.1)	BRL (<2.1)	BRL (<2.1)	BRL (<2.1)
4/18/2023	300	32	19	150	48	3.4	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)
5/11/2023	310	BRL (<50)	BRL (<50)	160	BRL (<50)	BRL (<50)	BRL (<4.1)	BRL (<4.1)	BRL (<4.1)	BRL (<4.1)	BRL (<4.1)	BRL (<4.1)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
6/6/2023	700	14	47	31	13	5.3	5.3	BRL (<1.9)	BRL (<1.9)	2.9	2	BRL (<1.9)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)
7/13/2023	260	55	26	210	76	2.8	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)
8/22/2023	180	61	20	170	66	1.9	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.9)	BRL (<1.9)	BRL (<1.9)	BRL (<1.9)	BRL (<1.9)	BRL (<1.9)
9/8/2023	420	61	33	180	62	3.9	24	4.5	BRL (<1.8)	12	6.2	BRL (<1.8)	2.4	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)
10/12/2023	330	29	23	110	36	4.6	38	4.3	2.9	14	7.3	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)
11/21/2023	310	23	21	85	34	3.9	43	5	2.6	13	8.6	BRL (<2.3)	BRL (<1.9)	BRL (<1.9)	BRL (<1.9)	BRL (<1.9)	BRL (<1.9)	BRL (<1.9)
12/21/2023	300	24	19	100	41	2.8	36	4.9	2.8	13	10	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)

Notes:

- Concentrations presented in ng/L - nanograms per Liter - parts per trillion
- * - Prior to June 11, 2018, the USEPA established the EPA Health Advisory for two PFAS chemicals, PFOA and PFOS, which was 70 ng/L. Subsequently, MassDEP's Office of Research and Standards (ORS) expanded on this Health Advisory and created the ORS Guideline that applied to the total summed of five PFAS chemicals, PFOS, PFOA, PFNA, PFHxS, and PFHpA, effective June 11, 2018.
- On December 13, 2019, MassDEP published the newly established clean up standards for PFAS in soil and groundwater. These standards were effective as of December 27, 2019 and apply to the total sum of six PFAS chemicals, PFOS, PFOA, PFNA, PFHxS, PFHpA, and PFDA; the new standard is 20 ng/L or parts per trillion (ppt). Concentrations of the six PFAS compounds presented in the table were not compared to the new MassDEP standards until the January 2020 monthly system sample collection, which is after the effective date of December 27, 2019.
- ^A: Concentrations of the three additional PFAS chemicals, PFNA, PFHxS, and PFHpA were not presented prior to 06.11.18. The USEPA Health Advisory only applies to the PFOS and PFOA compounds. Concentrations of PFNA, PFHxS, and PFHpA were not presented/tabulated until after the MassDEP ORS Guideline was in effect on 06.11.18.
- ^B: Concentrations of the PFAS compound, PFDA, were not presented prior to the May 2019 sampling period. On April 19, 2019, MassDEP presented a draft of proposed risk standards for PFAS that included a sixth, PFAS compound, PFDA.
- BRL - Below Laboratory Reporting Limits; reporting limit shown in parentheses.
- Concentrations in **bold** exceed applicable MassDEP ORS Guideline and/or the MCP Method 1 GW-1 groundwater risk standard.
- PFOS - Perfluorooctanesulfonic acid
- PFOA - Perfluorooctanoic Acid
- PFNA - Perfluorononanoic Acid
- PFHxS - Perfluorohexanesulfonic Acid
- PFHpA - Perfluoroheptanoic Acid
- PFDA - Perfluorodecanoic Acid
- NA - Concentration data not available

Table 1B - Summary of Groundwater Pump and Treatment System Total PFAS6 Analytical Data -GWTS #2

Barnstable County Fire and Rescue Training Academy

155 Flint Rock Road, Barnstable, MA

RTN 4-26179

SAMPLE ID	INFLUENT (PRW-4)						MIDPOINT						EFFLUENT					
USEPA Method 537.1m or PACE SOP 454	PFOS (ng/L)	PFOA (ng/L)	PFNA (ng/L)	PFHxS (ng/L)	PFHpA (ng/L)	PFDA (ng/L)	PFOS (ng/L)	PFOA (ng/L)	PFNA (ng/L)	PFHxS (ng/L)	PFHpA (ng/L)	PFDA (ng/L)	PFOS (ng/L)	PFOA (ng/L)	PFNA (ng/L)	PFHxS (ng/L)	PFHpA (ng/L)	PFDA (ng/L)
MCP Method 1 GW-1 Standard ¹⁵	20 ng/L						20 ng/L						20 ng/L					
SAMPLE DATE																		
System Startup on 11/11/19.																		
11/12/2019	4200	53	85	200	59	15	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)
11/15/2019	--	--	--	--	--	--	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)
11/19/2019	--	--	--	--	--	--	BRL (<5.2)	44	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)	BRL (<5.2)	42	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)
12/17/2019 ¹⁶	1500	43	51	180	54	10	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)
1/17/2020	2200	57	60	220	69	13	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)
2/13/2020	3100	74	66	310	92	17	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)	BRL (<5.2)	BRL (<7.4)	BRL (<4.9)	BRL (<5.2)	BRL (<7.1)	BRL (<4.1)
3/3/2020	3300	72	64	300	81	14	5.6	BRL (<0.23)	BRL (<0.48)	BRL (<0.33)	BRL (<0.37)	BRL (<0.18)	BRL (<0.43)	BRL (<0.23)	BRL (<0.48)	BRL (<0.33)	BRL (<0.37)	BRL (<0.18)
4/28/2020	1900	52	42	210	56	42	64	2.2	1.7	9.7	3.0	0.27	0.47	BRL (<0.23)	BRL (<0.48)	BRL (<0.33)	BRL (<0.37)	BRL (<0.18)
5/21/2020	1800	46	40	200	50	11	76	2.8	2.0	10	3.6	0.52	BRL (<0.43)	BRL (<0.23)	BRL (<0.48)	BRL (<0.33)	BRL (<0.37)	BRL (<0.18)
6/24/2020	1400	41	41	160	49	19	39	2.9	2.3	12	4.3	1.1	0.84	BRL (<0.49)	BRL (<0.80)	BRL (<0.53)	BRL (<0.51)	BRL (<0.64)
7/28/2020	1700	44	43	200	52	12	84	3.8	3.3	17	5.7	0.76	BRL (<0.43)	BRL (<0.49)	BRL (<0.80)	BRL (<0.53)	BRL (<0.51)	BRL (<0.64)
8/27/2020	1400	42	38	170	48	9	6.1	BRL (<0.49)	BRL (<0.80)	1.2	0.61	BRL (<0.64)	BRL (<0.43)	BRL (<0.49)	BRL (<0.80)	BRL (<0.53)	BRL (<0.51)	BRL (<0.64)
9/23/2020	2000	46	50	200	57	14	18	0.79	0.86	2.4	1.3	BRL (<0.64)	BRL (<0.43)	BRL (<0.49)	BRL (<0.80)	BRL (<0.53)	BRL (<0.51)	BRL (<0.64)
10/20/2020	2300	49	50	230	63	15	7.5	0.64	BRL (<2.0)	1.4	1.0	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
11/24/2020	2300	59	43	240	71	18	120	3.2	2.4	17	5.0	0.92	1.5	0.52	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
12/21/2020	1400	51	42	200	60	9.0	190	7.5	5.2	23	9.3	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
1/27/2021	1000	47	36	170	49	7.7	190	11	7.3	37	13	1.5	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
2/23/2021	2300	67	54	290	80	14	52	3.5	2.4	12	4.7	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
3/12/2021	1100	54	43	210	57	11	370	18	15	70	22	3.3	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
4/21/2021	690	28	25	100	32	7.6	120	7	5.3	22	9.3	1.7	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
4/21/2021	690	28	25	100	32	7.6	120	7	5.3	22	9.3	1.7	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
5/20/2021	970	32	38	130	37	10	BRL (<0.43)	BRL (<0.49)	BRL (<0.80)	BRL (<0.53)	BRL (<0.51)	BRL (<0.64)	42	3.1	2.4	9.1	4.9	BRL (<0.64)
System performance samples were not collected for the June 2021 Reporting Period because the System was shutdown as a result of breakthrough observed during the previous reporting period (May 2021).																		
Carbon change conducted on 07/06/2021; system restarted on 07/09/2021.																		
7/23/2021	720	26	29	95	30	9.3	310	11	12	39	13	4.5	BRL (<2.0)	0.51	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
8/25/2021	570	14	17	79	24	BRL (<3.9)	530	14	16	80	21	BRL (<3.9)	25	BRL (<5.0)	BRL (<5.1)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
9/20/2021	480	19	19	90	28	5.1	530	19	22	91	28	6.7	1.6	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
11/2/2021	560	19	21	90	30	6.2	540	17	19	85	28	6.2	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
11/17/2021	640	21	22	97	34	6.9	2.5	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	0.88	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
12/16/2021	570	19	20	92	30	6.4	1.3	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	1	0.53	BRL (<2.0)	BRL (<2.0)	0.9	BRL (<2.0)
1/25/2022	600	23	20	110	37	5.5	530	21	19	110	34	4.6	550	22	18	110	36	4.8
System performance samples were not collected for the February 2022 Reporting Period because the System was shutdown (2/18/22) as a result of breakthrough observed during the previous reporting period (January 2022).																		
System #2 was shutdown from February 2022 through October 2022 for contract renewal and replacement of damaged vessel.																		
10/25/2022	350	25	19	120	37	3.9	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)
11/30/2022	410	23	19	110	36	4.1	BRL (<1.9)	BRL (<1.9)	BRL (<1.9)	BRL (<1.9)	BRL (<1.9)	BRL (<1.9)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)
12/22/2022	520	21	19	110	36	4.1	8.8	BRL (<1.7)	BRL (<1.7)	1.9	BRL (<1.7)	BRL (<1.7)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)
1/16/2023	530	20	17	100	33	BRL (<4.1)	5.7	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.7)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)
2/10/2023	370	21	14	110	39	BRL (<10)	39	BRL (<10)	BRL (<10)	11	BRL (<10)	BRL (<10)	BRL (<10)	BRL (<10)	BRL (<10)	BRL (<10)	BRL (<10)	BRL (<10)
3/13/2023	440	30	18	140	52	3.7	110	6.7	4.1	32	12	BRL (<2.1)	BRL (<2.1)	BRL (<2.1)	BRL (<2.1)	BRL (<2.1)	BRL (<2.1)	BRL (<2.1)
4/18/2023	300	32	19	150	48	3.4	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)
5/11/2023	310	BRL (<50)	BRL (<50)	160	BRL (<50)	BRL (<50)	BRL (<4.1)	BRL (<4.1)	BRL (<4.1)	BRL (<4.1)	BRL (<4.1)	BRL (<4.1)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)
6/6/2023	700	14	47	31	13	5.3	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)
7/13/2023	260	55	26	210	76	2.8	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)	BRL (<1.7)
8/22/2023	180	61	20	170	66	1.9	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)
9/8/2023	420	61	33	180	62	3.9	7.7	BRL (<1.8)	BRL (<1.8)	3.5	BRL (<1.8)	BRL (<1.8)	7.9	2	BRL (<1.8)	4	2	BRL (<1.8)
10/12/2023	330	29	23	110	36	4.6	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)
11/21/2023	310	23	21	85	34	3.9	27	2.2	BRL (<2.1)	7.6	4.4	BRL (<2.1)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)	BRL (<2.0)
12/21/2023	300	24	19	100	41	2.8	240	20	16	86	35	2.5	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)

Notes:

- Concentrations presented in ng/L - nanograms per Liter - parts per trillion
- MassDEP's Office of Research and Standards (ORS) expanded upon the USEPA's Health Advisory and created the ORS Guideline that applies to the total summed of five PFAS chemicals, PFOS, PFOA, PFNA, PFHxS, and PFHpA, effective June 11, 2018.
- Concentrations of the PFAS compound, PFDA, are presented based on the April 19, 2019, MassDEP draft of new/proposed groundwater standards for PFAS that includes a sixth, PFAS compound, PFDA. However the concentration of PFDA is not included in total PFAS removal calculations.
- BRL - Below Laboratory Reporting Limits; reporting limit shown in parentheses.
- Concentrations in **bold** exceed applicable MassDEP ORS Guideline
- PFOS - Perfluorooctanesulfonic Acid
- PFOA - Perfluorooctanoic Acid
- PFNA - Perfluorononanoic Acid
- PFHxS - Perfluorohexanesulfonic Acid
- PFHpA - Perfluoroheptanoic Acid
- PFDA - Perfluorodecanoic Acid
- : Concentration data not available and/or sample was not collected on that date.
- Per MCP Regulations, the system was sampled one day, three days, and seven (7) days following the initial week of startup (11/11/19).
- On December 13, 2019, MassDEP published the newly established clean up standards for PFAS in soil and groundwater. These standards were effective as of December 27, 2019 and apply to the total sum of six PFAS chemicals, PFOS, PFOA, PFNA, PFHxS, PFHpA, and PFDA. Concentrations of the six PFAS compounds presented in the table were not compared to the new MassDEP standards until the January 2020 monthly system sample collection.
- The December monthly sample was collected from the system's effluent stream on 12/17/2019 following the receipt of the laboratory results from the 11/19/2019 sampling event on 12/16/2019.
The effluent was resampled again to ensure significant breakthrough was not occurring from the secondary carbon vessel.

Table 2A - Summary of Groundwater Pump and Treatment System Operating and Maintenance Data - System No. 1 (GWTS #1)

Barnstable County Fire and Rescue Training Academy

155 Flint Rock Road, Barnstable, MA

RTN 4-26179

Month	System Shut-downs	No. of Days System Operating	INFLUENT	EFFLUENT					Estimated Total PFAS6 Removal (g) ⁵	Date System Sampled	Regular Maintenance Conducted	Comments
			Average Estimated Instantaneous Flow Rate (GPM) ¹	Average Instantaneous Effluent Flow Rate (GPM) ²	Totalizer Read date	Totalizer (Gal)	Total Net Gallons Treated ³	Average Effluent Flow Rate (GPM) ⁴				
January 2023	No	31	14.5	24.22	01/30/23	23167497	679793	15.2	1.80349	1/16/2023	Conducted system checks, changed bag filters, flushed sightglass	
February 2023	No	28	15.4	25.43	02/24/23	23370215	202718	5.0	0.42564	2/10/2023	Conducted system checks, changed bag filters, flushed sightglass	
March 2023	No	31	9.3	26.00	03/31/23	23637288	267073	6.0	0.69205	3/13/2023	Conducted system checks, changed bag filters, flushed sightglass, replace sight glass 3.10.23	
April 2023	Yes	30	11.7	31.75	04/28/23	24236832	599544	13.9	1.25520	4/18/2023	Conducted system checks, changed bag filters, flushed sightglass, backwash carbon vessels	4.10.23 systems shut down to vaccumm sludge out of EQ tank, turned back on same day.
May 2023	No	31	7.5	33.44	05/30/23	24445739	208907	4.7	0.37213	5/11/2023	Conducted system checks, changed bag filters, flushed sightglass, backwash carbon vessels	
June 2023	No	30	5.4	32.67	06/29/23	24827515	381776	8.8	1.17245	6/6/2023	Conducted system checks, changed bag filters, flushed sightglass, backwash carbon vessels	
July 2023	No	31	2.8	32.44	07/31/23	24957541	130026	2.9	0.31036	7/13/2023	Conducted system checks, changed bag filters, flushed sightglass, backwash carbon vessels	
August 2023	Yes	29	2.8	32.25	08/28/23	25112492	154951	3.7	0.29299	8/22/2023	Conducted system checks, changed bag filters, flushed sightglass, backwash carbon vessels	8.29.23 system shutdown for well and force main cleaning. System re-started 8.31.23
September 2023	No	30	17.3	31.38	09/29/23	25891248	778756	18.0	2.24283	9/8/2023	Conducted system checks, changed bag filters, flushed sightglass, backwash carbon vessels	
October 2023	No	31	14.6	27.78	10/30/23	26526060	634812	14.2	1.28140	10/12/2023	Conducted system checks, changed bag filters, flushed sightglass, backwash carbon vessels	
November 2023	No	30	12.3	28.00	11/27/23	26847478	321418	7.4	0.58095	11/21/2023	Conducted system checks, changed bag filters	
December 2023	Yes	28	9.1	27.14	12/29/23	27284095	436617	10.8	0.80555	12/21/2023	Conducted system checks, changed bag filters	12.15.23 System Shutdown for totes pumpout restarted same day System Shutdown for EQ tank pumpout restarted same day; shutdown for carbon changeout, restarted 1.2.24. 12.18.23 12.29.23 System
TOTALS ⁶		179					2456580		5.51408			

1. The Average Estimated Instantaneous Flow Rate (AEIFR) is calculated based on timing the rise of water in the GWTS #1 Equalizer / Influent tank with both force mains temporarily diverted to that tank. This estimate represents the instantaneous flow rate from the recovery well, PRW-4. The AEIFR reported above assumes that 50% of the calculated flow is normally discharged to GWTS #2 via one of the 2 force mains.

2. The Average Instantaneous Effluent Flow Rate is an approximation based on timing the change in the totalizer meter reading (on the Effluent piping). The readings are collected after bag filter change and/or backwashing.

3. The calculated Net Gallons Treated are based on totalizer readings from each monitoring date and the totals are representative of the monthly IRA reporting period.

4. The Average Effluent Flow Rate is calculated from the net gallons (Total Net Gallons Treated) obtained from the system's effluent totalizer flow meter and days that the system was in operation.

5. The total mass of PFAS removed is calculated based on the total net gallons treated and and the total Influent PFAS6 concentration for the month.

6. The "Totals" shown (from left to right) include theTotal Days of System Operation, Total Gallons Treated, Average Effluent Flow Rate, and Estimated PFAS Removed are based on the sum of the respective monthly reporting period.

Table 2B - Summary of Groundwater Pumping and Treatment System Operating and Maintenance Data - System No. 2 (GWTS #2)
Former Barnstable County Fire Training Academy Site
155 Flint Rock Road, Barnstable, MA
RTN 4-26179

Month	System Shut-downs	No. of Days System Operating	INFLUENT	EFFLUENT					Estimated Total PFAS6 Removal (g) ⁵	Date System Sampled	Regular Maintenance Conducted	Comments
			Average Estimated Instantaneous Flow Rate (GPM) ¹	Average Instantaneous Effluent Flow Rate (GPM) ²	Totalizer Read date	Totalizer (Gal)	Total Net Gallons Treated ₃	Average Effluent Flow Rate (GPM) ₄				
January 2023	No	31	14.3	29.89	01/30/23	13156721	445,471	10.0	1.18183	1/16/2023	Conducted system checks, changed bag filters	
February 2023	No	28	15.1	24.00	02/24/23	13607352	450,631	11.2	0.94617	2/10/2023	Conducted system checks, changed bag filters	
March 2023	No	31	9.9	27.30	03/31/23	14243258	635,906	14.2	1.64777	3/13/2023	Conducted system checks, changed bag filters	
April 2023	Yes	30	12.1	36.25	04/28/23	14475848	232,590	5.4	0.48695	4/18/2023	Conducted system checks, changed bag filters, backwash carbon vessels	4.10.23 - systems shut down to vaccumm sludge out of EQ tank, turned back on same day.
May 2023	No	31	7.4	37.00	05/30/23	14932612	456,764	10.2	0.81363	5/11/2023	Conducted system checks, changed bag filters, backwash carbon vessels	
June 2023	No	30	4.7	36.78	06/29/23	15036400	103,788	2.4	0.31874	6/6/2023	Conducted system checks, changed bag filters, backwash carbon vessels	
July 2023	No	31	2.8	37.44	07/31/23	15160580	124,180	2.8	0.29641	7/13/2023	Conducted system checks, changed bag filters, backwash carbon vessels	
August 2023	Yes	29	2.8	37.38	08/28/23	15226053	65,473	1.6	0.12380	8/22/2023	Conducted system checks, changed bag filters, backwash carbon vessels	8.29.23 system shutdown for well and force main cleaning. System re-started 8.31.23
September 2023	No	30	17.6	35.11	09/29/23	15893538	667,485	15.5	1.92237	9/8/2023	Conducted system checks, changed bag filters, backwash carbon vessels	
October 2023	No	31	16.0	35.67	10/30/23	16456071	562,533	12.6	1.13550	10/12/2023	Conducted system checks, changed bag filters, backwash carbon vessels	
November 2023	No	30	12.1	35.88	11/27/23	16914234	458,163	10.6	0.82811	11/21/2023	Conducted system checks, changed bag filters	
December 2023	No	28	9.0	34.86	12/29/23	17184350	270,116	6.7	0.49836	12/21/2023	Conducted system checks, changed bag filters	12.15.23 System Shutdown for totes pumpout restarted same day System Shutdown for EQ tank pumpout restarted same day; shutdown for carbon changeout, restarted 1.2.24. 12.18.23 12.29.23 System
TOTALS ⁶		179					2,147,950		4.80455			

1. The Average Estimated Instantaneous Flow Rate (AEIFR) is calculated based on timing the rise of water in the GWTS #1 Equalizer / Influent tank with both force mains temporarily diverted to that tank. This estimate represents the instantaneous flow rate from the recovery well, PRW-4. The AEIFR reported above assumes that 50% of the calculated flow is normally discharged to GWTS #2 via one of the 2 force mains.

2. The Average Instantaneous Effluent Flow Rate is an approximation based on timing the change in the totalizer meter reading (on the Effluent piping). The readings are collected after bag filter change and/or backwashing.

3. The calculated Net Gallons Treated are based on totalizer readings from each monitoring date and the totals are representative of the monthly IRA reporting period.

4. The Average Effluent Flow Rate is calculated from the net gallons (Total Net Gallons Treated) obtained from the system's effluent totalizer flow meter and days that the system was in operation.

5. The total mass of PFAS removed is calculated based on the total net gallons treated and and the total Influent PFAS6 concentration for the month.

6. The "Totals" shown (from left to right) include theTotal Days of System Operation, Total Gallons Treated, Average Effluent Flow Rate, and Estimated PFAS Removed are based on the sum of the respective monthly reporting period.

Table 3 - Summary of Long Term Groundwater Monitoring Data
Former Barnstable County Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	Method 1 GW-1 Standards ⁴	HSW-6/HS-2(a)																			HSW-1/HS-1(a)														
SCREEN DEPTH (FEET)		Unknown ¹⁶																			Unknown ¹⁶														
WELL DIAMETER (INCHES)		2																			2														
WELL STATUS		Viable																			Viable														
SAMPLING DATE		1/21/2016	3/30/2016	8/11/2016	4/10/2017	7/27/2017	11/17/2017	2/9/2018	6/26/2018	1/9/2019	10/28/2019	7/28/2020	10/20/2020	1/26/2021	5/20/2021	7/28/2021	11/2/2021	1/25/2022	11/9/2022	11/2/2023	1/21/2016	8/11/2016	4/10/2017	7/27/2017	11/17/2017	2/9/2018	1/9/2019	4/23/2019	7/22/2019	10/28/2019	2/18/2020	5/11/2020	11/2/2021		
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L			
PFAS (Method 537.1m or PACE SOP 454)																																			
PFOS	20	77,000	320,000	41,000	28,000	21,000	45,000	25,000	950	1,300	3,600	2,300	5,700	2,800	2,700	1,500	1,900	1,600	1,700	3,200	110,000	56,000	38,000	24,000	25,000	13,000	1,800	2,000	1,100	1,800	740	1,300	1,800		
PFOA	20	--	--	--	660	--	320	160	15	94	79	80	48	320	180	45	550	170	160	160	--	--	1,000	350	1,300	320	840	100	64	46	36	100	470		
PFNA	20	--	--	--	--	--	--	--	BRL (<87)	26	46	40	52	35	47	57	65	46	150	170	--	--	--	--	--	--	43	65	43	33	22	57	46		
PFHxS	20	--	--	--	--	--	--	--	26	140	310	350	71	1,400	440	100	2,500	410	350	430	--	--	--	--	--	--	1,700	300	170	150	66	300	1,600		
PFHpA	20	--	--	--	--	--	--	--	15	66	100	69	56	640	150	49	870	160	200	190	--	--	--	--	--	--	510	67	52	43	32	63	430		
PFDA	20	--	--	--	--	--	--	--	--	--	30	18	23	21	19	13	12	7	19	34	--	--	--	--	--	--	--	55	19	13	9.1	37	12		
TOTAL 16 PFAS	20	77,000	320,000	41,000	28,660	21,000	45,320	25,160	1,006	1,626	4,165	2,857	5,950	5,216	3,536	1,764	5,897	2,393	2,579	4,184	110,000	56,000	39,000	24,350	26,300	13,320	4,893	2,587	1,448	2,085	905	1,857	4,358		

Notes:

1. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data in the IRA Status Reports. Data presented herein is summarized and data was selected based on quarterly sampling events.

2. On December 27, 2019 MassDEP MCP GW-1 Risk Standards for groundwater became final. The MCP GW-1 Risk Standard of 20 ng/L apply to the sum of and invidual concentrations of the six PFAS compounds presented above.

3. BRL - Below Laboratory Detection Limits

4. Concentrations presented in ng/L - nanograms per Liter - parts per trillion

7. Concentrations in **bold** exceed applicable Health Advisory Limit or Method 1 GW-1 Standard

5. PFOS - Perfluorooctanesulfonate

6. PFOA - Perfluorooctanoic Acid

7. PFNA - Perfluorononanoic Acid

8. PFHxS - Perfluorohexanesulfonic Acid

9. PFHpA - Perfluoroheptanoic Acid

10. PFDA - Perfluorodecanoic Acid

11. NA - Concentration data not available

12. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The wells were replaced with HSW-1/HS-1(a), HWS-2/HS2(a) as post-exacavation activities.

13. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.

14. NE- Not Established

15. Due to labeling error MW-3S was labeled as MW-3 on the laboratory report and COC in the November 2022.

16. Well construction logs could not be located for this monitoring well. Therefore well screen depth is unknown at this time.

Table 3 - Summary of Long Term Groundwater Monitoring Data
Former Barnstable County Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	Method 1 GW-1 Standards ¹	PFW-1																											
SCREEN DEPTH (FEET)		10-19																											
WELL DIAMETER (INCHES)		2																											
WELL STATUS		Viable																											
SAMPLING DATE		4/1/2015	10/7/2015	3/8/2016	3/30/2016	8/11/2016	4/10/2017	2/9/2018	6/26/2018	1/9/2019	4/23/2019	7/22/2019	10/28/2019	2/18/2020	5/11/2020	7/28/2020	10/20/2020	1/26/2021	5/20/2021	7/28/2021	11/2/2021	1/25/2022	4/21/2022	7/27/2022	11/9/2022	1/31/2023	4/4/2023	7/25/2023	11/2/2023
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
PFAS (Method 537.1m or PACE SOP 454)																													
PFOs	20	8,400	60,000	7,000	56,000	3,500	4,100	8,100	76,000	38,000	20,000	24,000	16,000	22,000	6,000	5,200	4,000	3,400	3,100	3,300	3,900	4,400	4,500	7,600	7,100	15,000	15,000	15,000	20,000
PFOA	20	360	800	--	--	--	--	470	1,500	160	300	560	130	220	250	210	110	150	160	330	170	270	260	540	500	330	200	730	370
PFNA	20	--	--	--	--	--	--	--	3,900	330	360	210	570	230	94	110	80	94	66	50	69	120	74	99	170	210	150	290	260
PFHxS	20	--	--	--	--	--	--	--	7,400	960	1,500	4,800	910	1,000	890	820	450	750	750	2,500	870	1,000	1,500	3,300	2,000	1,500	910	2,500	1,000
PFHpA	20	--	--	--	--	--	--	--	610	140	290	500	150	200	220	160	82	200	250	440	190	390	350	660	330	370	160	390	230
PFDA	20	--	--	--	--	--	--	--	--	--	110	160	120	200	81	89	37	69	45	28	54	36	36	38	42	78	79	92	95
TOTAL 16 PFAS	20	8,760	60,800	7,000	56000	3500	4,100	8,570	89,410	39,590	22,560	30,230	17,880	23,850	7,535	6,589	4,759	4,663	4,371	6,648	5,253	6,216	6,720	12,237	10,142	17,488	16,499	19,002	21,955

Notes:

1. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data in the IRA Status Reports. Data presented herein is summarized and data was selected based on quarterly sampling events.
2. On December 27, 2019 MassDEP MCP GW-1 Risk Standards for groundwater became final. The MCP GW-1 Risk Standard of 20 ng/L apply to the sum of and invidual concentrations of the six PFAS compounds presented above.
3. BRL - Below Laboratory Detection Limits
4. Concentrations presented in ng/L - nanograms per Liter - parts per trillion
7. Concentrations in **bold** exceed applicable Health Advisory Limit or Method 1 GW-1 Standard
5. PFOS - Perfluorooctanesulfonate
6. PFOA - Perfluorooctanoic Acid
7. PFNA - Perfluorononanoic Acid
8. PFHxS - Perfluorohexanesulfonic Acid
9. PFHpA - Perfluoroheptanoic Acid
10. PFDA - Perfluorodecanoic Acid
11. NA - Concentration data not available
12. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The wells were replaced with HSW-1/HS-1(a), HWS-2/HS2(a) as post-exacavation activities.
13. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.
14. NE- Not Established
15. Due to labeling error MW-3S was labeled as MW-3 on the laboratory report and COC in the November 2022.
16. Well construction logs could not be located for this monitoring well. Therefore well screen depth is unknown at this time.

Table 3 - Summary of Long Term Groundwater Monitoring Data
Former Barnstable County Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	Method 1 GW-1 Standards ⁴	PFW-2																					
SCREEN DEPTH (FEET)		10-20																					
WELL DIAMETER (INCHES)		2																					
WELL STATUS		Viable																					
SAMPLING DATE		4/1/2015	6/18/2015	10/27/2015	1/21/2016	3/30/2016	8/11/2016	12/8/2016	4/10/2017	7/27/2017	11/17/2017	2/9/2018	1/9/2019	10/28/2019	5/11/2020	10/20/2020	11/2/2021	4/21/2022	7/27/2022	11/9/2022	1/31/2023	4/2/2023	7/25/2023
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
PFAS (Method 537.1m or PACE SOP 454)																							
PFOS	20	220,000	200,000	32,000	39,000	120,000	65,000	13,000	17,000	73,000	25,000	32,000	5,200	2,100	690	1,700	1,200	630	2,600	1,900	1,600	1,100	3,300
PFOA	20	5200	BRL(<800)	--	1,100	2,100	--	--	970	910	400	400	720	74	48	30	170	620	190	110	250	730	240
PFNA	20	--	--	--	--	--	--	--	--	--	--	--	110	64	39	52	32	64	140	86	64	160	160
PFHxS	20	--	--	--	--	--	--	--	--	--	--	--	1,800	230	140	71	650	940	470	310	620	1,000	640
PFHpA	20	--	--	--	--	--	--	--	--	--	--	--	470	68	45	31	270	250	130	180	190	32	150
PFDA	20	--	--	--	--	--	--	--	--	--	--	--	--	27	14	23	4	6.8	15.0	27	BRL (<20)	11	42
TOTAL 16 PFAS	20	225,200	200,000	32,000	40,100	122,100	65,000	13,000	17,970	73,910	25,400	32,400	8,300	2,563	976	1,907	2,326	2,511	3,545	2,613	2,724	3,033	4,532

Notes:

1. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data in the IRA Status Reports. Data presented herein is summarized and data was selected based on quarterly sampling events.

2. On December 27, 2019 MassDEP MCP GW-1 Risk Standards for groundwater became final. The MCP GW-1 Risk Standard of 20 ng/L apply to the sum of and individual concentrations of the six PFAS compounds presented above.

3. BRL - Below Laboratory Detection Limits

4. Concentrations presented in ng/L - nanograms per Liter - parts per trillion

7. Concentrations in **bold** exceed applicable Health Advisory Limit or Method 1 GW-1 Standard

5. PFOS - Perfluorooctanesulfonate

6. PFOA - Perfluorooctanoic Acid

7. PFNA - Perfluorononanoic Acid

8. PFHxS - Perfluorohexanesulfonic Acid

9. PFHpA - Perfluoroheptanoic Acid

10. PFDA - Perfluorodecanoic Acid

11. NA - Concentration data not available

12. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The wells were replaced with HSW-1/HS-1(a), HWS-2/HS2(a) as post-exacavation activities.

13. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.

14. NE- Not Established

15. Due to labeling error MW-3S was labeled as MW-3 on the laboratory report and COC in the November 2022.

16. Well construction logs could not be located for this monitoring well. Therefore well screen depth is unknown at this time.

Table 3 - Summary of Long Term Groundwater Monitoring Data
Former Barnstable County Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	Method 1 GW-1 Standards ⁴	PFW-5																					
SCREEN DEPTH (FEET)		10-20																					
WELL DIAMETER (INCHES)		2																					
WELL STATUS		Viable																					
SAMPLING DATE		3/31/2015	4/11/2017	1/9/2019	4/23/2019	7/22/2019	10/28/2019	2/18/2020	5/11/2020	7/28/2020	10/20/2020	1/26/2021	5/19/2020	7/28/2021	11/2/2021	1/25/2022	4/21/2022	7/27/2022	11/9/2022	1/31/2023	4/4/2023	7/25/2023	11/3/2023
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
PFAS (Method 537.1m or PACE SOP 454)																							
PFOS	20	2,700	2,100	1,100	1,900	1,600	2,400	1,000	1,200	980	1,500	1,200	1,200	3,100	370	370	1,000	1,100	2,700	1,100	660	2,200	940
PFOA	20	250	170	64	150	120	26	88	120	100	120	84	120	180	89	150	73	14	24	110	110	99	64
PFNA	20	--	--	BRL (<8.7)	25	16	BRL (<4.9)	11	22	15	29	32	27	15	12	8.6	40.0	5.5	5.5	24.0	55.0	24.0	52.0
PFHxS	20	--	--	240	680	630	260	360	720	610	420	310	790	1,100	560	1,300	340	67	500	580	670	860	370
PFHpA	20	--	--	30	82	54	22	56	66	44	60	80	110	160	76	240	45	9.2	20	48	100	34	67
PFDA	20	--	--	--	12	11	BRL (<4.1)	10	13	11	16	5	7	7	BRL (<3.9)	5.4	11.0	13.0	7.8	BRL (<20)	5.1	7.7	5.5
TOTAL 16 PFAS	20	2,950	2,270	1,434	2,849	2,431	2,708	1,525	2,141	1,760	2,145	1,711	2,254	4,562	1,107	2,074	1,509	1,209	3,257	1,862	1,600	3,225	1,499

Notes:

1. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data in the IRA Status Reports. Data presented herein is summarized and data was selected based on quarterly sampling events.

2. On December 27, 2019 MassDEP MCP GW-1 Risk Standards for groundwater became final. The MCP GW-1 Risk Standard of 20 ng/L apply to the sum of and invidual concentrations of the six PFAS compounds presented above.

3. BRL - Below Laboratory Detection Limits

4. Concentrations presented in ng/L - nanograms per Liter - parts per trillion

7. Concentrations in **bold** exceed applicable Health Advisory Limit or Method 1 GW-1 Standard

5. PFOS - Perfluorooctanesulfonate

6. PFOA - Perfluorooctanoic Acid

7. PFNA - Perfluorononanoic Acid

8. PFHxS - Perfluorohexanesulfonic Acid

9. PFHpA - Perfluoroheptanoic Acid

10. PFDA - Perfluorodecanoic Acid

11. NA - Concentration data not available

12. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The wells were replaced with HSW-1/HS-1(a), HWS-2/HS2(a) as post-exacavation activities.

13. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.

14. NE- Not Established

15. Due to labeling error MW-3S was labeled as MW-3 on the laboratory report and COC in the November 2022.

16. Well construction logs could not be located for this monitoring well. Therefore well screen depth is unknown at this time.

Table 3 - Summary of Long Term Groundwater Monitoring Data
Former Barnstable County Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	Method 1 GW-1 Standards ⁴	OW-8A																								FS-15A	
SCREEN DEPTH (FEET)		15-25																								10-20	
WELL DIAMETER (INCHES)		2																								2	
WELL STATUS		Viable																								Viable	
SAMPLING DATE		11/22/2013	6/3/2014	4/11/2017	8/16/2017	6/26/2018	1/9/2019	4/23/2019	7/22/2019	10/28/2019	2/18/2020	5/11/2020	7/28/2020	10/20/2020	1/26/2021	5/19/2021	7/28/2021	11/3/2021	1/25/2022	4/21/2022	7/27/2022	11/9/2022	1/31/2023	4/4/2023	7/25/2023	6/16/2016	5/19/2021
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
PFAS (Method 537.1m or PACE SOP 454)																											
PFOs	20	2,700	8,600	1,700	770	2,800	990	880	780	220	650	150	170	40	230	120	11	520	120	1,200	130	76	480	680	130	1,700	12
PFOA	20	430	1,000	2,000	120	65	420	66	55	130	62	18	12	BRL (<5.0)	290	120	7	720	11	260	16	13	410	210	11	550	BRL (5.0)
PFNA	20	--	--	--	--	310	150	120	78	10	110	12	11	BRL (<5.1)	120	250	BRL (<5.1)	70	BRL (<5.1)	100	20	BRL (<1.9)	48	25	3	--	BRL (<5.1)
PFHxS	20	--	--	--	--	250	890	140	100	750	190	77	30	11	760	330	23	3,100	39	620	45	70	2,000	660	42	--	BRL (<4.4)
PFHpA	20	--	--	--	--	43	210	40	26	190	35	8.9	7.4	BRL (<6.7)	150	66	BRL (<6.7)	360	12	130	12	10	180	140	10	--	BRL (<6.7)
PFDA	20	--	--	--	--	--	--	15	18	14	17	3.6	10	BRL (<3.9)	BRL (<2.0)	3.9	BRL (<3.9)	BRL (<3.9)	BRL (<3.9)	15.0	BRL (<3.9)	BRL (<1.9)	BRL (<10)	4.6	2.1	--	BRL (<3.9)
TOTAL 16 PFAS	20	3,130	9,600	3,700	890	3,468	2,660	1,261	1,057	1,314	1,064	270	240	51	1,550	890	41	4,770	182	2,325	223	169	3,118	1,720	198	2,250	12

Notes:

1. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data in the IRA Status Reports. Data presented herein is summarized and data was selected based on quarterly sampling events.
2. On December 27, 2019 MassDEP MCP GW-1 Risk Standards for groundwater became final. The MCP GW-1 Risk Standard of 20 ng/L apply to the sum of and individual concentrations of the six PFAS compounds presented above.
3. BRL - Below Laboratory Detection Limits
4. Concentrations presented in ng/L - nanograms per Liter - parts per trillion
7. Concentrations in **bold** exceed applicable Health Advisory Limit or Method 1 GW-1 Standard
5. PFOS - Perfluorooctanesulfonate
6. PFOA - Perfluorooctanoic Acid
7. PFNA - Perfluorononanoic Acid
8. PFHxS - Perfluorohexanesulfonic Acid
9. PFHpA - Perfluoroheptanoic Acid
10. PFDA - Perfluorodecanoic Acid
11. NA - Concentration data not available
12. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The wells were replaced with HSW-1/HS-1(a), HWS-2/HS2(a) as post-exacavation activities.
13. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.
14. NE- Not Established
15. Due to labeling error MW-3S was labeled as MW-3 on the laboratory report and COC in the November 2022.
16. Well construction logs could not be located for this monitoring well. Therefore well screen depth is unknown at this time.

Table 3 - Summary of Long Term Groundwater Monitoring Data
Former Barnstable County Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	Method 1 GW-1 Standards ⁴	MW-35								MW-125																												
SCREEN DEPTH (FEET)		13.6-23.6								Unknown ¹⁶																												
WELL DIAMETER (INCHES)		2								2																												
WELL STATUS		Viable								Viable																												
SAMPLING DATE		6/3/2014	8/18/2016	11/3/2021	4/21/2022	7/27/2022	11/9/2022 ¹⁸	1/31/2023	11/2/2023	8/20/2014	4/1/2015	6/26/2018	1/11/2019	4/23/2019	7/23/2019	10/29/2019	2/19/2020	5/12/2020	7/29/2020	10/21/2020	1/27/2021	5/20/2021	11/2/2021	1/25/2022	4/20/2022	7/28/2022	2/1/2023	4/5/2023	7/25/2023	11/1/2023								
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L						
PFAS (Method 537.1m or PACE SOP 454)																																						
PFOS	20	4,900	1,900	1,400	1,300	1,600	4,200	830	2,800	2,500	4,800	3,000	2,700	2,800	2,800	2,300	3,100	3,500	2,900	3,900	2,300	360	1,400	950	1,700	1,500	1,100	630	1,100									
PFOA	20	530	690	360	330	470	890	220	280	400	470	280	650	920	250	380	580	280	220	280	230	46	150	100	170	350	190	150	190	150								
PFNA	20	--	--	36	64	68	110	24	97	--	--	56	64	92	87	80	78	86	51	51	28	6	27	27	18	17	21	14	27	24								
PFHxS	20	--	--	1,800	1,100	1,200	1,600	910	890	--	--	1,200	1,500	1,700	880	1,300	1,200	1,100	900	93	630	170	670	390	830	900	580	400	800	470								
PFHpA	20	--	--	210	160	190	530	81	210	--	--	130	490	440	170	310	390	140	120	110	74	14	73	63	75	100	66	71	120	140								
PFDA	20	--	--	BRL (<3.9)	7	10	8.3	BRL (<10)	8	--	--	--	--	16	11	10	7.5	23	18	13	21	BRL (<3.9)	BRL (<3.9)	4.7	BRL (<6.4)	7.5	BRL (<10)	BRL (<4.1)	5.8	BRL (<4.2)								
TOTAL 16 PFAS	20	5,430	2,590	3,806	2,961	3,538	7,338	2,065	4,285	2,900	5,270	4,666	5,404	5,968	4,198	4,380	5,356	5,129	4,209	4,447	3,283	596	2,320	1,535	2,793	2,875	1,957	1,265	2,243	1,444								

Notes:

1. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data in the IRA Status Reports. Data presented herein is summarized and data was selected based on quarterly sampling events.

2. On December 27, 2019 MassDEP MCP GW-1 Risk Standards for groundwater became final. The MCP GW-1 Risk Standard of 20 ng/L apply to the sum of and invidual concentrations of the six PFAS compounds presented above.

3. BRL - Below Laboratory Detection Limits

4. Concentrations presented in ng/L - nanograms per Liter - parts per trillion

7. Concentrations in **bold** exceed applicable Health Advisory Limit or Method 1 GW-1 Standard

5. PFOS - Perfluorooctanesulfonate

6. PFOA - Perfluorooctanoic Acid

7. PFNA - Perfluorononanoic Acid

8. PFHxS - Perfluorohexanesulfonic Acid

9. PFHpA - Perfluoroheptanoic Acid

10. PFDA - Perfluorodecanoic Acid

11. NA - Concentration data not available

12. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The wells were replaced with HSW-1/HS-1(a), HWS-2/HS2(a) as post-exacavation activities.

13. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.

14. NE- Not Established

15. Due to labeling error MW-35 was labeled as MW-3 on the laboratory report and COC in the November 2022.

16. Well construction logs could not be located for this monitoring well. Therefore well screen depth is unknown at this time.

Table 3 - Summary of Long Term Groundwater Monitoring Data
Former Barnstable County Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	Method 1 GW-1 Standards ⁴	MW-13		MW-15D		MW-22																						MW-23		MW-201						
SCREEN DEPTH (FEET)		27-37				14.5-24.5																						14-24		10-20						
WELL DIAMETER (INCHES)		2				2																						2		2						
WELL STATUS		Viable		Viable		Viable																						Viable		Viable						
SAMPLING DATE		7/29/2021	11/10/2022	4/2/2015	11/2/2023	6/3/2014	4/1/2015	6/26/2018	1/11/2019	4/23/2019	7/23/2019	10/29/2019	2/19/2020	5/12/2020	7/29/2020	10/21/20020	1/27/2021	5/20/2021	11/2/2021	1/25/2022	4/20/2022	7/28/2022	2/1/2023	4/5/2023	7/25/2023	11/1/2023	7/29/2021	11/10/2022	5/19/2021	11/9/2022						
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L						
PFAS (Method 537.1m or PACE SOP 454)																																				
PFOS	20	BRL(<0.020)	200	60	37	4,900	600	320	350	320	410	510	460	380	790	680	470	2,300	340	430	35	480	42	86	130	160	1,100	89	230	18						
PFOA	20	BRL(<0.020)	17	60	10	530	90	30	140	160	190	150	230	120	92	160	250	150	83	94	3.3	77.0	BRL (<10)	7.1	15	14	76	120	14	BRL (<1.9)						
PFNA	20	BRL(<0.020)	4.5	--	BRL (<1.9)	--	--	9	BRL (<8.7)	81	7.6	8.3	5	10	14	14	7	24	BRL (<5.1)	5.7	3.3	8.7	BRL (<10)	BRL (<1.8)	1.8	1.9	BRL (<20)	4.9	19	BRL (<1.9)						
PFHxS	20	BRL(<0.020)	95	--	11	--	--	130	680	600	520	690	540	330	360	740	800	570	220	280	18	370	25.0	23	67	71	260	180	84	15						
PFHpA	20	BRL(<0.020)	30	--	4.7	--	--	13	69	49	33	61	38	32	27	100	88	65	13	21	1	20	BRL (<10)	2	2	3	98	49	24	BRL (<1.9)						
PFDA	20	BRL(<0.020)	BRL (<1.9)	--	1.9	--	--	--	--	BRL (<4.1)	BRL (<4.1)	BRL (<4.1)	BRL (<4.1)	1	5	5	1	15	BRL (<3.9)	<3.9	<0.64	<3.9	BRL (<10)	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	BRL (<20)	BRL (<1.9)	BRL (<3.9)	BRL (<1.9)						
TOTAL 16 PFAS	20	0	346.5	120	64.2	5,430	690	502	1,239	1,210	1,161	1,419	1,273	873	1,288	1,699	1,616	3,124	656	831	60	956	67	118	216	250	1,534	443	371	33						

Notes:

1. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data in the IRA Status Reports. Data presented herein is summarized and data was selected based on quarterly sampling events.
2. On December 27, 2019 MassDEP MCP GW-1 Risk Standards for groundwater became final. The MCP GW-1 Risk Standard of 20 ng/L apply to the sum of and invidual concentrations of the six PFAS compounds presented above.
3. BRL - Below Laboratory Detection Limits
4. Concentrations presented in ng/L - nanograms per Liter - parts per trillion
7. Concentrations in **bold** exceed applicable Health Advisory Limit or Method 1 GW-1 Standard
5. PFOS - Perfluorooctanesulfonate
6. PFOA - Perfluorooctanoic Acid
7. PFNA - Perfluorononanoic Acid
8. PFHxS - Perfluorohexanesulfonic Acid
9. PFHpA - Perfluoroheptanoic Acid
10. PFDA - Perfluorodecanoic Acid
11. NA - Concentration data not available
12. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The wells were replaced with HSW-1/HS-1(a), HWS-2/HS2(a) as post-exacavation activities.
13. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.
14. NE- Not Established
15. Due to labeling error MW-3S was labeled as MW-3 on the laboratory report and COC in the November 2022.
16. Well construction logs could not be located for this monitoring well. Therefore well screen depth is unknown at this time.

Table 3 - Summary of Long Term Groundwater Monitoring Data
Former Barnstable County Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	Method 1 GW-1 Standards ⁴	MW-35i								PC-1																															
SCREEN DEPTH (FEET)		Unknown ¹⁶								29-40																															
WELL DIAMETER (INCHES)		2								2																															
WELL STATUS		Viable								Viable																															
SAMPLING DATE		8/20/2014	5/3/2017	1/10/2019	10/30/2019	10/22/2020	11/2/2021	11/11/2022	11/1/2023	6/17/2015	10/7/2015	3/30/2016	4/24/2017	2/6/2018	6/26/2018	1/11/2019	4/24/2019	7/23/2019	10/29/2019	2/19/2020	5/12/2020	7/28/2020	10/22/2020	1/27/2021	5/20/2021	11/1/2021	1/26/2022	4/20/2022	7/28/2022	11/10/2022	2/1/2023	4/5/2023	7/25/2023								
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L							
PFAS (Method 537.1m or PACE SOP 454)																																									
PFOs	20	60	42	BRL (<6)	BRL (<5.2)	BRL (<5.9)	BRL (<5.7)	23	21	48,000	2,000	56,000	5,700	9,000	10,000	1,700	8,000	4,300	1,600	1,700	1,700	1,900	1,200	1,500	1,500	440	630	660	940	850	78	510	440								
PFOA	20	BRL	14	BRL (<3.3)	BRL (<7.4)	BRL (<5.0)	BRL (<5.0)	2.8	BRL(<2.0)	1,100	BRL (<800)	1,200	--	370	190	140	300	150	72	180	110	63	110	59	49	48	66	76	53	230	35	250	81								
PFNA	20	--	--	BRL (<8.7)	BRL (<4.9)	BRL (<5.1)	BRL (<5.1)	BRL (<1.9)	BRL(<2.0)	--	--	--	--	--	140	62	150	140	75	70	110	58	100	52	72	33	31	30	44	61	BRL (<10)	27	30								
PFHxS	20	--	--	BRL (<5.6)	6	6	10.0	17	13	--	--	--	--	--	850	380	650	430	380	450	400	240	350	190	230	170	180	270	240	960	110	540	140								
PFHpA	20	--	--	BRL (<7.4)	BRL (<7.1)	BRL (<6.7)	BRL (<6.7)	4.1	BRL(<2.0)	--	--	--	--	--	200	200	180	230	150	240	150	98	190	76	83	100	95	110	78	550	41	160	130								
PFDA	20	--	--	--	BRL (<4.1)	BRL (<3.9)	BRL (<3.9)	BRL (<1.9)	BRL(<2.0)	--	--	--	--	--	--	--	78	67	19	20	28	36	27	26	15	BRL (<3.9)	7.5	6.7	9.4	23.0	BRL (<10)	BRL (<4.2)	7.5								
TOTAL 16 PFAS	20	60	56	BRL	6	6	10	47	34	49,100	2,000	57,200	5,700	9,370	11,380	2,482	9,358	5,317	2,296	2,660	2,498	2,395	1,977	1,903	1,949	791	1,010	1,153	1,364	2,674	264	1,487	829								

Notes:

1. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data in the IRA Status Reports. Data presented herein is summarized and data was selected based on quarterly sampling events.

2. On December 27, 2019 MassDEP MCP GW-1 Risk Standards for groundwater became final. The MCP GW-1 Risk Standard of 20 ng/L apply to the sum of and invidual concentrations of the six PFAS compounds presented above.

3. BRL - Below Laboratory Detection Limits

4. Concentrations presented in ng/L - nanograms per Liter - parts per trillion

7. Concentrations in **bold** exceed applicable Health Advisory Limit or Method 1 GW-1 Standard

5. PFOS - Perfluorooctanesulfonate

6. PFOA - Perfluorooctanoic Acid

7. PFNA - Perfluorononanoic Acid

8. PFHxS - Perfluorohexanesulfonic Acid

9. PFHpA - Perfluoroheptanoic Acid

10. PFDA - Perfluorodecanoic Acid

11. NA - Concentration data not available

12. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The wells were replaced with HSW-1/HS-1(a), HWS-2/HS2(a) as post-exacavation activities.

13. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.

14. NE- Not Established

15. Due to labeling error MW-3S was labeled as MW-3 on the laboratory report and COC in the November 2022.

16. Well construction logs could not be located for this monitoring well. Therefore well screen depth is unknown at this time.

Table 3 - Summary of Long Term Groundwater Monitoring Data
Former Barnstable County Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	Method 1 GW-1 Standards ⁴	PC-6A																							
SCREEN DEPTH (FEET)		35-45																							
WELL DIAMETER (INCHES)		2																							
WELL STATUS		Viable																							
SAMPLING DATE		3/9/2016	4/27/2017	6/26/2018	1/10/2019	4/24/2019	7/23/2019	10/29/2019	2/19/2020	5/12/2020	7/29/2020	10/21/2020	1/27/2021	5/20/2021	7/28/2021	11/1/2021	1/26/2022	4/20/2022	7/28/2022	11/10/2022	2/1/2023	4/5/2023	7/25/2023	11/3/2023	
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
PFAS (Method 537.1m or PACE SOP 454)																									
PFOS	20	1,300	3,200	1,300	1,800	1,900	940	1,100	1,600	86	1,300	920	1,100	920	500	550	760	1,100	730	470	640	390	440	360	
PFOA	20	110	150	60	30	68	33	62	67	4.1	37	28	35	31	14	22	29	34	26	30	29	27	19	11	
PFNA	20	--	--	55	25	60	36	48	65	3.8	44	44	58	45	23	32	41	72	42	47	58	45	29	24	
PFHxS	20	--	--	300	190	310	150	290	180	23	99	71	83	72	49	59	62	83	62	72	72	65	53	61	
PFHpA	20	--	--	75	37	83	45	86	71	9	43	37	43	42	24	32	39	40	33	47	37	36	26	11	
PFDA	20					10	BRL (<4.1)	7.4	5.9	0.7	11	12	12	11	3.9	10	10	16	11	12	13	9	8	8.7	
TOTAL 16 PFAS	20	1,410	3,350	1,790	2,082	2,431	1,204	1,593	1,989	127	1,534	1,112	1,331	1,121	614	705	941	1,345	904	678	849	572	575	476	

Notes:

1. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data in the IRA Status Reports. Data presented herein is summarized and data was selected based on quarterly sampling events.

2. On December 27, 2019 MassDEP MCP GW-1 Risk Standards for groundwater became final. The MCP GW-1 Risk Standard of 20 ng/L apply to the sum of and individual concentrations of the six PFAS compounds presented above.

3. BRL - Below Laboratory Detection Limits

4. Concentrations presented in ng/L - nanograms per Liter - parts per trillion

7. Concentrations in **bold** exceed applicable Health Advisory Limit or Method 1 GW-1 Standard

5. PFOS - Perfluorooctanesulfonate

6. PFOA - Perfluorooctanoic Acid

7. PFNA - Perfluorononanoic Acid

8. PFHxS - Perfluorohexanesulfonic Acid

9. PFHpA - Perfluoroheptanoic Acid

10. PFDA - Perfluorodecanoic Acid

11. NA - Concentration data not available

12. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The wells were replaced with HSW-1/HS-1(a), HWS-2/HS2(a) as post-exacavation activities.

13. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.

14. NE- Not Established

15. Due to labeling error MW-3S was labeled as MW-3 on the laboratory report and COC in the November 2022.

16. Well construction logs could not be located for this monitoring well. Therefore well screen depth is unknown at this time.

Table 3 - Summary of Long Term Groundwater Monitoring Data
Former Barnstable County Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	Method 1 GW-1 Standards ⁴	PC-11																				PC-14						
SCREEN DEPTH (FEET)		35-45																				28-38						
WELL DIAMETER (INCHES)		2																				2						
WELL STATUS		Viable																				Viable						
SAMPLING DATE		4/2/2015	5/12/2016	4/24/2017	2/6/2018	6/26/2018	1/10/2019	4/24/2019	7/23/2019	10/29/2019	2/19/2020	5/12/2020	7/29/2020	10/21/2020	1/27/2021	5/19/2021	7/28/2021	11/1/2021	1/26/2022	4/20/2022	11/10/2022	11/1/2023	8/20/2014	3/30/2016	4/28/2017	11/2/2021	11/11/2022	11/1/2023
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
PFAS (Method 537.1m or PACE SOP 454)																												
PFOS	20	4,400	32,000	3,600	4,000	9,600	14,000	200,000	68,000	22,000	18,000	12,000	9,500	7,200	2,700	2,100	2,400	2,900	1,900	1,600	2,300	830	550	2,100	1,600	700	700	380
PFOA	20	550	430	250	180	250	410	640	BRL (<240)	150	290	140	130	150	78	59	74	58	40	70	120	80	40	250	160	26	76	18
PFNA	20	--	--	--	--	230	190	1,700	540	320	140	130	110	100	74	69	61	78	63	88	82	74	--	--	--	37	69	34
PFHxS	20	--	--	--	--	1,500	1,500	2,400	1,200	800	1,300	720	610	640	250	170	320	270	160	240	620	200	--	--	--	92	160	77
PFHpA	20	--	--	--	--	200	310	210	BRL (<210)	160	210	140	130	160	92	65	75	88	60	87	210	99	--	--	--	43	62	34
PFDA	20	--	--	--	--	--	--	450	BRL (<260)	73	69	56	55	52	69	32	31	21	18	20	22	9.2	--	--	--	BRL (<3.9)	7.3	6.4
TOTAL 16 PFAS	20	4950	32430	3850	4180	11,780	16,410	205,400	69,740	23,503	20,009	13,186	10,535	8,302	3,263	2,495	2,961	3,415	2,241	2,105	3,354	1,292	590	2,350	1,760	898	1,074	549

Notes:

1. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data in the IRA Status Reports. Data presented herein is summarized and data was selected based on quarterly sampling events.

2. On December 27, 2019 MassDEP MCP GW-1 Risk Standards for groundwater became final. The MCP GW-1 Risk Standard of 20 ng/L apply to the sum of and invidual concentrations of the six PFAS compounds presented above.

3. BRL - Below Laboratory Detection Limits

4. Concentrations presented in ng/L - nanograms per Liter - parts per trillion

7. Concentrations in **bold** exceed applicable Health Advisory Limit or Method 1 GW-1 Standard

5. PFOS - Perfluorooctanesulfonate

6. PFOA - Perfluorooctanoic Acid

7. PFNA - Perfluorononanoic Acid

8. PFHxS - Perfluorohexanesulfonic Acid

9. PFHpA - Perfluoroheptanoic Acid

10. PFDA - Perfluorodecanoic Acid

11. NA - Concentration data not available

12. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The wells were replaced with HSW-1/HS-1(a), HWS-2/HS2(a) as post-exacavation activities.

13. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.

14. NE- Not Established

15. Due to labeling error MW-3S was labeled as MW-3 on the laboratory report and COC in the November 2022.

16. Well construction logs could not be located for this monitoring well. Therefore well screen depth is unknown at this time.

Table 3 - Summary of Long Term Groundwater Monitoring Data
Former Barnstable County Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	Method 1 GW-1 Standards ⁴	PC-16d																								PC-18								
SCREEN DEPTH (FEET)		Unknown ¹⁶																								40-50								
WELL DIAMETER (INCHES)		2																								2								
WELL STATUS		Viable																								Viable								
SAMPLING DATE		4/2/2015	10/7/2015	2/6/2018	6/26/2018	1/10/2019	4/24/2019	7/23/2019	10/29/2019	2/19/2020	5/12/2020	7/28/2020	10/21/2020	1/27/2021	5/20/2021	7/28/2021	11/1/2021	1/26/2022	4/20/2022	7/28/2022	11/10/2022	2/1/2023	4/5/2023	7/26/2023	11/2/2023	6/17/2015	10/7/2015	4/27/2017	2/6/2018	1/10/2019	10/29/2019	10/21/2020	11/1/2021	11/10/2022
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	
PFAS (Method 537.1m or PACE SOP 454)																																		
PFOS	20	700	560	980	1,900	1,600	2,000	1,400	1,300	1,600	1,200	930	1,900	690	1,200	460	250	300	580	1,300	1,700	290	1,300	410	200	1,200	900	580	890	1,500	1,500	330	290	140
PFOA	20	70	84	64	150	9.3	140	33	75	130	57	99	99	46	70	18	8.9	18	38	130	89	16	120	20	11	110	590	--	70	110	75	18	6.3	8.2
PFNA	20	--	--	--	100	BRL (<8.7)	110	36	79	110	63	49	62	48	83	23	8.9	26	45	70	59	18	72	25	BRL (<11)	--	--	--	--	130	79	20	10	12
PFHxS	20	--	--	--	670	60	520	270	220	360	170	260	280	110	16	72	49	55	160	680	360	75	490	88	54	--	--	--	--	540	220	57	59	32
PFHpA	20	--	--	--	170	13	140	74	80	92	61	68	63	54	47	15	9	25	42	88	71	19	110	28	22	--	--	--	--	140	80	21	20	18
PFDA	20	--	--	--	--	--	8.7	BRL (<4.1)	7.2	7.2	8.5	11	11	5	9	6	BRL (<3.9)	BRL (<3.9)	4.2	10.0	11.0	BRL (<10)	8.2	BRL (<10)	BRL (<11)	--	--	--	--	--	7.2	6.8	BRL (<3.9)	2.2
TOTAL 16 PFAS	20	770	644	1044	2,990	1,682	2,919	1,813	1,761	2,299	1,560	1,417	2,415	953	1,425	594	326	424	869	2,278	2,290	418	2,100	571	287	1310	1490	580	960	2420	1,961	453	385	212

Notes:

1. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data in the IRA Status Reports. Data presented herein is summarized and data was selected based on quarterly sampling events.
2. On December 27, 2019 MassDEP MCP GW-1 Risk Standards for groundwater became final. The MCP GW-1 Risk Standard of 20 ng/L apply to the sum of and invidual concentrations of the six PFAS compounds presented above.
3. BRL - Below Laboratory Detection Limits
4. Concentrations presented in ng/L - nanograms per Liter - parts per trillion
7. Concentrations in **bold** exceed applicable Health Advisory Limit or Method 1 GW-1 Standard
5. PFOS - Perfluorooctanesulfonate
6. PFOA - Perfluorooctanoic Acid
7. PFNA - Perfluorononanoic Acid
8. PFHxS - Perfluorohexanesulfonic Acid
9. PFHpA - Perfluoroheptanoic Acid
10. PFDA - Perfluorodecanoic Acid
11. NA - Concentration data not available
12. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The wells were replaced with HSW-1/HS-1(a), HWS-2/HS2(a) as post-exacavation activities.
13. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.
14. NE- Not Established
15. Due to labeling error MW-3S was labeled as MW-3 on the laboratory report and COC in the November 2022.
16. Well construction logs could not be located for this monitoring well. Therefore well screen depth is unknown at this time.

Table 3 - Summary of Long Term Groundwater Monitoring Data
Former Barnstable County Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	Method 1 GW-1 Standards ¹	PC-28																				
SCREEN DEPTH (FEET)		30-39																				
WELL DIAMETER (INCHES)		2																				
WELL STATUS		Viable																				
SAMPLING DATE		3/9/2016	4/28/2017	1/10/2019	4/24/2019	7/23/2019	10/28/2019	2/19/2020	5/12/2020	7/29/2020	10/21/2020	1/27/2021	5/20/2021	7/28/2021	11/3/2021	1/26/2022	4/20/2022	7/28/2022	11/10/2022	2/1/2023	4/4/2023	7/26/2023
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
PFAS (Method 537.1m or PACE SOP 454)																						
PFOS	20	400	770	38	18	82	270	270	430	200	1,100	1,200	820	100	730	670	1,200	550	960	1,200	600	190
PFOA	20	27	61	BRL (<3.3)	BRL (<7.4)	190	12	BRL (<7.4)	18	12	65	48	22	38	16	26	34	30	56	48	29	11
PFNA	20	--	--	BRL(<8.7)	BRL (<4.9)	BRL (<4.9)	9	BRL (<4.9)	15	10	49	61	33	45	23	28	59	45	82	95	46	17
PFHxS	20	--	--	17	15	30	94	72	120	71	230	170	110	120	85	83	95	75	130	120	76	55
PFHpA	20	--	--	20	24	25	33	23	41	30	89	66	45	53	43	51	47	40	75	66	44	26
PFDA	20	--	--	--	BRL (<4.1)	BRL (<4.1)	BRL (<4.1)	BRL (<4.1)	2.2	BRL (<4.1)	8	10	6	9	BRL (<3.9)	7.5	14.0	9.0	15.0	18.0	10.0	4.8
TOTAL 16 PFAS	20	427	831	75	57	327	418	365	626	323	1,541	1,555	1,036	365	897	865.5	1,449.0	749.0	1,318.0	1,547.0	805.0	303.8

Notes:

1. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data in the IRA Status Reports. Data presented herein is summarized and data was selected based on quarterly sampling events.

2. On December 27, 2019 MassDEP MCP GW-1 Risk Standards for groundwater became final. The MCP GW-1 Risk Standard of 20 ng/L apply to the sum of and invidual concentrations of the six PFAS compounds presented above.

3. BRL - Below Laboratory Detection Limits

4. Concentrations presented in ng/L - nanograms per Liter - parts per trillion

7. Concentrations in **bold** exceed applicable Health Advisory Limit or Method 1 GW-1 Standard

5. PFOS - Perfluorooctanesulfonate

6. PFOA - Perfluorooctanoic Acid

7. PFNA - Perfluorononanoic Acid

8. PFHxS - Perfluorohexanesulfonic Acid

9. PFHpA - Perfluoroheptanoic Acid

10. PFDA - Perfluorodecanoic Acid

11. NA - Concentration data not available

12. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The wells were replaced with HSW-1/HS-1(a), HWS-2/HS2(a) as post-exacavation activities.

13. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.

14. NE- Not Established

15. Due to labeling error MW-3S was labeled as MW-3 on the laboratory report and COC in the November 2022.

16. Well construction logs could not be located for this monitoring well. Therefore well screen depth is unknown at this time.

Table 3 - Summary of Long Term Groundwater Monitoring Data
Former Barnstable County Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	Method 1 GW-1 Standards ⁴	PC-30																								PC-345							
SCREEN DEPTH (FEET)		39-49																								5-15							
WELL DIAMETER (INCHES)		2																								2							
WELL STATUS		Viable																								Viable							
SAMPLING DATE		3/9/2016	4/27/2017	2/6/2018	6/26/2018	1/10/2019	4/24/2019	7/23/2019	10/29/2019	2/19/2020	5/12/2020	7/29/2020	10/21/2020	1/27/2021	5/20/2021	7/28/2021	11/1/2021	1/26/2022	4/20/2022	7/28/2022	11/10/2022	2/1/2023	4/5/2023	7/25/2023	11/2/2023	4/14/2016	11/2/2021	4/21/2022	7/27/2022	11/9/2022	1/31/2023	11/2/2023	
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	
PFAS (Method 537.1m or PACE SOP 454)																																	
PFOS	20	980	2,500	1,900	1,600	2,200	1,200	4,300	960	1,200	880	1,100	850	580	540	450	720	480	340	180	340	1,100	580	390	870	1,300	1,300	580	710	1,300	1,500	800	
PFOA	20	88	--	98	99	85	85	79	55	130	45	38	32	48	26	21	30	25	23	16	21	45	35	26	37	72	74	65	69	80	94	73	
PFNA	20	--	--	--	80	88	100	100	61	74	45	57	40	24	40	BRL (<5.1)	51	34	23	19	43	110	65	45	69	--	150	100	130	140	230	120	
PFHxS	20	--	--	--	510	390	340	300	220	210	180	120	100	76	64	68	96	72	63	43	59	110	96	80	98	--	160	140	140	130	210	130	
PFHpA	20	--	--	--	130	110	110	96	71	87	80	48	47	47	40	34	43	35	33	25	29	54	45	41	45	--	87	77	74	98	110	97	
PFDA	20	--	--	--	--	--	12	BRL (<4.1)	6	5.9	8.2	7.7	6.2	5.3	5.2	4.9	BRL (<3.9)	6.4	4.7	4.8	5.3	16.0	10.0	6.9	BRL (<10)	--	7.8	7.2	8.6	16	17	13	
TOTAL 16 PFAS	20	1068	2500	1998	2,419	2,873	1,847	4,875	1,373	1,707	1,238	1,371	1,075	780	715	578	940	652	487	288	497	1,435	831	589	1,119	1372	1,779	969	1,132	1,764	2,161	1,233	

Notes:

1. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data in the IRA Status Reports. Data presented herein is summarized and data was selected based on quarterly sampling events.

2. On December 27, 2019 MassDEP MCP GW-1 Risk Standards for groundwater became final. The MCP GW-1 Risk Standard of 20 ng/L apply to the sum of and invidual concentrations of the six PFAS compounds presented above.

3. BRL - Below Laboratory Detection Limits

4. Concentrations presented in ng/L - nanograms per Liter - parts per trillion

7. Concentrations in **bold** exceed applicable Health Advisory Limit or Method 1 GW-1 Standard

5. PFOS - Perfluorooctanesulfonate

6. PFOA - Perfluorooctanoic Acid

7. PFNA - Perfluorononanoic Acid

8. PFHxS - Perfluorohexanesulfonic Acid

9. PFHpA - Perfluoroheptanoic Acid

10. PFDA - Perfluorodecanoic Acid

11. NA - Concentration data not available

12. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The wells were replaced with HSW-1/HS-1(a), HWS-2/HS2(a) as post-exacavation activities.

13. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.

14. NE- Not Established

15. Due to labeling error MW-3S was labeled as MW-3 on the laboratory report and COC in the November 2022.

16. Well construction logs could not be located for this monitoring well. Therefore well screen depth is unknown at this time.

Table 3 - Summary of Long Term Groundwater Monitoring Data
Former Barnstable County Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	Method 1 GW-1 Standards ⁴	PC-36S							PC-36D			PC-37		PC-38												PC-39							PC-39D	
SCREEN DEPTH (FEET)		14-24												Unknown ¹⁶												Unknown ¹⁶							46-51	
WELL DIAMETER (INCHES)		2												2												2								
WELL STATUS		Viable							Viable			Viable		Viable												Viable								
SAMPLING DATE		4/14/2016	1/11/2019	10/29/2019	10/22/2020	11/3/2021	11/10/2022	11/2/2023	4/14/2016	4/24/2017	11/2/2023	4/10/2017	11/3/2023	4/24/2017	10/29/2019	5/12/2020	7/28/2020	10/21/2020	1/27/2021	5/20/2021	7/28/2021	11/1/2021	1/26/2022	11/10/2022	11/3/2023	4/24/2017	2/19/2020	11/2/2021	7/28/2022	11/10/2022	2/1/2023	4/4/2023	7/26/2023	7/26/2023
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	
PFAS (Method 537.1m or PACE SOP 454)																																		
PFOS	20	35	64	1,200	700	640	760	130	3,100	2,500	620	45	45	BRL (<2.6)	BRL (<5.2)	4.5	BRL (<5.2)	BRL (<5.7)	3	BRL (<5.7)	BRL (<5.7)	BRL (<5.7)	BRL (<5.7)	5.5	3.5	1,200	820	140	180	160	180	96	54	29
PFOA	20	BRL (<5.3)	BRL (<3.3)	54	36	32	37	12	150	120	17	BRL (<20)	6.7	BRL (<4.6)	BRL (<7.4)	BRL (<0.23)	BRL (<7.4)	BRL (<5.0)	BRL (<2.0)	BRL (<5.0)	BRL (<5.0)	BRL (<5.0)	BRL (<2.0)	BRL (<1.9)	46	28	BRL (<5.0)	BRL (<5.0)	2.2	BRL (<10)	BRL (<4.1)	BRL (<1.9)	BRL (<1.9)	
PFNA	20	--	BRL (<8.7)	80	57	71	120	10	--	--	32	--	2.4	--	BRL (<4.9)	BRL (<0.48)	BRL (<4.9)	BRL (<5.1)	BRL (<2.0)	BRL (<5.1)	BRL (<5.1)	BRL (<5.1)	BRL (<5.1)	BRL (<2.0)	BRL (<1.9)	--	61	6.9	6.0	5.2	BRL (<10)	BRL (<4.1)	2.4	2.8
PFHxS	20	--	38	120	79	73	90	140	--	--	45	--	83	--	6	2.2	BRL (<5.2)	BRL (<4.4)	2	BRL (<4.4)	BRL (<4.4)	BRL (<4.4)	BRL (<4.4)	BRL (<2.0)	BRL (<1.9)	--	100	4.9	12.0	12	13	9.2	5.7	6.5
PFHpA	20	--	BRL (<7.4)	62	42	38	49	18	--	--	23	--	11	--	BRL (<7.1)	BRL (<0.37)	BRL (<7.1)	BRL (<6.7)	BRL (<2.0)	BRL (<6.7)	BRL (<6.7)	BRL (<6.7)	BRL (<6.7)	BRL (<2.0)	BRL (<1.9)	--	28	BRL (<6.7)	BRL (<6.7)	4	BRL (<10)	BRL (<4.1)	2.4	2.1
PFDA	20	--	--	11	11	11	13	BRL (<1.9)	--	--	6	--	BRL (<1.8)	--	BRL (<4.1)	BRL (<0.18)	BRL (<4.1)	BRL (<3.9)	BRL (<2.0)	BRL (<3.9)	BRL (<3.9)	BRL (<3.9)	BRL (<3.9)	BRL (<2.0)	BRL (<1.9)	--	BRL (<4.1)	BRL (<3.9)	BRL (<3.9)	BRL (<1.8)	BRL (<10)	BRL (<4.1)	BRL (<1.9)	BRL (<1.9)
TOTAL 16 PFAS	20	35	102	1,527	925	865	1,069	310	3250	2620	743	45	148.1	BRL	6.1	6.7	BRL	BRL	4.3	BRL	BRL	BRL	BRL	5.5	3.5	1,246	1037	151.8	198	183.4	193	105.2	64.5	40.4

Notes:

1. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data in the IRA Status Reports. Data presented herein is summarized and data was selected based on quarterly sampling events.
2. On December 27, 2019 MassDEP MCP GW-1 Risk Standards for groundwater became final. The MCP GW-1 Risk Standard of 20 ng/L apply to the sum of and individual concentrations of the six PFAS compounds presented above.
3. BRL - Below Laboratory Detection Limits
4. Concentrations presented in ng/L - nanograms per Liter - parts per trillion
7. Concentrations in **bold** exceed applicable Health Advisory Limit or Method 1 GW-1 Standard
5. PFOS - Perfluorooctanesulfonate
6. PFOA - Perfluorooctanoic Acid
7. PFNA - Perfluorononanoic Acid
8. PFHxS - Perfluorohexanesulfonic Acid
9. PFHpA - Perfluoroheptanoic Acid
10. PFDA - Perfluorodecanoic Acid
11. NA - Concentration data not available
12. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The wells were replaced with HSW-1/HS-1(a), HWS-2/HS2(a) as post-exacavation activities.
13. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.
14. NE- Not Established
15. Due to labeling error MW-3S was labeled as MW-3 on the laboratory report and COC in the November 2022.
16. Well construction logs could not be located for this monitoring well. Therefore well screen depth is unknown at this time.

Table 3 - Summary of Long Term Groundwater Monitoring Data
Former Barnstable County Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	Method 1 GW-1 Standards ⁴	PC-29		HW-15	HW-1D ¹³						
SCREEN DEPTH (FEET)		25-35		Unknown ¹⁹	Unknown ¹⁹						
WELL DIAMETER (INCHES)		2			2						
WELL STATUS		Viable			Viable						
SAMPLING DATE		11/10/2022	11/1/2023	11/1/2023	5/3/2017	1/10/2019	10/28/2019	10/21/2020	11/3/2021	11/11/2022	11/1/2023
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
PFAS (Method 537.1m or PACE SOP 454)											
PFOS	20	2.4	BRL (<1.8)	BRL (<1.8)	25	BRL (<6)	BRL (<5.2)	BRL (<5.7)	BRL (<5.7)	17	16
PFOA	20	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	8	BRL (<3.3)	BRL (<7.4)	BRL (<5.0)	BRL (<5.0)	BRL (<1.9)	BRL (<1.8)
PFNA	20	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	--	BRL (<8.7)	BRL (<4.9)	BRL (<5.1)	BRL (<5.1)	BRL (<1.9)	BRL (<1.8)
PFHxS	20	3.6	2.1	BRL (<1.8)	--	BRL (<5.6)	BRL (<5.2)	BRL (<4.4)	BRL (<4.4)	37	13
PFHpA	20	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	--	BRL (<7.4)	BRL (<7.1)	BRL (<6.7)	BRL (<6.7)	BRL (<1.9)	BRL (<1.8)
PFDA	20	BRL (<1.8)	BRL (<1.8)	BRL (<1.8)	--	--	BRL (<4.1)	BRL (<3.9)	BRL (<3.9)	BRL (<1.9)	BRL (<1.8)
TOTAL 16 PFAS	20	6	2.1	BRL	33	BRL	BRL	BRL	BRL	54	29

Notes:

1. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data in the IRA Status Reports. Data presented herein is summarized and data was selected based on quarterly sampling events.
2. On December 27, 2019 MassDEP MCP GW-1 Risk Standards for groundwater became final. The MCP GW-1 Risk Standard of 20 ng/L apply to the sum of and individual concentrations of the six PFAS compounds presented above.
3. BRL - Below Laboratory Detection Limits
4. Concentrations presented in ng/L - nanograms per Liter - parts per trillion
7. Concentrations in **bold** exceed applicable Health Advisory Limit or Method 1 GW-1 Standard
5. PFOS - Perfluorooctanesulfonate
6. PFOA - Perfluorooctanoic Acid
7. PFNA - Perfluorononanoic Acid
8. PFHxS - Perfluorohexanesulfonic Acid
9. PFHpA - Perfluoroheptanoic Acid
10. PFDA - Perfluorodecanoic Acid
11. NA - Concentration data not available
12. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The wells were replaced with HSW-1/HS-1(a), HWS-2/HS2(a) as post-exacavation activities.
13. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.
14. NE- Not Established
15. Due to labeling error MW-3S was labeled as MW-3 on the laboratory report and COC in the November 2022.
16. Well construction logs could not be located for this monitoring well. Therefore well screen depth is unknown at this time.

Table 4 - Groundwater Elevation and Gauging Date 2018-2023
Former Barnstable County Fire Rescue Training Academy
RTN 4-26179

[illegible]

Table 5 - Summary of Phase II CSA Groundwater Analytical Results
Former Barnstable County Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	USEPA ^{1,2} HEALTH ADVISORY	Method 1 GW-1 Standards ⁴	MW-301	MW-302	MW-303	MW-304		MW-305	MW-306	MW-307S	MW-307D	MW-308S	MW-308D	MW-309	MW-310	MW-311	
SCREEN DEPTH (FEET)			5-15	5-15	5-15	5-15		5-15	5-15	10-20	35-40	10-20	35-40	30-35	5-15	6-16	
SAMPLING DATE			2/13/2023	2/13/2023	2/13/2023	2/13/2023	11/3/2023	2/13/2023	2/13/2023	11/9/2022	11/9/2022	11/9/2022	11/9/2022	11/9/2022	11/9/2022	2/13/2023	2/13/2023
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L		ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	
PFAS (Method 537.1m or PACE SOP 454)																	
PFOS	70	20	BRL (<10.0)	1400	200	70	88	1400	62	2.1	BRL (<1.9)	2.2	5.4	11	62	2400	5900
PFOA	70	20	BRL (<10.0)	12	BRL (<10.0)	23	52	250	BRL (<10.0)	BRL (<2.0)	BRL (<1.9)	BRL (<1.9)	BRL (<2.0)	BRL (<1.9)	BRL (<10.0)	160	470
PFNA	NE	20	BRL (<10.0)	BRL (<10.0)	13	BRL (<10.0)	10	95	BRL (<10.0)	BRL (<2.0)	BRL (<1.9)	BRL (<1.9)	BRL (<2.0)	BRL (<1.9)	BRL (<10.0)	54	190
PFHxS	NE	20	BRL (<10.0)	340	45	47	160	960	33	BRL (<2.0)	BRL (<1.9)	BRL (<1.9)	BRL (<2.0)	4.6	48	840	1600
PFHpA	NE	20	BRL (<10.0)	BRL (<10.0)	BRL (<10.0)	24	78	250	BRL (<10.0)	BRL (<2.0)	BRL (<1.9)	BRL (<1.9)	BRL (<2.0)	BRL (<1.9)	BRL (<10.0)	170	300
PFDA	NE	20	BRL (<10.0)	BRL (<10.0)	BRL (<10.0)	BRL (<10.0)	2.4	BRL (<10.0)	BRL (<10.0)	BRL (<2.0)	BRL (<1.9)	BRL (<1.9)	BRL (<2.0)	BRL (<1.9)	BRL (<10.0)	BRL (<10.0)	67
TOTAL Σ6 PFAS	70	20	BRL (<10.0)	1752	258	164	390.4	2955	95	2.1	BRL (<1.9)	2.2	5.4	15.6	110	3624	8527

Notes:

1. Current Massachusetts Contingency Plan GW-1 Risk Stands, finalized on 12.27.2019 and Massachusetts maximum contaminant level.

2. BRL - Below Laboratory Detection Limits

3. Concentrations presented in ng/L - nanograms per Liter - parts per trillion

4. Concentrations in **bold** exceed applicable MCP Method 1 GW-1 Standard

5. PFOS - Perfluorooctanesulfonate

6. PFOA - Perfluorooctanoic Acid

6. PFNA - Perfluorononanoic Acid

7. PFHxS - Perfluorohexanesulfonic Acid

8. PFHpA - Perfluoroheptanoic Acid

9. PFDA - Perfluorodecanoic Acid

10. Monitoring well logs could not be located for WS-101, HW-2S & HW-2D. Therefore well screen details are unknown.

Table 5 - Summary of Phase II CSA Groundwater Analytical Results
Former Barnstable County Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	USEPA ^{1,2} HEALTH ADVISORY	Method 1 GW-1 Standards ⁴	WS-101	PC-39D	MW-401S	MW-401D	MW-402S	MW-402D	MW-403S	MW-403D	MW-404S	MW-404D	HW-2S	HW-2D
SCREEN DEPTH (FEET)			---	46-51	14-24	45-50	29.5-39.5	51-56	18.5-28.5	43-48	29.5-39.5	45-50	---	---
SAMPLING DATE			11/11/2022	7/26/2023	7/26/2023	7/26/2023	7/26/2023	7/26/2023	7/26/2023	7/26/2023	11/2/2023	11/2/2023	11/21/2023	11/21/2023
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
PFAS (Method 537.1m or PACE SOP 454)														
PFOS	70	20	BRL (<1.9)	29	BRL (<1.8)	9.1	BRL (<4.1)	BRL (<1.9)	9.4	20	BRL (<2.0)	220	150	170
PFOA	70	20	BRL (<1.9)	BRL (<1.9)	BRL (<1.8)	7.1	BRL (<4.1)	BRL (<1.9)	49	8.6	BRL (<2.0)	16	3	23
PFNA	NE	20	BRL (<1.9)	2.8	BRL (<1.8)	3.3	BRL (<4.1)	BRL (<1.9)	12	BRL (<1.9)	BRL (<2.0)	3.8	22	3.2
PFHxS	NE	20	BRL (<1.9)	6.5	BRL (<1.8)	22	BRL (<4.1)	3.9	14	13	21	89	14	61
PFHpA	NE	20	BRL (<1.9)	2.1	BRL (<1.8)	4.4	BRL (<4.1)	BRL (<1.9)	57	3.9	BRL (<2.0)	11	3.6	11
PFDA	NE	20	BRL (<1.9)	BRL (<1.9)	BRL (<1.8)	BRL (<1.8)	BRL (<4.1)	BRL (<1.9)	BRL (<1.8)	BRL (<1.9)	BRL (<2.0)	2.5	BRL(<1.9)	BRL(<2.1)
TOTAL Σ6 PFAS	70	20	BRL (<1.9)	40.4	BRL (<1.8)	45.9	BRL (<4.1)	3.9	141.4	45.5	21	342.3	192.6	268.2

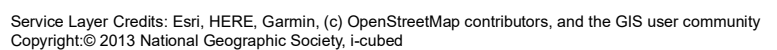
Notes:
1. Current Massachusetts Contingency Plan GW-1 Risk Stands, finalized on 12.27.2019 and Massachusetts maximum contaminant level.
2. BRL - Below Laboratory Detection Limits
3. Concentrations presented in ng/L - nanograms per Liter - parts per trillion
4. Concentrations in **bold** exceed applicable MCP Method 1 GW-1 Standard
5. PFOS - Perfluorooctanesulfonate
6. PFOA - Perfluorooctanoic Acid
6. PFNA - Perfluorononanoic Acid
7. PFHxS - Perfluorohexanesulfonic Acid
8. PFHpA - Perfluoroheptanoic Acid
9. PFDA - Perfluorodecanoic Acid

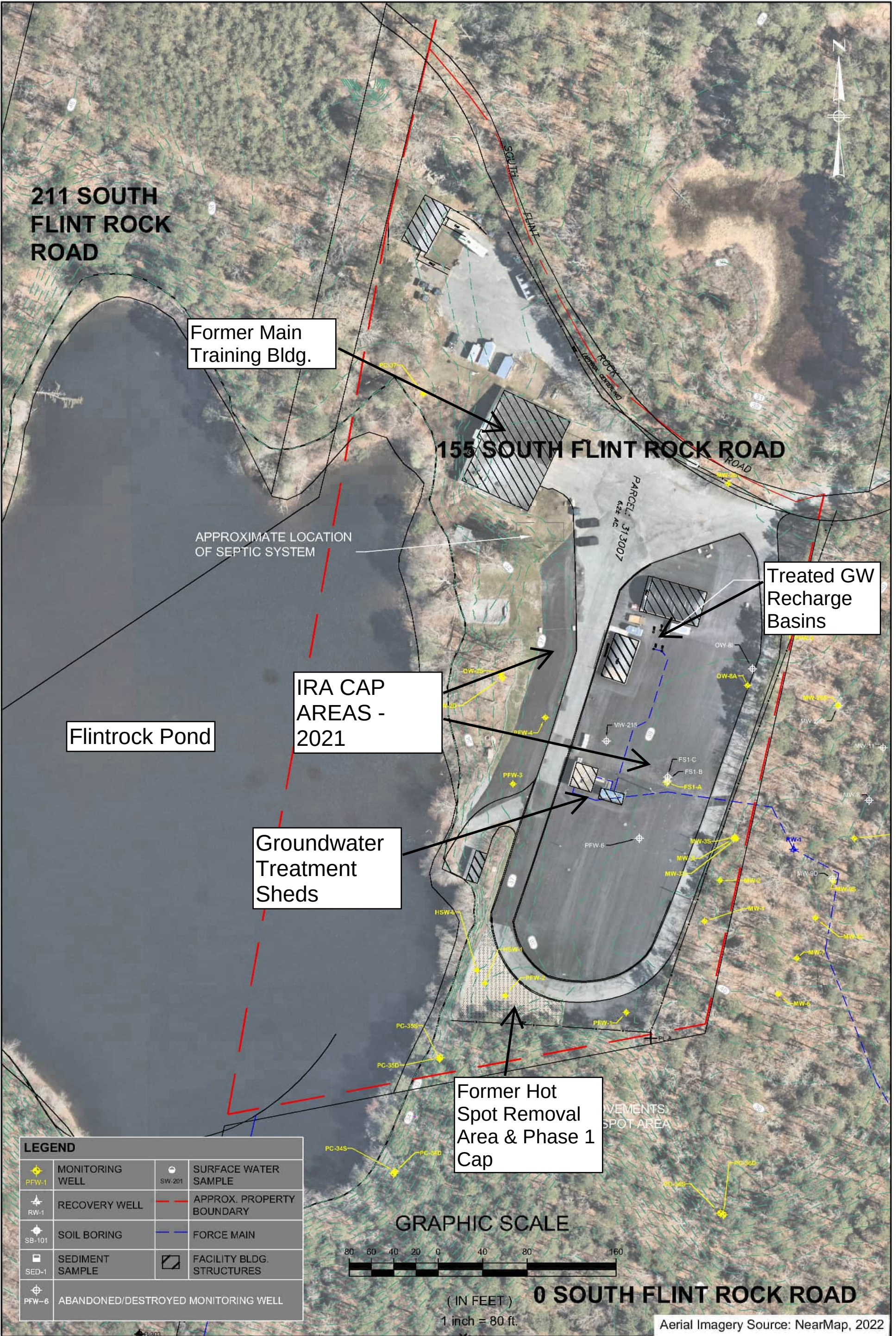
10. Monitoring well logs could not be located for WS-101, HW-2S & HW-2D. Therefore well screen details are unknown.

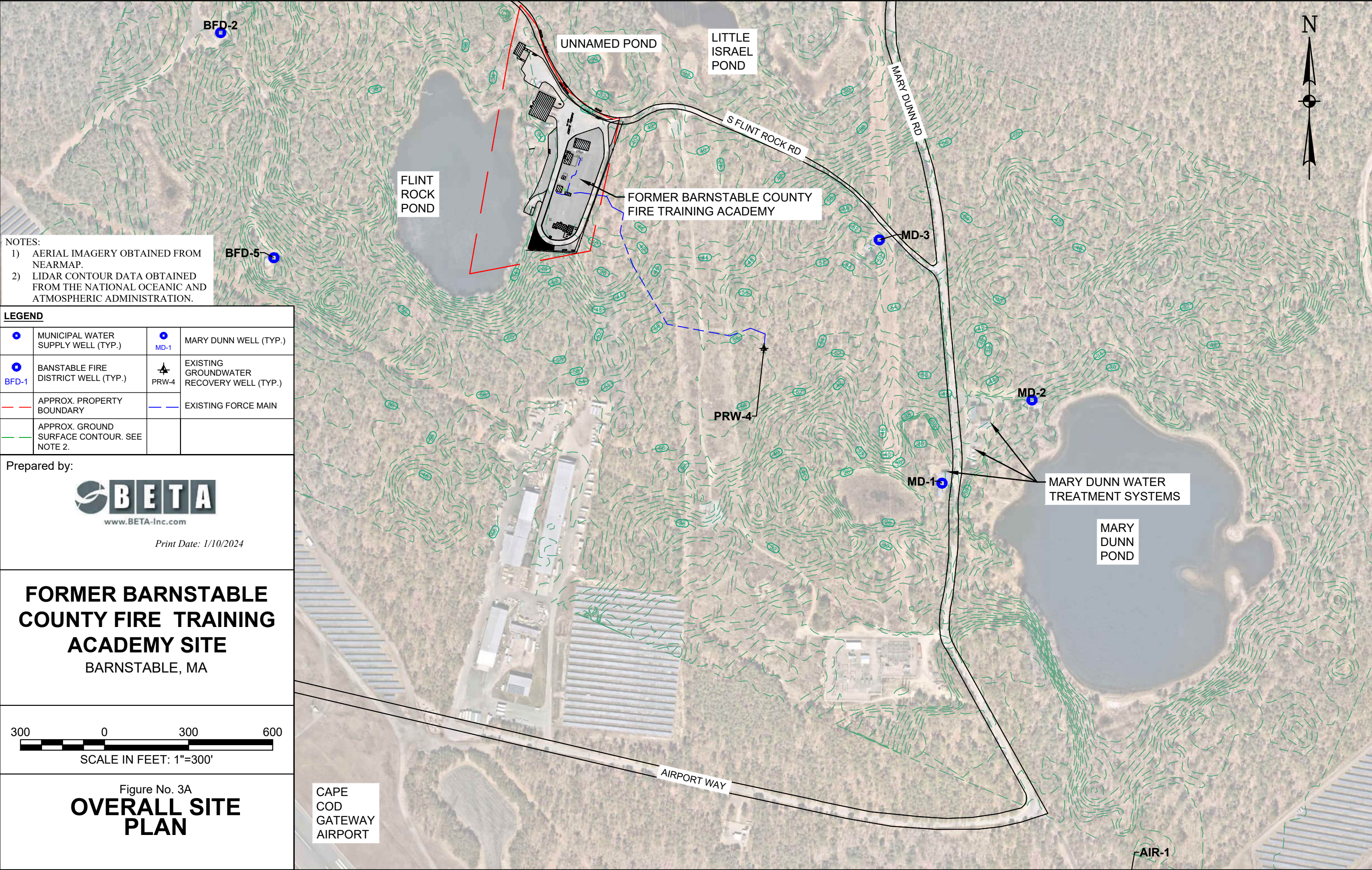
FIGURES



**BARNSTABLE COUNTY
FIRE & RESCUE TRAINING ACADEMY SITE
155 S. FLINT ROCK ROAD
BARNSTABLE, MA 02630
RTN 4-26179**







NOTES:
1) AERIAL IMAGERY OBTAINED FROM NEARMAP.
2) LIDAR CONTOUR DATA OBTAINED FROM THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION.

LEGEND			
	MUNICIPAL WATER SUPPLY WELL (TYP.)		MARY DUNN WELL (TYP.)
	BANSTABLE FIRE DISTRICT WELL (TYP.)		EXISTING GROUNDWATER RECOVERY WELL (TYP.)
	APPROX. PROPERTY BOUNDARY		EXISTING FORCE MAIN
	APPROX. GROUND SURFACE CONTOUR. SEE NOTE 2.		

Prepared by:



www.BETA-inc.com

Print Date: 1/10/2024

**FORMER BARNSTABLE
COUNTY FIRE TRAINING
ACADEMY SITE**
BARNSTABLE, MA

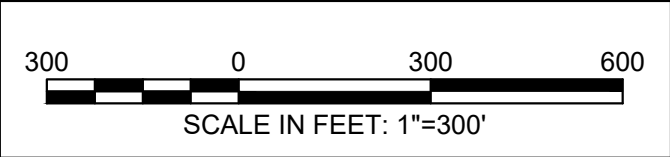
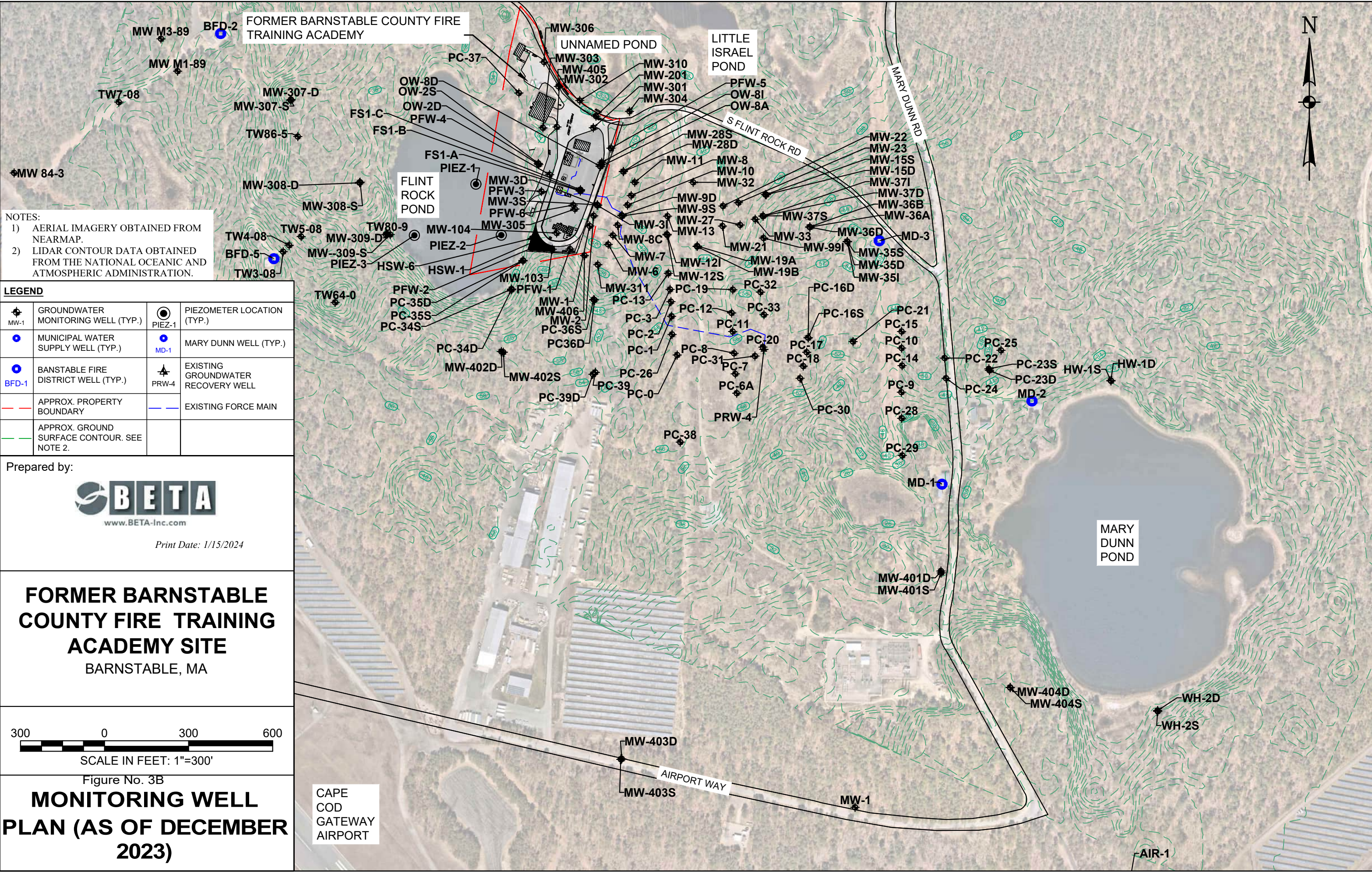


Figure No. 3A
**OVERALL SITE
PLAN**

CAPE
COD
GATEWAY
AIRPORT



MassDEP - Bureau of Waste Site Cleanup

Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

FIGURE 4

Site Information:

BARNSTABLE COUNTY FIRE & RESCUE TRAINING ACADEMY
155 SOUTH FLINT ROCK ROAD BARNSTABLE, MA
4-000026179

NAD83 UTM Meters:

4614868mN, 393038mE (Zone: 19)

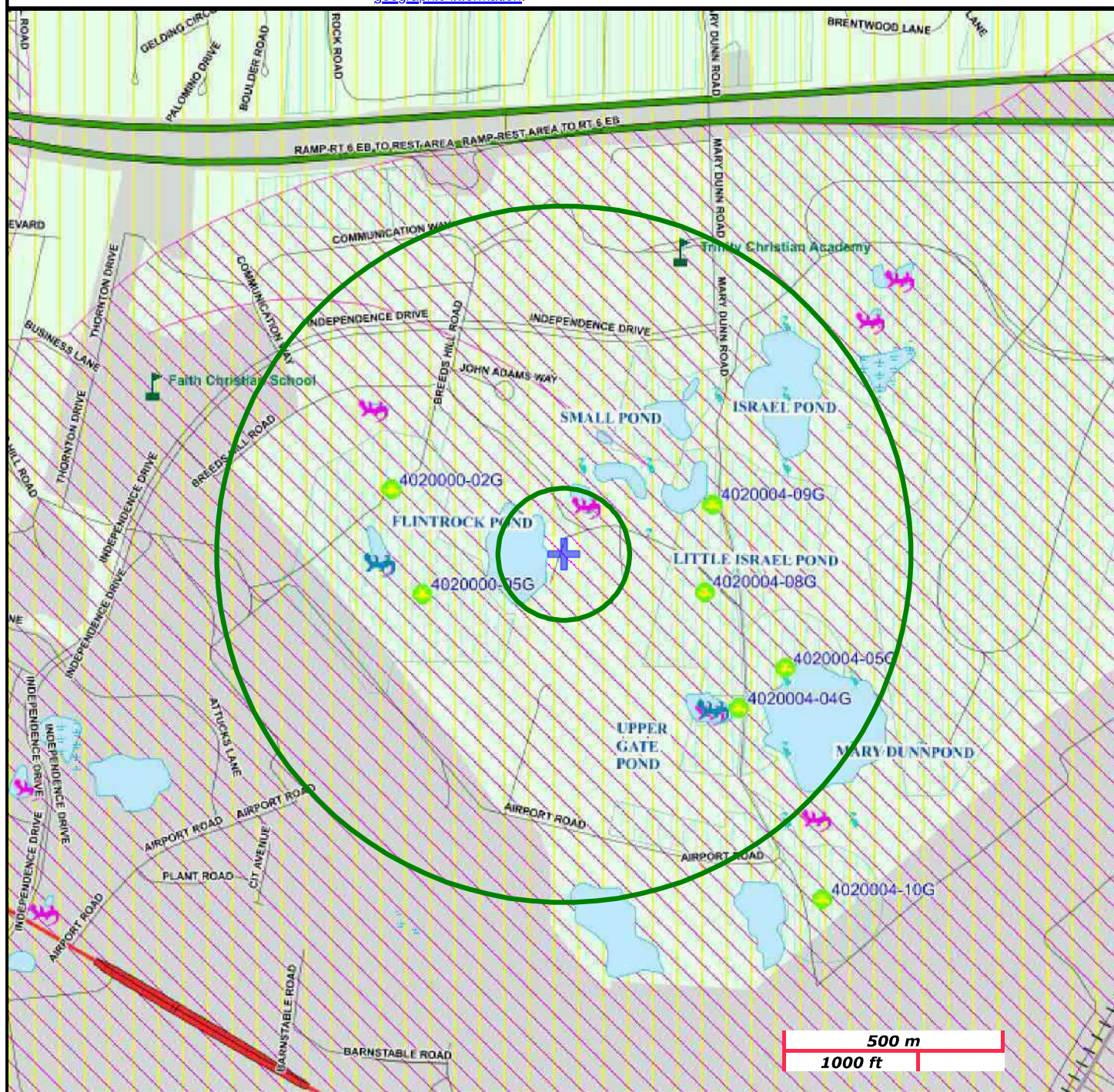
April 23, 2021

The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at:
<https://www.mass.gov/orgs/massgis-bureau-of-geographic-information>.



MassDEP

Commonwealth of Massachusetts
Department of Environmental Protection



Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail

Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct

Basins: Major, PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam

Aquifers: Medium Yield, High Yield, EPA Sole Source

Non Potential Drinking Water Source Area: Medium, High (Yield)

PWS Protection Areas: Zone II, IWPA, Zone A

Hydrography: Open Water, PWS Reservoir, Tidal Flat

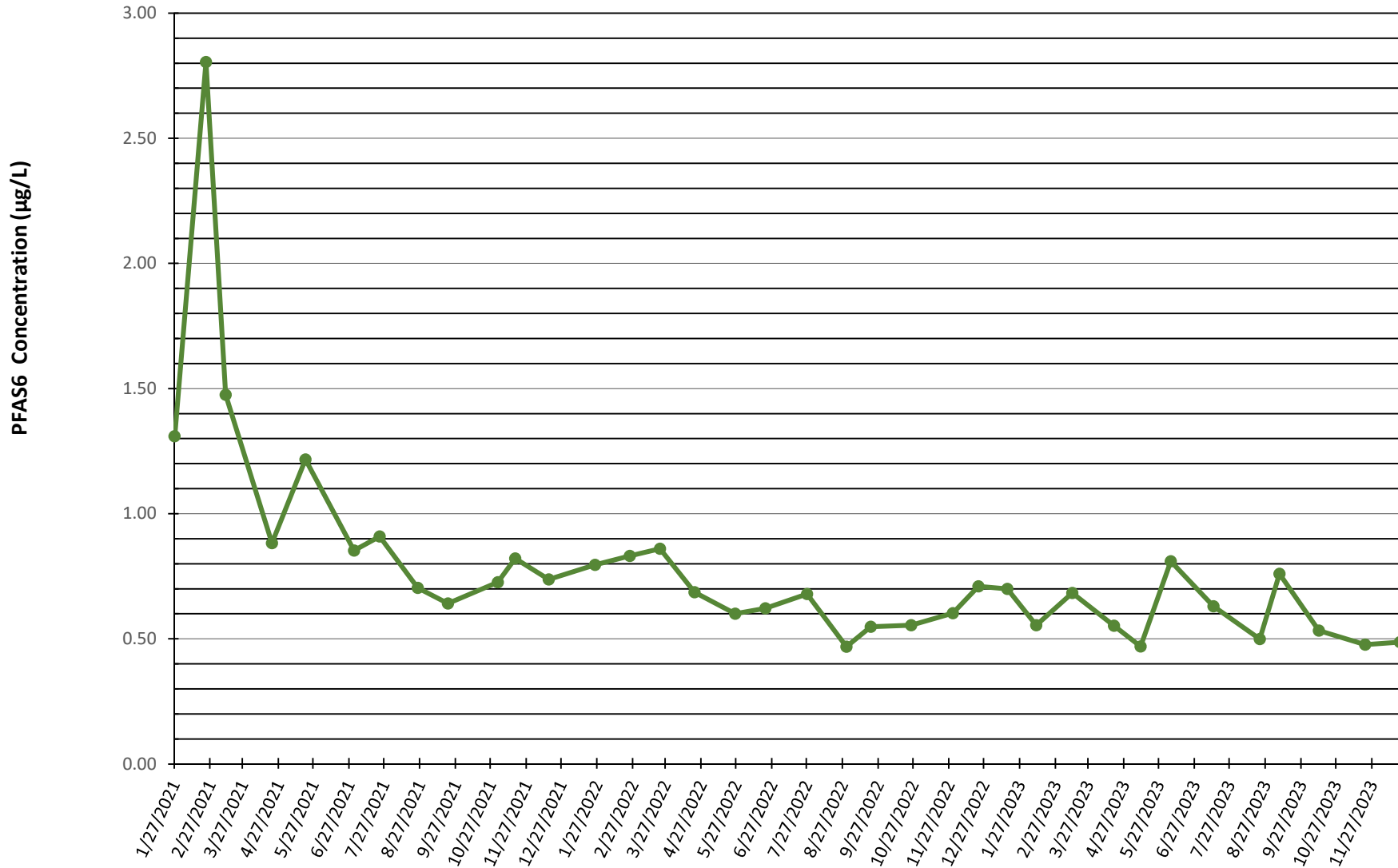
Wetlands: Freshwater, Saltwater, Cranberry Bog

FEMA 100yr Floodplain; Protected Open Space; ACEC

Est. Rare Wetland Wildlife Hab; Vernal Pool: Cert., Potential

Solid Waste Landfill; PWS: Com. GW, SW, Emerg., Non-Com.

Figure 5 - BFTA PRW-4/GWTS INFLUENT PFAS6 Concentrations 2021-2023



Former Barnstable County Fire Training Academy Site
155 South Flint Rock Road, Barnstable, MA

Time (Date)

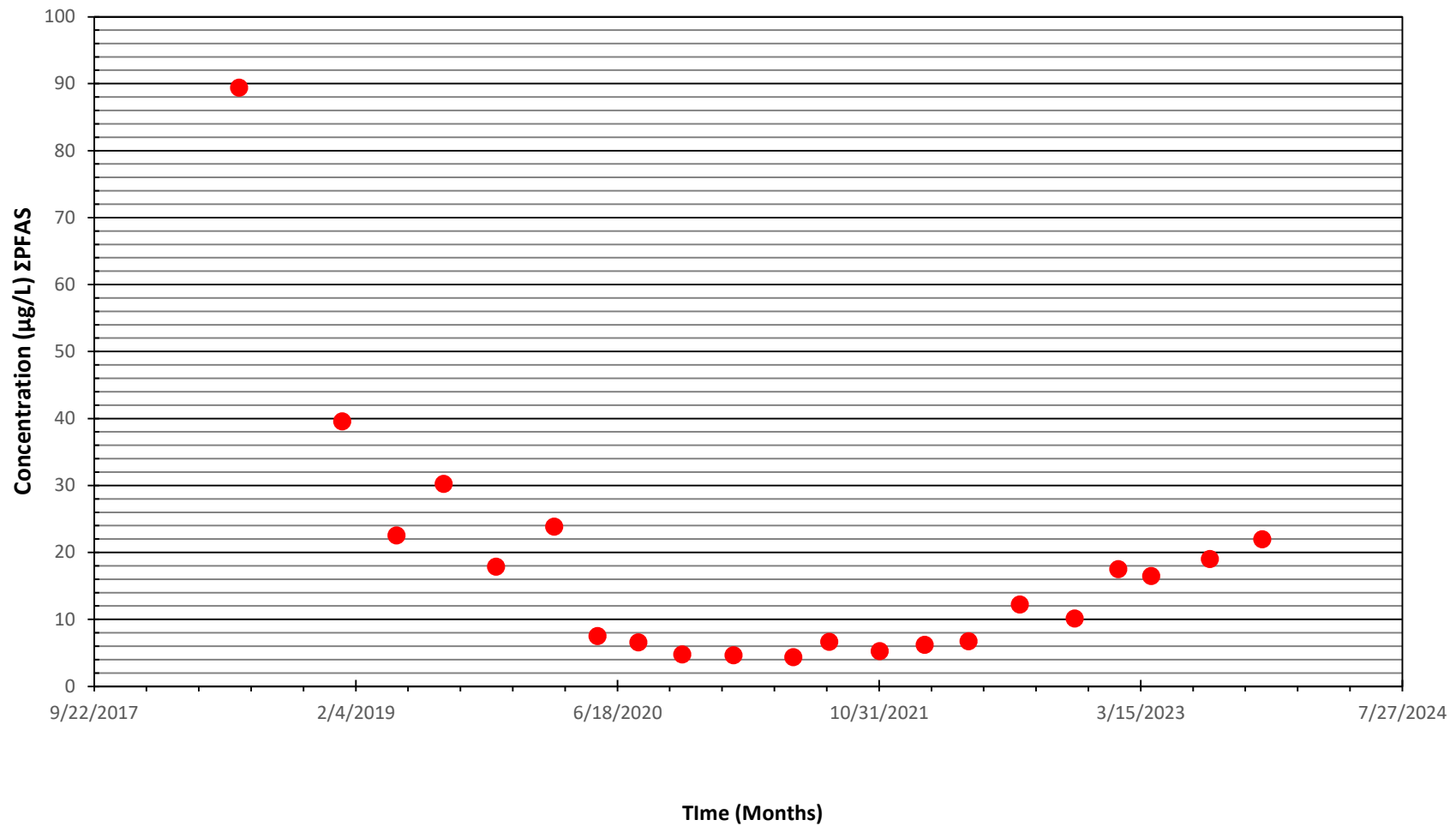
RTN 4-26179

Notes:

1. Concentrations depicted represent the sum of the five (5) PFAS compounds, PFOS, PFOA, PFHpA, PFHxS, and PFNA from June 2018 to April 2019. Concentrations depicted from April 2019 to current graphical date represent the sum of the six (6) PFAS compounds PFOS, PFOA, PFHpA, PFHxS, PFNA, and PFDA.
2. Concentrations are in micrograms per liter (µg/L) or parts per billion (ppb).



Figure 6 - ΣPFAS Concentrations in PFW-1 from June 2018 - November 2023



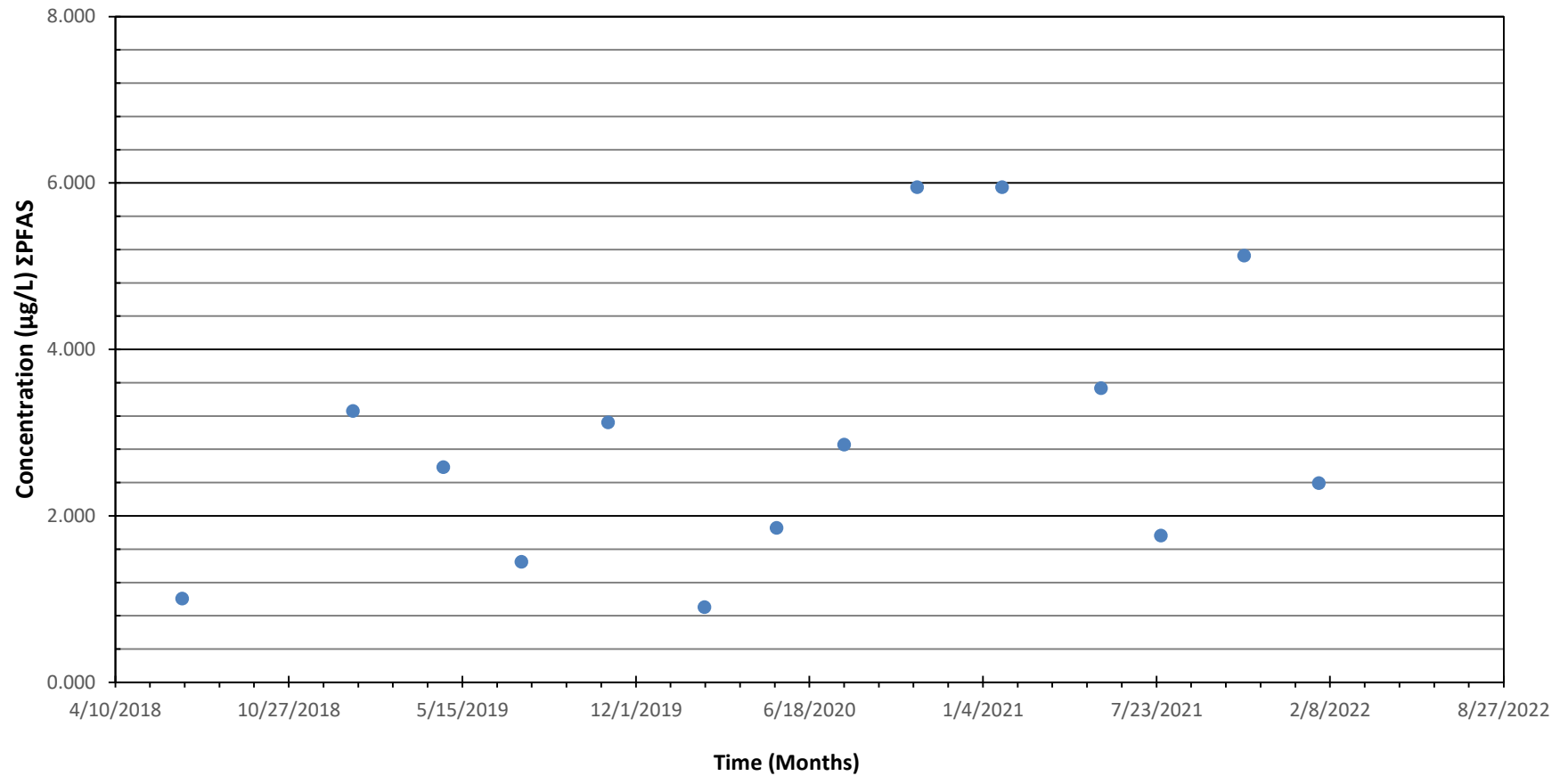
Barnstable County Fire & Rescue Training Academy
155 South Flint Rock Road, Barnstable, MA
RTN 4-26179



Notes:

1. Concentrations depicted represent the sum of the five (5) PFAS compounds, PFOS, PFOA, PFHpA, PFHxS, and PFNA from June 2018 to April 2019. Concentrations depicted from April 2019 to current graphical date represent the sum of the six (6) PFAS compounds PFOS, PFOA, PFHpA, PFHxS, PFNA, and PFDA.
2. Concentrations are in micrograms per liter (µg/L) or parts per billion (ppb).

Figure 6A - ΣPFAS Concentrations in HSW-1/HSW-6 from June 2018 - January 2022

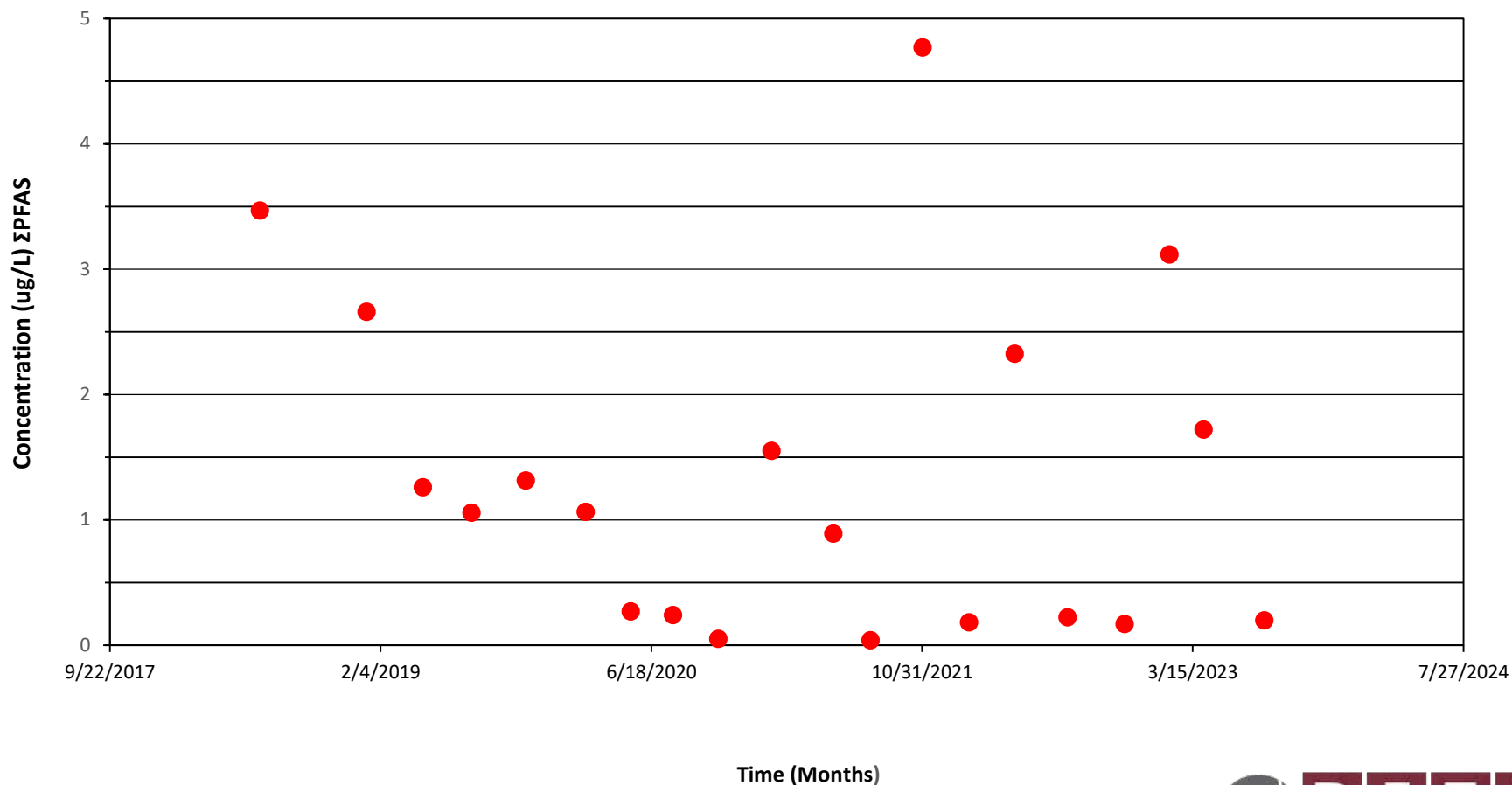


Barnstable County Fire & Rescue Training Academy
155 South Flint Rock Road, Barnstable, MA
RTN 4-26179



- Notes:
1. Concentrations depicted represent the sum of the five (5) PFAS compounds, PFOS, PFOA, PFHpA, PFHxS, and PFNA from June 2018 to April 2019. Concentrations depicted from April 2019 to to current graphical date represent the sum of the six (6) PFAS compounds PFOS, PFOA, PFHpA, PFHxS, PFNA, and PFDA.
 2. Concentrations are in in micrograms per liter (µg/L) .
 3. The averages concentrations of HSW-1 and HSW-6 were utilized.

Figure 7 - ΣPFAS Concentrations in OW-8A from January 2019 - November 2023



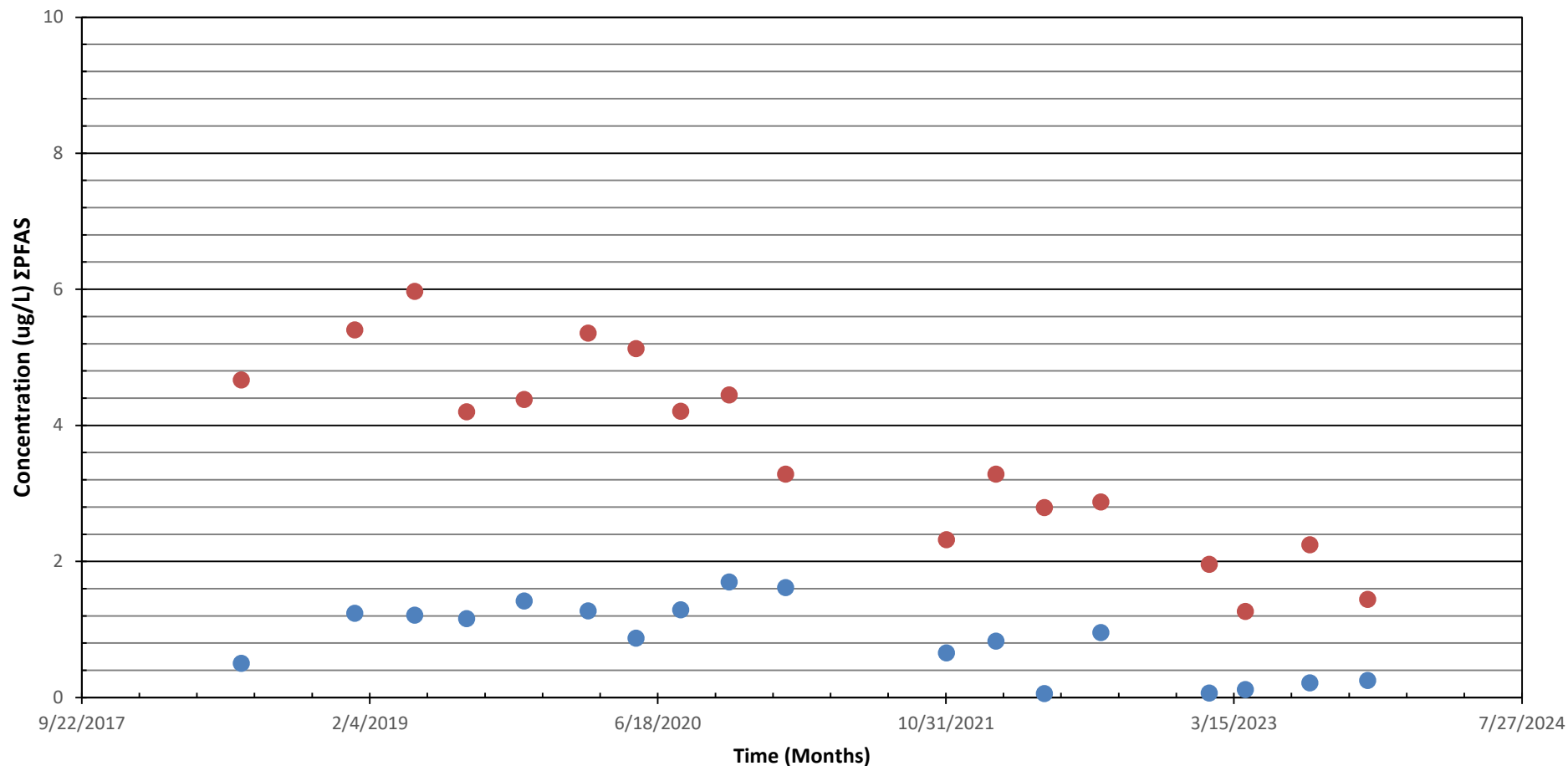
Barnstable County Fire & Rescue Training Academy
155 South Flint Rock Road, Barnstable, MA
RTN 4-26179



Notes:

1. Concentrations depicted represent the sum of the the five (5) PFAS compounds, PFOS, PFOA, PFHpA, PFHxS, and PFNA from June 2018 to April 2019. Concentrations depicted from April 2019 to current graphical date represent the sum of the six (6) PFAS compounds PFOS, PFOA, PFHpA, PFHxS, PFNA, and PFDA.
2. Concentrations are in micrograms per liter (ug/L) or parts per billion (ppb) .

Figure 8 - ΣPFAS Concentrations in MW-12 and MW-22 from June 2018 - November 2023



Barnstable County Fire & Rescue Training Academy
155 South Flint Rock Road, Barnstable, MA
RTN 4-26179

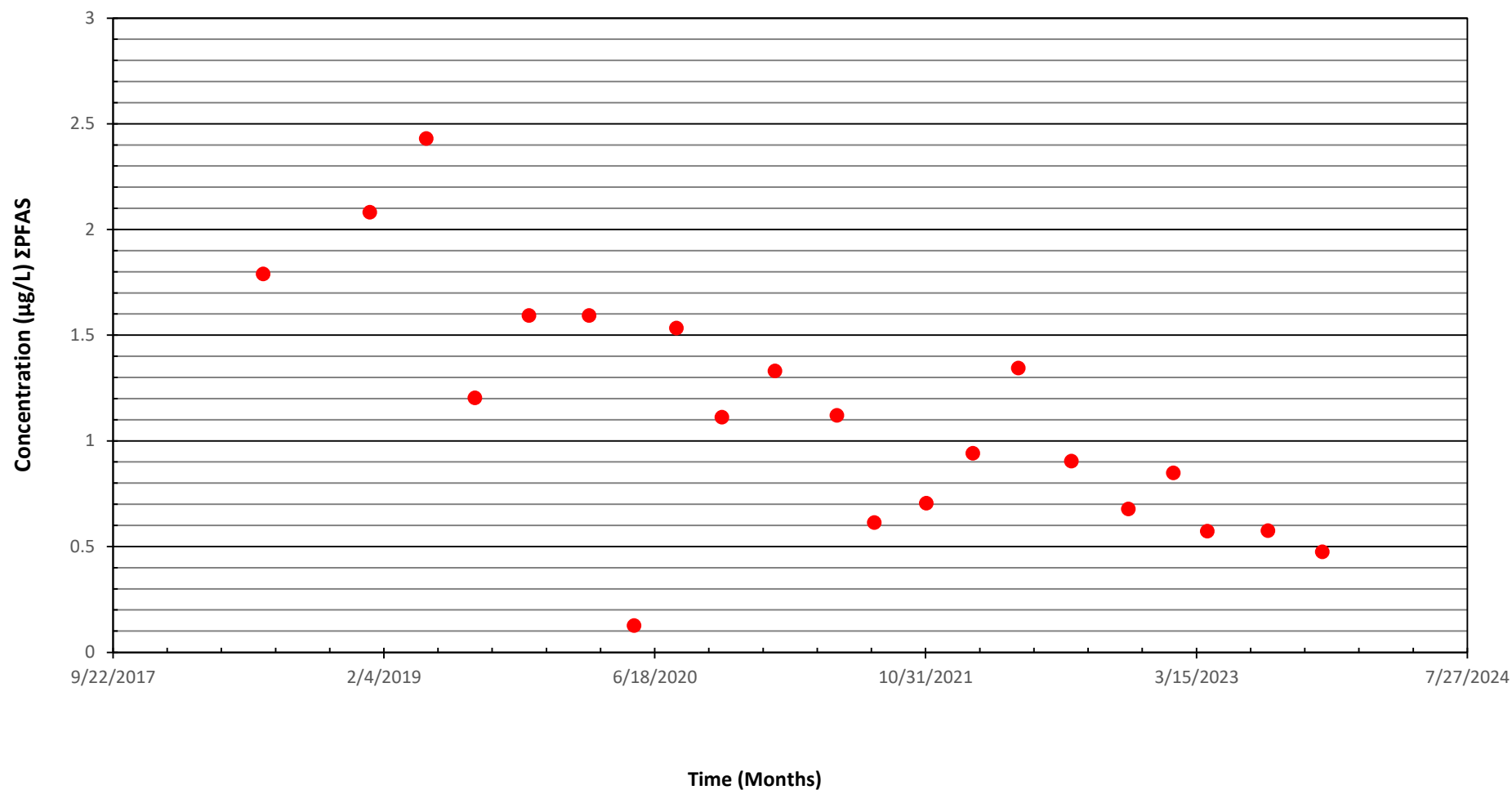
● MW-22 ● MW-12S



Notes:

1. Concentrations depicted represent the sum of the five (5) PFAS compounds, PFOS, PFOA, PFHpA, PFHxS, and PFNA from June 2018 to April 2019. Concentrations depicted from April 2019 to October 2019 represent the sum of the six (6) PFAS compounds PFOS, PFOA, PFHpA, PFHxS, PFNA, and PFDA.
2. Concentrations are in in micrograms per liter (µg/L) or parts per billion (ppb).
3. Concentrations from May 2021 were not included due to sample naming issue and concentrations from July 2021 are not depicted because both wells were dry.

Figure 9A - ΣPFAS Concentrations in PC-6A from June 2018 - November 2023



Barnstable County Fire & Rescue Training Academy
155 South Flint Rock Road, Barnstable, MA
RTN 4-26179

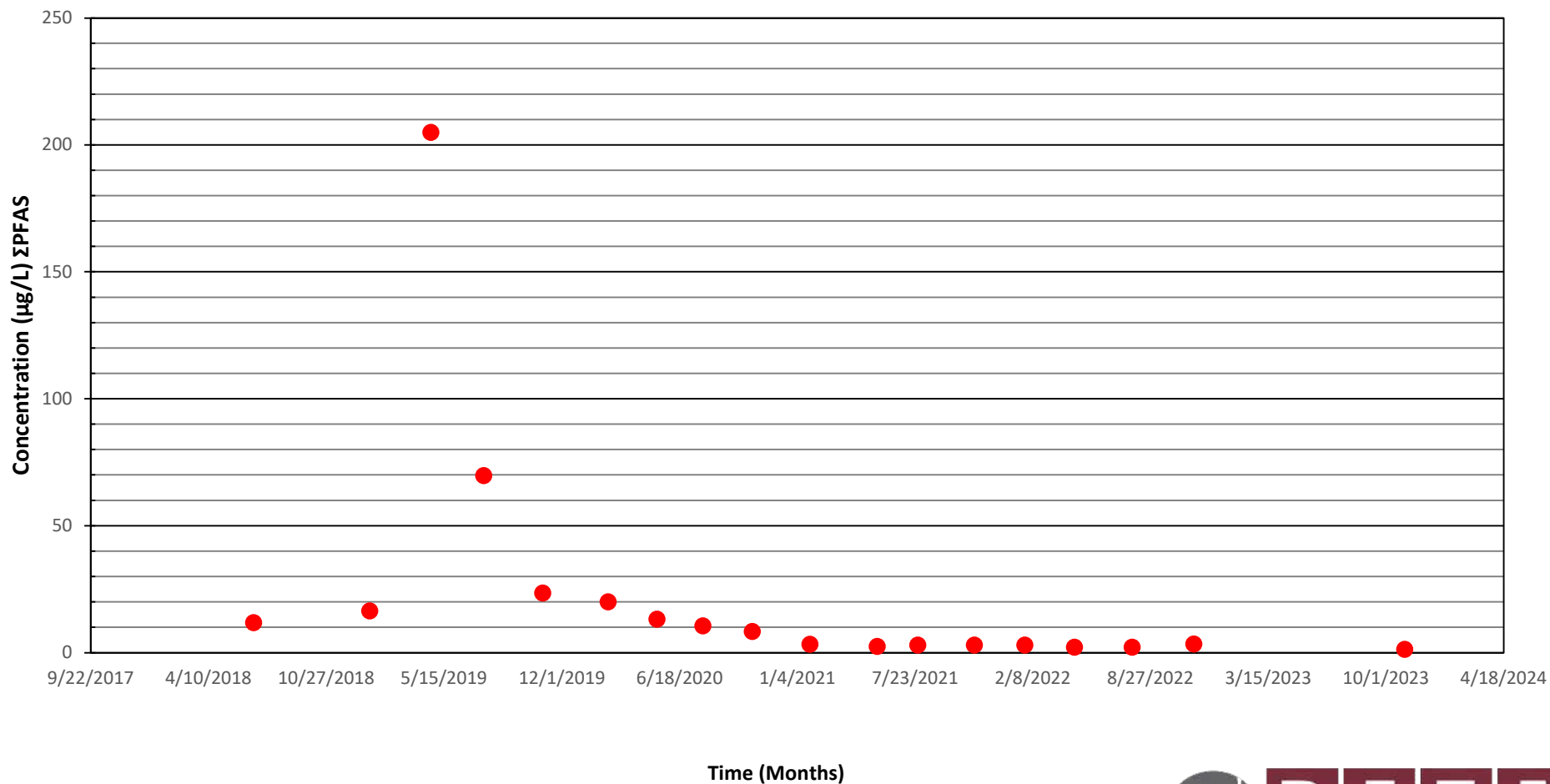
● PC-6A



Notes:

1. Concentrations depicted represent the sum of the five (5) PFAS compounds, PFOS, PFOA, PFHpA, PFHxS, and PFNA from June 2018 to April 2019. Concentrations depicted from April 2019 to October 2019 represent the sum of the six (6) PFAS compounds PFOS, PFOA, PFHpA, PFHxS, PFNA, and PFDA.
2. Concentrations are in micrograms per liter (µg/L) or parts per billion (ppb).

Figure 9B - ΣPFAS Concentrations in PC-11 from June 2018 - November 2023



Barnstable County Fire & Rescue Training Academy
155 South Flint Rock Road, Barnstable, MA
RTN 4-26179

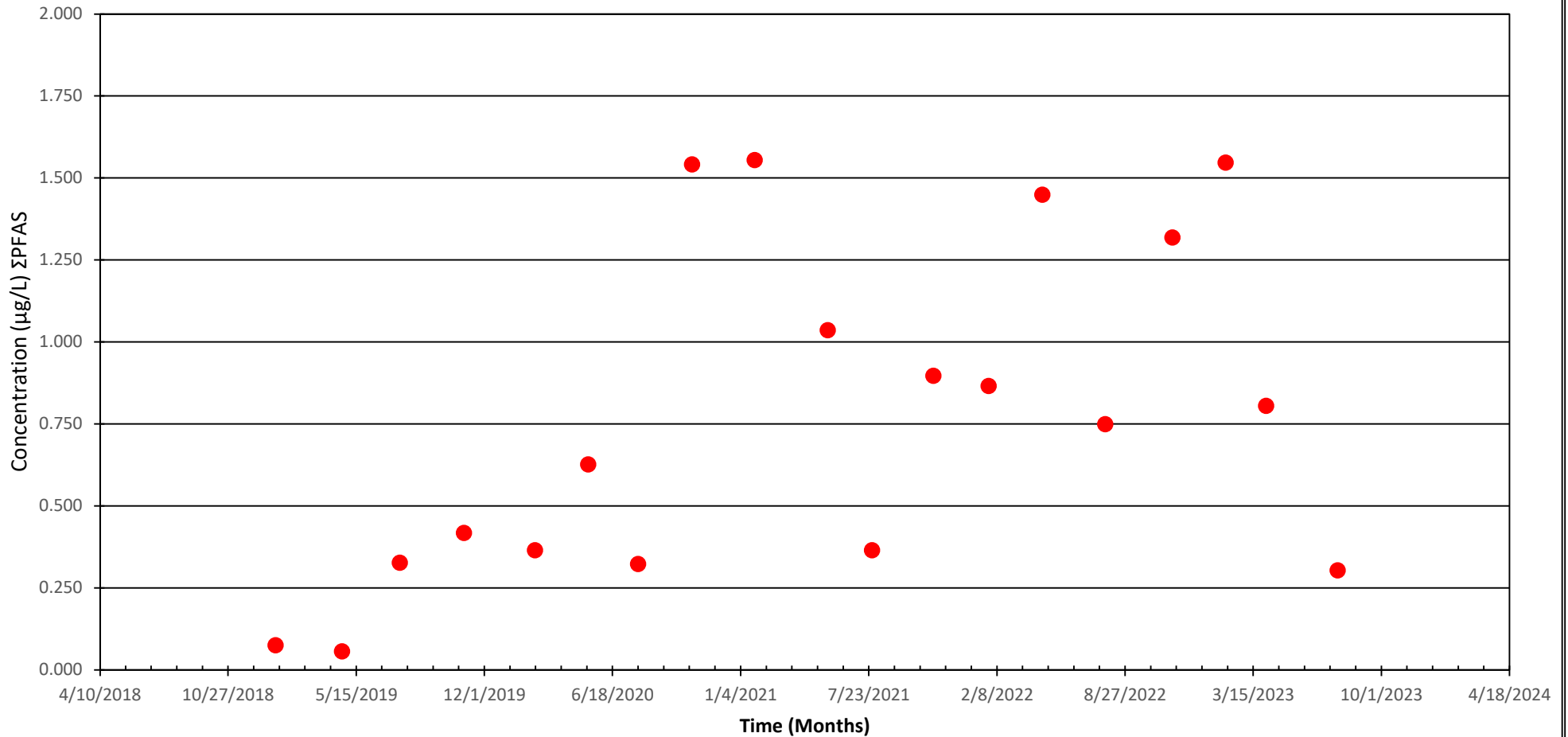
● PC-11



Notes:

1. Concentrations depicted represent the sum of the five (5) PFAS compounds, PFOS, PFOA, PFHpA, PFHxS, and PFNA from June 2018 to April 2019. Concentrations depicted from April 2019 to October 2019 represent the sum of the six (6) PFAS compounds PFOS, PFOA, PFHpA, PFHxS, PFNA, and PFDA.
2. Concentrations are in micrograms per liter (µg/L) or parts per billion (ppb).

Figure 9C - ΣPFAS Concentrations in PC-28 from January 2019 - November 2023



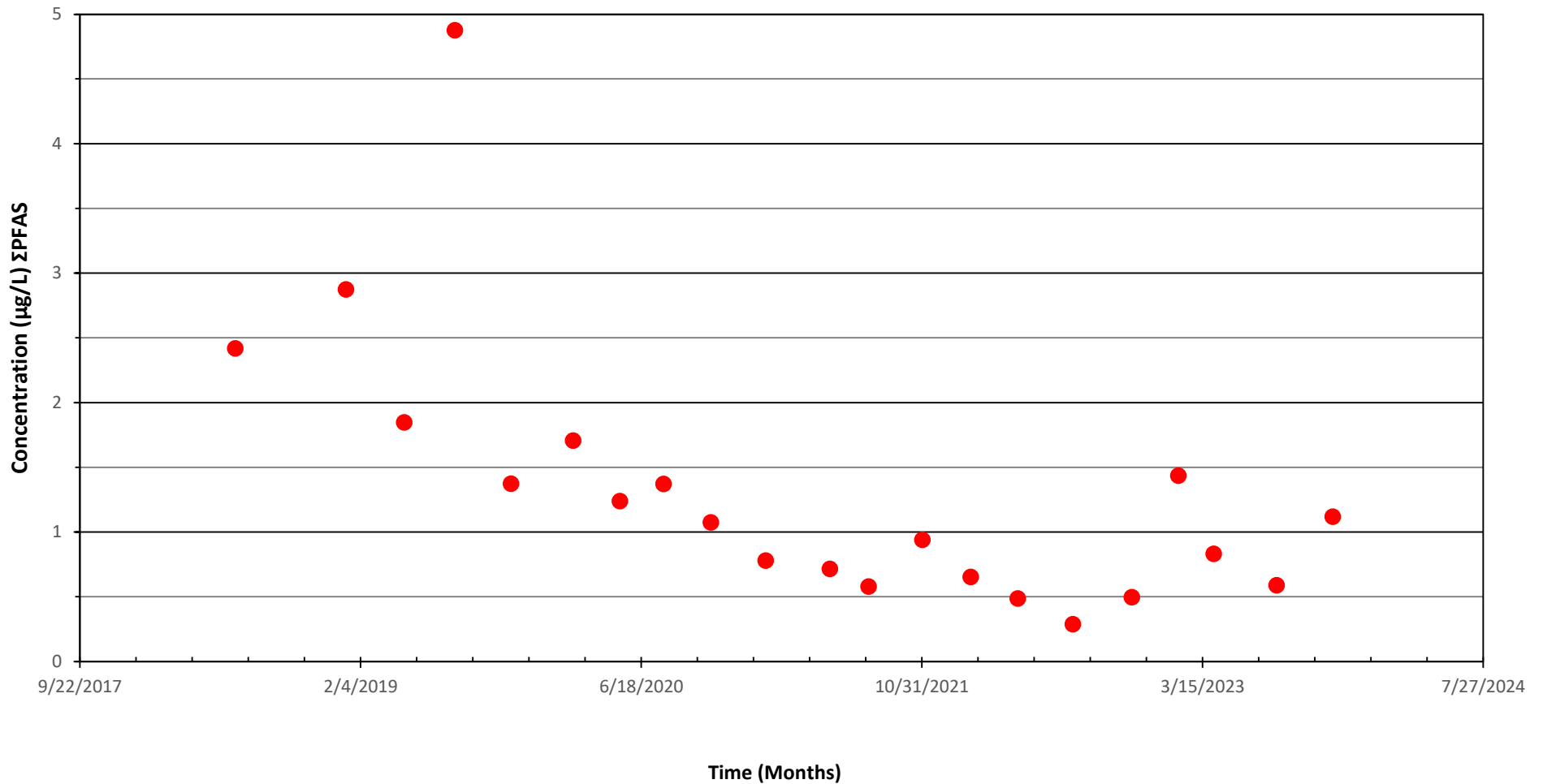
Barnstable County Fire & Rescue Training Academy
155 South Flint Rock Road, Barnstable, MA
RTN 4-26179



Notes:

1. Concentrations depicted represent the sum of the five (5) PFAS compounds, PFOS, PFOA, PFHpA, PFHxS, and PFNA from June 2018 to April 2019. Concentrations depicted from April 2019 to October 2019 represent the sum of the six (6) PFAS compounds PFOS, PFOA, PFHpA, PFHxS, PFNA, and PFDA.
2. Concentrations are in micrograms per liter (µg/L) or parts per billion (ppb).

Figure 9D - ΣPFAS Concentrations in PC-30 from June 2018 - November 2023



Barnstable County Fire & Rescue Training Academy
155 South Flint Rock Road, Barnstable, MA
RTN 4-26179

● PC-30



Notes:

1. Concentrations depicted represent the sum of the five (5) PFAS compounds, PFOS, PFOA, PFHpA, PFHxS, and PFNA from June 2018 to April 2019. Concentrations depicted from April 2019 to the graphically represented date are represented as the sum of the six (6) PFAS compounds PFOS, PFOA, PFHpA, PFHxS, PFNA, and PFDA.
2. Concentrations are in micrograms per liter (µg/L) or parts per billion (ppb).

APPENDICES

APPENDIX A

BWSC TRANSMITTAL FORM (UNSIGNED)



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC 105

Immediate Response Action (IRA) Transmittal Form

Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart D)

Release Tracking Number

4 - 26179

A. SITE LOCATION:

1. Release Name/Location Aid: BARNSTABLE COUNTY FIRE TRAINING ACADEMY
2. Street Address: 155 SOUTH FLINT ROCK ROAD
3. City/Town: BARNSTABLE 4. Zip Code: 026300000
- ☐ 5. Check here if this location is Adequately Regulated, pursuant to 310 CMR 40.0110-0114.
- ☐ a. CERCLA ☐ b. HSWA Corrective Action ☐ c. Solid Waste Management
- ☐ d. RCRA State Program (21C Facilities)

B. THIS FORM IS BEING USED TO: (check all that apply)

1. List Submittal Date of Initial IRA Written Plan (if previously submitted): 9/26/2016
- ☐ 2. Submit an **Initial IRA Plan**.
- ☐ 3. Submit a **Revised IRA Plan** of a previously submitted written IRA Plan.
- ☐ 4. Submit an **Imminent Hazard Evaluation**. (check one)
- ☐ a. An Imminent Hazard exists in connection with this Release or Threat of Release.
- ☐ b. An Imminent Hazard does not exist in connection with this Release or Threat of Release.
- ☐ c. It is unknown whether an Imminent Hazard exists in connection with this Release or Threat of Release, and further assessment activities will be undertaken.
- ☐ d. It is unknown whether an Imminent Hazard exists in connection with this Release or Threat of Release. However, response actions will address those conditions that could pose an Imminent Hazard.
- ☐ 5. Submit a request to **Terminate an Active Remedial System or Response Action** Taken to Address an Imminent Hazard.
- ☒ 6. Submit an **IRA Status Report**
- ☒ 7. Submit a **Remedial Monitoring Report**. (This report can only be submitted through eDEP.)
- a. Type of Report: (check one) ☐ i. Initial Report ☒ ii. Interim Report ☐ iii. Final Report
- b. Frequency of Submittal: (check all that apply)
- ☐ i. A Remedial Monitoring Report(s) submitted monthly to address an Imminent Hazard.
- ☐ ii. A Remedial Monitoring Report(s) submitted monthly to address a Condition of Substantial Release Migration.
- ☒ iii. A Remedial Monitoring Report(s) submitted every six months, concurrent with an IRA Status Report.
- ☐ iv. A Remedial Monitoring Report(s) submitted annually, concurrent with an IRA Status Report.
- c. Number of Remedial Systems and/or Monitoring Programs: 2

A separate BWSC105A, IRA Remedial Monitoring Report, must be filled out for each Remedial System and/or Monitoring Program addressed by this transmittal form.



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC 105

Immediate Response Action (IRA) Transmittal Form

Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart D)

Release Tracking Number

4 - 26179

☐ 8. Submit an **IRA Completion Statement**.

☐ a. Check here if future response actions addressing this Release or Threat of Release notification condition will be conducted as part of the Response Actions planned or ongoing at a Site that has already been Tier Classified under a different Release Tracking Number (RTN)

b. Provide Release Tracking Number of Tier Classified Site (Primary RTN): _____

These additional response actions must occur according to the deadlines applicable to the Primary RTN. Use the Primary RTN when making all future submittals for the site unless specifically relating to this Immediate Response Action.

☐ 9. Submit a **Revised IRA Completion Statement**.

☐ 10. Submit a **Plan for the Application of Remedial Additives** near a sensitive receptor, pursuant to 310 CMR 40.0046(3).

(All sections of this transmittal form must be filled out unless otherwise noted above)

C. RELEASE OR THREAT OF RELEASE CONDITIONS THAT WARRANT IRA:

1. Media Impacted and Receptors Affected: (check all that apply)

- | | | |
|--|--|---|
| ☐ a. Paved Surface | ☐ b. Basement | ☐ c. School |
| ☒ d. Public Water Supply | ☒ e. Surface Water | ☒ f. Zone 2 |
| ☐ g. Private Well | ☐ h. Residence | ☒ i. Soil |
| ☒ j. Groundwater | ☒ k. Sediments | ☒ l. Wetland |
| ☐ m. Storm Drain | ☐ n. Indoor Air | ☐ o. Air |
| ☐ p. Soil Gas | ☐ q. Sub-Slab Soil Gas | ☐ r. Critical Exposure Pathway |
| ☐ s. NAPL | ☐ t. Unknown | |
| ☐ r. Others | Specify: _____ | |

2. Sources of the Release or TOR: (check all that apply)

- | | | |
|--|---|-----------------------------------|
| ☐ a. Transformer | ☐ b. Fuel Tank | ☐ c. Pipe |
| ☐ d. OHM Delivery | ☐ e. AST | ☐ f. Drums |
| ☐ g. Tanker Truck | ☐ h. Hose | ☐ i. Line |
| ☐ j. UST | Describe: _____ | |
| ☐ k. Vehicle | ☐ l. Boat/Vessel | |
| ☐ m. Unknown | ☒ n. Other: FIRE FIGHTING FOAMS | |

3. Type of Release or TOR: (check all that apply)

- | | | | |
|--|--|---|--------------------------------------|
| ☐ a. Dumping | ☐ b. Fire | ☐ c. AST Removal | ☐ d. Overfill |
| ☐ e. Rupture | ☐ f. Vehicle Accident | ☐ g. Leak | ☐ h. Spill |
| ☐ i. Test failure | ☐ j. TOR Only | | |
| ☐ k. UST Removal | Describe: _____ | | |
| ☐ l. Unknown | ☒ m. Other: HISTORIC FIRE TRAINING | | |

4. Identify Oils and Hazardous Materials Released: (check all that apply)

- | | |
|--|--|
| ☐ a. Oils | ☐ b. Chlorinated Solvents |
| ☐ c. Heavy Metals | ☒ d. Others |
| Specify: PFAS | |

D. DESCRIPTION OF RESPONSE ACTIONS: (check all that apply, for volumes list cumulative amounts)

- | | |
|---|---|
| ☐ 1. Assessment and/or Monitoring Only | ☒ 2. Temporary Covers or Caps |
| ☐ 3. Deployment of Absorbent or Containment Materials | ☐ 4. Temporary Water Supplies |
| ☐ 5. Structure Venting System/HVAC Modification System | ☐ 6. Temporary Evacuation or Relocation of Residents |
| ☐ 7. Product or NAPL Recovery | ☐ 8. Fencing and Sign Posting |
| ☒ 9. Groundwater Treatment Systems | ☐ 10. Soil Vapor Extraction |
| ☐ 11. Remedial Additives | ☐ 12. Air Sparging |
| ☐ 13. Active Exposure Pathway Mitigation System | ☐ 14. Passive Exposure Pathway Mitigation System |



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC 105

Immediate Response Action (IRA) Transmittal Form
Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart D)

Release Tracking Number

4 - 26179

D. DESCRIPTION OF RESPONSE ACTIONS: (cont.)

☒ 15. Excavation of Contaminated Soils.

- ☐ a. Re-use, Recycling or Treatment ☐ i. On Site Estimated volume in cubic yards _____
☐ ii. Off Site Estimated volume in cubic yards _____

iiia. Receiving Facility: _____ Town: _____ State: _____

iiib. Receiving Facility: _____ Town: _____ State: _____

iiic. Describe: _____

- ☐ b. Store ☐ i. On Site Estimated volume in cubic yards _____
☐ ii. Off Site Estimated volume in cubic yards _____

iiia. Receiving Facility: _____ Town: _____ State: _____

iiib. Receiving Facility: _____ Town: _____ State: _____

- ☒ c. Landfill ☐ i. Cover Estimated volume in cubic yards _____

Receiving Facility: _____ Town: _____ State: _____

- ☒ ii. Disposal Estimated volume in cubic yards 200

Receiving Facility: WASTE MANAGEMENT LANDFILL Town: TAUNTON State: MA

☐ 16. Removal of Drums, Tanks, or Containers:

a. Describe Quantity and Amount: _____

b. Receiving Facility: _____ Town: _____ State: _____

c. Receiving Facility: _____ Town: _____ State: _____

☒ 17. Removal of Other Contaminated Media:

a. Specify Type and Volume: 641 TONS-PFAS IMPACTED SUBSTRATE AND SOIL-WAYNE DISPOSAL, MICHIGAN

☒ 18. Other Response Actions:

Describe: CAPPED APPROX. 59,000 SF OF FTA-HOT MIX ASPHALT PAVEMENT, TEMP COVERED APPROX. 4,000 SF WITH MEMBRANE AND STONE COVER

☐ 19. Use of Innovative Technologies:

Describe: _____



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC 105

Immediate Response Action (IRA) Transmittal Form

Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart D)

Release Tracking Number

4 - 26179

E. LSP SIGNATURE AND STAMP:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and 309 CMR 4.03(2), and (iii) the provisions of 309 CMR 4.03(3), to the best of my knowledge, information and belief,

> if Section B of this form indicates that an **Immediate Response Action Plan** is being submitted, the response action(s) that is(are) the subject of this submittal (i) has (have) been developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is(are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) complies(y) with the identified provisions of all orders, permits, and approvals identified in this submittal;

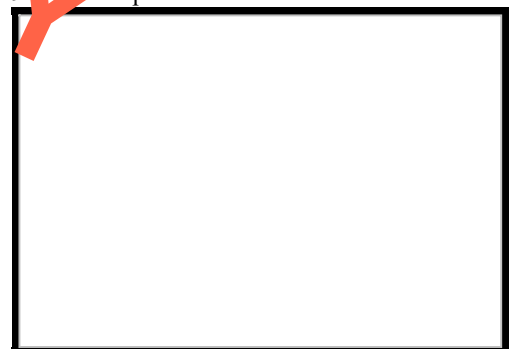
> if Section B of this form indicates that an **Imminent Hazard Evaluation** is being submitted, this Imminent Hazard Evaluation was developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and the assessment activity(ies) undertaken to support this Imminent Hazard Evaluation comply(ies) with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000;

> if Section B of this form indicates that an **Immediate Response Action Status Report** and/or a **Remedial Monitoring Report** is(are) being submitted, the response action(s) that is (are) the subject of this submittal (i) is (are) being implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> if Section B of this form indicates that an **Immediate Response Action Completion Statement** or a request to **Terminate an Active Remedial System or Response Action(s) Taken to Address an Imminent Hazard** is being submitted, the response action(s) that is(are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is(are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal.

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate, or materially incomplete.

1. LSP #: 1443
2. First Name: ROGER P 3. Last Name: THIBAUT
4. Telephone: 508-331-2700 5. Ext: 6. Email:
7. Signature:
8. Date: (mm/dd/yyyy) 9. LSP Stamp:





Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC 105

Immediate Response Action (IRA) Transmittal Form
Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart D)

Release Tracking Number

4 - 26179

F. PERSON UNDERTAKING IRA:

1. Check all that apply: ☐ a. change in contact name ☐ b. change of address ☐ c. change in the person undertaking response actions
2. Name of Organization: BARNSTABLE COUNTY COMMISSIONERS
3. Contact First Name: PAUL 4. Last Name: RUSZALA
5. Street: 3195 MAIN ST 6. Title: _____
7. City/Town: BARNSTABLE 8. State: MA 9. Zip Code: 026301105
10. Telephone: 508-375-6643 11. Ext: _____ 12. Email: _____

G. RELATIONSHIP TO RELEASE OR THREAT OF RELEASE OF PERSON UNDERTAKING IRA:

- ☐ Check here to change relationship
- ☒ 1. RP or PRP ☐ a. Owner ☐ b. Operator ☐ c. Generator ☐ d. Transporter
☒ e. Other RP or PRP Specify Relationship: NON-SPECIFIED PRP
- ☐ 2. Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)
- ☐ 3. Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))
- ☐ 4. Any Other Person Undertaking Response Actions: Specify Relationship: _____

H. REQUIRED ATTACHMENT AND SUBMITTALS:

- ☐ 1. Check here if any Remediation Waste, generated as a result of this IRA, will be stored, treated, managed, recycled or reused at the site following submission of the IRA Completion Statement. If this box is checked, you must submit one of the following plans, along with the appropriate transmittal form:
☐ a. A Release Abatement Measure (RAM) Plan (BWSC106) ☐ b. Phase IV Remedy Implementation Plan (BWSC108)
- ☒ 2. Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by MassDEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.
- ☒ 3. Check here to certify that the Chief Municipal Officer and the Local Board of Health were notified of the implementation of an Immediate Response Action taken to control, prevent, abate or eliminate an Imminent Hazard.
- ☐ 4. Check here to certify that the Chief Municipal Officer and the Local Board of Health were notified of the submittal of a Completion Statement for an Immediate Response Action taken to control, prevent, abate or eliminate an Imminent Hazard.
- ☐ 5. Check here if any non-updatable information provided on this form is incorrect, e.g. Release Address/Location Aid. Send corrections to BWSC.eDEP@state.ma.us.
- ☒ 6. Check here to certify that the LSP Opinion containing the material facts, data, and other information is attached.



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC 105

Immediate Response Action (IRA) Transmittal Form

Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart D)

Release Tracking Number

4 - 26179

I. CERTIFICATION OF PERSON UNDERTAKING IRA:

1. I, _____, attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form; (ii) that, based on my inquiry of the/those individual(s) immediately responsible for obtaining the information, the material information contained herein is, to the best of my knowledge, information and belief, true, accurate and complete; (iii) that, to the best of my knowledge, information and belief, I/the person(s) or entity(ies) on whose behalf this submittal is made satisfy(ies) the criteria in 310 CMR 40.0183(2); (iv) that I/the person(s) or entity(ies) on whose behalf this submittal is made have provided notice in accordance with 310 CMR 40.0183(5); and (v) that I am fully authorized to make this attestation on behalf of the person(s) or entity(ies) legally responsible for this submittal. I/the person(s) or entity(ies) on whose behalf this submittal is made is/are aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

2. By: _____ 3. Title: _____

4. For: BARNSTABLE COUNTY COMMISSIONERS 5. Date: _____ (mm/dd/yyyy)

☐ 6. Check here if the address of the person providing certification is different from address recorded in Section F.

7. Street: _____

8. City/Town: _____ 9. State: _____ 10. Zip Code: _____

11. Telephone: _____ 12. Ext: _____ 13. Email: _____

YOU ARE SUBJECT TO AN ANNUAL COMPLIANCE ASSURANCE FEE OF UP TO \$10,000 PER BILLABLE YEAR FOR THIS DISPOSAL SITE. YOU MUST LEGIBLY COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE.

Date Stamp (DEP USE ONLY): _____

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Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup
IRA REMEDIAL MONITORING REPORT

BWSC105 -A

Pursuant to 310 CMR 40.0400 (SUBPART D)

Release Tracking Number

Remedial System or Monitoring Program:

1

of:

2

4

-

26179

A. DESCRIPTION OF ACTIVE OPERATION AND MAINTENANCE ACTIVITY:

1. Type of Active Operation and Maintenance Activity: (check all that apply)

☒ a. Active Remedial System: (check all that apply)

☐ i. NAPL Recovery

☐ ii. Soil Vapor Extraction/Bioventing

☐ iii. Vapor-phase Carbon Adsorption

☒ iv. Groundwater Recovery

☐ v. Dual/Multi-phase Extraction

☒ vi. Aqueous-phase Carbon Adsorption

☐ vii. Air Stripping

☐ viii. Sparging/Biosparging

☐ ix. Cat/Thermal Oxidation

☐ x. Other Describe: _____

☐ b. Active Exposure Pathway Elimination Measure

Active Exposure Pathway Mitigation System to address (check one): ☐ i. Indoor Air ☐ ii. Drinking Water

☐ c. Application of Remedial Additives: (check all that apply)

☐ i. To the Subsurface

☐ ii. To Groundwater (Injection)

☐ iii. To the Surface

☐ d. Active Remedial Monitoring Program Without the Application of Remedial Additives: (check all that apply; Sections C, D and E are not required; attach supporting information, data, maps and/or sketches needed by checking Section G5)

☐ i. Reactive Wall

☐ ii. Natural Attenuation

☐ iii. Other

Describe: _____

2. Mode of Operation: (check one)

☒ a. Continuous

☐ b. Intermittent

☐ c. Pulsed

☐ d. One-time Event Only

☐ e. Other: _____

3. System Effluent/Discharge: (check all that apply)

☐ a. Sanitary Sewer/ POTW

☒ b. Groundwater Re-infiltration/Re-injection: (check one)

☐ i. Downgradient

☒ ii. Upgradient

☐ c. Vapor-phase Discharge to Ambient Air: (check one)

☐ i. Off-gas Controls

☐ ii. No Off-gas Controls

☐ d. Drinking Water Supply

☐ e. Surface Water (including Storm Drains)

☐ f. Other Describe: _____

B. MONITORING FREQUENCY:

1. Reporting period that is the subject of this submittal:

From: 7/1/2023

To: 12/31/2023

(mm/dd/yyyy)

(mm/dd/yyyy)

2. Number of monitoring events during the reporting period: (check one)

☐ a. System Startup: (if applicable)

☐ i. Days 1, 3, 6, and then weekly thereafter, for the first month.

☐ ii. Other Describe: _____

☒ b. Post-system Startup (after first month) or Monitoring Program:

☒ i. Monthly

☐ ii. Quarterly

☐ iii. Annually

☐ iv. Other Describe: _____

☒ 3. Check here to certify that the number of required monitoring events were conducted during the reporting period.

C. EFFLUENT/DISCHARGE REGULATION: (check one to indicate how the effluent/discharge limits were established)

☐ 1. NPDES: (check one)

☐ a. Remediation General Permit

☐ b. Individual Permit

☐ c. Emergency Exclusion

Effective Date of Permit: _____

(mm/dd/yyyy)

☐ 2. MCP Performance Standard

MCP Citations(s): _____

☒ 3. DEP Approval Letter

Date of Letter: 11/16/2018

(mm/dd/yyyy)

☐ 4. Other Describe: _____



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

IRA REMEDIAL MONITORING REPORT

Pursuant to 310 CMR 40.0400 (SUBPART D)

Remedial System or Monitoring Program: 1 of 2

BWSC105 -A

Release Tracking Number

4 - 26179

D. WASTEWATER TREATMENT PLANT OPERATOR: (check one)

☒ 1. Required due to Remedial Wastewater Treatment Plant in place for more than 30 days.

a. Name: TJMCGOFF

b. Grade: 4

c. License No: 15570

d. License Exp. Date: 12/31/2023

(mm/dd/yyyy)

☐ 2. Not Required

☐ 3. Not Applicable

E. STATUS OF ACTIVE REMEDIAL SYSTEM OR ACTIVE REMEDIAL MONITORING PROGRAM DURING REPORTING PERIOD: (check all that apply)

☒ 1. The Active Remedial System was functional one or more days during the Reporting Period.

a. Days System was Fully Functional: 180

b. GW Recovered (gals): 2456580

c. NAPL Recovered (gals):

d. GW Discharged (gals): 2456580

e. Avg. Soil Gas Recovery Rate (scfm):

f. Avg. Sparging Rate (scfm):

☐ 2. Remedial Additives: (check all that apply)

☐ a. No Remedial Additives applied during the Reporting Period.

☐ b. Enhanced Bioremediation Additives applied: (total quantity applied at the site for the current reporting period)

☐ i. Nitrogen/Phosphorus:

☐ ii. Peroxides:

Name of Additive	Date	Quantity	Units

Name of Additive	Date	Quantity	Units

☐ iii. Microorganisms:

☐ iv. Other:

Name of Additive	Date	Quantity	Units

Name of Additive	Date	Quantity	Units

☐ c. Chemical oxidation/reduction additives applied: (total quantity applied at the site for the current reporting period)

☐ i. Permanganates:

☐ ii. Peroxides:

Name of Additive	Date	Quantity	Units

Name of Additive	Date	Quantity	Units

☐ iii. Persulfates:

☐ iv. Other:

Name of Additive	Date	Quantity	Units

Name of Additive	Date	Quantity	Units



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

IRA REMEDIAL MONITORING REPORT

Pursuant to 310 CMR 40.0400 (SUBPART D)

Remedial System or Monitoring Program: 1 of 2

BWSC105 -A

Release Tracking Number

4 - 26179

E. STATUS OF ACTIVE REMEDIAL SYSTEM OR ACTIVE REMEDIAL MONITORING PROGRAM DURING REPORTING PERIOD: (cont.)

☐ d. Other additives applied: (total quantity applied at the site for the current reporting period)

Name of Additive	Date	Quantity	Units

Name of Additive	Date	Quantity	Units

☐ e. Check here if any additional Remedial Additives were applied. Attach list of additional additives and include Name of Additive, Date Applied, Quantity Applied and Units (in gals. or lbs.)

F. SHUTDOWNS OF ACTIVE REMEDIAL SYSTEM OR ACTIVE REMEDIAL MONITORING PROGRAM: (check all that apply)

☐ 1. The Active Remedial System had unscheduled shutdowns on one or more occasions during the Reporting Period.

a. Number of Unscheduled Shutdowns: b. Total Number of Days of Unscheduled Shutdowns:

c. Reason(s) for Unscheduled Shutdowns:

☒ 2. The Active Remedial System had scheduled shutdowns on one or more occasions during the Reporting Period.

a. Number of Scheduled Shutdowns: 4 b. Total Number of Days of Scheduled Shutdowns: 5

c. Reason(s) for Scheduled Shutdowns: WELL MAINTENANCE, EQ TANK PUMPOUT, CARBON CHANGEOUT

☐ 3. The Active Remedial System or Active Remedial Monitoring Program was permanently shutdown/discontinued during the Reporting Period.

a. Date of Final System or Monitoring Program Shutdown: (mm/dd/yyyy)

☐ b. No Further Effluent Discharge

☐ c. No Further Application of Remedial Additives planned; sufficient monitoring completed to demonstrate compliance with 310 CMR 40.0046.

☐ d. No Further Submittals Planned.

☐ e. Other: Describe:

G. SUMMARY STATEMENTS: (check all that apply for the current reporting period)

☒ 1. All Active Remedial System checks and effluent analyses required by the approved plan and/or permit were performed when applicable.

☒ 2. There were no significant problems or prolonged (>25% of reporting period) unscheduled shutdowns of the Active Remedial System.

☒ 3. The Active Remedial System or Active Remedial Monitoring Program operated in conformance with the MCP, and all applicable approval conditions and/or permits.

4. Indicate any Operational Problems or Notes:

SLOW DOWNS OBSERVED IN RECOVERY WELL FLOW RATES AND VOLUMES DUE TO IRON FOULING PRIOR TO WE

☐ 5. Check here if additional/supporting Information, data, maps, and/or sketches are attached to the form.



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup
IRA REMEDIAL MONITORING REPORT
MEASUREMENTS

BWSC105 -B

Pursuant to 310 CMR 40.0400 (SUBPART D)

Remedial System or Monitoring Program:

1

of: 2

Release Tracking Number

4

26179

For each Point of Measurement, related to concentration indicate the highest concentration detected during the reporting period, of each oil, hazardous material and/or remedial additive.

For each Point of Measurement for pressure differentials, indicate the lowest pressure differential detected during the reporting period.

Point of Measurement	Date (mm/dd/yyyy)	Contaminant, Measurement and/or Indicator Parameter	Influent Concentration (where applicable)	Midpoint Concentration (where applicable)	(check one)	Check here, if ND/BDL	Permissible Concentration or Pressure Differential	Units	Within Permissible Limits? (Y/N)
					☒ Discharge ☐ Ground Water Concentration Pressure Differential				
SYSTEM	07/13/2023	PFAS6	0.63			☒	0.020	UG/L	YES
SYSTEM	08/22/2023	PFAS6	0.50			☒	0.020	UG/L	YES
SYSTEM	09/08/2023	PFAS6	0.76	0.05	0.002	☐	0.020	UG/L	YES
SYSTEM	10/12/2023	PFAS6	0.53	0.07		☒	0.020	UG/L	YES
SYSTEM	11/21/2023	PFAS6	0.48	0.07		☒	0.020	UG/L	YES
SYSTEM	12/21/2023	PFAS6	0.49	0.07		☒	0.020	UG/L	YES

☒ Check here, if any additional BWSC105 B, Measurements Form(s), are needed.



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup
IRA REMEDIAL MONITORING REPORT
MEASUREMENTS

BWSC105 -B

Pursuant to 310 CMR 40.0400 (SUBPART D)

Remedial System or Monitoring Program:

of:

Release Tracking Number

For each Point of Measurement, related to concentration indicate the highest concentration detected during the reporting period, of each oil, hazardous material and/or remedial additive.

For each Point of Measurement for pressure differentials, indicate the lowest pressure differential detected during the reporting period.

Point of Measurement	Date (mm/dd/yyyy)	Contaminant, Measurement and/or Indicator Parameter	Influent Concentration (where applicable)	Midpoint Concentration (where applicable)	Groundwater Concentration	Check here, if ND/BDL	Permissible Concentration	Units	Within Permissible Limits? (Y/N)
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☐ Check here if any additional BWSC105 B, Measurements Form(s), are needed.

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Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup
IRA REMEDIAL MONITORING REPORT

BWSC105 -A

Pursuant to 310 CMR 40.0400 (SUBPART D)

Release Tracking Number

Remedial System or Monitoring Program: 2 of: 2

4 - 26179

A. DESCRIPTION OF ACTIVE OPERATION AND MAINTENANCE ACTIVITY:

1. Type of Active Operation and Maintenance Activity: (check all that apply)

☒ a. Active Remedial System: (check all that apply)

- ☐ i. NAPL Recovery ☐ ii. Soil Vapor Extraction/Bioventing ☐ iii. Vapor-phase Carbon Adsorption
☒ iv. Groundwater Recovery ☐ v. Dual/Multi-phase Extraction ☒ vi. Aqueous-phase Carbon Adsorption
☐ vii. Air Stripping ☐ viii. Sparging/Biosparging ☐ ix. Cat/Thermal Oxidation
☐ x. Other Describe: _____

☐ b. Active Exposure Pathway Elimination Measure

Active Exposure Pathway Mitigation System to address (check one): ☐ i. Indoor Air ☐ ii. Drinking Water

☐ c. Application of Remedial Additives: (check all that apply)

- ☐ i. To the Subsurface ☐ ii. To Groundwater (Injection) ☐ iii. To the Surface

☐ d. Active Remedial Monitoring Program Without the Application of Remedial Additives: (check all that apply; Sections C, D and E are not required; attach supporting information, data, maps and/or sketches needed by checking Section G5)

- ☐ i. Reactive Wall ☐ ii. Natural Attenuation ☐ iii. Other Describe: _____

2. Mode of Operation: (check one)

- ☒ a. Continuous ☐ b. Intermittent ☐ c. Pulsed ☐ d. One-time Event Only ☐ e. Other: _____

3. System Effluent/Discharge: (check all that apply)

- ☐ a. Sanitary Sewer/ POTW
☒ b. Groundwater Re-infiltration/Re-injection: (check one) ☐ i. Downgradient ☒ ii. Upgradient
☐ c. Vapor-phase Discharge to Ambient Air: (check one) ☐ i. Off-gas Controls ☐ ii. No Off-gas Controls
☐ d. Drinking Water Supply
☐ e. Surface Water (including Storm Drains)
☐ f. Other Describe: _____

B. MONITORING FREQUENCY:

1. Reporting period that is the subject of this submittal:

From: 7/1/2023 To: 12/31/2023
(mm/dd/yyyy) (mm/dd/yyyy)

2. Number of monitoring events during the reporting period: (check one)

☐ a. System Startup: (if applicable)

- ☐ i. Days 1, 3, 6, and then weekly thereafter, for the first month.
☐ ii. Other Describe: _____

☒ b. Post-system Startup (after first month) or Monitoring Program:

- ☒ i. Monthly
☐ ii. Quarterly
☐ iii. Annually
☐ iv. Other Describe: _____

☒ 3. Check here to certify that the number of required monitoring events were conducted during the reporting period.

C. EFFLUENT/DISCHARGE REGULATION: (check one to indicate how the effluent/discharge limits were established)

- ☐ 1. NPDES: (check one) ☐ a. Remediation General Permit ☐ b. Individual Permit
☐ c. Emergency Exclusion Effective Date of Permit: _____

(mm/dd/yyyy)

☐ 2. MCP Performance Standard MCP Citations(s): _____

☒ 3. DEP Approval Letter Date of Letter: 11/18/2018
(mm/dd/yyyy)

☐ 4. Other Describe: _____



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

IRA REMEDIAL MONITORING REPORT

Pursuant to 310 CMR 40.0400 (SUBPART D)

Remedial System or Monitoring Program: 2 of 2

BWSC105 -A

Release Tracking Number

4 - 26179

D. WASTEWATER TREATMENT PLANT OPERATOR: (check one)

☒ 1. Required due to Remedial Wastewater Treatment Plant in place for more than 30 days.

a. Name: TJMCGOFF

b. Grade: 4

c. License No: 15570

d. License Exp. Date: 12/31/2023

(mm/dd/yyyy)

☐ 2. Not Required

☐ 3. Not Applicable

E. STATUS OF ACTIVE REMEDIAL SYSTEM OR ACTIVE REMEDIAL MONITORING PROGRAM DURING REPORTING PERIOD: (check all that apply)

☒ 1. The Active Remedial System was functional one or more days during the Reporting Period.

a. Days System was Fully Functional: 180

b. GW Recovered (gals): 2147950

c. NAPL Recovered (gals):

d. GW Discharged (gals): 2147950

e. Avg. Soil Gas Recovery Rate (scfm):

f. Avg. Sparging Rate (scfm):

☐ 2. Remedial Additives: (check all that apply)

☐ a. No Remedial Additives applied during the Reporting Period.

☐ b. Enhanced Bioremediation Additives applied: (total quantity applied at the site for the current reporting period)

☐ i. Nitrogen/Phosphorus:

☐ ii. Peroxides:

Name of Additive	Date	Quantity	Units

Name of Additive	Date	Quantity	Units

☐ iii. Microorganisms:

☐ iv. Other:

Name of Additive	Date	Quantity	Units

Name of Additive	Date	Quantity	Units

☐ c. Chemical oxidation/reduction additives applied: (total quantity applied at the site for the current reporting period)

☐ i. Permanganates:

☐ ii. Peroxides:

Name of Additive	Date	Quantity	Units

Name of Additive	Date	Quantity	Units

☐ iii. Persulfates:

☐ iv. Other:

Name of Additive	Date	Quantity	Units

Name of Additive	Date	Quantity	Units



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

IRA REMEDIAL MONITORING REPORT

Pursuant to 310 CMR 40.0400 (SUBPART D)

Remedial System or Monitoring Program: 2 of 2

BWSC105 -A

Release Tracking Number

4 - 26179

E. STATUS OF ACTIVE REMEDIAL SYSTEM OR ACTIVE REMEDIAL MONITORING PROGRAM DURING REPORTING PERIOD: (cont.)

☐ d. Other additives applied: (total quantity applied at the site for the current reporting period)

Name of Additive	Date	Quantity	Units

Name of Additive	Date	Quantity	Units

☐ e. Check here if any additional Remedial Additives were applied. Attach list of additional additives and include Name of Additive, Date Applied, Quantity Applied and Units (in gals. or lbs.)

F. SHUTDOWNS OF ACTIVE REMEDIAL SYSTEM OR ACTIVE REMEDIAL MONITORING PROGRAM: (check all that apply)

☐ 1. The Active Remedial System had unscheduled shutdowns on one or more occasions during the Reporting Period.

a. Number of Unscheduled Shutdowns: b. Total Number of Days of Unscheduled Shutdowns:

c. Reason(s) for Unscheduled Shutdowns:

☒ 2. The Active Remedial System had scheduled shutdowns on one or more occasions during the Reporting Period.

a. Number of Scheduled Shutdowns: 4 b. Total Number of Days of Scheduled Shutdowns: 3

c. Reason(s) for Scheduled Shutdowns: WELL MAINTENANCE, TANK WW MAINTENANCE, CARBON CHANGEOUT

☐ 3. The Active Remedial System or Active Remedial Monitoring Program was permanently shutdown/discontinued during the Reporting Period.

a. Date of Final System or Monitoring Program Shutdown: (mm/dd/yyyy)

☐ b. No Further Effluent Discharge

☐ c. No Further Application of Remedial Additives planned; sufficient monitoring completed to demonstrate compliance with 310 CMR 40.0046.

☐ d. No Further Submittals Planned.

☐ e. Other: Describe:

G. SUMMARY STATEMENTS: (check all that apply for the current reporting period)

☒ 1. All Active Remedial System checks and effluent analyses required by the approved plan and/or permit were performed when applicable.

☒ 2. There were no significant problems or prolonged (>25% of reporting period) unscheduled shutdowns of the Active Remedial System.

☒ 3. The Active Remedial System or Active Remedial Monitoring Program operated in conformance with the MCP, and all applicable approval conditions and/or permits.

4. Indicate any Operational Problems or Notes:

SLOW DOWN OBSERVED IN RECOVERY WELL FLOR RATE AND VOLUMES DUE TO IRON FOULING PRIOR TO WELL

☐ 5. Check here if additional/supporting Information, data, maps, and/or sketches are attached to the form.



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup
IRA REMEDIAL MONITORING REPORT
MEASUREMENTS

BWSC105 -B

Pursuant to 310 CMR 40.0400 (SUBPART D)

Remedial System or Monitoring Program: 2 of: 2

Release Tracking Number

4

26179

For each Point of Measurement, related to concentration indicate the highest concentration detected during the reporting period, of each oil, hazardous material and/or remedial additive.

For each Point of Measurement for pressure differentials, indicate the lowest pressure differential detected during the reporting period.

Point of Measurement	Date (mm/dd/yyyy)	Contaminant, Measurement and/or Indicator Parameter	Influent Concentration (where applicable)	Midpoint Concentration (where applicable)	(check one)	Check here, if ND/BDL	Permissible Concentration or Pressure Differential	Units	Within Permissible Limits? (Y/N)
					☒ Discharge ☐ GroundWater Concentration Pressure Differential				
SYSTEM	07/13/2023	PFAS6	0.63			☒	0.020	UG/L	YES
SYSTEM	08/22/2023	PFAS6	0.50			☒	0.020	UG/L	YES
SYSTEM	09/08/2023	PFAS6	0.76	0.01	0.02	☐	0.020	UG/L	YES
SYSTEM	10/12/2023	PFAS6	0.53			☒	0.020	UG/L	YES
SYSTEM	11/21/2023	PFAS6	0.48	0.04		☒	0.020	UG/L	YES
SYSTEM	12/21/2023	PFAS6	0.49	0.4	0.02	☐	0.020	UG/L	YES

☐ Check here, if any additional BWSC105 B, Measurements Form(s), are needed.



BARNSTABLE COUNTY
SUPERIOR COURTHOUSE
3195 MAIN STREET
P.O. BOX 427
BARNSTABLE, MASSACHUSETTS 02630

Paul Ruszala, P.E.
Assets and Infrastructure Manager
(508) 419-2860
paul.ruszala@capecod.gov

June 6, 2023

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup
Southeast Regional Office
20 Riverside Drive
Lakeville, MA 02587

ATTN: Navpreet Brolowski, P.E., LSP, Project Manager

Re: Delegation of Authority
Massachusetts Contingency Plan Filings
Former Barnstable County Fire Training Academy Site
155 South Flint Rock Road, Barnstable, MA
DEP Release Tracking No. RTN 4-26179

Dear Ms. Brolowski:

The purpose of this letter is to delegate signature authority for the filing of Massachusetts Contingency Plan submittals related to the Former Barnstable County Fire Training Academy Site to the Licensed Site Professional (LSP) on record, Roger Thibault, P.E., LSP. Effective upon the issuance of this letter, I authorize Roger Thibault, P.E., LSP, to submit and sign the above referenced documents on behalf of myself and Barnstable County.

If you have any questions upon review of this notification, please contact me, or Roger Thibault, P.E., LSP for the Site at BETA Group, Inc. at your convenience.

Thank you,

A handwritten signature in blue ink that reads "Paul Ruszala". The signature is written in a cursive, flowing style.

Paul Ruszala, P.E.
Assets and Infrastructure Manager

APPENDIX B

LABORATORY REPORTS/CERTIFICATES OF ANALYSIS Groundwater Treatment Systems Performance Monitoring

August 7, 2023

Laura Bouley
Barnstable County Regional Government of Cape Cod
3195 Main St, PO Box 427
Barnstable, MA 02630

Project Location: Barnstable, MA
Client Job Number:
Project Number: 6206
Laboratory Work Order Number: 23G2784

Enclosed are results of analyses for samples as received by the laboratory on July 19, 2023. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kaitlyn A. Feliciano
Project Manager

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Barnstable County Regional Government of Cape Cod
3195 Main St, PO Box 427
Barnstable, MA 02630
ATTN: Laura Bouley

REPORT DATE: 8/7/2023

PURCHASE ORDER NUMBER: 23000936

PROJECT NUMBER: 6206

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 23G2784

The results of analyses performed on the following samples submitted to CON-TEST, a Pace Analytical Laboratory, are found in this report.

PROJECT LOCATION: Barnstable, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
Influent (PRW4)	23G2784-01	Ground Water		SOP-454 PFAS	
SYS#1 MID	23G2784-02	Ground Water		SOP-454 PFAS	
SYS#1 EFFLUENT	23G2784-03	Ground Water		SOP-454 PFAS	
SYS#2 MID	23G2784-04	Ground Water		SOP-454 PFAS	
SYS#2 EFF	23G2784-05	Ground Water		SOP-454 PFAS	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SOP-454 PFAS

Qualifications:

MS-12

Matrix spike recovery and matrix spike duplicate recovery outside of control limits. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

Analyte & Samples(s) Qualified:

6:2 Fluorotelomersulfonic acid (6:2FTS A)

B346742-MS1, B346742-MSD1

Perfluoroheptanesulfonic acid (PFHpS)

B346742-MS1, B346742-MSD1

Perfluoropentanesulfonic acid (PFPeS)

B346742-MS1, B346742-MSD1

PF-19

Sample re-analyzed at a dilution that was re-fortified with internal standard.

Analyte & Samples(s) Qualified:

6:2 Fluorotelomersulfonic acid (6:2FTS A)

23G2784-01RE1[Influent (PRW4)]

Perfluorohexanesulfonic acid (PFHxS)

23G2784-01RE1[Influent (PRW4)]

Perfluorooctanesulfonic acid (PFOS)

23G2784-01RE1[Influent (PRW4)]

PF-23

Qualifier ion ratio <50% of associated calibration. Detection is suspect.

Analyte & Samples(s) Qualified:

Perfluorodecanesulfonic acid (PFDS)

23G2784-01[Influent (PRW4)]

S-29

Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:

M2PFTA

23G2784-01[Influent (PRW4)]

M3HFPO-DA

S091519-CCV1

The results of analyses reported only relate to samples submitted to Con-Test, a Pace Analytical Laboratory, for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Lisa A. Worthington
Technical Representative

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23G2784

Date Received: 7/19/2023

Field Sample #: Influent (PRW4)

Sampled: 7/13/2023 09:50

Sample ID: 23G2784-01

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	45	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluorobutanesulfonic acid (PFBS)	14	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluoropentanoic acid (PFPeA)	160	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluorohexanoic acid (PFHxA)	160	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	37	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluorodecanoic acid (PFDA)	2.8	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluoroheptanesulfonic acid (PFHpS)	6.1	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluorodecanesulfonic acid (PFDS)	3.1	1.8	ng/L	1	PF-23	SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluorooctanesulfonamide (FOSA)	5.0	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluorononanesulfonic acid (PFNS)	3.9	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	61	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluoro-1-butanefulfonamide (FBFA)	23	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluorohexanesulfonic acid (PFHxS)	210	18	ng/L	10	PF-19	SOP-454 PFAS	8/2/23	8/3/23 16:23	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	230	18	ng/L	10	PF-19	SOP-454 PFAS	8/2/23	8/3/23 16:23	QNW
Perfluoropentanesulfonic acid (PFPeS)	26	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluoroundecanoic acid (PFUnA)	68	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluoroheptanoic acid (PFHpA)	76	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluorooctanoic acid (PFOA)	55	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW
Perfluorooctanesulfonic acid (PFOS)	260	18	ng/L	10	PF-19	SOP-454 PFAS	8/2/23	8/3/23 16:23	QNW
Perfluorononanoic acid (PFNA)	26	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:29	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23G2784

Date Received: 7/19/2023

Sampled: 7/13/2023 09:40

Field Sample #: SYS#1 MID

Sample ID: 23G2784-02

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	16	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluoropentanoic acid (PFPeA)	13	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluorohexanoic acid (PFHxA)	6.2	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	2.0	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:36	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23G2784

Date Received: 7/19/2023

Field Sample #: SYS#1 EFFLUENT

Sampled: 7/13/2023 09:30

Sample ID: 23G2784-03

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:44	QNW

Project Location: Barnstable, MA

Sample Description:

Work Order: 23G2784

Date Received: 7/19/2023

Sampled: 7/13/2023 10:10

Field Sample #: SYS#2 MID

Sample ID: 23G2784-04

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	3.0	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluoropentanoic acid (PFPeA)	1.8	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluorodecanoic acid (PFDA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluorooctanoic acid (PFOA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW
Perfluorononanoic acid (PFNA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:51	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23G2784

Date Received: 7/19/2023

Field Sample #: SYS#2 EFF

Sampled: 7/13/2023 10:00

Sample ID: 23G2784-05

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluorodecanoic acid (PFDA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluorooctanoic acid (PFOA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW
Perfluorononanoic acid (PFNA)	ND	1.7	ng/L	1		SOP-454 PFAS	8/2/23	8/3/23 12:58	QNW

Sample Extraction Data

Prep Method:SOP 454-PFAAS **Analytical Method:**SOP-454 PFAS

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23G2784-01 [Influent (PRW4)]	B346742	279	1.00	08/02/23
23G2784-01RE1 [Influent (PRW4)]	B346742	279	1.00	08/02/23
23G2784-02 [SYS#1 MID]	B346742	273	1.00	08/02/23
23G2784-03 [SYS#1 EFFLUENT]	B346742	283	1.00	08/02/23
23G2784-04 [SYS#2 MID]	B346742	290	1.00	08/02/23
23G2784-05 [SYS#2 EFF]	B346742	288	1.00	08/02/23

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B346742 - SOP 454-PFAAS
Blank (B346742-BLK1)

Prepared: 08/02/23 Analyzed: 08/03/23

Perfluorobutanoic acid (PFBA)	ND	2.0	ng/L
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L
Perfluoropentanoic acid (PFPeA)	ND	2.0	ng/L
Perfluorohexanoic acid (PFHxA)	ND	2.0	ng/L
11Cl-PF3OUdS (F53B Major)	ND	2.0	ng/L
9Cl-PF3ONS (F53B Minor)	ND	2.0	ng/L
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	2.0	ng/L
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.0	ng/L
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	2.0	ng/L
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	2.0	ng/L
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.0	ng/L
N-EtFOSAA (NEtFOSAA)	ND	2.0	ng/L
N-MeFOSAA (NMeFOSAA)	ND	2.0	ng/L
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	2.0	ng/L
Perfluorodecanesulfonic acid (PFDS)	ND	2.0	ng/L
Perfluorooctanesulfonamide (FOSA)	ND	2.0	ng/L
Perfluorononanesulfonic acid (PFNS)	ND	2.0	ng/L
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	2.0	ng/L
Perfluoro-1-butanesulfonamide (FBSA)	ND	2.0	ng/L
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	2.0	ng/L
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	2.0	ng/L
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	2.0	ng/L
Perfluoropentanesulfonic acid (PFPeS)	ND	2.0	ng/L
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.0	ng/L
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L

LCS (B346742-BS1)

Prepared: 08/02/23 Analyzed: 08/03/23

Perfluorobutanoic acid (PFBA)	11.0	2.0	ng/L	9.92	111	73-129
Perfluorobutanesulfonic acid (PFBS)	9.40	2.0	ng/L	8.78	107	72-130
Perfluoropentanoic acid (PFPeA)	11.1	2.0	ng/L	9.92	112	72-129
Perfluorohexanoic acid (PFHxA)	11.1	2.0	ng/L	9.92	112	72-129
11Cl-PF3OUdS (F53B Major)	7.26	2.0	ng/L	9.35	77.7	55.1-141
9Cl-PF3ONS (F53B Minor)	7.96	2.0	ng/L	9.25	86.0	59.6-146
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	9.27	2.0	ng/L	9.35	99.2	60.3-131
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.61	2.0	ng/L	9.92	86.8	37.6-167
8:2 Fluorotelomersulfonic acid (8:2FTS A)	9.15	2.0	ng/L	9.53	96.1	67-138
Perfluorodecanoic acid (PFDA)	11.5	2.0	ng/L	9.92	116	71-129
Perfluorododecanoic acid (PFDoA)	10.9	2.0	ng/L	9.92	110	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	7.88	2.0	ng/L	8.83	89.3	49.4-154

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B346742 - SOP 454-PFAAS
LCS (B346742-BS1)

Prepared: 08/02/23 Analyzed: 08/03/23

Perfluoroheptanesulfonic acid (PFHpS)	12.4	2.0	ng/L	9.48		131	69-134			
N-EtFOSAA (NEtFOSAA)	10.5	2.0	ng/L	9.92		106	61-135			
N-MeFOSAA (NMeFOSAA)	11.0	2.0	ng/L	9.92		111	65-136			
Perfluorotetradecanoic acid (PFTA)	11.7	2.0	ng/L	9.92		118	71-132			
Perfluorotridecanoic acid (PFTTrDA)	12.9	2.0	ng/L	9.92		130	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.9	2.0	ng/L	9.28		118	63-143			
Perfluorodecanesulfonic acid (PFDS)	6.68	2.0	ng/L	9.58		69.8	53-142			
Perfluorooctanesulfonamide (FOSA)	11.1	2.0	ng/L	9.92		112	67-137			
Perfluorononanesulfonic acid (PFNS)	9.27	2.0	ng/L	9.53		97.3	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	9.50	2.0	ng/L	9.92		95.7	61.7-156			
Perfluoro-1-butanefulfonamide (FBSA)	8.12	2.0	ng/L	9.92		81.8	61.3-145			
Perfluorohexanesulfonic acid (PFHxS)	9.89	2.0	ng/L	9.08		109	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	10.5	2.0	ng/L	9.92		106	59.8-147			
Perfluoro-5-oxahexanoic acid (PFMBA)	9.43	2.0	ng/L	9.92		95.1	59.5-146			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	11.6	2.0	ng/L	9.43		123	64-140			
Perfluoropentanesulfonic acid (PFPeS)	10.9	2.0	ng/L	9.33		117	71-127			
Perfluoroundecanoic acid (PFUnA)	11.7	2.0	ng/L	9.92		118	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	10.0	2.0	ng/L	9.92		101	58.5-143			
Perfluoroheptanoic acid (PFHpA)	10.6	2.0	ng/L	9.92		107	72-130			
Perfluorooctanoic acid (PFOA)	10.7	2.0	ng/L	9.92		108	71-133			
Perfluorooctanesulfonic acid (PFOS)	10.1	2.0	ng/L	9.18		110	65-140			
Perfluorononanoic acid (PFNA)	11.7	2.0	ng/L	9.92		118	69-130			

Matrix Spike (B346742-MS1)
Source: 23G2784-03

Prepared: 08/02/23 Analyzed: 08/03/23

Perfluorobutanoic acid (PFBA)	11.6	1.8	ng/L	8.86	0.721	123	73-129			
Perfluorobutanesulfonic acid (PFBS)	8.95	1.8	ng/L	7.84	ND	114	72-130			
Perfluoropentanoic acid (PFPeA)	11.3	1.8	ng/L	8.86	ND	128	72-129			
Perfluorohexanoic acid (PFHxA)	11.4	1.8	ng/L	8.86	ND	129	72-129			
11Cl-PF3OUdS (F53B Major)	7.71	1.8	ng/L	8.35	ND	92.4	58.3-140			
9Cl-PF3ONS (F53B Minor)	8.27	1.8	ng/L	8.26	ND	100	61.4-144			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.74	1.8	ng/L	8.35	ND	105	62.4-128			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	7.62	1.8	ng/L	8.86	ND	86.0	36.7-171			
8:2 Fluorotelomersulfonic acid (8:2FTS A)	10.8	1.8	ng/L	8.51	ND	127	67-138			
Perfluorodecanoic acid (PFDA)	9.99	1.8	ng/L	8.86	ND	113	71-129			
Perfluorododecanoic acid (PFDoA)	10.7	1.8	ng/L	8.86	ND	121	72-134			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	7.67	1.8	ng/L	7.89	ND	97.2	54.3-149			
Perfluoroheptanesulfonic acid (PFHpS)	12.1	1.8	ng/L	8.46	ND	143	* 69-134			MS-12
N-EtFOSAA (NEtFOSAA)	10.4	1.8	ng/L	8.86	ND	117	61-135			
N-MeFOSAA (NMeFOSAA)	11.1	1.8	ng/L	8.86	ND	125	65-136			
Perfluorotetradecanoic acid (PFTA)	10.7	1.8	ng/L	8.86	ND	121	71-132			
Perfluorotridecanoic acid (PFTTrDA)	12.1	1.8	ng/L	8.86	ND	137	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.0	1.8	ng/L	8.29	ND	121	63-143			
Perfluorodecanesulfonic acid (PFDS)	7.00	1.8	ng/L	8.55	ND	81.8	53-142			
Perfluorooctanesulfonamide (FOSA)	11.3	1.8	ng/L	8.86	ND	127	67-137			
Perfluorononanesulfonic acid (PFNS)	9.05	1.8	ng/L	8.51	ND	106	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	9.38	1.8	ng/L	8.86	ND	106	64.2-154			
Perfluoro-1-butanefulfonamide (FBSA)	7.68	1.8	ng/L	8.86	ND	86.6	65.9-140			
Perfluorohexanesulfonic acid (PFHxS)	9.99	1.8	ng/L	8.11	ND	123	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	9.87	1.8	ng/L	8.86	ND	111	61.9-143			
Perfluoro-5-oxahexanoic acid (PFMBA)	8.79	1.8	ng/L	8.86	ND	99.2	61.4-142			

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B346742 - SOP 454-PFAAS

Matrix Spike (B346742-MS1)		Source: 23G2784-03			Prepared: 08/02/23 Analyzed: 08/03/23					
6:2 Fluorotelomersulfonic acid (6:2FTS A)	14.4	1.8	ng/L	8.42	ND	171	*	64-140		MS-12
Perfluoropentanesulfonic acid (PFPeS)	11.0	1.8	ng/L	8.33	ND	132	*	71-127		MS-12
Perfluoroundecanoic acid (PFUnA)	11.2	1.8	ng/L	8.86	ND	126		69-133		
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	9.36	1.8	ng/L	8.86	ND	106		62-138		
Perfluoroheptanoic acid (PFHpA)	10.3	1.8	ng/L	8.86	ND	117		72-130		
Perfluorooctanoic acid (PFOA)	10.9	1.8	ng/L	8.86	ND	123		71-133		
Perfluorooctanesulfonic acid (PFOS)	10.7	1.8	ng/L	8.20	ND	131		65-140		
Perfluorononanoic acid (PFNA)	10.4	1.8	ng/L	8.86	ND	118		69-130		

Matrix Spike Dup (B346742-MSD1)		Source: 23G2784-03			Prepared: 08/02/23 Analyzed: 08/03/23					
Perfluorobutanoic acid (PFBA)	11.8	1.8	ng/L	8.96	0.721	123		73-129	1.14	30
Perfluorobutanesulfonic acid (PFBS)	9.36	1.8	ng/L	7.93	ND	118		72-130	4.50	30
Perfluoropentanoic acid (PFPeA)	10.9	1.8	ng/L	8.96	ND	121		72-129	4.05	30
Perfluorohexanoic acid (PFHxA)	10.9	1.8	ng/L	8.96	ND	122		72-129	4.29	30
11Cl-PF3OUdS (F53B Major)	7.20	1.8	ng/L	8.44	ND	85.2		58.3-140	6.96	30
9Cl-PF3ONS (F53B Minor)	7.88	1.8	ng/L	8.35	ND	94.3		61.4-144	4.87	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	9.09	1.8	ng/L	8.44	ND	108		62.4-128	4.02	30
Hexafluoropropylene oxide dimer acid (HFPO-DA)	7.05	1.8	ng/L	8.96	ND	78.7		36.7-171	7.69	30
8:2 Fluorotelomersulfonic acid (8:2FTS A)	9.69	1.8	ng/L	8.60	ND	113		67-138	10.8	30
Perfluorodecanoic acid (PFDA)	10.7	1.8	ng/L	8.96	ND	120		71-129	7.32	30
Perfluorododecanoic acid (PFDoA)	10.6	1.8	ng/L	8.96	ND	119		72-134	0.642	30
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	8.16	1.8	ng/L	7.98	ND	102		54.3-149	6.18	30
Perfluoroheptanesulfonic acid (PFHpS)	12.2	1.8	ng/L	8.56	ND	143	*	69-134	0.842	30 MS-12
N-EtFOSAA (NEtFOSAA)	11.3	1.8	ng/L	8.96	ND	126		61-135	8.09	30
N-MeFOSAA (NMeFOSAA)	11.9	1.8	ng/L	8.96	ND	133		65-136	7.20	30
Perfluorotetradecanoic acid (PFTA)	11.4	1.8	ng/L	8.96	ND	127		71-132	6.40	30
Perfluorotridecanoic acid (PFTDA)	12.9	1.8	ng/L	8.96	ND	144		65-144	6.61	30
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.6	1.8	ng/L	8.38	ND	126		63-143	5.32	30
Perfluorodecanesulfonic acid (PFDS)	6.38	1.8	ng/L	8.65	ND	73.8		53-142	9.18	30
Perfluorooctanesulfonamide (FOSA)	11.6	1.8	ng/L	8.96	ND	129		67-137	2.33	30
Perfluorononanesulfonic acid (PFNS)	9.38	1.8	ng/L	8.60	ND	109		69-127	3.62	30
Perfluoro-1-hexanesulfonamide (FHxSA)	9.72	1.8	ng/L	8.96	ND	108		64.2-154	3.57	30
Perfluoro-1-butanedisulfonamide (FBSA)	7.81	1.8	ng/L	8.96	ND	87.1		65.9-140	1.71	30
Perfluorohexanesulfonic acid (PFHxS)	9.45	1.8	ng/L	8.20	ND	115		68-131	5.59	30
Perfluoro-4-oxapentanoic acid (PFMPA)	10.6	1.8	ng/L	8.96	ND	118		61.9-143	7.11	30
Perfluoro-5-oxahexanoic acid (PFMBA)	9.30	1.8	ng/L	8.96	ND	104		61.4-142	5.68	30
6:2 Fluorotelomersulfonic acid (6:2FTS A)	10.2	1.8	ng/L	8.51	ND	120		64-140	33.6	30 MS-12
Perfluoropentanesulfonic acid (PFPeS)	11.2	1.8	ng/L	8.43	ND	133	*	71-127	1.50	30 MS-12
Perfluoroundecanoic acid (PFUnA)	11.3	1.8	ng/L	8.96	ND	126		69-133	0.720	30
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	9.82	1.8	ng/L	8.96	ND	110		62-138	4.89	30
Perfluoroheptanoic acid (PFHpA)	10.4	1.8	ng/L	8.96	ND	116		72-130	0.223	30
Perfluorooctanoic acid (PFOA)	10.7	1.8	ng/L	8.96	ND	120		71-133	1.51	30
Perfluorooctanesulfonic acid (PFOS)	10.4	1.8	ng/L	8.29	ND	125		65-140	3.16	30
Perfluorononanoic acid (PFNA)	11.0	1.8	ng/L	8.96	ND	122		69-130	4.73	30

FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
MS-12	Matrix spike recovery and matrix spike duplicate recovery outside of control limits. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.
PF-19	Sample re-analyzed at a dilution that was re-fortified with internal standard.
PF-23	Qualifier ion ratio <50% of associated calibration. Detection is suspect.
S-29	Extracted Internal Standard is outside of control limits.

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Influent (PRW4) (23G2784-01) Lab File ID: 23G2784-01.d Analyzed: 08/03/23 12:29									
M8FOSA	142128.8	3.996567	203,271.00	3.988567	70	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	42917.02	2.537883	41,857.00	2.51325	103	50 - 150	0.0246	+/-0.50	
M2PFTA	123061.6	4.3378	404,600.00	4.329683	30	50 - 150	0.0081	+/-0.50	*
M2-8:2FTS	80729.94	3.8028	75,334.00	3.794833	107	50 - 150	0.0080	+/-0.50	
MPFBA	220644	1.075083	328,410.00	1.066783	67	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	135538.4	2.880217	153,702.00	2.855667	88	50 - 150	0.0246	+/-0.50	
M6PFDA	414610.4	3.811283	536,206.00	3.803317	77	50 - 150	0.0080	+/-0.50	
M3PFBS	149150.2	1.928117	159,311.00	1.90325	94	50 - 150	0.0249	+/-0.50	
M7PFUnA	319349.7	3.962017	471,177.00	3.946033	68	50 - 150	0.0160	+/-0.50	
M5PFPeA	285457.2	1.749417	323,976.00	1.7231	88	50 - 150	0.0263	+/-0.50	
M5PFHxA	505446.2	2.629833	545,494.00	2.596983	93	50 - 150	0.0329	+/-0.50	
M3PFHxS	80540.1	3.2345	84,448.00	3.218333	95	50 - 150	0.0162	+/-0.50	
M4PFHpA	479072.4	3.203083	509,261.00	3.186933	94	50 - 150	0.0162	+/-0.50	
M8PFOA	494180.4	3.469917	539,496.00	3.461933	92	50 - 150	0.0080	+/-0.50	
M8PFOS	61100.77	3.660133	81,518.00	3.644167	75	50 - 150	0.0160	+/-0.50	
M9PFNA	426664.7	3.661183	490,814.00	3.6452	87	50 - 150	0.0160	+/-0.50	
MPFDaA	230412	4.09665	377,312.00	4.08865	61	50 - 150	0.0080	+/-0.50	
D5-NEtFOSAA	83568.09	3.9695	113,617.00	3.9615	74	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	95203.26	3.889733	136,692.00	3.88175	70	50 - 150	0.0080	+/-0.50	
Influent (PRW4) (23G2784-01RE1) Lab File ID: 23G2784-01RE1.d Analyzed: 08/03/23 16:23									
M2-6:2FTS	38294.86	3.453267	33,267.00	3.445283	115	50 - 150	0.0080	+/-0.50	
M3PFHxS	92314.63	3.226417	84,448.00	3.21025	109	50 - 150	0.0162	+/-0.50	
M8PFOS	92087.82	3.65215	81,518.00	3.644167	113	50 - 150	0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
SYS#1 MID (23G2784-02)		Lab File ID: 23G2784-02.d				Analyzed: 08/03/23 12:36			
M8FOSA	167858.2	3.996567	203,271.00	3.988567	83	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	34682.8	2.529667	41,857.00	2.51325	83	50 - 150	0.0164	+/-0.50	
M2PFTA	222593.3	4.3378	404,600.00	4.329683	55	50 - 150	0.0081	+/-0.50	
M2-8:2FTS	111604.9	3.8028	75,334.00	3.794833	148	50 - 150	0.0080	+/-0.50	
MPFBA	296553.8	1.075083	328,410.00	1.066783	90	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	147745.9	2.880217	153,702.00	2.855667	96	50 - 150	0.0246	+/-0.50	
M6PFDA	451143.8	3.811283	536,206.00	3.803317	84	50 - 150	0.0080	+/-0.50	
M3PFBS	157212.9	1.919817	159,311.00	1.90325	99	50 - 150	0.0166	+/-0.50	
M7PFUnA	348091.4	3.962017	471,177.00	3.946033	74	50 - 150	0.0160	+/-0.50	
M2-6:2FTS	37638.32	3.4614	33,267.00	3.445283	113	50 - 150	0.0161	+/-0.50	
M5PFPeA	314104.1	1.741117	323,976.00	1.7231	97	50 - 150	0.0180	+/-0.50	
M5PFHxA	539899.1	2.621617	545,494.00	2.596983	99	50 - 150	0.0246	+/-0.50	
M3PFHxS	87837.91	3.2345	84,448.00	3.218333	104	50 - 150	0.0162	+/-0.50	
M4PFHpA	513750.1	3.203083	509,261.00	3.186933	101	50 - 150	0.0162	+/-0.50	
M8PFOA	529849.2	3.469917	539,496.00	3.461933	98	50 - 150	0.0080	+/-0.50	
M8PFOS	73364.02	3.65215	81,518.00	3.644167	90	50 - 150	0.0080	+/-0.50	
M9PFNA	485960.2	3.661183	490,814.00	3.6452	99	50 - 150	0.0160	+/-0.50	
MPFDoA	263035.6	4.096633	377,312.00	4.08865	70	50 - 150	0.0080	+/-0.50	
D5-NEtFOSAA	86161.9	3.969483	113,617.00	3.9615	76	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	96886.85	3.889733	136,692.00	3.88175	71	50 - 150	0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
SYS#1 EFFLUENT (23G2784-03)		Lab File ID: 23G2784-03.d				Analyzed: 08/03/23 12:44			
M8FOSA	167736.1	3.996567	203,271.00	3.988567	83	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	32625.06	2.529667	41,857.00	2.51325	78	50 - 150	0.0164	+/-0.50	
M2PFTA	325487.3	4.3378	404,600.00	4.329683	80	50 - 150	0.0081	+/-0.50	
M2-8:2FTS	83168.7	3.794833	75,334.00	3.794833	110	50 - 150	0.0000	+/-0.50	
MPFBA	294973.2	1.075083	328,410.00	1.066783	90	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	172325.1	2.872033	153,702.00	2.855667	112	50 - 150	0.0164	+/-0.50	
M6PFDA	453386.2	3.803317	536,206.00	3.803317	85	50 - 150	0.0000	+/-0.50	
M3PFBS	153426.4	1.919817	159,311.00	1.90325	96	50 - 150	0.0166	+/-0.50	
M7PFUnA	350909.5	3.954033	471,177.00	3.946033	74	50 - 150	0.0080	+/-0.50	
M2-6:2FTS	38385.81	3.453267	33,267.00	3.445283	115	50 - 150	0.0080	+/-0.50	
M5PFPeA	306028.7	1.741117	323,976.00	1.7231	94	50 - 150	0.0180	+/-0.50	
M5PFHxA	524491.2	2.6134	545,494.00	2.596983	96	50 - 150	0.0164	+/-0.50	
M3PFHxS	86727.55	3.226417	84,448.00	3.218333	103	50 - 150	0.0081	+/-0.50	
M4PFHpA	515081.7	3.195017	509,261.00	3.186933	101	50 - 150	0.0081	+/-0.50	
M8PFOA	549933.6	3.469917	539,496.00	3.461933	102	50 - 150	0.0080	+/-0.50	
M8PFOS	70425.56	3.65215	81,518.00	3.644167	86	50 - 150	0.0080	+/-0.50	
M9PFNA	453387.5	3.653183	490,814.00	3.6452	92	50 - 150	0.0080	+/-0.50	
MPFDaA	293369	4.096633	377,312.00	4.08865	78	50 - 150	0.0080	+/-0.50	
D5-NEtFOSAA	94230.13	3.9615	113,617.00	3.9615	83	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	95295.75	3.88175	136,692.00	3.88175	70	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
SYS#2 MID (23G2784-04)		Lab File ID: 23G2784-04.d				Analyzed: 08/03/23 12:51			
M8FOSA	164348	4.00455	203,271.00	3.988567	81	50 - 150	0.0160	+/-0.50	
M2-4:2FTS	30271.9	2.5461	41,857.00	2.51325	72	50 - 150	0.0328	+/-0.50	
M2PFTA	326582	4.3378	404,600.00	4.329683	81	50 - 150	0.0081	+/-0.50	
M2-8:2FTS	94175.2	3.8028	75,334.00	3.794833	125	50 - 150	0.0080	+/-0.50	
MPFBA	285413.9	1.075083	328,410.00	1.066783	87	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	146150.5	2.880217	153,702.00	2.855667	95	50 - 150	0.0246	+/-0.50	
M6PFDA	464034.4	3.81925	536,206.00	3.803317	87	50 - 150	0.0159	+/-0.50	
M3PFBS	142654.9	1.928117	159,311.00	1.90325	90	50 - 150	0.0249	+/-0.50	
M7PFUnA	363661.3	3.962017	471,177.00	3.946033	77	50 - 150	0.0160	+/-0.50	
M2-6:2FTS	36676.82	3.469383	33,267.00	3.445283	110	50 - 150	0.0241	+/-0.50	
M5PFPeA	292397.8	1.749417	323,976.00	1.7231	90	50 - 150	0.0263	+/-0.50	
M5PFHxA	496226.9	2.629833	545,494.00	2.596983	91	50 - 150	0.0329	+/-0.50	
M3PFHxS	79331.53	3.242583	84,448.00	3.218333	94	50 - 150	0.0243	+/-0.50	
M4PFHpA	481456.8	3.21145	509,261.00	3.186933	95	50 - 150	0.0245	+/-0.50	
M8PFOA	496111.1	3.4779	539,496.00	3.461933	92	50 - 150	0.0160	+/-0.50	
M8PFOS	71338.67	3.660133	81,518.00	3.644167	88	50 - 150	0.0160	+/-0.50	
M9PFNA	449140.4	3.661183	490,814.00	3.6452	92	50 - 150	0.0160	+/-0.50	
MPFDoA	291027	4.096633	377,312.00	4.08865	77	50 - 150	0.0080	+/-0.50	
D5-NEtFOSAA	90560.65	3.969483	113,617.00	3.9615	80	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	100689.7	3.889733	136,692.00	3.88175	74	50 - 150	0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
SYS#2 EFF (23G2784-05)		Lab File ID: 23G2784-05.d				Analyzed: 08/03/23 12:58			
M8FOSA	163790.1	3.996567	203,271.00	3.988567	81	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	31284.77	2.537883	41,857.00	2.51325	75	50 - 150	0.0246	+/-0.50	
M2PFTA	323697.7	4.3378	404,600.00	4.329683	80	50 - 150	0.0081	+/-0.50	
M2-8:2FTS	97209.51	3.8028	75,334.00	3.794833	129	50 - 150	0.0080	+/-0.50	
MPFBA	288884	1.075083	328,410.00	1.066783	88	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	145296.6	2.880217	153,702.00	2.855667	95	50 - 150	0.0246	+/-0.50	
M6PFDA	454385.7	3.811283	536,206.00	3.803317	85	50 - 150	0.0080	+/-0.50	
M3PFBS	141334	1.919817	159,311.00	1.90325	89	50 - 150	0.0166	+/-0.50	
M7PFUnA	357215	3.962017	471,177.00	3.946033	76	50 - 150	0.0160	+/-0.50	
M2-6:2FTS	33903	3.4614	33,267.00	3.445283	102	50 - 150	0.0161	+/-0.50	
M5PFPeA	291750.7	1.749417	323,976.00	1.7231	90	50 - 150	0.0263	+/-0.50	
M5PFHxA	496580.9	2.621617	545,494.00	2.596983	91	50 - 150	0.0246	+/-0.50	
M3PFHxS	79691.69	3.2345	84,448.00	3.218333	94	50 - 150	0.0162	+/-0.50	
M4PFHpA	479390.4	3.203083	509,261.00	3.186933	94	50 - 150	0.0162	+/-0.50	
M8PFOA	505655.3	3.469917	539,496.00	3.461933	94	50 - 150	0.0080	+/-0.50	
M8PFOS	66299.18	3.660133	81,518.00	3.644167	81	50 - 150	0.0160	+/-0.50	
M9PFNA	434250.3	3.661183	490,814.00	3.6452	88	50 - 150	0.0160	+/-0.50	
MPFDoA	283772.8	4.096633	377,312.00	4.08865	75	50 - 150	0.0080	+/-0.50	
D5-NEtFOSAA	86847.27	3.969483	113,617.00	3.9615	76	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	95852.56	3.889733	136,692.00	3.88175	70	50 - 150	0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Blank (B346742-BLK1)			Lab File ID: B346742-BLK1.d			Analyzed: 08/03/23 09:47			
M8FOSA	178917.5	3.980567	203,271.00	3.980567	88	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	46831.59	2.52145	41,857.00	2.505033	112	50 - 150	0.0164	+/-0.50	
M2PFTA	380344.5	4.329683	404,600.00	4.329683	94	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	76184.52	3.794833	75,334.00	3.794833	101	50 - 150	0.0000	+/-0.50	
MPFBA	301205	1.066783	328,410.00	1.058467	92	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	159738.7	2.855667	153,702.00	2.847483	104	50 - 150	0.0082	+/-0.50	
M6PFDA	482243.3	3.79535	536,206.00	3.79535	90	50 - 150	0.0000	+/-0.50	
M3PFBS	157896.3	1.911533	159,311.00	1.894967	99	50 - 150	0.0166	+/-0.50	
M7PFUnA	404738.2	3.946033	471,177.00	3.946033	86	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	31705.04	3.445283	33,267.00	3.445283	95	50 - 150	0.0000	+/-0.50	
M5PFPeA	317153.8	1.731383	323,976.00	1.7231	98	50 - 150	0.0083	+/-0.50	
M5PFHxA	535887.1	2.605183	545,494.00	2.596983	98	50 - 150	0.0082	+/-0.50	
M3PFHxS	86488.25	3.218333	84,448.00	3.21025	102	50 - 150	0.0081	+/-0.50	
M4PFHpA	496648.2	3.178867	509,261.00	3.178867	98	50 - 150	0.0000	+/-0.50	
M8PFOA	521991.6	3.453817	539,496.00	3.453817	97	50 - 150	0.0000	+/-0.50	
M8PFOS	77865.54	3.644167	81,518.00	3.636183	96	50 - 150	0.0080	+/-0.50	
M9PFNA	469547.1	3.6452	490,814.00	3.637217	96	50 - 150	0.0080	+/-0.50	
MPFDoA	323373.6	4.08865	377,312.00	4.08065	86	50 - 150	0.0080	+/-0.50	
D5-NEtFOSAA	99723.87	3.9535	113,617.00	3.9535	88	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	117369.8	3.873767	136,692.00	3.873767	86	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (B346742-BS1)		Lab File ID: B346742-BS1.d			Analyzed: 08/03/23 09:39				
M8FOSA	177818.9	3.988567	203,271.00	3.980567	87	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	45602.89	2.52145	41,857.00	2.505033	109	50 - 150	0.0164	+/-0.50	
M2PFTA	277261.7	4.329683	404,600.00	4.329683	69	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	90697.51	3.794833	75,334.00	3.794833	120	50 - 150	0.0000	+/-0.50	
MPFBA	302897.3	1.066783	328,410.00	1.058467	92	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	149437.3	2.86385	153,702.00	2.847483	97	50 - 150	0.0164	+/-0.50	
M6PFDA	488158.5	3.803317	536,206.00	3.79535	91	50 - 150	0.0080	+/-0.50	
M3PFBS	159837.7	1.911533	159,311.00	1.894967	100	50 - 150	0.0166	+/-0.50	
M7PFUnA	379665	3.954033	471,177.00	3.946033	81	50 - 150	0.0080	+/-0.50	
M2-6:2FTS	34249.32	3.453267	33,267.00	3.445283	103	50 - 150	0.0080	+/-0.50	
M5PFPeA	315999.2	1.741117	323,976.00	1.7231	98	50 - 150	0.0180	+/-0.50	
M5PFHxA	541283.5	2.6134	545,494.00	2.596983	99	50 - 150	0.0164	+/-0.50	
M3PFHxS	85790.14	3.218333	84,448.00	3.21025	102	50 - 150	0.0081	+/-0.50	
M4PFHpA	519185.5	3.186933	509,261.00	3.178867	102	50 - 150	0.0081	+/-0.50	
M8PFOA	533966.9	3.461933	539,496.00	3.453817	99	50 - 150	0.0081	+/-0.50	
M8PFOS	75951.33	3.644167	81,518.00	3.636183	93	50 - 150	0.0080	+/-0.50	
M9PFNA	463258.4	3.6452	490,814.00	3.637217	94	50 - 150	0.0080	+/-0.50	
MPFDoA	297178.8	4.08865	377,312.00	4.08065	79	50 - 150	0.0080	+/-0.50	
D5-NEtFOSAA	103780.5	3.9615	113,617.00	3.9535	91	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	125072.1	3.873767	136,692.00	3.873767	91	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike (B346742-MS1)			Lab File ID: B346742-MS1.d			Analyzed: 08/03/23 09:54			
M8FOSA	153577.5	3.988567	203,271.00	3.980567	76	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	32798.7	2.52145	41,857.00	2.505033	78	50 - 150	0.0164	+/-0.50	
M2PFTA	273314.2	4.329683	404,600.00	4.329683	68	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	78891.35	3.794833	75,334.00	3.794833	105	50 - 150	0.0000	+/-0.50	
MPFBA	278462.3	1.075083	328,410.00	1.058467	85	50 - 150	0.0166	+/-0.50	
M3HFPO-DA	143286.6	2.86385	153,702.00	2.847483	93	50 - 150	0.0164	+/-0.50	
M6PFDA	441350.5	3.803317	536,206.00	3.79535	82	50 - 150	0.0080	+/-0.50	
M3PFBS	145963.6	1.911533	159,311.00	1.894967	92	50 - 150	0.0166	+/-0.50	
M7PFUnA	325651.3	3.954033	471,177.00	3.946033	69	50 - 150	0.0080	+/-0.50	
M2-6:2FTS	31418.17	3.453267	33,267.00	3.445283	94	50 - 150	0.0080	+/-0.50	
M5PFPeA	294633	1.741117	323,976.00	1.7231	91	50 - 150	0.0180	+/-0.50	
M5PFHxA	505804.9	2.605183	545,494.00	2.596983	93	50 - 150	0.0082	+/-0.50	
M3PFHxS	75389.87	3.218333	84,448.00	3.21025	89	50 - 150	0.0081	+/-0.50	
M4PFHpA	480057.1	3.186933	509,261.00	3.178867	94	50 - 150	0.0081	+/-0.50	
M8PFOA	489921.6	3.461933	539,496.00	3.453817	91	50 - 150	0.0081	+/-0.50	
M8PFOS	62123.59	3.644167	81,518.00	3.636183	76	50 - 150	0.0080	+/-0.50	
M9PFNA	444417	3.6452	490,814.00	3.637217	91	50 - 150	0.0080	+/-0.50	
MPFDoA	263406.6	4.08865	377,312.00	4.08065	70	50 - 150	0.0080	+/-0.50	
D5-NEtFOSAA	86375.98	3.9615	113,617.00	3.9535	76	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	100374.4	3.88175	136,692.00	3.873767	73	50 - 150	0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY

SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike Dup (B346742-MSD1)			Lab File ID: B346742-MSD1.d			Analyzed: 08/03/23 10:01			
M8FOSA	149947	3.988567	203,271.00	3.980567	74	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	30289.07	2.52145	41,857.00	2.505033	72	50 - 150	0.0164	+/-0.50	
M2PFTA	267111.9	4.329683	404,600.00	4.329683	66	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	65253.95	3.794833	75,334.00	3.794833	87	50 - 150	0.0000	+/-0.50	
MPFBA	272103.1	1.066783	328,410.00	1.058467	83	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	156759	2.86385	153,702.00	2.847483	102	50 - 150	0.0164	+/-0.50	
M6PFDA	418272.5	3.803317	536,206.00	3.79535	78	50 - 150	0.0080	+/-0.50	
M3PFBS	140961.2	1.911533	159,311.00	1.894967	88	50 - 150	0.0166	+/-0.50	
M7PFUnA	321478.1	3.954033	471,177.00	3.946033	68	50 - 150	0.0080	+/-0.50	
M2-6:2FTS	31820	3.445283	33,267.00	3.445283	96	50 - 150	0.0000	+/-0.50	
M5PFPeA	289613.6	1.731383	323,976.00	1.7231	89	50 - 150	0.0083	+/-0.50	
M5PFHxA	493622	2.605183	545,494.00	2.596983	90	50 - 150	0.0082	+/-0.50	
M3PFHxS	76170.88	3.218333	84,448.00	3.21025	90	50 - 150	0.0081	+/-0.50	
M4PFHpA	472932.8	3.186933	509,261.00	3.178867	93	50 - 150	0.0081	+/-0.50	
M8PFOA	484446.4	3.461933	539,496.00	3.453817	90	50 - 150	0.0081	+/-0.50	
M8PFOS	65762.29	3.644167	81,518.00	3.636183	81	50 - 150	0.0080	+/-0.50	
M9PFNA	419993.8	3.6452	490,814.00	3.637217	86	50 - 150	0.0080	+/-0.50	
MPFDoA	253706	4.08865	377,312.00	4.08065	67	50 - 150	0.0080	+/-0.50	
D5-NEtFOSAA	86023.32	3.9535	113,617.00	3.9535	76	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	89764.23	3.88175	136,692.00	3.873767	66	50 - 150	0.0080	+/-0.50	

CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
<i>SOP-454 PFAS in Water</i>	
Perfluorobutanoic acid (PFBA)	NH-P,PA
Perfluorobutanesulfonic acid (PFBS)	NH-P,PA
Perfluoropentanoic acid (PFPeA)	NH-P,PA
Perfluorohexanoic acid (PFHxA)	NH-P,PA
11Cl-PF3OUdS (F53B Major)	NH-P,PA
9Cl-PF3ONS (F53B Minor)	NH-P,PA
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P,PA
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P,PA
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P,PA
Perfluorodecanoic acid (PFDA)	NH-P,PA
Perfluorododecanoic acid (PFDoA)	NH-P,PA
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	NH-P,PA
Perfluoroheptanesulfonic acid (PFHpS)	NH-P,PA
N-EtFOSAA (NEtFOSAA)	NH-P,PA
N-MeFOSAA (NMeFOSAA)	NH-P,PA
Perfluorotetradecanoic acid (PFTA)	NH-P,PA
Perfluorotridecanoic acid (PFTrDA)	NH-P,PA
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P,PA
Perfluorodecanesulfonic acid (PFDS)	NH-P,PA
Perfluorooctanesulfonamide (FOSA)	NH-P,PA
Perfluorononanesulfonic acid (PFNS)	NH-P,PA
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P,PA
Perfluoro-1-butanefulfonamide (FBSA)	NH-P,PA
Perfluorohexanesulfonic acid (PFHxS)	NH-P,PA
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P,PA
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P,PA
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P,PA
Perfluoropentanesulfonic acid (PFPeS)	NH-P,PA
Perfluoroundecanoic acid (PFUnA)	NH-P,PA
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P,PA
Perfluoroheptanoic acid (PFHpA)	NH-P,PA
Perfluorooctanoic acid (PFOA)	NH-P,PA
Perfluorooctanesulfonic acid (PFOS)	NH-P,PA
Perfluorononanoic acid (PFNA)	NH-P,PA

Con-Test, a Pace Environmental Laboratory, operates under the following certifications and accreditations:

Code	Description	Number	Expires
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2023
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2024

Company Name: <u>BETA</u>										Access COC's and Support Requests									
Address: <u>Barnstable, MA</u>										Requested Turnaround Time									
Phone: <u>508-238-1111</u>										7-Day ☐ 10-Day ☐ 15-Day ☐ 30-Day ☐									
Project Name: <u>BETA</u>										Due Date: <u>11/13/23</u>									
Project Location: <u>Barnstable, MA</u>										Rush-Approval Required ☐									
Project Number: <u>6206</u>										1-Day ☐ 3-Day ☐ 4-Day ☐									
Project Manager: <u>Roger Thibault</u>										2-Day ☐									
Pace Quote Name/Number: <u>1</u>										Data Delivery									
Invoice Recipient: <u>BETA</u>										Format: ☒ PDF ☐ EXCEL ☐									
Sampled By: <u>Laura Bouley</u>										Other: ☐									
Client Sample ID / Description										Beginning Date/Time									
1 <u>Sys #1 Inflow (new)</u>										7/13/23 9:50									
2 <u>Sys #1 Mid</u>										7/13/23 9:40									
3 <u>Sys #1 Effluent</u>										7/13/23 9:30									
4 <u>Sys #1 Effluent MSMD</u>										7/13/23 9:30									
5 <u>Sys #2 Mid</u>										7/13/23 10:10									
6 <u>Sys #2 Eff</u>										7/13/23 10:00									
Client Comments:										Ending Date/Time									
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DC#_Title: ENV-FRM-ELON-0001 v07_Sample Receiving Checklist

Effective Date: 07/13/2023

Log In Back-Sheet

Client BETAProject BETAMCP/RCP Required MA MCPDeliverable Package Requirement GW-1Location Barnstable, MAPWSID# (When Applicable) N/A

Arrival Method:

Courier ☒ Fed Ex ☐ Walk In ☐ Other ☐Received By / Date / Time MEM 7/19/23 1757Back-Sheet By / Date / Time STM 7/20/23 1534Temperature Method Gun # 4Temp X < 6° C Actual Temperature 5.1Rush Samples: Yes / ☒ No NotifyShort Hold: Yes / ☒ No Notify

Notes regarding Samples/COC outside of SOP:

Login Sample Receipt Checklist – (Rejection Criteria Listing
– Using Acceptance Policy) Any False statement will be
brought to the attention of the Client – True or False

	True	False
Received on Ice	☒	☐
Received in Cooler	☒	☐
Custody Seal: DATE TIME	☐	☒
COC Relinquished	☒	☐
COC/Samples Labels Agree	☒	☐
All Samples in Good Condition	☒	☐
Samples Received within Holding Time	☒	☐
Is there enough Volume	☒	☐
Proper Media/Container Used	☒	☐
Splitting Samples Required	☐	☒
MS/MSD	☒	☐
Trip Blanks	☐	☒
Lab to Filters	☐	☒
COC Legible	☒	☐
COC Included: (Check all included)		
Client ☒	Analysis ☒	Sampler Name ☒
Project ☒	IDs ☒	Collection Date/Time ☒
All Samples Proper pH: <u>N/A</u> ☐ ☐		

Additional Container Notes

Note: West Virginia requires all samples to have their temperature taken. Note any outliers.

Sample	Soils Jars				Ambers				Plastics							VOA Vials						Other / Fill in																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	(Circle Amb/Clear)				1 Liter		250mL		100mL	1 Liter		500mL	250mL				VOA Vials						Other / Fill in																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	16oz Amb/Clear	8oz Amb/Clear	4oz Amb/Clear	2oz Amb/Clear	Unpreserved	HCL	Sulfuric	Sulfuric	Phosphoric	HCl	Unpreserved	Sulfuric	Unpreserved	Sulfuric	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unpreserved	Unp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September 8, 2023

Roger Thibault
Beta Group, Inc. - RI
6 Blackstone Valley Place suite 101
Lincoln, RI 02865

Project Location: Barnstable, MA
Client Job Number:
Project Number: 6206
Laboratory Work Order Number: 23H3896

Enclosed are results of analyses for samples as received by the laboratory on August 25, 2023. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kaitlyn A. Feliciano
Project Manager

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332Beta Group, Inc. - RI
6 Blackstone Valley Place suite 101
Lincoln, RI 02865
ATTN: Roger Thibault

REPORT DATE: 9/8/2023

PURCHASE ORDER NUMBER: 23000936

PROJECT NUMBER: 6206

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 23H3896

The results of analyses performed on the following samples submitted to CON-TEST, a Pace Analytical Laboratory, are found in this report.

PROJECT LOCATION: Barnstable, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
INF (PRW-4)	23H3896-01	Ground Water		SOP-454 PFAS	
System #1 Mid	23H3896-02	Ground Water		SOP-454 PFAS	
System #1 Eff	23H3896-03	Ground Water		SOP-454 PFAS	
System #2 Mid	23H3896-04	Ground Water		SOP-454 PFAS	
System #2 Eff	23H3896-05	Ground Water		SOP-454 PFAS	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SOP-454 PFAS**Qualifications:****MS-22**

Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is within method specified criteria.

Analyte & Samples(s) Qualified:**9CI-PF3ONS (F53B Minor)**

B350896-MS1

Perfluoro-1-butanesulfonamide (FBSA)

B350896-MS1

Perfluoro-1-hexanesulfonamide (FHxSA)

B350896-MS1

Perfluoro-4-oxapentanoic acid (PFMPA)

B350896-MS1

Perfluoro-5-oxahexanoic acid (PFMBA)

B350896-MS1

Perfluorobutanesulfonic acid (PFBS)

B350896-MS1

Perfluorododecanoic acid (PFDoA)

B350896-MS1

Perfluorohexanoic acid (PFHxA)

B350896-MS1

Perfluorononanesulfonic acid (PFNS)

B350896-MS1

Perfluoropentanoic acid (PFPeA)

B350896-MS1

Perfluorotetradecanoic acid (PFTA)

B350896-MS1

MS-23

Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is outside of the method specified criteria. Reduced precision anticipated for any reported result for this compound.

Analyte & Samples(s) Qualified:**Perfluorodecanoic acid (PFDA)**

B350896-MS1, B350896-MSD1

PF-17

Extracted Internal Standard recovery is outside of control limits. Data is not significantly affected since associated analyte is not detected and bias is on the high side.

Analyte & Samples(s) Qualified:**M2-6:2FTS**

23H3896-04[System #2 Mid], B350896-BLK1

PF-19

Sample re-analyzed at a dilution that was re-fortified with internal standard.

Analyte & Samples(s) Qualified:**6:2 Fluorotelomersulfonic acid (6:2FTS A)**

23H3896-01RE1[INF (PRW-4)]

Perfluorohexanesulfonic acid (PFHxS)

23H3896-01RE1[INF (PRW-4)]

Perfluorooctanesulfonic acid (PFOS)

23H3896-01RE1[INF (PRW-4)]

PF-23

Qualifier ion ratio <50% of associated calibration. Detection is suspect.

Analyte & Samples(s) Qualified:**Perfluorodecanesulfonic acid (PFDS)**

23H3896-01[INF (PRW-4)]

R-06

Matrix spike duplicate RPD is outside of control limits. Reduced precision is anticipated for reported result for this compound in this sample.

Analyte & Samples(s) Qualified:

4,8-Dioxa-3H-perfluorononanoic acid (ADONA)

B350896-MSD1

Hexafluoropropylene oxide dimer acid (HFPO-DA)

B350896-MSD1

N-EtFOSAA (NEtFOSAA)

B350896-MSD1

Perfluorooctanesulfonamide (FOSA)

B350896-MSD1

S-29

Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:

M2-6:2FTS

B350896-MSD1

The results of analyses reported only relate to samples submitted to Con-Test, a Pace Analytical Laboratory, for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Lisa A. Worthington
Technical Representative

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23H3896

Date Received: 8/25/2023

Field Sample #: INF (PRW-4)

Sampled: 8/22/2023 13:40

Sample ID: 23H3896-01

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	38	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluorobutanesulfonic acid (PFBS)	11	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluoropentanoic acid (PFPeA)	140	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluorohexanoic acid (PFHxA)	140	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	27	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluorodecanoic acid (PFDA)	1.9	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluoroheptanesulfonic acid (PFHpS)	4.7	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluorodecanesulfonic acid (PFDS)	4.0	1.8	ng/L	1	PF-23	SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluorooctanesulfonamide (FOSA)	4.2	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluorononanesulfonic acid (PFNS)	2.7	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	45	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluoro-1-butanefulfonamide (FBFA)	29	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluorohexanesulfonic acid (PFHxS)	170	35	ng/L	20	PF-19	SOP-454 PFAS	9/6/23	9/7/23 13:10	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	220	35	ng/L	20	PF-19	SOP-454 PFAS	9/6/23	9/7/23 13:10	QNW
Perfluoropentanesulfonic acid (PFPeS)	19	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluoroundecanoic acid (PFUnA)	52	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluoroheptanoic acid (PFHpA)	66	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluorooctanoic acid (PFOA)	61	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW
Perfluorooctanesulfonic acid (PFOS)	180	35	ng/L	20	PF-19	SOP-454 PFAS	9/6/23	9/7/23 13:10	QNW
Perfluorononanoic acid (PFNA)	20	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:18	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23H3896

Date Received: 8/25/2023

Field Sample #: System #1 Mid

Sampled: 8/22/2023 13:10

Sample ID: 23H3896-02

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	13	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluoropentanoic acid (PFPeA)	8.5	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluorohexanoic acid (PFHxA)	4.0	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:25	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23H3896

Date Received: 8/25/2023

Field Sample #: System #1 Eff

Sampled: 8/22/2023 13:00

Sample ID: 23H3896-03

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluorooctanoic acid (PFOA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW
Perfluorononanoic acid (PFNA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:32	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23H3896

Date Received: 8/25/2023

Field Sample #: System #2 Mid

Sampled: 8/22/2023 13:25

Sample ID: 23H3896-04

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	2.9	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:39	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23H3896

Date Received: 8/25/2023

Field Sample #: System #2 Eff

Sampled: 8/22/2023 13:30

Sample ID: 23H3896-05

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Nonfluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/6/23	9/7/23 12:47	QNW

Sample Extraction Data

Prep Method:SOP 454-PFAAS Analytical Method:SOP-454 PFAS

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23H3896-01 [INF (PRW-4)]	B350896	282	1.00	09/06/23
23H3896-01RE1 [INF (PRW-4)]	B350896	282	1.00	09/06/23
23H3896-02 [System #1 Mid]	B350896	279	1.00	09/06/23
23H3896-03 [System #1 Eff]	B350896	264	1.00	09/06/23
23H3896-04 [System #2 Mid]	B350896	274	1.00	09/06/23
23H3896-05 [System #2 Eff]	B350896	271	1.00	09/06/23

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B350896 - SOP 454-PFAAS
Blank (B350896-BLK1)

Prepared: 09/06/23 Analyzed: 09/07/23

Perfluorobutanoic acid (PFBA)	ND	1.7	ng/L
Perfluorobutanesulfonic acid (PFBS)	ND	1.7	ng/L
Perfluoropentanoic acid (PFPeA)	ND	1.7	ng/L
Perfluorohexanoic acid (PFHxA)	ND	1.7	ng/L
11Cl-PF3OUdS (F53B Major)	ND	1.7	ng/L
9Cl-PF3ONS (F53B Minor)	ND	1.7	ng/L
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.7	ng/L
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.7	ng/L
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.7	ng/L
Perfluorodecanoic acid (PFDA)	ND	1.7	ng/L
Perfluorododecanoic acid (PFDoA)	ND	1.7	ng/L
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.7	ng/L
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.7	ng/L
N-EtFOSAA (NEtFOSAA)	ND	1.7	ng/L
N-MeFOSAA (NMeFOSAA)	ND	1.7	ng/L
Perfluorotetradecanoic acid (PFTA)	ND	1.7	ng/L
Perfluorotridecanoic acid (PFTrDA)	ND	1.7	ng/L
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.7	ng/L
Perfluorodecanesulfonic acid (PFDS)	ND	1.7	ng/L
Perfluorooctanesulfonamide (FOSA)	ND	1.7	ng/L
Perfluorononanesulfonic acid (PFNS)	ND	1.7	ng/L
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.7	ng/L
Perfluoro-1-butanesulfonamide (FBSA)	ND	1.7	ng/L
Perfluorohexanesulfonic acid (PFHxS)	ND	1.7	ng/L
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.7	ng/L
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.7	ng/L
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.7	ng/L
Perfluoropentanesulfonic acid (PFPeS)	ND	1.7	ng/L
Perfluoroundecanoic acid (PFUnA)	ND	1.7	ng/L
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.7	ng/L
Perfluoroheptanoic acid (PFHpA)	ND	1.7	ng/L
Perfluorooctanoic acid (PFOA)	ND	1.7	ng/L
Perfluorooctanesulfonic acid (PFOS)	ND	1.7	ng/L
Perfluorononanoic acid (PFNA)	ND	1.7	ng/L

LCS (B350896-BS1)

Prepared: 09/06/23 Analyzed: 09/07/23

Perfluorobutanoic acid (PFBA)	8.86	1.7	ng/L	8.64	103	73-129
Perfluorobutanesulfonic acid (PFBS)	7.93	1.7	ng/L	7.65	104	72-130
Perfluoropentanoic acid (PFPeA)	8.90	1.7	ng/L	8.64	103	72-129
Perfluorohexanoic acid (PFHxA)	8.80	1.7	ng/L	8.64	102	72-129
11Cl-PF3OUdS (F53B Major)	7.31	1.7	ng/L	8.14	89.7	55.1-141
9Cl-PF3ONS (F53B Minor)	7.20	1.7	ng/L	8.06	89.4	59.6-146
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.38	1.7	ng/L	8.14	103	60.3-131
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.99	1.7	ng/L	8.64	104	37.6-167
8:2 Fluorotelomersulfonic acid (8:2FTS A)	8.17	1.7	ng/L	8.30	98.5	67-138
Perfluorodecanoic acid (PFDA)	8.90	1.7	ng/L	8.64	103	71-129
Perfluorododecanoic acid (PFDoA)	9.42	1.7	ng/L	8.64	109	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	7.41	1.7	ng/L	7.69	96.3	49.4-154

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B350896 - SOP 454-PFAAS
LCS (B350896-BS1)

Prepared: 09/06/23 Analyzed: 09/07/23

Perfluoroheptanesulfonic acid (PFHpS)	9.22	1.7	ng/L	8.26		112	69-134			
N-EtFOSAA (NEtFOSAA)	9.86	1.7	ng/L	8.64		114	61-135			
N-MeFOSAA (NMeFOSAA)	9.84	1.7	ng/L	8.64		114	65-136			
Perfluorotetradecanoic acid (PFTA)	9.38	1.7	ng/L	8.64		108	71-132			
Perfluorotridecanoic acid (PFTTrDA)	9.33	1.7	ng/L	8.64		108	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	8.28	1.7	ng/L	8.08		102	63-143			
Perfluorodecanesulfonic acid (PFDS)	8.10	1.7	ng/L	8.34		97.1	53-142			
Perfluorooctanesulfonamide (FOSA)	9.44	1.7	ng/L	8.64		109	67-137			
Perfluorononanesulfonic acid (PFNS)	8.46	1.7	ng/L	8.30		102	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	7.54	1.7	ng/L	8.64		87.3	61.7-156			
Perfluoro-1-butanefulfonamide (FBSA)	8.04	1.7	ng/L	8.64		93.0	61.3-145			
Perfluorohexanesulfonic acid (PFHxS)	8.61	1.7	ng/L	7.91		109	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	7.87	1.7	ng/L	8.64		91.0	59.8-147			
Perfluoro-5-oxahexanoic acid (PFMBA)	7.42	1.7	ng/L	8.64		85.8	59.5-146			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	8.99	1.7	ng/L	8.21		109	64-140			
Perfluoropentanesulfonic acid (PFPeS)	8.54	1.7	ng/L	8.13		105	71-127			
Perfluoroundecanoic acid (PFUnA)	8.79	1.7	ng/L	8.64		102	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	8.69	1.7	ng/L	8.64		100	58.5-143			
Perfluoroheptanoic acid (PFHpA)	8.94	1.7	ng/L	8.64		103	72-130			
Perfluorooctanoic acid (PFOA)	9.58	1.7	ng/L	8.64		111	71-133			
Perfluorooctanesulfonic acid (PFOS)	8.64	1.7	ng/L	8.00		108	65-140			
Perfluorononanoic acid (PFNA)	9.11	1.7	ng/L	8.64		105	69-130			

Matrix Spike (B350896-MS1)
Source: 23H3896-05

Prepared: 09/06/23 Analyzed: 09/07/23

Perfluorobutanoic acid (PFBA)	6.69	1.8	ng/L	9.07	ND	73.7	73-129			
Perfluorobutanesulfonic acid (PFBS)	5.50	1.8	ng/L	8.03	ND	68.4	* 72-130			MS-22
Perfluoropentanoic acid (PFPeA)	6.43	1.8	ng/L	9.07	ND	70.8	* 72-129			MS-22
Perfluorohexanoic acid (PFHxA)	6.31	1.8	ng/L	9.07	ND	69.5	* 72-129			MS-22
11Cl-PF3OUdS (F53B Major)	5.16	1.8	ng/L	8.55	ND	60.3	58.3-140			
9Cl-PF3ONS (F53B Minor)	5.04	1.8	ng/L	8.46	ND	59.5	* 61.4-144			MS-22
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	5.87	1.8	ng/L	8.55	ND	68.6	62.4-128			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	6.42	1.8	ng/L	9.07	ND	70.7	36.7-171			
8:2 Fluorotelomersulfonic acid (8:2FTS A)	6.48	1.8	ng/L	8.71	ND	74.4	67-138			
Perfluorodecanoic acid (PFDA)	6.30	1.8	ng/L	9.07	ND	69.4	* 71-129			MS-23
Perfluorododecanoic acid (PFDoA)	6.45	1.8	ng/L	9.07	ND	71.1	* 72-134			MS-22
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	5.24	1.8	ng/L	8.08	ND	64.9	54.3-149			
Perfluoroheptanesulfonic acid (PFHpS)	6.72	1.8	ng/L	8.67	ND	77.6	69-134			
N-EtFOSAA (NEtFOSAA)	6.12	1.8	ng/L	9.07	ND	67.4	61-135			
N-MeFOSAA (NMeFOSAA)	7.84	1.8	ng/L	9.07	ND	86.4	65-136			
Perfluorotetradecanoic acid (PFTA)	6.24	1.8	ng/L	9.07	ND	68.8	* 71-132			MS-22
Perfluorotridecanoic acid (PFTTrDA)	6.02	1.8	ng/L	9.07	ND	66.4	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	5.91	1.8	ng/L	8.48	ND	69.7	63-143			
Perfluorodecanesulfonic acid (PFDS)	5.51	1.8	ng/L	8.76	ND	63.0	53-142			
Perfluorooctanesulfonamide (FOSA)	6.44	1.8	ng/L	9.07	ND	70.9	67-137			
Perfluorononanesulfonic acid (PFNS)	5.92	1.8	ng/L	8.71	ND	67.9	* 69-127			MS-22
Perfluoro-1-hexanesulfonamide (FHxSA)	5.33	1.8	ng/L	9.07	ND	58.7	* 64.2-154			MS-22
Perfluoro-1-butanefulfonamide (FBSA)	5.71	1.8	ng/L	9.07	ND	63.0	* 65.9-140			MS-22
Perfluorohexanesulfonic acid (PFHxS)	5.87	1.8	ng/L	8.30	ND	70.7	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	5.52	1.8	ng/L	9.07	ND	60.8	* 61.9-143			MS-22
Perfluoro-5-oxahexanoic acid (PFMBA)	5.13	1.8	ng/L	9.07	ND	56.5	* 61.4-142			MS-22

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B350896 - SOP 454-PFAAS

Matrix Spike (B350896-MS1)		Source: 23H3896-05		Prepared: 09/06/23		Analyzed: 09/07/23				
6:2 Fluorotelomersulfonic acid (6:2FTS A)	6.24	1.8	ng/L	8.62	ND	72.4	64-140			
Perfluoropentanesulfonic acid (PFPeS)	6.08	1.8	ng/L	8.53	ND	71.3	71-127			
Perfluoroundecanoic acid (PFUnA)	6.38	1.8	ng/L	9.07	ND	70.3	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	6.22	1.8	ng/L	9.07	ND	68.5	62-138			
Perfluoroheptanoic acid (PFHpA)	6.56	1.8	ng/L	9.07	ND	72.3	72-130			
Perfluorooctanoic acid (PFOA)	6.78	1.8	ng/L	9.07	ND	74.7	71-133			
Perfluorooctanesulfonic acid (PFOS)	6.03	1.8	ng/L	8.39	ND	71.8	65-140			
Perfluorononanoic acid (PFNA)	6.46	1.8	ng/L	9.07	ND	71.2	69-130			

Matrix Spike Dup (B350896-MSD1)		Source: 23H3896-05		Prepared: 09/06/23		Analyzed: 09/07/23				
Perfluorobutanoic acid (PFBA)	8.57	1.8	ng/L	8.75	ND	97.9	73-129	24.7	30	
Perfluorobutanesulfonic acid (PFBS)	7.31	1.8	ng/L	7.75	ND	94.4	72-130	28.3	30	
Perfluoropentanoic acid (PFPeA)	8.25	1.8	ng/L	8.75	ND	94.3	72-129	24.8	30	
Perfluorohexanoic acid (PFHxA)	8.11	1.8	ng/L	8.75	ND	92.7	72-129	25.0	30	
11Cl-PF3OUdS (F53B Major)	6.77	1.8	ng/L	8.24	ND	82.1	58.3-140	27.0	30	
9Cl-PF3ONS (F53B Minor)	6.38	1.8	ng/L	8.16	ND	78.2	61.4-144	23.5	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	7.96	1.8	ng/L	8.24	ND	96.5	62.4-128	30.2 *	30	R-06
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.80	1.8	ng/L	8.75	ND	101	36.7-171	31.4 *	30	R-06
8:2 Fluorotelomersulfonic acid (8:2FTS A)	7.81	1.8	ng/L	8.40	ND	93.0	67-138	18.7	30	
Perfluorodecanoic acid (PFDA)	8.68	1.8	ng/L	8.75	ND	99.1	71-129	31.7 *	30	MS-23
Perfluorododecanoic acid (PFDoA)	8.38	1.8	ng/L	8.75	ND	95.7	72-134	26.0	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	6.86	1.8	ng/L	7.79	ND	88.0	54.3-149	26.8	30	
Perfluoroheptanesulfonic acid (PFHpS)	8.20	1.8	ng/L	8.36	ND	98.1	69-134	19.8	30	
N-EtFOSAA (NEtFOSAA)	8.37	1.8	ng/L	8.75	ND	95.6	61-135	31.1 *	30	R-06
N-MeFOSAA (NMeFOSAA)	10.1	1.8	ng/L	8.75	ND	116	65-136	25.6	30	
Perfluorotetradecanoic acid (PFTA)	7.81	1.8	ng/L	8.75	ND	89.2	71-132	22.3	30	
Perfluorotridecanoic acid (PFTrDA)	7.72	1.8	ng/L	8.75	ND	88.2	65-144	24.7	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	7.94	1.8	ng/L	8.18	ND	97.0	63-143	29.3	30	
Perfluorodecanesulfonic acid (PFDS)	7.34	1.8	ng/L	8.45	ND	86.9	53-142	28.4	30	
Perfluorooctanesulfonamide (FOSA)	8.74	1.8	ng/L	8.75	ND	99.9	67-137	30.4 *	30	R-06
Perfluorononanesulfonic acid (PFNS)	7.60	1.8	ng/L	8.40	ND	90.4	69-127	24.9	30	
Perfluoro-1-hexanesulfonamide (FHxSA)	6.72	1.8	ng/L	8.75	ND	76.8	64.2-154	23.2	30	
Perfluoro-1-butanedisulfonamide (FBSA)	7.43	1.8	ng/L	8.75	ND	84.9	65.9-140	26.1	30	
Perfluorohexanesulfonic acid (PFHxS)	7.39	1.8	ng/L	8.01	ND	92.3	68-131	22.9	30	
Perfluoro-4-oxapentanoic acid (PFMPA)	7.25	1.8	ng/L	8.75	ND	82.9	61.9-143	27.1	30	
Perfluoro-5-oxahexanoic acid (PFMBA)	6.59	1.8	ng/L	8.75	ND	75.3	61.4-142	25.0	30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	7.89	1.8	ng/L	8.31	ND	94.9	64-140	23.3	30	
Perfluoropentanesulfonic acid (PFPeS)	7.48	1.8	ng/L	8.23	ND	90.9	71-127	20.7	30	
Perfluoroundecanoic acid (PFUnA)	7.87	1.8	ng/L	8.75	ND	89.9	69-133	20.9	30	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	8.14	1.8	ng/L	8.75	ND	93.0	62-138	26.7	30	
Perfluoroheptanoic acid (PFHpA)	8.19	1.8	ng/L	8.75	ND	93.6	72-130	22.0	30	
Perfluorooctanoic acid (PFOA)	8.94	1.8	ng/L	8.75	ND	102	71-133	27.4	30	
Perfluorooctanesulfonic acid (PFOS)	7.59	1.8	ng/L	8.10	ND	93.8	65-140	23.0	30	
Perfluorononanoic acid (PFNA)	8.32	1.8	ng/L	8.75	ND	95.1	69-130	25.2	30	

FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
MS-22	Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is within method specified criteria.
MS-23	Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is outside of the method specified criteria. Reduced precision anticipated for any reported result for this compound.
PF-17	Extracted Internal Standard recovery is outside of control limits. Data is not significantly affected since associated analyte is not detected and bias is on the high side.
PF-19	Sample re-analyzed at a dilution that was re-fortified with internal standard.
PF-23	Qualifier ion ratio <50% of associated calibration. Detection is suspect.
R-06	Matrix spike duplicate RPD is outside of control limits. Reduced precision is anticipated for reported result for this compound in this sample.
S-29	Extracted Internal Standard is outside of control limits.

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
INF (PRW-4) (23H3896-01) Lab File ID: 23H3896-01.d Analyzed: 09/07/23 12:18									
M8FOSA	224112.1	3.988567	295,072.00	3.988567	76	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	72589.62	2.51325	84,353.00	2.52145	86	50 - 150	-0.0082	+/-0.50	
M2PFTA	421284.9	4.30535	461,881.00	4.305367	91	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	70521.73	3.786867	87,800.00	3.786867	80	50 - 150	0.0000	+/-0.50	
MPFBA	329674.5	1.066783	441,517.00	1.066783	75	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	156976.1	2.847483	196,708.00	2.855667	80	50 - 150	-0.0082	+/-0.50	
M6PFDA	567992.2	3.787383	670,003.00	3.787383	85	50 - 150	0.0000	+/-0.50	
M3PFBS	192729	1.90325	199,443.00	1.911533	97	50 - 150	-0.0083	+/-0.50	
M7PFUnA	480264.7	3.93005	561,324.00	3.93005	86	50 - 150	0.0000	+/-0.50	
M5PFPeA	389380.8	1.731383	424,146.00	1.731383	92	50 - 150	0.0000	+/-0.50	
M5PFHxA	675140.5	2.605183	702,253.00	2.605183	96	50 - 150	0.0000	+/-0.50	
M3PFHxS	104629.7	3.21025	113,578.00	3.21025	92	50 - 150	0.0000	+/-0.50	
M4PFHpA	649335.9	3.170783	698,710.00	3.178867	93	50 - 150	-0.0081	+/-0.50	
M8PFOA	732754.9	3.445833	711,382.00	3.445833	103	50 - 150	0.0000	+/-0.50	
M8PFOS	83659.73	3.6282	109,423.00	3.6282	76	50 - 150	0.0000	+/-0.50	
M9PFNA	614390.1	3.62925	615,272.00	3.629233	100	50 - 150	0.0000	+/-0.50	
MPFDxA	363508.6	4.064667	449,736.00	4.072683	81	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	131307	3.937517	151,416.00	3.937517	87	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	143477.3	3.857667	173,530.00	3.865617	83	50 - 150	-0.0079	+/-0.50	
INF (PRW-4) (23H3896-01RE1) Lab File ID: 23H3896-01RE1.d Analyzed: 09/07/23 13:10									
M2-6:2FTS	74682.21	3.4293	67,332.00	3.429317	111	50 - 150	0.0000	+/-0.50	
M3PFHxS	135691.6	3.201883	113,578.00	3.201883	119	50 - 150	0.0000	+/-0.50	
M8PFOS	130052.2	3.6282	109,423.00	3.6282	119	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
System #1 Mid (23H3896-02)		Lab File ID: 23H3896-02.d				Analyzed: 09/07/23 12:25			
M8FOSA	217714.1	3.980583	295,072.00	3.988567	74	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	54274.43	2.51325	84,353.00	2.52145	64	50 - 150	-0.0082	+/-0.50	
M2PFTA	380949.8	4.30535	461,881.00	4.305367	82	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	53746.99	3.7789	87,800.00	3.786867	61	50 - 150	-0.0080	+/-0.50	
MPFBA	412408.8	1.066783	441,517.00	1.066783	93	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	193291.4	2.847483	196,708.00	2.855667	98	50 - 150	-0.0082	+/-0.50	
M6PFDA	545440.6	3.779417	670,003.00	3.787383	81	50 - 150	-0.0080	+/-0.50	
M3PFBS	183418.5	1.90325	199,443.00	1.911533	92	50 - 150	-0.0083	+/-0.50	
M7PFUnA	426120.3	3.93005	561,324.00	3.93005	76	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	77160.3	3.4373	67,332.00	3.4373	115	50 - 150	0.0000	+/-0.50	
M5PFPeA	387743.3	1.7231	424,146.00	1.731383	91	50 - 150	-0.0083	+/-0.50	
M5PFHxA	642668.2	2.596983	702,253.00	2.605183	92	50 - 150	-0.0082	+/-0.50	
M3PFHxS	97678.32	3.2019	113,578.00	3.21025	86	50 - 150	-0.0083	+/-0.50	
M4PFHpA	621836.6	3.170783	698,710.00	3.178867	89	50 - 150	-0.0081	+/-0.50	
M8PFOA	716100.3	3.445833	711,382.00	3.445833	101	50 - 150	0.0000	+/-0.50	
M8PFOS	87795.95	3.6282	109,423.00	3.6282	80	50 - 150	0.0000	+/-0.50	
M9PFNA	601243.2	3.629233	615,272.00	3.629233	98	50 - 150	0.0000	+/-0.50	
MPFDoA	353906.7	4.064667	449,736.00	4.072683	79	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	112837.9	3.937533	151,416.00	3.937517	75	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	129749.5	3.857667	173,530.00	3.865617	75	50 - 150	-0.0079	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
System #1 Eff (23H3896-03)		Lab File ID: 23H3896-03.d				Analyzed: 09/07/23 12:32			
M8FOSA	257628.2	3.980583	295,072.00	3.988567	87	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	59732.77	2.51325	84,353.00	2.52145	71	50 - 150	-0.0082	+/-0.50	
M2PFTA	402381.5	4.30535	461,881.00	4.305367	87	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	57049.42	3.778883	87,800.00	3.786867	65	50 - 150	-0.0080	+/-0.50	
MPFBA	451765.5	1.066783	441,517.00	1.066783	102	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	173155.5	2.847483	196,708.00	2.855667	88	50 - 150	-0.0082	+/-0.50	
M6PFDA	573803.9	3.779417	670,003.00	3.787383	86	50 - 150	-0.0080	+/-0.50	
M3PFBS	193554.5	1.90325	199,443.00	1.911533	97	50 - 150	-0.0083	+/-0.50	
M7PFUnA	474700.3	3.93005	561,324.00	3.93005	85	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	95959.16	3.445283	67,332.00	3.4373	143	50 - 150	0.0080	+/-0.50	
M5PFPeA	418164.6	1.731383	424,146.00	1.731383	99	50 - 150	0.0000	+/-0.50	
M5PFHxA	685134.8	2.596967	702,253.00	2.605183	98	50 - 150	-0.0082	+/-0.50	
M3PFHxS	104799.5	3.201883	113,578.00	3.21025	92	50 - 150	-0.0084	+/-0.50	
M4PFHpA	679198.4	3.170783	698,710.00	3.178867	97	50 - 150	-0.0081	+/-0.50	
M8PFOA	764405.2	3.445833	711,382.00	3.445833	107	50 - 150	0.0000	+/-0.50	
M8PFOS	91310.63	3.6282	109,423.00	3.6282	83	50 - 150	0.0000	+/-0.50	
M9PFNA	629960.8	3.629233	615,272.00	3.629233	102	50 - 150	0.0000	+/-0.50	
MPFDoA	386381.1	4.064667	449,736.00	4.072683	86	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	128964.9	3.937517	151,416.00	3.937517	85	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	143988.3	3.857667	173,530.00	3.865617	83	50 - 150	-0.0079	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
System #2 Mid (23H3896-04)		Lab File ID: 23H3896-04.d				Analyzed: 09/07/23 12:39			
M8FOSA	270155.6	3.980567	295,072.00	3.988567	92	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	58163.2	2.51325	84,353.00	2.52145	69	50 - 150	-0.0082	+/-0.50	
M2PFTA	434753.4	4.30535	461,881.00	4.305367	94	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	59126.55	3.778883	87,800.00	3.786867	67	50 - 150	-0.0080	+/-0.50	
MPFBA	445745.7	1.066783	441,517.00	1.066783	101	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	188178.8	2.847483	196,708.00	2.855667	96	50 - 150	-0.0082	+/-0.50	
M6PFDA	623541.2	3.779417	670,003.00	3.787383	93	50 - 150	-0.0080	+/-0.50	
M3PFBS	197876.4	1.90325	199,443.00	1.911533	99	50 - 150	-0.0083	+/-0.50	
M7PFUnA	504679.2	3.93005	561,324.00	3.93005	90	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	101939.3	3.4373	67,332.00	3.4373	151	50 - 150	0.0000	+/-0.50	*
M5PFPeA	427118	1.731383	424,146.00	1.731383	101	50 - 150	0.0000	+/-0.50	
M5PFHxA	700562.3	2.596967	702,253.00	2.605183	100	50 - 150	-0.0082	+/-0.50	
M3PFHxS	108491.1	3.201883	113,578.00	3.21025	96	50 - 150	-0.0084	+/-0.50	
M4PFHpA	691293.3	3.170783	698,710.00	3.178867	99	50 - 150	-0.0081	+/-0.50	
M8PFOA	811326.9	3.445833	711,382.00	3.445833	114	50 - 150	0.0000	+/-0.50	
M8PFOS	102349.7	3.6282	109,423.00	3.6282	94	50 - 150	0.0000	+/-0.50	
M9PFNA	680085.3	3.629233	615,272.00	3.629233	111	50 - 150	0.0000	+/-0.50	
MPFDoA	410046.3	4.064667	449,736.00	4.072683	91	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	146730.6	3.937517	151,416.00	3.937517	97	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	162016.8	3.85765	173,530.00	3.865617	93	50 - 150	-0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
System #2 Eff (23H3896-05)		Lab File ID: 23H3896-05.d				Analyzed: 09/07/23 12:47			
M8FOSA	254621.5	3.9806	295,072.00	3.988567	86	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	59014.63	2.505033	84,353.00	2.52145	70	50 - 150	-0.0164	+/-0.50	
M2PFTA	407582.1	4.297283	461,881.00	4.305367	88	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	55635.68	3.7789	87,800.00	3.786867	63	50 - 150	-0.0080	+/-0.50	
MPFBA	435030.8	1.066783	441,517.00	1.066783	99	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	163560.8	2.8393	196,708.00	2.855667	83	50 - 150	-0.0164	+/-0.50	
M6PFDA	573554.6	3.779433	670,003.00	3.787383	86	50 - 150	-0.0080	+/-0.50	
M3PFBS	186873.5	1.90325	199,443.00	1.911533	94	50 - 150	-0.0083	+/-0.50	
M7PFUnA	449065.9	3.922067	561,324.00	3.93005	80	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	79738.88	3.4373	67,332.00	3.4373	118	50 - 150	0.0000	+/-0.50	
M5PFPeA	403748.4	1.7231	424,146.00	1.731383	95	50 - 150	-0.0083	+/-0.50	
M5PFHxA	678953.4	2.596967	702,253.00	2.605183	97	50 - 150	-0.0082	+/-0.50	
M3PFHxS	104836.2	3.2019	113,578.00	3.21025	92	50 - 150	-0.0083	+/-0.50	
M4PFHpA	649378.3	3.1708	698,710.00	3.178867	93	50 - 150	-0.0081	+/-0.50	
M8PFOA	747357.4	3.43785	711,382.00	3.445833	105	50 - 150	-0.0080	+/-0.50	
M8PFOS	90882.25	3.628217	109,423.00	3.6282	83	50 - 150	0.0000	+/-0.50	
M9PFNA	623238.7	3.62925	615,272.00	3.629233	101	50 - 150	0.0000	+/-0.50	
MPFDoA	345046.7	4.064683	449,736.00	4.072683	77	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	121888.1	3.937533	151,416.00	3.937517	80	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	134064.2	3.857683	173,530.00	3.865617	77	50 - 150	-0.0079	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Blank (B350896-BLK1)			Lab File ID: B350896-BLK1.d			Analyzed: 09/07/23 11:13			
M8FOSA	259893.3	3.980583	295,072.00	3.988567	88	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	75388.81	2.51325	84,353.00	2.52145	89	50 - 150	-0.0082	+/-0.50	
M2PFTA	417949.9	4.30535	461,881.00	4.305367	90	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	87461.82	3.7789	87,800.00	3.786867	100	50 - 150	-0.0080	+/-0.50	
MPFBA	374469.2	1.058467	441,517.00	1.066783	85	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	159327	2.847483	196,708.00	2.855667	81	50 - 150	-0.0082	+/-0.50	
M6PFDA	586562.8	3.779417	670,003.00	3.787383	88	50 - 150	-0.0080	+/-0.50	
M3PFBS	182752.8	1.90325	199,443.00	1.911533	92	50 - 150	-0.0083	+/-0.50	
M7PFUnA	459220.7	3.93005	561,324.00	3.93005	82	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	106239	3.4373	67,332.00	3.4373	158	50 - 150	0.0000	+/-0.50	*
M5PFPeA	380252.1	1.7231	424,146.00	1.731383	90	50 - 150	-0.0083	+/-0.50	
M5PFHxA	661403.8	2.596983	702,253.00	2.605183	94	50 - 150	-0.0082	+/-0.50	
M3PFHxS	101183.8	3.2019	113,578.00	3.21025	89	50 - 150	-0.0083	+/-0.50	
M4PFHpA	650024.9	3.170783	698,710.00	3.178867	93	50 - 150	-0.0081	+/-0.50	
M8PFOA	763498.5	3.445833	711,382.00	3.445833	107	50 - 150	0.0000	+/-0.50	
M8PFOS	90019.09	3.6282	109,423.00	3.6282	82	50 - 150	0.0000	+/-0.50	
M9PFNA	613658.1	3.629233	615,272.00	3.629233	100	50 - 150	0.0000	+/-0.50	
MPFDoA	376566.7	4.064683	449,736.00	4.072683	84	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	131146.3	3.937533	151,416.00	3.937517	87	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	140321.6	3.857667	173,530.00	3.865617	81	50 - 150	-0.0079	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (B350896-BS1)			Lab File ID: B350896-BS1R.d			Analyzed: 09/07/23 11:34			
M8FOSA	244033.5	3.980583	295,072.00	3.988567	83	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	70886.69	2.52145	84,353.00	2.52145	84	50 - 150	0.0000	+/-0.50	
M2PFTA	417143.5	4.305383	461,881.00	4.305367	90	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	70806.94	3.7789	87,800.00	3.786867	81	50 - 150	-0.0080	+/-0.50	
MPFBA	364918.5	1.066783	441,517.00	1.066783	83	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	161803.3	2.847483	196,708.00	2.855667	82	50 - 150	-0.0082	+/-0.50	
M6PFDA	570987.3	3.779433	670,003.00	3.787383	85	50 - 150	-0.0080	+/-0.50	
M3PFBS	177419.1	1.911533	199,443.00	1.911533	89	50 - 150	0.0000	+/-0.50	
M7PFUnA	450780	3.930067	561,324.00	3.93005	80	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	97477.74	3.4373	67,332.00	3.4373	145	50 - 150	0.0000	+/-0.50	
M5PFPeA	367059.6	1.731383	424,146.00	1.731383	87	50 - 150	0.0000	+/-0.50	
M5PFHxA	643477.4	2.605183	702,253.00	2.605183	92	50 - 150	0.0000	+/-0.50	
M3PFHxS	98729.11	3.2019	113,578.00	3.21025	87	50 - 150	-0.0083	+/-0.50	
M4PFHpA	634947.3	3.1708	698,710.00	3.178867	91	50 - 150	-0.0081	+/-0.50	
M8PFOA	731055.8	3.445833	711,382.00	3.445833	103	50 - 150	0.0000	+/-0.50	
M8PFOS	89271.38	3.628217	109,423.00	3.6282	82	50 - 150	0.0000	+/-0.50	
M9PFNA	602186.3	3.62925	615,272.00	3.629233	98	50 - 150	0.0000	+/-0.50	
MPFDoA	370396.5	4.064683	449,736.00	4.072683	82	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	122096.7	3.937533	151,416.00	3.937517	81	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	144472.6	3.857667	173,530.00	3.865617	83	50 - 150	-0.0079	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike (B350896-MS1)			Lab File ID: B350896-MS1.d			Analyzed: 09/07/23 11:20			
M8FOSA	245626.3	3.980583	295,072.00	3.988567	83	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	57948.48	2.51325	84,353.00	2.52145	69	50 - 150	-0.0082	+/-0.50	
M2PFTA	402827.6	4.305367	461,881.00	4.305367	87	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	58751.91	3.7789	87,800.00	3.786867	67	50 - 150	-0.0080	+/-0.50	
MPFBA	418091.5	1.058467	441,517.00	1.066783	95	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	152692.6	2.847483	196,708.00	2.855667	78	50 - 150	-0.0082	+/-0.50	
M6PFDA	567102.4	3.779433	670,003.00	3.787383	85	50 - 150	-0.0080	+/-0.50	
M3PFBS	185318.1	1.90325	199,443.00	1.911533	93	50 - 150	-0.0083	+/-0.50	
M7PFUnA	434373.8	3.930067	561,324.00	3.93005	77	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	86602.06	3.437317	67,332.00	3.4373	129	50 - 150	0.0000	+/-0.50	
M5PFPeA	385117.1	1.7231	424,146.00	1.731383	91	50 - 150	-0.0083	+/-0.50	
M5PFHxA	647447.9	2.596983	702,253.00	2.605183	92	50 - 150	-0.0082	+/-0.50	
M3PFHxS	101669.1	3.2019	113,578.00	3.21025	90	50 - 150	-0.0083	+/-0.50	
M4PFHpA	632420.7	3.170783	698,710.00	3.178867	91	50 - 150	-0.0081	+/-0.50	
M8PFOA	729847.4	3.43785	711,382.00	3.445833	103	50 - 150	-0.0080	+/-0.50	
M8PFOS	94164.59	3.628217	109,423.00	3.6282	86	50 - 150	0.0000	+/-0.50	
M9PFNA	587999.4	3.62925	615,272.00	3.629233	96	50 - 150	0.0000	+/-0.50	
MPFDoA	346869.7	4.064683	449,736.00	4.072683	77	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	125007.5	3.937533	151,416.00	3.937517	83	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	135004.1	3.857667	173,530.00	3.865617	78	50 - 150	-0.0079	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike Dup (B350896-MSD1)			Lab File ID: B350896-MSD1.d			Analyzed: 09/07/23 11:27			
M8FOSA	250668.1	3.980583	295,072.00	3.988567	85	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	54831.89	2.52145	84,353.00	2.52145	65	50 - 150	0.0000	+/-0.50	
M2PFTA	438134.5	4.30535	461,881.00	4.305367	95	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	58343.79	3.7789	87,800.00	3.786867	66	50 - 150	-0.0080	+/-0.50	
MPFBA	465564.3	1.066783	441,517.00	1.066783	105	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	167573.8	2.847483	196,708.00	2.855667	85	50 - 150	-0.0082	+/-0.50	
M6PFDA	590790.3	3.787383	670,003.00	3.787383	88	50 - 150	0.0000	+/-0.50	
M3PFBS	193633.3	1.911533	199,443.00	1.911533	97	50 - 150	0.0000	+/-0.50	
M7PFUnA	476812.3	3.93005	561,324.00	3.93005	85	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	108814.8	3.4453	67,332.00	3.4373	162	50 - 150	0.0080	+/-0.50	*
M5PFPeA	425681.7	1.731383	424,146.00	1.731383	100	50 - 150	0.0000	+/-0.50	
M5PFHxA	700235.3	2.605183	702,253.00	2.605183	100	50 - 150	0.0000	+/-0.50	
M3PFHxS	108951.9	3.210267	113,578.00	3.21025	96	50 - 150	0.0000	+/-0.50	
M4PFHpA	674190.1	3.178867	698,710.00	3.178867	96	50 - 150	0.0000	+/-0.50	
M8PFOA	789647.1	3.445833	711,382.00	3.445833	111	50 - 150	0.0000	+/-0.50	
M8PFOS	100218.1	3.628217	109,423.00	3.6282	92	50 - 150	0.0000	+/-0.50	
M9PFNA	633822.6	3.62925	615,272.00	3.629233	103	50 - 150	0.0000	+/-0.50	
MPFDoA	363562.4	4.064667	449,736.00	4.072683	81	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	127781.4	3.937533	151,416.00	3.937517	84	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	141652	3.865617	173,530.00	3.865617	82	50 - 150	0.0000	+/-0.50	

CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
<i>SOP-454 PFAS in Water</i>	
Perfluorobutanoic acid (PFBA)	NH-P,PA,NY
Perfluorobutanesulfonic acid (PFBS)	NH-P,PA,NY
Perfluoropentanoic acid (PFPeA)	NH-P,PA,NY
Perfluorohexanoic acid (PFHxA)	NH-P,PA,NY
11Cl-PF3OUdS (F53B Major)	NH-P,PA,NY
9Cl-PF3ONS (F53B Minor)	NH-P,PA
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P,PA,NY
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P,PA,NY
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P,PA
Perfluorodecanoic acid (PFDA)	NH-P,PA,NY
Perfluorododecanoic acid (PFDoA)	NH-P,PA,NY
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	NH-P,PA,NY
Perfluoroheptanesulfonic acid (PFHpS)	NH-P,PA,NY
N-EtFOSAA (NEtFOSAA)	NH-P,PA,NY
N-MeFOSAA (NMeFOSAA)	NH-P,PA,NY
Perfluorotetradecanoic acid (PFTA)	NH-P,PA,NY
Perfluorotridecanoic acid (PFTrDA)	NH-P,PA,NY
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P,PA,NY
Perfluorodecanesulfonic acid (PFDS)	NH-P,PA
Perfluorooctanesulfonamide (FOSA)	NH-P,PA
Perfluorononanesulfonic acid (PFNS)	NH-P,PA
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P,PA
Perfluoro-1-butanefulfonamide (FBSA)	NH-P,PA
Perfluorohexanesulfonic acid (PFHxS)	NH-P,PA,NY
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P,PA,NY
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P,PA,NY
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P,PA,NY
Perfluoropentanesulfonic acid (PFPeS)	NH-P,PA,NY
Perfluoroundecanoic acid (PFUnA)	NH-P,PA,NY
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P,PA
Perfluoroheptanoic acid (PFHpA)	NH-P,PA,NY
Perfluorooctanoic acid (PFOA)	NH-P,PA,NY
Perfluorooctanesulfonic acid (PFOS)	NH-P,PA,NY
Perfluorononanoic acid (PFNA)	NH-P,PA,NY
<i>SOP-466 PFAS in Soil</i>	
Perfluorobutanoic acid (PFBA)	NH-P,PA,NY
Perfluorobutanesulfonic acid (PFBS)	NH-P,PA
Perfluoropentanoic acid (PFPeA)	NH-P,PA,NY
Perfluorohexanoic acid (PFHxA)	NH-P,PA,NY
11Cl-PF3OUdS (F53B Major)	NH-P,PA
9Cl-PF3ONS (F53B Minor)	NH-P,PA
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P,PA
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P,PA
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P,PA,NY
Perfluorodecanoic acid (PFDA)	NH-P,PA,NY
Perfluorododecanoic acid (PFDoA)	NH-P,PA,NY

CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
<i>SOP-466 PFAS in Soil</i>	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	NH-P,PA
Perfluoroheptanesulfonic acid (PFHpS)	NH-P,PA
N-EtFOSAA (NEtFOSAA)	NH-P,PA,NY
N-MeFOSAA (NMeFOSAA)	NH-P,PA
Perfluorotetradecanoic acid (PFTA)	NH-P,PA,NY
Perfluorotridecanoic acid (PFTrDA)	NH-P,PA,NY
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P,PA
Perfluorodecanesulfonic acid (PFDS)	NH-P,PA
Perfluorooctanesulfonamide (FOSA)	NH-P,PA
Perfluorononanesulfonic acid (PFNS)	NH-P,PA
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P,PA
Perfluoro-1-butanesulfonamide (FBSA)	NH-P,PA
Perfluorohexanesulfonic acid (PFHxS)	NH-P,PA
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P,PA
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P,PA
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P,PA
Perfluoropentanesulfonic acid (PFPeS)	NH-P,PA
Perfluoroundecanoic acid (PFUnA)	NH-P,PA,NY
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P,PA
Perfluoroheptanoic acid (PFHpA)	NH-P,PA,NY
Perfluorooctanoic acid (PFOA)	NH-P,PA,NY
Perfluorooctanesulfonic acid (PFOS)	NH-P,PA,NY
Perfluorononanoic acid (PFNA)	NH-P,PA,NY

Con-Test, a Pace Environmental Laboratory, operates under the following certifications and accreditations:

Code	Description	Number	Expires
NY	New York State Department of Health	10899 NELAP	04/1/2024
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2024
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2024



DC#_Title: ENV-FRM-ELON-0001 v07_Sample Receiving Checklist

Effective Date: 07/13/2023

Log In Back-Sheet

Client Beta Group Inc.

Project BETA

MCP/RCP Required N/A

Deliverable Package Requirement N/A

Location Barnstable, MA

PWSID# (When Applicable) N/A

Arrival Method:

Courier ☒ Fed Ex ☐ Walk In ☐ Other ☐

Received By / Date / Time EGR/8-25-23/1520

Back-Sheet By / Date / Time AAM/8-26-23/0801

Temperature Method Temp Gun # 5

Temp ☒ < 6° C Actual Temperature 2.0°C

Rush Samples: Yes / ☒ No Notify

Short Hold: Yes ☒ No Notify

Notes regarding Samples/COC outside of SOP:

Login Sample Receipt Checklist – (Rejection Criteria Listing
– Using Acceptance Policy) Any False statement will be
brought to the attention of the Client – True or False

	True	False
Received on Ice	☒	☐
Received in Cooler	☒	☐
Custody Seal: DATE TIME	☐	☒
COC Relinquished	☒	☐
COC/Samples Labels Agree	☒	☐
All Samples in Good Condition	☒	☐
Samples Received within Holding Time	☒	☐
Is there enough Volume	☒	☐
Proper Media/Container Used	☒	☐
Splitting Samples Required	☐	☒
MS/MSD	☒	☐
Trip Blanks	☐	☒
Lab to Filters	☐	☒
COC Legible	☒	☐
COC Included: (Check all included)		
Client ☒	Analysis ☒	Sampler Name ☒
Project ☒	IDs ☒	Collection Date/Time ☒
All Samples Proper pH: <u>N/A</u>	☐	☐

Additional Container Notes

Note: West Virginia requires all samples to have their temperature taken. Note any outliers.

[illegible]

October 9, 2023

Roger Thibault
Beta Group, Inc. - RI
701 George Washington Highway
Lincoln, RI 02865

Project Location: Barnstable, MA
Client Job Number:
Project Number: 6206
Laboratory Work Order Number: 23I1599

Enclosed are results of analyses for samples as received by the laboratory on September 13, 2023. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kaitlyn A. Feliciano
Project Manager

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332Beta Group, Inc. - RI
701 George Washington Highway
Lincoln, RI 02865
ATTN: Roger Thibault

REPORT DATE: 10/9/2023

PURCHASE ORDER NUMBER: 23000936

PROJECT NUMBER: 6206

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 2311599

The results of analyses performed on the following samples submitted to CON-TEST, a Pace Analytical Laboratory, are found in this report.

PROJECT LOCATION: Barnstable, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
INF (PRW-4)	2311599-01	Ground Water		SOP-454 PFAS	
System #1 mid	2311599-02	Ground Water		SOP-454 PFAS	
System #1 Eff	2311599-03	Ground Water		SOP-454 PFAS	
System #2 Mid	2311599-04	Ground Water		SOP-454 PFAS	
System #2 Eff	2311599-05	Ground Water		SOP-454 PFAS	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SOP-454 PFAS**Qualifications:****L-01**

Laboratory fortified blank/laboratory control sample recovery outside of control limits. Data validation is not affected since all results are "not detected" for all samples in this batch for this compound and bias is on the high side.

Analyte & Samples(s) Qualified:**N-EtFOSAA (NEtFOSAA)**

B352013-BS1

N-MeFOSAA (NMeFOSAA)

B352013-BS1

L-05

Laboratory fortified blank/laboratory control sample recovery is outside of control limits. Reported value for this compound is likely to be biased on the high side.

Analyte & Samples(s) Qualified:**6:2 Fluorotelomersulfonic acid (6:2FTS A)**

2311599-01RE1[INF (PRW-4)], 2311599-02[System #1 mid], 2311599-04[System #2 Mid], 2311599-05[System #2 Eff], B352013-BS1, B352013-MS1, B352013-MSD1

N-EtFOSAA (NEtFOSAA)

B352013-MS1, B352013-MSD1

N-MeFOSAA (NMeFOSAA)

B352013-MS1, B352013-MSD1

Perfluorobutanoic acid (PFBA)

2311599-01[INF (PRW-4)], 2311599-02[System #1 mid], 2311599-03[System #1 Eff], 2311599-04[System #2 Mid], 2311599-05[System #2 Eff], B352013-BS1, B352013-MS1, B352013-MSD1

Perfluoroheptanoic acid (PFHpA)

2311599-01[INF (PRW-4)], 2311599-02[System #1 mid], 2311599-05[System #2 Eff], B352013-BS1, B352013-MS1, B352013-MSD1

Perfluorononanesulfonic acid (PFNS)

2311599-01[INF (PRW-4)], B352013-BS1, B352013-MS1, B352013-MSD1

MS-12

Matrix spike recovery and matrix spike duplicate recovery outside of control limits. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

Analyte & Samples(s) Qualified:**6:2 Fluorotelomersulfonic acid (6:2FTS A)**

2311599-04[System #2 Mid], B352013-MS1, B352013-MSD1

N-EtFOSAA (NEtFOSAA)

B352013-MS1, B352013-MSD1

Perfluorobutanoic acid (PFBA)

2311599-04[System #2 Mid], B352013-MS1, B352013-MSD1

Perfluorodecanoic acid (PFDA)

B352013-MS1, B352013-MSD1

Perfluorohexanoic acid (PFHxA)

2311599-04[System #2 Mid], B352013-MS1, B352013-MSD1

Perfluorononanoic acid (PFNA)

B352013-MS1, B352013-MSD1

Perfluoropentanoic acid (PFPeA)

2311599-04[System #2 Mid], B352013-MS1, B352013-MSD1

Perfluoroundecanoic acid (PFUnA)

B352013-MS1, B352013-MSD1

MS-22

Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is within method specified criteria.

Analyte & Samples(s) Qualified:**8:2 Fluorotelomersulfonic acid (8:2FTS A)**

B352013-MSD1

N-MeFOSAA (NMeFOSAA)

B352013-MS1

Perfluorobutanesulfonic acid (PFBS)

B352013-MS1

Perfluorododecanoic acid (PFDoA)

B352013-MS1

Perfluoroheptanoic acid (PFHpA)

B352013-MS1

Perfluorohexanesulfonic acid (PFHxS)

2311599-04[System #2 Mid], B352013-MS1

Perfluorooctanesulfonamide (FOSA)

B352013-MS1

Perfluorooctanesulfonic acid (PFOS)

2311599-04[System #2 Mid], B352013-MSD1

Perfluoropentanesulfonic acid (PFPeS)

B352013-MS1

PF-17

Extracted Internal Standard recovery is outside of control limits. Data is not significantly affected since associated analyte is not detected and bias is on the high side.

Analyte & Samples(s) Qualified:**M3PFBS**

2311599-04[System #2 Mid]

PF-19

Sample re-analyzed at a dilution that was re-fortified with internal standard.

Analyte & Samples(s) Qualified:**6:2 Fluorotelomersulfonic acid (6:2FTS A)**

2311599-01RE1[INF (PRW-4)]

Perfluorohexanesulfonic acid (PFHxS)

2311599-01RE1[INF (PRW-4)]

Perfluorooctanesulfonic acid (PFOS)

2311599-01RE1[INF (PRW-4)]

S-29

Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:**M2-6:2FTS**

2311599-04[System #2 Mid]

M2PFTA

2311599-03[System #1 Eff]

M3PFBS

S094256-CCV4

MPFBA

2311599-04[System #2 Mid], S094256-CCV2, S094256-CCV4

MPFDoA

S094256-CCV4

V-20

Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:**11Cl-PF3OUdS (F53B Major)**

S094256-CCV2, S094256-CCV6

9Cl-PF3ONS (F53B Minor)

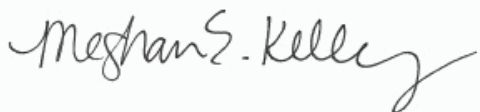
S094256-CCV2, S094256-CCV4, S094256-CCV5, S094256-CCV6

Perfluorodecanesulfonic acid (PFDS)

S094256-CCV6

The results of analyses reported only relate to samples submitted to Con-Test, a Pace Analytical Laboratory, for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Meghan E. Kelley
Reporting Specialist

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 2311599

Date Received: 9/13/2023

Field Sample #: INF (PRW-4)

Sampled: 9/8/2023 13:20

Sample ID: 2311599-01

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	36	1.9	ng/L	1	L-05	SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluorobutanesulfonic acid (PFBS)	13	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluoropentanoic acid (PFPeA)	110	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluorohexanoic acid (PFHxA)	110	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	57	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluorodecanoic acid (PFDA)	3.9	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluoroheptanesulfonic acid (PFHpS)	13	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluorodecanesulfonic acid (PFDS)	6.8	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluorooctanesulfonamide (FOSA)	5.1	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluorononanesulfonic acid (PFNS)	5.2	1.9	ng/L	1	L-05	SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	75	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluoro-1-butanefulfonamide (FBFA)	23	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluorohexanesulfonic acid (PFHxS)	180	38	ng/L	20	PF-19	SOP-454 PFAS	9/27/23	10/6/23 10:22	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	160	38	ng/L	20	L-05, PF-19	SOP-454 PFAS	9/27/23	10/6/23 10:22	RRB
Perfluoropentanesulfonic acid (PFPeS)	19	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluoroundecanoic acid (PFUnA)	65	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluoroheptanoic acid (PFHpA)	62	1.9	ng/L	1	L-05	SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluorooctanoic acid (PFOA)	61	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB
Perfluorooctanesulfonic acid (PFOS)	420	38	ng/L	20	PF-19	SOP-454 PFAS	9/27/23	10/6/23 10:22	RRB
Perfluorononanoic acid (PFNA)	33	1.9	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:24	RRB

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 2311599

Date Received: 9/13/2023

Field Sample #: System #1 mid

Sampled: 9/8/2023 13:10

Sample ID: 2311599-02

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	23	1.8	ng/L	1	L-05	SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluoropentanoic acid (PFPeA)	30	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluorohexanoic acid (PFHxA)	20	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	2.4	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluorohexanesulfonic acid (PFHxS)	12	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	12	1.8	ng/L	1	L-05	SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluoroundecanoic acid (PFUnA)	1.9	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluoroheptanoic acid (PFHpA)	6.5	1.8	ng/L	1	L-05	SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluorooctanoic acid (PFOA)	4.5	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluorooctanesulfonic acid (PFOS)	24	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:32	RRB

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 2311599

Date Received: 9/13/2023

Field Sample #: System #1 Eff

Sampled: 9/8/2023 13:00

Sample ID: 2311599-03

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	2.7	1.8	ng/L	1	L-05	SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluoropentanoic acid (PFPeA)	2.7	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Nonfluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluorooctanesulfonic acid (PFOS)	2.4	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 16:39	RRB

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 2311599

Date Received: 9/13/2023

Field Sample #: System #2 Mid

Sampled: 9/8/2023 13:40

Sample ID: 2311599-04

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	4.8	1.8	ng/L	1	L-05, MS-12	SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluoropentanoic acid (PFPeA)	5.8	1.8	ng/L	1	MS-12	SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluorohexanoic acid (PFHxA)	3.9	1.8	ng/L	1	MS-12	SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluorohexanesulfonic acid (PFHxS)	3.5	1.8	ng/L	1	MS-22	SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	4.3	1.8	ng/L	1	L-05, MS-12	SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluorooctanesulfonic acid (PFOS)	7.7	1.8	ng/L	1	MS-22	SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:03	RRB

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 2311599

Date Received: 9/13/2023

Field Sample #: System #2 Eff

Sampled: 9/8/2023 13:30

Sample ID: 2311599-05

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	5.3	1.8	ng/L	1	L-05	SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluoropentanoic acid (PFPeA)	6.4	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluorohexanoic acid (PFHxA)	4.3	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluorohexanesulfonic acid (PFHxS)	4.0	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	4.6	1.8	ng/L	1	L-05	SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluoroheptanoic acid (PFHpA)	2.0	1.8	ng/L	1	L-05	SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluorooctanoic acid (PFOA)	2.0	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluorooctanesulfonic acid (PFOS)	7.9	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	9/27/23	10/4/23 17:11	RRB

Sample Extraction Data

Prep Method:SOP 454-PFAAS **Analytical Method:**SOP-454 PFAS

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23I1599-01 [INF (PRW-4)]	B352013	265	1.00	09/27/23
23I1599-01RE1 [INF (PRW-4)]	B352013	265	1.00	09/27/23
23I1599-02 [System #1 mid]	B352013	280	1.00	09/27/23
23I1599-03 [System #1 Eff]	B352013	283	1.00	09/27/23
23I1599-04 [System #2 Mid]	B352013	271	1.00	09/27/23
23I1599-05 [System #2 Eff]	B352013	285	1.00	09/27/23

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B352013 - SOP 454-PFAAS
Blank (B352013-BLK1)

Prepared: 09/27/23 Analyzed: 10/04/23

Perfluorobutanoic acid (PFBA)	ND	1.8	ng/L
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.8	ng/L
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L
Nonfluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L

LCS (B352013-BS1)

Prepared: 09/27/23 Analyzed: 10/04/23

Perfluorobutanoic acid (PFBA)	11.9	1.8	ng/L	9.14	130	*	73-129	L-05
Perfluorobutanesulfonic acid (PFBS)	10.1	1.8	ng/L	8.09	125		72-130	
Perfluoropentanoic acid (PFPeA)	11.5	1.8	ng/L	9.14	126		72-129	
Perfluorohexanoic acid (PFHxA)	11.5	1.8	ng/L	9.14	126		72-129	
11Cl-PF3OUdS (F53B Major)	10.3	1.8	ng/L	8.61	120		43.3-138	
9Cl-PF3ONS (F53B Minor)	10.0	1.8	ng/L	8.52	117		52-140	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.26	1.8	ng/L	8.61	96.0		53.7-152	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.49	1.8	ng/L	9.14	92.9		42.1-145	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	10.9	1.8	ng/L	8.77	124		67-138	
Perfluorodecanoic acid (PFDA)	11.8	1.8	ng/L	9.14	129		71-129	
Perfluorododecanoic acid (PFDoA)	11.6	1.8	ng/L	9.14	127		72-134	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	10.2	1.8	ng/L	8.13	125		52.7-147	

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B352013 - SOP 454-PFAAS										
LCS (B352013-BS1)										
				Prepared: 09/27/23 Analyzed: 10/04/23						
Perfluoroheptanesulfonic acid (PFHpS)	11.4	1.8	ng/L	8.73		130	69-134			
N-EtFOSAA (NEtFOSAA)	13.0	1.8	ng/L	9.14		142	* 61-135			L-01
N-MeFOSAA (NMeFOSAA)	12.9	1.8	ng/L	9.14		141	* 65-136			L-01
Perfluorotetradecanoic acid (PFTA)	9.94	1.8	ng/L	9.14		109	71-132			
Perfluorotridecanoic acid (PFTTrDA)	10.5	1.8	ng/L	9.14		115	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	11.1	1.8	ng/L	8.54		130	63-143			
Perfluorodecanesulfonic acid (PFDS)	9.90	1.8	ng/L	8.82		112	53-142			
Perfluorooctanesulfonamide (FOSA)	12.0	1.8	ng/L	9.14		131	67-137			
Perfluorononanesulfonic acid (PFNS)	11.6	1.8	ng/L	8.77		132	* 69-127			L-05
Perfluoro-1-hexanesulfonamide (FHxSA)	8.77	1.8	ng/L	9.14		95.9	50-150			
Perfluoro-1-butanefulfonamide (FBSA)	8.93	1.8	ng/L	9.14		97.7	50-150			
Perfluorohexanesulfonic acid (PFHxS)	10.4	1.8	ng/L	8.36		124	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	9.82	1.8	ng/L	9.14		108	53.8-150			
Perfluoro-5-oxahexanoic acid (PFMBA)	8.84	1.8	ng/L	9.14		96.7	54.5-152			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	12.5	1.8	ng/L	8.68		144	* 64-140			L-05
Perfluoropentanesulfonic acid (PFPeS)	10.5	1.8	ng/L	8.59		122	71-127			
Perfluoroundecanoic acid (PFUnA)	12.1	1.8	ng/L	9.14		133	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	10.3	1.8	ng/L	9.14		113	50.5-159			
Perfluoroheptanoic acid (PFHpA)	12.0	1.8	ng/L	9.14		132	* 72-130			L-05
Perfluorooctanoic acid (PFOA)	11.2	1.8	ng/L	9.14		123	71-133			
Perfluorooctanesulfonic acid (PFOS)	10.6	1.8	ng/L	8.45		126	65-140			
Perfluorononanoic acid (PFNA)	11.6	1.8	ng/L	9.14		126	69-130			
Matrix Spike (B352013-MS1)										
				Source: 2311599-04		Prepared: 09/27/23 Analyzed: 10/04/23				
Perfluorobutanoic acid (PFBA)	16.3	1.7	ng/L	8.60	4.84	134	* 73-129			L-05, MS-12
Perfluorobutanesulfonic acid (PFBS)	9.99	1.7	ng/L	7.61	ND	131	* 72-130			MS-22
Perfluoropentanoic acid (PFPeA)	18.0	1.7	ng/L	8.60	5.84	141	* 72-129			MS-12
Perfluorohexanoic acid (PFHxA)	15.6	1.7	ng/L	8.60	3.91	136	* 72-129			MS-12
11Cl-PF3OUdS (F53B Major)	9.36	1.7	ng/L	8.10	ND	116	50-150			
9Cl-PF3ONS (F53B Minor)	9.88	1.7	ng/L	8.02	ND	123	50-150			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.22	1.7	ng/L	8.10	ND	101	51.4-161			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	7.55	1.7	ng/L	8.60	ND	87.8	40.3-148			
8:2 Fluorotelomersulfonic acid (8:2FTS A)	11.3	1.7	ng/L	8.26	ND	137	67-138			
Perfluorodecanoic acid (PFDA)	11.9	1.7	ng/L	8.60	ND	138	* 71-129			MS-12
Perfluorododecanoic acid (PFDoA)	11.8	1.7	ng/L	8.60	ND	137	* 72-134			MS-22
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	9.99	1.7	ng/L	7.65	ND	131	57.2-150			
Perfluoroheptanesulfonic acid (PFHpS)	11.0	1.7	ng/L	8.21	ND	134	69-134			
N-EtFOSAA (NEtFOSAA)	12.9	1.7	ng/L	8.60	ND	150	* 61-135			L-05, MS-12
N-MeFOSAA (NMeFOSAA)	12.2	1.7	ng/L	8.60	ND	142	* 65-136			L-05, MS-22
Perfluorotetradecanoic acid (PFTA)	10.2	1.7	ng/L	8.60	ND	118	71-132			
Perfluorotridecanoic acid (PFTTrDA)	10.6	1.7	ng/L	8.60	ND	123	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.6	1.7	ng/L	8.04	ND	132	63-143			
Perfluorodecanesulfonic acid (PFDS)	9.02	1.7	ng/L	8.30	ND	109	53-142			
Perfluorooctanesulfonamide (FOSA)	11.9	1.7	ng/L	8.60	ND	139	* 67-137			MS-22
Perfluorononanesulfonic acid (PFNS)	9.47	1.7	ng/L	8.26	ND	115	69-127			L-05
Perfluoro-1-hexanesulfonamide (FHxSA)	9.83	1.7	ng/L	8.60	ND	114	50-150			
Perfluoro-1-butanefulfonamide (FBSA)	8.99	1.7	ng/L	8.60	ND	105	49.5-154			
Perfluorohexanesulfonic acid (PFHxS)	13.8	1.7	ng/L	7.87	3.45	132	* 68-131			MS-22
Perfluoro-4-oxapentanoic acid (PFMPA)	9.38	1.7	ng/L	8.60	ND	109	50-150			

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B352013 - SOP 454-PFAAS										
Matrix Spike (B352013-MS1)	Source: 23I1599-04			Prepared: 09/27/23 Analyzed: 10/04/23						
Perfluoro-5-oxahexanoic acid (PFMBA)	8.42	1.7	ng/L	8.60	ND	97.9	58.1-164			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	18.8	1.7	ng/L	8.17	4.25	178 *	64-140			L-05, MS-12
Perfluoropentanesulfonic acid (PFPeS)	10.5	1.7	ng/L	8.08	ND	130 *	71-127			MS-22
Perfluoroundecanoic acid (PFUnA)	12.4	1.7	ng/L	8.60	ND	144 *	69-133			MS-12
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	9.70	1.7	ng/L	8.60	ND	113	54.6-170			
Perfluoroheptanoic acid (PFHpA)	13.4	1.7	ng/L	8.60	1.84	134 *	72-130			L-05, MS-22
Perfluorooctanoic acid (PFOA)	13.1	1.7	ng/L	8.60	1.66	133	71-133			
Perfluorooctanesulfonic acid (PFOS)	18.9	1.7	ng/L	7.95	7.73	140	65-140			
Perfluorononanoic acid (PFNA)	12.4	1.7	ng/L	8.60	ND	144 *	69-130			MS-12
Matrix Spike Dup (B352013-MSD1)	Source: 23I1599-04			Prepared: 09/27/23 Analyzed: 10/04/23						
Perfluorobutanoic acid (PFBA)	16.5	1.8	ng/L	8.88	4.84	132 *	73-129	1.27	30	L-05, MS-12
Perfluorobutanesulfonic acid (PFBS)	10.1	1.8	ng/L	7.86	ND	128	72-130	1.01	30	
Perfluoropentanoic acid (PFPeA)	17.6	1.8	ng/L	8.88	5.84	133 *	72-129	2.05	30	MS-12
Perfluorohexanoic acid (PFHxA)	15.6	1.8	ng/L	8.88	3.91	132 *	72-129	0.187	30	MS-12
11Cl-PF3OUdS (F53B Major)	10.5	1.8	ng/L	8.37	ND	125	50-150	11.3	30	
9Cl-PF3ONS (F53B Minor)	10.0	1.8	ng/L	8.28	ND	121	50-150	1.51	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.48	1.8	ng/L	8.37	ND	101	51.4-161	3.11	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.15	1.8	ng/L	8.88	ND	91.7	40.3-148	7.57	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	12.4	1.8	ng/L	8.53	ND	146 *	67-138	9.23	30	MS-22
Perfluorodecanoic acid (PFDA)	12.3	1.8	ng/L	8.88	ND	139 *	71-129	3.68	30	MS-12
Perfluorododecanoic acid (PFDoA)	11.8	1.8	ng/L	8.88	ND	133	72-134	0.155	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	9.89	1.8	ng/L	7.90	ND	125	57.2-150	1.02	30	
Perfluoroheptanesulfonic acid (PFHpS)	11.1	1.8	ng/L	8.48	ND	131	69-134	1.27	30	
N-EtFOSAA (NEtFOSAA)	12.3	1.8	ng/L	8.88	ND	138 *	61-135	4.71	30	L-05, MS-12
N-MeFOSAA (NMeFOSAA)	11.4	1.8	ng/L	8.88	ND	128	65-136	6.91	30	L-05
Perfluorotetradecanoic acid (PFTA)	9.60	1.8	ng/L	8.88	ND	108	71-132	5.79	30	
Perfluorotridecanoic acid (PFTrDA)	9.44	1.8	ng/L	8.88	ND	106	65-144	11.5	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.2	1.8	ng/L	8.30	ND	123	63-143	3.86	30	
Perfluorodecanesulfonic acid (PFDS)	9.88	1.8	ng/L	8.57	ND	115	53-142	9.07	30	
Perfluorooctanesulfonamide (FOSA)	11.7	1.8	ng/L	8.88	ND	132	67-137	1.77	30	
Perfluorononanesulfonic acid (PFNS)	10.0	1.8	ng/L	8.53	ND	118	69-127	5.86	30	L-05
Perfluoro-1-hexanesulfonamide (FHxSA)	7.74	1.8	ng/L	8.88	ND	87.2	50-150	23.8	30	
Perfluoro-1-butanefulfonamide (FBSA)	8.59	1.8	ng/L	8.88	ND	96.7	49.5-154	4.65	30	
Perfluorohexanesulfonic acid (PFHxS)	13.8	1.8	ng/L	8.13	3.45	127	68-131	0.342	30	
Perfluoro-4-oxapentanoic acid (PFMPA)	9.63	1.8	ng/L	8.88	ND	108	50-150	2.55	30	
Perfluoro-5-oxahexanoic acid (PFMBA)	8.55	1.8	ng/L	8.88	ND	96.3	58.1-164	1.59	30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	16.3	1.8	ng/L	8.44	4.25	142 *	64-140	14.6	30	L-05, MS-12
Perfluoropentanesulfonic acid (PFPeS)	10.4	1.8	ng/L	8.35	ND	124	71-127	1.80	30	
Perfluoroundecanoic acid (PFUnA)	12.2	1.8	ng/L	8.88	ND	137 *	69-133	1.47	30	MS-12
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	10.1	1.8	ng/L	8.88	ND	114	54.6-170	4.32	30	
Perfluoroheptanoic acid (PFHpA)	13.4	1.8	ng/L	8.88	1.84	130	72-130	0.164	30	L-05
Perfluorooctanoic acid (PFOA)	12.4	1.8	ng/L	8.88	1.66	121	71-133	5.57	30	
Perfluorooctanesulfonic acid (PFOS)	19.4	1.8	ng/L	8.22	7.73	142 *	65-140	2.53	30	MS-22
Perfluorononanoic acid (PFNA)	12.4	1.8	ng/L	8.88	ND	140 *	69-130	0.674	30	MS-12

FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
L-01	Laboratory fortified blank/laboratory control sample recovery outside of control limits. Data validation is not affected since all results are "not detected" for all samples in this batch for this compound and bias is on the high side.
L-05	Laboratory fortified blank/laboratory control sample recovery is outside of control limits. Reported value for this compound is likely to be biased on the high side.
MS-12	Matrix spike recovery and matrix spike duplicate recovery outside of control limits. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.
MS-22	Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is within method specified criteria.
PF-17	Extracted Internal Standard recovery is outside of control limits. Data is not significantly affected since associated analyte is not detected and bias is on the high side.
PF-19	Sample re-analyzed at a dilution that was re-fortified with internal standard.
S-29	Extracted Internal Standard is outside of control limits.
V-20	Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
INF (PRW-4) (23I1599-01) Lab File ID: 23I1599-01.d Analyzed: 10/04/23 16:24									
M8FOSA	502991.9	4.02055	608,759.00	4.0206	83	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	153102.3	2.537883	153,326.00	2.5461	100	50 - 150	-0.0082	+/-0.50	
M2PFTA	2133414	4.345933	2,591,570.00	4.345984	82	50 - 150	-0.0001	+/-0.50	
M2-8:2FTS	199013.7	3.818733	170,096.00	3.818767	117	50 - 150	0.0000	+/-0.50	
MPFBA	1112117	1.0917	966,534.00	1.0917	115	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	181354.8	2.880217	221,694.00	2.880217	82	50 - 150	0.0000	+/-0.50	
M6PFDA	1109524	3.81925	1,154,485.00	3.819283	96	50 - 150	0.0000	+/-0.50	
M3PFBS	283240.5	1.9364	276,059.00	1.9364	103	50 - 150	0.0000	+/-0.50	
M7PFUnA	1343094	3.970017	1,473,612.00	3.970067	91	50 - 150	0.0000	+/-0.50	
M5PFPeA	884944.4	1.757717	847,074.00	1.757717	104	50 - 150	0.0000	+/-0.50	
M5PFHxA	1311536	2.629833	1,335,060.00	2.629833	98	50 - 150	0.0000	+/-0.50	
M3PFHxS	244294.8	3.242583	259,138.00	3.242583	94	50 - 150	0.0000	+/-0.50	
M4PFHpA	1441482	3.203083	1,457,383.00	3.203083	99	50 - 150	0.0000	+/-0.50	
M8PFOA	1641739	3.477917	1,593,269.00	3.477917	103	50 - 150	0.0000	+/-0.50	
M8PFOS	168505.2	3.668133	219,776.00	3.668167	77	50 - 150	0.0000	+/-0.50	
M9PFNA	987798.5	3.669167	1,104,239.00	3.6692	89	50 - 150	0.0000	+/-0.50	
MPFDaA	1701253	4.104633	1,939,189.00	4.104683	88	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	275794.5	3.977483	306,548.00	3.977533	90	50 - 150	-0.0001	+/-0.50	
D3-NMeFOSAA	330255.1	3.897717	349,587.00	3.897767	94	50 - 150	0.0000	+/-0.50	
INF (PRW-4) (23I1599-01RE1) Lab File ID: 23I0599-01RE1.d Analyzed: 10/06/23 10:22									
M2-6:2FTS	132044.1	3.445283	113,214.00	3.4453	117	50 - 150	0.0000	+/-0.50	
M3PFHxS	262263.1	3.218333	233,415.00	3.218333	112	50 - 150	0.0000	+/-0.50	
M8PFOS	230827.5	3.652167	183,737.00	3.652167	126	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
System #1 mid (23I1599-02)		Lab File ID: 23I1599-02.d				Analyzed: 10/04/23 16:32			
M8FOSA	398178.3	4.02055	608,759.00	4.0206	65	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	79427.07	2.5461	153,326.00	2.5461	52	50 - 150	0.0000	+/-0.50	
M2PFTA	1465864	4.345933	2,591,570.00	4.345984	57	50 - 150	-0.0001	+/-0.50	
M2-8:2FTS	98817.96	3.818733	170,096.00	3.818767	58	50 - 150	0.0000	+/-0.50	
MPFBA	959886.8	1.0917	966,534.00	1.0917	99	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	152296	2.880217	221,694.00	2.880217	69	50 - 150	0.0000	+/-0.50	
M6PFDA	810910.4	3.819267	1,154,485.00	3.819283	70	50 - 150	0.0000	+/-0.50	
M3PFBS	221874.4	1.9364	276,059.00	1.9364	80	50 - 150	0.0000	+/-0.50	
M7PFUnA	1024233	3.970017	1,473,612.00	3.970067	70	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	91467.59	3.4694	117,714.00	3.4694	78	50 - 150	0.0000	+/-0.50	
M5PFPeA	701120	1.757717	847,074.00	1.757717	83	50 - 150	0.0000	+/-0.50	
M5PFHxA	1038248	2.629833	1,335,060.00	2.629833	78	50 - 150	0.0000	+/-0.50	
M3PFHxS	187883.3	3.242583	259,138.00	3.242583	73	50 - 150	0.0000	+/-0.50	
M4PFHpA	1127346	3.203083	1,457,383.00	3.203083	77	50 - 150	0.0000	+/-0.50	
M8PFOA	1277839	3.4779	1,593,269.00	3.477917	80	50 - 150	0.0000	+/-0.50	
M8PFOS	142363	3.66015	219,776.00	3.668167	65	50 - 150	-0.0080	+/-0.50	
M9PFNA	845899	3.669167	1,104,239.00	3.6692	77	50 - 150	0.0000	+/-0.50	
MPFDoA	1217230	4.10465	1,939,189.00	4.104683	63	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	207514.1	3.9695	306,548.00	3.977533	68	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	237911.6	3.897733	349,587.00	3.897767	68	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
System #1 Eff (23I1599-03)		Lab File ID: 23I1599-03.d				Analyzed: 10/04/23 16:39			
M8FOSA	383069.7	4.020566	608,759.00	4.0206	63	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	82459.18	2.5461	153,326.00	2.5461	54	50 - 150	0.0000	+/-0.50	
M2PFTA	1231673	4.34595	2,591,570.00	4.345984	48	50 - 150	0.0000	+/-0.50	*
M2-8:2FTS	86878.02	3.81875	170,096.00	3.818767	51	50 - 150	0.0000	+/-0.50	
MPFBA	976329	1.0917	966,534.00	1.0917	101	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	197765.6	2.880217	221,694.00	2.880217	89	50 - 150	0.0000	+/-0.50	
M6PFDA	765456.9	3.819267	1,154,485.00	3.819283	66	50 - 150	0.0000	+/-0.50	
M3PFBS	227664.8	1.9364	276,059.00	1.9364	82	50 - 150	0.0000	+/-0.50	
M7PFUnA	865512.4	3.970033	1,473,612.00	3.970067	59	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	82092.88	3.4694	117,714.00	3.4694	70	50 - 150	0.0000	+/-0.50	
M5PFPeA	698239.1	1.757717	847,074.00	1.757717	82	50 - 150	0.0000	+/-0.50	
M5PFHxA	1041217	2.629833	1,335,060.00	2.629833	78	50 - 150	0.0000	+/-0.50	
M3PFHxS	186116.5	3.242583	259,138.00	3.242583	72	50 - 150	0.0000	+/-0.50	
M4PFHpA	1104232	3.2031	1,457,383.00	3.203083	76	50 - 150	0.0000	+/-0.50	
M8PFOA	1195673	3.477917	1,593,269.00	3.477917	75	50 - 150	0.0000	+/-0.50	
M8PFOS	148823.9	3.668133	219,776.00	3.668167	68	50 - 150	0.0000	+/-0.50	
M9PFNA	813810.8	3.669183	1,104,239.00	3.6692	74	50 - 150	0.0000	+/-0.50	
MPFDoA	1003017	4.10465	1,939,189.00	4.104683	52	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	163398.7	3.9775	306,548.00	3.977533	53	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	185082.7	3.897733	349,587.00	3.897767	53	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
System #2 Mid (2311599-04)		Lab File ID: WorklistData-0084.d				Analyzed: 10/04/23 17:03			
M8FOSA	681424.6	4.020566	608,759.00	4.020566	112	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	152217.3	2.5461	153,326.00	2.537883	99	50 - 150	0.0082	+/-0.50	
M2PFTA	3107209	4.34595	2,591,570.00	4.34595	120	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	200458.7	3.81875	170,096.00	3.81875	118	50 - 150	0.0000	+/-0.50	
MPFBA	1608145	1.0917	966,534.00	1.0917	166	50 - 150	0.0000	+/-0.50	*
M3HFPO-DA	280488	2.880217	221,694.00	2.872033	127	50 - 150	0.0082	+/-0.50	
M6PFDA	1474353	3.819267	1,154,485.00	3.819267	128	50 - 150	0.0000	+/-0.50	
M3PFBS	427189.5	1.9364	276,059.00	1.9364	155	50 - 150	0.0000	+/-0.50	*
M7PFUnA	1887008	3.970033	1,473,612.00	3.970033	128	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	204084.5	3.4694	117,714.00	3.461417	173	50 - 150	0.0080	+/-0.50	*
M5PFPeA	1224884	1.757717	847,074.00	1.757717	145	50 - 150	0.0000	+/-0.50	
M5PFHxA	1866385	2.629833	1,335,060.00	2.629833	140	50 - 150	0.0000	+/-0.50	
M3PFHxS	362389.7	3.242583	259,138.00	3.2345	140	50 - 150	0.0081	+/-0.50	
M4PFHpA	2017810	3.2031	1,457,383.00	3.2031	138	50 - 150	0.0000	+/-0.50	
M8PFOA	2320021	3.477917	1,593,269.00	3.477917	146	50 - 150	0.0000	+/-0.50	
M8PFOS	282449.8	3.668133	219,776.00	3.660167	129	50 - 150	0.0080	+/-0.50	
M9PFNA	1479820	3.669183	1,104,239.00	3.6612	134	50 - 150	0.0080	+/-0.50	
MPFDoA	2353265	4.10465	1,939,189.00	4.104667	121	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	375287.2	3.9775	306,548.00	3.969517	122	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	434732.8	3.897733	349,587.00	3.897733	124	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
System #2 Eff (23I1599-05)		Lab File ID: WorklistData-0085.d				Analyzed: 10/04/23 17:11			
M8FOSA	445318.1	4.02055	608,759.00	4.020566	73	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	96442.66	2.5461	153,326.00	2.537883	63	50 - 150	0.0082	+/-0.50	
M2PFTA	1647924	4.345933	2,591,570.00	4.34595	64	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	100688.5	3.81875	170,096.00	3.81875	59	50 - 150	0.0000	+/-0.50	
MPFBA	1112217	1.0917	966,534.00	1.0917	115	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	185898.3	2.880217	221,694.00	2.872033	84	50 - 150	0.0082	+/-0.50	
M6PFDA	931871.6	3.819267	1,154,485.00	3.819267	81	50 - 150	0.0000	+/-0.50	
M3PFBS	264779.8	1.9364	276,059.00	1.9364	96	50 - 150	0.0000	+/-0.50	
M7PFUnA	1121246	3.970033	1,473,612.00	3.970033	76	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	99879.36	3.4694	117,714.00	3.461417	85	50 - 150	0.0080	+/-0.50	
M5PFPeA	813520.6	1.757717	847,074.00	1.757717	96	50 - 150	0.0000	+/-0.50	
M5PFHxA	1195217	2.629833	1,335,060.00	2.629833	90	50 - 150	0.0000	+/-0.50	
M3PFHxS	226921.6	3.242583	259,138.00	3.2345	88	50 - 150	0.0081	+/-0.50	
M4PFHpA	1289460	3.2031	1,457,383.00	3.2031	88	50 - 150	0.0000	+/-0.50	
M8PFOA	1372981	3.477917	1,593,269.00	3.477917	86	50 - 150	0.0000	+/-0.50	
M8PFOS	176077.9	3.66015	219,776.00	3.660167	80	50 - 150	0.0000	+/-0.50	
M9PFNA	1011737	3.669167	1,104,239.00	3.6612	92	50 - 150	0.0080	+/-0.50	
MPFDoA	1351229	4.10465	1,939,189.00	4.104667	70	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	227085.4	3.9695	306,548.00	3.969517	74	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	242738	3.897733	349,587.00	3.897733	69	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Blank (B352013-BLK1)			Lab File ID: B352013-BLK1.d			Analyzed: 10/04/23 10:46			
M8FOSA	482430.9	4.020566	608,759.00	4.02055	79	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	136051.4	2.5543	153,326.00	2.562517	89	50 - 150	-0.0082	+/-0.50	
M2PFTA	1904733	4.354067	2,591,570.00	4.354067	73	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	148694.4	3.827083	170,096.00	3.827067	87	50 - 150	0.0000	+/-0.50	
MPFBA	1042060	1.0917	966,534.00	1.100017	108	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	191996.9	2.8884	221,694.00	2.896583	87	50 - 150	-0.0082	+/-0.50	
M6PFDA	963909.2	3.827567	1,154,485.00	3.827567	83	50 - 150	0.0000	+/-0.50	
M3PFBS	268185.8	1.944683	276,059.00	1.95315	97	50 - 150	-0.0085	+/-0.50	
M7PFUnA	1209219	3.970033	1,473,612.00	3.978017	82	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	143986.5	3.4694	117,714.00	3.4694	122	50 - 150	0.0000	+/-0.50	
M5PFPeA	818873.4	1.766017	847,074.00	1.7743	97	50 - 150	-0.0083	+/-0.50	
M5PFHxA	1191315	2.646767	1,335,060.00	2.646767	89	50 - 150	0.0000	+/-0.50	
M3PFHxS	228695.4	3.242583	259,138.00	3.242583	88	50 - 150	0.0000	+/-0.50	
M4PFHpA	1279267	3.21145	1,457,383.00	3.21145	88	50 - 150	0.0000	+/-0.50	
M8PFOA	1460210	3.4859	1,593,269.00	3.4859	92	50 - 150	0.0000	+/-0.50	
M8PFOS	189436	3.668133	219,776.00	3.668133	86	50 - 150	0.0000	+/-0.50	
M9PFNA	994646.2	3.669183	1,104,239.00	3.669167	90	50 - 150	0.0000	+/-0.50	
MPFDoA	1467709	4.11265	1,939,189.00	4.112633	76	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	262839.7	3.9775	306,548.00	3.985483	86	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	285264.3	3.897733	349,587.00	3.905917	82	50 - 150	-0.0082	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (B352013-BS1)		Lab File ID: B352013-BS1.d				Analyzed: 10/04/23 10:38			
M8FOSA	406779.4	4.02055	608,759.00	4.02055	67	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	117689.7	2.5543	153,326.00	2.562517	77	50 - 150	-0.0082	+/-0.50	
M2PFTA	1723446	4.354067	2,591,570.00	4.354067	67	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	146023.4	3.827067	170,096.00	3.827067	86	50 - 150	0.0000	+/-0.50	
MPFBA	921268.3	1.0917	966,534.00	1.100017	95	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	167697.3	2.8884	221,694.00	2.896583	76	50 - 150	-0.0082	+/-0.50	
M6PFDA	851913.9	3.82755	1,154,485.00	3.827567	74	50 - 150	0.0000	+/-0.50	
M3PFBS	237300.5	1.95315	276,059.00	1.95315	86	50 - 150	0.0000	+/-0.50	
M7PFUnA	1062058	3.970017	1,473,612.00	3.978017	72	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	111588.1	3.4694	117,714.00	3.4694	95	50 - 150	0.0000	+/-0.50	
M5PFPeA	707391.9	1.766017	847,074.00	1.7743	84	50 - 150	-0.0083	+/-0.50	
M5PFHxA	1054660	2.646767	1,335,060.00	2.646767	79	50 - 150	0.0000	+/-0.50	
M3PFHxS	202363.5	3.242583	259,138.00	3.242583	78	50 - 150	0.0000	+/-0.50	
M4PFHpA	1130664	3.21145	1,457,383.00	3.21145	78	50 - 150	0.0000	+/-0.50	
M8PFOA	1280627	3.485883	1,593,269.00	3.4859	80	50 - 150	0.0000	+/-0.50	
M8PFOS	158095	3.668133	219,776.00	3.668133	72	50 - 150	0.0000	+/-0.50	
M9PFNA	888899.3	3.669167	1,104,239.00	3.669167	80	50 - 150	0.0000	+/-0.50	
MPFDoA	1308083	4.112633	1,939,189.00	4.112633	67	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	219380.5	3.977483	306,548.00	3.985483	72	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	242824.8	3.897717	349,587.00	3.905917	69	50 - 150	-0.0082	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike (B352013-MS1)			Lab File ID: B352013-MS1.d			Analyzed: 10/04/23 10:53			
M8FOSA	411998	4.02055	608,759.00	4.02055	68	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	85843.98	2.5543	153,326.00	2.562517	56	50 - 150	-0.0082	+/-0.50	
M2PFTA	1536372	4.354067	2,591,570.00	4.354067	59	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	125709.8	3.827067	170,096.00	3.827067	74	50 - 150	0.0000	+/-0.50	
MPFBA	936510.4	1.0917	966,534.00	1.100017	97	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	189815	2.8884	221,694.00	2.896583	86	50 - 150	-0.0082	+/-0.50	
M6PFDA	833400.5	3.82755	1,154,485.00	3.827567	72	50 - 150	0.0000	+/-0.50	
M3PFBS	233469.4	1.944683	276,059.00	1.95315	85	50 - 150	-0.0085	+/-0.50	
M7PFUnA	981473.8	3.970033	1,473,612.00	3.978017	67	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	97617.72	3.4694	117,714.00	3.4694	83	50 - 150	0.0000	+/-0.50	
M5PFPeA	715238.8	1.766017	847,074.00	1.7743	84	50 - 150	-0.0083	+/-0.50	
M5PFHxA	1061703	2.646767	1,335,060.00	2.646767	80	50 - 150	0.0000	+/-0.50	
M3PFHxS	187917	3.242583	259,138.00	3.242583	73	50 - 150	0.0000	+/-0.50	
M4PFHpA	1094159	3.21145	1,457,383.00	3.21145	75	50 - 150	0.0000	+/-0.50	
M8PFOA	1215909	3.4859	1,593,269.00	3.4859	76	50 - 150	0.0000	+/-0.50	
M8PFOS	158550	3.668133	219,776.00	3.668133	72	50 - 150	0.0000	+/-0.50	
M9PFNA	855444.9	3.669167	1,104,239.00	3.669167	77	50 - 150	0.0000	+/-0.50	
MPFDoA	1187565	4.112633	1,939,189.00	4.112633	61	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	201791	3.9775	306,548.00	3.985483	66	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	246056	3.897733	349,587.00	3.905917	70	50 - 150	-0.0082	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike Dup (B352013-MSD1)			Lab File ID: B352013-MSD1.d			Analyzed: 10/04/23 11:01			
M8FOSA	345569.2	4.02055	608,759.00	4.02055	57	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	99462.17	2.554317	153,326.00	2.562517	65	50 - 150	-0.0082	+/-0.50	
M2PFTA	2546910	4.35405	2,591,570.00	4.354067	98	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	154324.7	3.827067	170,096.00	3.827067	91	50 - 150	0.0000	+/-0.50	
MPFBA	1150971	1.100017	966,534.00	1.100017	119	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	227289.8	2.8884	221,694.00	2.896583	103	50 - 150	-0.0082	+/-0.50	
M6PFDA	1070423	3.82755	1,154,485.00	3.827567	93	50 - 150	0.0000	+/-0.50	
M3PFBS	294833.3	1.95315	276,059.00	1.95315	107	50 - 150	0.0000	+/-0.50	
M7PFUnA	1340177	3.970017	1,473,612.00	3.978017	91	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	145928.9	3.477383	117,714.00	3.4694	124	50 - 150	0.0080	+/-0.50	
M5PFPeA	893621.8	1.766017	847,074.00	1.7743	105	50 - 150	-0.0083	+/-0.50	
M5PFHxA	1321037	2.646767	1,335,060.00	2.646767	99	50 - 150	0.0000	+/-0.50	
M3PFHxS	243520.8	3.242583	259,138.00	3.242583	94	50 - 150	0.0000	+/-0.50	
M4PFHpA	1399694	3.21145	1,457,383.00	3.21145	96	50 - 150	0.0000	+/-0.50	
M8PFOA	1585282	3.4859	1,593,269.00	3.4859	99	50 - 150	0.0000	+/-0.50	
M8PFOS	197425.4	3.668133	219,776.00	3.668133	90	50 - 150	0.0000	+/-0.50	
M9PFNA	1094566	3.669167	1,104,239.00	3.669167	99	50 - 150	0.0000	+/-0.50	
MPFDoA	1665500	4.112633	1,939,189.00	4.112633	86	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	256425	3.9775	306,548.00	3.985483	84	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	307822.9	3.897733	349,587.00	3.905917	88	50 - 150	-0.0082	+/-0.50	

CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
<i>SOP-454 PFAS in Water</i>	
Perfluorobutanoic acid (PFBA)	NH-P,PA,NY
Perfluorobutanesulfonic acid (PFBS)	NH-P,PA,NY
Perfluoropentanoic acid (PFPeA)	NH-P,PA,NY
Perfluorohexanoic acid (PFHxA)	NH-P,PA,NY
11Cl-PF3OUdS (F53B Major)	NH-P,PA,NY
9Cl-PF3ONS (F53B Minor)	NH-P,PA
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P,PA,NY
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P,PA,NY
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P,PA
Perfluorodecanoic acid (PFDA)	NH-P,PA,NY
Perfluorododecanoic acid (PFDoA)	NH-P,PA,NY
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	NH-P,PA,NY
Perfluoroheptanesulfonic acid (PFHpS)	NH-P,PA,NY
N-EtFOSAA (NEtFOSAA)	NH-P,PA,NY
N-MeFOSAA (NMeFOSAA)	NH-P,PA,NY
Perfluorotetradecanoic acid (PFTA)	NH-P,PA,NY
Perfluorotridecanoic acid (PFTrDA)	NH-P,PA,NY
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P,PA,NY
Perfluorodecanesulfonic acid (PFDS)	NH-P,PA
Perfluorooctanesulfonamide (FOSA)	NH-P,PA
Perfluorononanesulfonic acid (PFNS)	NH-P,PA
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P,PA
Perfluoro-1-butanedisulfonamide (FBSA)	NH-P,PA
Perfluorohexanesulfonic acid (PFHxS)	NH-P,PA,NY
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P,PA,NY
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P,PA,NY
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P,PA,NY
Perfluoropentanesulfonic acid (PFPeS)	NH-P,PA,NY
Perfluoroundecanoic acid (PFUnA)	NH-P,PA,NY
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P,PA
Perfluoroheptanoic acid (PFHpA)	NH-P,PA,NY
Perfluorooctanoic acid (PFOA)	NH-P,PA,NY
Perfluorooctanesulfonic acid (PFOS)	NH-P,PA,NY
Perfluorononanoic acid (PFNA)	NH-P,PA,NY

Con-Test, a Pace Environmental Laboratory, operates under the following certifications and accreditations:

Code	Description	Number	Expires
NY	New York State Department of Health	10899 NELAP	04/1/2024
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2024
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2024

Company Name: BETA Group Inc. Address: 701 George Washington Hwy, Lincoln, RI Phone: _____ Project Name: BETA Project Location: Barnstable, MA Project Number: 6206 Project Manager: Roger Thibault Con-Test Quote Name/Number: _____ Invoice Recipient: Stacy Wildanger - AP@BETA-inc.com Sampled By: Laura Bouley		Fax: 413-525-6405 Email: info@contestlabs.com 7-Day ☐ 10-Day ☐ PPAS 15-Day (Std) ☒ Due Date: _____ 1-Day ☐ 3-Day ☐ 2-Day ☐ 4-Day ☐ Format: PDF ☒ EXCEL ☒ Other: _____ CLP Like Data Pkg Required: ☐ Email To: rhibault@beta-inc.com Fax To #: _____ SOXHLET ☐ NON SOXHLET ☐	
Con-Test Work Order# 1 INF (PRW-4) 2 System #1 Mid 3 System #1 Eff 4 System #2 Mid 5 System #2 Eff 6 System #2 Mid MS/MSD*		Beginning Date/Time 9/8/2023 13:20 9/8/2023 13:10 9/8/2023 13:00 9/8/2023 13:40 9/8/2023 13:30 9/8/2023 13:40	
Matrix Code GW H GW M-L GW L GW M-L GW M-L GW M-L		VIALS 2 2 2 2 2 2	
GLASS 2 2 2 2 2 2		PLASTIC 2 2 2 2 2 2	
BACTERIA 2 2 2 2 2 2		ENCORE 2 2 2 2 2 2	
Client Comments: Lab requested MS/MSD - Sample confirmation and report to rhibault@beta-inc.com & lbouley@beta-inc.com			
Relinquished By: (signature) <i>[Signature]</i> Date/Time: 9/18/23 18:00			
Received By: (signature) <i>[Signature]</i> Date/Time: 9/18/23 18:00			
Relinquished By: (signature) <i>[Signature]</i> Date/Time: 9/13/23 23:00			
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DC#_Title: ENV-FRM-ELON-0001 v07_Sample Receiving Checklist

Effective Date: 07/13/2023

Log In Back-Sheet

Client BETA
Project Barnstable, MA
MCP/RCP Required MA MCP
Deliverable Package Requirement GW-1
Location Barnstable, MA
PWSID# (When Applicable) NA
Arrival Method:
Courier ☒ Fed Ex ☐ Walk In ☐ Other ☐
Received By / Date / Time STM 9/13/23 1615
Back-Sheet By / Date / Time GC 9/13/23 1646
Temperature Method gun # 5
Temp < 6° C Actual Temperature 3.4
Rush Samples: Yes / ☒ No Notify _____
Short Hold: Yes / ☒ No Notify _____

Notes regarding Samples/COC outside of SOP:

Login Sample Receipt Checklist – (Rejection Criteria Listing
– Using Acceptance Policy) Any False statement will be
brought to the attention of the Client – True or False

	True	False
Received on Ice	☒	☐
Received in Cooler	☒	☐
Custody Seal: DATE TIME	☐	☒
COC Relinquished	☒	☐
COC/Samples Labels Agree	☒	☐
All Samples in Good Condition	☒	☐
Samples Received within Holding Time	☒	☐
Is there enough Volume	☒	☐
Proper Media/Container Used	☒	☐
Splitting Samples Required	☐	☒
MS/MSD	☒	☐
Trip Blanks	☐	☒
Lab to Filters	☐	☒
COC Legible	☒	☐
COC Included: (Check all included)		
Client ☒ Analysis ☒ Sampler Name ☒		
Project ☒ IDs ☒ Collection Date/Time ☒		
All Samples Proper pH: <u>N/A</u>	☐	☐

Additional Container Notes

Note: West Virginia requires all samples to have their
temperature taken. Note any outliers.

October 27, 2023

Roger Thibault
Beta Group, Inc. - RI
701 George Washington Highway
Lincoln, RI 02865

Project Location: Barnstable, MA
Client Job Number:
Project Number: 6206
Laboratory Work Order Number: 23J2019

Enclosed are results of analyses for samples as received by the laboratory on October 13, 2023. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kaitlyn A. Feliciano
Project Manager

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Chain of Custody/Sample Receipt	27

Beta Group, Inc. - RI
701 George Washington Highway
Lincoln, RI 02865
ATTN: Roger Thibault

REPORT DATE: 10/27/2023

PURCHASE ORDER NUMBER: 23000936

PROJECT NUMBER: 6206

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 23J2019

The results of analyses performed on the following samples submitted to CON-TEST, a Pace Analytical Laboratory, are found in this report.

PROJECT LOCATION: Barnstable, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
INF (PRW-4)	23J2019-01	Ground Water		SOP-454 PFAS	
System #1 Mid	23J2019-02	Ground Water		SOP-454 PFAS	
System #1 Eff	23J2019-03	Ground Water		SOP-454 PFAS	
System #2 Mid	23J2019-04	Ground Water		SOP-454 PFAS	
System #2 Eff	23J2019-05	Ground Water		SOP-454 PFAS	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SOP-454 PFAS**Qualifications:****L-01**

Laboratory fortified blank/laboratory control sample recovery outside of control limits. Data validation is not affected since all results are "not detected" for all samples in this batch for this compound and bias is on the high side.

Analyte & Samples(s) Qualified:**N-MeFOSAA (NMeFOSAA)**

B355533-BS1

MS-12

Matrix spike recovery and matrix spike duplicate recovery outside of control limits. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

Analyte & Samples(s) Qualified:**N-EtFOSAA (NEtFOSAA)**

B355533-MS1, B355533-MSD1

N-MeFOSAA (NMeFOSAA)

B355533-MS1, B355533-MSD1

MS-19

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:**6:2 Fluorotelomersulfonic acid (6:2FTS A)**

23J2019-01[INF (PRW-4)], B355533-MS1, B355533-MSD1

8:2 Fluorotelomersulfonic acid (8:2FTS A)

23J2019-01[INF (PRW-4)], B355533-MS1, B355533-MSD1

Perfluorohexanoic acid (PFHxA)

23J2019-01[INF (PRW-4)], B355533-MS1, B355533-MSD1

Perfluorooctanesulfonic acid (PFOS)

23J2019-01RE1[INF (PRW-4)], B355533-MS1, B355533-MSD1

Perfluoropentanoic acid (PFPeA)

23J2019-01[INF (PRW-4)], B355533-MSD1

MS-22

Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is within method specified criteria.

Analyte & Samples(s) Qualified:**Perfluoroheptanesulfonic acid (PFHpS)**

23J2019-01[INF (PRW-4)], B355533-MS1

Perfluoroheptanoic acid (PFHpA)

23J2019-01[INF (PRW-4)], B355533-MS1

Perfluorooctanoic acid (PFOA)

23J2019-01[INF (PRW-4)], B355533-MS1

Perfluoroundecanoic acid (PFUnA)

23J2019-01[INF (PRW-4)], B355533-MSD1

PF-19

Sample re-analyzed at a dilution that was re-fortified with internal standard.

Analyte & Samples(s) Qualified:**Perfluorohexanesulfonic acid (PFHxS)**

23J2019-01RE1[INF (PRW-4)]

Perfluorooctanesulfonic acid (PFOS)

23J2019-01RE1[INF (PRW-4)]

S-29

Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:**M2-4:2FTS**

S095407-CCV3

The results of analyses reported only relate to samples submitted to Con-Test, a Pace Analytical Laboratory, for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Lisa A. Worthington
Technical Representative

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23J2019

Date Received: 10/13/2023

Field Sample #: INF (PRW-4)

Sampled: 10/12/2023 10:20

Sample ID: 23J2019-01

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	24	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluorobutanesulfonic acid (PFBS)	6.7	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluoropentanoic acid (PFPeA)	69	1.9	ng/L	1	MS-19	SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluorohexanoic acid (PFHxA)	65	1.9	ng/L	1	MS-19	SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	37	1.9	ng/L	1	MS-19	SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluorodecanoic acid (PFDA)	4.6	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluoroheptanesulfonic acid (PFHpS)	6.4	1.9	ng/L	1	MS-22	SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluorodecanesulfonic acid (PFDS)	2.2	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluorooctanesulfonamide (FOSA)	4.2	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluorononanesulfonic acid (PFNS)	3.2	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	45	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluoro-1-butanefulfonamide (FBFA)	11	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluorohexanesulfonic acid (PFHxS)	110	93	ng/L	50	PF-19	SOP-454 PFAS	10/23/23	10/25/23 11:19	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	79	1.9	ng/L	1	MS-19	SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluoropentanesulfonic acid (PFPeS)	9.9	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluoroundecanoic acid (PFUnA)	36	1.9	ng/L	1	MS-22	SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluoroheptanoic acid (PFHpA)	36	1.9	ng/L	1	MS-22	SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluorooctanoic acid (PFOA)	29	1.9	ng/L	1	MS-22	SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW
Perfluorooctanesulfonic acid (PFOS)	330	93	ng/L	50	MS-19, PF-19	SOP-454 PFAS	10/23/23	10/25/23 11:19	QNW
Perfluorononanoic acid (PFNA)	23	1.9	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:04	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23J2019

Date Received: 10/13/2023

Field Sample #: System #1 Mid

Sampled: 10/12/2023 10:10

Sample ID: 23J2019-02

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	20	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluoropentanoic acid (PFPeA)	27	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluorohexanoic acid (PFHxA)	20	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	2.3	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	3.8	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluorohexanesulfonic acid (PFHxS)	14	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	12	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluoroundecanoic acid (PFUnA)	2.0	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluoroheptanoic acid (PFHpA)	7.3	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluorooctanoic acid (PFOA)	4.3	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluorooctanesulfonic acid (PFOS)	38	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW
Perfluorononanoic acid (PFNA)	2.9	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:11	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23J2019

Date Received: 10/13/2023

Field Sample #: System #1 Eff

Sampled: 10/12/2023 10:00

Sample ID: 23J2019-03

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:18	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23J2019

Date Received: 10/13/2023

Field Sample #: System #2 Mid

Sampled: 10/12/2023 10:40

Sample ID: 23J2019-04

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	5.5	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluoropentanoic acid (PFPeA)	4.3	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluorohexanoic acid (PFHxA)	1.9	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:26	QNW

Project Location: Barnstable, MA

Sample Description:

Work Order: 23J2019

Date Received: 10/13/2023

Field Sample #: System #2 Eff

Sampled: 10/12/2023 10:50

Sample ID: 23J2019-05

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluoro-1-butanesulfonamide (FBSA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	10/23/23	10/23/23 19:33	QNW

Sample Extraction Data

Prep Method:SOP 454-PFAAS **Analytical Method:**SOP-454 PFAS

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23J2019-01 [INF (PRW-4)]	B355533	267	1.00	10/23/23
23J2019-01RE1 [INF (PRW-4)]	B355533	267	1.00	10/23/23
23J2019-02 [System #1 Mid]	B355533	270	1.00	10/23/23
23J2019-03 [System #1 Eff]	B355533	283	1.00	10/23/23
23J2019-04 [System #2 Mid]	B355533	272	1.00	10/23/23
23J2019-05 [System #2 Eff]	B355533	279	1.00	10/23/23

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B355533 - SOP 454-PFAAS
Blank (B355533-BLK1)

Prepared & Analyzed: 10/23/23

Perfluorobutanoic acid (PFBA)	ND	1.9	ng/L
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L
Perfluoropentanoic acid (PFPeA)	ND	1.9	ng/L
Perfluorohexanoic acid (PFHxA)	ND	1.9	ng/L
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.9	ng/L
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L
Perfluorotridecanoic acid (PFTrDA)	ND	1.9	ng/L
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L
Perfluoro-1-butanesulfonamide (FBSA)	ND	1.9	ng/L
Perfluorohexanesulfonic acid (PFHxS)	ND	1.9	ng/L
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.9	ng/L
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L
Perfluoroheptanoic acid (PFHpA)	ND	1.9	ng/L
Perfluorooctanoic acid (PFOA)	ND	1.9	ng/L
Perfluorooctanesulfonic acid (PFOS)	ND	1.9	ng/L
Perfluorononanoic acid (PFNA)	ND	1.9	ng/L

LCS (B355533-BS1)

Prepared & Analyzed: 10/23/23

Perfluorobutanoic acid (PFBA)	9.84	1.9	ng/L	9.59	103	73-129
Perfluorobutanesulfonic acid (PFBS)	8.54	1.9	ng/L	8.49	101	72-130
Perfluoropentanoic acid (PFPeA)	10.2	1.9	ng/L	9.59	106	72-129
Perfluorohexanoic acid (PFHxA)	10.5	1.9	ng/L	9.59	109	72-129
11Cl-PF3OUdS (F53B Major)	8.19	1.9	ng/L	9.03	90.7	43.3-138
9Cl-PF3ONS (F53B Minor)	8.01	1.9	ng/L	8.94	89.6	52-140
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	10.4	1.9	ng/L	9.03	115	53.7-152
Hexafluoropropylene oxide dimer acid (HFPO-DA)	9.77	1.9	ng/L	9.59	102	42.1-145
8:2 Fluorotelomersulfonic acid (8:2FTS A)	9.15	1.9	ng/L	9.20	99.4	67-138
Perfluorodecanoic acid (PFDA)	12.0	1.9	ng/L	9.59	125	71-129
Perfluorododecanoic acid (PFDoA)	10.4	1.9	ng/L	9.59	109	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	9.20	1.9	ng/L	8.53	108	52.7-147

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B355533 - SOP 454-PFAAS										
LCS (B355533-BS1)										
				Prepared & Analyzed: 10/23/23						
Perfluoroheptanesulfonic acid (PFHpS)	10.9	1.9	ng/L	9.16		119	69-134			
N-EtFOSAA (NEtFOSAA)	12.5	1.9	ng/L	9.59		131	61-135			
N-MeFOSAA (NMeFOSAA)	13.4	1.9	ng/L	9.59		139	* 65-136			L-01
Perfluorotetradecanoic acid (PFTA)	8.97	1.9	ng/L	9.59		93.6	71-132			
Perfluorotridecanoic acid (PFTTrDA)	11.8	1.9	ng/L	9.59		123	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	9.13	1.9	ng/L	8.97		102	63-143			
Perfluorodecanesulfonic acid (PFDS)	8.92	1.9	ng/L	9.25		96.4	53-142			
Perfluorooctanesulfonamide (FOSA)	10.3	1.9	ng/L	9.59		107	67-137			
Perfluorononanesulfonic acid (PFNS)	10.2	1.9	ng/L	9.20		111	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	8.70	1.9	ng/L	9.59		90.7	50-150			
Perfluoro-1-butanefulfonamide (FBSA)	9.94	1.9	ng/L	9.59		104	50-150			
Perfluorohexanesulfonic acid (PFHxS)	9.74	1.9	ng/L	8.77		111	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	9.96	1.9	ng/L	9.59		104	53.8-150			
Perfluoro-5-oxahexanoic acid (PFMBA)	10.9	1.9	ng/L	9.59		114	54.5-152			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	11.2	1.9	ng/L	9.11		123	64-140			
Perfluoropentanesulfonic acid (PFPeS)	8.82	1.9	ng/L	9.01		97.8	71-127			
Perfluoroundecanoic acid (PFUnA)	10.2	1.9	ng/L	9.59		107	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	10.0	1.9	ng/L	9.59		105	50.5-159			
Perfluoroheptanoic acid (PFHpA)	9.26	1.9	ng/L	9.59		96.6	72-130			
Perfluorooctanoic acid (PFOA)	8.61	1.9	ng/L	9.59		89.8	71-133			
Perfluorooctanesulfonic acid (PFOS)	9.02	1.9	ng/L	8.87		102	65-140			
Perfluorononanoic acid (PFNA)	10.1	1.9	ng/L	9.59		106	69-130			
Matrix Spike (B355533-MS1)										
			Source: 23J2019-01		Prepared & Analyzed: 10/23/23					
Perfluorobutanoic acid (PFBA)	34.7	1.9	ng/L	9.47	23.8	115	73-129			
Perfluorobutanesulfonic acid (PFBS)	15.7	1.9	ng/L	8.38	6.73	107	72-130			
Perfluoropentanoic acid (PFPeA)	80.9	1.9	ng/L	9.47	69.0	126	72-129			
Perfluorohexanoic acid (PFHxA)	85.0	1.9	ng/L	9.47	64.8	213	* 72-129			MS-19
11Cl-PF3OUdS (F53B Major)	8.55	1.9	ng/L	8.92	ND	95.8	50-150			
9Cl-PF3ONS (F53B Minor)	9.10	1.9	ng/L	8.82	ND	103	50-150			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	11.0	1.9	ng/L	8.92	ND	123	51.4-161			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	9.44	1.9	ng/L	9.47	ND	99.7	40.3-148			
8:2 Fluorotelomersulfonic acid (8:2FTS A)	31.1	1.9	ng/L	9.09	37.5	-70.4	* 67-138			MS-19
Perfluorodecanoic acid (PFDA)	16.8	1.9	ng/L	9.47	4.58	129	71-129			
Perfluorododecanoic acid (PFDoA)	10.9	1.9	ng/L	9.47	ND	115	72-134			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	9.16	1.9	ng/L	8.43	ND	109	57.2-150			
Perfluoroheptanesulfonic acid (PFHpS)	19.0	1.9	ng/L	9.04	6.42	139	* 69-134			MS-22
N-EtFOSAA (NEtFOSAA)	13.9	1.9	ng/L	9.47	ND	147	* 61-135			MS-12
N-MeFOSAA (NMeFOSAA)	13.9	1.9	ng/L	9.47	ND	146	* 65-136			MS-12
Perfluorotetradecanoic acid (PFTA)	9.47	1.9	ng/L	9.47	ND	100	71-132			
Perfluorotridecanoic acid (PFTTrDA)	12.9	1.9	ng/L	9.47	ND	136	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	9.70	1.9	ng/L	8.85	ND	110	63-143			
Perfluorodecanesulfonic acid (PFDS)	10.5	1.9	ng/L	9.14	2.21	90.3	53-142			
Perfluorooctanesulfonamide (FOSA)	14.3	1.9	ng/L	9.47	4.16	107	67-137			
Perfluorononanesulfonic acid (PFNS)	14.5	1.9	ng/L	9.09	3.21	124	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	56.0	1.9	ng/L	9.47	45.0	117	50-150			
Perfluoro-1-butanefulfonamide (FBSA)	23.8	1.9	ng/L	9.47	11.4	131	49.5-154			
Perfluorohexanesulfonic acid (PFHxS)	103	1.9	ng/L	8.66	96.9	68.4	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	11.5	1.9	ng/L	9.47	ND	122	50-150			

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B355533 - SOP 454-PFAAS										
Matrix Spike (B355533-MS1)	Source: 23J2019-01			Prepared & Analyzed: 10/23/23						
Perfluoro-5-oxahexanoic acid (PFMBA)	11.1	1.9	ng/L	9.47	ND	117	58.1-164			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	97.8	1.9	ng/L	8.99	79.5	203 *	64-140			MS-19
Perfluoropentanesulfonic acid (PFPeS)	19.0	1.9	ng/L	8.90	9.89	102	71-127			
Perfluoroundecanoic acid (PFUnA)	43.2	1.9	ng/L	9.47	36.4	72.1	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	10.6	1.9	ng/L	9.47	ND	112	54.6-170			
Perfluoroheptanoic acid (PFHpA)	48.8	1.9	ng/L	9.47	36.4	131 *	72-130			MS-22
Perfluorooctanoic acid (PFOA)	41.8	1.9	ng/L	9.47	29.0	136 *	71-133			MS-22
Perfluorooctanesulfonic acid (PFOS)	323	1.9	ng/L	8.76	329	-71.6 *	65-140			MS-19
Perfluorononanoic acid (PFNA)	33.5	1.9	ng/L	9.47	23.1	110	69-130			
Matrix Spike Dup (B355533-MSD1)	Source: 23J2019-01			Prepared & Analyzed: 10/23/23						
Perfluorobutanoic acid (PFBA)	34.3	1.8	ng/L	9.17	23.8	114	73-129	1.21	30	
Perfluorobutanesulfonic acid (PFBS)	15.5	1.8	ng/L	8.12	6.73	108	72-130	1.14	30	
Perfluoropentanoic acid (PFPeA)	80.9	1.8	ng/L	9.17	69.0	130 *	72-129	0.0309	30	MS-19
Perfluorohexanoic acid (PFHxA)	79.3	1.8	ng/L	9.17	64.8	158 *	72-129	6.90	30	MS-19
11Cl-PF3OUdS (F53B Major)	8.48	1.8	ng/L	8.64	ND	98.2	50-150	0.738	30	
9Cl-PF3ONS (F53B Minor)	8.46	1.8	ng/L	8.55	ND	98.9	50-150	7.31	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	10.2	1.8	ng/L	8.64	ND	118	51.4-161	7.55	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.38	1.8	ng/L	9.17	ND	91.4	40.3-148	11.9	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	32.5	1.8	ng/L	8.80	37.5	-57.1 *	67-138	4.32	30	MS-19
Perfluorodecanoic acid (PFDA)	14.8	1.8	ng/L	9.17	4.58	112	71-129	12.5	30	
Perfluorododecanoic acid (PFDoA)	9.56	1.8	ng/L	9.17	ND	104	72-134	13.4	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	8.80	1.8	ng/L	8.16	ND	108	57.2-150	3.97	30	
Perfluoroheptanesulfonic acid (PFHpS)	17.1	1.8	ng/L	8.76	6.42	122	69-134	10.3	30	
N-EtFOSAA (NEtFOSAA)	12.8	1.8	ng/L	9.17	ND	140 *	61-135	8.15	30	MS-12
N-MeFOSAA (NMeFOSAA)	12.8	1.8	ng/L	9.17	ND	139 *	65-136	8.37	30	MS-12
Perfluorotetradecanoic acid (PFTA)	8.48	1.8	ng/L	9.17	ND	92.5	71-132	11.0	30	
Perfluorotridecanoic acid (PFTrDA)	10.7	1.8	ng/L	9.17	ND	116	65-144	18.6	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	9.76	1.8	ng/L	8.58	ND	114	63-143	0.585	30	
Perfluorodecanesulfonic acid (PFDS)	10.1	1.8	ng/L	8.85	2.21	89.2	53-142	3.50	30	
Perfluorooctanesulfonamide (FOSA)	12.8	1.8	ng/L	9.17	4.16	94.0	67-137	11.3	30	
Perfluorononanesulfonic acid (PFNS)	12.9	1.8	ng/L	8.80	3.21	111	69-127	11.3	30	
Perfluoro-1-hexanesulfonamide (FHxSA)	56.6	1.8	ng/L	9.17	45.0	127	50-150	1.08	30	
Perfluoro-1-butananesulfonamide (FBSA)	23.1	1.8	ng/L	9.17	11.4	128	49.5-154	2.84	30	
Perfluorohexanesulfonic acid (PFHxS)	103	1.8	ng/L	8.39	96.9	73.8	68-131	0.261	30	
Perfluoro-4-oxapentanoic acid (PFMPA)	10.8	1.8	ng/L	9.17	ND	118	50-150	6.21	30	
Perfluoro-5-oxahexanoic acid (PFMBA)	10.7	1.8	ng/L	9.17	ND	116	58.1-164	3.48	30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	97.0	1.8	ng/L	8.71	79.5	202 *	64-140	0.744	30	MS-19
Perfluoropentanesulfonic acid (PFPeS)	18.4	1.8	ng/L	8.62	9.89	98.4	71-127	3.39	30	
Perfluoroundecanoic acid (PFUnA)	40.9	1.8	ng/L	9.17	36.4	49.2 *	69-133	5.51	30	MS-22
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	9.93	1.8	ng/L	9.17	ND	108	54.6-170	6.68	30	
Perfluoroheptanoic acid (PFHpA)	47.1	1.8	ng/L	9.17	36.4	118	72-130	3.44	30	
Perfluorooctanoic acid (PFOA)	37.8	1.8	ng/L	9.17	29.0	96.5	71-133	10.1	30	
Perfluorooctanesulfonic acid (PFOS)	303	1.8	ng/L	8.48	329	-307 *	65-140	6.32	30	MS-19
Perfluorononanoic acid (PFNA)	30.8	1.8	ng/L	9.17	23.1	84.1	69-130	8.29	30	

FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
L-01	Laboratory fortified blank/laboratory control sample recovery outside of control limits. Data validation is not affected since all results are "not detected" for all samples in this batch for this compound and bias is on the high side.
MS-12	Matrix spike recovery and matrix spike duplicate recovery outside of control limits. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
MS-22	Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is within method specified criteria.
PF-19	Sample re-analyzed at a dilution that was re-fortified with internal standard.
S-29	Extracted Internal Standard is outside of control limits.

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
INF (PRW-4) (23J2019-01) Lab File ID: 23J2019-01.d Analyzed: 10/23/23 19:04									
M8FOSA	502115.3	3.964617	821,917.00	3.964583	61	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	132546.8	2.4228	129,066.00	2.422817	103	50 - 150	0.0000	+/-0.50	
M2PFTA	1200590	4.224583	1,832,048.00	4.22455	66	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	458347.8	3.723133	435,904.00	3.715133	105	50 - 150	0.0080	+/-0.50	
MPFBA	651732.1	1.025233	1,056,683.00	1.016917	62	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	284404	2.76565	271,315.00	2.76565	105	50 - 150	0.0000	+/-0.50	
M6PFDA	1452744	3.715683	1,948,024.00	3.715667	75	50 - 150	0.0000	+/-0.50	
M3PFBS	319062.3	1.83695	380,054.00	1.828667	84	50 - 150	0.0083	+/-0.50	
M7PFUnA	1138616	3.857833	1,568,864.00	3.8578	73	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	163766.2	3.372217	115,021.00	3.372183	142	50 - 150	0.0000	+/-0.50	
M5PFPeA	764981.9	1.6652	970,321.00	1.656933	79	50 - 150	0.0083	+/-0.50	
M5PFHxA	1284786	2.506633	1,537,112.00	2.506633	84	50 - 150	0.0000	+/-0.50	
M3PFHxS	230401.9	3.145367	278,396.00	3.14535	83	50 - 150	0.0000	+/-0.50	
M4PFHpA	1335367	3.113433	1,611,197.00	3.105283	83	50 - 150	0.0082	+/-0.50	
M8PFOA	1590432	3.380933	1,797,293.00	3.380917	88	50 - 150	0.0000	+/-0.50	
M8PFOS	200776.9	3.572317	292,966.00	3.5723	69	50 - 150	0.0000	+/-0.50	
M9PFNA	1165321	3.57335	1,513,453.00	3.573333	77	50 - 150	0.0000	+/-0.50	
MPFDoA	1013018	3.98475	1,463,922.00	3.992717	69	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	256073	3.865333	360,379.00	3.8653	71	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	313920.2	3.785583	381,542.00	3.793533	82	50 - 150	-0.0080	+/-0.50	
INF (PRW-4) (23J2019-01RE1) Lab File ID: 23J2019-01RE1.d Analyzed: 10/25/23 11:19									
M3PFHxS	257794.8	3.17765	286,562.00	3.17765	90	50 - 150	0.0000	+/-0.50	
M8PFOS	272840.3	3.59625	301,976.00	3.59625	90	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
System #1 Mid (23J2019-02)		Lab File ID: 23J2019-02.d				Analyzed: 10/23/23 19:11			
M8FOSA	605049.7	3.9646	821,917.00	3.964583	74	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	121570.8	2.4228	129,066.00	2.422817	94	50 - 150	0.0000	+/-0.50	
M2PFTA	1387844	4.224566	1,832,048.00	4.22455	76	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	492028.3	3.723117	435,904.00	3.715133	113	50 - 150	0.0080	+/-0.50	
MPFBA	840802.5	1.025233	1,056,683.00	1.016917	80	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	296751.2	2.76565	271,315.00	2.76565	109	50 - 150	0.0000	+/-0.50	
M6PFDA	1488718	3.715667	1,948,024.00	3.715667	76	50 - 150	0.0000	+/-0.50	
M3PFBS	330684	1.83695	380,054.00	1.828667	87	50 - 150	0.0083	+/-0.50	
M7PFUnA	1226180	3.857817	1,568,864.00	3.8578	78	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	110348	3.372183	115,021.00	3.372183	96	50 - 150	0.0000	+/-0.50	
M5PFPeA	809214.3	1.6652	970,321.00	1.656933	83	50 - 150	0.0083	+/-0.50	
M5PFHxA	1326353	2.506633	1,537,112.00	2.506633	86	50 - 150	0.0000	+/-0.50	
M3PFHxS	245395.2	3.14535	278,396.00	3.14535	88	50 - 150	0.0000	+/-0.50	
M4PFHpA	1382661	3.113417	1,611,197.00	3.105283	86	50 - 150	0.0081	+/-0.50	
M8PFOA	1627356	3.380917	1,797,293.00	3.380917	91	50 - 150	0.0000	+/-0.50	
M8PFOS	214945.6	3.5723	292,966.00	3.5723	73	50 - 150	0.0000	+/-0.50	
M9PFNA	1283608	3.57335	1,513,453.00	3.573333	85	50 - 150	0.0000	+/-0.50	
MPFDaA	1065165	3.984733	1,463,922.00	3.992717	73	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	281970.9	3.8653	360,379.00	3.8653	78	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	328989.4	3.785567	381,542.00	3.793533	86	50 - 150	-0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
System #1 Eff (23J2019-03)		Lab File ID: 23J2019-03.d				Analyzed: 10/23/23 19:18			
M8FOSA	625183.7	3.9646	821,917.00	3.964583	76	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	116061.9	2.4228	129,066.00	2.422817	90	50 - 150	0.0000	+/-0.50	
M2PFTA	1252372	4.2165	1,832,048.00	4.22455	68	50 - 150	-0.0080	+/-0.50	
M2-8:2FTS	407124.7	3.723117	435,904.00	3.715133	93	50 - 150	0.0080	+/-0.50	
MPFBA	873320.8	1.025233	1,056,683.00	1.016917	83	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	341494.4	2.765667	271,315.00	2.76565	126	50 - 150	0.0000	+/-0.50	
M6PFDA	1427831	3.715667	1,948,024.00	3.715667	73	50 - 150	0.0000	+/-0.50	
M3PFBS	332681.9	1.828667	380,054.00	1.828667	88	50 - 150	0.0000	+/-0.50	
M7PFUnA	1168418	3.857817	1,568,864.00	3.8578	74	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	99898.55	3.3722	115,021.00	3.372183	87	50 - 150	0.0000	+/-0.50	
M5PFPeA	823924.1	1.656933	970,321.00	1.656933	85	50 - 150	0.0000	+/-0.50	
M5PFHxA	1329384	2.506633	1,537,112.00	2.506633	86	50 - 150	0.0000	+/-0.50	
M3PFHxS	247337.9	3.14535	278,396.00	3.14535	89	50 - 150	0.0000	+/-0.50	
M4PFHpA	1437373	3.113417	1,611,197.00	3.105283	89	50 - 150	0.0081	+/-0.50	
M8PFOA	1608379	3.380917	1,797,293.00	3.380917	89	50 - 150	0.0000	+/-0.50	
M8PFOS	223046.5	3.572317	292,966.00	3.5723	76	50 - 150	0.0000	+/-0.50	
M9PFNA	1230812	3.57335	1,513,453.00	3.573333	81	50 - 150	0.0000	+/-0.50	
MPFDoA	1003297	3.984733	1,463,922.00	3.992717	69	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	261870	3.8653	360,379.00	3.8653	73	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	322185.4	3.785567	381,542.00	3.793533	84	50 - 150	-0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
System #2 Mid (23J2019-04)		Lab File ID: 23J2019-04.d				Analyzed: 10/23/23 19:26			
M8FOSA	576219.5	3.9646	821,917.00	3.964583	70	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	110515.6	2.422817	129,066.00	2.422817	86	50 - 150	0.0000	+/-0.50	
M2PFTA	1187223	4.2165	1,832,048.00	4.22455	65	50 - 150	-0.0080	+/-0.50	
M2-8:2FTS	354519.2	3.71515	435,904.00	3.715133	81	50 - 150	0.0000	+/-0.50	
MPFBA	839196.1	1.025233	1,056,683.00	1.016917	79	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	278565.8	2.757483	271,315.00	2.76565	103	50 - 150	-0.0082	+/-0.50	
M6PFDA	1417577	3.715667	1,948,024.00	3.715667	73	50 - 150	0.0000	+/-0.50	
M3PFBS	323253.5	1.828667	380,054.00	1.828667	85	50 - 150	0.0000	+/-0.50	
M7PFUnA	1153869	3.84985	1,568,864.00	3.8578	74	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	93628.47	3.3722	115,021.00	3.372183	81	50 - 150	0.0000	+/-0.50	
M5PFPeA	787068.9	1.656917	970,321.00	1.656933	81	50 - 150	0.0000	+/-0.50	
M5PFHxA	1268683	2.50665	1,537,112.00	2.506633	83	50 - 150	0.0000	+/-0.50	
M3PFHxS	228508.3	3.14535	278,396.00	3.14535	82	50 - 150	0.0000	+/-0.50	
M4PFHpA	1326305	3.105283	1,611,197.00	3.105283	82	50 - 150	0.0000	+/-0.50	
M8PFOA	1543573	3.380917	1,797,293.00	3.380917	86	50 - 150	0.0000	+/-0.50	
M8PFOS	221913	3.5638	292,966.00	3.5723	76	50 - 150	-0.0085	+/-0.50	
M9PFNA	1256515	3.56485	1,513,453.00	3.573333	83	50 - 150	-0.0085	+/-0.50	
MPFDoA	1024234	3.984733	1,463,922.00	3.992717	70	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	269196.8	3.85735	360,379.00	3.8653	75	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	294487.1	3.785567	381,542.00	3.793533	77	50 - 150	-0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
System #2 Eff (23J2019-05)		Lab File ID: 23J2019-05.d				Analyzed: 10/23/23 19:33			
M8FOSA	640899.8	3.964583	821,917.00	3.964583	78	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	111733.6	2.4228	129,066.00	2.422817	87	50 - 150	0.0000	+/-0.50	
M2PFTA	1459732	4.216483	1,832,048.00	4.22455	80	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	419751.8	3.7231	435,904.00	3.715133	96	50 - 150	0.0080	+/-0.50	
MPFBA	924469.2	1.025233	1,056,683.00	1.016917	87	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	361934.7	2.757467	271,315.00	2.76565	133	50 - 150	-0.0082	+/-0.50	
M6PFDA	1417091	3.71565	1,948,024.00	3.715667	73	50 - 150	0.0000	+/-0.50	
M3PFBS	349119.1	1.828667	380,054.00	1.828667	92	50 - 150	0.0000	+/-0.50	
M7PFUnA	1163262	3.8578	1,568,864.00	3.8578	74	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	98823.78	3.372183	115,021.00	3.372183	86	50 - 150	0.0000	+/-0.50	
M5PFPeA	871263.5	1.656917	970,321.00	1.656933	90	50 - 150	0.0000	+/-0.50	
M5PFHxA	1401711	2.506633	1,537,112.00	2.506633	91	50 - 150	0.0000	+/-0.50	
M3PFHxS	260797.8	3.14535	278,396.00	3.14535	94	50 - 150	0.0000	+/-0.50	
M4PFHpA	1485815	3.105283	1,611,197.00	3.105283	92	50 - 150	0.0000	+/-0.50	
M8PFOA	1700018	3.380917	1,797,293.00	3.380917	95	50 - 150	0.0000	+/-0.50	
M8PFOS	219403.7	3.5723	292,966.00	3.5723	75	50 - 150	0.0000	+/-0.50	
M9PFNA	1281874	3.564833	1,513,453.00	3.573333	85	50 - 150	-0.0085	+/-0.50	
MPFDaA	1096356	3.984717	1,463,922.00	3.992717	75	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	272939.8	3.8653	360,379.00	3.8653	76	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	321713.4	3.78555	381,542.00	3.793533	84	50 - 150	-0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Blank (B355533-BLK1)			Lab File ID: B355533-BLK1.d			Analyzed: 10/23/23 18:13			
M8FOSA	608221.4	3.9646	821,917.00	3.964583	74	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	98178.12	2.4228	129,066.00	2.422817	76	50 - 150	0.0000	+/-0.50	
M2PFTA	1223891	4.224566	1,832,048.00	4.22455	67	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	392100.3	3.71515	435,904.00	3.715133	90	50 - 150	0.0000	+/-0.50	
MPFBA	727468.6	1.016917	1,056,683.00	1.016917	69	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	264443.3	2.765667	271,315.00	2.76565	97	50 - 150	0.0000	+/-0.50	
M6PFDA	1422157	3.715667	1,948,024.00	3.715667	73	50 - 150	0.0000	+/-0.50	
M3PFBS	292541.7	1.828667	380,054.00	1.828667	77	50 - 150	0.0000	+/-0.50	
M7PFUnA	1100744	3.857817	1,568,864.00	3.8578	70	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	97864.61	3.3722	115,021.00	3.372183	85	50 - 150	0.0000	+/-0.50	
M5PFPeA	684342.8	1.656917	970,321.00	1.656933	71	50 - 150	0.0000	+/-0.50	
M5PFHxA	1101464	2.506633	1,537,112.00	2.506633	72	50 - 150	0.0000	+/-0.50	
M3PFHxS	223298.7	3.14535	278,396.00	3.14535	80	50 - 150	0.0000	+/-0.50	
M4PFHpA	1190759	3.1053	1,611,197.00	3.105283	74	50 - 150	0.0000	+/-0.50	
M8PFOA	1397928	3.380917	1,797,293.00	3.380917	78	50 - 150	0.0000	+/-0.50	
M8PFOS	219119.6	3.572317	292,966.00	3.5723	75	50 - 150	0.0000	+/-0.50	
M9PFNA	1143912	3.57335	1,513,453.00	3.573333	76	50 - 150	0.0000	+/-0.50	
MPFDaA	990460.6	3.984733	1,463,922.00	3.992717	68	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	254477.2	3.8653	360,379.00	3.8653	71	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	285571.9	3.785567	381,542.00	3.793533	75	50 - 150	-0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (B355533-BS1)		Lab File ID: B355533-BS1.d			Analyzed: 10/23/23 18:06				
M8FOSA	595250.9	3.9646	821,917.00	3.964583	72	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	94413.04	2.4228	129,066.00	2.422817	73	50 - 150	0.0000	+/-0.50	
M2PFTA	1346136	4.224566	1,832,048.00	4.22455	73	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	440122.3	3.71515	435,904.00	3.715133	101	50 - 150	0.0000	+/-0.50	
MPFBA	706808.9	1.016917	1,056,683.00	1.016917	67	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	233297.2	2.76565	271,315.00	2.76565	86	50 - 150	0.0000	+/-0.50	
M6PFDA	1514079	3.715667	1,948,024.00	3.715667	78	50 - 150	0.0000	+/-0.50	
M3PFBS	295813.3	1.828667	380,054.00	1.828667	78	50 - 150	0.0000	+/-0.50	
M7PFUnA	1166835	3.857817	1,568,864.00	3.8578	74	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	97538.33	3.372183	115,021.00	3.372183	85	50 - 150	0.0000	+/-0.50	
M5PFPeA	671688.4	1.656917	970,321.00	1.656933	69	50 - 150	0.0000	+/-0.50	
M5PFHxA	1109130	2.506633	1,537,112.00	2.506633	72	50 - 150	0.0000	+/-0.50	
M3PFHxS	228152	3.14535	278,396.00	3.14535	82	50 - 150	0.0000	+/-0.50	
M4PFHpA	1230879	3.105283	1,611,197.00	3.105283	76	50 - 150	0.0000	+/-0.50	
M8PFOA	1470098	3.380917	1,797,293.00	3.380917	82	50 - 150	0.0000	+/-0.50	
M8PFOS	227185.9	3.572317	292,966.00	3.5723	78	50 - 150	0.0000	+/-0.50	
M9PFNA	1204170	3.56485	1,513,453.00	3.573333	80	50 - 150	-0.0085	+/-0.50	
MPFDoA	1042903	3.984733	1,463,922.00	3.992717	71	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	263104.5	3.8653	360,379.00	3.8653	73	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	301507.7	3.785567	381,542.00	3.793533	79	50 - 150	-0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike (B355533-MS1) Lab File ID: B355533-MS1.d Analyzed: 10/23/23 18:21									
M8FOSA	604759.4	3.9646	821,917.00	3.964583	74	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	118773.9	2.422817	129,066.00	2.422817	92	50 - 150	0.0000	+/-0.50	
M2PFTA	1331351	4.224583	1,832,048.00	4.22455	73	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	549913.9	3.71515	435,904.00	3.715133	126	50 - 150	0.0000	+/-0.50	
MPFBA	669512.8	1.025233	1,056,683.00	1.016917	63	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	264098.4	2.765667	271,315.00	2.76565	97	50 - 150	0.0000	+/-0.50	
M6PFDA	1434128	3.715667	1,948,024.00	3.715667	74	50 - 150	0.0000	+/-0.50	
M3PFBS	331806.8	1.83695	380,054.00	1.828667	87	50 - 150	0.0083	+/-0.50	
M7PFUnA	1158891	3.857817	1,568,864.00	3.8578	74	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	168134.2	3.3722	115,021.00	3.372183	146	50 - 150	0.0000	+/-0.50	
M5PFPeA	794126.6	1.656917	970,321.00	1.656933	82	50 - 150	0.0000	+/-0.50	
M5PFHxA	1282214	2.50665	1,537,112.00	2.506633	83	50 - 150	0.0000	+/-0.50	
M3PFHxS	242892.5	3.145367	278,396.00	3.14535	87	50 - 150	0.0000	+/-0.50	
M4PFHpA	1365547	3.1053	1,611,197.00	3.105283	85	50 - 150	0.0000	+/-0.50	
M8PFOA	1636391	3.380933	1,797,293.00	3.380917	91	50 - 150	0.0000	+/-0.50	
M8PFOS	206288.7	3.572317	292,966.00	3.5723	70	50 - 150	0.0000	+/-0.50	
M9PFNA	1152595	3.57335	1,513,453.00	3.573333	76	50 - 150	0.0000	+/-0.50	
MPFDoA	993621	3.992733	1,463,922.00	3.992717	68	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	279406.1	3.865317	360,379.00	3.8653	78	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	325306.4	3.785583	381,542.00	3.793533	85	50 - 150	-0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

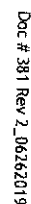
Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike Dup (B355533-MSD1)		Lab File ID: B355533-MSD1.d				Analyzed: 10/23/23 18:28			
M8FOSA	639300.4	3.9646	821,917.00	3.964583	78	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	129626.6	2.422817	129,066.00	2.422817	100	50 - 150	0.0000	+/-0.50	
M2PFTA	1434126	4.224566	1,832,048.00	4.22455	78	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	480880.9	3.71515	435,904.00	3.715133	110	50 - 150	0.0000	+/-0.50	
MPFBA	649382.3	1.025233	1,056,683.00	1.016917	61	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	285744.6	2.765667	271,315.00	2.76565	105	50 - 150	0.0000	+/-0.50	
M6PFDA	1544331	3.715667	1,948,024.00	3.715667	79	50 - 150	0.0000	+/-0.50	
M3PFBS	325102.1	1.828667	380,054.00	1.828667	86	50 - 150	0.0000	+/-0.50	
M7PFUnA	1300811	3.857817	1,568,864.00	3.8578	83	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	171834.1	3.3722	115,021.00	3.372183	149	50 - 150	0.0000	+/-0.50	
M5PFPeA	774060.2	1.656917	970,321.00	1.656933	80	50 - 150	0.0000	+/-0.50	
M5PFHxA	1289046	2.50665	1,537,112.00	2.506633	84	50 - 150	0.0000	+/-0.50	
M3PFHxS	240726	3.145367	278,396.00	3.14535	86	50 - 150	0.0000	+/-0.50	
M4PFHpA	1347917	3.1053	1,611,197.00	3.105283	84	50 - 150	0.0000	+/-0.50	
M8PFOA	1634092	3.380933	1,797,293.00	3.380917	91	50 - 150	0.0000	+/-0.50	
M8PFOS	216109	3.572317	292,966.00	3.5723	74	50 - 150	0.0000	+/-0.50	
M9PFNA	1208642	3.57335	1,513,453.00	3.573333	80	50 - 150	0.0000	+/-0.50	
MPFDoA	1153125	3.984733	1,463,922.00	3.992717	79	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	292271.9	3.865317	360,379.00	3.8653	81	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	341460.4	3.785567	381,542.00	3.793533	89	50 - 150	-0.0080	+/-0.50	

CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
<i>SOP-454 PFAS in Water</i>	
Perfluorobutanoic acid (PFBA)	NH-P,PA,NY
Perfluorobutanesulfonic acid (PFBS)	NH-P,PA,NY
Perfluoropentanoic acid (PFPeA)	NH-P,PA,NY
Perfluorohexanoic acid (PFHxA)	NH-P,PA,NY
11Cl-PF3OUdS (F53B Major)	NH-P,PA,NY
9Cl-PF3ONS (F53B Minor)	NH-P,PA
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P,PA,NY
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P,PA,NY
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P,PA
Perfluorodecanoic acid (PFDA)	NH-P,PA,NY
Perfluorododecanoic acid (PFDoA)	NH-P,PA,NY
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	NH-P,PA,NY
Perfluoroheptanesulfonic acid (PFHpS)	NH-P,PA,NY
N-EtFOSAA (NEtFOSAA)	NH-P,PA,NY
N-MeFOSAA (NMeFOSAA)	NH-P,PA,NY
Perfluorotetradecanoic acid (PFTA)	NH-P,PA,NY
Perfluorotridecanoic acid (PFTrDA)	NH-P,PA,NY
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P,PA,NY
Perfluorodecanesulfonic acid (PFDS)	NH-P,PA
Perfluorooctanesulfonamide (FOSA)	NH-P,PA
Perfluorononanesulfonic acid (PFNS)	NH-P,PA
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P,PA
Perfluoro-1-butanefulfonamide (FBSA)	NH-P,PA
Perfluorohexanesulfonic acid (PFHxS)	NH-P,PA,NY
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P,PA,NY
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P,PA,NY
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P,PA,NY
Perfluoropentanesulfonic acid (PFPeS)	NH-P,PA,NY
Perfluoroundecanoic acid (PFUnA)	NH-P,PA,NY
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P,PA
Perfluoroheptanoic acid (PFHpA)	NH-P,PA,NY
Perfluorooctanoic acid (PFOA)	NH-P,PA,NY
Perfluorooctanesulfonic acid (PFOS)	NH-P,PA,NY
Perfluorononanoic acid (PFNA)	NH-P,PA,NY

Con-Test, a Pace Environmental Laboratory, operates under the following certifications and accreditations:

Code	Description	Number	Expires
NY	New York State Department of Health	10899 NELAP	04/1/2024
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2024
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2024



ANALYSIS REQUESTED

Page 1 of 1

[illegible]

Total Number Of:

VIALS _____
GLASS _____

PLASTIC _____
BACTERIA _____

ENCORE

	Glassware in the fridge?
	Y / N

[illegible][illegible][illegible]

¹ Matrix Codes:
GW = Ground Water
WW = Wastewater

DW = Drinking Water
 A = Air
 C = Cell

S = Soil
SL = Sludge
SOL = Solid

[illegible]

RECREATION CODES:
I = Iceed

Please use the following codes to indicate:

M = Methanol
n = n-CL

N = Nitric Acid

H - High; M - Medium; L - Low; C - Clean; U - Unknown

S = Sulfuric Acid

B = Sodium Bisulfate

required		
	NEt ₃ and AIBN (AIBN is pre-dried)	X = Sodium Hydroxide

WRTA	☐	Other	☐	T = Sodium Thiosulfate
		Chromatogram	☐	

☐ AIHA-LAP, LLC	☐ O = Other (please define) ☐ Non-
--	--

Any missing information in not the intent of the document that must be complete and accurate and is used to determine what information is not responsible for any omitted information on the Chain of Custody. The

relationship on each project and will try to assist with missing information, but will not be held accountable.

1

	DC#_Title: ENV-FRM-ELON-0001 v07_Sample Receiving Checklist
	Effective Date: 07/13/2023

Log In Back-Sheet

Client Beta Group
 Project BETA
 MCP/RCP Required MA/MCP
 Deliverable Package Requirement GW-1
 Location Barnstable, MA
 PWSID# (When Applicable) N/A
 Arrival Method:
 Courier ☒ Fed Ex ☐ Walk In ☐ Other ☐
 Received By / Date / Time MEM 10/13/23 1545
 Back-Sheet By / Date / Time STM 10/13/23 1636
 Temperature Method Gon # 4
 Temp ☒ < 6° C Actual Temperature 2.2
 Rush Samples: Yes ☐ No ☒ Notify ☐
 Short Hold: Yes ☐ No ☒ Notify ☐

Notes regarding Samples/COC outside of SOP:

Login Sample Receipt Checklist - (Rejection Criteria Listing
 - Using Acceptance Policy) Any False statement will be
 brought to the attention of the Client - True or False

	True	False
Received on Ice	☒	☐
Received in Cooler	☒	☐
Custody Seal: DATE TIME	☐	☒
COC Relinquished	☒	☐
COC/Samples Labels Agree	☒	☐
All Samples in Good Condition	☒	☐
Samples Received within Holding Time	☒	☐
Is there enough Volume	☒	☐
Proper Media/Container Used	☒	☐
Splitting Samples Required	☐	☒
MS/MSD	☐	☒
Trip Blanks	☐	☒
Lab to Filters	☐	☒
COC Legible	☒	☐
COC Included: (Check all included)		
Client ☒ Analysis ☒ Sampler Name ☒		
Project ☒ IDs ☒ Collection Date/Time ☒		
All Samples Proper pH: <u>N/A</u>	☐	☐

Additional Container Notes

Note: West Virginia requires all samples to have their
 temperature taken. Note any outliers.

December 19, 2023

Roger Thibault
Beta Group, Inc. - RI
701 George Washington Highway
Lincoln, RI 02865

Project Location: Barnstable, MA
Client Job Number:
Project Number: 6206.04
Laboratory Work Order Number: 23K2976

Enclosed are results of analyses for samples as received by the laboratory on November 22, 2023. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kaitlyn A. Feliciano
Project Manager

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332Beta Group, Inc. - RI
701 George Washington Highway
Lincoln, RI 02865
ATTN: Roger Thibault

REPORT DATE: 12/19/2023

PURCHASE ORDER NUMBER: 23000936

PROJECT NUMBER: 6206.04

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 23K2976

The results of analyses performed on the following samples submitted to CON-TEST, a Pace Analytical Laboratory, are found in this report.

PROJECT LOCATION: Barnstable, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
GWTS-1 EFF	23K2976-01	Ground Water		SOP-454 PFAS	
GWTS-1 INFLUENT	23K2976-02	Ground Water		SOP-454 PFAS	
GWTS-1 MID POINT	23K2976-03	Ground Water		SOP-454 PFAS	
GWTS-2 EFFLUENT	23K2976-04	Ground Water		SOP-454 PFAS	
GWTS-2 MID POINT	23K2976-05	Ground Water		SOP-454 PFAS	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

SOP-454 PFAS**Qualifications:****L-01**

Laboratory fortified blank/laboratory control sample recovery outside of control limits. Data validation is not affected since all results are "not detected" for all samples in this batch for this compound and bias is on the high side.

Analyte & Samples(s) Qualified:**N-EtFOSAA (NEtFOSAA)**

23K2976-01[GWTS-1 EFF], 23K2976-05[GWTS-2 MID POINT]

Perfluorodecanoic acid (PFDA)

23K2976-01[GWTS-1 EFF], 23K2976-05[GWTS-2 MID POINT]

Perfluorononanoic acid (PFNA)

23K2976-01[GWTS-1 EFF], 23K2976-05[GWTS-2 MID POINT]

Perfluorotetradecanoic acid (PFTA)

23K2976-01[GWTS-1 EFF], 23K2976-05[GWTS-2 MID POINT]

L-02

Laboratory fortified blank/laboratory control sample recovery and duplicate recoveries outside of control limits. Data validation is not affected since all results are "not detected" for associated samples in this batch and bias is on the high side.

Analyte & Samples(s) Qualified:**6:2 Fluorotelomersulfonic acid (6:2FTS A)**

23K2976-01[GWTS-1 EFF]

N-EtFOSAA (NEtFOSAA)

23K2976-02RE2[GWTS-1 INFLUENT], 23K2976-03RE1[GWTS-1 MID POINT], 23K2976-04RE1[GWTS-2 EFFLUENT], B360698-BS1, B360698-BSD1

N-MeFOSAA (NMeFOSAA)

23K2976-01[GWTS-1 EFF], 23K2976-05[GWTS-2 MID POINT], B359274-BS1, B359274-BSD1

L-06

Laboratory fortified blank/laboratory control sample recovery and/or duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the high side.

Analyte & Samples(s) Qualified:**6:2 Fluorotelomersulfonic acid (6:2FTS A)**

23K2976-05[GWTS-2 MID POINT], B359274-BS1, B359274-BSD1

Perfluorohexanesulfonic acid (PFHxS)

23K2976-02RE2[GWTS-1 INFLUENT], 23K2976-03RE1[GWTS-1 MID POINT]

L-07

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:**N-EtFOSAA (NEtFOSAA)**

B359274-BS1

Perfluorodecanoic acid (PFDA)

B359274-BS1

Perfluorododecanoic acid (PFDoA)

B360698-BSD1

Perfluorononanoic acid (PFNA)

B359274-BS1

Perfluorotetradecanoic acid (PFTA)

B359274-BS1

PF-18

Re-analysis confirmed Extracted Internal Standard failure due to matrix effects.

Analyte & Samples(s) Qualified:**M2-4:2FTS**

23K2976-02RE2[GWTS-1 INFLUENT], 23K2976-03RE1[GWTS-1 MID POINT], 23K2976-04RE1[GWTS-2 EFFLUENT], 23K2976-05[GWTS-2 MID POINT]

M2PFTA

23K2976-02RE2[GWTS-1 INFLUENT], 23K2976-05[GWTS-2 MID POINT]

M8FOSA

23K2976-02RE2[GWTS-1 INFLUENT], 23K2976-04RE1[GWTS-2 EFFLUENT]

MPFDoA

23K2976-02RE2[GWTS-1 INFLUENT], 23K2976-05[GWTS-2 MID POINT]

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

PF-19

Sample re-analyzed at a dilution that was re-fortified with internal standard.

Analyte & Samples(s) Qualified:**Perfluorooctanesulfonic acid (PFOS)**

23K2976-02RE3[GWTS-1 INFLUENT]

S-29

Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:**D3-NMeFOSAA**

23K2976-01[GWTS-1 EFF]

D5-NEtFOSAA

23K2976-02RE2[GWTS-1 INFLUENT]

M2-4:2FTS

23K2976-01[GWTS-1 EFF]

M2-8:2FTS

S097696-CCV4

M2PFTA

23K2976-03RE1[GWTS-1 MID POINT]

M8FOSA

23K2976-01[GWTS-1 EFF]

V-20

Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:**9CI-PF3ONS (F53B Minor)**

S097984-CCV3

The results of analyses reported only relate to samples submitted to Con-Test, a Pace Analytical Laboratory, for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Lisa A. Worthington
Technical Representative

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K2976

Date Received: 11/22/2023

Field Sample #: GWTS-1 EFF

Sampled: 11/21/2023 16:00

Sample ID: 23K2976-01

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L	1	L-01	SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1	L-01	SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1	L-02	SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1	L-01	SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.9	ng/L	1	L-02	SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluorooctanoic acid (PFOA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW
Perfluorononanoic acid (PFNA)	ND	1.9	ng/L	1	L-01	SOP-454 PFAS	12/12/23	12/12/23 16:21	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K2976

Date Received: 11/22/2023

Field Sample #: GWTS-1 INFLUENT

Sampled: 11/21/2023 16:15

Sample ID: 23K2976-02

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	21	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluorobutanesulfonic acid (PFBS)	5.7	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluoropentanoic acid (PFPeA)	61	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluorohexanoic acid (PFHxA)	57	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	37	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluorodecanoic acid (PFDA)	3.9	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluoroheptanesulfonic acid (PFHpS)	4.0	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1	L-02	SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluorodecanesulfonic acid (PFDS)	2.1	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluorooctanesulfonamide (FOSA)	3.7	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluorononanesulfonic acid (PFNS)	2.6	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	40	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluoro-1-butanesulfonamide (FBSA)	7.5	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluorohexanesulfonic acid (PFHxS)	85	1.9	ng/L	1	L-06	SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	76	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluoropentanesulfonic acid (PFPeS)	8.6	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluoroundecanoic acid (PFUnA)	34	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluoroheptanoic acid (PFHpA)	34	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluorooctanoic acid (PFOA)	23	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW
Perfluorooctanesulfonic acid (PFOS)	310	19	ng/L	10	PF-19	SOP-454 PFAS	12/15/23	12/18/23 18:45	QNW
Perfluorononanoic acid (PFNA)	21	1.9	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:32	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K2976

Date Received: 11/22/2023

Field Sample #: GWTS-1 MID POINT

Sampled: 11/21/2023 16:00

Sample ID: 23K2976-03

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	21	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluoropentanoic acid (PFPeA)	30	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluorohexanoic acid (PFHxA)	22	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
11Cl-PF3OUdS (F53B Major)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
9Cl-PF3ONS (F53B Minor)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	2.3	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluorodecanoic acid (PFDA)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluorododecanoic acid (PFDoA)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
N-EtFOSAA (NEtFOSAA)	ND	2.3	ng/L	1	L-02	SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
N-MeFOSAA (NMeFOSAA)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluorotetradecanoic acid (PFTA)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluorooctanesulfonamide (FOSA)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluorononanesulfonic acid (PFNS)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	4.1	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluorohexanesulfonic acid (PFHxS)	13	2.3	ng/L	1	L-06	SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	16	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluoroundecanoic acid (PFUnA)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluoroheptanoic acid (PFHpA)	8.6	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluorooctanoic acid (PFOA)	5.0	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluorooctanesulfonic acid (PFOS)	43	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW
Perfluorononanoic acid (PFNA)	2.6	2.3	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:40	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K2976

Date Received: 11/22/2023

Field Sample #: GWTS-2 EFFLUENT

Sampled: 11/21/2023 17:00

Sample ID: 23K2976-04

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluoropentanoic acid (PFPeA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluorohexanoic acid (PFHxA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
11Cl-PF3OUdS (F53B Major)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
9Cl-PF3ONS (F53B Minor)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
N-EtFOSAA (NEtFOSAA)	ND	2.0	ng/L	1	L-02	SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
N-MeFOSAA (NMeFOSAA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluorooctanesulfonamide (FOSA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluorononanesulfonic acid (PFNS)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluoro-1-butanedisulfonamide (FBSA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		SOP-454 PFAS	12/15/23	12/18/23 17:47	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K2976

Date Received: 11/22/2023

Field Sample #: GWTS-2 MID POINT

Sampled: 11/21/2023 16:45

Sample ID: 23K2976-05

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	10	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluoropentanoic acid (PFPeA)	12	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluorohexanoic acid (PFHxA)	8.5	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
11Cl-PF3OUdS (F53B Major)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
9Cl-PF3ONS (F53B Minor)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	2.5	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluorodecanoic acid (PFDA)	ND	2.1	ng/L	1	L-01	SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluorododecanoic acid (PFDoA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
N-EtFOSAA (NEtFOSAA)	ND	2.1	ng/L	1	L-01	SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
N-MeFOSAA (NMeFOSAA)	ND	2.1	ng/L	1	L-02	SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluorotetradecanoic acid (PFTA)	ND	2.1	ng/L	1	L-01	SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluorooctanesulfonamide (FOSA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluorononanesulfonic acid (PFNS)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	3.2	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluorohexanesulfonic acid (PFHxS)	7.6	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	6.4	2.1	ng/L	1	L-06	SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluoroundecanoic acid (PFUnA)	2.4	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluoroheptanoic acid (PFHpA)	4.4	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluorooctanoic acid (PFOA)	2.2	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluorooctanesulfonic acid (PFOS)	27	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW
Perfluorononanoic acid (PFNA)	ND	2.1	ng/L	1	L-01	SOP-454 PFAS	12/12/23	12/12/23 17:19	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332**Sample Extraction Data****Prep Method:**SOP 454-PFAAS **Analytical Method:**SOP-454 PFAS

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23K2976-01 [GWTS-1 EFF]	B359274	259	1.00	12/12/23
23K2976-05 [GWTS-2 MID POINT]	B359274	234	1.00	12/12/23

Prep Method:SOP 454-PFAAS **Analytical Method:**SOP-454 PFAS

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23K2976-02RE2 [GWTS-1 INFLUENT]	B360698	259	1.00	12/15/23
23K2976-02RE3 [GWTS-1 INFLUENT]	B360698	259	1.00	12/15/23
23K2976-03RE1 [GWTS-1 MID POINT]	B360698	222	1.00	12/15/23
23K2976-04RE1 [GWTS-2 EFFLUENT]	B360698	246	1.00	12/15/23

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B359274 - SOP 454-PFAAS

Blank (B359274-BLK1)

Prepared & Analyzed: 12/12/23

Perfluorobutanoic acid (PFBA)	ND	1.8	ng/L
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.8	ng/L
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L
Perfluoro-1-butanesulfonamide (FBSA)	ND	1.8	ng/L
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L

LCS (B359274-BS1)

Prepared & Analyzed: 12/12/23

Perfluorobutanoic acid (PFBA)	11.6	1.9	ng/L	9.36	124	71-129
Perfluorobutanesulfonic acid (PFBS)	10.0	1.9	ng/L	8.29	121	72-130
Perfluoropentanoic acid (PFPeA)	11.4	1.9	ng/L	9.36	122	72-129
Perfluorohexanoic acid (PFHxA)	11.8	1.9	ng/L	9.36	126	72-129
11Cl-PF3OUdS (F53B Major)	8.22	1.9	ng/L	8.82	93.2	43.3-138
9Cl-PF3ONS (F53B Minor)	8.72	1.9	ng/L	8.73	99.9	52-140
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	9.25	1.9	ng/L	8.82	105	53.7-152
Hexafluoropropylene oxide dimer acid (HFPO-DA)	11.3	1.9	ng/L	9.36	121	42.1-145
8:2 Fluorotelomersulfonic acid (8:2FTS A)	12.1	1.9	ng/L	8.99	135	67-138
Perfluorodecanoic acid (PFDA)	12.2	1.9	ng/L	9.36	130 *	71-129
Perfluorododecanoic acid (PFDoA)	12.1	1.9	ng/L	9.36	129	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	10.1	1.9	ng/L	8.33	121	52.7-147

L-07

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B359274 - SOP 454-PFAAS										
LCS (B359274-BS1)										
Prepared & Analyzed: 12/12/23										
Perfluoroheptanesulfonic acid (PFHpS)	11.6	1.9	ng/L	8.94		130	69-134			
N-EtFOSAA (NEtFOSAA)	13.9	1.9	ng/L	9.36		149 *	61-135			L-07
N-MeFOSAA (NMeFOSAA)	14.1	1.9	ng/L	9.36		151 *	65-136			L-02
Perfluorotetradecanoic acid (PFTA)	13.3	1.9	ng/L	9.36		142 *	71-132			L-07
Perfluorotridecanoic acid (PFTTrDA)	12.8	1.9	ng/L	9.36		136	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.7	1.9	ng/L	8.75		122	63-143			
Perfluorodecanesulfonic acid (PFDS)	10.4	1.9	ng/L	9.03		115	53-142			
Perfluorooctanesulfonamide (FOSA)	11.7	1.9	ng/L	9.36		125	67-137			
Perfluorononanesulfonic acid (PFNS)	10.0	1.9	ng/L	8.99		111	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	8.31	1.9	ng/L	9.36		88.8	50-150			
Perfluoro-1-butanefulfonamide (FBSA)	9.00	1.9	ng/L	9.36		96.2	50-150			
Perfluorohexanesulfonic acid (PFHxS)	10.1	1.9	ng/L	8.57		118	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	11.5	1.9	ng/L	9.36		123	53.8-150			
Perfluoro-5-oxahexanoic acid (PFMBA)	11.1	1.9	ng/L	9.36		118	54.5-152			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	12.5	1.9	ng/L	8.89		141 *	64-140			L-06
Perfluoropentanesulfonic acid (PFPeS)	10.3	1.9	ng/L	8.80		118	71-127			
Perfluoroundecanoic acid (PFUnA)	11.6	1.9	ng/L	9.36		124	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	12.5	1.9	ng/L	9.36		134	50.5-159			
Perfluoroheptanoic acid (PFHpA)	11.5	1.9	ng/L	9.36		123	72-130			
Perfluorooctanoic acid (PFOA)	11.6	1.9	ng/L	9.36		123	71-133			
Perfluorooctanesulfonic acid (PFOS)	10.6	1.9	ng/L	8.66		123	65-140			
Perfluorononanoic acid (PFNA)	12.5	1.9	ng/L	9.36		133 *	69-130			L-07
LCS Dup (B359274-BSD1)										
Prepared & Analyzed: 12/12/23										
Perfluorobutanoic acid (PFBA)	10.1	1.8	ng/L	8.76		115	73-129	14.6	30	
Perfluorobutanesulfonic acid (PFBS)	8.54	1.8	ng/L	7.76		110	72-130	16.1	30	
Perfluoropentanoic acid (PFPeA)	9.79	1.8	ng/L	8.76		112	72-129	15.1	30	
Perfluorohexanoic acid (PFHxA)	10.2	1.8	ng/L	8.76		116	72-129	14.8	30	
11Cl-PF3OUdS (F53B Major)	7.45	1.8	ng/L	8.26		90.2	43.3-138	9.82	30	
9Cl-PF3ONS (F53B Minor)	7.83	1.8	ng/L	8.17		95.9	52-140	10.7	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	7.60	1.8	ng/L	8.26		92.0	53.7-152	19.6	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	9.05	1.8	ng/L	8.76		103	42.1-145	22.1	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	10.5	1.8	ng/L	8.41		125	67-138	14.4	30	
Perfluorodecanoic acid (PFDA)	10.7	1.8	ng/L	8.76		123	71-129	12.7	30	
Perfluorododecanoic acid (PFDoA)	11.0	1.8	ng/L	8.76		125	72-134	9.45	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	8.59	1.8	ng/L	7.80		110	52.7-147	15.7	30	
Perfluoroheptanesulfonic acid (PFHpS)	10.3	1.8	ng/L	8.37		124	69-134	11.4	30	
N-EtFOSAA (NEtFOSAA)	10.8	1.8	ng/L	8.76		123	61-135	25.4	30	
N-MeFOSAA (NMeFOSAA)	13.1	1.8	ng/L	8.76		149 *	65-136	7.73	30	L-02
Perfluorotetradecanoic acid (PFTA)	10.6	1.8	ng/L	8.76		121	71-132	22.6	30	
Perfluorotridecanoic acid (PFTTrDA)	10.2	1.8	ng/L	8.76		117	65-144	22.2	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	9.45	1.8	ng/L	8.19		115	63-143	12.6	30	
Perfluorodecanesulfonic acid (PFDS)	8.62	1.8	ng/L	8.46		102	53-142	18.6	30	
Perfluorooctanesulfonamide (FOSA)	9.81	1.8	ng/L	8.76		112	67-137	17.6	30	
Perfluorononanesulfonic acid (PFNS)	8.53	1.8	ng/L	8.41		101	69-127	16.0	30	
Perfluoro-1-hexanesulfonamide (FHxSA)	7.01	1.8	ng/L	8.76		79.9	50-150	17.0	30	
Perfluoro-1-butanefulfonamide (FBSA)	7.96	1.8	ng/L	8.76		90.9	50-150	12.2	30	
Perfluorohexanesulfonic acid (PFHxS)	8.72	1.8	ng/L	8.02		109	68-131	14.4	30	
Perfluoro-4-oxapentanoic acid (PFMPA)	10.1	1.8	ng/L	8.76		115	53.8-150	13.4	30	

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QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B359274 - SOP 454-PFAAS
LCS Dup (B359274-BSD1)

Prepared & Analyzed: 12/12/23

Perfluoro-5-oxahexanoic acid (PFMBA)	9.47	1.8	ng/L	8.76		108	54.5-152	15.6	30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	12.4	1.8	ng/L	8.33		149	* 64-140	1.09	30	L-06
Perfluoropentanesulfonic acid (PFPeS)	8.73	1.8	ng/L	8.24		106	71-127	16.9	30	
Perfluoroundecanoic acid (PFUnA)	9.32	1.8	ng/L	8.76		106	69-133	21.6	30	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	10.4	1.8	ng/L	8.76		119	50.5-159	18.7	30	
Perfluoroheptanoic acid (PFHpA)	9.88	1.8	ng/L	8.76		113	72-130	15.2	30	
Perfluorooctanoic acid (PFOA)	9.51	1.8	ng/L	8.76		109	71-133	19.4	30	
Perfluorooctanesulfonic acid (PFOS)	9.68	1.8	ng/L	8.11		119	65-140	9.41	30	
Perfluorononanoic acid (PFNA)	10.4	1.8	ng/L	8.76		118	69-130	18.5	30	

Batch B360698 - SOP 454-PFAAS
Blank (B360698-BLK1)

Prepared: 12/15/23 Analyzed: 12/18/23

Perfluorobutanoic acid (PFBA)	ND	1.8	ng/L
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.8	ng/L
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L
Perfluoro-1-butanefulfonamide (FBSA)	ND	1.8	ng/L
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B360698 - SOP 454-PFAAS

LCS (B360698-BS1)

Prepared: 12/15/23 Analyzed: 12/19/23

Perfluorobutanoic acid (PFBA)	10.5	1.8	ng/L	8.78		119	73-129			
Perfluorobutanesulfonic acid (PFBS)	9.37	1.8	ng/L	7.77		121	72-130			
Perfluoropentanoic acid (PFPeA)	10.2	1.8	ng/L	8.78		116	72-129			
Perfluorohexanoic acid (PFHxA)	10.3	1.8	ng/L	8.78		117	72-129			
11Cl-PF3OUdS (F53B Major)	8.84	1.8	ng/L	8.27		107	43.3-138			
9Cl-PF3ONS (F53B Minor)	9.29	1.8	ng/L	8.19		113	52-140			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.32	1.8	ng/L	8.27		101	53.7-152			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.46	1.8	ng/L	8.78		96.3	42.1-145			
8:2 Fluorotelomersulfonic acid (8:2FTS A)	10.5	1.8	ng/L	8.43		124	67-138			
Perfluorodecanoic acid (PFDA)	10.9	1.8	ng/L	8.78		124	71-129			
Perfluorododecanoic acid (PFDoA)	11.4	1.8	ng/L	8.78		129	72-134			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	10.4	1.8	ng/L	7.82		133	52.7-147			
Perfluoroheptanesulfonic acid (PFHpS)	9.48	1.8	ng/L	8.39		113	69-134			
N-EtFOSAA (NEtFOSAA)	12.2	1.8	ng/L	8.78		139	* 61-135			L-02
N-MeFOSAA (NMeFOSAA)	11.9	1.8	ng/L	8.78		135	65-136			
Perfluorotetradecanoic acid (PFTA)	11.5	1.8	ng/L	8.78		131	71-132			
Perfluorotridecanoic acid (PFTrDA)	11.8	1.8	ng/L	8.78		135	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.2	1.8	ng/L	8.21		125	63-143			
Perfluorodecanesulfonic acid (PFDS)	9.24	1.8	ng/L	8.48		109	53-142			
Perfluorooctanesulfonamide (FOSA)	10.3	1.8	ng/L	8.78		117	67-137			
Perfluorononanesulfonic acid (PFNS)	8.51	1.8	ng/L	8.43		101	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	6.80	1.8	ng/L	8.78		77.4	50-150			
Perfluoro-1-butanessulfonamide (FBSA)	6.98	1.8	ng/L	8.78		79.5	50-150			
Perfluorohexanesulfonic acid (PFHxS)	10.1	1.8	ng/L	8.04		126	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	9.91	1.8	ng/L	8.78		113	53.8-150			
Perfluoro-5-oxahexanoic acid (PFMBA)	9.10	1.8	ng/L	8.78		104	54.5-152			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	11.0	1.8	ng/L	8.34		131	64-140			
Perfluoropentanesulfonic acid (PFPeS)	9.41	1.8	ng/L	8.26		114	71-127			
Perfluoroundecanoic acid (PFUnA)	11.7	1.8	ng/L	8.78		133	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	9.27	1.8	ng/L	8.78		106	50.5-159			
Perfluoroheptanoic acid (PFHpA)	10.6	1.8	ng/L	8.78		120	72-130			
Perfluorooctanoic acid (PFOA)	10.6	1.8	ng/L	8.78		120	71-133			
Perfluorooctanesulfonic acid (PFOS)	9.70	1.8	ng/L	8.13		119	65-140			
Perfluorononanoic acid (PFNA)	10.7	1.8	ng/L	8.78		122	69-130			

LCS Dup (B360698-BSD1)

Prepared: 12/15/23 Analyzed: 12/19/23

Perfluorobutanoic acid (PFBA)	10.8	1.8	ng/L	9.07		119	73-129	3.08	30	
Perfluorobutanesulfonic acid (PFBS)	9.42	1.8	ng/L	8.03		117	72-130	0.502	30	
Perfluoropentanoic acid (PFPeA)	10.5	1.8	ng/L	9.07		116	72-129	3.12	30	
Perfluorohexanoic acid (PFHxA)	10.5	1.8	ng/L	9.07		116	72-129	2.20	30	
11Cl-PF3OUdS (F53B Major)	8.66	1.8	ng/L	8.54		101	43.3-138	2.07	30	
9Cl-PF3ONS (F53B Minor)	9.05	1.8	ng/L	8.45		107	52-140	2.60	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.60	1.8	ng/L	8.54		101	53.7-152	3.34	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	10.5	1.8	ng/L	9.07		116	42.1-145	21.9	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	10.9	1.8	ng/L	8.71		125	67-138	3.58	30	
Perfluorodecanoic acid (PFDA)	11.7	1.8	ng/L	9.07		129	71-129	6.96	30	
Perfluorododecanoic acid (PFDoA)	12.3	1.8	ng/L	9.07		136	* 72-134	8.04	30	L-07
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	10.6	1.8	ng/L	8.07		132	52.7-147	2.10	30	

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QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B360698 - SOP 454-PFAAS										
LCS Dup (B360698-BSD1)										
Prepared: 12/15/23 Analyzed: 12/19/23										
Perfluoroheptanesulfonic acid (PFHpS)	9.89	1.8	ng/L	8.66		114	69-134	4.27	30	
N-EtFOSAA (NEtFOSAA)	13.0	1.8	ng/L	9.07		143	* 61-135	5.81	30	L-02
N-MeFOSAA (NMeFOSAA)	11.9	1.8	ng/L	9.07		131	65-136	0.307	30	
Perfluorotetradecanoic acid (PFTA)	11.5	1.8	ng/L	9.07		127	71-132	0.299	30	
Perfluorotridecanoic acid (PFTrDA)	12.3	1.8	ng/L	9.07		136	65-144	4.39	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.1	1.8	ng/L	8.48		120	63-143	1.07	30	
Perfluorodecanesulfonic acid (PFDS)	9.33	1.8	ng/L	8.75		107	53-142	1.03	30	
Perfluorooctanesulfonamide (FOSA)	11.2	1.8	ng/L	9.07		124	67-137	8.35	30	
Perfluorononanesulfonic acid (PFNS)	9.72	1.8	ng/L	8.71		112	69-127	13.3	30	
Perfluoro-1-hexanesulfonamide (FHxSA)	7.12	1.8	ng/L	9.07		78.5	50-150	4.49	30	
Perfluoro-1-butanefulfonamide (FBSA)	7.33	1.8	ng/L	9.07		80.8	50-150	4.84	30	
Perfluorohexanesulfonic acid (PFHxS)	9.53	1.8	ng/L	8.30		115	68-131	6.25	30	
Perfluoro-4-oxapentanoic acid (PFMPA)	10.1	1.8	ng/L	9.07		111	53.8-150	1.85	30	
Perfluoro-5-oxahexanoic acid (PFMBA)	9.27	1.8	ng/L	9.07		102	54.5-152	1.85	30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	11.2	1.8	ng/L	8.62		130	64-140	2.13	30	
Perfluoropentanesulfonic acid (PFPeS)	9.83	1.8	ng/L	8.52		115	71-127	4.35	30	
Perfluoroundecanoic acid (PFUnA)	11.6	1.8	ng/L	9.07		128	69-133	0.759	30	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	9.53	1.8	ng/L	9.07		105	50.5-159	2.77	30	
Perfluoroheptanoic acid (PFHpA)	10.5	1.8	ng/L	9.07		116	72-130	0.293	30	
Perfluorooctanoic acid (PFOA)	10.7	1.8	ng/L	9.07		118	71-133	1.63	30	
Perfluorooctanesulfonic acid (PFOS)	9.13	1.8	ng/L	8.39		109	65-140	6.02	30	
Perfluorononanoic acid (PFNA)	11.4	1.8	ng/L	9.07		126	69-130	6.59	30	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
L-01	Laboratory fortified blank/laboratory control sample recovery outside of control limits. Data validation is not affected since all results are "not detected" for all samples in this batch for this compound and bias is on the high side.
L-02	Laboratory fortified blank/laboratory control sample recovery and duplicate recoveries outside of control limits. Data validation is not affected since all results are "not detected" for associated samples in this batch and bias is on the high side.
L-06	Laboratory fortified blank/laboratory control sample recovery and/or duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the high side.
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
PF-18	Re-analysis confirmed Extracted Internal Standard failure due to matrix effects.
PF-19	Sample re-analyzed at a dilution that was re-fortified with internal standard.
S-29	Extracted Internal Standard is outside of control limits.
V-20	Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

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INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
GWTS-1 EFF (23K2976-01) Lab File ID: 23K2976-01.d Analyzed: 12/12/23 16:21									
M8FOSA	296950.9	3.9486	707,119.00	3.956617	42	50 - 150	-0.0080	+/-0.50	*
M2-4:2FTS	42641.36	2.463967	117,614.00	2.488617	36	50 - 150	-0.0247	+/-0.50	*
M2PFTA	543784.8	4.313433	1,087,831.00	4.313433	50	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	99378.77	3.7789	165,683.00	3.7789	60	50 - 150	0.0000	+/-0.50	
MPFBA	505859.6	1.058467	801,955.00	1.058467	63	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	144759.7	2.798383	230,692.00	2.81475	63	50 - 150	-0.0164	+/-0.50	
M6PFDA	821522.8	3.779417	1,409,304.00	3.779433	58	50 - 150	0.0000	+/-0.50	
M3PFBS	192259.9	1.861817	305,252.00	1.878383	63	50 - 150	-0.0166	+/-0.50	
M7PFUnA	650337.3	3.92205	1,281,109.00	3.930067	51	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	41980.03	3.41245	73,080.00	3.420517	57	50 - 150	-0.0081	+/-0.50	
M5PFPeA	482767	1.698283	726,231.00	1.714833	66	50 - 150	-0.0166	+/-0.50	
M5PFHxA	728925	2.5477	1,130,870.00	2.57235	64	50 - 150	-0.0247	+/-0.50	
M3PFHxS	132803.2	3.17765	215,682.00	3.18575	62	50 - 150	-0.0081	+/-0.50	
M4PFHpA	700954.3	3.14655	1,101,580.00	3.15465	64	50 - 150	-0.0081	+/-0.50	
M8PFOA	794054.8	3.421167	1,201,948.00	3.429867	66	50 - 150	-0.0087	+/-0.50	
M8PFOS	141156.9	3.620217	233,924.00	3.620233	60	50 - 150	0.0000	+/-0.50	
M9PFNA	749152.3	3.62125	1,205,846.00	3.621267	62	50 - 150	0.0000	+/-0.50	
MPFDoA	574059.1	4.064667	1,115,887.00	4.072683	51	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	86582.93	3.929533	162,242.00	3.937533	53	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	76422.09	3.8497	158,055.00	3.857683	48	50 - 150	-0.0080	+/-0.50	*

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INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
GWTS-1 INFLUENT (23K2976-02RE2)			Lab File ID: 23K2976-02RE2.d			Analyzed: 12/18/23 17:32			
M8FOSA	368405.8	3.956617	785,370.00	3.972583	47	50 - 150	-0.0160	+/-0.50	*
M2-4:2FTS	99821.38	2.505033	253,797.00	2.5543	39	50 - 150	-0.0493	+/-0.50	*
M2PFTA	297706.3	4.321583	2,191,245.00	4.337817	14	50 - 150	-0.0162	+/-0.50	*
M2-8:2FTS	246218.3	3.786883	290,438.00	3.8028	85	50 - 150	-0.0159	+/-0.50	
MPFBA	539438.8	1.075083	851,124.00	1.0834	63	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	199766.1	2.831117	228,269.00	2.872033	88	50 - 150	-0.0409	+/-0.50	
M6PFDA	1288757	3.7874	1,765,419.00	3.803317	73	50 - 150	-0.0159	+/-0.50	
M3PFBS	278532.9	1.894967	314,234.00	1.944683	89	50 - 150	-0.0497	+/-0.50	
M7PFUnA	979278.3	3.938067	1,675,624.00	3.954033	58	50 - 150	-0.0160	+/-0.50	
M2-6:2FTS	187340.9	3.429317	183,944.00	3.445283	102	50 - 150	-0.0160	+/-0.50	
M5PFPeA	644464.9	1.7231	784,382.00	1.766017	82	50 - 150	-0.0429	+/-0.50	
M5PFHxA	1146318	2.588767	1,328,451.00	2.646767	86	50 - 150	-0.0580	+/-0.50	
M3PFHxS	160020.9	3.193817	192,255.00	3.218333	83	50 - 150	-0.0245	+/-0.50	
M4PFHpA	1124893	3.162717	1,301,472.00	3.186933	86	50 - 150	-0.0242	+/-0.50	
M8PFOA	1343152	3.43785	1,492,035.00	3.46195	90	50 - 150	-0.0241	+/-0.50	
M8PFOS	167911.2	3.628217	210,426.00	3.644167	80	50 - 150	-0.0160	+/-0.50	
M9PFNA	1014774	3.62925	1,446,382.00	3.645217	70	50 - 150	-0.0160	+/-0.50	
MPFDoA	622145.9	4.080683	1,449,550.00	4.09665	43	50 - 150	-0.0160	+/-0.50	*
D5-NEtFOSAA	149923.1	3.945533	304,370.00	3.9615	49	50 - 150	-0.0160	+/-0.50	*
D3-NMeFOSAA	225803.7	3.865633	396,602.00	3.881767	57	50 - 150	-0.0161	+/-0.50	
GWTS-1 INFLUENT (23K2976-02RE3)			Lab File ID: 23K2976-02RE3.d			Analyzed: 12/18/23 18:45			
M8PFOS	210803.2	3.6282	210,426.00	3.6282	100	50 - 150	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY

SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
GWTS-1 MID POINT (23K2976-03RE1) Lab File ID: 23K2976-03RE1.d Analyzed: 12/18/23 17:40									
M8FOSA	482743.1	3.956617	785,370.00	3.972583	61	50 - 150	-0.0160	+/-0.50	
M2-4:2FTS	83353.45	2.505033	253,797.00	2.5543	33	50 - 150	-0.0493	+/-0.50	*
M2PFTA	994392.3	4.321583	2,191,245.00	4.337817	45	50 - 150	-0.0162	+/-0.50	*
M2-8:2FTS	193870.2	3.786883	290,438.00	3.8028	67	50 - 150	-0.0159	+/-0.50	
MPFBA	635856.7	1.075083	851,124.00	1.0834	75	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	207691	2.8393	228,269.00	2.872033	91	50 - 150	-0.0327	+/-0.50	
M6PFDA	1293081	3.7874	1,765,419.00	3.803317	73	50 - 150	-0.0159	+/-0.50	
M3PFBS	258004.3	1.894967	314,234.00	1.944683	82	50 - 150	-0.0497	+/-0.50	
M7PFUnA	1108793	3.938067	1,675,624.00	3.954033	66	50 - 150	-0.0160	+/-0.50	
M2-6:2FTS	118231.6	3.429317	183,944.00	3.445283	64	50 - 150	-0.0160	+/-0.50	
M5PFPeA	623421.6	1.7231	784,382.00	1.766017	79	50 - 150	-0.0429	+/-0.50	
M5PFHxA	1077399	2.588767	1,328,451.00	2.646767	81	50 - 150	-0.0580	+/-0.50	
M3PFHxS	150779.7	3.193817	192,255.00	3.218333	78	50 - 150	-0.0245	+/-0.50	
M4PFHpA	1044599	3.162717	1,301,472.00	3.186933	80	50 - 150	-0.0242	+/-0.50	
M8PFOA	1230180	3.43785	1,492,035.00	3.46195	82	50 - 150	-0.0241	+/-0.50	
M8PFOS	156473.2	3.628217	210,426.00	3.644167	74	50 - 150	-0.0160	+/-0.50	
M9PFNA	1162797	3.62925	1,446,382.00	3.645217	80	50 - 150	-0.0160	+/-0.50	
MPFDoA	1012655	4.080683	1,449,550.00	4.09665	70	50 - 150	-0.0160	+/-0.50	
D5-NEtFOSAA	167810.1	3.945533	304,370.00	3.9615	55	50 - 150	-0.0160	+/-0.50	
D3-NMeFOSAA	237231.9	3.865633	396,602.00	3.881767	60	50 - 150	-0.0161	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY
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Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
GWTS-2 EFFLUENT (23K2976-04RE1)			Lab File ID: 23K2976-04RE1.d			Analyzed: 12/18/23 17:47			
M8FOSA	310030.6	3.956617	785,370.00	3.972583	39	50 - 150	-0.0160	+/-0.50	*
M2-4:2FTS	76540.09	2.505033	253,797.00	2.5543	30	50 - 150	-0.0493	+/-0.50	*
M2PFTA	1109752	4.321567	2,191,245.00	4.337817	51	50 - 150	-0.0163	+/-0.50	
M2-8:2FTS	186874.7	3.786867	290,438.00	3.8028	64	50 - 150	-0.0159	+/-0.50	
MPFBA	688011.6	1.075083	851,124.00	1.0834	81	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	208886	2.8393	228,269.00	2.872033	92	50 - 150	-0.0327	+/-0.50	
M6PFDA	1227953	3.787383	1,765,419.00	3.803317	70	50 - 150	-0.0159	+/-0.50	
M3PFBS	262667.9	1.894967	314,234.00	1.944683	84	50 - 150	-0.0497	+/-0.50	
M7PFUnA	985186.4	3.93805	1,675,624.00	3.954033	59	50 - 150	-0.0160	+/-0.50	
M2-6:2FTS	102973.7	3.4293	183,944.00	3.445283	56	50 - 150	-0.0160	+/-0.50	
M5PFPeA	634139.9	1.731383	784,382.00	1.766017	81	50 - 150	-0.0346	+/-0.50	
M5PFHxA	1097360	2.588767	1,328,451.00	2.646767	83	50 - 150	-0.0580	+/-0.50	
M3PFHxS	150256.9	3.193817	192,255.00	3.218333	78	50 - 150	-0.0245	+/-0.50	
M4PFHpA	1026574	3.1627	1,301,472.00	3.186933	79	50 - 150	-0.0242	+/-0.50	
M8PFOA	1206528	3.437833	1,492,035.00	3.46195	81	50 - 150	-0.0241	+/-0.50	
M8PFOS	158881.4	3.6282	210,426.00	3.644167	76	50 - 150	-0.0160	+/-0.50	
M9PFNA	1083831	3.629233	1,446,382.00	3.645217	75	50 - 150	-0.0160	+/-0.50	
MPFDoA	805831.1	4.080667	1,449,550.00	4.09665	56	50 - 150	-0.0160	+/-0.50	
D5-NEtFOSAA	191434.9	3.945533	304,370.00	3.9615	63	50 - 150	-0.0160	+/-0.50	
D3-NMeFOSAA	211271.5	3.865617	396,602.00	3.881767	53	50 - 150	-0.0162	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
GWTS-2 MID POINT (23K2976-05) Lab File ID: 23K2976-05.d Analyzed: 12/12/23 17:19									
M8FOSA	383467.2	3.948617	707,119.00	3.948617	54	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	42142.64	2.472183	117,614.00	2.472183	36	50 - 150	0.0000	+/-0.50	*
M2PFTA	539178.1	4.31345	1,087,831.00	4.31345	50	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	112384.2	3.77095	165,683.00	3.7789	68	50 - 150	-0.0080	+/-0.50	
MPFBA	483560.1	1.058467	801,955.00	1.050167	60	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	155475	2.806583	230,692.00	2.806583	67	50 - 150	0.0000	+/-0.50	
M6PFDA	887200.6	3.779433	1,409,304.00	3.77145	63	50 - 150	0.0080	+/-0.50	
M3PFBS	192488.1	1.8701	305,252.00	1.861817	63	50 - 150	0.0083	+/-0.50	
M7PFUnA	669421.3	3.922083	1,281,109.00	3.922067	52	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	45724.85	3.412467	73,080.00	3.412467	63	50 - 150	0.0000	+/-0.50	
M5PFPeA	467904.2	1.706567	726,231.00	1.698283	64	50 - 150	0.0083	+/-0.50	
M5PFHxA	725445.4	2.5477	1,130,870.00	2.547717	64	50 - 150	0.0000	+/-0.50	
M3PFHxS	131963.2	3.177667	215,682.00	3.177667	61	50 - 150	0.0000	+/-0.50	
M4PFHpA	680878.9	3.146567	1,101,580.00	3.146567	62	50 - 150	0.0000	+/-0.50	
M8PFOA	835319.6	3.421183	1,201,948.00	3.421183	69	50 - 150	0.0000	+/-0.50	
M8PFOS	136424.6	3.620233	233,924.00	3.620233	58	50 - 150	0.0000	+/-0.50	
M9PFNA	736182.4	3.621267	1,205,846.00	3.621267	61	50 - 150	0.0000	+/-0.50	
MPFDoA	538641.9	4.064683	1,115,887.00	4.064683	48	50 - 150	0.0000	+/-0.50	*
D5-NEtFOSAA	90235.61	3.92955	162,242.00	3.929533	56	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	80077	3.849717	158,055.00	3.849717	51	50 - 150	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY

SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Blank (B359274-BLK1)			Lab File ID: B359274-BLK1.d			Analyzed: 12/12/23 15:09			
M8FOSA	533133.8	3.9486	707,119.00	3.956617	75	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	97740.15	2.4886	117,614.00	2.488617	83	50 - 150	0.0000	+/-0.50	
M2PFTA	782428	4.31345	1,087,831.00	4.313433	72	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	132006.4	3.7789	165,683.00	3.7789	80	50 - 150	0.0000	+/-0.50	
MPFBA	645401.6	1.058467	801,955.00	1.058467	80	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	151390.3	2.822933	230,692.00	2.81475	66	50 - 150	0.0082	+/-0.50	
M6PFDA	1102131	3.779417	1,409,304.00	3.779433	78	50 - 150	0.0000	+/-0.50	
M3PFBS	254040.4	1.886667	305,252.00	1.878383	83	50 - 150	0.0083	+/-0.50	
M7PFUnA	976215.1	3.93005	1,281,109.00	3.930067	76	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	76637.4	3.4205	73,080.00	3.420517	105	50 - 150	0.0000	+/-0.50	
M5PFPeA	616155.8	1.714833	726,231.00	1.714833	85	50 - 150	0.0000	+/-0.50	
M5PFHxA	957204.6	2.572333	1,130,870.00	2.57235	85	50 - 150	0.0000	+/-0.50	
M3PFHxS	172614	3.185733	215,682.00	3.18575	80	50 - 150	0.0000	+/-0.50	
M4PFHpA	955898.1	3.154633	1,101,580.00	3.15465	87	50 - 150	0.0000	+/-0.50	
M8PFOA	1087647	3.42985	1,201,948.00	3.429867	90	50 - 150	0.0000	+/-0.50	
M8PFOS	191119.9	3.620217	233,924.00	3.620233	82	50 - 150	0.0000	+/-0.50	
M9PFNA	1031575	3.621267	1,205,846.00	3.621267	86	50 - 150	0.0000	+/-0.50	
MPFDoA	788992.7	4.072667	1,115,887.00	4.072683	71	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	124915.1	3.937517	162,242.00	3.937533	77	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	120957.7	3.857667	158,055.00	3.857683	77	50 - 150	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (B359274-BS1)			Lab File ID: B359274-BS1.d			Analyzed: 12/12/23 14:54			
M8FOSA	470092.3	3.948617	707,119.00	3.956617	66	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	90437.59	2.496817	117,614.00	2.488617	77	50 - 150	0.0082	+/-0.50	
M2PFTA	732676.2	4.313433	1,087,831.00	4.313433	67	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	116620.7	3.786867	165,683.00	3.7789	70	50 - 150	0.0080	+/-0.50	
MPFBA	596422.4	1.066783	801,955.00	1.058467	74	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	133353	2.831117	230,692.00	2.81475	58	50 - 150	0.0164	+/-0.50	
M6PFDA	986463.6	3.779433	1,409,304.00	3.779433	70	50 - 150	0.0000	+/-0.50	
M3PFBS	226033.3	1.894967	305,252.00	1.878383	74	50 - 150	0.0166	+/-0.50	
M7PFUnA	861109.9	3.930067	1,281,109.00	3.930067	67	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	82379.9	3.4205	73,080.00	3.420517	113	50 - 150	0.0000	+/-0.50	
M5PFPeA	558811.5	1.7231	726,231.00	1.714833	77	50 - 150	0.0083	+/-0.50	
M5PFHxA	879492.9	2.58055	1,130,870.00	2.57235	78	50 - 150	0.0082	+/-0.50	
M3PFHxS	154641.3	3.185733	215,682.00	3.18575	72	50 - 150	0.0000	+/-0.50	
M4PFHpA	830689.3	3.154633	1,101,580.00	3.15465	75	50 - 150	0.0000	+/-0.50	
M8PFOA	1000500	3.42985	1,201,948.00	3.429867	83	50 - 150	0.0000	+/-0.50	
M8PFOS	178385.6	3.620217	233,924.00	3.620233	76	50 - 150	0.0000	+/-0.50	
M9PFNA	924280.1	3.62125	1,205,846.00	3.621267	77	50 - 150	0.0000	+/-0.50	
MPFDoA	745462.4	4.072683	1,115,887.00	4.072683	67	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	101226.9	3.937533	162,242.00	3.937533	62	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	114061.2	3.857667	158,055.00	3.857683	72	50 - 150	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY

SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS Dup (B359274-BSD1) Lab File ID: B359274-BSD1.d Analyzed: 12/12/23 15:02									
M8FOSA	513966.4	3.948617	707,119.00	3.956617	73	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	94907.81	2.488617	117,614.00	2.488617	81	50 - 150	0.0000	+/-0.50	
M2PFTA	752696.1	4.313433	1,087,831.00	4.313433	69	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	119074.9	3.7789	165,683.00	3.7789	72	50 - 150	0.0000	+/-0.50	
MPFBA	627670.9	1.058467	801,955.00	1.058467	78	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	162260.6	2.82295	230,692.00	2.81475	70	50 - 150	0.0082	+/-0.50	
M6PFDA	1054641	3.779417	1,409,304.00	3.779433	75	50 - 150	0.0000	+/-0.50	
M3PFBS	240375.4	1.886683	305,252.00	1.878383	79	50 - 150	0.0083	+/-0.50	
M7PFUnA	899127.6	3.930067	1,281,109.00	3.930067	70	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	73516.53	3.420517	73,080.00	3.420517	101	50 - 150	0.0000	+/-0.50	
M5PFPeA	591541.8	1.714833	726,231.00	1.714833	81	50 - 150	0.0000	+/-0.50	
M5PFHxA	923094.2	2.57235	1,130,870.00	2.57235	82	50 - 150	0.0000	+/-0.50	
M3PFHxS	169604.1	3.18575	215,682.00	3.18575	79	50 - 150	0.0000	+/-0.50	
M4PFHpA	895369.4	3.15465	1,101,580.00	3.15465	81	50 - 150	0.0000	+/-0.50	
M8PFOA	1058221	3.429867	1,201,948.00	3.429867	88	50 - 150	0.0000	+/-0.50	
M8PFOS	177264.5	3.620233	233,924.00	3.620233	76	50 - 150	0.0000	+/-0.50	
M9PFNA	990372.1	3.621267	1,205,846.00	3.621267	82	50 - 150	0.0000	+/-0.50	
MPFDoA	727170.3	4.072683	1,115,887.00	4.072683	65	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	120943.9	3.937533	162,242.00	3.937533	75	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	115210.8	3.857667	158,055.00	3.857683	73	50 - 150	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY

SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Blank (B360698-BLK1)			Lab File ID: B360698-BLK1.d			Analyzed: 12/18/23 17:04			
M8FOSA	553063.7	3.9646	785,370.00	3.972583	70	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	166287.2	2.537883	253,797.00	2.5543	66	50 - 150	-0.0164	+/-0.50	
M2PFTA	1182525	4.3297	2,191,245.00	4.337817	54	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	212657.9	3.8028	290,438.00	3.8028	73	50 - 150	0.0000	+/-0.50	
MPFBA	614589.9	1.0834	851,124.00	1.0834	72	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	215058.2	2.86385	228,269.00	2.872033	94	50 - 150	-0.0082	+/-0.50	
M6PFDA	1191323	3.79535	1,765,419.00	3.803317	67	50 - 150	-0.0080	+/-0.50	
M3PFBS	235123	1.928117	314,234.00	1.944683	75	50 - 150	-0.0166	+/-0.50	
M7PFUnA	1045248	3.94605	1,675,624.00	3.954033	62	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	148329.1	3.4373	183,944.00	3.445283	81	50 - 150	-0.0080	+/-0.50	
M5PFPeA	592654.3	1.757717	784,382.00	1.766017	76	50 - 150	-0.0083	+/-0.50	
M5PFHxA	1005876	2.629833	1,328,451.00	2.646767	76	50 - 150	-0.0169	+/-0.50	
M3PFHxS	144130.8	3.21025	192,255.00	3.218333	75	50 - 150	-0.0081	+/-0.50	
M4PFHpA	975806.4	3.178867	1,301,472.00	3.186933	75	50 - 150	-0.0081	+/-0.50	
M8PFOA	1156591	3.453817	1,492,035.00	3.46195	78	50 - 150	-0.0081	+/-0.50	
M8PFOS	158197	3.644183	210,426.00	3.644167	75	50 - 150	0.0000	+/-0.50	
M9PFNA	1087174	3.645217	1,446,382.00	3.645217	75	50 - 150	0.0000	+/-0.50	
MPFDoA	853963.4	4.088666	1,449,550.00	4.09665	59	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	220644.5	3.953517	304,370.00	3.9615	72	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	242926.7	3.873783	396,602.00	3.881767	61	50 - 150	-0.0080	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (B360698-BS1)			Lab File ID: B360698-BS1.d			Analyzed: 12/19/23 11:13			
M8FOSA	577920.9	3.9566	770,047.00	3.9566	75	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	175475.7	2.52145	221,149.00	2.52145	79	50 - 150	0.0000	+/-0.50	
M2PFTA	1347624	4.329683	2,053,088.00	4.329683	66	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	387931.3	3.794833	456,451.00	3.794833	85	50 - 150	0.0000	+/-0.50	
MPFBA	659758.1	1.0834	839,274.00	1.075083	79	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	204706.1	2.847483	204,484.00	2.847483	100	50 - 150	0.0000	+/-0.50	
M6PFDA	1411861	3.79535	1,710,765.00	3.79535	83	50 - 150	0.0000	+/-0.50	
M3PFBS	248521.4	1.911533	304,809.00	1.90325	82	50 - 150	0.0083	+/-0.50	
M7PFUnA	1181177	3.946033	1,671,274.00	3.946033	71	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	144940.6	3.4373	167,667.00	3.4373	86	50 - 150	0.0000	+/-0.50	
M5PFPeA	630882.9	1.741117	760,379.00	1.741117	83	50 - 150	0.0000	+/-0.50	
M5PFHxA	1060639	2.605183	1,276,662.00	2.605183	83	50 - 150	0.0000	+/-0.50	
M3PFHxS	149274.2	3.201883	182,978.00	3.201883	82	50 - 150	0.0000	+/-0.50	
M4PFHpA	1053276	3.170783	1,247,426.00	3.170783	84	50 - 150	0.0000	+/-0.50	
M8PFOA	1194369	3.445833	1,428,397.00	3.445833	84	50 - 150	0.0000	+/-0.50	
M8PFOS	174387.1	3.644167	214,587.00	3.636183	81	50 - 150	0.0080	+/-0.50	
M9PFNA	1152054	3.6452	1,399,645.00	3.6452	82	50 - 150	0.0000	+/-0.50	
MPFDoA	967001.6	4.08865	1,387,742.00	4.08865	70	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	226872.1	3.9535	331,684.00	3.9535	68	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	312701.1	3.873767	431,045.00	3.873767	73	50 - 150	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS Dup (B360698-BSD1) Lab File ID: B360698-BSD1.d Analyzed: 12/19/23 11:20									
M8FOSA	553248.8	3.9566	770,047.00	3.9566	72	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	169126.7	2.51325	221,149.00	2.52145	76	50 - 150	-0.0082	+/-0.50	
M2PFTA	1239702	4.329683	2,053,088.00	4.329683	60	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	370743.3	3.794833	456,451.00	3.794833	81	50 - 150	0.0000	+/-0.50	
MPFBA	642613.1	1.0834	839,274.00	1.075083	77	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	173415.6	2.8393	204,484.00	2.847483	85	50 - 150	-0.0082	+/-0.50	
M6PFDA	1317725	3.79535	1,710,765.00	3.79535	77	50 - 150	0.0000	+/-0.50	
M3PFBS	240894.7	1.90325	304,809.00	1.90325	79	50 - 150	0.0000	+/-0.50	
M7PFUnA	1115192	3.946033	1,671,274.00	3.946033	67	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	150327.6	3.4373	167,667.00	3.4373	90	50 - 150	0.0000	+/-0.50	
M5PFPeA	611886.2	1.741117	760,379.00	1.741117	80	50 - 150	0.0000	+/-0.50	
M5PFHxA	1029337	2.596983	1,276,662.00	2.605183	81	50 - 150	-0.0082	+/-0.50	
M3PFHxS	145857.2	3.201883	182,978.00	3.201883	80	50 - 150	0.0000	+/-0.50	
M4PFHpA	1003883	3.170783	1,247,426.00	3.170783	80	50 - 150	0.0000	+/-0.50	
M8PFOA	1170772	3.445833	1,428,397.00	3.445833	82	50 - 150	0.0000	+/-0.50	
M8PFOS	168350.6	3.636183	214,587.00	3.636183	78	50 - 150	0.0000	+/-0.50	
M9PFNA	1114675	3.637217	1,399,645.00	3.6452	80	50 - 150	-0.0080	+/-0.50	
MPFDoA	912851.6	4.08865	1,387,742.00	4.08865	66	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	208605.9	3.9535	331,684.00	3.9535	63	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	288492.4	3.873767	431,045.00	3.873767	67	50 - 150	0.0000	+/-0.50	

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CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
<i>SOP-454 PFAS in Water</i>	
Perfluorobutanoic acid (PFBA)	NH-P,PA,NY
Perfluorobutanesulfonic acid (PFBS)	NH-P,PA,NY
Perfluoropentanoic acid (PFPeA)	NH-P,PA,NY
Perfluorohexanoic acid (PFHxA)	NH-P,PA,NY
11Cl-PF3OUdS (F53B Major)	NH-P,PA,NY
9Cl-PF3ONS (F53B Minor)	NH-P,PA
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P,PA,NY
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P,PA,NY
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P,PA
Perfluorodecanoic acid (PFDA)	NH-P,PA,NY
Perfluorododecanoic acid (PFDoA)	NH-P,PA,NY
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	NH-P,PA,NY
Perfluoroheptanesulfonic acid (PFHpS)	NH-P,PA,NY
N-EtFOSAA (NEtFOSAA)	NH-P,PA,NY
N-MeFOSAA (NMeFOSAA)	NH-P,PA,NY
Perfluorotetradecanoic acid (PFTA)	NH-P,PA,NY
Perfluorotridecanoic acid (PFTrDA)	NH-P,PA,NY
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P,PA,NY
Perfluorodecanesulfonic acid (PFDS)	NH-P,PA
Perfluorooctanesulfonamide (FOSA)	NH-P,PA
Perfluorononanesulfonic acid (PFNS)	NH-P,PA
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P,PA
Perfluoro-1-butanefulfonamide (FBSA)	NH-P,PA
Perfluorohexanesulfonic acid (PFHxS)	NH-P,PA,NY
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P,PA,NY
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P,PA,NY
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P,PA,NY
Perfluoropentanesulfonic acid (PFPeS)	NH-P,PA,NY
Perfluoroundecanoic acid (PFUnA)	NH-P,PA,NY
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P,PA
Perfluoroheptanoic acid (PFHpA)	NH-P,PA,NY
Perfluorooctanoic acid (PFOA)	NH-P,PA,NY
Perfluorooctanesulfonic acid (PFOS)	NH-P,PA,NY
Perfluorononanoic acid (PFNA)	NH-P,PA,NY

Con-Test, a Pace Environmental Laboratory, operates under the following certifications and accreditations:

Code	Description	Number	Expires
NY	New York State Department of Health	10899 NELAP	04/1/2024
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2024
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2024



DC#_ Title: ENV-FRM-ELON-0001 v07_Sample Receiving Checklist

Effective Date: 07/13/2023

Log In Back-Sheet

Client Beta Group
 Project Barnstable Fire Training Academy
 MCP/RCP Required MA-MCP
 Deliverable Package Requirement GW-1
 Location Barnstable, MA
 PWSID# (When Applicable) na
 Arrival Method:
 Courier ☒ Fed Ex ☐ Walk In ☐ Other ☐
 Received By / Date / Time Mon 11/27/23 1115
 Back-Sheet By / Date / Time Mon 11/27/23 0844
 Temperature Method Gun # 5
 Temp < 6° C Actual Temperature 49
 Rush Samples: Yes / No Notify No
 Short Hold: Yes / No Notify No

Notes regarding Samples/COC outside of SOP:

Log In Sample Receipt Checklist – (Rejection Criteria Listing
 – Using Acceptance Policy) Any False statement will be
 brought to the attention of the Client – True or False

	True	False
Received on Ice	☒	☐
Received in Cooler	☒	☐
Custody Seal: DATE TIME	☐	☒
COC Relinquished	☒	☐
COC/Samples Labels Agree	☒	☐
All Samples in Good Condition	☒	☐
Samples Received within Holding Time	☒	☐
Is there enough Volume	☒	☐
Proper Media/Container Used	☒	☐
Splitting Samples Required	☐	☒
MS/MSD	☐	☒
Trip Blanks	☐	☒
Lab to Filters	☐	☒
COC Legible	☒	☐
COC Included: (Check all included)		
Client ☒ Analysis ☒	Sampler Name	☒
Project ☒ IDs ☒	Collection Date/Time	☒
All Samples Proper pH:	☐	☐

Additional Container Notes

Note: West Virginia requires all samples to have their
 temperature taken. Note any outliers.

	DC#_Title: ENV-FRM-ELON-0001 v07_Sample Receiving Checklist Effective Date: 07/13/2023
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[illegible]

January 17, 2024

Roger Thibault
Beta Group, Inc. - RI
701 George Washington Highway
Lincoln, RI 02865

Project Location: Barnstable, MA
Client Job Number:
Project Number: 6206
Laboratory Work Order Number: 23L3486

Enclosed are results of analyses for samples as received by the laboratory on December 26, 2023. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kaitlyn A. Feliciano
Project Manager

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332Beta Group, Inc. - RI
701 George Washington Highway
Lincoln, RI 02865
ATTN: Roger Thibault

REPORT DATE: 1/17/2024

PURCHASE ORDER NUMBER: 23000936

PROJECT NUMBER: 6206

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 23L3486

The results of analyses performed on the following samples submitted to CON-TEST, a Pace Analytical Laboratory, are found in this report.

PROJECT LOCATION: Barnstable, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
INF (PRW-4)	23L3486-01	Ground Water		SOP-454 PFAS	
Sytem #1 Mid	23L3486-02	Ground Water		SOP-454 PFAS	
Sytem #1 Eff	23L3486-03	Ground Water		SOP-454 PFAS	
Sytem #2 Mid	23L3486-04	Ground Water		SOP-454 PFAS	
Sytem #2 Eff	23L3486-05	Ground Water		SOP-454 PFAS	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

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SOP-454 PFAS**Qualifications:****MS-19**

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:**6:2 Fluorotelomersulfonic acid (6:2FTS A)**

23L3486-01[INF (PRW-4)], B361897-MS1, B361897-MSD1

8:2 Fluorotelomersulfonic acid (8:2FTS A)

23L3486-01[INF (PRW-4)], B361897-MSD1

Perfluoro-1-hexanesulfonamide (FHxSA)

23L3486-01[INF (PRW-4)], B361897-MSD1

Perfluorohexanesulfonic acid (PFHxS)

23L3486-01[INF (PRW-4)], B361897-MS1, B361897-MSD1

Perfluorohexanoic acid (PFHxA)

23L3486-01[INF (PRW-4)], B361897-MSD1

Perfluorooctanesulfonic acid (PFOS)

23L3486-01RE1[INF (PRW-4)], B361897-MSD1

Perfluoropentanoic acid (PFPeA)

23L3486-01[INF (PRW-4)], B361897-MSD1

PF-18

Re-analysis confirmed Extracted Internal Standard failure due to matrix effects.

Analyte & Samples(s) Qualified:**D5-NEtFOSAA**

23L3486-01[INF (PRW-4)], B361897-MSD1

M2-4:2FTS

23L3486-01[INF (PRW-4)], B361897-MS1, B361897-MSD1

M2-8:2FTS

23L3486-01[INF (PRW-4)], B361897-MS1, B361897-MSD1

PF-19

Sample re-analyzed at a dilution that was re-fortified with internal standard.

Analyte & Samples(s) Qualified:**Perfluorooctanesulfonic acid (PFOS)**

23L3486-01RE1[INF (PRW-4)], 23L3486-04RE2[Sytem #2 Mid]

PF-20

Quantifying ion signal to noise ratio is <10. Detection is suspect.

Analyte & Samples(s) Qualified:**Perfluoroundecanoic acid (PFUnA)**

23L3486-02[Sytem #1 Mid]

PF-23

Qualifier ion ratio <50% of associated calibration. Detection is suspect.

Analyte & Samples(s) Qualified:**Perfluorodecanesulfonic acid (PFDS)**

23L3486-01[INF (PRW-4)], 23L3486-04[Sytem #2 Mid]

S-29

Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:**D3-NMeFOSAA**

23L3486-02[Sytem #1 Mid], 23L3486-05[Sytem #2 Eff], B361897-MSD1

D5-NEtFOSAA

23L3486-02[Sytem #1 Mid], 23L3486-05[Sytem #2 Eff]

M2-4:2FTS

23L3486-02[Sytem #1 Mid], 23L3486-03[Sytem #1 Eff], 23L3486-04[Sytem #2 Mid], 23L3486-05[Sytem #2 Eff]

M2-6:2FTS

23L3486-02[Sytem #1 Mid], 23L3486-03[Sytem #1 Eff], 23L3486-05[Sytem #2 Eff]

M2-8:2FTS

23L3486-02[Sytem #1 Mid], 23L3486-03[Sytem #1 Eff], 23L3486-04[Sytem #2 Mid], 23L3486-05[Sytem #2 Eff]

M2PFTA

B361897-MS1

M7PFUnA

23L3486-02[Sytem #1 Mid], 23L3486-05[Sytem #2 Eff]

MPFDoA

23L3486-02[Sytem #1 Mid], 23L3486-05[Sytem #2 Eff], B361897-MS1

The results of analyses reported only relate to samples submitted to Con-Test, a Pace Analytical Laboratory, for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Lisa A. Worthington
Technical Representative

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23L3486

Date Received: 12/26/2023

Field Sample #: INF (PRW-4)

Sampled: 12/21/2023 10:10

Sample ID: 23L3486-01

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	25	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluorobutanesulfonic acid (PFBS)	6.3	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluoropentanoic acid (PFPeA)	71	1.8	ng/L	1	MS-19	SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluorohexanoic acid (PFHxA)	67	1.8	ng/L	1	MS-19	SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	45	1.8	ng/L	1	MS-19	SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluorodecanoic acid (PFDA)	2.8	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluoroheptanesulfonic acid (PFHpS)	4.1	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluorodecanesulfonic acid (PFDS)	2.3	1.8	ng/L	1	PF-23	SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluorooctanesulfonamide (FOSA)	3.7	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluorononanesulfonic acid (PFNS)	2.9	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	50	1.8	ng/L	1	MS-19	SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluoro-1-butanefulfonamide (FBFA)	11	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluorohexanesulfonic acid (PFHxS)	100	1.8	ng/L	1	MS-19	SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	71	1.8	ng/L	1	MS-19	SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluoropentanesulfonic acid (PFPeS)	9.6	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluoroundecanoic acid (PFUnA)	36	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluoroheptanoic acid (PFHpA)	41	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluorooctanoic acid (PFOA)	24	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW
Perfluorooctanesulfonic acid (PFOS)	300	18	ng/L	10	MS-19, PF-19	SOP-454 PFAS	1/12/24	1/16/24 11:03	QNW
Perfluorononanoic acid (PFNA)	19	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:50	QNW

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Project Location: Barnstable, MA

Sample Description:

Work Order: 23L3486

Date Received: 12/26/2023

Field Sample #: Sytem #1 Mid

Sampled: 12/21/2023 10:00

Sample ID: 23L3486-02

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	23	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluoropentanoic acid (PFPeA)	36	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluorohexanoic acid (PFHxA)	27	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	3.1	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	3.9	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluorohexanesulfonic acid (PFHxS)	13	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	12	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluoroundecanoic acid (PFUnA)	2.7	1.8	ng/L	1	PF-20	SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluoroheptanoic acid (PFHpA)	10	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluorooctanoic acid (PFOA)	4.9	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluorooctanesulfonic acid (PFOS)	36	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW
Perfluorononanoic acid (PFNA)	2.8	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 15:58	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23L3486

Date Received: 12/26/2023

Field Sample #: Sytem #1 Eff

Sampled: 12/21/2023 10:05

Sample ID: 23L3486-03

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	5.1	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:05	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23L3486

Date Received: 12/26/2023

Field Sample #: Sytem #2 Mid

Sampled: 12/21/2023 10:20

Sample ID: 23L3486-04

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	22	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluorobutanesulfonic acid (PFBS)	5.3	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluoropentanoic acid (PFPeA)	62	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluorohexanoic acid (PFHxA)	57	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	35	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluorodecanoic acid (PFDA)	2.5	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluoroheptanesulfonic acid (PFHpS)	3.3	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluorodecanesulfonic acid (PFDS)	2.0	1.8	ng/L	1	PF-23	SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluorooctanesulfonamide (FOSA)	3.0	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluorononanesulfonic acid (PFNS)	2.1	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	41	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluoro-1-butanefulfonamide (FBFA)	9.7	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluorohexanesulfonic acid (PFHxS)	86	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	58	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluoropentanesulfonic acid (PFPeS)	8.6	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluoroundecanoic acid (PFUnA)	28	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluoroheptanoic acid (PFHpA)	35	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluorooctanoic acid (PFOA)	20	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW
Perfluorooctanesulfonic acid (PFOS)	240	18	ng/L	10	PF-19	SOP-454 PFAS	1/12/24	1/16/24 11:10	QNW
Perfluorononanoic acid (PFNA)	16	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:12	QNW

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Project Location: Barnstable, MA

Sample Description:

Work Order: 23L3486

Date Received: 12/26/2023

Field Sample #: Sytem #2 Eff

Sampled: 12/21/2023 10:15

Sample ID: 23L3486-05

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/12/24	1/12/24 16:19	QNW

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Sample Extraction Data**Prep Method:**SOP 454-PFAAS **Analytical Method:**SOP-454 PFAS

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23L3486-01 [INF (PRW-4)]	B361897	276	1.00	01/12/24
23L3486-01RE1 [INF (PRW-4)]	B361897	276	1.00	01/12/24
23L3486-02 [Sytem #1 Mid]	B361897	276	1.00	01/12/24
23L3486-03 [Sytem #1 Eff]	B361897	276	1.00	01/12/24
23L3486-04 [Sytem #2 Mid]	B361897	276	1.00	01/12/24
23L3486-04RE2 [Sytem #2 Mid]	B361897	276	1.00	01/12/24
23L3486-05 [Sytem #2 Eff]	B361897	276	1.00	01/12/24

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QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B361897 - SOP 454-PFAAS
Blank (B361897-BLK1)

Prepared & Analyzed: 01/12/24

Perfluorobutanoic acid (PFBA)	ND	1.8	ng/L
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.8	ng/L
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L

LCS (B361897-BS1)

Prepared: 01/12/24 Analyzed: 01/16/24

Perfluorobutanoic acid (PFBA)	7.13	1.8	ng/L	9.17	77.7	73-129
Perfluorobutanesulfonic acid (PFBS)	5.88	1.8	ng/L	8.12	72.4	72-130
Perfluoropentanoic acid (PFPeA)	7.48	1.8	ng/L	9.17	81.5	72-129
Perfluorohexanoic acid (PFHxA)	7.31	1.8	ng/L	9.17	79.7	72-129
11Cl-PF3OUdS (F53B Major)	6.52	1.8	ng/L	8.64	75.4	43.3-138
9Cl-PF3ONS (F53B Minor)	6.15	1.8	ng/L	8.55	71.9	52-140
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	6.75	1.8	ng/L	8.64	78.1	53.7-152
Hexafluoropropylene oxide dimer acid (HFPO-DA)	9.18	1.8	ng/L	9.17	100	42.1-145
8:2 Fluorotelomersulfonic acid (8:2FTS A)	7.41	1.8	ng/L	8.81	84.2	67-138
Perfluorodecanoic acid (PFDA)	7.58	1.8	ng/L	9.17	82.6	71-129
Perfluorododecanoic acid (PFDoA)	7.85	1.8	ng/L	9.17	85.5	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	6.73	1.8	ng/L	8.17	82.4	52.7-147

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B361897 - SOP 454-PFAAS

LCS (B361897-BS1)

Prepared: 01/12/24 Analyzed: 01/16/24

Perfluoroheptanesulfonic acid (PFHpS)	7.33	1.8	ng/L	8.76		83.6	69-134			
N-EtFOSAA (NEtFOSAA)	8.86	1.8	ng/L	9.17		96.5	61-135			
N-MeFOSAA (NMeFOSAA)	9.09	1.8	ng/L	9.17		99.1	65-136			
Perfluorotetradecanoic acid (PFTA)	7.49	1.8	ng/L	9.17		81.6	71-132			
Perfluorotridecanoic acid (PFTTrDA)	7.29	1.8	ng/L	9.17		79.4	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	6.68	1.8	ng/L	8.58		77.8	63-143			
Perfluorodecanesulfonic acid (PFDS)	5.49	1.8	ng/L	8.85		62.0	53-142			
Perfluorooctanesulfonamide (FOSA)	7.79	1.8	ng/L	9.17		84.9	67-137			
Perfluorononanesulfonic acid (PFNS)	6.23	1.8	ng/L	8.81		70.8	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	6.61	1.8	ng/L	9.17		72.1	50-150			
Perfluoro-1-butanefulfonamide (FBSA)	6.92	1.8	ng/L	9.17		75.4	50-150			
Perfluorohexanesulfonic acid (PFHxS)	5.95	1.8	ng/L	8.39		70.9	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	7.07	1.8	ng/L	9.17		77.1	53.8-150			
Perfluoro-5-oxahexanoic acid (PFMBA)	7.50	1.8	ng/L	9.17		81.7	54.5-152			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	6.66	1.8	ng/L	8.72		76.4	64-140			
Perfluoropentanesulfonic acid (PFPeS)	6.53	1.8	ng/L	8.62		75.7	71-127			
Perfluoroundecanoic acid (PFUnA)	7.89	1.8	ng/L	9.17		86.0	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	6.60	1.8	ng/L	9.17		72.0	50.5-159			
Perfluoroheptanoic acid (PFHpA)	7.54	1.8	ng/L	9.17		82.2	72-130			
Perfluorooctanoic acid (PFOA)	7.44	1.8	ng/L	9.17		81.1	71-133			
Perfluorooctanesulfonic acid (PFOS)	6.66	1.8	ng/L	8.49		78.5	65-140			
Perfluorononanoic acid (PFNA)	7.67	1.8	ng/L	9.17		83.6	69-130			

Matrix Spike (B361897-MS1)

Source: 23L3486-01

Prepared & Analyzed: 01/12/24

Perfluorobutanoic acid (PFBA)	33.8	1.8	ng/L	9.04	24.7	101	73-129			
Perfluorobutanesulfonic acid (PFBS)	14.1	1.8	ng/L	8.00	6.32	96.9	72-130			
Perfluoropentanoic acid (PFPeA)	80.9	1.8	ng/L	9.04	70.8	112	72-129			
Perfluorohexanoic acid (PFHxA)	77.1	1.8	ng/L	9.04	67.4	108	72-129			
11Cl-PF3OUdS (F53B Major)	6.94	1.8	ng/L	8.52	ND	81.5	50-150			
9Cl-PF3ONS (F53B Minor)	7.96	1.8	ng/L	8.43	ND	94.5	50-150			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	7.70	1.8	ng/L	8.52	ND	90.4	51.4-161			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	7.56	1.8	ng/L	9.04	ND	83.7	40.3-148			
8:2 Fluorotelomersulfonic acid (8:2FTS A)	52.9	1.8	ng/L	8.68	45.1	89.6	67-138			
Perfluorodecanoic acid (PFDA)	9.94	1.8	ng/L	9.04	2.83	78.6	71-129			
Perfluorododecanoic acid (PFDoA)	7.81	1.8	ng/L	9.04	ND	86.4	72-134			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	8.04	1.8	ng/L	8.05	ND	100	57.2-150			
Perfluoroheptanesulfonic acid (PFHpS)	13.6	1.8	ng/L	8.63	4.14	109	69-134			
N-EtFOSAA (NEtFOSAA)	9.61	1.8	ng/L	9.04	ND	106	61-135			
N-MeFOSAA (NMeFOSAA)	10.2	1.8	ng/L	9.04	ND	113	65-136			
Perfluorotetradecanoic acid (PFTA)	8.58	1.8	ng/L	9.04	ND	94.9	71-132			
Perfluorotridecanoic acid (PFTTrDA)	10.7	1.8	ng/L	9.04	ND	118	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	8.55	1.8	ng/L	8.45	ND	101	63-143			
Perfluorodecanesulfonic acid (PFDS)	8.16	1.8	ng/L	8.72	2.30	67.1	53-142			
Perfluorooctanesulfonamide (FOSA)	13.7	1.8	ng/L	9.04	3.71	111	67-137			
Perfluorononanesulfonic acid (PFNS)	10.3	1.8	ng/L	8.68	2.85	85.9	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	59.8	1.8	ng/L	9.04	50.4	104	50-150			
Perfluoro-1-butanefulfonamide (FBSA)	20.3	1.8	ng/L	9.04	11.4	97.8	49.5-154			
Perfluorohexanesulfonic acid (PFHxS)	103	1.8	ng/L	8.27	100	38.2 *	68-131			MS-19
Perfluoro-4-oxapentanoic acid (PFMPA)	9.60	1.8	ng/L	9.04	ND	106	50-150			
Perfluoro-5-oxahexanoic acid (PFMBA)	8.35	1.8	ng/L	9.04	ND	92.4	58.1-164			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B361897 - SOP 454-PFAAS										
Matrix Spike (B361897-MS1)										
Source: 23L3486-01			Prepared & Analyzed: 01/12/24							
6:2 Fluorotelomersulfonic acid (6:2FTS A)	83.5	1.8	ng/L	8.59	71.2	143	*	64-140		MS-19
Perfluoropentanesulfonic acid (PFPeS)	17.5	1.8	ng/L	8.50	9.57	93.0		71-127		
Perfluoroundecanoic acid (PFUnA)	45.1	1.8	ng/L	9.04	36.4	95.4		69-133		
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	7.28	1.8	ng/L	9.04	ND	80.5		54.6-170		
Perfluoroheptanoic acid (PFHpA)	50.4	1.8	ng/L	9.04	41.3	100		72-130		
Perfluorooctanoic acid (PFOA)	33.7	1.8	ng/L	9.04	24.3	104		71-133		
Perfluorooctanesulfonic acid (PFOS)	338	1.8	ng/L	8.36	331	87.8		65-140		
Perfluorononanoic acid (PFNA)	28.1	1.8	ng/L	9.04	19.3	97.0		69-130		
Matrix Spike Dup (B361897-MSD1)										
Source: 23L3486-01			Prepared & Analyzed: 01/12/24							
Perfluorobutanoic acid (PFBA)	33.0	1.9	ng/L	9.25	24.7	90.3		73-129	2.32	30
Perfluorobutanesulfonic acid (PFBS)	14.2	1.9	ng/L	8.19	6.32	96.5		72-130	1.10	30
Perfluoropentanoic acid (PFPeA)	76.3	1.9	ng/L	9.25	70.8	59.8	*	72-129	5.81	30 MS-19
Perfluorohexanoic acid (PFHxA)	72.9	1.9	ng/L	9.25	67.4	59.6	*	72-129	5.63	30 MS-19
11Cl-PF3OUdS (F53B Major)	8.65	1.9	ng/L	8.72	ND	99.3		50-150	21.9	30
9Cl-PF3ONS (F53B Minor)	8.97	1.9	ng/L	8.62	ND	104		50-150	11.8	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.44	1.9	ng/L	8.72	ND	96.9		51.4-161	9.27	30
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.84	1.9	ng/L	9.25	ND	95.5		40.3-148	15.5	30
8:2 Fluorotelomersulfonic acid (8:2FTS A)	49.4	1.9	ng/L	8.88	45.1	48.1	*	67-138	6.85	30 MS-19
Perfluorodecanoic acid (PFDA)	10.9	1.9	ng/L	9.25	2.83	87.0		71-129	9.03	30
Perfluorododecanoic acid (PFDoA)	8.33	1.9	ng/L	9.25	ND	90.0		72-134	6.41	30
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	8.59	1.9	ng/L	8.24	ND	104		57.2-150	6.56	30
Perfluoroheptanesulfonic acid (PFHpS)	14.2	1.9	ng/L	8.84	4.14	114		69-134	4.49	30
N-EtFOSAA (NEtFOSAA)	11.4	1.9	ng/L	9.25	ND	123		61-135	16.9	30
N-MeFOSAA (NMeFOSAA)	10.5	1.9	ng/L	9.25	ND	113		65-136	2.97	30
Perfluorotetradecanoic acid (PFTA)	10.1	1.9	ng/L	9.25	ND	109		71-132	16.2	30
Perfluorotridecanoic acid (PFTrDA)	9.99	1.9	ng/L	9.25	ND	108		65-144	6.55	30
4:2 Fluorotelomersulfonic acid (4:2FTS A)	9.14	1.9	ng/L	8.65	ND	106		63-143	6.68	30
Perfluorodecanesulfonic acid (PFDS)	9.93	1.9	ng/L	8.93	2.30	85.5		53-142	19.7	30
Perfluorooctanesulfonamide (FOSA)	14.2	1.9	ng/L	9.25	3.71	113		67-137	3.09	30
Perfluorononanesulfonic acid (PFNS)	11.6	1.9	ng/L	8.88	2.85	98.1		69-127	11.5	30
Perfluoro-1-hexanesulfonamide (FHxSA)	54.3	1.9	ng/L	9.25	50.4	42.5	*	50-150	9.58	30 MS-19
Perfluoro-1-butanedisulfonamide (FBSA)	20.1	1.9	ng/L	9.25	11.4	93.7		49.5-154	0.839	30
Perfluorohexanesulfonic acid (PFHxS)	104	1.9	ng/L	8.47	100	39.7	*	68-131	0.195	30 MS-19
Perfluoro-4-oxapentanoic acid (PFMPA)	10.2	1.9	ng/L	9.25	ND	111		50-150	6.35	30
Perfluoro-5-oxahexanoic acid (PFMBA)	9.13	1.9	ng/L	9.25	ND	98.6		58.1-164	8.82	30
6:2 Fluorotelomersulfonic acid (6:2FTS A)	74.1	1.9	ng/L	8.79	71.2	33.1	*	64-140	11.9	30 MS-19
Perfluoropentanesulfonic acid (PFPeS)	18.0	1.9	ng/L	8.70	9.57	96.7		71-127	2.89	30
Perfluoroundecanoic acid (PFUnA)	44.2	1.9	ng/L	9.25	36.4	84.1		69-133	1.88	30
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	8.16	1.9	ng/L	9.25	ND	88.2		54.6-170	11.3	30
Perfluoroheptanoic acid (PFHpA)	48.2	1.9	ng/L	9.25	41.3	73.9		72-130	4.52	30
Perfluorooctanoic acid (PFOA)	32.7	1.9	ng/L	9.25	24.3	90.8		71-133	3.06	30
Perfluorooctanesulfonic acid (PFOS)	328	1.9	ng/L	8.56	331	-29.2	*	65-140	2.96	30 MS-19
Perfluorononanoic acid (PFNA)	27.8	1.9	ng/L	9.25	19.3	91.7		69-130	1.02	30

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
PF-18	Re-analysis confirmed Extracted Internal Standard failure due to matrix effects.
PF-19	Sample re-analyzed at a dilution that was re-fortified with internal standard.
PF-20	Quantifying ion signal to noise ratio is <10. Detection is suspect.
PF-23	Qualifier ion ratio <50% of associated calibration. Detection is suspect.
S-29	Extracted Internal Standard is outside of control limits.

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INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
INF (PRW-4) (23L3486-01) Lab File ID: 23L3486-01.d Analyzed: 01/12/24 15:50									
M8FOSA	582910.1	3.980567	1,061,108.00	3.972583	55	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	131418.1	2.57895	396,067.00	2.570733	33	50 - 150	0.0082	+/-0.50	*
M2PFTA	1108299	4.329683	2,119,169.00	4.329683	52	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	157154.2	3.8028	349,506.00	3.8028	45	50 - 150	0.0000	+/-0.50	*
MPFBA	590487.7	1.0834	958,835.00	1.075083	62	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	204084.9	2.8884	240,709.00	2.8884	85	50 - 150	0.0000	+/-0.50	
M6PFDA	1028155	3.803317	1,672,896.00	3.803317	61	50 - 150	0.0000	+/-0.50	
M3PFBS	343808.5	1.96145	432,420.00	1.95315	80	50 - 150	0.0083	+/-0.50	
M7PFUnA	998849.8	3.954033	1,878,708.00	3.946033	53	50 - 150	0.0080	+/-0.50	
M2-6:2FTS	193449.6	3.445283	270,850.00	3.445283	71	50 - 150	0.0000	+/-0.50	
M5PFPeA	696591.6	1.7826	871,191.00	1.7743	80	50 - 150	0.0083	+/-0.50	
M5PFHxA	1206374	2.663233	1,531,885.00	2.655	79	50 - 150	0.0082	+/-0.50	
M3PFHxS	208283	3.226417	282,246.00	3.218333	74	50 - 150	0.0081	+/-0.50	
M4PFHpA	1208411	3.195017	1,560,948.00	3.195017	77	50 - 150	0.0000	+/-0.50	
M8PFOA	1391556	3.461933	1,664,897.00	3.453817	84	50 - 150	0.0081	+/-0.50	
M8PFOS	181878.1	3.644167	288,744.00	3.644167	63	50 - 150	0.0000	+/-0.50	
M9PFNA	1098484	3.6452	1,570,395.00	3.6452	70	50 - 150	0.0000	+/-0.50	
MPFDoA	996721.6	4.08865	1,916,220.00	4.08865	52	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	212633.1	3.9615	432,086.00	3.9535	49	50 - 150	0.0080	+/-0.50	*
D3-NMeFOSAA	253772.3	3.88175	490,728.00	3.873767	52	50 - 150	0.0080	+/-0.50	
INF (PRW-4) (23L3486-01RE1) Lab File ID: 23L3486-01RE2.d Analyzed: 01/16/24 11:03									
M8PFOS	255499.7	3.65215	297,291.00	3.652167	86	50 - 150	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Sytem #1 Mid (23L3486-02)		Lab File ID: 23L3486-02.d				Analyzed: 01/12/24 15:58			
M8FOSA	564354.6	3.980567	1,061,108.00	3.972583	53	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	110757.6	2.57895	396,067.00	2.570733	28	50 - 150	0.0082	+/-0.50	*
M2PFTA	1093690	4.329683	2,119,169.00	4.329683	52	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	109169.9	3.8028	349,506.00	3.8028	31	50 - 150	0.0000	+/-0.50	*
MPFBA	616527.6	1.0834	958,835.00	1.075083	64	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	179294.3	2.8884	240,709.00	2.8884	74	50 - 150	0.0000	+/-0.50	
M6PFDA	942856.5	3.803317	1,672,896.00	3.803317	56	50 - 150	0.0000	+/-0.50	
M3PFBS	285618	1.96145	432,420.00	1.95315	66	50 - 150	0.0083	+/-0.50	
M7PFUnA	871777.8	3.954033	1,878,708.00	3.946033	46	50 - 150	0.0080	+/-0.50	*
M2-6:2FTS	120437.7	3.445283	270,850.00	3.445283	44	50 - 150	0.0000	+/-0.50	*
M5PFPeA	597596.6	1.7826	871,191.00	1.7743	69	50 - 150	0.0083	+/-0.50	
M5PFHxA	1024860	2.663233	1,531,885.00	2.655	67	50 - 150	0.0082	+/-0.50	
M3PFHxS	192440.6	3.226417	282,246.00	3.218333	68	50 - 150	0.0081	+/-0.50	
M4PFHpA	1027320	3.195017	1,560,948.00	3.195017	66	50 - 150	0.0000	+/-0.50	
M8PFOA	1150758	3.461933	1,664,897.00	3.453817	69	50 - 150	0.0081	+/-0.50	
M8PFOS	175644.9	3.644167	288,744.00	3.644167	61	50 - 150	0.0000	+/-0.50	
M9PFNA	1020928	3.6452	1,570,395.00	3.6452	65	50 - 150	0.0000	+/-0.50	
MPFDoA	924534.1	4.08865	1,916,220.00	4.08865	48	50 - 150	0.0000	+/-0.50	*
D5-NEtFOSAA	198329.4	3.9615	432,086.00	3.9535	46	50 - 150	0.0080	+/-0.50	*
D3-NMeFOSAA	214858.7	3.88175	490,728.00	3.873767	44	50 - 150	0.0080	+/-0.50	*

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INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Sytem #1 Eff (23L3486-03)		Lab File ID: 23L3486-03.d				Analyzed: 01/12/24 16:05			
M8FOSA	742500.2	3.980567	1,061,108.00	3.972583	70	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	124637.5	2.58715	396,067.00	2.570733	31	50 - 150	0.0164	+/-0.50	*
M2PFTA	1465630	4.3378	2,119,169.00	4.329683	69	50 - 150	0.0081	+/-0.50	
M2-8:2FTS	143869.7	3.8028	349,506.00	3.8028	41	50 - 150	0.0000	+/-0.50	*
MPFBA	774548.8	1.0834	958,835.00	1.075083	81	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	195700.6	2.8884	240,709.00	2.8884	81	50 - 150	0.0000	+/-0.50	
M6PFDA	1154063	3.803317	1,672,896.00	3.803317	69	50 - 150	0.0000	+/-0.50	
M3PFBS	343927.8	1.96145	432,420.00	1.95315	80	50 - 150	0.0083	+/-0.50	
M7PFUnA	1228518	3.954033	1,878,708.00	3.946033	65	50 - 150	0.0080	+/-0.50	
M2-6:2FTS	130646	3.453267	270,850.00	3.445283	48	50 - 150	0.0080	+/-0.50	*
M5PFPeA	726763.1	1.7826	871,191.00	1.7743	83	50 - 150	0.0083	+/-0.50	
M5PFHxA	1238366	2.672333	1,531,885.00	2.655	81	50 - 150	0.0173	+/-0.50	
M3PFHxS	229337.7	3.226417	282,246.00	3.218333	81	50 - 150	0.0081	+/-0.50	
M4PFHpA	1257111	3.195017	1,560,948.00	3.195017	81	50 - 150	0.0000	+/-0.50	
M8PFOA	1346939	3.461933	1,664,897.00	3.453817	81	50 - 150	0.0081	+/-0.50	
M8PFOS	224906.5	3.644167	288,744.00	3.644167	78	50 - 150	0.0000	+/-0.50	
M9PFNA	1277499	3.6452	1,570,395.00	3.6452	81	50 - 150	0.0000	+/-0.50	
MPFDoA	1287029	4.08865	1,916,220.00	4.08865	67	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	270266.1	3.9615	432,086.00	3.9535	63	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	294305.6	3.88175	490,728.00	3.873767	60	50 - 150	0.0080	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Sytem #2 Mid (23L3486-04) Lab File ID: 23L3486-04.d Analyzed: 01/12/24 16:12									
M8FOSA	620997.2	3.980583	1,061,108.00	3.972583	59	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	125443.6	2.57895	396,067.00	2.570733	32	50 - 150	0.0082	+/-0.50	*
M2PFTA	1211422	4.329683	2,119,169.00	4.329683	57	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	164564.8	3.8028	349,506.00	3.8028	47	50 - 150	0.0000	+/-0.50	*
MPFBA	600367.2	1.0834	958,835.00	1.075083	63	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	198227.7	2.8884	240,709.00	2.8884	82	50 - 150	0.0000	+/-0.50	
M6PFDA	1041136	3.803317	1,672,896.00	3.803317	62	50 - 150	0.0000	+/-0.50	
M3PFBS	331829.2	1.96145	432,420.00	1.95315	77	50 - 150	0.0083	+/-0.50	
M7PFUnA	1057287	3.954033	1,878,708.00	3.946033	56	50 - 150	0.0080	+/-0.50	
M2-6:2FTS	151361.7	3.445283	270,850.00	3.445283	56	50 - 150	0.0000	+/-0.50	
M5PFPeA	680088.1	1.7826	871,191.00	1.7743	78	50 - 150	0.0083	+/-0.50	
M5PFHxA	1162281	2.672333	1,531,885.00	2.655	76	50 - 150	0.0173	+/-0.50	
M3PFHxS	199436.8	3.226417	282,246.00	3.218333	71	50 - 150	0.0081	+/-0.50	
M4PFHpA	1190378	3.195017	1,560,948.00	3.195017	76	50 - 150	0.0000	+/-0.50	
M8PFOA	1299793	3.461933	1,664,897.00	3.453817	78	50 - 150	0.0081	+/-0.50	
M8PFOS	180030	3.644167	288,744.00	3.644167	62	50 - 150	0.0000	+/-0.50	
M9PFNA	1090887	3.6452	1,570,395.00	3.6452	69	50 - 150	0.0000	+/-0.50	
MPFDoA	999647	4.08865	1,916,220.00	4.08865	52	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	228036.9	3.9615	432,086.00	3.9535	53	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	248472.1	3.88175	490,728.00	3.873767	51	50 - 150	0.0080	+/-0.50	
Sytem #2 Mid (23L3486-04RE2) Lab File ID: 23L3486-04RE2.d Analyzed: 01/16/24 11:10									
M8PFOS	249893.3	3.65215	297,291.00	3.652167	84	50 - 150	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Sytem #2 Eff (23L3486-05)			Lab File ID: 23L3486-05.d			Analyzed: 01/12/24 16:19			
M8FOSA	577554.6	3.980567	1,061,108.00	3.972583	54	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	114450.7	2.57895	396,067.00	2.570733	29	50 - 150	0.0082	+/-0.50	*
M2PFTA	1109907	4.3378	2,119,169.00	4.329683	52	50 - 150	0.0081	+/-0.50	
M2-8:2FTS	115072.7	3.8028	349,506.00	3.8028	33	50 - 150	0.0000	+/-0.50	*
MPFBA	695792.3	1.0834	958,835.00	1.075083	73	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	208447.5	2.8884	240,709.00	2.8884	87	50 - 150	0.0000	+/-0.50	
M6PFDA	858190.2	3.803317	1,672,896.00	3.803317	51	50 - 150	0.0000	+/-0.50	
M3PFBS	304560.6	1.96145	432,420.00	1.95315	70	50 - 150	0.0083	+/-0.50	
M7PFUnA	903671.9	3.954033	1,878,708.00	3.946033	48	50 - 150	0.0080	+/-0.50	*
M2-6:2FTS	112680.4	3.453267	270,850.00	3.445283	42	50 - 150	0.0080	+/-0.50	*
M5PFPeA	645895.9	1.7826	871,191.00	1.7743	74	50 - 150	0.0083	+/-0.50	
M5PFHxA	1108142	2.663233	1,531,885.00	2.655	72	50 - 150	0.0082	+/-0.50	
M3PFHxS	193865.9	3.226417	282,246.00	3.218333	69	50 - 150	0.0081	+/-0.50	
M4PFHpA	1117727	3.195017	1,560,948.00	3.195017	72	50 - 150	0.0000	+/-0.50	
M8PFOA	1204138	3.461933	1,664,897.00	3.453817	72	50 - 150	0.0081	+/-0.50	
M8PFOS	155183.6	3.644167	288,744.00	3.644167	54	50 - 150	0.0000	+/-0.50	
M9PFNA	990950.5	3.6452	1,570,395.00	3.6452	63	50 - 150	0.0000	+/-0.50	
MPFDoA	928979.1	4.08865	1,916,220.00	4.08865	48	50 - 150	0.0000	+/-0.50	*
D5-NEtFOSAA	196944.6	3.9615	432,086.00	3.9535	46	50 - 150	0.0080	+/-0.50	*
D3-NMeFOSAA	225706.1	3.88175	490,728.00	3.873767	46	50 - 150	0.0080	+/-0.50	*

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INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Blank (B361897-BLK1)			Lab File ID: B361897-BLK1.d			Analyzed: 01/12/24 15:29			
M8FOSA	686765.1	3.972583	1,061,108.00	3.972583	65	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	263530.5	2.57895	396,067.00	2.570733	67	50 - 150	0.0082	+/-0.50	
M2PFTA	1416521	4.329683	2,119,169.00	4.329683	67	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	215245.2	3.8028	349,506.00	3.8028	62	50 - 150	0.0000	+/-0.50	
MPFBA	711547.9	1.075083	958,835.00	1.075083	74	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	205646.5	2.8884	240,709.00	2.8884	85	50 - 150	0.0000	+/-0.50	
M6PFDA	1179099	3.803317	1,672,896.00	3.803317	70	50 - 150	0.0000	+/-0.50	
M3PFBS	326657.1	1.96145	432,420.00	1.95315	76	50 - 150	0.0083	+/-0.50	
M7PFUnA	1277683	3.954033	1,878,708.00	3.946033	68	50 - 150	0.0080	+/-0.50	
M2-6:2FTS	206597.9	3.445283	270,850.00	3.445283	76	50 - 150	0.0000	+/-0.50	
M5PFPeA	677525.3	1.7826	871,191.00	1.7743	78	50 - 150	0.0083	+/-0.50	
M5PFHxA	1174895	2.663233	1,531,885.00	2.655	77	50 - 150	0.0082	+/-0.50	
M3PFHxS	207973.9	3.226417	282,246.00	3.218333	74	50 - 150	0.0081	+/-0.50	
M4PFHpA	1220931	3.195017	1,560,948.00	3.195017	78	50 - 150	0.0000	+/-0.50	
M8PFOA	1373173	3.461933	1,664,897.00	3.453817	82	50 - 150	0.0081	+/-0.50	
M8PFOS	213026.6	3.644167	288,744.00	3.644167	74	50 - 150	0.0000	+/-0.50	
M9PFNA	1220203	3.6452	1,570,395.00	3.6452	78	50 - 150	0.0000	+/-0.50	
MPFDaA	1235960	4.08865	1,916,220.00	4.08865	64	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	274655.6	3.9535	432,086.00	3.9535	64	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	279182.8	3.88175	490,728.00	3.873767	57	50 - 150	0.0080	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY

SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (B361897-BS1)			Lab File ID: B361897-BS1R.d			Analyzed: 01/16/24 15:11			
M8FOSA	729846.1	3.980583	858,508.00	3.9806	85	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	185670.9	2.603583	203,806.00	2.603583	91	50 - 150	0.0000	+/-0.50	
M2PFTA	1409129	4.337817	1,566,293.00	4.337833	90	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	228709	3.810767	224,419.00	3.810783	102	50 - 150	0.0000	+/-0.50	
MPFBA	764507.8	1.0917	787,120.00	1.0917	97	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	189466	2.904767	232,777.00	2.904767	81	50 - 150	0.0000	+/-0.50	
M6PFDA	1289012	3.811283	1,461,978.00	3.8113	88	50 - 150	0.0000	+/-0.50	
M3PFBS	326517	1.978033	329,707.00	1.978033	99	50 - 150	0.0000	+/-0.50	
M7PFUnA	1311078	3.962017	1,389,136.00	3.96205	94	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	168471	3.461417	136,933.00	3.461417	123	50 - 150	0.0000	+/-0.50	
M5PFPeA	720991.4	1.799667	748,067.00	1.799667	96	50 - 150	0.0000	+/-0.50	
M5PFHxA	1229143	2.68875	1,249,301.00	2.688767	98	50 - 150	0.0000	+/-0.50	
M3PFHxS	217103.6	3.2345	219,871.00	3.2345	99	50 - 150	0.0000	+/-0.50	
M4PFHpA	1257382	3.21145	1,276,106.00	3.2031	99	50 - 150	0.0084	+/-0.50	
M8PFOA	1325284	3.469917	1,341,043.00	3.469933	99	50 - 150	0.0000	+/-0.50	
M8PFOS	219856.5	3.65215	243,516.00	3.652167	90	50 - 150	0.0000	+/-0.50	
M9PFNA	1245811	3.6532	1,216,795.00	3.6532	102	50 - 150	0.0000	+/-0.50	
MPFDoA	1182254	4.104633	1,341,525.00	4.096667	88	50 - 150	0.0080	+/-0.50	
D5-NEtFOSAA	248762.8	3.9695	308,901.00	3.969517	81	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	276585.7	3.889733	351,266.00	3.889767	79	50 - 150	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY

SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike (B361897-MS1)			Lab File ID: B361897-MS1.d			Analyzed: 01/12/24 15:36			
M8FOSA	554170.1	3.972583	1,061,108.00	3.972583	52	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	137110.5	2.57895	396,067.00	2.570733	35	50 - 150	0.0082	+/-0.50	*
M2PFTA	820842.2	4.329683	2,119,169.00	4.329683	39	50 - 150	0.0000	+/-0.50	*
M2-8:2FTS	169938.6	3.8028	349,506.00	3.8028	49	50 - 150	0.0000	+/-0.50	*
MPFBA	599656.3	1.0834	958,835.00	1.075083	63	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	204778	2.8884	240,709.00	2.8884	85	50 - 150	0.0000	+/-0.50	
M6PFDA	1043223	3.803317	1,672,896.00	3.803317	62	50 - 150	0.0000	+/-0.50	
M3PFBS	340597.6	1.96145	432,420.00	1.95315	79	50 - 150	0.0083	+/-0.50	
M7PFUnA	1023742	3.954033	1,878,708.00	3.946033	54	50 - 150	0.0080	+/-0.50	
M2-6:2FTS	216205.3	3.445283	270,850.00	3.445283	80	50 - 150	0.0000	+/-0.50	
M5PFPeA	705970.6	1.7826	871,191.00	1.7743	81	50 - 150	0.0083	+/-0.50	
M5PFHxA	1215382	2.663233	1,531,885.00	2.655	79	50 - 150	0.0082	+/-0.50	
M3PFHxS	223298.9	3.226417	282,246.00	3.218333	79	50 - 150	0.0081	+/-0.50	
M4PFHpA	1219936	3.195017	1,560,948.00	3.195017	78	50 - 150	0.0000	+/-0.50	
M8PFOA	1409270	3.461933	1,664,897.00	3.453817	85	50 - 150	0.0081	+/-0.50	
M8PFOS	188199.8	3.644167	288,744.00	3.644167	65	50 - 150	0.0000	+/-0.50	
M9PFNA	1080447	3.6452	1,570,395.00	3.6452	69	50 - 150	0.0000	+/-0.50	
MPFDoA	943516.3	4.08865	1,916,220.00	4.08865	49	50 - 150	0.0000	+/-0.50	*
D5-NEtFOSAA	225738.6	3.9615	432,086.00	3.9535	52	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	252587.1	3.88175	490,728.00	3.873767	51	50 - 150	0.0080	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike Dup (B361897-MSD1)			Lab File ID: B361897-MSD1.d			Analyzed: 01/12/24 15:43			
M8FOSA	569878	3.972583	1,061,108.00	3.972583	54	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	123632.6	2.57895	396,067.00	2.570733	31	50 - 150	0.0082	+/-0.50	*
M2PFTA	1123219	4.329683	2,119,169.00	4.329683	53	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	161197.2	3.8028	349,506.00	3.8028	46	50 - 150	0.0000	+/-0.50	*
MPFBA	561609.7	1.0834	958,835.00	1.075083	59	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	187583.9	2.8884	240,709.00	2.8884	78	50 - 150	0.0000	+/-0.50	
M6PFDA	997487	3.803317	1,672,896.00	3.803317	60	50 - 150	0.0000	+/-0.50	
M3PFBS	314188.9	1.96145	432,420.00	1.95315	73	50 - 150	0.0083	+/-0.50	
M7PFUnA	1003031	3.954033	1,878,708.00	3.946033	53	50 - 150	0.0080	+/-0.50	
M2-6:2FTS	166518.9	3.445283	270,850.00	3.445283	61	50 - 150	0.0000	+/-0.50	
M5PFPeA	642337.6	1.7826	871,191.00	1.7743	74	50 - 150	0.0083	+/-0.50	
M5PFHxA	1113241	2.663233	1,531,885.00	2.655	73	50 - 150	0.0082	+/-0.50	
M3PFHxS	196855.3	3.226417	282,246.00	3.218333	70	50 - 150	0.0081	+/-0.50	
M4PFHpA	1129360	3.195017	1,560,948.00	3.195017	72	50 - 150	0.0000	+/-0.50	
M8PFOA	1256021	3.461933	1,664,897.00	3.453817	75	50 - 150	0.0081	+/-0.50	
M8PFOS	171629.3	3.644167	288,744.00	3.644167	59	50 - 150	0.0000	+/-0.50	
M9PFNA	1014221	3.6452	1,570,395.00	3.6452	65	50 - 150	0.0000	+/-0.50	
MPFDoA	998683.2	4.08865	1,916,220.00	4.08865	52	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	213961.7	3.9615	432,086.00	3.9535	50	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	240938.2	3.88175	490,728.00	3.873767	49	50 - 150	0.0080	+/-0.50	*

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CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
<i>SOP-454 PFAS in Water</i>	
Perfluorobutanoic acid (PFBA)	NH-P,PA,NY
Perfluorobutanesulfonic acid (PFBS)	NH-P,PA,NY
Perfluoropentanoic acid (PFPeA)	NH-P,PA,NY
Perfluorohexanoic acid (PFHxA)	NH-P,PA,NY
11Cl-PF3OUdS (F53B Major)	NH-P,PA,NY
9Cl-PF3ONS (F53B Minor)	NH-P,PA
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P,PA,NY
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P,PA,NY
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P,PA
Perfluorodecanoic acid (PFDA)	NH-P,PA,NY
Perfluorododecanoic acid (PFDoA)	NH-P,PA,NY
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	NH-P,PA,NY
Perfluoroheptanesulfonic acid (PFHpS)	NH-P,PA,NY
N-EtFOSAA (NEtFOSAA)	NH-P,PA,NY
N-MeFOSAA (NMeFOSAA)	NH-P,PA,NY
Perfluorotetradecanoic acid (PFTA)	NH-P,PA,NY
Perfluorotridecanoic acid (PFTrDA)	NH-P,PA,NY
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P,PA,NY
Perfluorodecanesulfonic acid (PFDS)	NH-P,PA
Perfluorooctanesulfonamide (FOSA)	NH-P,PA
Perfluorononanesulfonic acid (PFNS)	NH-P,PA
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P,PA
Perfluoro-1-butanedisulfonamide (FBSA)	NH-P,PA
Perfluorohexanesulfonic acid (PFHxS)	NH-P,PA,NY
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P,PA,NY
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P,PA,NY
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P,PA,NY
Perfluoropentanesulfonic acid (PFPeS)	NH-P,PA,NY
Perfluoroundecanoic acid (PFUnA)	NH-P,PA,NY
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P,PA
Perfluoroheptanoic acid (PFHpA)	NH-P,PA,NY
Perfluorooctanoic acid (PFOA)	NH-P,PA,NY
Perfluorooctanesulfonic acid (PFOS)	NH-P,PA,NY
Perfluorononanoic acid (PFNA)	NH-P,PA,NY

Con-Test, a Pace Environmental Laboratory, operates under the following certifications and accreditations:

Code	Description	Number	Expires
NY	New York State Department of Health	10899 NELAP	04/1/2024
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2024
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2024

Company Name:	BETA Group Inc.
Address:	701 George Washington Hwy, Lincoln, RI
Phone:	
Project Name:	BFTA
Project Location:	Barnstable, MA
Project Number:	6206
Project Manager:	Roger Thibault
Con-Test Quote Name/Number:	
Invoice Recipient:	**Stacy Wildanger - AP@BETA-Inc.com
Sampled By:	Laura Boulev

39 Spruce Street
East Longmeadow, MA 01028

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CHAIN OF CUSTODY RECORD

ANALYSIS REQUESTED

[illegible]

Disclaimer: Con-Test Labs is not responsible for any omitted information on the Chain of Custody. The Chain of Custody is a legal document that must be complete and accurate and is used to determine what analyses the laboratory will perform. Any missing information is not the laboratory's responsibility. Con-Test values your partnership on each project and will try to assist with missing information, but will not be held accountable.



DC#_ Title: ENV-FRM-ELON-0001 v07_Sample Receiving Checklist

Effective Date: 07/13/2023

Log In Back-Sheet

Client Beta Group Inc
 Project Barnstable Fire Training Academy
 MCP/RCP Required MA-MCP
 Deliverable Package Requirement CV-1
 Location Barnstable, MA
 PWSID# (When Applicable) NA
 Arrival Method:
 Courier ☒ Fed Ex ☐ Walk In ☐ Other ☐
 Received By / Date / Time Mem 12/24/23 1430
 Back-Sheet By / Date / Time Mem 12/24/23 1516
 Temperature Method Gar # 5
 Temp < 6° C Actual Temperature 28
 Rush Samples: Yes / No Notify No
 Short Hold: Yes / No Notify No

Notes regarding Samples/COC outside of SOP:

Login Sample Receipt Checklist – (Rejection Criteria Listing
 – Using Acceptance Policy) Any False statement will be
 brought to the attention of the Client – True or False

	True	False
Received on Ice	☒	☐
Received in Cooler	☒	☐
Custody Seal: DATE TIME	☒	☒
COC Relinquished	☒	☐
COC/Samples Labels Agree	☒	☐
All Samples in Good Condition	☒	☐
Samples Received within Holding Time	☒	☐
Is there enough Volume	☒	☐
Proper Media/Container Used	☒	☐
Splitting Samples Required	☒	☒
MS/MSD	☒	☐
Trip Blanks	☐	☒
Lab to Filters	☐	☒
COC Legible	☒	☐
COC Included: (Check all included)		
Client ☒ Analysis ☒	Sampler Name ☒	
Project ☒ IDs ☒	Collection Date/Time ☒	

All Samples Proper pH:

N/A

☐
☐

Additional Container Notes

Note: West Virginia requires all samples to have their
 temperature taken. Note any outliers.

Face. SHANE'S TREATMENT

[illegible]

Historic Laboratory Results for Monthly System Sampling 2023

Please note- these results are historic results provided by Pace, these results are for informational purpose only and do not reflect actual results of what may be in submitted samples.

SAMPLE ID	INF PRW-4	System #1 Mid	System #1 Effluent	System #2 Mid	System #2 Effluent
SAMPLING DATE	11/21/2023	11/21/2023	11/21/2023	11/21/2023	11/21/2023
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L
PFAS					
PFOS	310	43	BRL (<1.9)	27	BRL (<2.0)
PFOA	23	5	BRL (<1.9)	2.2	BRL (<2.0)
PFNA	21	5	BRL (<1.9)	BRL (<2.1)	BRL (<2.0)
PFHxS	85	13	BRL (<1.9)	7.6	BRL (<2.0)
PFHpA	34	9	BRL (<1.9)	4.4	BRL (<2.0)
PFDA	4	BRL (<2.3)	BRL (<1.9)	BRL (<2.1)	BRL (<2.0)
TOTAL Σ6 PFAS	477	75	0	41	0
Comments					

APPENDIX C

PREVIOUS SITE DATA TABLES

Table 2A - Summary of Groundwater Pump and Treatment System Operating and Maintenance Data - System No. 1 (GWTS #1)
Barnstable County Fire and Rescue Training Academy
155 Flint Rock Road, Barnstable, MA
RTN 4-26179

[illegible]

Table 2A - Summary of Groundwater Pump and Treatment System Operating and Maintenance Data - System No. 1 (DWTS 1)
Barnstable County Fire and Rescue Training Academy
155 Fleet Beach Road, Barnstable, MA
01914-0017

Date	Operator	System Operating on Arrival	Adjusting bag filter differential pressure (psi)		Pre-Filter Checkpoint Differential Pressure (psi)				Post-Filter Checkpoint Differential Pressure (psi)		K ¹ Effluent Tank (psi)	Estimated Accumulated Flow Rate (gpm)	Estimated Instantaneous Effluent Rate (gpm)	Days System Operating	Instantaneous Effluent Rate (ppm)	Total Solids (lb)	Net Gallons Treated	Average Effluent Rate (gpm)	Residual Tank (psi)	System Operating on Departure	System Sampled	Comments
			Pre	Post	Single P1	Single P2	Single P3	Single P4														
8/10/2020	GWTT	Yes	--	--	22	2	16	16	4.43	19.9	9.5	4	--	88.00	170161	21552	4.5	0.000	Yes	No	Conducted system checks and changed bag filters twice due to excess iron oxide precipitate carry over from accumulation in EC tank. Adjusted VFD to 25Hz.	
8/16/2020	GWTT	Yes	--	--	27	15	22	27	5.58	19.1	9.6	7	--	81.00	170894	46076	9.4	0.001	Yes	No	Conducted system checks and changed bag filters. flushed out right glass on the EC tank.	
8/16/2020	GWTT	Yes	--	--	27	15	26	26	5.52	19.4	9.4	10	--	26.00	170893	41322	9.6	0.001	Yes	No	Conducted system checks and changed bag filters twice due to iron oxide accumulation in the EC tank, tank needs to be emptied. System shutdown on 8/15/2020 for carbon changes.	
gpm																						
8/16/2020	GWTT	Yes	--	--	--	18	8	8.90	17.0	8.9	10	--	44.00	170167	47976	12.3	0.001	Yes	No	No	Rechecked system after carbon changes. Conducted system checks and changed bag filters. Adjusted VFD to 26Hz.	
8/17/2020	GWTT	Yes	--	--	18	5	5	5	7.00	17.0	8.9	10	--	48.00	170894	42577	12.3	0.002	Yes	No	Conducted system checks and changed bag filters twice.	
8/17/2020	GWTT	No	--	--	17	5	5	5	7.07	17.1	8.7	10	--	46.00	170400	45776	10.5	0.002	Yes	No	Conducted system checks and changed bag filters. Transfer pump off an arrival due to high level alarm in EC tank.	
8/18/2020	GWTT	Yes	--	--	18	7	7	7	7.08	19.5	7.7	10	--	46.00	170400	44267	9.2	0.002	Yes	No	Conducted system checks and changed bag filters.	
8/18/2020	GWTT	Yes	--	--	16	7	10	11	7.42	16.5	8.5	10	--	40.00	170230	45551	9.7	0.002	Yes	No	Conducted system checks and changed bag filters. System sampled on 8/27/2020. Iron sediment vacuumed pumped out from the EC tank on 8/27/2020.	
8/19/2020	GWTT	Yes	--	--	10	7	9	13	7.87	16.0	8.0	10	--	40.00	170421	46721	11.5	0.003	Yes	No	Conducted system checks and changed bag filters.	
Total - August 2020 ¹																						
8/19/2020	GWTT	Yes	--	--	16	7	9	13	8.76	17.0	8.4	4	--	46.00	170401	47394	9.6	0.001	Yes	No	Conducted system checks and changed bag filters.	
8/19/2020	GWTT	Yes	--	--	16	10	9	15	8.46	17.0	8.9	8	--	36.00	170894	47862	8.3	0.001	Yes	No	Conducted system checks and changed bag filters. Increased VFD to 26 Hz.	
8/19/2020	GWTT	Yes	--	--	10	10	5	10	8.40	16.7	8.9	11	--	36.00	170401	20860	6.9	0.001	Yes	No	Conducted system checks and changed bag filters.	
8/19/2020	GWTT	Yes	--	--	15	10	9	5	9.33	15.1	8.9	15	--	46.00	170401	37248	4.5	0.001	Yes	No	Conducted system checks and changed bag filters. Backwashed primary carbon vessel.	
8/19/2020	GWTT	Yes	--	--	2	5	2	5	8.55	15.1	8.9	10	--	46.00	170401	27767	5.8	0.001	Yes	No	Conducted system checks and changed bag filters.	
8/19/2020	GWTT	Yes	--	--	6	7	4	7	10.28	10.9	8.9	10	--	46.00	170401	27767	4.8	0.001	Yes	No	Conducted system checks and changed bag filters.	
8/19/2020	GWTT	Yes	--	--	2	6	2	7	10.28	10.1	8.9	10	--	46.00	170719	10952	2.5	0.001	Yes	No	Conducted system checks and changed bag filters.	
Total - September 2020 ¹																						
8/19/2020	GWTT	Yes	--	--	2	5	5	5	10.63	9.1	8.9	2	--	46.00	170401	8766	3.1	0.00009	Yes	No	Conducted system checks and changed bag filters.	
8/19/2020	GWTT	Yes	--	--	16	7	5	10	10.77	9.4	8.9	1	--	46.00	170401	30371	7.0	0.00046	Yes	No	Conducted system checks and changed bag filters.	
8/19/2020	GWTT	Yes	--	--	17	9	10	16	10.90	8.1	8.7	17	--	39.00	170677	76237	4.8	0.00114	Yes	No	Conducted system checks and changed bag filters.	
8/19/2020	GWTT	Yes	--	--	10	10	10	10	10.93	8.1	8.9	10	--	46.00	170401	26781	4.2	0.0011	Yes	No	Conducted system checks and changed bag filters.	
8/19/2020	GWTT	Yes	--	--	10	10	10	10	10.93	7.1	8.9	10	--	46.00	170676	36750	8.2	0.00112	Yes	Yes	Conducted system checks and changed bag filters. System sampled on 10/5/2020.	
8/19/2020	GWTT	Yes	--	--	17	10	12	15	10.05	6.8	8.8	10	--	46.00	180180	36750	6.4	0.00189	Yes	No	Conducted system checks and changed bag filters.	
8/19/2020	GWTT	Yes	--	--	19	12	12	16	10.08	4.4	8.1	10	--	31.00	180619	21639	5.9	0.00107	Yes	No	Conducted system checks and changed bag filters.	
8/19/2020	GWTT	Yes	--	--	10	12	10	14	10.00	5.8	10.9	10	--	36.00	180401	21362	5.7	0.00149	Yes	No	Conducted system checks and changed bag filters.	
Total - October 2020 ¹																						
11/1/2020	GWTT	Yes	--	--	10	12	10	14	10.07	5.2	10.7	2	--	46.00	180401	11275	2.6	0.00008	Yes	No	Conducted system checks and changed bag filters.	
11/2/2020	GWTT	Yes	--	--	8	12	8	14	10.81	4.9	11.5	8	--	36.00	180401	8486	1.5	0.00013	Yes	No	Conducted system checks and changed bag filters.	
11/2/2020	GWTT	Yes	--	--	16	12	12	16	10.80	6.1	9.1	9	--	30.00	180401	20817	4.7	0.00023	Yes	No	Conducted system checks and changed bag filters.	
11/3/2020	GWTT	No	--	--	--	--	--	--	--	--	--	12	--	--	180401	8582	1.5	--	No	No	GWTT observed an effluent flow coming into the EC tank. GWTT inspected the electrical components at PWR-4 and reset the power. After power reset, electrical current was at 77 A and power tripped and shut off. GWTT operator suggest the pump has locked up or the motor has failed. GWTT shut down both systems.	
System Shutdown due to pump failure at recovery well PWR-4 pump replaced on 11/20/2020.																						
11/12/2020	GWTT	Yes	--	--	--	--	--	--	--	10.6	10.6	10	--	10.00	180401	2882	2.0	0.00039	Yes	Yes	Following the replacement of the well pump at PWR-4 on 11/20/2020, GWTT restarted both systems, adjusted the transfer pump flow rate from 18 Hz, changed the bag filter twice.	
11/12/2020	GWTT	Yes	--	--	15	10	10	17	10.91	10.1	10.1	10	--	10.00	180401	13071	3.1	0.00076	Yes	Yes	Following the replacement of the well pump at PWR-4 on 11/20/2020, GWTT restarted both systems, adjusted the transfer pump flow rate from 18 Hz, changed the bag filter twice.	
Total - November 2020 ¹																						
11/12/2020	GWTT	Yes	--	--	15	10	13	17	10.91	10.6	10.6	10	--	10.00	180176	49977	2.4	0.0001	Yes	No	Conducted system checks and changed bag filters. Transfer pump off on arrival due to high level in EC tank.	
11/12/2020	GWTT	Yes	--	--	--	--	--	--	--	10.1	10.1	10	--	10.00	180401	81084	10.1	0.00008	Yes	No	System shutdown briefly to vacuum out the exterior tanks, both EC tanks, bag filters, and drums. Conducted system checks and changed bag filters.	
11/12/2020	GWTT	Yes	--	--	16	16	16	17	1.86	10.0	10.1	7	--	46.00	180106	115278	10.0	0.00126	Yes	No	Conducted system checks and changed bag filters.	
11/12/2020	GWTT	Yes	--	--	17	16	6	9	1.85	10.1	10.1	11	--	11.00	180401	108419	18.8	0.00019	Yes	No	Conducted system checks and changed bag filters. Backwashed the primary carbon vessel. Adjusted VFD from 18 Hz to 12 Hz to maintain maximum contact time through carbon vessels.	
11/12/2020	GWTT	Yes	--	--	10	5	8	10	1.90	10.6	10.6	10	--	46.00	180401	108419	18.8	0.00071	Yes	No	Conducted system checks and changed bag filters.	
11/12/2020	GWTT	Yes	--	--	10	10	10	10	1.87	10.1	10.1	10	--	46.00	180401	105111	10.1	0.00021	Yes	No	Conducted system checks and changed bag filters. Increased transfer pump speed from 12 Hz to 15 Hz.	
11/12/2020	GWTT	Yes	--	--	--	--	--	--	--	--	--	15	--	--	180401	115278	12.8	0.00040	Yes	Yes	Conducted system checks and changed bag filters. Increased transfer pump speed from 15 Hz to 15 Hz.	
11/12/2020	GWTT	Yes	--	--	16	12	16	17	2.13	17.4	18.2	10	--	10.00	180401	16710	12.9	0.00017	Yes	No	Conducted system checks and changed bag filters. Increased transfer pump speed from 15 Hz to 18 Hz.	
11/12/2020	GWTT	Yes	--	--	16	16	5	8	2.10	12.1	10.1	10	--	10.00	180401	115278	10.1	0.00017	Yes	No	Conducted system checks and changed bag filters. Conducted backwash of the primary carbon vessel, and reduced the speed on the transfer pump from 18 Hz to 12 Hz.	
Total - December 2020 ¹																						
1/1/2021	GWTT	Yes	--	--	16	10	16	16	2.48	17.4	17.7	4	--	46.00	180176	122422	17.8	0.00013	Yes	No	Conducted system checks and changed bag filters. Increased the speed on the transfer pump from 12 Hz to 18 Hz.	
1/1/2021	GWTT	Yes	--	--	16	10	12	17	2.79	16.8	17.4	4	--	46.00	180181	102223	21.6	0.00008	Yes	No	Conducted system checks and changed bag filters. Increased the speed on the transfer pump from 12 Hz to 18 Hz.	
1/1/2021	GWTT	Yes	--	--	16	10	12	16	2.81	16.1	17.4	8	--	36.00	180401	112427	21.6	0.00124	Yes	No	Conducted system checks and changed bag filters.	
1/1/2021	GWTT	Yes	--	--	16	10	16	16	2.18	16.1	17.1	11	--	36.00	180401	87180	10.1	0.00119	Yes	No	Conducted system checks and changed bag filters.	
1/1/2021	GWTT	Yes	--	--	16	10	3	8	2.81	16.4	16.4	10	--	47.00	180401	16522	16.8	0.00180	Yes	No	Conducted system checks and changed bag filters. conducted backwash of the primary carbon vessel, reduced discharge flow.	
1/1/2021	GWTT	Yes	--	--	16	16	16	17	2.78	16.0	16.0	10	--	46.00	180707	77625	18.0	0.00231	Yes	No	Conducted system checks, changed bag filters twice, and increased VFD on transfer pump from 18 Hz to 42 Hz.	
1/1/2021	GWTT	Yes	--	--	16	16	12	15	2.88	17.4	18.7	10	--	50.00	175480	146633	25.5	0.00480	Yes	No	Conducted system checks, changed bag filters, and reduced the VFD on the transfer pump from 42 Hz to 42 Hz.	
1/1/2021	GWTT	Yes	--	--	16	16	15	15	1.82	11.1	11.4	10	--	46.00	180401	80138	10.7	0.00010	Yes	No	Conducted system checks, changed bag filters.	
1/1/2021	GWTT	Yes	--	--	12	12	15	19	1.81	11.4	11.4	10	--	46.00	180401	109463	10.0	0.00094	Yes	Yes	Conducted system checks, changed bag filters. System sampled on 1/28/2021.	
Total - January 2021 ¹																						
1/1/2021	GWTT	Yes	--	--	15	10	10	10	4.45	26.1	13.2	2	--	41.00	180180	110771	17.9	0.00055	Yes	No	Conducted system checks and changed bag filters. Transfer pump VFD set to 42 Hz.	
1/1/2021	GWTT	Yes	--	--	15	17	17	15	5.00	25.1	12.6	5	--	41.00	180108	94789	15.5	0.00118	Yes	No	Conducted system checks and changed bag filters.	
1/1/2021	GWTT	Yes	--	--	15	17	16	10	4.45	19.0	8.5	8	--	41.00	180402	64633	15.0	0.00110	Yes	No	Conducted system checks and changed bag filters.	
1/1/2021	GWTT	Yes	--	--	16	16	16	16	4.55	19.9	10.0	12	--	41.00	180401	74633	13.0	0.0021	Yes	No	Conducted system checks and changed bag filters.	
1/1/2021	GWTT	Yes	--	--	15	16	15	15	3.78	13.1	6.3	10	--	41.00	180400	10261	10.5	0.00097	Yes	No	Conducted system checks and changed bag filters.	
1/1/2021	GWTT	Yes	--	--	15	16	12	16	3.80	13.1	5.7	10	--	41.00	180401	10111	10.1	8.4	0.00002	Yes	No	Conducted system checks and changed bag filters. Backwashed primary LAC vessel. Adjusted VFD from 40 Hz to 52 Hz (26 gpm to 45 gpm). System sampled on 2/23/2021.
1/1/2021	GWTT	Yes	--	--	16	16	12	16	3.80	13.1	5.7	10	--	41.00	180401	10111	10.1	8.4	0.00002	Yes	No	Conducted system checks and changed bag filters. Backwashed primary LAC vessel. Adjusted VFD from 40 Hz to 52 Hz (26 gpm to 45 gpm). System sampled on 2/23/2021.
1/1/2021	GWTT	Yes	--	--	16	12	15	15	10.00	4.4	10.0	10	--	41.00	180401	115278	10.1	0.00017	Yes	No	Conducted system checks and changed bag filters.	
Total - February 2021 ¹																						
2/1/2021	GWTT	Yes	--	--	16	10	16	16	2.48	17.4	17.7	4	--	46.00	180176	122422	17.8	0.00013	Yes	No	Conducted system checks and changed bag filters. Increased the speed on the transfer pump from 12 Hz to 18 Hz.	
2/1/2021	GWTT	Yes	--	--	16	10	12	17	2.79	16.8	17.4	4	--	46.00	180181	102223	21.6	0.00008	Yes	No	Conducted system checks and changed bag filters. Increased the speed on the transfer pump from 12 Hz to 18 Hz.	
2/1/2021	GWTT	Yes	--	--	16	10	12	16	2.81	16.1	17.4	8	--	36.00	180401	112427	21.6	0.00124	Yes	No	Conducted system checks and changed bag filters.	
2/1/2021	GWTT	Yes	--	--	16	10	16	16	2.18	16.1	17.1	11	--	36.00	180401	87180	10.1	0.00119	Yes	No	Conducted system checks and changed bag filters.	
2/1/2021	GWTT	Yes	--	--	16	10	3	8	2.81	16.4	16.4	10	--	47.00	180401	16522	16.8	0.00180	Yes	No	Conducted system checks and changed bag filters. conducted backwash of the primary carbon vessel, reduced discharge flow.	
2/1/2021	GWTT	Yes	--	--	16	16	16	17	2.78	16.0	16.0	10	--	46.00	180707	77625						

Table 2A - Summary of Groundwater Pump and Treatment System Operating and Maintenance Data - System No. 1 (GWTS #2, Barnstable County Fire and Rescue Training Academy
155 Flint Rock Road, Barnstable, MA
RTN 4-26179

[illegible]

Table 2A - Summary of Groundwater Pump and Treatment System Operating and Maintenance Data - System No. 1 (GWTS #1)
Barnstable County Fire and Rescue Training Academy
155 Flint Rock Road, Barnstable, MA
RTN 4-26179

Date	Operator	System Operator's Approval	Adjust Bag After Additional Process (mg)		Pre-filter changed (effluent flow rate)		Pre-filter changed (effluent flow rate)		4" effluent flow rate (GPM)	Estimated effluent flow rate (GPM)	Relief	Days System Operating	Input Effluent Flow Rate (GPM)	Influent effluent flow rate (GPM)	Ammonia		Estimated Total Nitrogen Annual (kg)	System Operating as Designed	System Slaughter	Comments	
			Pre	Post	Stage 1	Stage 2	Stage 1	Stage 2							Volatilized (lb)	Net Gallons Treated					Average Effluent Flow Rate (GPM)
3/1/2020	CHT	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	No	Repair was returned to the Site on 2/12/2020. CHT and Cante personnel installed heaters inside the system to defrost/thaw the frozen components for the system.	
3/10/2020	CHT	No	--	--	36	6	26	16	2.02	46.6	20.4	1	--	30.00	104200	3205	25.2	0.0011	Yes	Repaired system after freeze conditions, no damage observed. Conducted system checks and changed bag filters.	
3/11/2020	CHT	No	--	--	45	12	26	26	0.40	46.2	20.3	4	--	27.00	104000	7010	36.2	0.0026	Yes	Conducted system checks and changed bag filter twice.	
3/14/2020	CHT	Yes	--	--	45	34	26	36	2.76	46.0	20.0	8	--	30.00	103000	8276	34.4	0.0044	Yes	No	Conducted system checks and changed bag filters. Backwashed primary carbon vessel - suggested that carbon carry over is present. From the primary vessel for the secondary vessel 2
3/14/2020	CHT	Yes	--	--	45	12	14	12	0.20	42.0	20.0	11	--	27.00	104700	1401	15.5	0.0007	Yes	No	Conducted system checks and changed bag filters.
3/14/2020	CHT	Yes	--	--	45	13	17	20	2.33	43.8	20.8	15	--	30.00	103470	9074	15.7	0.0005	Yes	No	Conducted system checks and changed bag filters. CHTS2 shut down waiting for a Carbon Changeout, 48 effluent water was directed through CHTS1S2.
3/16/2020	CHT	Yes	--	--	44	12	26	17	3.22	36.1	36.1	39	--	30.00	104000	10040	17.4	0.0027	Yes	Yes	Conducted system checks and changed bag filters. Backwashed secondary carbon vessel. System sampled 5/26/22
3/20/2020	CHT	Yes	--	--	44	9	14	24	0.43	36.7	35.7	25	--	30.00	104357	11778	12.6	0.0016	Yes	No	Conducted system checks and changed bag filters. Increased VSD to 42Hz.
Totals February 2020										46.6	20.0	25	30.0		10457	15.5	0.0015				
4/1/2020	CHT	Yes	--	--	50	13	29	30	1.66	33.4	33.4	4	--	30.00	102100	8790	15.2	0.0023	Yes	No	Conducted system checks and changed bag filters. Backwashed primary carbon vessel.
4/1/2020	CHT	Yes	--	--	49	7	15	17	1.47	33.9	33.9	7	--	34.00	102600	7323	17.4	0.0047	Yes	No	Conducted system checks and changed bag filters.
4/1/2020	CHT	Yes	--	--	50	16	26	26	0.47	33.4	33.4	10	--	30.00	103000	8081	18.7	0.0027	Yes	No	Conducted system checks and changed bag filters. Backwashed secondary carbon vessel.
4/1/2020	CHT	Yes	--	--	50	8	12	14	1.06	31.0	31.0	14	--	30.00	103710	9239	18.7	0.0030	Yes	No	Conducted system checks and changed bag filters.
4/10/2020	CHT	Yes	--	--	50	10	25	25	0.72	30.0	30.0	14	--	30.00	103740	9099	17.2	0.0019	Yes	No	Conducted system checks and changed bag filters. Adjust VSD.
4/13/2020	CHT	Yes	--	--	50	10	26	26	0.80	33.5	33.5	21	--	34.00	104700	9925	23.0	0.0035	Yes	Yes	Conducted system checks and changed bag filters. Backwashed primary carbon vessel. System sampled 5/22/22.
4/13/2020	CHT	Yes	--	--	54	14	26	26	6.37	38.1	38.1	24	--	36.00	104000	10844	25.2	0.0022	Yes	No	Conducted system checks and changed bag filters. Pump out backwash tank through treatment system.
4/14/2020	CHT	Yes	--	--	53	20	26	30	5.17	25.7	25.7	28	--	30.00	104000	11943	34.2	0.0010	Yes	No	Conducted system checks and changed bag filters.
Totals March 2020										39.9	33.3	31	30.0		10408	17.6	0.0022				
4/17/2020	CHT	Yes	--	--	51	12	32	34	1.46	30.0	30.0	1	--	30.00	103400	12422	21.4	0.0008	Yes	No	Conducted system checks and changed bag filters.
4/17/2020	CHT	Yes	--	--	48	26	33	36	6.72	18.2	18.2	4	--	20.00	117100	8064	18.7	0.0020	Yes	No	Conducted system

Table 2A - Summary of Groundwater Pump and Treatment System Operating and Maintenance Data - System No. 1 (GWTS #1)
Barnstable County Fire and Rescue Training Academy
155 Fleet Beach Road, Barnstable, MA
01914-0029

Date	Operator	System Operating on Alert?	Average lag after differential pressure (min)		Pre-Filter Checkpoint Differential Pressure (psi)		Post-Filter Checkpoint Differential Pressure (psi)		4" Inflow Tank (ft)	4" Inflow Tank (ft)		Days System Operating	Instantaneous Effluent Flow Rate (GPM)*	Instantaneous Effluent Flow Rate (GPM)**	Location (lat)	Net Gallons Treated	Average Effluent Flow Rate (GPM)*	Estimated Total PPMs Removed (kg)†	System Operating on Superior?	System Sampled	Comments		
			Pre	Post	Range PT	Range PT	Range PT	Range PT		Estimated Combined Instantaneous Inflow Rate (GPM)††	Estimated Combined Instantaneous Inflow Rate (GPM)††												
9/30/2023	GWTT	Yes	--	--	43	38	9	13	0.61	0.61	0.61	2	--	38.00	2883780	120702	22.5	0.00017	Yes	No	Conducted system checks and changed bag filters. Backwash primary carbon vessel, pump down backwash tank.		
9/30/2023	GWTT	Yes	--	--	58	58	15	15	0.87	0.83	0.83	4	--	37.00	2385759	117643	23.9	0.00005	Yes	No	Conducted system checks and changed bag filters.		
9/30/2023	GWTT	Yes	--	--	37	30	16	20	0.97	0.91	0.91	9	--	36.00	2385669	108949	23.9	0.00001	Yes	No	Conducted system checks and changed bag filters.		
9/30/2023	GWTT	Yes	--	--	66	56	50.5	20	0.93	0.64	0.64	12	--	41.00	2385603	58888	13.7	0.00003	Yes	No	Conducted system checks and changed bag filters. Backwash primary carbon vessel.		
9/30/2023	GWTT	Yes	--	--	45	35	30	14	0.96	0.93	0.93	14	--	34.00	2385476	83021	15.5	0.00005	Yes	No	Conducted system checks and changed bag filters. Decant green tank.		
9/30/2023	GWTT	Yes	--	--	40	32	15	15	0.97	0.93	0.93	19	--	35.00	2385440	94501	21.9	0.00010	Yes	Yes	Conducted system checks and changed bag filters. System sampled.		
System shutdown 9/30/2023. Replace well pump, conduct acid treatment to well and main line. System restarted 9/31/23																							
9/30/2023	GWTT	No	--	--	--	--	--	--	40	14	1.83	49.2	49.2	20	--	37.00	2384721	34571	3.0	0.00023	Yes	No	Conducted system checks, changed bag filters multiple times, flush sludge out of sightglass on holding tank. Flush acid from recovery well pipe into outside edge tank and diked. Add stock acid to reuse pit.
9/30/2023	GWTT	Yes	--	--	47	33	13	14	2.15	17.0	17.0	23	--	34.00	2383887	45672	10.3	0.00001	Yes	No	Conducted system checks and changed bag filters.		
Totals - September 2023†																							
9/30/2023	GWTT	Yes	--	--	47	38	15	20	2.13	17.4	17.4	3	--	34.00	2383220	12623	12.2	0.00014	Yes	No	Conducted system checks and changed bag filters. Pump down green tank.		
9/30/2023	GWTT	Yes	--	--	44	34	14	18	2.12	17.9	17.9	7	--	35.00	2379312	84702	14.7	0.00040	Yes	No	Conducted system checks and changed bag filters.		
9/30/2023	GWTT	Yes	--	--	44	38	15	20	Not Reported	Not Reported	Not Reported	11	--	35.00	2380386	84124	14.6	0.00002	Yes	No	Conducted system checks and changed bag filters. EC/ML Level alarm kept coming on, couldn't take 4" inflow reading. System #2 restarted.		
9/30/2023	GWTT	Yes	--	--	43	30	12	15	2.15	17.0	17.0	10	--	34.00	2380352	93249	21.1	0.00013	Yes	No	Conducted system checks and changed bag filters. Start system # 2		
9/30/2023	GWTT	Yes	--	--	40	37	15	18	2.13	17.5	17.5	10	--	35.00	2379993	72342	13.1	0.00006	Yes	No	Conducted system checks and changed bag filters.		
9/30/2023	GWTT	Yes	--	--	44	36	16	20	2.00	16.7	17.8	24	--	35.00	2379768	83591	18.8	0.00151	Yes	No	Conducted system checks and changed bag filters.		
9/30/2023	GWTT	Yes	--	--	43	33	16	19	2.05	16.6	16.6	29	--	33.00	2378840	71122	16.5	0.00132	Yes	No	Conducted system checks and changed bag filters.		
9/30/2023	GWTT	Yes	--	--	43	34	12	17	2.08	16.9	16.9	24	--	34.00	2378500	82401	10.8	0.00117	Yes	Yes	Conducted system checks and changed bag filters. Tighten carbon vessel covers. System Sampled 10.25.22		
9/30/2023	GWTT	Yes	--	--	38	35	12	16	2.40	11.0	25.1	31	--	35.00	2378394	83641	16.1	0.00191	Yes	No	Conducted system checks and changed bag filters. High Level alarm light not turning on but still shutting off.		
Totals - October 2023†																							
10/1/2023	GWTT	Yes	--	--	42	34	15	19	2.42	10.7	25.1	4	--	35.00	2377816	79401	13.8	0.00021	Yes	No	Conducted system checks and changed bag filters.		
10/1/2023	GWTT	Yes	--	--	23	15	13	16	2.30	13.3	26.4	7	--	35.00	2375510	40204	9.4	0.00025	Yes	No	Conducted system checks and changed bag filters.		
10/1/2023	GWTT	Yes	--	--	39	15	14	14	2.47	49.7	24.8	13	--	34.00	2368311	63001	10.4	0.00044	Yes	No	Conducted system checks and changed bag filters. Flush iron sludge from site glass.		
10/1/2023	GWTT	Yes	--	--	34	17	14	20	2.40	49.0	24.3	13	--	35.00	2367510	70901	12.4	0.00077	Yes	No	Conducted system checks and changed bag filters. Flushed levels in discharge threaded plug		
10/1/2023	GWTT	Yes	--	--	38	17	16	19	2.54	49.4	24.2	10	--	35.00	2365375	72601	17.7	0.00123	Yes	No	Conducted system checks and changed bag filters.		
10/1/2023	GWTT	Yes	--	--	39	30	17	21	2.40	49.4	23.8	24	--	35.00	2374889	70144	18.2	0.00147	Yes	No	Conducted system checks and changed bag filters. Flush iron sludge from site glass.		
10/1/2023	GWTT	Yes	--	--	35	16	16	20	2.72	49.1	23.3	25	--	35.00	2369975	94381	16.4	0.00117	Yes	No	Conducted system checks and changed bag filters. Flush iron sludge from site glass.		
10/1/2023	GWTT	Yes	--	--	35	16	16	20	2.76	49.1	23.1	26	--	35.00	2369485	58901	13.6	0.00147	Yes	Yes	Conducted system checks and changed bag filters. System sampled 11.20.23.		
Totals - November 2023†																							
11/1/2023	GWTT	Yes	--	--	42	37	17	21	2.78	49.0	23.0	2	--	35.00	2369310	82401	10.8	0.00008	Yes	No	Conducted system checks and changed bag filters.		
11/1/2023	GWTT	Yes	--	--	34	16	16	21	2.81	43.8	20.9	1	--	35.00	2368721	58801	11.6	0.00026	Yes	No	Conducted system checks and changed bag filters.		
11/1/2023	GWTT	Yes	--	--	31	19	19	22	3.00	40.4	20.4	4	--	29.00	2368489	78124	13.6	0.00047	Yes	No	Conducted system checks and changed bag filters.		
11/1/2023	GWTT	Yes	--	--	34	18	18	21	3.48	45.4	20.2	12	--	34.00	2371081	41201	10.4	0.00048	Yes	No	Conducted system checks and changed bag filters.		
11/1/2023	GWTT	Yes	--	--	39	30	19	22	3.40	47.2	18.4	14	--	35.00	2369988	83621	15.6	0.00096	Yes	No	Conducted system checks and changed bag filters. Flush site glass.		
11/1/2023	GWTT	Yes	--	--	23	19	19	19	3.52	34.9	17.4	10	--	29.00	2368177	61381	15.6	0.00116	Yes	No	Conducted system checks and changed bag filters.		
11/1/2023	GWTT	Yes	--	--	37	30	24	24	3.73	33.0	16.5	10	--	35.00	2367507	48701	10.9	0.00109	Yes	Yes	Conducted system checks and changed bag filters. System sample collected on 11/23/23.		
11/1/2023	GWTT	Yes	--	--	34	20	20	24	3.70	33.1	16.4	27	--	35.00	2365801	86401	12.0	0.00125	Yes	No	Conducted system checks and changed bag filters.		
11/1/2023	GWTT	Yes	--	--	31	20	20	22	4.00	33.1	15.1	30	--	34.00	2365704	44901	14.8	0.00171	Yes	No	Conducted system checks and changed bag filters. Flush site glass.		
Totals - December 2023†																							

1. GC - Groundwater Engineering, LLC† - Groundwater Treatment Technologies

2. Prior to November 2023, the instantaneous inflow rate (IIR) and effluent (EIR) flow rates are calculated based on the cross-sectional volume per vertical inch of the inflow tank and measured/observed (MO) into or sharing (SIS) of the tank. The diameter of the inflow tank is approximately 78 inches. The cross-sectional volume of the tank is approximately 13.1 cubic feet per vertical linear foot. Therefore the flow rate calculation factor is approximately 122.3 gallons per 1-inch. Since 10/1/2023 (Following the replacement of the effluent tanks), EIR/EIR flow rates are estimated by averaging 60% of the Combined Instantaneous Inflow Rate value.

3. Following the operation of the new flow meters and the installation of GWTS#1 on November 1, 2023, instantaneous inflow flow rates are estimated by averaging 60% of the Combined Instantaneous Inflow Rate value.

4. Prior to November 2023 the total mass of PPMs removed is calculated based on the calculated effluent flow rate, the number of days the system has been operating, and the average total inflow PPM concentration for the month. Since November 2023, the total mass of PPMs removed is calculated based on the effluent flow rate.

5. No, or -- Not Reported

6. As of April 1, 2024, the system's O&M data reporting was changed to include the pressure readings from the bag filter unit's pressure gauges before and after the bag filters are changed/replaced, if applicable.

7. Prior to November 2023, the average inflow rate (AIR) could not include the calculated treatment rate (AIR) to (SIS) of the tank due to a blockage in the site glass on the EIR tank from accumulated iron oxide precipitates in the bottom of the tank. The iron-oxide precipitates were removed from the EIR tank on Oct. 28, 2023.

8. Following the operation of the new flow meters and the installation of GWTS#1 on November 1, 2023, instantaneous inflow flow rates are estimated by averaging 60% of the Combined Instantaneous Inflow Rate value.

9. The average effluent flow rate is calculated from the net gallons (Total Gallons Treated) divided from the system's effluent volume flow meter and days that the system was in operation.

10. The average effluent flow rate is calculated from the net gallons (Total Gallons Treated) divided from the system's effluent volume flow meter and days that the system was in operation.

11. Prior to Nov. 1, 2020, calculated average inflow flow rates and the average instantaneous inflow flow rates were calculated based on the reported treatment rate. The reported flow meter readings on the effluent discharge piping were not reliable at flow rates less than 40 GPM.

12. Therefore the data are shared to indicate that they are approximations only and for this reason the July through October data are also considered approximations.

13. As of September 2023, the "Daily" Average Flow rate is left to right included the Average Instantaneous Inflow Rate, Total Days of Operation, Average Instantaneous Effluent Flow Rate, and Estimated PPMs Removed for the respective monthly reporting period.

14. Running average values shown for the effluent flow rate. Prior to November 7, 2023, totals shown (from left to right) included the Average Instantaneous Inflow Rate, Total Days of Operation, Average Instantaneous Effluent Flow Rate, and Estimated PPMs Removed for the respective monthly reporting period.

15. The calculated Total Gallons Treated and Average Effluent Flow Rates are based on recorded data and the totals are representative of the monthly flow reporting period. The average effluent flow rates calculated from the first recording date are based on measurements from the last recording date of the previous reporting period.

16. February 16, 2023 GWTS#1 was shut down waiting for a Carbon Changeout, all water was routed through GWTS #1. The estimated instantaneous inflow flow rate was not divided between the 2 systems and therefore matches the Combined instantaneous Estimated inflow flow rate.

Table 28 - Summary of Groundwater Pump and Treatment System Operating and Maintenance Data - System No. 2 (GWTS #2)
Barnstable County Fire and Rescue Training Academy
155 Flint Rock Road, Barnstable, MA
RTN 4-26179

Date	Operator ¹	System Operating on Arrival	Days System Operating	Transfer Pump Pres. (psi)	Pre-Filter Changeout Differential Pressure (psi) ²			Post-Filter Changeout Differential Pressure (psi)		Carbon Vessels. Pre-change out (psi)		Carbon Vessels. Post-change out (psi)		Instantaneous Estimated INFLUENT ⁷	EFFLUENT				Estimated Total PFAs Removal (kg)	System Operating on Departure	System Sampled	Comments
				Gauge: P1	Gauge: P2	Gauge: P3	Gauge: P2	Gauge: P3	Gauge: P4	Gauge: P5	Gauge: P4	Gauge: P5	Flow Rate (GPM) ^{4,6}	Totalizer (Gal)	Instant. Flow Rate (GPM) ⁴	Net Gallons Treated ⁴	Average Effluent Flow Rate (GPM) ⁴					
11/11/2019	GWTT	Yes	1	38	0	0	0	0	0	<2	0	2	2	12.56	416900	32.00	0.0	--	0.00032	Yes	No	Influent flow stream from PRW-4 split and started system #2. Conducted system checks, changed bag filters after initial flush.
11/15/2019	GWTT	Yes	4	40	24	2	5	2	2	2	2	2	2	34.00	451645	34.00	34745.0	8.043	0.0008	Yes	Yes	Conducted system pressure checks and changed the bag filters. System shutdown temporarily to calculate influent flow rate at GWTPS #1. Collected system startup samples on 11/12/19 and 11/15/19.
11/18/2019	GWTT	Yes	7	--	32	2	6	6	2	2	4	4	4	44.00	491280	33.00	39635.0	9.175	0.0016	Yes	No	Conducted system pressure checks and changed the bag filters. System shutdown temporarily to calculate influent flow rate at GWTPS #1.
11/22/2019	GWTT	Yes	11	40	31	4	7	7	4	4	6	5	5	12.50	549022	34.00	57742.0	10.025	0.0028	Yes	No	Conducted system pressure checks and changed the bag filters. System shutdown temporarily to calculate influent flow rate at GWTPS #1. Collected system startup samples on 11/19/19.
11/25/2019	GWTT	Yes	14	40	15	6	7	7	4	5	5	6	6	12.50	594623	33.00	45601.0	10.556	0.0037	Yes	No	Conducted system pressure checks and changed the bag filters.
11/29/2019	GWTT	Yes	18	40	18	6	8	8	3	3	4	4	4	NR	649150	34.00	54527.0	9.466	0.0043	Yes	No	Conducted system pressure checks and changed the bag filters.
Totals - November 2019 ¹⁰				19										23.11		33	232250	8.49	0.0040			
12/2/2019	BETA	Yes	2	--	--	--	--	--	--	--	--	--	--	--	686500	--	37350.0	8.6	--	No	Yes	System shutdown at 10:00 for force main de-scale process; system locked out and tagged out.
12/4/2019	BETA	No	2	40	--	--	7	7	--	--	4	4	4	22.70	686700	30.00	200.0	0.07	0.00000	Yes	No	System restarted at 12:12 upon finishing the de-scale purging process and restarted PRW-4.
12/6/2019	GWTT	No	4	35	--	--	14	13	--	--	10	8	8	25.0	707866	47.00	21166.0	7.35	0.00029	Yes	No	System off upon arrival and bag filters were completed clogged with iron sediments. Bag filters had to be changed after 20 minutes of operation. GWTT observed a high amount of solids floating in the EQ tank and pumped down the EQ tank and observed significant iron sediment sludge on the bottom of the tank. GWTT notified BETA that they would raise the floats in EQ tank to help lessen the agitation of the sludge and carryover into the bag filters. System was on high level alarm and continued to shutoff of PRW-4, which shut off system #1 due to significant iron oxide sediment accumulation in EQ tank.
12/9/2019	GWTT	Yes	7	37	39	8	16	16	7	5	14	8	8	25.0	813065	46.00	105199.0	24.35	0.00171	Yes	No	Conducted system checks, changed bag filters. Raising floats in EQ tank has not affected the iron sediment at the bottom.
12/13/2019	GWTT	Yes	11	38	43	11	21	20	10	5	18	7	7	25.0	943807	42.00	130742.0	22.70	0.00250	Yes	No	Conducted system checks, changed bag filters.
12/16/2019	GWTT	Yes	14	45	43	13	23	22	10	3	21	5	5	25.0	1049390	41.00	105583.0	24.44	0.00343	Yes	No	Conducted system checks, changed bag filters, EQ tank "High Level" alarm triggered.
12/20/2019	GWTT	Yes	18	42	33	14	20	20	10	4	18	6.00	25.0	1148998	43.00	99608.0	17.29	0.00312	Yes	No	Conducted system checks and changed the bag filters. System shutdown temporarily for pump out of iron oxide sediment accumulation in EQ tank.	
12/23/2019	GWTT	Yes	21	--	--	--	--	--	--	--	--	--	--	--	1209649	NR	60651.0	14.04	0.00296	Yes	No	System shutdown at 08:00 for carbon changeout conducted on System #1.
12/26/2019	GWTT	Yes	22	38	30	15	19	19	14	6	18	7	7	24.2	1209820	42.00	171.0	0.04	0.00001	Yes	No	System restarted at 09:30 AM following carbon changeout conducted on System #1. Conducted system checks and changed bag filters.
12/30/2019	GWTT	Yes	26	38	38	13	22	22	12	5	20	7	7	24.00	1320824	40.00	111004.0	19.27	0.00503	Yes	No	Conducted system pressure checks and changed the bag filters. Reset pump control floats in EQ tank back to original depths (following the removal of iron sediments at bottom of the tank).
Totals - December 2019 ¹⁰				27										24.49		41	671674	17.3	0.005			
1/3/2020	GWTT	Yes	3	43	35	13	20	20	10	4	18	6	6	--	1422315	42.00	101491.0	17.6	0.00076	Yes	No	Conducted system checks, changed bag filters.
1/6/2020	GWTT	Yes	6	40	27	15	19	19	11	5	16	8	8	20.98	1507290	43.00	84975.0	19.7	0.00169	Yes	No	Conducted system checks, changed bag filters.
1/10/2020	GWTT	Yes	10	38	29	15	19	19	13	5	17	6	6	20.42	1602935	43.00	95645.0	16.6	0.00237	Yes	No	Conducted system checks, changed bag filters.
1/13/2020	GWTT	Yes	13	38	26	16	19	19	18	6	6	8	8	18.28	1674840	41.00	71905.0	16.6	0.00309	Yes	No	Conducted system checks, changed bag filters.
1/17/2020	GWTT	Yes	17	--	28	16	20	20	15	6	18	7	7	16.94	1750933	41.00	76093.0	13.2	0.00321	Yes	No	Conducted system checks, changed bag filters.
1/20/2020	GWTT	Yes	20	38	25	16	11	11	15	6	18	7	7	15.44	1808630	48.00	57697.0	13.4	0.00382	Yes	No	Conducted system checks, changed bag filters. Backwashed primary LGAC vessel.
1/24/2020	GWTT	Yes	24	35	19	9	11.5	11.5	6	7	8	8	8	11.93	1872940	48.00	64310.0	11.2	0.00383	Yes	No	Conducted system checks, changed bag filters.
1/24/2020	GWTT	Yes	24	35	19	9	11.5	11.5	6	7	8	8	8	10.65	1872940	48.00	0.0	#DIV/0!				
1/27/2020	GWTT	Yes	27	35	16	10	12	11	7	7	9	8.00	10.65	1915785	46.00	42845.0	9.9	0.00383	Yes	No	Conducted system checks, changed bag filters, pumped backwash water through system's influent stream.	
1/31/2020	GWTT	Yes	31	36	18	10	12	12	9	8	8	7	7	9.01	1962050	--	46265.0	8.0	0.00356	Yes	No	Conducted system checks, changed bag filters.
Totals - January 2020 ^{10,11}				31			2/22/1900							14.92		44	641226	14.4	0.004			
2/4/2020	GWTT	Yes	4	2	18	10	12	12	9	8	8	7	7	7.66	2000333	46.00	38283	6.6	0.00053	Yes	No	Conducted system checks, changed bag filters.
2/7/2020	GWTT	Yes	7	36	14	11	12	11	8	7	8	6	6	7.75	2023878	46.00	23545	5.5	0.00076	Yes	No	Conducted system checks, changed bag filters.
2/11/2020	GWTT	Yes	11	35	14	12	13	13	9	8	10	8	8	5.53	2049888	47.00	26010	4.5	0.00099	Yes	No	Conducted system checks, changed bag filters.
2/13/2020	GWTT	Yes	13	36	13	12	14	13	10	8	10	8	8	4.97	2060169	46.00	10281	3.6	0.00093	Yes	Yes	Conducted system checks, changed bag filters. Pumped backwash water from GWTS #1 through system.
2/18/2020	GWTT	Yes	18	36	15	12	13	14	9	8	9	8	8	3.68	2081950	57.00	21781	3.0	0.00109	Yes	Yes	Conducted system checks, changed bag filters.
2/21/2020	GWTT	Yes	21	36	15	13	14	13	10	8	10	8	8	2.70	2094054	48.00	12104	2.8	0.00117	Yes	Yes	Conducted system checks, changed bag filters.
2/24/2020	GWTT	Yes	24	37	43	5	16	16	2	2	13	7	7	23.11	2108080	47.00	14026	3.2	0.00156	Yes	Yes	Conducted system checks, changed bag filters. Bag filters packed with significant iron-oxide sediments, influent flow rate into EQ tank significantly increased; slug of iron must have broke through. Had to change bag filters twice.
2/26/2020	GWTT	Yes	26	36	43	6	16	15	6	2	16	8	8	23.56	2134241	45.00	26161	9.1	0.00472	Yes	Yes	Conducted system checks and changed bag filters.
2/28/2020	GWTT	Yes	28	36	44	5	21	20	5	2	18	7	7	24.02	2168295	42.00	34054	11.8	0.00661	Yes	Yes	Conducted system checks, changed bag filters. Approximately 6 inch of iron-oxide sludge has accumulated on bottom of EQ tank; control float switches were raised to reduce disruption of settled sludge.
Totals - February 2020 ^{10,11}				29										11.44		47	206245	4.9	0.003			
3/2/2020	GWTT	Yes	2	36	35	10	15	15	9	5	10	11	11	21.6	2249000	48.00	80705	18.7	0.00078	Yes	Yes	Conducted system checks, changed bag filters. Backwashed primary LGAC vessel, vacuumed the iron-oxide sludge out of the EQ tank, and into 55-gal drums on site; water from the drum can be decanted back through the system. System sampled on 3/3/2020.
3/6/2020	GWTT	Yes	6	37	25	10	16	15	8	8	12	10	10	20.4	2315739	47.00	66739	11.6	0.00145	Yes	No	Conducted system checks, changed bag filters. System shutdown temporarily to pump backwash water from exterior totes through system.
3/9/2020	GWTT	Yes	9	37	30	9	16	16	7	6.5	14	10	10	20.4	2366315	44.00	50576	11.7	0.00220	Yes	No	Conducted system checks, changed bag filters.
3/13/2020	GWTT	Yes	13	38	37	9	20	20	8	5	18	10	10	18.9	2476035	42.00	109720	19.0	0.00518	Yes	No	Conducted system checks, changed bag filters.
3/16/2020	GWTT	Yes	16	38	29	15	20	20	12	8	18	10	10	16.3	2544838	41.00	68823	15.9	0.00533	Yes	No	Conducted system checks, changed bag filters.
3/20/2020	GWTT	Yes	20	38	28	17	19	19	10	7	17	10	10	17.0	2615618	41.00	70760	12.3	0.00514	Yes	No	Conducted system checks, changed bag filters. Observed significant iron-oxide accumulation in EQ tank.
3/23/2020	GWTT	Yes	23	38	26	16	21	20	14	8.5	18	10	10	20.4	2636761	41.00	21143	4.9	0.00235	Yes	No	Conducted system checks, changed bag filters.
3/26/2020	GWTT	Yes	26	38	29	14	20	19	14	8.5	18	10	10	20.4	2663514	41.00	26753	6.2	0.00337	Yes	No	Conducted system checks, changed bag filters.
3/30/2020	GWTT	Yes	30	46	44	5	24	24	2	1	20	9	9	18.8	2721065	37.00	57551	10.0	0.00627	Yes	No	Conducted system checks, changed bag filters.
Totals - March 2020 ^{10,11}				31										19.37		42	552770	12.4	0.00549			
4/2/2020	GWTT	Yes	2	42	42	13	24	23	10	3	21	5	5	20.8	2768543	27.00	47478	11.0	0.00028	Yes	No	Conducted system checks, changed bag filters, and slowed down the effluent discharge flow rate to reduce carry over of significant iron sludge into the bag filters.
4/6/2020	GWTT	Yes	6	42.5	42	12	27	27	10	3	25	6	6	19.7	2833368	25.00	64825	11.3	0.00085	Yes	No	Conducted system checks and changed bag filters.
4/9/2020	GWTT	Yes	8.5	39	--	--	9	8	7	6.5	7	6.5	7	17.7	2903750	39.00	70382	16.3	0.00174	Yes	No	System shutdown for 2-4 hours at 7am for vac out of EQ holding tank and backwash of primary carbon vessel. Conducted system checks and changed bag filters.
4/13/2020	GWTT	Yes	12.5	39	24.5	7	10	9	4	5	8	6.0	6.0	15.6	3004475	38.00	100725	17.5	0.0			

Table 28 - Summary of Groundwater Pump and Treatment System Operating and Maintenance Data - System No. 2 (GWTS #2)
Barnstable County Fire and Rescue Training Academy
155 Flint Rock Road, Barnstable, MA
RTN 4-26179

Date	Operator ¹	System Operating on Arrival	Days System Operating	Transfer Pump Pres. (psi)	Pre-Filter Changeout Differential Pressure (psi) ²			Post-Filter Changeout Differential Pressure (psi)			Carbon Vessels. Pre-change out (psi)		Carbon Vessels. Post-change out (psi)		Instantaneous Estimated INFLUENT ⁷	EFFLUENT				Estimated Total PFAs Removal (kg)	System Operating on Departure	System Sampled	Comments
				Gauge: P1	Gauge: P2	Gauge: P3	Gauge: P2	Gauge: P3	Gauge: P4	Gauge: P5	Gauge: P4	Gauge: P5	Flow Rate (GPM) ^{4,6}	Totalizer (Gal)	Instant. Flow Rate (GPM) ⁴	Net Gallons Treated ⁴	Average Effluent Flow Rate (GPM) ⁵						
5/1/2020	GWTT	Yes	1	47	43	9	22	22	8	3	20	5.0	16.3	3320924	32.00	49114	8.5	0.00310	Yes	No	Conducted system checks and changed bag filters twice during visit, system on idle upon arrival due to high level.		
5/5/2020	GWTT	Yes	5	42	42	12	26	26	10	3	23	5.0	18.0	3359082	25.00	38158	6.6	0.00241	Yes	No	Conducted system checks and changed bag filters twice; influent flow rate has spiked but has caused a large influx of iron sediments.		
5/8/2020	GWTT	Yes	8	42	35	13	22	22	10	4	20	6.0	18.1	3426824	34.00	67742	15.7	0.00570	Yes	No	Conducted system checks and changed bag filters.		
5/11/2020	GWTT	Yes	11	42	25	16	22	22	14	5	20	6.0	16.5	3485100	32.00	58276	13.5	0.00490	Yes	No	Conducted system checks and changed bag filters. Pumped down green exterior tote holding backwash water from system #1.		
5/15/2020	GWTT	Yes	15	39	35	17	8.5	8	16	4	7	6.0	12.8	3562051	38.00	76951	13.4	0.00485	Yes	No	Conducted system checks and changed bag filters. Backwashed primary LGAC vessel.		
5/18/2020	GWTT	Yes	18	39	16	8	9	9	6	6	7	6.0	13.3	3614934	39.00	52883	12.2	0.00445	Yes	Yes	Conducted system checks and changed bag filters. Pumped down green exterior tote holding backwash water from S.15.20 through System #2. System sampled on 5/21/2020.		
5/22/2020	GWTT	Yes	22	42	24	7	10	10	4	4	7	6.0	12.0	3682536	36.00	67602	11.7	0.00426	Yes	No	Conducted system checks and changed bag filters.		
5/26/2020	GWTT	Yes	26	41	44	4	17	16	0	0	14	5.0	14.8	3735642	34.00	53106	9.2	0.00335	Yes	No	Conducted system checks and changed bag filters twice.		
5/29/2020	GWTT	Yes	29	40	44	4	21	19	4	1	15	4.0	14.8	3785810	34.00	50168	11.6	0.00422	Yes	No	Conducted system checks and changed bag filters twice.		
Totals - May 2020 ^{3,8}				31									15.2		33.8	514000	11.5	0.00418					
6/2/2020	GWTT	Yes	2	43	42	8	23	23	8	3	21	5.0	14.4	3832928	32.00	47118	8.2	0.00235	Yes	No	Conducted system checks and changed bag filters, primary carbon vessel needs to be backwashed.		
6/5/2020	GWTT	Yes	5	40	35	9	13	13	2	2	10	5.0	17.7	3887828	35.00	54900	12.7	0.00366	Yes	No	Conducted system checks and changed bag filters.		
6/9/2020	GWTT	Yes	9	40	21	10	7.5	7	8	5	6	5.0	15.9	3922210	35.00	34382	6.0	0.00172	Yes	No	Conducted system checks and changed bag filters. Bakcwashed primary LGAC vessel, pumped down outside holding tank through system before backwashing carbon vessel.		
6/12/2020	GWTT	Yes	12	40	21	10	7.5	7	8	5	6	5.0	14.9	3970210	35.00	48000	11.1	0.00320	Yes	No	Conducted system checks and changed bag filters.		
6/16/2020	GWTT	Yes	16	41	23	8	10	10	6	5	8	6.0	13.1	4029179	36.00	58969	10.2	0.00295	Yes	No	Conducted system checks and changed bag filters. Pumped backwash water from exterior holding totes through system.		
6/19/2020	GWTT	Yes	19	40	21	10	7.5	7	8	5	6	5.0	12.3	4069514	38.00	40335	9.3	0.00269	Yes	No	Conducted system checks and changed bag filters.		
6/22/2020	GWTT	Yes	22	41	14	10	11	11	9	5	9	5.0	10.7	4102439	37.00	32925	7.6	0.00219	Yes	No	Conducted system checks and changed bag filters.		
6/25/2020	GWTT	Yes	25	42	16	12	10	10	8	4	5	5.0	10.9	4128010	35.00	25571	5.9	0.00170	Yes	No	Conducted system checks and changed bag filters.		
6/29/2020	GWTT	Yes	29	41	16	9	10	10	8	5	9	5.0	11.9	4154842	35.00	26832	4.7	0.00134	Yes	No	Conducted system checks and changed bag filters.		
Totals - June 2020 ⁶				30									13.5		35.3	369032	8.5	0.00238					
7/2/2020	GWTT	Yes	2	42	43	4	12	11	0	0	10	5.0	13.3	4173048	34.00	18206	4.2	0.00146	Yes	No	Conducted system checks and changed bag filters.		
7/6/2020	GWTT	Yes	6	42	37	8	16.5	16	7	3	14	5.0	12.3	4243300	34.00	70252	12.2	0.00423	Yes	No	Conducted system checks and changed bag filters.		
7/9/2020	GWTT	Yes	9	43	42	8	23	23	8	3	21	5.0	12.3	4279505	31.00	36205	8.4	0.00291	Yes	No	Conducted system checks and changed bag filters.		
7/12/2020	GWTT	Yes	12	47	47	18	18	18	7	3	16	5.0	11.6	4329440	32.00	49935	11.6	0.00401	Yes	No	Conducted system checks and changed bag filters.		
7/16/2020	GWTT	Yes	16	42	25	13	16.5	16	12	5	14	7.0	10.2	4374349	33.00	44909	7.8	0.00271	Yes	No	Conducted system checks and changed bag filters.		
7/20/2020	GWTT	Yes	20	40	34	12	7.5	7	10	3	6	5.0	9.3	4435010	40.00	60661	10.5	0.00365	Yes	No	Conducted system checks and changed bag filters. Pumped backwash water from System #1 through system and then backwashed primary LGAC vessel.		
7/24/2020	GWTT	Yes	24	40	37	4	9.5	9	2	2	8	6.0	8.5	4493135	40.00	58125	10.1	0.00350	Yes	No	Changed bag filters and pumped excess backwash water through system.		
7/27/2020	GWTT	Yes	27	41	43	6	13	12	2	0	10	5.0	8.2	4521639	38.00	28504	6.6	0.00229	Yes	No	Conducted system checks and changed bag filters twice due to iron-oxide accumulation in the EQ tank.		
7/30/2020	GWTT	Yes	30	41	32	7	14	13	6	3	10	5.0	9.0	4585515	37.00	63876	14.8	0.00513	Yes	No	Conducted system checks; the system is receiving more water (influent) than GWTS#1, operator assumes it's related to the build up of iron in the force main piping.		
Totals - July 2020 ^{3,8}				31									10.5		35.4	430673	9.6	0.00335					
8/4/2020	GWTT	No	4	41	41	7	17	16	5	3	14	5.5	9.5	4669181	38.00	83666	11.6	0.00336	Yes	No	System down on arrival due to split/rupture of 2 inch hard hose connecting the transfer pump to the bag filters. Hose was replaced and system restarted on 8/4/2020. Conducted system checks and changed bag filters.		
8/7/2020	GWTT	Yes	7	41	18	14	16	15	12	6	12	6.0	9.6	4686019	34.00	16838	3.9	0.00113	Yes	No	Conducted system checks and changed bag filters.		
8/10/2020	GWTT	Yes	10	40.5	16.5	14	15	14	11	5	12	6.0	9.4	4701138	31.00	15119	3.5	0.00101	Yes	No	Conducted system checks and changed bag filters. System shutdown on 8/12/2020 for carbon changeout.		
8/14/2020	GWTT	Yes	12	40	--	--	15	14	--	--	10.5	6.0	8.8	4714722	41.00	13584	2.4	0.00068	Yes	No	Restarted system after carbon changeout. Conducted system checks and changed bag filters.		
8/17/2020	GWTT	Yes	15	40	16.5	13.5	15	14	10	6	12	6.0	8.8	4732036	41.00	17314	4.0	0.00116	Yes	No	Conducted system checks and changed bag filters.		
8/20/2020	GWTT	Yes	18	44	22	12	15	14	10	5	12	6.0	8.7	4744901	40.00	12865	3.0	0.00086	Yes	No	Conducted system checks and changed bag filters.		
8/24/2020	GWTT	Yes	22	41	19	13	15	14	10	5	12	6.0	7.7	4774135	40.00	29234	5.1	0.00147	Yes	No	Conducted system checks and changed bag filters.		
8/28/2020	GWTT	Yes	26	30	18	14	25	23	10	5	20	12.0	8.3	4793800	40.00	19665	3.4	0.00099	Yes	No	Conducted system checks and changed bag filters. System sampled on 8/27/2020 and iron sediment vacuum removed from EQ tank on 8/27/2020.		
8/31/2020	GWTT	Yes	29	40	20	12	14	12	8	6	10	7.0	8.0	4807524	42.00	13724	3.2	0.00092	Yes	No	Conducted system checks and changed bag filters.		
Totals - August 2020 ^{3,8}				29									8.7		38.6	222009	5.3	0.00144					
9/4/2020	GWTT	Yes	4	40	15	12	13	13	8	6	10	6.0	6.3	4821810	42.00	14286	2.5	0.00099	Yes	No	Conducted system checks and changed bag filters.		
9/8/2020	GWTT	Yes	8	40	45	4	9	8	0	0	6	6.0	8.9	4834498	38.00	12688	2.2	0.00088	Yes	No	Conducted system checks and changed bag filters.		
9/11/2020	GWTT	Yes	11	44	16	6	9	7	5	5	6	5.0	7.1	4866725	38.00	32227	7.5	0.00299	Yes	No	Conducted system checks and changed bag filters.		
9/15/2020	GWTT	Yes	15	42	19	7	8	7	6	5	6	8.0	6.6	4907555	38.00	40830	7.1	0.00284	Yes	No	Conducted system checks and changed bag filters.		
9/18/2020	GWTT	Yes	18	42	9.5	27	8	7	6	5	6	5.0	5.5	4937021	37.00	29466	6.8	0.00273	Yes	No	Conducted system checks and changed bag filters.		
9/21/2020	GWTT	Yes	21	35	14	8	9	9	6	5	6	5.0	5.4	4963941	37.00	26920	6.2	0.00250	Yes	No	Conducted system checks and changed bag filters.		
9/25/2020	GWTT	Yes	25	45	21	7	8	7	4	4	4	5.0	4.9	4999400	35.00	35459	6.2	0.00247	Yes	No	Conducted system checks and changed bag filters.		
9/28/2020	GWTT	Yes	28	43	43	3	10	10	8	5	8	5.0	5.0	5032229	35.00	32829	7.6	0.00304	Yes	No	Conducted system checks and changed bag filters.		
Totals - September 2020 ^{3,8}				30									6.2		37.5	224705	5.2	0.00202					
10/2/2020	GWTT	Yes	2	43	28	6	9	8	5	4	7	5.0	4.5	5076447	34.00	44218	7.7	0.00352	Yes	No	Conducted system checks and changed bag filters.		
10/5/2020	GWTT	Yes	5	40	15	12	13	13	8	6	10	6.0	4.8	5088882	35.00	12435	2.9	0.00132	Yes	No	Conducted system checks and changed bag filters.		
10/8/2020	GWTT	Yes	8	42	10	9	9	9	6	5	6	5.0	4.8	5097900	35.0								

Table 28 - Summary of Groundwater Pump and Treatment System Operating and Maintenance Data - System No. 2 (GWTS #2)
Barnstable County Fire and Rescue Training Academy
155 Flint Rock Road, Barnstable, MA
RTN 4-26179

Date	Operator ¹	System Operating on Arrival	Days System Operating	Transfer Pump Pres. (psi)	Pre-Filter Changeout Differential Pressure (psi) ²			Post-Filter Changeout Differential Pressure (psi)		Carbon Vessels. Pre-change out (psi)		Carbon Vessels. Post-change out (psi)		Instantaneous Estimated INFLUENT ⁷	EFFLUENT				Estimated Total PFAs Removal (kg)	System Operating on Departure	System Sampled	Comments
				Gauge: P1	Gauge: P2	Gauge: P3	Gauge: P2	Gauge: P3	Gauge: P4	Gauge: P5	Gauge: P4	Gauge: P5	Flow Rate (GPM) ^{4,6}	Totalizer (Gal)	Instant. Flow Rate (GPM) ⁴	Net Gallons Treated ⁴	Average Effluent Flow Rate (GPM) ⁴					
12/1/2020	GWTT	Yes	1	44	44	4	13.5	13	2	3	10	5.5	32.8	5219532	32.00	24352	4.2	0.00126	Yes	No	Conducted system checks and changed bag filters twice.	
12/3/2020	GWTT	Yes	3	43	--	--	8	7.5	--	--	6	6.0	31.4	5286833	36.00	67301	23.4	0.00697	Yes	No	Conducted system checks, Global on site to vacuum out the EQ tank, backwash primary GAC vessel.	
12/7/2020	GWTT	Yes	7	43	41	5	10	10	2	2	8	6.0	32.5	5390190	33.00	103357	17.9	0.00535	Yes	No	Conducted system checks and changed bag filters twice. Pumped backwash water through system.	
12/11/2020	GWTT	Yes	11	44	42	8	14	14	6	3	10	6.0	33.1	5483045	33.00	92855	16.1	0.00481	Yes	No	Conducted system checks and changed bag filters.	
12/15/2020	GWTT	Yes	15	45	45	10	18	18	9	5	15	5.0	31.4	5578819	34.00	95774	16.6	0.00496	Yes	No	Conducted system checks and changed bag filters. High level alarm in NF tank was active on arrival. Bag filters were impacted with iron.	
12/18/2020	GWTT	Yes	18	45	39	18	25	25	16	4	18	7.0	32.8	5670557	28.00	91738	21.2	0.00633	Yes	No	Conducted system checks and changed bag filters. Increased flow rate through system.	
12/21/2020	GWTT	Yes	21	41	38	8	20	20	6	4	16	8.0	--	5765668	41.00	95111	22.0	0.00656	Yes	Yes	Conducted system checks and changed bag filters.	
12/24/2020	GWTT	Yes	24	48	41	16	26	26	14	3	22	7.0	28.7	5859505	38.00	93837	21.7	0.00648	Yes	No	Conducted system checks and changed bag filters. High level alarm in NF tank was active on arrival. Bag filters were impacted with iron.	
12/28/2020	GWTT	Yes	28	45	41	23	31	31	20	4	25	6.0	26.3	5975018	38.00	115513	20.1	0.00598	Yes	No	Conducted system checks and changed bag filters.	
Totals - December 2020 ^{1,8}				31									31.1		34.8	779838	17.5	0.005				
1/1/2021	GWTT	Yes	1	48	42	22	33	33	20	3	30	5.0	23.7	6069850	26.00	94832	16.5	0.00365	Yes	No	Conducted system checks and changed bag filters.	
1/4/2021	GWTT	Yes	4	46	37	28	27	27	16	5	24	6.0	22.4	6159356	33.00	89506	20.7	0.00459	Yes	No	Conducted system checks and changed bag filters.	
1/8/2021	GWTT	Yes	8	48	40	18	30	30	18	2	24	5.0	21.6	6265900	30.00	106544	18.5	0.00410	Yes	No	Conducted system checks and changed bag filters.	
1/11/2021	GWTT	Yes	11	42	26	26	25	24	22	6	22	7.0	17.1	6343500	30.00	77600	18.0	0.00398	Yes	No	Conducted system checks and changed bag filters. Took bag filter unit #3330 offline.	
1/15/2021	GWTT	Yes	15	45	43	28	33	33	16	3	30	5.0	18.3	6425570	38.00	82070	14.2	0.00316	Yes	No	Conducted system checks and changed bag filters. Bag filter housing from unit #3330 was replaced.	
1/18/2021	GWTT	Yes	18	44	42	16	8	8	13	3	9	9.0	22.0	6480181	32.00	54611	12.6	0.00280	Yes	No	Conducted system checks and changed bag filters. Pumped backwash water from GWTS #1 through system, then backwashed the primary carbon vessel. Bag filter housing from unit #3330 was replaced.	
1/22/2021	GWTT	Yes	22	43	28	10	11	11	7	5	8	6.0	18.7	6561860	32.00	81679	14.2	0.00314	Yes	No	Conducted system checks and changed bag filters. Pumped contents of backwash from GWTS#1 through system.	
1/25/2021	GWTT	Yes	25	43	26	12	16	16	9	5	12	6.0	15.6	6619040	29.00	57180	13.2	0.00293	Yes	No	Conducted system checks and changed bag filters.	
1/29/2021	GWTT	Yes	29	44	28	14	19	19	10	5	16	6.0	15.9	6683438	27.00	64398	11.2	0.00248	Yes	No	Conducted system checks and changed bag filters.	
Totals - January 2021 ^{1,8}				31									19.5		30.8	708420	15.9	0.004				
2/2/2021	GWTT	Yes	2	44	26	16	14	14	15	6	10	5.0	13.2	6736550	30.00	53112	9.2	0.00438	Yes	No	Conducted system checks and changed bag filters.	
2/5/2021	GWTT	Yes	5	44	24	16	19	19	13	5	16	6.0	11.6	6770434	30.00	33884	7.8	0.00372	Yes	No	Conducted system checks and changed bag filters.	
2/8/2021	GWTT	Yes	8	44	25	18	21	21	16	6	18	6.0	9.5	6800133	27.00	29699	6.9	0.00326	Yes	No	Conducted system checks and changed bag filters.	
2/12/2021	GWTT	Yes	12	44	28	17	21	21	14	5	18	6.0	10.0	6834311	26.00	34178	5.9	0.00282	Yes	No	Conducted system checks and changed bag filters.	
2/19/2021	GWTT	Yes	19	44	23	20	21	21	17	6	18	6.0	6.3	6876800	26.00	42489	4.2	0.00200	Yes	No	Conducted system checks and changed bag filters.	
2/22/2021	GWTT	Yes	22	--	30	12	--	--	7	4	--	--	5.7	6889638	11.00	12838	3.0	0.00141	No	Yes	Conducted system checks and changed bag filters. System shutdown on departure due to significant iron fouling in the EQ tank and in primary carbon vessel. GWTT and BETA decided to shut down GWTS #2 until a pump out of the tanks can be completed to reduce additional iron sedimentation in the carbon vessels. System was sampled on 2/23/2021.	
Totals - February 2021 ^{1,8}				22									10.9		25.0	206200	6.5	0.002				
3/1/2021	GWTT	No	--	--	--	--	--	--	--	--	--	--	--	6889715	--	--	--	--	--	--	--	System off.
3/5/2021	GWTT	No	--	--	--	--	--	--	--	--	--	--	--	6889715	--	--	--	--	--	--	--	Settled water from EQ tank pumped into System #1. Blue lay flat hose was replaced with hard hose at influent manifold.
3/8/2021	GWTT	No	--	--	--	--	--	--	--	--	--	--	--	6889715	--	--	--	--	--	--	--	Flushed influent line into System #1.
3/12/2021	GWTT	No	1	42	8	7	6	6	4	3	4	3.0	24.2	6892375	36.00	2660	0.5	0.00012	Yes	Yes	Global Cycle on site to vacuum iron oxide sediments from the EQ tank, bag filter housings, and exterior totes. Both carbon vessels backwashed. Restarted system, conducted system checks, changed bag filters twice.	
3/15/2021	GWTT	Yes	3	43	42	8	12	12	6	3	12	4.0	19.5	6978828	30.00	86453	20.0	0.00499	Yes	No	Conducted system checks and changed bag filters.	
3/19/2021	GWTT	Yes	7	44	42	28	27	27	16	4	23	4.0	19.7	7074315	30.00	95487	16.6	0.00414	Yes	No	Conducted system checks and changed bag filters.	
3/22/2021	GWTT	Yes	10	44	42	18	28	28	16	3	28	4.0	18.0	7129300	30.00	54985	12.7	0.00318	Yes	No	Conducted system checks and changed bag filters.	
3/26/2021	GWTT	Yes	14	43	42	18	8	8	16	2	5	5.0	16.9	7197740	31.00	68440	11.9	0.00297	Yes	No	Conducted system checks and changed bag filters twice. Backwashed primary LGAC vessel. Reduced discharge to 30 GPM to reduce the amount of iron sludge carry over into LGAC vessels.	
3/30/2021	GWTT	Yes	18	44	42	14	13	13	5	3	10	5.0	15.6	7286339	28.00	88599	15.4	0.00384	Yes	No	Conducted system checks and changed bag filters.	
Totals - March 2021 ^{1,8}				19									17.9		30.8	396624	14.5	0.002				
4/2/2021	GWTT	Yes	2	44	41	13	21	21	10	3	18	5.0	15.8	7350578	25.00	64239	14.9	0.00222	Yes	No	Conducted system checks and changed bag filters.	
4/6/2021	GWTT	Yes	6	45	43	12	25	25	10	2	22	4.0	14.8	7400768	22.00	50190	8.7	0.00130	Yes	No	Conducted system checks and changed bag filters.	
4/9/2021	GWTT	Yes	9	46	42	15	9	9	12	3	6	6.5	14.5	7451550	23.00	50782	11.8	0.00176	Yes	No	Conducted system checks, changed bag filters, and backwashed primary carbon vessel.	
4/13/2021	GWTT	Yes	13	46	34	9	12	12	7	4	10	6.0	12.6	7536033	21.00	84483	14.7	0.00219	Yes	Yes	Conducted system checks and changed bag filters.	
4/15/2021	GWTT	Yes	15	45	20	10	14	14	8	5	12	8.0	11.2	7576369	24.00	40336	14.0	0.00209	Yes	No	Conducted system checks and changed bag filters.	
4/19/2021	GWTT	Yes	19	46	30	10	16	16	8	4	14	6.0	9.5	7645588	20.00	69219	12.0	0.00179	Yes	No	Conducted system checks and changed bag filters.	
4/23/2021	GWTT	Yes	23	46	31	10	16	16	8	4	13	6.0	8.1	7706867	19.00	61279	10.6	0.00159	Yes	No	Conducted system checks and changed bag filters.	
4/27/2021	GWTT	Yes	27	47	28	23	18	18	10	5	17	6.0	6.9	7759389	18.00	52522	9.1	0.00136	Yes	No	Conducted system checks and changed bag filters.	
4/30/2021	GWTT	Yes	30	46	23	15	17	17	12	5	14	6.0	6.1	7793537	19.00	34148	7.9	0.00118	Yes	No	Conducted system checks and changed bag filters.	
Totals - April 2021 ^{1,8}				30									11.1		21.2	507198	11.7	0.002				
5/4/2021	GWTT	Yes	4	46	25	15	8	8	12	5	7	6.0	4.9	7831797	21.00	38260	6.6	0.00117	Yes	No	Conducted system checks and changed bag filters. Backwashed primary LGAC vessel.	
5/7/2021	GWTT	Yes	7	46	25	15	9	9	8	8	7	7.0	4.2	7855288	23.00	23491	5.4	0.00112	Yes	No	Conducted system checks and changed bag filters.	
5/10/2021	GWTT	Yes	10	44	36	4	13	13	2	2	10	9.0	21.4	7874795	29.00	19507	4.5	0.00093	Yes	No	Conducted system checks, changed bag filters, increased discharge/effluent flow rate.	
5/14/2021	GWTT	Yes	14	46	43	6	40	7	4	3	12	8.0	21.9	7923831	26.00	49036	8.5	0.00175	Yes	Yes	Conducted system checks and changed bag filters twice	
5/17/2021	GWTT	Yes	17	46	41	9	18	17	7	4	14	6.0	--	79								

Table 28 - Summary of Groundwater Pump and Treatment System Operating and Maintenance Data - System No. 2 (GWTS #2)
Barnstable County Fire and Rescue Training Academy
155 Flint Rock Road, Barnstable, MA
RTN 4-26179

Date	Operator ¹	System Operating on Arrival	Days System Operating	Transfer Pump Pres. (psi)	Pre-Filter Changeout Differential Pressure (psi) ²		Post-Filter Changeout Differential Pressure (psi)		Carbon Vessels Pre-change out (psi)		Carbon Vessels Post-change out (psi)		Instantaneous Estimated INFLUENT ⁷	EFFLUENT				Estimated Total PFAs Removal (kg)	System Operating on Departure	System Sampled	Comments
				Gauge: P1	Gauge: P2	Gauge: P3	Gauge: P2	Gauge: P3	Gauge: P4	Gauge: P5	Gauge: P4	Gauge: P5	Flow Rate (GPM) ^{4,6}	Totalizer (gal)	Instant. Flow Rate (GPM) ⁵	Net Gallons Treated ⁴	Average Effluent Flow Rate (GPM) ⁵				
9/3/2021	GWTT	Yes	3	46	24	7	10	10	5	5	8	8	12.0	9123034	27	58414	10.1	0.00011	Yes	No	Conducted system checks, changed bag filters.
9/7/2021	GWTT	Yes	7	46	31	10	14	14	7	8	11.0	10.0	12.6	9184007	27.00	60973	10.6	0.00026	Yes	No	Conducted system checks, changed bag filters, pumped backwash water from GWTS#1 through system.
9/10/2021	GWTT	Yes	10	46	24	11	14	14	10	10	12	12.0	9.9	9224854	25.00	40847	9.5	0.00033	Yes	No	Conducted system checks, changed bag filters.
9/14/2021	GWTT	Yes	14	46	24	11	14	14	10	10	12	12.0	8.5	9272468	24.00	47614	8.3	0.00040	Yes	No	Conducted system checks, changed bag filters.
9/17/2021	GWTT	Yes	17	48	24	12	15	15	8	9	13	13.0	10.5	9297187	24.00	24719	5.7	0.00034	Yes	No	Conducted system checks and changed bag filters.
9/20/2021	GWTT	Yes	20	48	14	11	12	12	10	9	10	10.0	10.6	9311469	26.00	14282	3.3	0.00023	Yes	Yes	Conducted system checks and changed bag filters.
9/24/2021	GWTT	Yes	24	46	--	--	10	10	--	--	8	7.0	8.8	9331227	27.00	19758	3.4	0.00029	Yes	No	Conducted system checks and changed bag filters.
9/27/2021	GWTT	Yes	27	46	10	10	10	10	8	8	8	8.0	8.2	9342333	27.00	11106	2.6	0.00024	Yes	No	Conducted system checks and changed bag filters.
Totals - September 2021 ^{4,10}				30									10.1	25.9	277713	6.4	0.001				
10/1/2021	GWTT	Yes	1	46	10	10	10	10	8	8	8	8	7.8	9355201	27	12868	2.2	0.00001	Yes	No	Conducted system checks, changed bag filters.
10/5/2021	GWTT	Yes	5	46	10	10	10	10	8	8	8.0	8.0	8.0	9363138	27	7937	1.4	0.00003	No	No	Conducted system checks, changed bag filters. System shutdown due to influx of iron oxide sediment overloading the bag filters.
10/8/2021	GWTT	No	6	46	24	11	14	14	10	10	12	12.0	9.2	9365050	25.00	1912	0.4	0.00001	Yes	No	Restarted system, conducted system checks, changed bag filters twice.
10/12/2021	GWTT	Yes	10	48	42	12	25	23	11	11	20	20.0	9.5	9405023	20.00	39973	6.9	0.00028	Yes	No	Conducted system checks, changed bag filters. System in high level alarm on arrival.
10/15/2021	GWTT	Yes	13	49	41	15	28	28	14	15	24	25.0	9.6	9445540	18.00	40517	9.4	0.00048	Yes	No	Conducted system checks, changed bag filters twice due to high flux of iron sediments.
10/19/2021	GWTT	Yes	17	48	43	17	28	28	16	16	26	26.0	8.9	9497110	18.00	51570	9.0	0.00060	Yes	No	Conducted system checks, changed bag filters twice due to high flux of iron sediments and swapped force main piping to reduce iron flux into system.
10/22/2021	GWTT	Yes	20	47	15	10	--	--	--	--	16	15.0	8.7	9516542	24.00	19432	4.5	0.00036	Yes	No	Conducted system checks, changed bag filters and backwashed secondary LGAC vessel.
10/26/2021	GWTT	Yes	24	46	19	17	10	10	15	15	7	7.0	8.5	9539918	27.00	23376	4.1	0.00039	Yes	No	Conducted system checks, changed bag filters. Slightly increased discharge flow rate. Pumped backwash water through system.
10/29/2021	GWTT	Yes	27	46	12	11	11	11	8	8	9	9.0	6.8	9554825	26.00	14907	3.5	0.00037	Yes	No	Conducted system checks and changed bag filters.
Totals - October 2021 ^{4,10}				29									6.8	23.6	212492	5.1	0.0006				
11/2/2021	GWTT	Yes	2	46	13	12	11	11	10	10	10	9	6.3	9566990	27	12165	2.1	0.00029	Yes	No	Conducted system checks, changed bag filters.
11/5/2021	GWTT	Yes	5	38	12	11	12	12	10	10	10.0	10.0	6.0	9574635	26	7645	1.8	0.00025	No	No	Conducted system checks, changed bag filters and replaced broken pressure gauge on transfer pump.
11/8/2021	GWTT	No	8	40	35	8	15	15	8	9	14	13.0	6.2	9612590	25.00	37955	8.8	0.00122	Yes	No	Conducted system checks, changed bag filters twice.
11/12/2021	GWTT	Yes	12	44	37	12	22	22	10	10	20	20.0	5.9	9659581	20.00	46991	8.2	0.00113	Yes	No	Conducted system checks, changed bag filters. System in high level alarm on arrival.
11/15/2021	GWTT	Yes	15	42	43	11	10	10	10	11	7	6.0	6.1	9691324	18.00	31743	7.3	0.00102	Yes	No	Conducted system checks, changed bag filters twice. Backwashed both primary and secondary carbon vessels.
11/22/2021	GWTT	Yes	18	43	--	--	8	8	--	--	6	7.0	28.9	9717710	21.00	26386	2.6	0.00036	Yes	No	System shutdown for maintenance and redevelopment on PRW-4 and force main on 11/17/2021- system restarted on 11/22/2021. GWTT flushed 2,500 gallons from the force mains (PRW-4) prior to system restart. Bag filters changed twice, significant iron sediment still coming through in the influent.
11/26/2021	GWTT	Yes	22	48	45	5	12	12	4	6	10	11.0	31.1	9748840	21.00	31130	5.4	0.00075	Yes	No	Conducted system checks and changed bag filters.
11/30/2021	GWTT	Yes	26	46	35	17	22	22	15	16	20	20.0	28.9	9817965	24.00	69125	12.0	0.00167	Yes	No	Conducted system checks and changed bag filters, increased flow through transfer pump in response to cycling high level alarm (increased influent rates).
Totals - November 2021 ^{4,10}				26									14.9	22.8	263140	7.0	0.001				
12/3/2021	GWTT	Yes	3	43	42	21	30	30	24	24	24	8	30.1	9870995	20	53030	12.3	0.00153	Yes	No	Conducted system checks, changed bag filters.
12/7/2021	GWTT	Yes	7	44	42	27	36	36	25	26	34.0	35.0	29.9	9939134	15	68139	11.8	0.00148	No	No	Conducted system checks, changed bag filters
12/9/2021	GWTT	Yes	9	42	42	29	28	24	22	26	22	22.0	29.4	9973745	25.00	34611	12.0	0.00150	Yes	No	Conducted system checks, changed bag filters, Global Cycle conducted a pump out
12/13/2021	GWTT	Yes	13	38	34	15	20	20	14	16	17	17.0	30.1	10076138	25.00	104393	18.1	0.00226	Yes	No	Conducted system checks, changed bag filters, and backwashed primary carbon vessel and increased discharge flow rate.
12/16/2021	GWTT	Yes	16	38	43	7	19	19	4	5	16	13.0	30.4	10153382	25.00	75244	17.4	0.00217	Yes	Yes	Conducted system checks, changed bag filters.
12/20/2021	GWTT	Yes	20	47	43	11	21	21	18	12	12.0	5.0	28.7	10246532	32	93150	16.2	0.00202	Yes	No	Conducted system checks, changed bag filters.
12/23/2021	GWTT	Yes	23	40	44	9	22	22	6	4	19.0	12.0	28.0	10314095	31	67563	15.6	0.00195	Yes	No	Conducted system checks, changed bag filters.
12/28/2021	GWTT	Yes	28	39	43	10	22	22	7	4	21.0	10.0	28.3	10409055	29	94960	13.2	0.00165	Yes	No	Conducted system checks, changed bag filters, pumped backwash water through system.
12/31/2021	GWTT	Yes	31	35	23	11	9	9	9	6	6.0	7.0	28.1	10459586	37	50531	11.7	0.00146	Yes	No	Conducted system checks, changed bag filters. Primary carbon vessel backwashed.
Totals - December 2021 ^{4,10}				31									29.4	26.6	641621	14.4	0.002				
1/4/2022	GWTT	Yes	4	46	41	6	14	14	4	4	12	10	26.8	10523955	34	64369	11.2	0.00150	Yes	No	Conducted system checks, changed bag filters.
1/10/2022	GWTT	Yes	10	37	45	5	11	11	3	3	10.0	10.0	25.3	10586232	35	62277	7.2	0.00097	No	No	Conducted system checks, changed bag filters twice. Pumped backwash water from GWTS #1 through system.
1/14/2022	GWTT	Yes	14	37	44	2	14	13	0	0	10	11.0	26.4	10648575	36.00	62343	10.8	0.00146	Yes	No	Conducted system checks, changed bag filters.
1/18/2022	GWTT	Yes	18	36	45	2	14	14	0	0	12	12.0	24.2	10690606	34.00	42031	7.3	0.00098	Yes	No	Conducted system checks, changed bag filters twice.
1/21/2022	GWTT	Yes	21	37	45	4	13	13	0	2	10	12.0	23.9	10729831	25.00	39225	9.1	0.00122	Yes	No	Conducted system checks, changed bag filters.
1/24/2022	GWTT	Yes	24	36	43	4	14	14	0	0	11	11.0	23.0	10792092	35.00	62261	14.4	0.00194	Yes	Yes	Conducted system checks, changed bag filters twice. System sampled on 1/25/2022.
1/28/2022	GWTT	Yes	28	36	45	3	15	15	0	0	10.0	11.0	22.5	10838454	33	46362	8.0	0.00108	No	No	Conducted system checks, changed bag filters.
1/31/2022	GWTT	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	No	No	Upon arrival, system was shutdown due to loss of power from snow storm on 1/29/2022. Heat was off and system was frozen. Attempts were made to drain water from the pumps and associated piping, but everything was frozen.
Totals - January 2022 ^{4,10}				29									24.6	33.1	378968	9.1	0.0011				
2/1/2022	GWTT	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	No	No	Power was restored to the Site on 2/1/2022. GWTT and County personnel installed heaters inside the system to defrost/thaw the frozen components for system restart. GWTT observed a burst pipe in the back flow components of the bag filters units from the transfer pump.
2/4/2022	GWTT	Yes	1	36	22	12	13	13	8	9	10.0	12.0	23.4	10863650	36	25196	17.5	0.00208	Yes	No	Conducted system checks, changed bag filters twice. Replaced transfer pump housing and associated back flow piping and effluent manifold.
2/7/2022	GWTT	No	4	34	25	10	13	13	7	8	10	10.0	23.1	10903412	37	39762	9.2	0.00110	Yes	No	Conducted system checks, changed bag filters. Tripped breaker caused bag filter /transfer pump to not work properly. Breaker was reset.
2/11/2022	GWTT	Yes	8	34	25	10	12	12	6	7	8	9.0	22.0	10940222	36	36810	6.4	0.00076	Yes	No	Conducted system checks, changed bag filters and increased influent flow rate into system.
2/14/2022	GWTT	Yes	11	35	40	5	12	12	1	4	9	10.0	21.1	10999120	37	58898	13.6	0.00162	Yes	No	changed bag filters, pump down outside tank.
2/18/2022	GWTT	Yes	15	--	--	--	--	--	--	--	--	--	18.9	11087310	--	88190	15.3	0.00182	No	No	Shut system down, waiting for carbon change.
Totals - February 2022 ^{4,10}				15									20.8	36.5	248856	11.5	0.001				
10/14/2022	GWTT	Yes	1	34	--	--	7	7	--	--	4.0	2.0	28.5	11089444	38	2134	0.0	0.00000	Yes	No	Restart system, fresh carbon.
10/18/2022	GWTT	Yes	5	35	23	6	8	8	5	5	6	6.0	28.8	11162219	39	72775	12.6	0.00150	Yes	No	Conducted system checks, changed bag filters.
10/21/2022	GWTT	Yes	8	35	30	6	9	9	5	4	7	6.0	27.8	11242964	37	80745	18.7	0.00223	Yes	No	Conducted system checks, changed bag filters. Troubleshoot system leaks
10/24/2022	GWTT	Yes	11	37	45	8	13	13	6	2	10	6.0	29.9	11313284	37	70520	16.3	0.00194	Yes	No	Conducted system check, changed bag filters, fix system leaks
10/28/2022	GWTT	Yes	15	37	45	9	14	14	7	2	12	7.0	29.9	11374550	36	61266	10.6	0.00127	Yes	Yes	Conducted system check, changed bag filters, tightened carbon vessels covers slightly. System Sampled 10.25.22
10/31/2022	GWTT	Yes	18	38	43	10	15	15	8	2	14	2.0	29.4	11444035	35	69485	16.1	0.00192	Yes	No	Conducted system check, changed bag filters twice.
Totals - October 2022 ^{4,10}				18									28.4	37.0	356725	13.8	0.001				

Table 2B - Summary of Groundwater Pump and Treatment System Operating and Maintenance Data - System No. 2 (GWTS #2)
Barnstable County Fire and Rescue Training Academy
155 Flint Rock Road, Barnstable, MA
RTN 4-26179

Date	Operator ¹	System Operating on Arrival	Days System Operating	Transfer Pump Pres. (psi)	Pre-Filter Changeout Differential Pressure (psi) ²		Post-Filter Changeout Differential Pressure (psi)		Carbon Vessels Pre-change out (psi)		Carbon Vessels Post-change out (psi)		Instantaneous Estimated INFLUENT ⁷	EFFLUENT				Estimated Total PFAs Removal (kg)	System Operating on Departure	System Sampled	Comments
				Gauge: P1	Gauge: P2	Gauge: P3	Gauge: P2	Gauge: P3	Gauge: P4	Gauge: P5	Gauge: P4	Gauge: P5	Flow Rate (GPM) ^{1,4}	Totalizer (gal)	Instant. Flow Rate (GPM) ⁶	Net Gallons Treated ⁴	Average Effluent Flow Rate (GPM) ⁵				
11/4/2022	GWTT	Yes	4	36	43	13	14	14	12	6	12.0	8.0	25.3	11525639	35	81604	14.2	0.00169	Yes	No	Conducted system checks, changed bag filters.
11/7/2022	GWTT	Yes	7	36	45	10	15	15	8	6	14	8.0	26.6	11568450	33	42811	9.9	0.00118	Yes	No	Conducted system checks, changed bag filters twice.
11/11/2022	GWTT	Yes	11	36	46	8	13	14	7	6	12	8.0	24.8	11624279	35	55829	9.7	0.00115	Yes	No	Conducted system checks, changed bag filters twice.
11/15/2022	GWTT	Yes	15	36	45	10	14	14	10	6	12	8.0	24.5	11707510	35	83231	14.4	0.00172	Yes	No	Conducted system checks, changed bag filters twice.
11/18/2022	GWTT	Yes	18	42	38	12	16	16	9	6	15	8.0	24.2	11788225	34	80715	18.7	0.00223	Yes	No	Conducted system checks, changed bag filters.
11/21/2022	GWTT	Yes	21	36	39	15	16	16	13	7	14	8.0	23.4	11873254	33	85029	19.7	0.00234	Yes	No	Conducted system checks, changed bag filters twice.
11/25/2022	GWTT	Yes	25	44	43	14	19	19	10	6	18	8.0	22.5	11971614	32	98360	17.1	0.00203	Yes	No	Conducted system check, changed bag filters.
11/28/2022	GWTT	Yes	28	38	43	14	20	20	11	6	16	8.0	22.3	12034170	30	62556	14.5	0.00172	Yes	Yes	Conducted system check, changed bag filters. System sampled 11.30.22.
Totals - November 2022 ¹⁰				30									24.2	33.2	465720	10.8	0.001				
12/2/2022	GWTT	Yes	2	38	44	14	22	22	11	6	20.0	8.0	22.0	12101180	29	67010	11.6	0.00139	Yes	No	Conducted system checks, changed bag filters. Lubricated bag filter o-rings.
12/5/2022	GWTT	Yes	5	38	43	13	21	21	8	6	16	9.0	20.9	12165056	31	63876	14.8	0.00176	Yes	No	Conducted system checks, changed bag filters.
12/9/2022	GWTT	Yes	9	38	44	14	20	20	11	6	16	8.0	20.4	12252009	32	86953	15.1	0.00180	Yes	No	Conducted system checks, changed bag filters.
12/12/2022	GWTT	Yes	12	39	48	14	18	18	8	5	18	8.0	20.2	12300520	30	48511	11.2	0.00134	Yes	No	Conducted system checks, changed bag filters.
12/16/2022	GWTT	Yes	16	38	41	17	21	21	11	6	20	8.0	18.6	12397999	27	97479	16.9	0.00202	Yes	No	Conducted system checks, changed bag filters.
12/19/2022	GWTT	Yes	19	38	39	17	21	21	12	6	18	8.0	17.4	12472484	29	74485	17.2	0.00205	Yes	No	Conducted system checks, changed bag filters.
12/22/2022	GWTT	Yes	22	38	39	14	19	19	12	6	16	8.0	16.5	12546180	30	73696	17.1	0.00203	Yes	Yes	Conducted system checks, changed bag filters.System sampled 12.22.22
12/27/2022	GWTT	Yes	27	39	45	13	21	21	15	6	18	7.0	16.6	12641561	28	95381	13.2	0.00158	Yes	No	Conducted system checks, changed bag filters.
12/30/2022	GWTT	Yes	30	39	36	16	22	22	15	6	20	7.5	15.3	12711250	30	69689	16.1	0.00192	Yes	No	Conducted system checks, changed bag filters twice.
Totals - December 2022 ¹⁰				31									18.6	29.6	677080	15.2	0.002				

1. GWTT - Groundwater Treatment Technologies
2. Pressure readings before filter bag changeout or if no changeout was done.
3. Influent flow is an instantaneous estimate of the flow rate from the submersible Well Pump at PRW-4.
4. During monthly reporting periods the net gallons are calculated from previous effluent totalizer readings. (Difference between the current totalizer reading - the last dated totalizer reading).
5. The Average effluent flow rate is calculated from the net gallons obtained from the system's effluent totalizer flow meter and days that the system was in operation.
6. The "Totals" shown (from left to right) include the, Total Days of System Operation, Average Instantaneous Influent Flow Rate, Average Instantaneous Effluent Flow Rate, Total Gallons Treated, Average Net Effluent Flow Rate, and Estimated PFAS Removed for the respective monthly reporting period.
7. Instantaneous influent flow rates are estimated by approximating 50% of the influent flow rate values calculated from GWPTS #1 [See Table 2A].
8. Instantaneous effluent flow rate estimated by stopwatch at totalizer meter.
9. Flow calculated based on gallons marking on EQ tank. Estimated flow rate = 25 GPM (i.e. flow is calculated based on an in-situ observation of flow into the EQ tank, and 100 gallons of groundwater flows into the EQ tank for a 4 minute duration).
10. The monthly totals represent the monthly IBA reporting period and the average effluent flow rates calculated from the first monitoring date are based on measurements from the last monitoring date of the previous reporting period.

Table 4B- Summary of Historic Groundwater PFAS Analytical Data
Former Barnstable Country Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	USEPA ^{1,2} HEALTH ADVISORY	Method 1 GW-1 Standards ⁴	HS-1 ¹⁵		HS-6 ¹⁵	HS-2 ¹⁵	HS-2S ¹⁵		PFW-3			PFW-4	OW-2A	OW-2S	OW-2D	FS-1	RW-1		PC-2		PC-3		PC-4	
SCREEN DEPTH (FEET)																								
WELL DIAMETER (INCHES)									2			2							2		2		2	
WELL STATUS			Abandoned		Abandoned	Abandoned	Abandoned		Viable			Viable	Not Viable	Not Viable	Not Viable	Not Viable	OFF		Viable		Damaged - Not Viable		Destroyed	
SAMPLING DATE			8/11/2016	12/8/2016	8/11/2016	7/27/2017	8/18/2016	5/3/2017	4/1/2015	10/15/2015	4/18/2017	4/1/2015	6/3/2014	4/14/2016	4/14/2016	4/11/2017	4/1/2015	4/11/2017	6/17/2015	4/24/2017	8/20/2014	6/17/2015	6/17/2015	3/8/2016
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
PFAS (Method 537.2)																								
PFO	70	20	56,000	36,000	41,000	21,000	300	150	2,700	3,800	3,400	3,300	1,300	2,400	6	1,700	2,300	1,000	3,800	2,200	3,100	4,700	2,200	4,600
PFOA	70	20	460	1,800	450	370	BRL (<5.3)	8.2	140	170	230	420	150	250	BRL (<5.3)	730	240	58	220	110	180	200	79	160
PFNA	NE	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PFHxS	NE	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PFHpA	NE	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PFDA	NE	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
TOTAL Σ 6 PFAS	70	20	56,460	37,800	41,450	21,370	300	158	2,840	3,970	3,630	3,720	1,450	2,650	6	2,430	2,540	1,058	4,020	2,310	3,280	4,900	2,279	4,760

- Notes:
- Prior to June 11, 2018, the USEPA established the EPA Health Advisory for two PFAS chemicals, PFOA and PFOS, which was 70 ng/L. Subsequently, MassDEP's Office of Research and Standards (ORS) expanded on this Health Advisory and created the ORS Guideline that applies to the total summed of five PFAS chemicals, PFOS, PFOA, PFNA, PFHxS, and PFHpA, effective June 11, 2018.
 - The USEPA and MassDEP ORS Guideline applies to five PFAS chemicals of concern (PFOS, PFOA, PFNA, PFHpA, and PFHxS) individually as well as the sum of the five PFAS of concern.
 - The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data." Data presented herein is summarized and data was selected based on quarterly sampling events.
 - (--) Concentrations of the three additional PFAS chemicals, PFNA, PFHxS, and PFHpA were not presented until after the MassDEP ORS Guideline was in effect on 06.11.18. PFAS concentrations were regulated by the USEPA Health Advisory prior to 6.11.18. Concentrations of PFDA were not presented prior to April 19, 2019. MassDEP released drafted Method 1 groundwater risk standards for PFAS on April 19, 2019 that applies to the total sum and individual concentrations of six PFAS compounds (PFOS, PFOA, PFNA, PFHxS, PFHpA, and PFDA), which is 20 ng/L. These drafted groundwater standards were finalized and became effective on December 27, 2019.
 - BRL - Below Laboratory Detection Limits
 - Concentrations presented in ng/L - nanograms per Liter - parts per trillion
 - Concentrations in bold exceed applicable Health Advisory Limit or Method 1 GW-1 Standard
 - PFOS - Perfluorooctanesulfonate
 - PFOA - Perfluorooctanoic Acid
 - PFNA - Perfluorononanoic Acid
 - PFHxS - Perfluorohexanesulfonic Acid
 - PFHpA - Perfluoroheptanoic Acid
 - PFDA - Perfluorodecanoic Acid
 - NA - Concentration data not available
 - Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The well was replaced with HSW-1/HS-1a as post-exacavation activities.
 - Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.
 - NE- Not Established

Table 4B- Summary of Historic Groundwater PFAS Analytical Data
Former Barnstable Country Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	USEPA ^{1,2} HEALTH ADVISORY	Method 1 GW-1 Standards ⁴	PC-7					PC-8					PC-9									PC-10	
SCREEN DEPTH (FEET)																							
WELL DIAMETER(INCHES)			2					2														2	
WELL STATUS			Damaged - Not Viable					Damaged - Not Viable					Damaged - Not Viable									Viable	
SAMPLING DATE			4/2/2015	6/17/2015	10/7/2015	3/8/2016	4/27/2017	6/17/2015	10/7/2015	3/8/2016	4/24/2017	2/6/2018	4/1/2015	10/7/2015	3/9/2016	3/30/2016	4/28/2017	1/10/2019	10/30/2019	10/21/2020	4/6/2015	4/28/2017	
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L		
PFAS (Method 537.2)																							
PFOS	70	20	17,000	500	700	1,700	2,900	15,000	500	1,600	36,000	1,000	580	510	5,300	8,100	280	1,700	2,300	1,400	790	560	
PFOA	70	20	3,500	27	98	140	130	2,800	370	97	--	71	30	40	1,200	1,600	31	64	100	66	50	67	
PFNA	NE	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	53	90	88	--	--		
PFHxS	NE	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	360	420	200	--	--		
PFHpA	NE	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	81	120	77	--	--		
PFDA	NE	20							--	--	--	--	--	--	--	--	--	15	11	--	--		
TOTAL Σ 6 PFAS	70	20	20,500	527	798	1,840	3,030	17800	870	1697	36000	1071	610	550	6500	9700	311	2258	3045	1,842	840	627	

Notes:

1. Prior to June 11, 2018, the USEPA established the EPA Health Advisory for two PFAS chemicals, PFOA and PFOS, which was 70 ng/L. Subsequently, MassDEP's Office of Research and Standards (ORS) expanded on this Health Advisory and created the ORS Guideline that applies to the total summed of five PFAS chemicals, PFOS, PFOA, PFNA, PFHxS, and PFHpA, effective June 11, 2018.

2. The USEPA and MassDEP ORS Guideline applies to five PFAS chemicals of concern (PFOS, PFOA, PFNA, PFHpA, and PFHxS) individually as well as the sum of the five PFAS of concern.

3. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data. Data presented herein is summarized and data was selected based on quarterly sampling events.

4. (--) Concentrations of the three additional PFAS chemicals, PFNA, PFHxS, and PFHpA were not presented until after the MassDEP ORS Guideline was in effect on 06.11.18. PFAS concentrations were regulated by the USEPA Health Advisory prior to 6.11.18. Concentrations of PFDA were not presented prior to April 19, 2019. MassDEP released drafted Method 1 groundwater risk standards for PFAS on April 19, 2019 that applies to the total sum and individual concentrations of six PFAS compounds (PFOS, PFOA, PFNA, PFHxS, PFHpA, and PFDA), which is 20 ng/L. These drafted groundwater standards were finalized and became effective on December 27, 2019.

5. BRL - Below Laboratory Detection Limits

6. Concentrations presented in ng/L - nanograms per Liter - parts per trillion

7. Concentrations in bold exceed applicable Health Advisory Limit or Method 1 GW-1 Standard

8. PFOS - Perfluorooctanesulfonate

9. PFOA - Perfluorooctanoic Acid

10. PFNA - Perfluorononanoic Acid

11. PFHxS - Perfluorohexanesulfonic Acid

12. PFHpA - Perfluoroheptanoic Acid

13. PFDA - Perfluorodecanoic Acid

14. NA - Concentration data not available

15. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The well was replaced with HSW-1/HS-1a as post-exacavation activities.

16. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.

17. NE - Not Established

Table 4B- Summary of Historic Groundwater PFAS Analytical Data

Former Barnstable Country Fire and Rescue Training Academy

155 S. Flint Rock Road, Barnstable, MA

RTN 4-26179

SAMPLE ID	USEPA ^{1,2} HEALTH ADVISORY	Method 1 GW-1 Standards ⁴	PC-12			PC-13		PC-15			PC-19				PC-20D	PC-21D	PC-22		PC-23D	PC-24		PC-25
SCREEN DEPTH (FEET)																						
WELL DIAMETER (INCHES)																						
WELL STATUS			Viable			Viable		Destroyed - Not Viable			Damaged - Not Viable				Not Viable	Viable	Viable		Viable	Viable		Viable
SAMPLING DATE			6/17/2015	5/12/2016	4/26/2017	6/17/2015	4/24/2017	4/2/2015	4/28/2017	10/30/2019	4/2/2015	3/30/2016	4/27/2017	10/30/2019	3/9/2016	3/9/2016	4/2/2015	4/28/2017	6/17/2015	3/30/2016	4/28/2017	6/17/2015
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
PFAS (Method 537.2)																						
PFOS	70	20	1,300	1,700	1,600	2,400	2,800	1,300	780	970	3,300	1,600	2,000	1,900	3,200	230	1,200	1,400	1,000	420	320	2,300
PFOA	70	20	140	150	150	280	170	100	80	55	260	120	290	170	200	19	100	170	73	22	33	260
PFNA	NE	20	--	--	--	--	--	--	--	52	--	--	--	130	--	--	--	--	--	--	--	--
PFHxS	NE	20	--	--	--	--	--	--	--	290	--	--	--	450	--	--	--	--	--	--	--	--
PFHpA	NE	20	--	--	--	--	--	--	--	77	--	--	--	95	--	--	--	--	--	--	--	--
PFDA	NE	20	--	--	--	--	--	--	--	4.9	--	--	--	14	--	--	--	--	--	--	--	--
TOTAL Σ 6 PFAS	70	20	1440	1850	1750	2680	2,970	1,400	860	1,449	3560	1720	2290	2759	3,400	249	1300	1,570	1073	442	353	2,560

Notes:

1. Prior to June 11, 2018, the USEPA established the EPA Health Advisory for two PFAS chemicals, PFOA and PFOS, which was 70 ng/L. Subsequently, MassDEP's Office of Research and Standards (ORS) expanded on this Health Advisory and created the ORS Guideline that applies to the total summed of five PFAS chemicals, PFOS, PFOA, PFNA, PFHxS, and PFHpA, effective June 11, 2018.

2. The USEPA and MassDEP ORS Guideline applies to five PFAS chemicals of concern (PFOS, PFOA, PFNA, PFHpA, and PFHxS) individually as well as the sum of the five PFAS of concern.

3. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data. Data presented herein is summarized and data was selected based on quarterly sampling events.

4. (--) Concentrations of the three additional PFAS chemicals, PFNA, PFHxS, and PFHpA were not presented until after the MassDEP ORS Guideline was in effect on 06.11.18. PFAS concentrations were regulated by the USEPA Health Advisory prior to 6.11.18. Concentrations of PFDA were not presented prior to April 19, 2019. MassDEP released drafted Method 1 groundwater risk standards for PFAS on April 19, 2019 that applies to the total sum and individual concentrations of six PFAS compounds (PFOS, PFOA, PFNA, PFHxS, PFHpA, and PFDA), which is 20 ng/L. These drafted groundwater standards were finalized and became effective on December 27, 2019.

5. BRL - Below Laboratory Detection Limits

6. Concentrations presented in ng/L - nanograms per Liter - parts per trillion

7. Concentrations in bold exceed applicable Health Advisory Limit or Method 1 GW-1 Standard

8. PFOS - Perfluorooctanesulfonate

9. PFOA - Perfluorooctanoic Acid

10. PFNA - Perfluorononanoic Acid

11. PFHxS - Perfluorohexanesulfonic Acid

12. PFHpA - Perfluoroheptanoic Acid

13. PFDA - Perfluorodecanoic Acid

14. NA - Concentration data not available

15. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The well was replaced with HSW-1/HS-1a as post-exacavation activities.

16. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.

17. NE - Not Established

Table 4B- Summary of Historic Groundwater PFAS Analytical Data
Former Barnstable Country Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	USEPA ^{1,2} HEALTH ADVISORY	Method 1 GW-1 Standards ⁴	PC-26				PC-29	PC-31		PC-32		PC-33		PC-34D		PC-35S	PC-35D		PC-36D		PC-37
SCREEN DEPTH (FEET)																					
WELL DIAMETER (INCHES)																					
WELL STATUS			Viable				Viable	Viable		Viable		Viable		Viable		Viable	Viable		Viable		Viable
SAMPLING DATE			6/17/2015	10/8/2015	3/8/2016	4/24/2017	4/28/2017	3/8/2016	4/27/2017	3/30/2016	4/27/2017	3/30/2016	4/27/2017	4/14/2016	4/28/2017	4/14/2016	4/14/2016	4/28/2017	4/14/2016	4/24/2017	4/10/2017
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
PFAS (Method 537.2)																					
PFOS	70	20	1,000	1,900	1,200	380	1,400	1,200	12,000	1,200	960	2,700	2,100	1,400	1,500	1,700	2,000	1,700	3,100	2,500	45
PFOA	70	20	210	190	98	21	BRL (<4.6)	110	160	130	54	250	210	150	130	130	140	97	150	120	BRL (<20)
PFNA	NE	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PFHxS	NE	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PFHpA	NE	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PFDA	NE	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL Σ 6 PFAS	70	20	1,210	2,090	1,298	401	1400	1310	12160	1330	1014	2950	2310	1550	1630	1830	2140	1797	3250	2620	45

Notes:

1. Prior to June 11, 2018, the USEPA established the EPA Health Advisory for two PFAS chemicals, PFOA and PFOS, which was 70 ng/L. Subsequently, MassDEP's Office of Research and Standards (ORS) expanded on this Health Advisory and created the ORS Guideline that applies to the total summed of five PFAS chemicals, PFOS, PFOA, PFNA, PFHxS, and PFHpA, effective June 11, 2018.

2. The USEPA and MassDEP ORS Guideline applies to five PFAS chemicals of concern (PFOS, PFOA, PFNA, PFHpA, and PFHxS) individually as well as the sum of the five PFAS of concern.

3. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data. Data presented herein is summarized and data was selected based on quarterly sampling events.

4. (--) Concentrations of the three additional PFAS chemicals, PFNA, PFHxS, and PFHpA were not presented until after the MassDEP ORS Guideline was in effect on 06.11.18. PFAS concentrations were regulated by the USEPA Health Advisory prior to 6.11.18. Concentrations of PFDA were not presented prior to April 19, 2019. MassDEP released drafted Method 1 groundwater risk standards for PFAS on April 19, 2019 that applies to the total sum and individual concentrations of six PFAS compounds (PFOS, PFOA, PFNA, PFHxS, PFHpA, and PFDA), which is 20 ng/L. These drafted groundwater standards were finalized and became effective on December 27, 2019.

5. BRL - Below Laboratory Detection Limits

6. Concentrations presented in ng/L - nanograms per Liter - parts per trillion

7. Concentrations in bold exceed applicable Health Advisory Limit or Method 1 GW-1 Standard

8. PFOS - Perfluorooctanesulfonate

9. PFOA - Perfluorooctanoic Acid

10. PFNA - Perfluorononanoic Acid

11. PFHxS - Perfluorohexanesulfonic Acid

12. PFHpA - Perfluoroheptanoic Acid

13. PFDA - Perfluorodecanoic Acid

14. NA - Concentration data not available

15. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The well was replaced with HSW-1/HS-1a as post-exacavation activities.

16. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.

17. NE- Not Established

Table 4B- Summary of Historic Groundwater PFAS Analytical Data

Former Barnstable Country Fire and Rescue Training Academy

155 S. Flint Rock Road, Barnstable, MA

RTN 4-26179

SAMPLE ID	USEPA ^{1,2} HEALTH ADVISORY	Method 1 GW-1 Standards ⁴	MW-1			MW-3D	SBV-3	MW-6		MW-7	MW-10		MW-13	MW-15	MW-15D	MW-19i
SCREEN DEPTH (FEET)																
WELL DIAMETER (INCHES)																
WELL STATUS			Viable			Viable	Viable	Viable		Viable	Viable		Viable	Viable	Viable	Not Viable
SAMPLING DATE			11/22/2013	6/3/2014	4/28/2017	8/18/2016	11/22/2013	4/1/2015	4/25/2017	11/22/2013	11/22/2013	4/18/2016	7/29/2021	4/24/2017	4/2/2015	8/20/2014
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
PFAS (Method 537.2)																
PFOA	70	20	3,900	4,400	2,600	98	1,100	5,700	2,400	3,100	2,000	1,700	BRL (<0.020)	19	60	BRL
PFNA	70	20	320	880	290	10	350	510	140	580	670	440	BRL (<0.020)	27	60	BRL
PFNA	NE	20	--	--	--	--	--	--	--	--	--	--	BRL (<0.020)	--	--	--
PFHxS	NE	20	--	--	--	--	--	--	--	--	--	--	BRL (<0.020)	--	--	--
PFHpA	NE	20	--	--	--	--	--	--	--	--	--	--	BRL (<0.020)	--	--	--
PFDA	NE	20	--	--	--	--	--	--	--	--	--	--	BRL (<0.020)	--	--	--
TOTAL Σ 6 PFAS	70	20	4,220	5,280	2,890	108	1,450	6,210	2,540	3,680	2,670	2,140	0	46	120	0

Notes:

1. Prior to June 11, 2018, the USEPA established the EPA Health Advisory for two PFAS chemicals, PFOA and PFOS, which was 70 ng/L. Subsequently, MassDEP's Office of Research and Standards (ORS) expanded on this Health Advisory and created the ORS Guideline that applies to the total summed of five PFAS chemicals, PFOS, PFOA, PFNA, PFHxS, and PFHpA, effective June 11, 2018.
2. The USEPA and MassDEP ORS Guideline applies to five PFAS chemicals of concern (PFOS, PFOA, PFNA, PFHpA, and PFHxS) individually as well as the sum of the five PFAS of concern.
3. The complete PFAS concentration data set collected from PRW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOS/PFOA Analytical Data. Data presented herein is summarized and data was selected based on quarterly sampling events.
4. (--) Concentrations of the three additional PFAS chemicals, PFNA, PFHxS, and PFHpA were not presented until after the MassDEP ORS Guideline was in effect on 06.11.18. PFAS concentrations were regulated by the USEPA Health Advisory prior to 6.11.18. Concentrations of PFDA were not presented prior to April 19, 2019. MassDEP released drafted Method 1 groundwater risk standards for PFAS on April 19, 2019 that applies to the total sum and individual concentrations of six PFAS compounds (PFOS, PFOA, PFNA, PFHxS, PFHpA, and PFDA), which is 20 ng/L. These drafted groundwater standards were finalized and became effective on December 27, 2019.
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6. Concentrations presented in ng/L - nanograms per Liter - parts per trillion
7. Concentrations in bold exceed applicable Health Advisory Limit or Method 1 GW-1 Standard
8. PFOS - Perfluorooctanesulfonate
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12. PFHpA - Perfluoroheptanoic Acid
13. PFDA - Perfluorodecanoic Acid
14. NA - Concentration data not available
15. Monitoring well HS-1, HS-2, HS-2S, and HS-6 were destroyed or removed during soil removal activities in January 2017 as part of an Immediate Response Action Plan. The well was replaced with HSW-1/HS-1a as post-exacavation activities.
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17. NE - Not Established

Table 4B- Summary of Historic Groundwater PFAS Analytical Data
Former Barnstable Country Fire and Rescue Training Academy
155 S. Flint Rock Road, Barnstable, MA
RTN 4-26179

SAMPLE ID	USEPA ^{1,2} HEALTH ADVISORY	Method 1 GW-1 Standards ⁴	MW-28S	MW-30	MW-31	MW-32	MW-36D	MW-37	MW-37D	MW-99i			HW-2S
SCREEN DEPTH (FEET)													
WELL DIAMETER (INCHES)													
WELL STATUS			Viable	Viable	Viable	Not Viable	Viable	Viable	Viable	Not Viable			
SAMPLING DATE			4/1/2015	4/1/2015	8/18/2016	5/3/2017	4/6/2015	4/26/2017	4/2/2015	4/6/2015	4/26/2017	10/29/2019	5/3/2017
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
PFAS (Method 537.2)													
PFOA	70	20	2,100	1,400	3,200	240	140	77	60	730	240	630	15
PFNA	70	20	90	130	170	36	<20	77	90	70	18	50	8.2
PFHxS	NE	20	--	--	--	--	--	--	--	--	--	58	--
PFHpA	NE	20	--	--	--	--	--	--	--	--	--	340	--
PFDA	NE	20	--	--	--	--	--	--	--	--	--	46	--
TOTAL Σ 6 PFAS	70	20	2,190	1,530	3,370	276	140	154	150	800	258	1,130	23.2

Notes:

1. Prior to June 11, 2018, the USEPA established the EPA Health Advisory for two PFAS chemicals, PFOA and PFOS, which was 70 ng/L. Subsequently, MassDEP's Office of Research and Standards (ORS) expanded on this Health Advisory and created the ORS Guideline that applies to the total summed of five PFAS chemicals, PFOS, PFOA, PFNA, PFHxS, and PFHpA, effective June 11, 2018.

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13. PFDA - Perfluorodecanoic Acid

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16. Monitoring well HW-1D is a downgradient well located on the north side of Mary Dunn Pond.

17. NE - Not Established

APPENDIX D

LABORATORY REPORTS/CERTIFICATES OF ANALYSIS

Site Groundwater Monitoring

August 14, 2023

Laura Bouley
Barnstable County Regional Government of Cape Cod
3195 Main St, PO Box 427
Barnstable, MA 02630

Project Location: BARNSTABLE, MA
Client Job Number:
Project Number: 6206
Laboratory Work Order Number: 23G4062

Enclosed are results of analyses for samples as received by the laboratory on July 28, 2023. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kaitlyn A. Feliciano
Project Manager

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Barnstable County Regional Government of Cape Cod
3195 Main St, PO Box 427
Barnstable, MA 02630
ATTN: Laura Bouley

REPORT DATE: 8/14/2023

PURCHASE ORDER NUMBER: 23000936

PROJECT NUMBER: 6206

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 23G4062

The results of analyses performed on the following samples submitted to CON-TEST, a Pace Analytical Laboratory, are found in this report.

PROJECT LOCATION: BARNSTABLE, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
PC-16D	23G4062-01	Ground Water		SOP-454 PFAS	
MW-401S	23G4062-02	Ground Water		SOP-454 PFAS	
MW-401D	23G4062-03	Ground Water		SOP-454 PFAS	
MW-403S	23G4062-04	Ground Water		SOP-454 PFAS	
MW-403D	23G4062-05	Ground Water		SOP-454 PFAS	
MW-402S	23G4062-06	Ground Water		SOP-454 PFAS	
MW-402D	23G4062-07	Ground Water		SOP-454 PFAS	
PC-39	23G4062-08	Ground Water		SOP-454 PFAS	
PC-39D	23G4062-09	Ground Water		SOP-454 PFAS	
EB-7/25	23G4062-10	Ground Water		SOP-454 PFAS	
PFW-5	23G4062-11	Ground Water		SOP-454 PFAS	
OW-8A	23G4062-12	Ground Water		SOP-454 PFAS	
PFW-1	23G4062-13	Ground Water		SOP-454 PFAS	
PFW-2	23G4062-14	Ground Water		SOP-454 PFAS	
MW-12S	23G4062-15	Ground Water		SOP-454 PFAS	
MW-22	23G4062-16	Ground Water		SOP-454 PFAS	
PC-28	23G4062-17	Ground Water		SOP-454 PFAS	
PC-1	23G4062-18	Ground Water		SOP-454 PFAS	
PC-30	23G4062-19	Ground Water		SOP-454 PFAS	
PC-6A	23G4062-20	Ground Water		SOP-454 PFAS	
DUP - PFW-1	23G4062-21	Ground Water		SOP-454 PFAS	
EB-7.26.23	23G4062-22	Ground Water		SOP-454 PFAS	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SOP-454 PFAS

Qualifications:

B

Analyte is found in the associated laboratory blank as well as in the sample.

Analyte & Samples(s) Qualified:

6:2 Fluorotelomersulfonic acid (6:2FTS A)

B347867-BLK1, B347867-BS1

B-05

Data is not affected by elevated level in laboratory blank since sample(s) result is "Not Detected".

Analyte & Samples(s) Qualified:

6:2 Fluorotelomersulfonic acid (6:2FTS A)

23G4062-10[EB-7/25]

D-01

Sample extracted/prepared at a dilution due to sample matrix.

Analyte & Samples(s) Qualified:

23G4062-01RE2[PC-16D], 23G4062-06[MW-402S], 23G4062-19RE2[PC-30]

E

Reported result is estimated. Value reported over verified calibration range.

Analyte & Samples(s) Qualified:

6:2 Fluorotelomersulfonic acid (6:2FTS A)

B347705-MS1, B347705-MSD1

8:2 Fluorotelomersulfonic acid (8:2FTS A)

B347705-MS1, B347705-MSD1

Perfluoro-1-butanesulfonamide (FBSA)

B347705-MS1, B347705-MSD1

Perfluoro-1-hexanesulfonamide (FHxSA)

B347705-MS1, B347705-MSD1

Perfluorohexanoic acid (PFHxA)

B347705-MS1, B347705-MSD1

L-01

Laboratory fortified blank/laboratory control sample recovery outside of control limits. Data validation is not affected since all results are "not detected" for all samples in this batch for this compound and bias is on the high side.

Analyte & Samples(s) Qualified:

Perfluorononanesulfonic acid (PFNS)

B347867-BS1

Perfluorotetradecanoic acid (PFTA)

B347867-BS1

L-05

Laboratory fortified blank/laboratory control sample recovery is outside of control limits. Reported value for this compound is likely to be biased on the high side.

Analyte & Samples(s) Qualified:

6:2 Fluorotelomersulfonic acid (6:2FTS A)

B347867-BS1

Perfluorobutanesulfonic acid (PFBS)

B347867-BS1

Perfluorobutanoic acid (PFBA)

B347867-BS1

Perfluoroheptanoic acid (PFHpA)

B347867-BS1

Perfluorohexanesulfonic acid (PFHxS)

B347867-BS1

Perfluorononanoic acid (PFNA)

B347867-BS1

Perfluoropentanesulfonic acid (PFPeS)

B347867-BS1

MS-12

Matrix spike recovery and matrix spike duplicate recovery outside of control limits. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

Analyte & Samples(s) Qualified:**Perfluoro-4-oxapentanoic acid (PFMPA)**

23G4062-14[PFW-2], B347705-MS1, B347705-MSD1

Perfluorononanesulfonic acid (PFNS)

23G4062-14[PFW-2], B347705-MS1, B347705-MSD1

MS-19

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:**Perfluoro-1-butanefulfonamide (FBSA)**

B347705-MS1, B347705-MSD1

Perfluoro-1-hexanesulfonamide (FHxSA)

B347705-MS1, B347705-MSD1

Perfluorobutanoic acid (PFBA)

23G4062-14[PFW-2], B347705-MSD1

Perfluorodecanoic acid (PFDA)

23G4062-14[PFW-2], B347705-MS1

Perfluoroheptanesulfonic acid (PFHpS)

23G4062-14[PFW-2], B347705-MS1

Perfluoroheptanoic acid (PFHpA)

B347705-MSD1

Perfluorohexanesulfonic acid (PFHxS)

B347705-MS1, B347705-MSD1

Perfluorohexanoic acid (PFHxA)

B347705-MS1, B347705-MSD1

Perfluorononanoic acid (PFNA)

B347705-MSD1

Perfluorooctanesulfonic acid (PFOS)

B347705-MS1, B347705-MSD1

Perfluorooctanoic acid (PFOA)

B347705-MSD1

Perfluoropentanesulfonic acid (PFPeS)

23G4062-14[PFW-2], B347705-MSD1

Perfluoropentanoic acid (PFPeA)

B347705-MS1, B347705-MSD1

Perfluoroundecanoic acid (PFUnA)

23G4062-14[PFW-2], B347705-MSD1

MS-22

Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is within method specified criteria.

Analyte & Samples(s) Qualified:**4:2 Fluorotelomersulfonic acid (4:2FTS A)**

23G4062-14[PFW-2], B347705-MS1

Perfluorobutanesulfonic acid (PFBS)

23G4062-14[PFW-2], B347705-MSD1

Perfluorooctanesulfonamide (FOSA)

23G4062-14[PFW-2], B347705-MS1

PF-17

Extracted Internal Standard recovery is outside of control limits. Data is not significantly affected since associated analyte is not detected and bias is on the high side.

Analyte & Samples(s) Qualified:**M2-4:2FTS**

23G4062-04[MW-403S], 23G4062-12[OW-8A], 23G4062-15[MW-12S], 23G4062-20[PC-6A]

M2-6:2FTS

23G4062-05[MW-403D], 23G4062-12[OW-8A]

M2-8:2FTS

23G4062-07[MW-402D], 23G4062-09[PC-39D], 23G4062-10[EB-7/25], 23G4062-12[OW-8A], 23G4062-22RE1[EB-7.26.23]

PF-18

Duplicate analysis confirmed Extracted Internal Standard failure due to matrix effects.

Analyte & Samples(s) Qualified:**M2-4:2FTS**

23G4062-14[PFW-2], B347705-MS1, B347705-MSD1

M2-6:2FTS

23G4062-19RE2[PC-30], B347705-MS1, B347705-MSD1

M2-8:2FTS

23G4062-01RE2[PC-16D], 23G4062-19RE2[PC-30], B347705-MS1, B347705-MSD1

M2PFTA

23G4062-12[OW-8A]

M8FOSA

23G4062-12[OW-8A]

MPFBA

23G4062-14[PFW-2], 23G4062-19RE2[PC-30], B347705-MS1, B347705-MSD1

MPFDoA

23G4062-12[OW-8A]

PF-19

Sample re-analyzed at a dilution that was re-fortified with internal standard.

Analyte & Samples(s) Qualified:**6:2 Fluorotelomersulfonic acid (6:2FTS A)**

23G4062-04RE1[MW-403S], 23G4062-13RE1[PFW-1], 23G4062-14RE1[PFW-2], 23G4062-21RE1[DUP - PFW-1]

8:2 Fluorotelomersulfonic acid (8:2FTS A)

23G4062-13RE1[PFW-1], 23G4062-14RE1[PFW-2], 23G4062-21RE1[DUP - PFW-1]

Perfluoro-1-butanefulfonamide (FBSA)

23G4062-13RE1[PFW-1], 23G4062-14RE1[PFW-2], 23G4062-21RE1[DUP - PFW-1]

Perfluoro-1-hexanesulfonamide (FHxSA)

23G4062-11RE1[PFW-5], 23G4062-13RE1[PFW-1], 23G4062-14RE1[PFW-2], 23G4062-21RE1[DUP - PFW-1]

Perfluorobutanoic acid (PFBA)

23G4062-13RE1[PFW-1]

Perfluoroheptanesulfonic acid (PFHpS)

23G4062-13RE1[PFW-1], 23G4062-21RE1[DUP - PFW-1]

Perfluoroheptanoic acid (PFHpA)

23G4062-13RE1[PFW-1], 23G4062-14RE1[PFW-2], 23G4062-21RE1[DUP - PFW-1]

Perfluorohexanesulfonic acid (PFHxS)

23G4062-11RE1[PFW-5], 23G4062-13RE1[PFW-1], 23G4062-14RE1[PFW-2], 23G4062-15RE1[MW-12S], 23G4062-18RE1[PC-1], 23G4062-21RE1[DUP - PFW-1]

Perfluorohexanoic acid (PFHxA)

23G4062-13RE1[PFW-1], 23G4062-14RE1[PFW-2], 23G4062-15RE1[MW-12S], 23G4062-21RE1[DUP - PFW-1]

Perfluorononanoic acid (PFNA)

23G4062-13RE1[PFW-1], 23G4062-14RE1[PFW-2], 23G4062-21RE1[DUP - PFW-1]

Perfluorooctanesulfonamide (FOSA)

23G4062-15RE1[MW-12S]

Perfluorooctanesulfonic acid (PFOS)

23G4062-11RE1[PFW-5], 23G4062-13RE2[PFW-1], 23G4062-14RE1[PFW-2], 23G4062-15RE1[MW-12S], 23G4062-17RE1[PC-28], 23G4062-18RE1[PC-1], 23G4062-19RE3[PC-30], 23G4062-21RE2[DUP - PFW-1]

Perfluorooctanoic acid (PFOA)

23G4062-13RE1[PFW-1], 23G4062-14RE1[PFW-2], 23G4062-15RE1[MW-12S], 23G4062-21RE1[DUP - PFW-1]

Perfluoropentanesulfonic acid (PFPeS)

23G4062-13RE1[PFW-1], 23G4062-21RE1[DUP - PFW-1]

Perfluoropentanoic acid (PFPeA)

23G4062-13RE1[PFW-1], 23G4062-14RE1[PFW-2], 23G4062-15RE1[MW-12S], 23G4062-18RE1[PC-1], 23G4062-21RE1[DUP - PFW-1]

PF-20

Quantifying ion signal to noise ratio is <10. Detection is suspect.

Analyte & Samples(s) Qualified:**Perfluorobutanoic acid (PFBA)**

23G4062-15[MW-12S]

Perfluoropentanoic acid (PFPeA)

23G4062-15RE1[MW-12S]

PF-23

Qualifier ion ratio <50% of associated calibration. Detection is suspect.

Analyte & Samples(s) Qualified:**N-MeFOSAA (NMeFOSAA)**

23G4062-15[MW-12S]

Perfluorodecanesulfonic acid (PFDS)

23G4062-13[PFW-1], 23G4062-14[PFW-2], 23G4062-18[PC-1], 23G4062-20[PC-6A], 23G4062-21[DUP - PFW-1]

Perfluorononanesulfonic acid (PFNS)

23G4062-14[PFW-2]

R-05

Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound.

Analyte & Samples(s) Qualified:**Perfluorotridecanoic acid (PFTrDA)**

B348570-BSD1

S-29

Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:**D3-NMeFOSAA**

23G4062-08[PC-39]

D5-NEtFOSAA

23G4062-08[PC-39]

M2-6:2FTS

23G4062-15[MW-12S], 23G4062-18[PC-1], 23G4062-20[PC-6A]

M2-8:2FTS

23G4062-11[PFW-5], 23G4062-15[MW-12S], 23G4062-17[PC-28], 23G4062-18[PC-1], 23G4062-20[PC-6A], S091896-CCV3

M2PFTA

23G4062-08[PC-39], 23G4062-14[PFW-2]

M7PFUnA

23G4062-08[PC-39]

M8FOSA

23G4062-08[PC-39]

M8PFOS

23G4062-13[PFW-1], 23G4062-21[DUP - PFW-1]

M9PFNA

23G4062-21[DUP - PFW-1], B347705-MS1

MPFBA

23G4062-15[MW-12S], 23G4062-18[PC-1], 23G4062-20[PC-6A]

MPFDoA

23G4062-08[PC-39]

N-MeFOSAA (NMeFOSAA)

B347867-BS1

V-20

Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:**9Cl-PF3ONS (F53B Minor)**

S091896-CCV5

Perfluorononanesulfonic acid (PFNS)

S091896-CCV5

The results of analyses reported only relate to samples submitted to Con-Test, a Pace Analytical Laboratory, for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Lisa A. Worthington
Technical Representative

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Field Sample #: PC-16D

Sampled: 7/26/2023 11:00

Sample ID: 23G4062-01

Sample Matrix: Ground Water

Sample Flags: D-01

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	19	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluoropentanoic acid (PFPeA)	53	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluorohexanoic acid (PFHxA)	55	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluorodecanoic acid (PFDA)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	19	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluorohexanesulfonic acid (PFHxS)	88	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	32	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluoroundecanoic acid (PFUnA)	13	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Nonfluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluoroheptanoic acid (PFHpA)	28	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluorooctanoic acid (PFOA)	20	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluorooctanesulfonic acid (PFOS)	410	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW
Perfluorononanoic acid (PFNA)	25	10	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 11:23	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Field Sample #: MW-401S

Sampled: 7/26/2023 14:30

Sample ID: 23G4062-02

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:39	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Sampled: 7/26/2023 13:30

Field Sample #: MW-401D

Sample ID: 23G4062-03

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	4.3	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluoropentanoic acid (PFPeA)	6.5	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluorohexanoic acid (PFHxA)	6.6	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluorohexanesulfonic acid (PFHxS)	22	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluoroheptanoic acid (PFHpA)	4.4	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluorooctanoic acid (PFOA)	7.1	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluorooctanesulfonic acid (PFOS)	9.1	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW
Perfluorononanoic acid (PFNA)	3.3	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:47	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Sampled: 7/26/2023 12:00

Field Sample #: MW-403S

Sample ID: 23G4062-04

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	55	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluoropentanoic acid (PFPeA)	140	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluorohexanoic acid (PFHxA)	85	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluorohexanesulfonic acid (PFHxS)	14	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	190	37	ng/L	20	PF-19	SOP-454 PFAS	8/3/23	8/9/23 13:50	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluoroheptanoic acid (PFHpA)	57	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluorooctanoic acid (PFOA)	49	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluorooctanesulfonic acid (PFOS)	9.4	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW
Perfluorononanoic acid (PFNA)	12	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 18:54	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Sampled: 7/26/2023 10:55

Field Sample #: MW-403D

Sample ID: 23G4062-05

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	7.0	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluorobutanesulfonic acid (PFBS)	3.0	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluoropentanoic acid (PFPeA)	5.6	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluorohexanoic acid (PFHxA)	8.5	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluorohexanesulfonic acid (PFHxS)	13	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluoroheptanoic acid (PFHpA)	3.9	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluorooctanoic acid (PFOA)	8.6	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluorooctanesulfonic acid (PFOS)	20	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW
Perfluorononanoic acid (PFNA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:01	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Field Sample #: MW-402S

Sampled: 7/26/2023 15:00

Sample ID: 23G4062-06

Sample Matrix: Ground Water

Sample Flags: D-01

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluoropentanoic acid (PFPeA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluorohexanoic acid (PFHxA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
11Cl-PF3OUdS (F53B Major)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
9Cl-PF3ONS (F53B Minor)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluorodecanoic acid (PFDA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluorododecanoic acid (PFDoA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
N-EtFOSAA (NEtFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
N-MeFOSAA (NMeFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluorotetradecanoic acid (PFTA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluorotridecanoic acid (PFTrDA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluorooctanesulfonamide (FOSA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluorononanesulfonic acid (PFNS)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluoroundecanoic acid (PFUnA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluoroheptanoic acid (PFHpA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluorooctanoic acid (PFOA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW
Perfluorononanoic acid (PFNA)	ND	4.1	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:08	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Field Sample #: MW-402D

Sampled: 7/26/2023 13:30

Sample ID: 23G4062-07

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluorohexanesulfonic acid (PFHxS)	3.9	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluorooctanoic acid (PFOA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW
Perfluorononanoic acid (PFNA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:16	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Sampled: 7/26/2023 11:45

Field Sample #: PC-39

Sample ID: 23G4062-08

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	2.2	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluoropentanoic acid (PFPeA)	4.4	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluorohexanoic acid (PFHxA)	3.2	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluoro-1-butanedisulfonamide (FBSA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluorohexanesulfonic acid (PFHxS)	5.7	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	6.3	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluoroundecanoic acid (PFUnA)	4.6	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluoroheptanoic acid (PFHpA)	2.4	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluorooctanoic acid (PFOA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluorooctanesulfonic acid (PFOS)	54	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW
Perfluorononanoic acid (PFNA)	2.4	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:23	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Field Sample #: PC-39D

Sampled: 7/26/2023 11:00

Sample ID: 23G4062-09

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluoropentanoic acid (PFPeA)	2.4	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluorohexanoic acid (PFHxA)	2.9	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluorohexanesulfonic acid (PFHxS)	6.5	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	3.2	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluoroheptanoic acid (PFHpA)	2.1	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluorooctanoic acid (PFOA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluorooctanesulfonic acid (PFOS)	29	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW
Perfluorononanoic acid (PFNA)	2.8	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:30	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Field Sample #: EB-7/25

Sampled: 7/25/2023 14:00

Sample ID: 23G4062-10

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.9	ng/L	1	B-05	SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluorooctanoic acid (PFOA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW
Perfluorononanoic acid (PFNA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/4/23	8/7/23 12:00	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Field Sample #: PFW-5

Sampled: 7/25/2023 10:15

Sample ID: 23G4062-11

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	18	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluorobutanesulfonic acid (PFBS)	38	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluoropentanoic acid (PFPeA)	47	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluorohexanoic acid (PFHxA)	130	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	62	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluorodecanoic acid (PFDA)	7.7	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluoroheptanesulfonic acid (PFHpS)	110	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluorodecanesulfonic acid (PFDS)	2.9	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluorooctanesulfonamide (FOSA)	62	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluorononanesulfonic acid (PFNS)	8.2	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	350	91	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 13:58	QNW
Perfluoro-1-butanefulfonamide (FBFA)	47	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluorohexanesulfonic acid (PFHxS)	860	91	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 13:58	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	3.1	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluoropentanesulfonic acid (PFPeS)	76	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluoroundecanoic acid (PFUnA)	18	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluoroheptanoic acid (PFHpA)	34	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluorooctanoic acid (PFOA)	99	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW
Perfluorooctanesulfonic acid (PFOS)	2200	91	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 13:58	QNW
Perfluorononanoic acid (PFNA)	24	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 19:38	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Field Sample #: OW-8A

Sampled: 7/25/2023 11:20

Sample ID: 23G4062-12

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	45	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluorobutanesulfonic acid (PFBS)	3.4	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluoropentanoic acid (PFPeA)	22	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluorohexanoic acid (PFHxA)	20	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	1.9	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluorodecanoic acid (PFDA)	2.1	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluorooctanesulfonamide (FOSA)	30	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	10	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluoro-1-butanefulfonamide (FBFA)	3.3	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluorohexanesulfonic acid (PFHxS)	42	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluoropentanesulfonic acid (PFPeS)	3.0	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluoroundecanoic acid (PFUnA)	15	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluoroheptanoic acid (PFHpA)	9.9	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluorooctanoic acid (PFOA)	11	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluorooctanesulfonic acid (PFOS)	130	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW
Perfluorononanoic acid (PFNA)	2.5	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:00	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Field Sample #: PFW-1

Sampled: 7/25/2023 12:20

Sample ID: 23G4062-13

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	150	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:05	QNW
Perfluorobutanesulfonic acid (PFBS)	81	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
Perfluoropentanoic acid (PFPeA)	620	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:05	QNW
Perfluorohexanoic acid (PFHxA)	870	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:05	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	2200	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:05	QNW
Perfluorodecanoic acid (PFDA)	92	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
Perfluoroheptanesulfonic acid (PFHpS)	290	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:05	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	5.1	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
Perfluorodecanesulfonic acid (PFDS)	19	1.8	ng/L	1	PF-23	SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
Perfluorooctanesulfonamide (FOSA)	17	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
Perfluorononanesulfonic acid (PFNS)	170	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	2500	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:05	QNW
Perfluoro-1-butanefulfonamide (FBFA)	310	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:05	QNW
Perfluorohexanesulfonic acid (PFHxS)	2500	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:05	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	4700	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:05	QNW
Perfluoropentanesulfonic acid (PFPeS)	110	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:05	QNW
Perfluoroundecanoic acid (PFUnA)	160	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:07	QNW
Perfluoroheptanoic acid (PFHpA)	390	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:05	QNW
Perfluorooctanoic acid (PFOA)	730	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:05	QNW
Perfluorooctanesulfonic acid (PFOS)	15000	180	ng/L	100	PF-19	SOP-454 PFAS	8/3/23	8/9/23 17:04	QNW
Perfluorononanoic acid (PFNA)	290	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:05	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Field Sample #: PFW-2

Sampled: 7/25/2023 13:40

Sample ID: 23G4062-14

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	170	1.8	ng/L	1	MS-19	SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
Perfluorobutanesulfonic acid (PFBS)	53	1.8	ng/L	1	MS-22	SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
Perfluoropentanoic acid (PFPeA)	460	92	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:12	QNW
Perfluorohexanoic acid (PFHxA)	410	92	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:12	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	780	92	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:12	QNW
Perfluorodecanoic acid (PFDA)	42	1.8	ng/L	1	MS-19	SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
Perfluorododecanoic acid (PFDoA)	8.1	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
Perfluoroheptanesulfonic acid (PFHpS)	38	1.8	ng/L	1	MS-19	SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
Perfluorotridecanoic acid (PFTTrDA)	4.3	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	15	1.8	ng/L	1	MS-22	SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
Perfluorodecanesulfonic acid (PFDS)	19	1.8	ng/L	1	PF-23	SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
Perfluorooctanesulfonamide (FOSA)	11	1.8	ng/L	1	MS-22	SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
Perfluorononanesulfonic acid (PFNS)	15	1.8	ng/L	1	MS-12, PF-23	SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	770	92	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:12	QNW
Perfluoro-1-butanefulfonamide (FBFA)	160	92	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:12	QNW
Perfluorohexanesulfonic acid (PFHxS)	640	92	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:12	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1	MS-12	SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	1300	92	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:12	QNW
Perfluoropentanesulfonic acid (PFPeS)	74	1.8	ng/L	1	MS-19	SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
Perfluoroundecanoic acid (PFUnA)	120	1.8	ng/L	1	MS-19	SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:14	QNW
Perfluoroheptanoic acid (PFHpA)	150	92	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:12	QNW
Perfluorooctanoic acid (PFOA)	240	92	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:12	QNW
Perfluorooctanesulfonic acid (PFOS)	3300	92	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:12	QNW
Perfluorononanoic acid (PFNA)	160	92	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:12	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Field Sample #: MW-12S

Sampled: 7/25/2023 11:35

Sample ID: 23G4062-15

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	67	1.8	ng/L	1	PF-20	SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Perfluorobutanesulfonic acid (PFBS)	61	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Perfluoropentanoic acid (PFPeA)	230	89	ng/L	50	PF-19, PF-20	SOP-454 PFAS	8/3/23	8/9/23 14:19	QNW
Perfluorohexanoic acid (PFHxA)	210	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:19	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	8.1	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Perfluorodecanoic acid (PFDA)	5.8	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Perfluoroheptanesulfonic acid (PFHpS)	27	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
N-MeFOSAA (NMeFOSAA)	4.0	1.8	ng/L	1	PF-23	SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Perfluorodecanesulfonic acid (PFDS)	2.0	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Perfluorooctanesulfonamide (FOSA)	320	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:19	QNW
Perfluorononanesulfonic acid (PFNS)	5.6	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	110	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Perfluoro-1-butanefulfonamide (FBFA)	21	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Perfluorohexanesulfonic acid (PFHxS)	800	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:19	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	33	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Perfluoropentanesulfonic acid (PFPeS)	58	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Perfluoroundecanoic acid (PFUnA)	15	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Perfluoroheptanoic acid (PFHpA)	120	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW
Perfluorooctanoic acid (PFOA)	190	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:19	QNW
Perfluorooctanesulfonic acid (PFOS)	1100	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:19	QNW
Perfluorononanoic acid (PFNA)	27	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:22	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Sampled: 7/25/2023 13:05

Field Sample #: MW-22

Sample ID: 23G4062-16

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluoropentanoic acid (PFPeA)	3.0	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluorohexanoic acid (PFHxA)	3.7	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluoroheptanesulfonic acid (PFHpS)	2.1	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluorooctanesulfonamide (FOSA)	2.8	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluorohexanesulfonic acid (PFHxS)	67	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluoropentanesulfonic acid (PFPeS)	2.6	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluoroheptanoic acid (PFHpA)	2.1	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluorooctanoic acid (PFOA)	15	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluorooctanesulfonic acid (PFOS)	130	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW
Perfluorononanoic acid (PFNA)	1.8	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:29	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Field Sample #: PC-28

Sampled: 7/25/2023 14:40

Sample ID: 23G4062-17

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	10	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluorobutanesulfonic acid (PFBS)	3.3	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluoropentanoic acid (PFPeA)	24	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluorohexanoic acid (PFHxA)	22	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	3.3	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluorodecanoic acid (PFDA)	4.8	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluoroheptanesulfonic acid (PFHpS)	3.1	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluorodecanesulfonic acid (PFDS)	2.7	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluorooctanesulfonamide (FOSA)	3.6	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluorononanesulfonic acid (PFNS)	2.7	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	3.8	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluoro-1-butanesulfonamide (FBSA)	2.3	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluorohexanesulfonic acid (PFHxS)	55	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	15	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluoropentanesulfonic acid (PFPeS)	5.1	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluoroundecanoic acid (PFUnA)	43	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluoroheptanoic acid (PFHpA)	26	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluorooctanoic acid (PFOA)	11	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW
Perfluorooctanesulfonic acid (PFOS)	190	36	ng/L	20	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:27	QNW
Perfluorononanoic acid (PFNA)	17	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:36	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Field Sample #: PC-1

Sampled: 7/25/2023 10:30

Sample ID: 23G4062-18

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	76	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluorobutanesulfonic acid (PFBS)	8.6	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluoropentanoic acid (PFPeA)	160	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:34	QNW
Perfluorohexanoic acid (PFHxA)	140	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	140	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluorodecanoic acid (PFDA)	7.5	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluoroheptanesulfonic acid (PFHpS)	5.7	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluorodecanesulfonic acid (PFDS)	4.1	1.8	ng/L	1	PF-23	SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluorooctanesulfonamide (FOSA)	7.4	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluorononanesulfonic acid (PFNS)	3.8	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	80	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluoro-1-butanefulfonamide (FBFA)	14	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluorohexanesulfonic acid (PFHxS)	140	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:34	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	97	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluoropentanesulfonic acid (PFPeS)	16	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluoroundecanoic acid (PFUnA)	63	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluoroheptanoic acid (PFHpA)	130	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluorooctanoic acid (PFOA)	81	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW
Perfluorooctanesulfonic acid (PFOS)	440	89	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 14:34	QNW
Perfluorononanoic acid (PFNA)	30	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:44	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Field Sample #: PC-30

Sampled: 7/25/2023 13:00

Sample ID: 23G4062-19

Sample Matrix: Ground Water

Sample Flags: D-01

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	26	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluorobutanesulfonic acid (PFBS)	8.6	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluoropentanoic acid (PFPeA)	53	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluorohexanoic acid (PFHxA)	60	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
11Cl-PF3OUdS (F53B Major)	ND	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
9Cl-PF3ONS (F53B Minor)	ND	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	8.8	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluorodecanoic acid (PFDA)	6.9	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluorododecanoic acid (PFDoA)	ND	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluoroheptanesulfonic acid (PFHpS)	6.6	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
N-EtFOSAA (NEtFOSAA)	ND	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
N-MeFOSAA (NMeFOSAA)	ND	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluorotetradecanoic acid (PFTA)	ND	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluorooctanesulfonamide (FOSA)	ND	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluorononanesulfonic acid (PFNS)	ND	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	9.8	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluoro-1-butanefulfonamide (FBFA)	9.7	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluorohexanesulfonic acid (PFHxS)	80	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	48	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluoropentanesulfonic acid (PFPeS)	9.0	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluoroundecanoic acid (PFUnA)	25	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluoroheptanoic acid (PFHpA)	41	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluorooctanoic acid (PFOA)	26	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW
Perfluorooctanesulfonic acid (PFOS)	390	84	ng/L	20	PF-19	SOP-454 PFAS	8/10/23	8/11/23 15:14	QNW
Perfluorononanoic acid (PFNA)	45	4.2	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:01	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Field Sample #: PC-6A

Sampled: 7/26/2023 12:10

Sample ID: 23G4062-20

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	11	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluorobutanesulfonic acid (PFBS)	3.3	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluoropentanoic acid (PFPeA)	28	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluorohexanoic acid (PFHxA)	30	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	5.6	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluorodecanoic acid (PFDA)	8.1	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluoroheptanesulfonic acid (PFHpS)	4.0	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluorodecanesulfonic acid (PFDS)	4.2	1.8	ng/L	1	PF-23	SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluorooctanesulfonamide (FOSA)	2.7	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluorononanesulfonic acid (PFNS)	4.0	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	11	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluoro-1-butanefulfonamide (FBFA)	3.1	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluorohexanesulfonic acid (PFHxS)	53	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	6.4	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluoropentanesulfonic acid (PFPeS)	4.4	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluoroundecanoic acid (PFUnA)	82	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluoroheptanoic acid (PFHpA)	26	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluorooctanoic acid (PFOA)	19	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW
Perfluorooctanesulfonic acid (PFOS)	440	36	ng/L	20		SOP-454 PFAS	8/3/23	8/9/23 14:49	QNW
Perfluorononanoic acid (PFNA)	29	1.8	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 20:58	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Field Sample #: DUP - PFW-1

Sampled: 7/25/2023 12:20

Sample ID: 23G4062-21

Sample Matrix: Ground Water

Semivolatle Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	180	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
Perfluorobutanesulfonic acid (PFBS)	81	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
Perfluoropentanoic acid (PFPeA)	650	96	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 15:11	QNW
Perfluorohexanoic acid (PFHxA)	940	96	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 15:11	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	2300	96	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 15:11	QNW
Perfluorodecanoic acid (PFDA)	89	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
Perfluoroheptanesulfonic acid (PFHpS)	270	96	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 15:11	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	5.2	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
Perfluorodecanesulfonic acid (PFDS)	21	1.9	ng/L	1	PF-23	SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
Perfluorooctanesulfonamide (FOSA)	17	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
Perfluorononanesulfonic acid (PFNS)	180	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	2700	96	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 15:11	QNW
Perfluoro-1-butanefulfonamide (FBFA)	340	96	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 15:11	QNW
Perfluorohexanesulfonic acid (PFHxS)	2700	96	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 15:11	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	4700	96	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 15:11	QNW
Perfluoropentanesulfonic acid (PFPeS)	140	96	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 15:11	QNW
Perfluoroundecanoic acid (PFUnA)	170	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/3/23	8/7/23 21:05	QNW
Perfluoroheptanoic acid (PFHpA)	420	96	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 15:11	QNW
Perfluorooctanoic acid (PFOA)	800	96	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 15:11	QNW
Perfluorooctanesulfonic acid (PFOS)	17000	190	ng/L	100	PF-19	SOP-454 PFAS	8/3/23	8/9/23 17:12	QNW
Perfluorononanoic acid (PFNA)	310	96	ng/L	50	PF-19	SOP-454 PFAS	8/3/23	8/9/23 15:11	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: BARNSTABLE, MA

Sample Description:

Work Order: 23G4062

Date Received: 7/28/2023

Sampled: 7/26/2023 13:00

Field Sample #: EB-7.26.23

Sample ID: 23G4062-22

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Nonfluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluorooctanoic acid (PFOA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW
Perfluorononanoic acid (PFNA)	ND	1.9	ng/L	1		SOP-454 PFAS	8/10/23	8/11/23 12:09	QNW

Sample Extraction Data**Prep Method:**SOP 454-PFAAS **Analytical Method:**SOP-454 PFAS

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23G4062-02 [MW-401S]	B347705	273	1.00	08/03/23
23G4062-03 [MW-401D]	B347705	270	1.00	08/03/23
23G4062-04 [MW-403S]	B347705	271	1.00	08/03/23
23G4062-04RE1 [MW-403S]	B347705	271	1.00	08/03/23
23G4062-05 [MW-403D]	B347705	263	1.00	08/03/23
23G4062-06 [MW-402S]	B347705	122	1.00	08/03/23
23G4062-07 [MW-402D]	B347705	262	1.00	08/03/23
23G4062-08 [PC-39]	B347705	269	1.00	08/03/23
23G4062-09 [PC-39D]	B347705	263	1.00	08/03/23
23G4062-11 [PFW-5]	B347705	275	1.00	08/03/23
23G4062-11RE1 [PFW-5]	B347705	275	1.00	08/03/23
23G4062-12 [OW-8A]	B347705	273	1.00	08/03/23
23G4062-13 [PFW-1]	B347705	282	1.00	08/03/23
23G4062-13RE1 [PFW-1]	B347705	282	1.00	08/03/23
23G4062-13RE2 [PFW-1]	B347705	282	1.00	08/03/23
23G4062-14 [PFW-2]	B347705	272	1.00	08/03/23
23G4062-14RE1 [PFW-2]	B347705	272	1.00	08/03/23
23G4062-15 [MW-12S]	B347705	281	1.00	08/03/23
23G4062-15RE1 [MW-12S]	B347705	281	1.00	08/03/23
23G4062-16 [MW-22]	B347705	272	1.00	08/03/23
23G4062-17 [PC-28]	B347705	277	1.00	08/03/23
23G4062-17RE1 [PC-28]	B347705	277	1.00	08/03/23
23G4062-18 [PC-1]	B347705	282	1.00	08/03/23
23G4062-18RE1 [PC-1]	B347705	282	1.00	08/03/23
23G4062-20 [PC-6A]	B347705	277	1.00	08/03/23
23G4062-20RE1 [PC-6A]	B347705	277	1.00	08/03/23
23G4062-21 [DUP - PFW-1]	B347705	261	1.00	08/03/23
23G4062-21RE1 [DUP - PFW-1]	B347705	261	1.00	08/03/23
23G4062-21RE2 [DUP - PFW-1]	B347705	261	1.00	08/03/23

Prep Method:SOP 454-PFAAS **Analytical Method:**SOP-454 PFAS

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23G4062-10 [EB-7/25]	B347867	268	1.00	08/04/23

Prep Method:SOP 454-PFAAS **Analytical Method:**SOP-454 PFAS

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23G4062-01RE2 [PC-16D]	B348570	48.7	1.00	08/10/23
23G4062-19RE2 [PC-30]	B348570	119	1.00	08/10/23
23G4062-19RE3 [PC-30]	B348570	119	1.00	08/10/23
23G4062-22RE1 [EB-7.26.23]	B348570	257	1.00	08/10/23

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B347705 - SOP 454-PFAAS
Blank (B347705-BLK1)

Prepared: 08/03/23 Analyzed: 08/07/23

Perfluorobutanoic acid (PFBA)	ND	1.9	ng/L
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L
Perfluoropentanoic acid (PFPeA)	ND	1.9	ng/L
Perfluorohexanoic acid (PFHxA)	ND	1.9	ng/L
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.9	ng/L
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L
Perfluorotridecanoic acid (PFTrDA)	ND	1.9	ng/L
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L
Perfluoro-1-butanesulfonamide (FBSA)	ND	1.9	ng/L
Perfluorohexanesulfonic acid (PFHxS)	ND	1.9	ng/L
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.9	ng/L
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L
Perfluoroheptanoic acid (PFHpA)	ND	1.9	ng/L
Perfluorooctanoic acid (PFOA)	ND	1.9	ng/L
Perfluorooctanesulfonic acid (PFOS)	ND	1.9	ng/L
Perfluorononanoic acid (PFNA)	ND	1.9	ng/L

LCS (B347705-BS1)

Prepared: 08/03/23 Analyzed: 08/07/23

Perfluorobutanoic acid (PFBA)	11.1	2.0	ng/L	9.82	114	73-129
Perfluorobutanesulfonic acid (PFBS)	9.65	2.0	ng/L	8.69	111	72-130
Perfluoropentanoic acid (PFPeA)	10.6	2.0	ng/L	9.82	108	72-129
Perfluorohexanoic acid (PFHxA)	10.9	2.0	ng/L	9.82	111	72-129
11Cl-PF3OUdS (F53B Major)	7.94	2.0	ng/L	9.25	85.9	55.1-141
9Cl-PF3ONS (F53B Minor)	8.13	2.0	ng/L	9.15	88.8	59.6-146
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.91	2.0	ng/L	9.25	96.3	60.3-131
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.79	2.0	ng/L	9.82	89.5	37.6-167
8:2 Fluorotelomersulfonic acid (8:2FTS A)	10.3	2.0	ng/L	9.43	110	67-138
Perfluorodecanoic acid (PFDA)	10.6	2.0	ng/L	9.82	108	71-129
Perfluorododecanoic acid (PFDoA)	11.9	2.0	ng/L	9.82	121	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	8.40	2.0	ng/L	8.74	96.1	49.4-154

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B347705 - SOP 454-PFAAS
LCS (B347705-BS1)

Prepared: 08/03/23 Analyzed: 08/07/23

Perfluoroheptanesulfonic acid (PFHpS)	11.7	2.0	ng/L	9.38		125	69-134			
N-EtFOSAA (NEtFOSAA)	10.4	2.0	ng/L	9.82		106	61-135			
N-MeFOSAA (NMeFOSAA)	11.6	2.0	ng/L	9.82		118	65-136			
Perfluorotetradecanoic acid (PFTA)	11.1	2.0	ng/L	9.82		113	71-132			
Perfluorotridecanoic acid (PFTTrDA)	10.8	2.0	ng/L	9.82		110	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.4	2.0	ng/L	9.18		114	63-143			
Perfluorodecanesulfonic acid (PFDS)	9.72	2.0	ng/L	9.48		103	53-142			
Perfluorooctanesulfonamide (FOSA)	11.3	2.0	ng/L	9.82		115	67-137			
Perfluorononanesulfonic acid (PFNS)	11.4	2.0	ng/L	9.43		121	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	8.66	2.0	ng/L	9.82		88.2	61.7-156			
Perfluoro-1-butanefulfonamide (FBSA)	10.2	2.0	ng/L	9.82		104	61.3-145			
Perfluorohexanesulfonic acid (PFHxS)	9.79	2.0	ng/L	8.99		109	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	10.5	2.0	ng/L	9.82		106	59.8-147			
Perfluoro-5-oxahexanoic acid (PFMBA)	9.86	2.0	ng/L	9.82		100	59.5-146			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	9.87	2.0	ng/L	9.33		106	64-140			
Perfluoropentanesulfonic acid (PFPeS)	10.6	2.0	ng/L	9.23		115	71-127			
Perfluoroundecanoic acid (PFUnA)	11.0	2.0	ng/L	9.82		112	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	8.88	2.0	ng/L	9.82		90.4	58.5-143			
Perfluoroheptanoic acid (PFHpA)	11.1	2.0	ng/L	9.82		113	72-130			
Perfluorooctanoic acid (PFOA)	11.1	2.0	ng/L	9.82		113	71-133			
Perfluorooctanesulfonic acid (PFOS)	10.4	2.0	ng/L	9.08		114	65-140			
Perfluorononanoic acid (PFNA)	10.8	2.0	ng/L	9.82		110	69-130			

Matrix Spike (B347705-MS1)
Source: 23G4062-14

Prepared: 08/03/23 Analyzed: 08/07/23

Perfluorobutanoic acid (PFBA)	172	1.8	ng/L	8.96	165	80.0	73-129			
Perfluorobutanesulfonic acid (PFBS)	61.5	1.8	ng/L	7.93	52.5	113	72-130			
Perfluoropentanoic acid (PFPeA)	465	1.8	ng/L	8.96	472	-82.4 *	72-129			MS-19
Perfluorohexanoic acid (PFHxA)	427	1.8	ng/L	8.96	429	-26.0 *	72-129			E, MS-19
11Cl-PF3OUdS (F53B Major)	9.94	1.8	ng/L	8.44	ND	118	58.3-140			
9Cl-PF3ONS (F53B Minor)	10.2	1.8	ng/L	8.35	ND	122	61.4-144			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.51	1.8	ng/L	8.44	ND	101	62.4-128			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	7.70	1.8	ng/L	8.96	ND	86.0	36.7-171			
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	8.60	ND	*	67-138			E
Perfluorodecanoic acid (PFDA)	47.7	1.8	ng/L	8.96	42.3	61.1 *	71-129			MS-19
Perfluorododecanoic acid (PFDoA)	19.7	1.8	ng/L	8.96	8.10	130	72-134			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	8.23	1.8	ng/L	7.97	ND	103	54.3-149			
Perfluoroheptanesulfonic acid (PFHpS)	55.5	1.8	ng/L	8.55	37.5	210 *	69-134			MS-19
N-EtFOSAA (NEtFOSAA)	11.6	1.8	ng/L	8.96	ND	130	61-135			
N-MeFOSAA (NMeFOSAA)	12.2	1.8	ng/L	8.96	ND	136	65-136			
Perfluorotetradecanoic acid (PFTA)	11.9	1.8	ng/L	8.96	ND	132	71-132			
Perfluorotridecanoic acid (PFTTrDA)	15.5	1.8	ng/L	8.96	4.35	125	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	27.2	1.8	ng/L	8.37	14.9	147 *	63-143			MS-22
Perfluorodecanesulfonic acid (PFDS)	26.7	1.8	ng/L	8.64	19.0	88.7	53-142			
Perfluorooctanesulfonamide (FOSA)	23.3	1.8	ng/L	8.96	10.9	138 *	67-137			MS-22
Perfluorononanesulfonic acid (PFNS)	27.0	1.8	ng/L	8.60	14.6	145 *	69-127			MS-12
Perfluoro-1-hexanesulfonamide (FHxSA)	771	1.8	ng/L	8.96	725	516 *	64.2-154			E, MS-19
Perfluoro-1-butanefulfonamide (FBSA)	207	1.8	ng/L	8.96	192	162 *	65.9-140			E, MS-19
Perfluorohexanesulfonic acid (PFHxS)	577	1.8	ng/L	8.20	553	295 *	68-131			MS-19

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B347705 - SOP 454-PFAAS

Matrix Spike (B347705-MS1)		Source: 23G4062-14		Prepared: 08/03/23 Analyzed: 08/07/23						
Perfluoro-4-oxapentanoic acid (PFMPA)	14.4	1.8	ng/L	8.96	ND	161	* 61.9-143			MS-12
Perfluoro-5-oxahexanoic acid (PFMBA)	10.8	1.8	ng/L	8.96	ND	120	61.4-142			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	8.51	ND	*	64-140			E
Perfluoropentanesulfonic acid (PFPeS)	80.6	1.8	ng/L	8.42	73.7	82.2	71-127			
Perfluoroundecanoic acid (PFUnA)	128	1.8	ng/L	8.96	118	112	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	8.99	1.8	ng/L	8.96	ND	100	62-138			
Perfluoroheptanoic acid (PFHpA)	200	1.8	ng/L	8.96	192	91.3	72-130			
Perfluorooctanoic acid (PFOA)	293	1.8	ng/L	8.96	283	116	71-133			
Perfluorooctanesulfonic acid (PFOS)	1470	1.8	ng/L	8.29	1440	445	* 65-140			MS-19
Perfluorononanoic acid (PFNA)	198	1.8	ng/L	8.96	192	72.2	69-130			

Matrix Spike Dup (B347705-MSD1)		Source: 23G4062-14		Prepared: 08/03/23 Analyzed: 08/07/23						
Perfluorobutanoic acid (PFBA)	160	1.9	ng/L	9.27	165	-55.7	* 73-129	7.43	30	MS-19
Perfluorobutanesulfonic acid (PFBS)	55.9	1.9	ng/L	8.21	52.5	41.4	* 72-130	9.47	30	MS-22
Perfluoropentanoic acid (PFPeA)	435	1.9	ng/L	9.27	472	-405	* 72-129	6.72	30	MS-19
Perfluorohexanoic acid (PFHxA)	396	1.9	ng/L	9.27	429	-356	* 72-129	7.46	30	E, MS-19
11Cl-PF3OUdS (F53B Major)	9.86	1.9	ng/L	8.73	ND	113	58.3-140	0.848	30	
9Cl-PF3ONS (F53B Minor)	9.18	1.9	ng/L	8.64	ND	106	61.4-144	10.2	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	7.78	1.9	ng/L	8.73	ND	89.1	62.4-128	8.95	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	9.85	1.9	ng/L	9.27	ND	106	36.7-171	24.5	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L	8.90	ND	*	67-138	NC	30	E
Perfluorodecanoic acid (PFDA)	50.1	1.9	ng/L	9.27	42.3	83.9	71-129	4.73	30	
Perfluorododecanoic acid (PFDoA)	19.4	1.9	ng/L	9.27	8.10	122	72-134	1.85	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	7.82	1.9	ng/L	8.25	ND	94.8	54.3-149	5.12	30	
Perfluoroheptanesulfonic acid (PFHpS)	48.8	1.9	ng/L	8.86	37.5	128	69-134	12.8	30	
N-EtFOSAA (NEtFOSAA)	10.8	1.9	ng/L	9.27	ND	117	61-135	7.33	30	
N-MeFOSAA (NMeFOSAA)	12.1	1.9	ng/L	9.27	ND	130	65-136	1.06	30	
Perfluorotetradecanoic acid (PFTA)	10.8	1.9	ng/L	9.27	ND	116	71-132	9.72	30	
Perfluorotridecanoic acid (PFTrDA)	14.9	1.9	ng/L	9.27	4.35	114	65-144	4.18	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	24.8	1.9	ng/L	8.67	14.9	114	63-143	9.38	30	
Perfluorodecanesulfonic acid (PFDS)	24.8	1.9	ng/L	8.95	19.0	65.3	53-142	7.10	30	
Perfluorooctanesulfonamide (FOSA)	21.0	1.9	ng/L	9.27	10.9	109	67-137	10.3	30	
Perfluorononanesulfonic acid (PFNS)	28.0	1.9	ng/L	8.90	14.6	151	* 69-127	3.46	30	MS-12
Perfluoro-1-hexanesulfonamide (FHxSA)	638	1.9	ng/L	9.27	725	-940	* 64.2-154	18.9	30	E, MS-19
Perfluoro-1-butanesulfonamide (FBSA)	188	1.9	ng/L	9.27	192	-46.6	* 65.9-140	9.56	30	E, MS-19
Perfluorohexanesulfonic acid (PFHxS)	527	1.9	ng/L	8.48	553	-314	* 68-131	9.21	30	MS-19
Perfluoro-4-oxapentanoic acid (PFMPA)	14.1	1.9	ng/L	9.27	ND	152	* 61.9-143	2.30	30	MS-12
Perfluoro-5-oxahexanoic acid (PFMBA)	9.88	1.9	ng/L	9.27	ND	107	61.4-142	8.79	30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.9	ng/L	8.81	ND	*	64-140	NC	30	E
Perfluoropentanesulfonic acid (PFPeS)	78.3	1.9	ng/L	8.72	73.7	52.4	* 71-127	2.97	30	MS-19
Perfluoroundecanoic acid (PFUnA)	117	1.9	ng/L	9.27	118	-16.2	* 69-133	9.41	30	MS-19
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	8.47	1.9	ng/L	9.27	ND	91.3	62-138	5.99	30	
Perfluoroheptanoic acid (PFHpA)	179	1.9	ng/L	9.27	192	-143	* 72-130	11.3	30	MS-19
Perfluorooctanoic acid (PFOA)	262	1.9	ng/L	9.27	283	-222	* 71-133	11.1	30	MS-19
Perfluorooctanesulfonic acid (PFOS)	1420	1.9	ng/L	8.58	1440	-191	* 65-140	3.67	30	MS-19
Perfluorononanoic acid (PFNA)	182	1.9	ng/L	9.27	192	-106	* 69-130	8.57	30	MS-19

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B347867 - SOP 454-PFAAS
Blank (B347867-BLK1)

Prepared: 08/04/23 Analyzed: 08/07/23

Perfluorobutanoic acid (PFBA)	ND	1.9	ng/L							
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L							
Perfluoropentanoic acid (PFPeA)	ND	1.9	ng/L							
Perfluorohexanoic acid (PFHxA)	ND	1.9	ng/L							
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L							
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L							
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L							
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L							
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L							
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L							
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L							
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.9	ng/L							
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L							
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L							
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L							
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L							
Perfluorotridecanoic acid (PFTrDA)	ND	1.9	ng/L							
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L							
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L							
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L							
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L							
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L							
Perfluoro-1-butanesulfonamide (FBSA)	ND	1.9	ng/L							
Perfluorohexanesulfonic acid (PFHxS)	ND	1.9	ng/L							
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L							
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L							
6:2 Fluorotelomersulfonic acid (6:2FTS A)	2.7	1.9	ng/L							B
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L							
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L							
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L							
Perfluoroheptanoic acid (PFHpA)	ND	1.9	ng/L							
Perfluorooctanoic acid (PFOA)	ND	1.9	ng/L							
Perfluorooctanesulfonic acid (PFOS)	ND	1.9	ng/L							
Perfluorononanoic acid (PFNA)	ND	1.9	ng/L							

LCS (B347867-BS1)

Prepared: 08/04/23 Analyzed: 08/07/23

Perfluorobutanoic acid (PFBA)	12.2	1.9	ng/L	9.39		130	*	73-129		L-05
Perfluorobutanesulfonic acid (PFBS)	11.0	1.9	ng/L	8.31		132	*	72-130		L-05
Perfluoropentanoic acid (PFPeA)	11.7	1.9	ng/L	9.39		125		72-129		
Perfluorohexanoic acid (PFHxA)	11.8	1.9	ng/L	9.39		126		72-129		
11Cl-PF3OUdS (F53B Major)	9.98	1.9	ng/L	8.85		113		55.1-141		
9Cl-PF3ONS (F53B Minor)	9.34	1.9	ng/L	8.75		107		59.6-146		
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	10.4	1.9	ng/L	8.85		118		60.3-131		
Hexafluoropropylene oxide dimer acid (HFPO-DA)	10.7	1.9	ng/L	9.39		114		37.6-167		
8:2 Fluorotelomersulfonic acid (8:2FTS A)	11.5	1.9	ng/L	9.02		128		67-138		
Perfluorodecanoic acid (PFDA)	11.8	1.9	ng/L	9.39		125		71-129		
Perfluorododecanoic acid (PFDoA)	12.6	1.9	ng/L	9.39		134		72-134		
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	9.27	1.9	ng/L	8.36		111		49.4-154		

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B347867 - SOP 454-PFAAS
LCS (B347867-BS1)

Prepared: 08/04/23 Analyzed: 08/07/23

Perfluoroheptanesulfonic acid (PFHpS)	11.6	1.9	ng/L	8.97		129	69-134			
N-EtFOSAA (NEtFOSAA)	11.5	1.9	ng/L	9.39		123	61-135			
N-MeFOSAA (NMeFOSAA)	13.4	1.9	ng/L	9.39		142	* 65-136			S-29
Perfluorotetradecanoic acid (PFTA)	12.8	1.9	ng/L	9.39		136	* 71-132			L-01
Perfluorotridecanoic acid (PFTrDA)	12.4	1.9	ng/L	9.39		132	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	11.8	1.9	ng/L	8.78		134	63-143			
Perfluorodecanesulfonic acid (PFDS)	10.1	1.9	ng/L	9.06		112	53-142			
Perfluorooctanesulfonamide (FOSA)	12.5	1.9	ng/L	9.39		133	67-137			
Perfluorononanesulfonic acid (PFNS)	13.1	1.9	ng/L	9.02		145	* 69-127			L-01
Perfluoro-1-hexanesulfonamide (FHxSA)	10.0	1.9	ng/L	9.39		107	61.7-156			
Perfluoro-1-butanefulfonamide (FBSA)	11.4	1.9	ng/L	9.39		121	61.3-145			
Perfluorohexanesulfonic acid (PFHxS)	11.4	1.9	ng/L	8.59		133	* 68-131			L-05
Perfluoro-4-oxapentanoic acid (PFMPA)	11.5	1.9	ng/L	9.39		123	59.8-147			
Perfluoro-5-oxahexanoic acid (PFMBA)	11.1	1.9	ng/L	9.39		118	59.5-146			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	14.2	1.9	ng/L	8.92		159	* 64-140			B, L-05
Perfluoropentanesulfonic acid (PFPeS)	11.8	1.9	ng/L	8.83		134	* 71-127			L-05
Perfluoroundecanoic acid (PFUnA)	12.5	1.9	ng/L	9.39		133	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	10.4	1.9	ng/L	9.39		110	58.5-143			
Perfluoroheptanoic acid (PFHpA)	12.8	1.9	ng/L	9.39		136	* 72-130			L-05
Perfluorooctanoic acid (PFOA)	12.2	1.9	ng/L	9.39		130	71-133			
Perfluorooctanesulfonic acid (PFOS)	11.8	1.9	ng/L	8.69		136	65-140			
Perfluorononanoic acid (PFNA)	12.3	1.9	ng/L	9.39		131	* 69-130			L-05

Batch B348570 - SOP 454-PFAAS
Blank (B348570-BLK1)

Prepared: 08/10/23 Analyzed: 08/11/23

Perfluorobutanoic acid (PFBA)	ND	1.9	ng/L							
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L							
Perfluoropentanoic acid (PFPeA)	ND	1.9	ng/L							
Perfluorohexanoic acid (PFHxA)	ND	1.9	ng/L							
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L							
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L							
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L							
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L							
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L							
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L							
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L							
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.9	ng/L							
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L							
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L							
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L							
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L							
Perfluorotridecanoic acid (PFTrDA)	ND	1.9	ng/L							
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L							
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L							
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L							
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L							
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L							
Perfluoro-1-butanefulfonamide (FBSA)	ND	1.9	ng/L							

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B348570 - SOP 454-PFAAS
Blank (B348570-BLK1)

Prepared: 08/10/23 Analyzed: 08/11/23

Perfluorohexanesulfonic acid (PFHxS)	ND	1.9	ng/L
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.9	ng/L
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L
Perfluoroheptanoic acid (PFHpA)	ND	1.9	ng/L
Perfluorooctanoic acid (PFOA)	ND	1.9	ng/L
Perfluorooctanesulfonic acid (PFOS)	ND	1.9	ng/L
Perfluorononanoic acid (PFNA)	ND	1.9	ng/L

LCS (B348570-BS1)

Prepared: 08/10/23 Analyzed: 08/11/23

Perfluorobutanoic acid (PFBA)	8.70	2.0	ng/L	10.2	85.7	73-129
Perfluorobutanesulfonic acid (PFBS)	7.78	2.0	ng/L	8.98	86.6	72-130
Perfluoropentanoic acid (PFPeA)	8.48	2.0	ng/L	10.2	83.5	72-129
Perfluorohexanoic acid (PFHxA)	8.46	2.0	ng/L	10.2	83.4	72-129
11Cl-PF3OUdS (F53B Major)	8.78	2.0	ng/L	9.56	91.8	55.1-141
9Cl-PF3ONS (F53B Minor)	7.93	2.0	ng/L	9.46	83.8	59.6-146
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.17	2.0	ng/L	9.56	85.4	60.3-131
Hexafluoropropylene oxide dimer acid (HFPO-DA)	9.60	2.0	ng/L	10.2	94.5	37.6-167
8:2 Fluorotelomersulfonic acid (8:2FTS A)	8.39	2.0	ng/L	9.75	86.0	67-138
Perfluorodecanoic acid (PFDA)	8.86	2.0	ng/L	10.2	87.3	71-129
Perfluorododecanoic acid (PFDoA)	8.86	2.0	ng/L	10.2	87.3	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	7.71	2.0	ng/L	9.04	85.3	49.4-154
Perfluoroheptanesulfonic acid (PFHpS)	9.30	2.0	ng/L	9.70	95.9	69-134
N-EtFOSAA (NEtFOSAA)	7.83	2.0	ng/L	10.2	77.1	61-135
N-MeFOSAA (NMeFOSAA)	9.53	2.0	ng/L	10.2	93.9	65-136
Perfluorotetradecanoic acid (PFTA)	9.53	2.0	ng/L	10.2	93.9	71-132
Perfluorotridecanoic acid (PFTrDA)	9.60	2.0	ng/L	10.2	94.6	65-144
4:2 Fluorotelomersulfonic acid (4:2FTS A)	8.48	2.0	ng/L	9.49	89.3	63-143
Perfluorodecanesulfonic acid (PFDS)	7.72	2.0	ng/L	9.80	78.8	53-142
Perfluorooctanesulfonamide (FOSA)	8.40	2.0	ng/L	10.2	82.7	67-137
Perfluorononanesulfonic acid (PFNS)	8.37	2.0	ng/L	9.75	85.9	69-127
Perfluoro-1-hexanesulfonamide (FHxSA)	7.22	2.0	ng/L	10.2	71.1	61.7-156
Perfluoro-1-butanesulfonamide (FBSA)	8.01	2.0	ng/L	10.2	78.9	61.3-145
Perfluorohexanesulfonic acid (PFHxS)	7.71	2.0	ng/L	9.29	83.1	68-131
Perfluoro-4-oxapentanoic acid (PFMPA)	9.06	2.0	ng/L	10.2	89.3	59.8-147
Perfluoro-5-oxahexanoic acid (PFMBA)	8.19	2.0	ng/L	10.2	80.7	59.5-146
6:2 Fluorotelomersulfonic acid (6:2FTS A)	8.97	2.0	ng/L	9.64	93.0	64-140
Perfluoropentanesulfonic acid (PFPeS)	8.75	2.0	ng/L	9.54	91.7	71-127
Perfluoroundecanoic acid (PFUnA)	9.10	2.0	ng/L	10.2	89.7	69-133
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	8.15	2.0	ng/L	10.2	80.3	58.5-143
Perfluoroheptanoic acid (PFHpA)	9.01	2.0	ng/L	10.2	88.7	72-130
Perfluorooctanoic acid (PFOA)	8.49	2.0	ng/L	10.2	83.7	71-133
Perfluorooctanesulfonic acid (PFOS)	8.29	2.0	ng/L	9.39	88.3	65-140
Perfluorononanoic acid (PFNA)	9.11	2.0	ng/L	10.2	89.8	69-130

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B348570 - SOP 454-PFAAS
LCS Dup (B348570-BSI1)

Prepared: 08/10/23 Analyzed: 08/11/23

Perfluorobutanoic acid (PFBA)	9.36	2.0	ng/L	9.78		95.7	73-129	7.26	30	
Perfluorobutanesulfonic acid (PFBS)	8.32	2.0	ng/L	8.66		96.1	72-130	6.65	30	
Perfluoropentanoic acid (PFPeA)	8.95	2.0	ng/L	9.78		91.5	72-129	5.38	30	
Perfluorohexanoic acid (PFHxA)	9.17	2.0	ng/L	9.78		93.8	72-129	8.06	30	
11Cl-PF3OUdS (F53B Major)	8.46	2.0	ng/L	9.21		91.8	55.1-141	3.73	30	
9Cl-PF3ONS (F53B Minor)	8.51	2.0	ng/L	9.12		93.3	59.6-146	7.02	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.72	2.0	ng/L	9.21		94.7	60.3-131	6.55	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.98	2.0	ng/L	9.78		91.8	37.6-167	6.71	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	9.65	2.0	ng/L	9.39		103	67-138	14.1	30	
Perfluorodecanoic acid (PFDA)	9.71	2.0	ng/L	9.78		99.3	71-129	9.23	30	
Perfluorododecanoic acid (PFDoA)	8.90	2.0	ng/L	9.78		91.0	72-134	0.390	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	8.16	2.0	ng/L	8.70		93.7	49.4-154	5.68	30	
Perfluoroheptanesulfonic acid (PFHpS)	9.53	2.0	ng/L	9.34		102	69-134	2.45	30	
N-EtFOSAA (NEtFOSAA)	8.05	2.0	ng/L	9.78		82.3	61-135	2.84	30	
N-MeFOSAA (NMeFOSAA)	9.34	2.0	ng/L	9.78		95.5	65-136	2.09	30	
Perfluorotetradecanoic acid (PFTA)	9.51	2.0	ng/L	9.78		97.2	71-132	0.246	30	
Perfluorotridecanoic acid (PFTrDA)	13.6	2.0	ng/L	9.78		139	65-144	34.4 *	30	R-05
4:2 Fluorotelomersulfonic acid (4:2FTS A)	9.27	2.0	ng/L	9.14		101	63-143	8.87	30	
Perfluorodecanesulfonic acid (PFDS)	8.45	2.0	ng/L	9.44		89.5	53-142	9.02	30	
Perfluorooctanesulfonamide (FOSA)	9.34	2.0	ng/L	9.78		95.5	67-137	10.6	30	
Perfluorononanesulfonic acid (PFNS)	10.3	2.0	ng/L	9.39		109	69-127	20.4	30	
Perfluoro-1-hexanesulfonamide (FHxSA)	8.52	2.0	ng/L	9.78		87.1	61.7-156	16.5	30	
Perfluoro-1-butanefulfonamide (FBSA)	9.01	2.0	ng/L	9.78		92.1	61.3-145	11.7	30	
Perfluorohexanesulfonic acid (PFHxS)	8.41	2.0	ng/L	8.95		94.0	68-131	8.65	30	
Perfluoro-4-oxapentanoic acid (PFMPA)	9.67	2.0	ng/L	9.78		98.9	59.8-147	6.49	30	
Perfluoro-5-oxahexanoic acid (PFMBA)	8.79	2.0	ng/L	9.78		89.9	59.5-146	7.05	30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	7.51	2.0	ng/L	9.29		80.8	64-140	17.7	30	
Perfluoropentanesulfonic acid (PFPeS)	9.14	2.0	ng/L	9.19		99.4	71-127	4.33	30	
Perfluoroundecanoic acid (PFUnA)	9.90	2.0	ng/L	9.78		101	69-133	8.43	30	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	8.89	2.0	ng/L	9.78		90.9	58.5-143	8.69	30	
Perfluoroheptanoic acid (PFHpA)	9.51	2.0	ng/L	9.78		97.2	72-130	5.38	30	
Perfluorooctanoic acid (PFOA)	9.73	2.0	ng/L	9.78		99.5	71-133	13.6	30	
Perfluorooctanesulfonic acid (PFOS)	9.00	2.0	ng/L	9.05		99.5	65-140	8.14	30	
Perfluorononanoic acid (PFNA)	9.03	2.0	ng/L	9.78		92.4	69-130	0.895	30	

FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
B	Analyte is found in the associated laboratory blank as well as in the sample.
B-05	Data is not affected by elevated level in laboratory blank since sample(s) result is "Not Detected".
D-01	Sample extracted/prepared at a dilution due to sample matrix.
E	Reported result is estimated. Value reported over verified calibration range.
L-01	Laboratory fortified blank/laboratory control sample recovery outside of control limits. Data validation is not affected since all results are "not detected" for all samples in this batch for this compound and bias is on the high side.
L-05	Laboratory fortified blank/laboratory control sample recovery is outside of control limits. Reported value for this compound is likely to be biased on the high side.
MS-12	Matrix spike recovery and matrix spike duplicate recovery outside of control limits. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
MS-22	Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is within method specified criteria.
PF-17	Extracted Internal Standard recovery is outside of control limits. Data is not significantly affected since associated analyte is not detected and bias is on the high side.
PF-18	Duplicate analysis confirmed Extracted Internal Standard failure due to matrix effects.
PF-19	Sample re-analyzed at a dilution that was re-fortified with internal standard.
PF-20	Quantifying ion signal to noise ratio is <10. Detection is suspect.
PF-23	Qualifier ion ratio <50% of associated calibration. Detection is suspect.
R-05	Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound.
S-29	Extracted Internal Standard is outside of control limits.
V-20	Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PC-16D (23G4062-01RE2) Lab File ID: 23G4062-01RE2.d Analyzed: 08/11/23 11:23									
M8FOSA	228999.2	3.972583	287,815.00	3.972583	80	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	48904.16	2.496817	56,342.00	2.496817	87	50 - 150	0.0000	+/-0.50	
M2PFTA	333486.6	4.30535	480,520.00	4.30535	69	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	96711.49	3.778883	58,511.00	3.778883	165	50 - 150	0.0000	+/-0.50	*
MPFBA	319226	1.058467	415,125.00	1.058467	77	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	174163.5	2.831117	173,313.00	2.831117	100	50 - 150	0.0000	+/-0.50	
M6PFDA	635055.2	3.779417	659,331.00	3.779417	96	50 - 150	0.0000	+/-0.50	
M3PFBS	179831.4	1.894967	198,372.00	1.886667	91	50 - 150	0.0083	+/-0.50	
M7PFUnA	522914.6	3.93005	560,946.00	3.93005	93	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	43465.79	3.4293	38,169.00	3.4293	114	50 - 150	0.0000	+/-0.50	
M5PFPeA	372858	1.714833	418,578.00	1.706567	89	50 - 150	0.0083	+/-0.50	
M5PFHxA	624521.1	2.588767	697,827.00	2.58055	89	50 - 150	0.0082	+/-0.50	
M3PFHxS	96796.23	3.193817	107,774.00	3.193817	90	50 - 150	0.0000	+/-0.50	
M4PFHpA	600013.5	3.1627	656,777.00	3.1627	91	50 - 150	0.0000	+/-0.50	
M8PFOA	652612.2	3.437833	693,830.00	3.437833	94	50 - 150	0.0000	+/-0.50	
M8PFOS	93701.98	3.6282	112,919.00	3.6282	83	50 - 150	0.0000	+/-0.50	
M9PFNA	567797.8	3.629233	636,673.00	3.629233	89	50 - 150	0.0000	+/-0.50	
MPFDoA	400399.2	4.064667	474,020.00	4.064667	84	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	134627.5	3.937517	154,296.00	3.937517	87	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	155476.3	3.85765	169,060.00	3.85765	92	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
MW-401S (23G4062-02) Lab File ID: 23G4062-02.d Analyzed: 08/07/23 18:39									
M8FOSA	150971	3.964583	234,655.00	3.964583	64	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	49079.46	2.431017	46,178.00	2.431017	106	50 - 150	0.0000	+/-0.50	
M2PFTA	275858.7	4.281116	413,990.00	4.281116	67	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	50243.84	3.754983	54,885.00	3.754983	92	50 - 150	0.0000	+/-0.50	
MPFBA	259074.3	1.04185	369,907.00	1.04185	70	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	126612.9	2.782017	142,835.00	2.782017	89	50 - 150	0.0000	+/-0.50	
M6PFDA	374924	3.7555	543,778.00	3.7555	69	50 - 150	0.0000	+/-0.50	
M3PFBS	140453.8	1.83695	175,551.00	1.83695	80	50 - 150	0.0000	+/-0.50	
M7PFUnA	302259.4	3.897867	497,927.00	3.906067	61	50 - 150	-0.0082	+/-0.50	
M2-6:2FTS	40410.7	3.4044	34,993.00	3.4044	115	50 - 150	0.0000	+/-0.50	
M5PFPeA	272535.1	1.6652	352,853.00	1.6652	77	50 - 150	0.0000	+/-0.50	
M5PFHxA	466010.8	2.51485	583,759.00	2.51485	80	50 - 150	0.0000	+/-0.50	
M3PFHxS	74416.71	3.1615	91,916.00	3.169583	81	50 - 150	-0.0081	+/-0.50	
M4PFHpA	459039.5	3.1304	539,353.00	3.1304	85	50 - 150	0.0000	+/-0.50	
M8PFOA	465346.5	3.413117	571,242.00	3.413117	81	50 - 150	0.0000	+/-0.50	
M8PFOS	68052.1	3.60425	94,602.00	3.60425	72	50 - 150	0.0000	+/-0.50	
M9PFNA	433875.9	3.605283	543,849.00	3.605283	80	50 - 150	0.0000	+/-0.50	
MPFDaA	249710.6	4.040683	399,784.00	4.040683	62	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	72455.97	3.905533	126,657.00	3.913533	57	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	78826.04	3.833783	139,830.00	3.833783	56	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
MW-401D (23G4062-03) Lab File ID: 23G4062-03.d Analyzed: 08/07/23 18:47									
M8FOSA	136491	3.9566	234,655.00	3.964583	58	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	36118.04	2.431017	46,178.00	2.431017	78	50 - 150	0.0000	+/-0.50	
M2PFTA	265763.4	4.281116	413,990.00	4.281116	64	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	48727.2	3.754983	54,885.00	3.754983	89	50 - 150	0.0000	+/-0.50	
MPFBA	263074	1.033533	369,907.00	1.04185	71	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	136991.8	2.773833	142,835.00	2.782017	96	50 - 150	-0.0082	+/-0.50	
M6PFDA	362410.9	3.7555	543,778.00	3.7555	67	50 - 150	0.0000	+/-0.50	
M3PFBS	133969.9	1.83695	175,551.00	1.83695	76	50 - 150	0.0000	+/-0.50	
M7PFUnA	269766	3.906067	497,927.00	3.906067	54	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	31213.62	3.4044	34,993.00	3.4044	89	50 - 150	0.0000	+/-0.50	
M5PFPeA	263290.6	1.6652	352,853.00	1.6652	75	50 - 150	0.0000	+/-0.50	
M5PFHxA	442891.8	2.51485	583,759.00	2.51485	76	50 - 150	0.0000	+/-0.50	
M3PFHxS	75620.98	3.169583	91,916.00	3.169583	82	50 - 150	0.0000	+/-0.50	
M4PFHpA	420850.8	3.1304	539,353.00	3.1304	78	50 - 150	0.0000	+/-0.50	
M8PFOA	456571.7	3.413117	571,242.00	3.413117	80	50 - 150	0.0000	+/-0.50	
M8PFOS	62235.93	3.60425	94,602.00	3.60425	66	50 - 150	0.0000	+/-0.50	
M9PFNA	417967.6	3.605283	543,849.00	3.605283	77	50 - 150	0.0000	+/-0.50	
MPFDoA	225472.2	4.032683	399,784.00	4.040683	56	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	66786.39	3.905533	126,657.00	3.913533	53	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	78685.13	3.833783	139,830.00	3.833783	56	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
MW-403S (23G4062-04) Lab File ID: 23G4062-04.d Analyzed: 08/07/23 18:54									
M8FOSA	161875	3.964583	234,655.00	3.964583	69	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	72736.86	2.431017	46,178.00	2.431017	158	50 - 150	0.0000	+/-0.50	*
M2PFTA	298959.5	4.281116	413,990.00	4.281116	72	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	55663.13	3.754983	54,885.00	3.754983	101	50 - 150	0.0000	+/-0.50	
MPFBA	192101.2	1.033533	369,907.00	1.04185	52	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	117389.1	2.773833	142,835.00	2.782017	82	50 - 150	-0.0082	+/-0.50	
M6PFDA	413953.3	3.7555	543,778.00	3.7555	76	50 - 150	0.0000	+/-0.50	
M3PFBS	150511	1.83695	175,551.00	1.83695	86	50 - 150	0.0000	+/-0.50	
M7PFUnA	330474.7	3.897867	497,927.00	3.906067	66	50 - 150	-0.0082	+/-0.50	
M5PFPeA	264421	1.6652	352,853.00	1.6652	75	50 - 150	0.0000	+/-0.50	
M5PFHxA	509423.2	2.51485	583,759.00	2.51485	87	50 - 150	0.0000	+/-0.50	
M3PFHxS	89183.88	3.169583	91,916.00	3.169583	97	50 - 150	0.0000	+/-0.50	
M4PFHpA	489327.7	3.1304	539,353.00	3.1304	91	50 - 150	0.0000	+/-0.50	
M8PFOA	517663.1	3.413117	571,242.00	3.413117	91	50 - 150	0.0000	+/-0.50	
M8PFOS	70876.18	3.60425	94,602.00	3.60425	75	50 - 150	0.0000	+/-0.50	
M9PFNA	484498.7	3.605283	543,849.00	3.605283	89	50 - 150	0.0000	+/-0.50	
MPFDaA	256569	4.040683	399,784.00	4.040683	64	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	73743.45	3.90555	126,657.00	3.913533	58	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	81148.11	3.833783	139,830.00	3.833783	58	50 - 150	0.0000	+/-0.50	
MW-403S (23G4062-04RE1) Lab File ID: 23G4062-04RE1.d Analyzed: 08/09/23 13:50									
M2-6:2FTS	44805.77	3.41245	38,644.00	3.4044	116	50 - 150	0.0081	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
MW-403D (23G4062-05) Lab File ID: 23G4062-05.d Analyzed: 08/07/23 19:01									
M8FOSA	157931	3.964583	234,655.00	3.964583	67	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	53257.86	2.431017	46,178.00	2.431017	115	50 - 150	0.0000	+/-0.50	
M2PFTA	316256.1	4.281116	413,990.00	4.281116	76	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	62147.79	3.754983	54,885.00	3.754983	113	50 - 150	0.0000	+/-0.50	
MPFBA	228437.8	1.033533	369,907.00	1.04185	62	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	119972.4	2.773833	142,835.00	2.782017	84	50 - 150	-0.0082	+/-0.50	
M6PFDA	430584.1	3.7555	543,778.00	3.7555	79	50 - 150	0.0000	+/-0.50	
M3PFBS	149045.1	1.83695	175,551.00	1.83695	85	50 - 150	0.0000	+/-0.50	
M7PFUnA	359908.3	3.897867	497,927.00	3.906067	72	50 - 150	-0.0082	+/-0.50	
M2-6:2FTS	56897.89	3.39635	34,993.00	3.4044	163	50 - 150	-0.0080	+/-0.50	*
M5PFPeA	275337.1	1.6652	352,853.00	1.6652	78	50 - 150	0.0000	+/-0.50	
M5PFHxA	490539.5	2.51485	583,759.00	2.51485	84	50 - 150	0.0000	+/-0.50	
M3PFHxS	82945.98	3.1615	91,916.00	3.169583	90	50 - 150	-0.0081	+/-0.50	
M4PFHpA	489624.8	3.1304	539,353.00	3.1304	91	50 - 150	0.0000	+/-0.50	
M8PFOA	517968.3	3.413117	571,242.00	3.413117	91	50 - 150	0.0000	+/-0.50	
M8PFOS	75657.88	3.60425	94,602.00	3.60425	80	50 - 150	0.0000	+/-0.50	
M9PFNA	474233.3	3.605283	543,849.00	3.605283	87	50 - 150	0.0000	+/-0.50	
MPFDoA	288333.4	4.040683	399,784.00	4.040683	72	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	83862.38	3.905533	126,657.00	3.913533	66	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	91086.18	3.833783	139,830.00	3.833783	65	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
MW-402S (23G4062-06) Lab File ID: 23G4062-06.d Analyzed: 08/07/23 19:08									
M8FOSA	186415.6	3.964583	234,655.00	3.964583	79	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	46929.63	2.4228	46,178.00	2.431017	102	50 - 150	-0.0082	+/-0.50	
M2PFTA	320442	4.27305	413,990.00	4.281116	77	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	80480.77	3.754983	54,885.00	3.754983	147	50 - 150	0.0000	+/-0.50	
MPFBA	289598.6	1.04185	369,907.00	1.04185	78	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	133413.6	2.773833	142,835.00	2.782017	93	50 - 150	-0.0082	+/-0.50	
M6PFDA	468447.5	3.7555	543,778.00	3.7555	86	50 - 150	0.0000	+/-0.50	
M3PFBS	154091.1	1.83695	175,551.00	1.83695	88	50 - 150	0.0000	+/-0.50	
M7PFUnA	394485.1	3.897867	497,927.00	3.906067	79	50 - 150	-0.0082	+/-0.50	
M2-6:2FTS	41682.11	3.39635	34,993.00	3.4044	119	50 - 150	-0.0080	+/-0.50	
M5PFPeA	320848.8	1.6652	352,853.00	1.6652	91	50 - 150	0.0000	+/-0.50	
M5PFHxA	502213.8	2.51485	583,759.00	2.51485	86	50 - 150	0.0000	+/-0.50	
M3PFHxS	83849.16	3.169583	91,916.00	3.169583	91	50 - 150	0.0000	+/-0.50	
M4PFHpA	477854.7	3.1304	539,353.00	3.1304	89	50 - 150	0.0000	+/-0.50	
M8PFOA	520313.7	3.413117	571,242.00	3.413117	91	50 - 150	0.0000	+/-0.50	
M8PFOS	75917.21	3.60425	94,602.00	3.60425	80	50 - 150	0.0000	+/-0.50	
M9PFNA	493175.2	3.605283	543,849.00	3.605283	91	50 - 150	0.0000	+/-0.50	
MPFDoA	301727.6	4.040683	399,784.00	4.040683	75	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	101898.8	3.913533	126,657.00	3.913533	80	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	113350.5	3.833783	139,830.00	3.833783	81	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
MW-402D (23G4062-07) Lab File ID: 23G4062-07.d Analyzed: 08/07/23 19:16									
M8FOSA	165932.7	3.964583	234,655.00	3.964583	71	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	41781.62	2.431017	46,178.00	2.431017	90	50 - 150	0.0000	+/-0.50	
M2PFTA	334418.2	4.27305	413,990.00	4.281116	81	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	119044.9	3.747017	54,885.00	3.754983	217	50 - 150	-0.0080	+/-0.50	*
MPFBA	255851.7	1.04185	369,907.00	1.04185	69	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	157054.4	2.782017	142,835.00	2.782017	110	50 - 150	0.0000	+/-0.50	
M6PFDA	459887.8	3.7555	543,778.00	3.7555	85	50 - 150	0.0000	+/-0.50	
M3PFBS	143795.2	1.83695	175,551.00	1.83695	82	50 - 150	0.0000	+/-0.50	
M7PFUnA	382841	3.897867	497,927.00	3.906067	77	50 - 150	-0.0082	+/-0.50	
M2-6:2FTS	40301.08	3.4044	34,993.00	3.4044	115	50 - 150	0.0000	+/-0.50	
M5PFPeA	279281.2	1.6652	352,853.00	1.6652	79	50 - 150	0.0000	+/-0.50	
M5PFHxA	477054.1	2.51485	583,759.00	2.51485	82	50 - 150	0.0000	+/-0.50	
M3PFHxS	80613.44	3.169583	91,916.00	3.169583	88	50 - 150	0.0000	+/-0.50	
M4PFHpA	467096.2	3.1304	539,353.00	3.1304	87	50 - 150	0.0000	+/-0.50	
M8PFOA	495918.5	3.413117	571,242.00	3.413117	87	50 - 150	0.0000	+/-0.50	
M8PFOS	76676.27	3.60425	94,602.00	3.60425	81	50 - 150	0.0000	+/-0.50	
M9PFNA	475674.3	3.605283	543,849.00	3.605283	87	50 - 150	0.0000	+/-0.50	
MPFDoA	285923.1	4.040683	399,784.00	4.040683	72	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	85507.53	3.905533	126,657.00	3.913533	68	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	104898.4	3.825833	139,830.00	3.833783	75	50 - 150	-0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PC-39 (23G4062-08) Lab File ID: 23G4062-08.d Analyzed: 08/07/23 19:23									
M8FOSA	79020.97	3.964583	234,655.00	3.964583	34	50 - 150	0.0000	+/-0.50	*
M2-4:2FTS	52780.93	2.431017	46,178.00	2.431017	114	50 - 150	0.0000	+/-0.50	
M2PFTA	26252.84	4.27305	413,990.00	4.281116	06	50 - 150	-0.0081	+/-0.50	*
M2-8:2FTS	82278.42	3.747017	54,885.00	3.754983	150	50 - 150	-0.0080	+/-0.50	
MPFBA	200515.7	1.04185	369,907.00	1.04185	54	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	130503.6	2.773833	142,835.00	2.782017	91	50 - 150	-0.0082	+/-0.50	
M6PFDA	398278.4	3.7555	543,778.00	3.7555	73	50 - 150	0.0000	+/-0.50	
M3PFBS	144543.7	1.83695	175,551.00	1.83695	82	50 - 150	0.0000	+/-0.50	
M7PFUnA	235613.3	3.897867	497,927.00	3.906067	47	50 - 150	-0.0082	+/-0.50	*
M2-6:2FTS	45351.21	3.39635	34,993.00	3.4044	130	50 - 150	-0.0080	+/-0.50	
M5PFPeA	260091.5	1.6652	352,853.00	1.6652	74	50 - 150	0.0000	+/-0.50	
M5PFHxA	477546.2	2.51485	583,759.00	2.51485	82	50 - 150	0.0000	+/-0.50	
M3PFHxS	79567.2	3.169583	91,916.00	3.169583	87	50 - 150	0.0000	+/-0.50	
M4PFHpA	468047.4	3.1304	539,353.00	3.1304	87	50 - 150	0.0000	+/-0.50	
M8PFOA	493292.5	3.413117	571,242.00	3.413117	86	50 - 150	0.0000	+/-0.50	
M8PFOS	70076.2	3.60425	94,602.00	3.60425	74	50 - 150	0.0000	+/-0.50	
M9PFNA	429652.1	3.605283	543,849.00	3.605283	79	50 - 150	0.0000	+/-0.50	
MPFDoA	89738.79	4.040683	399,784.00	4.040683	22	50 - 150	0.0000	+/-0.50	*
D5-NEtFOSAA	41852.38	3.905533	126,657.00	3.913533	33	50 - 150	-0.0080	+/-0.50	*
D3-NMeFOSAA	64508.5	3.833783	139,830.00	3.833783	46	50 - 150	0.0000	+/-0.50	*

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PC-39D (23G4062-09) Lab File ID: 23G4062-09.d Analyzed: 08/07/23 19:30									
M8FOSA	171513.9	3.964583	234,655.00	3.964583	73	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	45122.95	2.431017	46,178.00	2.431017	98	50 - 150	0.0000	+/-0.50	
M2PFTA	352859.1	4.27305	413,990.00	4.281116	85	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	89030.52	3.747017	54,885.00	3.754983	162	50 - 150	-0.0080	+/-0.50	*
MPFBA	245740.6	1.04185	369,907.00	1.04185	66	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	129072.6	2.782017	142,835.00	2.782017	90	50 - 150	0.0000	+/-0.50	
M6PFDA	462718.1	3.7555	543,778.00	3.7555	85	50 - 150	0.0000	+/-0.50	
M3PFBS	149160.4	1.83695	175,551.00	1.83695	85	50 - 150	0.0000	+/-0.50	
M7PFUnA	404189.3	3.897867	497,927.00	3.906067	81	50 - 150	-0.0082	+/-0.50	
M2-6:2FTS	42772.15	3.39635	34,993.00	3.4044	122	50 - 150	-0.0080	+/-0.50	
M5PFPeA	283599.6	1.6652	352,853.00	1.6652	80	50 - 150	0.0000	+/-0.50	
M5PFHxA	494587.8	2.51485	583,759.00	2.51485	85	50 - 150	0.0000	+/-0.50	
M3PFHxS	83889.92	3.1615	91,916.00	3.169583	91	50 - 150	-0.0081	+/-0.50	
M4PFHpA	482015.4	3.1304	539,353.00	3.1304	89	50 - 150	0.0000	+/-0.50	
M8PFOA	511686.2	3.413117	571,242.00	3.413117	90	50 - 150	0.0000	+/-0.50	
M8PFOS	76492.3	3.60425	94,602.00	3.60425	81	50 - 150	0.0000	+/-0.50	
M9PFNA	479334.4	3.605283	543,849.00	3.605283	88	50 - 150	0.0000	+/-0.50	
MPFDoA	325237	4.032683	399,784.00	4.040683	81	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	102002.3	3.905533	126,657.00	3.913533	81	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	110883.5	3.833783	139,830.00	3.833783	79	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
EB-7/25 (23G4062-10) Lab File ID: 23G4062-10.d Analyzed: 08/07/23 12:00									
M8FOSA	157461.7	3.964583	234,655.00	3.964583	67	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	41201.98	2.447533	46,178.00	2.447533	89	50 - 150	0.0000	+/-0.50	
M2PFTA	306620.5	4.2892	413,990.00	4.2892	74	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	121114.6	3.76295	54,885.00	3.76295	221	50 - 150	0.0000	+/-0.50	*
MPFBA	296475.7	1.050167	369,907.00	1.04185	80	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	117844.5	2.7902	142,835.00	2.7902	83	50 - 150	0.0000	+/-0.50	
M6PFDA	441905.5	3.763467	543,778.00	3.763467	81	50 - 150	0.0000	+/-0.50	
M3PFBS	135649.1	1.853533	175,551.00	1.853533	77	50 - 150	0.0000	+/-0.50	
M7PFUnA	368305.1	3.91405	497,927.00	3.914067	74	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	29646.11	3.41245	34,993.00	3.41245	85	50 - 150	0.0000	+/-0.50	
M5PFPeA	264141.7	1.681733	352,853.00	1.681733	75	50 - 150	0.0000	+/-0.50	
M5PFHxA	445680.8	2.531267	583,759.00	2.531267	76	50 - 150	0.0000	+/-0.50	
M3PFHxS	73398.52	3.17765	91,916.00	3.177667	80	50 - 150	0.0000	+/-0.50	
M4PFHpA	423833.8	3.138483	539,353.00	3.14655	79	50 - 150	-0.0081	+/-0.50	
M8PFOA	440093.9	3.421167	571,242.00	3.421167	77	50 - 150	0.0000	+/-0.50	
M8PFOS	71494.55	3.612233	94,602.00	3.612233	76	50 - 150	0.0000	+/-0.50	
M9PFNA	433363	3.613267	543,849.00	3.613267	80	50 - 150	0.0000	+/-0.50	
MPFDoA	277274.1	4.048683	399,784.00	4.048683	69	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	98220.92	3.921533	126,657.00	3.921533	78	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	114314.4	3.841733	139,830.00	3.84175	82	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PFW-5 (23G4062-11) Lab File ID: 23G4062-11.d Analyzed: 08/07/23 19:38									
M8FOSA	174824.1	3.964583	234,655.00	3.964583	75	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	47890.96	2.431017	46,178.00	2.431017	104	50 - 150	0.0000	+/-0.50	
M2PFTA	314686	4.27305	413,990.00	4.281116	76	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	125863	3.747017	54,885.00	3.754983	229	50 - 150	-0.0080	+/-0.50	*
MPFBA	207940.5	1.04185	369,907.00	1.04185	56	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	150040.2	2.773833	142,835.00	2.782017	105	50 - 150	-0.0082	+/-0.50	
M6PFDA	499208.5	3.7555	543,778.00	3.7555	92	50 - 150	0.0000	+/-0.50	
M3PFBS	161212.4	1.83695	175,551.00	1.83695	92	50 - 150	0.0000	+/-0.50	
M7PFUnA	401262.7	3.897867	497,927.00	3.906067	81	50 - 150	-0.0082	+/-0.50	
M2-6:2FTS	49480.5	3.39635	34,993.00	3.4044	141	50 - 150	-0.0080	+/-0.50	
M5PFPeA	308987.3	1.6652	352,853.00	1.6652	88	50 - 150	0.0000	+/-0.50	
M5PFHxA	538310.1	2.51485	583,759.00	2.51485	92	50 - 150	0.0000	+/-0.50	
M3PFHxS	80644.48	3.169583	91,916.00	3.169583	88	50 - 150	0.0000	+/-0.50	
M4PFHpA	498831.4	3.1304	539,353.00	3.1304	92	50 - 150	0.0000	+/-0.50	
M8PFOA	546315.1	3.413117	571,242.00	3.413117	96	50 - 150	0.0000	+/-0.50	
M8PFOS	62936.53	3.60425	94,602.00	3.60425	67	50 - 150	0.0000	+/-0.50	
M9PFNA	361385.6	3.605283	543,849.00	3.605283	66	50 - 150	0.0000	+/-0.50	
MPFDoA	336118.9	4.0327	399,784.00	4.040683	84	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	103767.3	3.90555	126,657.00	3.913533	82	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	117856.3	3.833783	139,830.00	3.833783	84	50 - 150	0.0000	+/-0.50	
PFW-5 (23G4062-11RE1) Lab File ID: 23G4062-11RE1.d Analyzed: 08/09/23 13:58									
M3PFHxS	109445.1	3.177667	99,885.00	3.177667	110	50 - 150	0.0000	+/-0.50	
M8PFOA	702428.5	3.421167	630,424.00	3.421167	111	50 - 150	0.0000	+/-0.50	
M8PFOS	110066.7	3.612233	101,702.00	3.612233	108	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
OW-8A (23G4062-12) Lab File ID: 23G4062-12.d Analyzed: 08/07/23 20:00									
M8FOSA	99749.22	3.964583	234,655.00	3.964583	43	50 - 150	0.0000	+/-0.50	*
M2-4:2FTS	119012.2	2.4146	46,178.00	2.4228	258	50 - 150	-0.0082	+/-0.50	*
M2PFTA	44766.91	4.27305	413,990.00	4.27305	11	50 - 150	0.0000	+/-0.50	*
M2-8:2FTS	123074.6	3.754983	54,885.00	3.747017	224	50 - 150	0.0080	+/-0.50	*
MPFBA	190013.5	1.04185	369,907.00	1.033533	51	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	99763.11	2.757467	142,835.00	2.773833	70	50 - 150	-0.0164	+/-0.50	
M6PFDA	414674.4	3.7555	543,778.00	3.7555	76	50 - 150	0.0000	+/-0.50	
M3PFBS	153283.8	1.828667	175,551.00	1.828667	87	50 - 150	0.0000	+/-0.50	
M7PFUnA	347242.5	3.897867	497,927.00	3.897867	70	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	121227.4	3.39635	34,993.00	3.39635	346	50 - 150	0.0000	+/-0.50	*
M5PFPeA	298344.2	1.656917	352,853.00	1.656917	85	50 - 150	0.0000	+/-0.50	
M5PFHxA	574700	2.490217	583,759.00	2.506633	98	50 - 150	-0.0164	+/-0.50	
M3PFHxS	83434.38	3.153433	91,916.00	3.1615	91	50 - 150	-0.0081	+/-0.50	
M4PFHpA	542509.7	3.122333	539,353.00	3.1304	101	50 - 150	-0.0081	+/-0.50	
M8PFOA	573125.3	3.405067	571,242.00	3.413117	100	50 - 150	-0.0081	+/-0.50	
M8PFOS	67677.51	3.60425	94,602.00	3.60425	72	50 - 150	0.0000	+/-0.50	
M9PFNA	480340.5	3.605283	543,849.00	3.605283	88	50 - 150	0.0000	+/-0.50	
MPFDoA	169411.8	4.0327	399,784.00	4.0327	42	50 - 150	0.0000	+/-0.50	*
D5-NeiFOSAA	111497.7	3.90555	126,657.00	3.90555	88	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	127283.1	3.825833	139,830.00	3.825833	91	50 - 150	0.0000	+/-0.50	
PFW-1 (23G4062-13) Lab File ID: 23G4062-13.d Analyzed: 08/07/23 20:07									
M8FOSA	195397.1	3.964583	234,655.00	3.964583	83	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	56269	2.4146	46,178.00	2.4228	122	50 - 150	-0.0082	+/-0.50	
M2PFTA	358104.3	4.27305	413,990.00	4.27305	87	50 - 150	0.0000	+/-0.50	
MPFBA	230309.1	1.033533	369,907.00	1.033533	62	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	141360.9	2.76565	142,835.00	2.773833	99	50 - 150	-0.0082	+/-0.50	
M6PFDA	423157.8	3.755517	543,778.00	3.7555	78	50 - 150	0.0000	+/-0.50	
M3PFBS	164792.9	1.828667	175,551.00	1.828667	94	50 - 150	0.0000	+/-0.50	
M7PFUnA	430275.5	3.897883	497,927.00	3.897867	86	50 - 150	0.0000	+/-0.50	
M5PFPeA	302010.9	1.656917	352,853.00	1.656917	86	50 - 150	0.0000	+/-0.50	
M5PFHxA	520306	2.506633	583,759.00	2.506633	89	50 - 150	0.0000	+/-0.50	
M3PFHxS	57978.96	3.1615	91,916.00	3.1615	63	50 - 150	0.0000	+/-0.50	
M4PFHpA	416897.1	3.122333	539,353.00	3.1304	77	50 - 150	-0.0081	+/-0.50	
M8PFOA	400299.9	3.413133	571,242.00	3.413117	70	50 - 150	0.0000	+/-0.50	
M8PFOS	29982.65	3.612233	94,602.00	3.60425	32	50 - 150	0.0080	+/-0.50	*
MPFDoA	353056.4	4.0327	399,784.00	4.0327	88	50 - 150	0.0000	+/-0.50	
D5-NeiFOSAA	102124.5	3.90555	126,657.00	3.90555	81	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	107589.4	3.825833	139,830.00	3.825833	77	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PFW-1 (23G4062-13RE1) Lab File ID: 23G4062-13RE1.d Analyzed: 08/09/23 14:05									
M2-8:2FTS	92635.48	3.76295	75,328.00	3.76295	123	50 - 150	0.0000	+/-0.50	
MPFBA	414549.5	1.04185	400,836.00	1.050167	103	50 - 150	-0.0083	+/-0.50	
M2-6:2FTS	51340.7	3.41245	38,644.00	3.4044	133	50 - 150	0.0081	+/-0.50	
M5PFPeA	413927	1.681733	393,535.00	1.681733	105	50 - 150	0.0000	+/-0.50	
M5PFHxA	677899.1	2.539483	649,360.00	2.531267	104	50 - 150	0.0082	+/-0.50	
M3PFHxS	108993.3	3.177667	99,885.00	3.177667	109	50 - 150	0.0000	+/-0.50	
M4PFHpA	641292.2	3.138483	612,608.00	3.138483	105	50 - 150	0.0000	+/-0.50	
M8PFOA	671263.8	3.421183	630,424.00	3.421167	106	50 - 150	0.0000	+/-0.50	
M8PFOS	96513.73	3.612233	101,702.00	3.612233	95	50 - 150	0.0000	+/-0.50	
M9PFNA	592774.7	3.613267	609,134.00	3.613267	97	50 - 150	0.0000	+/-0.50	
PFW-1 (23G4062-13RE2) Lab File ID: 23G4062-13RE2.d Analyzed: 08/09/23 17:04									
M8PFOS	107588.6	3.60425	101,702.00	3.612233	106	50 - 150	-0.0080	+/-0.50	
PFW-2 (23G4062-14) Lab File ID: 23G4062-14.d Analyzed: 08/07/23 20:14									
M8FOSA	146507.7	3.9566	234,655.00	3.964583	62	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	85904.56	2.4146	46,178.00	2.4228	186	50 - 150	-0.0082	+/-0.50	*
M2PFTA	129489	4.27305	413,990.00	4.27305	31	50 - 150	0.0000	+/-0.50	*
MPFBA	138848.7	1.033533	369,907.00	1.033533	38	50 - 150	0.0000	+/-0.50	*
M3HFPO-DA	134503.8	2.773833	142,835.00	2.773833	94	50 - 150	0.0000	+/-0.50	
M6PFDA	398581.7	3.755517	543,778.00	3.7555	73	50 - 150	0.0000	+/-0.50	
M3PFBS	137602.1	1.828667	175,551.00	1.828667	78	50 - 150	0.0000	+/-0.50	
M7PFUnA	358748.3	3.897883	497,927.00	3.897867	72	50 - 150	0.0000	+/-0.50	
M5PFPeA	246317.7	1.656917	352,853.00	1.656917	70	50 - 150	0.0000	+/-0.50	
M5PFHxA	467337	2.506633	583,759.00	2.506633	80	50 - 150	0.0000	+/-0.50	
M3PFHxS	75719.4	3.1615	91,916.00	3.1615	82	50 - 150	0.0000	+/-0.50	
M4PFHpA	435210	3.122333	539,353.00	3.1304	81	50 - 150	-0.0081	+/-0.50	
M8PFOA	458215.1	3.413133	571,242.00	3.413117	80	50 - 150	0.0000	+/-0.50	
M8PFOS	58444.62	3.60425	94,602.00	3.60425	62	50 - 150	0.0000	+/-0.50	
MPFDoA	251043.5	4.0327	399,784.00	4.0327	63	50 - 150	0.0000	+/-0.50	
D5-NeFOSAA	90011.03	3.90555	126,657.00	3.90555	71	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	102119.3	3.825833	139,830.00	3.825833	73	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PFW-2 (23G4062-14RE1) Lab File ID: 23G4062-14RE1.d Analyzed: 08/09/23 14:12									
M2-8:2FTS	75278.35	3.76295	75,328.00	3.76295	100	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	41836.8	3.41245	38,644.00	3.4044	108	50 - 150	0.0081	+/-0.50	
M5PFPeA	386709.4	1.681733	393,535.00	1.681733	98	50 - 150	0.0000	+/-0.50	
M5PFHxA	639889.3	2.531267	649,360.00	2.531267	99	50 - 150	0.0000	+/-0.50	
M3PFHxS	101328.1	3.177667	99,885.00	3.177667	101	50 - 150	0.0000	+/-0.50	
M4PFHpA	610685.6	3.138483	612,608.00	3.138483	100	50 - 150	0.0000	+/-0.50	
M8PFOA	641846	3.421167	630,424.00	3.421167	102	50 - 150	0.0000	+/-0.50	
M8PFOS	95763.78	3.612233	101,702.00	3.612233	94	50 - 150	0.0000	+/-0.50	
M9PFNA	603056.8	3.613267	609,134.00	3.613267	99	50 - 150	0.0000	+/-0.50	
MW-12S (23G4062-15) Lab File ID: 23G4062-15.d Analyzed: 08/07/23 20:22									
M8FOSA	169552.2	3.964583	234,655.00	3.964583	72	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	259047.5	2.3736	46,178.00	2.4228	561	50 - 150	-0.0492	+/-0.50	*
M2PFTA	237298.8	4.27305	413,990.00	4.27305	57	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	148351.4	3.754983	54,885.00	3.747017	270	50 - 150	0.0080	+/-0.50	*
MPFBA	60882.63	1.016917	369,907.00	1.033533	16	50 - 150	-0.0166	+/-0.50	*
M3HFPO-DA	91048.47	2.732933	142,835.00	2.773833	64	50 - 150	-0.0409	+/-0.50	
M6PFDA	415967.1	3.755517	543,778.00	3.7555	76	50 - 150	0.0000	+/-0.50	
M3PFBS	135436.6	1.777867	175,551.00	1.828667	77	50 - 150	-0.0508	+/-0.50	
M7PFUnA	395692.5	3.897883	497,927.00	3.897867	79	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	182999.9	3.3883	34,993.00	3.39635	523	50 - 150	-0.0080	+/-0.50	*
M5PFPeA	178062.5	1.615567	352,853.00	1.656917	50	50 - 150	-0.0414	+/-0.50	
M5PFHxA	482809	2.44915	583,759.00	2.506633	83	50 - 150	-0.0575	+/-0.50	
M3PFHxS	77129.96	3.153433	91,916.00	3.1615	84	50 - 150	-0.0081	+/-0.50	
M4PFHpA	466218.1	3.113417	539,353.00	3.1304	86	50 - 150	-0.0170	+/-0.50	
M8PFOA	515252.6	3.405083	571,242.00	3.413117	90	50 - 150	-0.0080	+/-0.50	
M8PFOS	63093.67	3.596267	94,602.00	3.60425	67	50 - 150	-0.0080	+/-0.50	
M9PFNA	410059.7	3.605283	543,849.00	3.605283	75	50 - 150	0.0000	+/-0.50	
MPFDoA	292019.6	4.0327	399,784.00	4.0327	73	50 - 150	0.0000	+/-0.50	
D5-NeFOSAA	121582	3.90555	126,657.00	3.90555	96	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	125818.5	3.825833	139,830.00	3.825833	90	50 - 150	0.0000	+/-0.50	
MW-12S (23G4062-15RE1) Lab File ID: 23G4062-15RE1.d Analyzed: 08/09/23 14:19									
M8FOSA	275895.9	3.964583	261,250.00	3.964583	106	50 - 150	0.0000	+/-0.50	
M5PFPeA	428275.1	1.681733	393,535.00	1.681733	109	50 - 150	0.0000	+/-0.50	
M5PFHxA	707418.9	2.531267	649,360.00	2.531267	109	50 - 150	0.0000	+/-0.50	
M3PFHxS	107509.2	3.177667	99,885.00	3.177667	108	50 - 150	0.0000	+/-0.50	
M8PFOA	721220.4	3.421183	630,424.00	3.421167	114	50 - 150	0.0000	+/-0.50	
M8PFOS	108784.2	3.612233	101,702.00	3.612233	107	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
MW-22 (23G4062-16) Lab File ID: 23G4062-16.d Analyzed: 08/07/23 20:29									
M8FOSA	164169	3.964583	234,655.00	3.964583	70	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	55416.56	2.4228	46,178.00	2.4228	120	50 - 150	0.0000	+/-0.50	
M2PFTA	334643.7	4.27305	413,990.00	4.27305	81	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	79491.37	3.747017	54,885.00	3.747017	145	50 - 150	0.0000	+/-0.50	
MPFBA	208625.5	1.033533	369,907.00	1.033533	56	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	123492.9	2.76565	142,835.00	2.773833	86	50 - 150	-0.0082	+/-0.50	
M6PFDA	441587.1	3.7555	543,778.00	3.7555	81	50 - 150	0.0000	+/-0.50	
M3PFBS	145167.1	1.828667	175,551.00	1.828667	83	50 - 150	0.0000	+/-0.50	
M7PFUnA	365385.7	3.897867	497,927.00	3.897867	73	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	45220.53	3.39635	34,993.00	3.39635	129	50 - 150	0.0000	+/-0.50	
M5PFPeA	268614.1	1.656917	352,853.00	1.656917	76	50 - 150	0.0000	+/-0.50	
M5PFHxA	480432.3	2.506633	583,759.00	2.506633	82	50 - 150	0.0000	+/-0.50	
M3PFHxS	82124.13	3.1615	91,916.00	3.1615	89	50 - 150	0.0000	+/-0.50	
M4PFHpA	470298.7	3.122317	539,353.00	3.1304	87	50 - 150	-0.0081	+/-0.50	
M8PFOA	503661.3	3.405067	571,242.00	3.413117	88	50 - 150	-0.0081	+/-0.50	
M8PFOS	75440.43	3.596267	94,602.00	3.60425	80	50 - 150	-0.0080	+/-0.50	
M9PFNA	447618.2	3.605283	543,849.00	3.605283	82	50 - 150	0.0000	+/-0.50	
MPFDoA	292759.8	4.032683	399,784.00	4.0327	73	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	91887	3.905533	126,657.00	3.90555	73	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	108744.7	3.825833	139,830.00	3.825833	78	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PC-28 (23G4062-17) Lab File ID: 23G4062-17.d Analyzed: 08/07/23 20:36									
M8FOSA	187333.9	3.9566	234,655.00	3.964583	80	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	59667.62	2.4146	46,178.00	2.4228	129	50 - 150	-0.0082	+/-0.50	
M2PFTA	355418.7	4.27305	413,990.00	4.27305	86	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	124274.5	3.747017	54,885.00	3.747017	226	50 - 150	0.0000	+/-0.50	*
MPFBA	220529.5	1.033533	369,907.00	1.033533	60	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	123714.5	2.76565	142,835.00	2.773833	87	50 - 150	-0.0082	+/-0.50	
M6PFDA	516870.1	3.7555	543,778.00	3.7555	95	50 - 150	0.0000	+/-0.50	
M3PFBS	162505.7	1.820383	175,551.00	1.828667	93	50 - 150	-0.0083	+/-0.50	
M7PFUnA	421473.3	3.897867	497,927.00	3.897867	85	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	48758.73	3.39635	34,993.00	3.39635	139	50 - 150	0.0000	+/-0.50	
M5PFPeA	302229.1	1.656917	352,853.00	1.656917	86	50 - 150	0.0000	+/-0.50	
M5PFHxA	545301	2.498417	583,759.00	2.506633	93	50 - 150	-0.0082	+/-0.50	
M3PFHxS	91818.99	3.1615	91,916.00	3.1615	100	50 - 150	0.0000	+/-0.50	
M4PFHpA	529747.9	3.122333	539,353.00	3.1304	98	50 - 150	-0.0081	+/-0.50	
M8PFOA	566170.1	3.405067	571,242.00	3.413117	99	50 - 150	-0.0081	+/-0.50	
M8PFOS	77908.23	3.60425	94,602.00	3.60425	82	50 - 150	0.0000	+/-0.50	
M9PFNA	494703.5	3.605283	543,849.00	3.605283	91	50 - 150	0.0000	+/-0.50	
MPFDoA	328310.3	4.0327	399,784.00	4.0327	82	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	108953.4	3.90555	126,657.00	3.90555	86	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	124114.2	3.825833	139,830.00	3.825833	89	50 - 150	0.0000	+/-0.50	
PC-28 (23G4062-17RE1) Lab File ID: 23G4062-17RE1.d Analyzed: 08/09/23 14:27									
M8PFOS	101363.3	3.612233	101,702.00	3.612233	100	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PC-1 (23G4062-18) Lab File ID: 23G4062-18.d Analyzed: 08/07/23 20:44									
M8FOSA	185050.3	3.964583	234,655.00	3.964583	79	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	68694.93	2.4146	46,178.00	2.4228	149	50 - 150	-0.0082	+/-0.50	
M2PFTA	331283.6	4.27305	413,990.00	4.27305	80	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	140313	3.747017	54,885.00	3.747017	256	50 - 150	0.0000	+/-0.50	*
MPFBA	172894.5	1.033533	369,907.00	1.033533	47	50 - 150	0.0000	+/-0.50	*
M3HFPO-DA	128082.2	2.76565	142,835.00	2.773833	90	50 - 150	-0.0082	+/-0.50	
M6PFDA	443739.9	3.7555	543,778.00	3.7555	82	50 - 150	0.0000	+/-0.50	
M3PFBS	151207.8	1.828667	175,551.00	1.828667	86	50 - 150	0.0000	+/-0.50	
M7PFUnA	373345.2	3.897867	497,927.00	3.897867	75	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	84211.92	3.39635	34,993.00	3.39635	241	50 - 150	0.0000	+/-0.50	*
M5PFPeA	279240.3	1.656917	352,853.00	1.656917	79	50 - 150	0.0000	+/-0.50	
M5PFHxA	522813.5	2.498417	583,759.00	2.506633	90	50 - 150	-0.0082	+/-0.50	
M3PFHxS	84573.12	3.1615	91,916.00	3.1615	92	50 - 150	0.0000	+/-0.50	
M4PFHpA	496542.7	3.122333	539,353.00	3.1304	92	50 - 150	-0.0081	+/-0.50	
M8PFOA	516237.4	3.405067	571,242.00	3.413117	90	50 - 150	-0.0081	+/-0.50	
M8PFOS	67387.29	3.60425	94,602.00	3.60425	71	50 - 150	0.0000	+/-0.50	
M9PFNA	428616.9	3.5973	543,849.00	3.605283	79	50 - 150	-0.0080	+/-0.50	
MPFDoA	312065.6	4.0327	399,784.00	4.0327	78	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	95236.14	3.90555	126,657.00	3.90555	75	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	109703.5	3.825833	139,830.00	3.825833	78	50 - 150	0.0000	+/-0.50	
PC-1 (23G4062-18RE1) Lab File ID: 23G4062-18RE1.d Analyzed: 08/09/23 14:34									
M5PFPeA	411837.9	1.681733	393,535.00	1.681733	105	50 - 150	0.0000	+/-0.50	
M3PFHxS	106283.8	3.17765	99,885.00	3.177667	106	50 - 150	0.0000	+/-0.50	
M8PFOS	102802.2	3.612233	101,702.00	3.612233	101	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PC-30 (23G4062-19RE2) Lab File ID: 23G4062-19RE2.d Analyzed: 08/11/23 12:01									
M8FOSA	161669	3.972583	287,815.00	3.972583	56	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	47280.97	2.496817	56,342.00	2.496817	84	50 - 150	0.0000	+/-0.50	
M2PFTA	285293.1	4.30535	480,520.00	4.30535	59	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	92228.58	3.778883	58,511.00	3.778883	158	50 - 150	0.0000	+/-0.50	*
MPFBA	202368.2	1.058467	415,125.00	1.058467	49	50 - 150	0.0000	+/-0.50	*
M3HFPO-DA	123620.8	2.831117	173,313.00	2.831117	71	50 - 150	0.0000	+/-0.50	
M6PFDA	457284.6	3.779417	659,331.00	3.779417	69	50 - 150	0.0000	+/-0.50	
M3PFBS	127607.8	1.886667	198,372.00	1.886667	64	50 - 150	0.0000	+/-0.50	
M7PFUnA	375224.6	3.92205	560,946.00	3.93005	67	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	61655.15	3.4205	38,169.00	3.4293	162	50 - 150	-0.0088	+/-0.50	*
M5PFPeA	254850.1	1.714833	418,578.00	1.706567	61	50 - 150	0.0083	+/-0.50	
M5PFHxA	441274.8	2.58055	697,827.00	2.58055	63	50 - 150	0.0000	+/-0.50	
M3PFHxS	72422.7	3.193817	107,774.00	3.193817	67	50 - 150	0.0000	+/-0.50	
M4PFHpA	446671.7	3.1627	656,777.00	3.1627	68	50 - 150	0.0000	+/-0.50	
M8PFOA	492513.8	3.437833	693,830.00	3.437833	71	50 - 150	0.0000	+/-0.50	
M8PFOS	63987.68	3.620217	112,919.00	3.6282	57	50 - 150	-0.0080	+/-0.50	
M9PFNA	408567.7	3.629233	636,673.00	3.629233	64	50 - 150	0.0000	+/-0.50	
MPFDoA	238894.7	4.064667	474,020.00	4.064667	50	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	101361.4	3.937517	154,296.00	3.937517	66	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	114984.7	3.85765	169,060.00	3.85765	68	50 - 150	0.0000	+/-0.50	
PC-30 (23G4062-19RE3) Lab File ID: 23G4062-19RE3.d Analyzed: 08/11/23 15:14									
M8PFOS	111323.9	3.620217	112,919.00	3.620217	99	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PC-6A (23G4062-20) Lab File ID: 23G4062-20.d Analyzed: 08/07/23 20:58									
M8FOSA	147343.7	3.9566	234,655.00	3.964583	63	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	82650.27	2.4146	46,178.00	2.4228	179	50 - 150	-0.0082	+/-0.50	*
M2PFTA	238276.9	4.27305	413,990.00	4.27305	58	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	95636.63	3.747017	54,885.00	3.747017	174	50 - 150	0.0000	+/-0.50	*
MPFBA	163742.9	1.033533	369,907.00	1.033533	44	50 - 150	0.0000	+/-0.50	*
M3HFPO-DA	120900.1	2.76565	142,835.00	2.773833	85	50 - 150	-0.0082	+/-0.50	
M6PFDA	462475	3.7555	543,778.00	3.7555	85	50 - 150	0.0000	+/-0.50	
M3PFBS	149945.7	1.828667	175,551.00	1.828667	85	50 - 150	0.0000	+/-0.50	
M7PFUnA	393525.7	3.897883	497,927.00	3.897867	79	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	81576.27	3.39635	34,993.00	3.39635	233	50 - 150	0.0000	+/-0.50	*
M5PFPeA	275271.5	1.656917	352,853.00	1.656917	78	50 - 150	0.0000	+/-0.50	
M5PFHxA	514611.8	2.506633	583,759.00	2.506633	88	50 - 150	0.0000	+/-0.50	
M3PFHxS	86745.28	3.1615	91,916.00	3.1615	94	50 - 150	0.0000	+/-0.50	
M4PFHpA	506882.4	3.122333	539,353.00	3.1304	94	50 - 150	-0.0081	+/-0.50	
M8PFOA	540772.2	3.405067	571,242.00	3.413117	95	50 - 150	-0.0081	+/-0.50	
M8PFOS	77129.62	3.596267	94,602.00	3.60425	82	50 - 150	-0.0080	+/-0.50	
M9PFNA	460661.1	3.5973	543,849.00	3.605283	85	50 - 150	-0.0080	+/-0.50	
MPFDoA	310591.4	4.0327	399,784.00	4.0327	78	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	102423.5	3.90555	126,657.00	3.90555	81	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	116920.2	3.825833	139,830.00	3.825833	84	50 - 150	0.0000	+/-0.50	
PC-6A (23G4062-20RE1) Lab File ID: 23G4062-20RE1.d Analyzed: 08/09/23 14:49									
M8PFOS	104005.3	3.612233	101,702.00	3.612233	102	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
DUP - PFW-1 (23G4062-21) Lab File ID: 23G4062-21.d Analyzed: 08/07/23 21:05									
M8FOSA	197724.7	3.9566	234,655.00	3.964583	84	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	57798.23	2.4146	46,178.00	2.4228	125	50 - 150	-0.0082	+/-0.50	
M2PFTA	367888.3	4.27305	413,990.00	4.27305	89	50 - 150	0.0000	+/-0.50	
MPFBA	238188.9	1.033533	369,907.00	1.033533	64	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	135938.9	2.76565	142,835.00	2.773833	95	50 - 150	-0.0082	+/-0.50	
M6PFDA	412746.8	3.755517	543,778.00	3.7555	76	50 - 150	0.0000	+/-0.50	
M3PFBS	167635.3	1.820383	175,551.00	1.828667	95	50 - 150	-0.0083	+/-0.50	
M7PFUnA	418656.1	3.897883	497,927.00	3.897867	84	50 - 150	0.0000	+/-0.50	
M5PFPeA	301524.6	1.656917	352,853.00	1.656917	85	50 - 150	0.0000	+/-0.50	
M5PFHxA	520617.5	2.498417	583,759.00	2.506633	89	50 - 150	-0.0082	+/-0.50	
M3PFHxS	59867.8	3.1615	91,916.00	3.1615	65	50 - 150	0.0000	+/-0.50	
M4PFHpA	417235.6	3.113417	539,353.00	3.1304	77	50 - 150	-0.0170	+/-0.50	
M8PFOA	405788.7	3.413133	571,242.00	3.413117	71	50 - 150	0.0000	+/-0.50	
M8PFOS	28087.83	3.612233	94,602.00	3.60425	30	50 - 150	0.0080	+/-0.50	*
M9PFNA	115197.1	3.605283	543,849.00	3.605283	21	50 - 150	0.0000	+/-0.50	*
MPFDaA	335358.8	4.0327	399,784.00	4.0327	84	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	105488.5	3.90555	126,657.00	3.90555	83	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	105573.9	3.825833	139,830.00	3.825833	76	50 - 150	0.0000	+/-0.50	
DUP - PFW-1 (23G4062-21RE1) Lab File ID: 23G4062-21RE1.d Analyzed: 08/09/23 15:11									
M2-8:2FTS	92567.39	3.76295	75,328.00	3.76295	123	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	55779.5	3.41245	38,644.00	3.41245	144	50 - 150	0.0000	+/-0.50	
M5PFPeA	421712.5	1.681733	393,535.00	1.681733	107	50 - 150	0.0000	+/-0.50	
M5PFHxA	684754.6	2.531267	649,360.00	2.531267	105	50 - 150	0.0000	+/-0.50	
M3PFHxS	106834.9	3.177667	99,885.00	3.177667	107	50 - 150	0.0000	+/-0.50	
M4PFHpA	644681.9	3.138483	612,608.00	3.138483	105	50 - 150	0.0000	+/-0.50	
M8PFOA	682813.4	3.421167	630,424.00	3.421183	108	50 - 150	0.0000	+/-0.50	
M8PFOS	103750.6	3.612233	101,702.00	3.612233	102	50 - 150	0.0000	+/-0.50	
M9PFNA	590511.9	3.613267	609,134.00	3.613267	97	50 - 150	0.0000	+/-0.50	
DUP - PFW-1 (23G4062-21RE2) Lab File ID: 23G4062-21RE2.d Analyzed: 08/09/23 17:12									
M8PFOS	100819.4	3.60425	101,702.00	3.612233	99	50 - 150	-0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
EB-7.26.23 (23G4062-22RE1) Lab File ID: 23G4062-22RE1.d Analyzed: 08/11/23 12:09									
M8FOSA	246119.7	3.972583	287,815.00	3.972583	86	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	60005.45	2.496817	56,342.00	2.496817	107	50 - 150	0.0000	+/-0.50	
M2PFTA	473031.1	4.30535	480,520.00	4.30535	98	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	164114.3	3.778883	58,511.00	3.778883	280	50 - 150	0.0000	+/-0.50	*
MPFBA	410538.8	1.058467	415,125.00	1.058467	99	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	154976.2	2.831117	173,313.00	2.831117	89	50 - 150	0.0000	+/-0.50	
M6PFDA	680950.9	3.779417	659,331.00	3.779417	103	50 - 150	0.0000	+/-0.50	
M3PFBS	192108	1.886667	198,372.00	1.886667	97	50 - 150	0.0000	+/-0.50	
M7PFUnA	598767.6	3.93005	560,946.00	3.93005	107	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	42432.35	3.4205	38,169.00	3.4293	111	50 - 150	-0.0088	+/-0.50	
M5PFPeA	388871.8	1.706567	418,578.00	1.706567	93	50 - 150	0.0000	+/-0.50	
M5PFHxA	643693.8	2.58055	697,827.00	2.58055	92	50 - 150	0.0000	+/-0.50	
M3PFHxS	101676	3.193817	107,774.00	3.193817	94	50 - 150	0.0000	+/-0.50	
M4PFHpA	608830.8	3.1627	656,777.00	3.1627	93	50 - 150	0.0000	+/-0.50	
M8PFOA	666878.2	3.437833	693,830.00	3.437833	96	50 - 150	0.0000	+/-0.50	
M8PFOS	102818.3	3.6282	112,919.00	3.6282	91	50 - 150	0.0000	+/-0.50	
M9PFNA	637143.8	3.629233	636,673.00	3.629233	100	50 - 150	0.0000	+/-0.50	
MPFDoA	416175.9	4.064667	474,020.00	4.064667	88	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	160651.3	3.937517	154,296.00	3.937517	104	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	168380.3	3.85765	169,060.00	3.85765	100	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Blank (B347705-BLK1)			Lab File ID: B347705-BLK1.d			Analyzed: 08/07/23 18:10			
M8FOSA	156067.5	3.956583	234,655.00	3.964583	67	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	46330.26	2.439333	46,178.00	2.431017	100	50 - 150	0.0083	+/-0.50	
M2PFTA	223381.9	4.281116	413,990.00	4.281116	54	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	51697.9	3.754983	54,885.00	3.754983	94	50 - 150	0.0000	+/-0.50	
MPFBA	268873.9	1.04185	369,907.00	1.04185	73	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	125483.6	2.782017	142,835.00	2.782017	88	50 - 150	0.0000	+/-0.50	
M6PFDA	404575	3.7555	543,778.00	3.7555	74	50 - 150	0.0000	+/-0.50	
M3PFBS	119377.9	1.845233	175,551.00	1.83695	68	50 - 150	0.0083	+/-0.50	
M7PFUnA	343225	3.906067	497,927.00	3.906067	69	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	30228.16	3.4044	34,993.00	3.4044	86	50 - 150	0.0000	+/-0.50	
M5PFPeA	276263.2	1.673467	352,853.00	1.6652	78	50 - 150	0.0083	+/-0.50	
M5PFHxA	465106.3	2.51485	583,759.00	2.51485	80	50 - 150	0.0000	+/-0.50	
M3PFHxS	63385.62	3.169583	91,916.00	3.169583	69	50 - 150	0.0000	+/-0.50	
M4PFHpA	439988.6	3.1304	539,353.00	3.1304	82	50 - 150	0.0000	+/-0.50	
M8PFOA	464684	3.413117	571,242.00	3.413117	81	50 - 150	0.0000	+/-0.50	
M8PFOS	58953.86	3.60425	94,602.00	3.60425	62	50 - 150	0.0000	+/-0.50	
M9PFNA	435544.8	3.605283	543,849.00	3.605283	80	50 - 150	0.0000	+/-0.50	
MPFDoA	264071.5	4.040683	399,784.00	4.040683	66	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	90778.05	3.913533	126,657.00	3.913533	72	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	98660.48	3.833783	139,830.00	3.833783	71	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (B347705-BS1)			Lab File ID: B347705-BS1.d			Analyzed: 08/07/23 18:03			
M8FOSA	181360.4	3.964583	234,655.00	3.964583	77	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	50759.4	2.431017	46,178.00	2.431017	110	50 - 150	0.0000	+/-0.50	
M2PFTA	357492.6	4.281116	413,990.00	4.281116	86	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	66890.21	3.754983	54,885.00	3.754983	122	50 - 150	0.0000	+/-0.50	
MPFBA	305692.8	1.033533	369,907.00	1.04185	83	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	144224	2.782017	142,835.00	2.782017	101	50 - 150	0.0000	+/-0.50	
M6PFDA	490774	3.7555	543,778.00	3.7555	90	50 - 150	0.0000	+/-0.50	
M3PFBS	156864	1.83695	175,551.00	1.83695	89	50 - 150	0.0000	+/-0.50	
M7PFUnA	411743.3	3.906067	497,927.00	3.906067	83	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	37891.53	3.4044	34,993.00	3.4044	108	50 - 150	0.0000	+/-0.50	
M5PFPeA	312240.9	1.6652	352,853.00	1.6652	88	50 - 150	0.0000	+/-0.50	
M5PFHxA	524265.1	2.51485	583,759.00	2.51485	90	50 - 150	0.0000	+/-0.50	
M3PFHxS	83509.46	3.169583	91,916.00	3.169583	91	50 - 150	0.0000	+/-0.50	
M4PFHpA	506359.4	3.1304	539,353.00	3.1304	94	50 - 150	0.0000	+/-0.50	
M8PFOA	545760.1	3.413117	571,242.00	3.413117	96	50 - 150	0.0000	+/-0.50	
M8PFOS	80549.05	3.60425	94,602.00	3.60425	85	50 - 150	0.0000	+/-0.50	
M9PFNA	507004.2	3.605283	543,849.00	3.605283	93	50 - 150	0.0000	+/-0.50	
MPFDoA	322346.9	4.040683	399,784.00	4.040683	81	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	98263.45	3.913533	126,657.00	3.913533	78	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	115052.6	3.833783	139,830.00	3.833783	82	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike (B347705-MS1) Lab File ID: B347705-MS1.d Analyzed: 08/07/23 18:18									
M8FOSA	137990.8	3.964583	234,655.00	3.964583	59	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	87297.3	2.431017	46,178.00	2.431017	189	50 - 150	0.0000	+/-0.50	*
M2PFTA	247720.3	4.281133	413,990.00	4.281116	60	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	301101.1	3.754983	54,885.00	3.754983	549	50 - 150	0.0000	+/-0.50	*
MPFBA	135627	1.04185	369,907.00	1.04185	37	50 - 150	0.0000	+/-0.50	*
M3HFPO-DA	128214.3	2.773833	142,835.00	2.782017	90	50 - 150	-0.0082	+/-0.50	
M6PFDA	386732.6	3.763483	543,778.00	3.7555	71	50 - 150	0.0080	+/-0.50	
M3PFBS	134361.2	1.83695	175,551.00	1.83695	77	50 - 150	0.0000	+/-0.50	
M7PFUnA	334320.1	3.906067	497,927.00	3.906067	67	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	272013.5	3.4044	34,993.00	3.4044	777	50 - 150	0.0000	+/-0.50	*
M5PFPeA	239659.4	1.6652	352,853.00	1.6652	68	50 - 150	0.0000	+/-0.50	
M5PFHxA	455807.3	2.51485	583,759.00	2.51485	78	50 - 150	0.0000	+/-0.50	
M3PFHxS	68740.71	3.169583	91,916.00	3.169583	75	50 - 150	0.0000	+/-0.50	
M4PFHpA	413532.3	3.1304	539,353.00	3.1304	77	50 - 150	0.0000	+/-0.50	
M8PFOA	431613.4	3.413133	571,242.00	3.413117	76	50 - 150	0.0000	+/-0.50	
M8PFOS	50687.04	3.612233	94,602.00	3.60425	54	50 - 150	0.0080	+/-0.50	
M9PFNA	252288.9	3.613267	543,849.00	3.605283	46	50 - 150	0.0080	+/-0.50	*
MPFDaA	256384.6	4.040683	399,784.00	4.040683	64	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	78092.32	3.90555	126,657.00	3.913533	62	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	91704.87	3.833783	139,830.00	3.833783	66	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike Dup (B347705-MSD1)			Lab File ID: B347705-MSD1.d			Analyzed: 08/07/23 18:25			
M8FOSA	129435.7	3.9646	234,655.00	3.964583	55	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	91549.66	2.431017	46,178.00	2.431017	198	50 - 150	0.0000	+/-0.50	*
M2PFTA	235019.3	4.281133	413,990.00	4.281116	57	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	272851.1	3.754983	54,885.00	3.754983	497	50 - 150	0.0000	+/-0.50	*
MPFBA	146426.1	1.04185	369,907.00	1.04185	40	50 - 150	0.0000	+/-0.50	*
M3HFPO-DA	112663.6	2.773833	142,835.00	2.782017	79	50 - 150	-0.0082	+/-0.50	
M6PFDA	409931.3	3.755517	543,778.00	3.7555	75	50 - 150	0.0000	+/-0.50	
M3PFBS	143507.8	1.83695	175,551.00	1.83695	82	50 - 150	0.0000	+/-0.50	
M7PFUnA	368245.4	3.906067	497,927.00	3.906067	74	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	257686.5	3.39635	34,993.00	3.4044	736	50 - 150	-0.0080	+/-0.50	*
M5PFPeA	261191.2	1.6652	352,853.00	1.6652	74	50 - 150	0.0000	+/-0.50	
M5PFHxA	488142.6	2.51485	583,759.00	2.51485	84	50 - 150	0.0000	+/-0.50	
M3PFHxS	75318.77	3.169583	91,916.00	3.169583	82	50 - 150	0.0000	+/-0.50	
M4PFHpA	469342.4	3.1304	539,353.00	3.1304	87	50 - 150	0.0000	+/-0.50	
M8PFOA	480388.6	3.413133	571,242.00	3.413117	84	50 - 150	0.0000	+/-0.50	
M8PFOS	55741.86	3.60425	94,602.00	3.60425	59	50 - 150	0.0000	+/-0.50	
M9PFNA	283481.3	3.613267	543,849.00	3.605283	52	50 - 150	0.0080	+/-0.50	
MPFDoA	263926.8	4.040683	399,784.00	4.040683	66	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	90582.3	3.913533	126,657.00	3.913533	72	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	104522.5	3.833783	139,830.00	3.833783	75	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Blank (B347867-BLK1)			Lab File ID: B347867-BLK1.d			Analyzed: 08/07/23 10:48			
M8FOSA	139256.3	3.964583	234,655.00	3.964583	59	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	38407.7	2.447533	46,178.00	2.447533	83	50 - 150	0.0000	+/-0.50	
M2PFTA	253276.5	4.2892	413,990.00	4.2892	61	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	53825.86	3.76295	54,885.00	3.76295	98	50 - 150	0.0000	+/-0.50	
MPFBA	239882.2	1.050167	369,907.00	1.04185	65	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	103118.7	2.798383	142,835.00	2.7902	72	50 - 150	0.0082	+/-0.50	
M6PFDA	363058	3.771433	543,778.00	3.763467	67	50 - 150	0.0080	+/-0.50	
M3PFBS	123288.6	1.853533	175,551.00	1.853533	70	50 - 150	0.0000	+/-0.50	
M7PFUnA	288334	3.91405	497,927.00	3.914067	58	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	25026.28	3.41245	34,993.00	3.41245	72	50 - 150	0.0000	+/-0.50	
M5PFPeA	240629.2	1.681733	352,853.00	1.681733	68	50 - 150	0.0000	+/-0.50	
M5PFHxA	409891.1	2.539483	583,759.00	2.531267	70	50 - 150	0.0082	+/-0.50	
M3PFHxS	64225.32	3.17765	91,916.00	3.177667	70	50 - 150	0.0000	+/-0.50	
M4PFHpA	380288.4	3.14655	539,353.00	3.14655	71	50 - 150	0.0000	+/-0.50	
M8PFOA	415729.1	3.421167	571,242.00	3.421167	73	50 - 150	0.0000	+/-0.50	
M8PFOS	59645.87	3.612233	94,602.00	3.612233	63	50 - 150	0.0000	+/-0.50	
M9PFNA	378087.5	3.613267	543,849.00	3.613267	70	50 - 150	0.0000	+/-0.50	
MPFDoA	235450.6	4.048683	399,784.00	4.048683	59	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	77466.88	3.921533	126,657.00	3.921533	61	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	90408.52	3.841733	139,830.00	3.84175	65	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (B347867-BS1)			Lab File ID: B347867-BS1.d			Analyzed: 08/07/23 10:40			
M8FOSA	148357.8	3.964583	234,655.00	3.964583	63	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	41332.74	2.447533	46,178.00	2.447533	90	50 - 150	0.0000	+/-0.50	
M2PFTA	280833.1	4.2892	413,990.00	4.2892	68	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	56124.76	3.76295	54,885.00	3.76295	102	50 - 150	0.0000	+/-0.50	
MPFBA	245600.5	1.050167	369,907.00	1.04185	66	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	101154.2	2.798383	142,835.00	2.7902	71	50 - 150	0.0082	+/-0.50	
M6PFDA	382922.5	3.77145	543,778.00	3.763467	70	50 - 150	0.0080	+/-0.50	
M3PFBS	127793.7	1.853533	175,551.00	1.853533	73	50 - 150	0.0000	+/-0.50	
M7PFUnA	309660.7	3.914067	497,927.00	3.914067	62	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	30811.67	3.41245	34,993.00	3.41245	88	50 - 150	0.0000	+/-0.50	
M5PFPeA	247987.8	1.681733	352,853.00	1.681733	70	50 - 150	0.0000	+/-0.50	
M5PFHxA	422332	2.539483	583,759.00	2.531267	72	50 - 150	0.0082	+/-0.50	
M3PFHxS	68233.92	3.177667	91,916.00	3.177667	74	50 - 150	0.0000	+/-0.50	
M4PFHpA	392623.3	3.14655	539,353.00	3.14655	73	50 - 150	0.0000	+/-0.50	
M8PFOA	421825.3	3.421183	571,242.00	3.421167	74	50 - 150	0.0000	+/-0.50	
M8PFOS	62281.26	3.612233	94,602.00	3.612233	66	50 - 150	0.0000	+/-0.50	
M9PFNA	389425	3.613267	543,849.00	3.613267	72	50 - 150	0.0000	+/-0.50	
MPFDoA	245887.6	4.048683	399,784.00	4.048683	62	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	76410.12	3.921533	126,657.00	3.921533	60	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	85740.3	3.84175	139,830.00	3.84175	61	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Blank (B348570-BLK1)			Lab File ID: B348570-BLK1.d			Analyzed: 08/11/23 10:02			
M8FOSA	190974.2	3.972583	287,815.00	3.972583	66	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	44634.98	2.51325	56,342.00	2.51325	79	50 - 150	0.0000	+/-0.50	
M2PFTA	272994.5	4.313416	480,520.00	4.313416	57	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	50819.35	3.78685	58,511.00	3.78685	87	50 - 150	0.0000	+/-0.50	
MPFBA	299066.9	1.058467	415,125.00	1.058467	72	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	154730.4	2.8393	173,313.00	2.8393	89	50 - 150	0.0000	+/-0.50	
M6PFDA	482211.2	3.787383	659,331.00	3.787383	73	50 - 150	0.0000	+/-0.50	
M3PFBS	153794.6	1.894967	198,372.00	1.894967	78	50 - 150	0.0000	+/-0.50	
M7PFUnA	349355.2	3.93005	560,946.00	3.938033	62	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	31484.81	3.4293	38,169.00	3.4293	82	50 - 150	0.0000	+/-0.50	
M5PFPeA	314961.2	1.7231	418,578.00	1.7231	75	50 - 150	0.0000	+/-0.50	
M5PFHxA	532696.7	2.596967	697,827.00	2.596983	76	50 - 150	0.0000	+/-0.50	
M3PFHxS	81363.6	3.201883	107,774.00	3.201883	75	50 - 150	0.0000	+/-0.50	
M4PFHpA	512785.2	3.170783	656,777.00	3.170783	78	50 - 150	0.0000	+/-0.50	
M8PFOA	528073.1	3.437833	693,830.00	3.445833	76	50 - 150	-0.0080	+/-0.50	
M8PFOS	74254.83	3.6282	112,919.00	3.6282	66	50 - 150	0.0000	+/-0.50	
M9PFNA	455624	3.629233	636,673.00	3.629233	72	50 - 150	0.0000	+/-0.50	
MPFDoA	290611.7	4.07265	474,020.00	4.072667	61	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	98760.29	3.937517	154,296.00	3.945517	64	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	111730	3.865617	169,060.00	3.865617	66	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (B348570-BS1)		Lab File ID: B348570-BS1.d				Analyzed: 08/11/23 09:47			
M8FOSA	199788.8	3.972583	287,815.00	3.972583	69	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	50953.1	2.51325	56,342.00	2.51325	90	50 - 150	0.0000	+/-0.50	
M2PFTA	395222.5	4.313416	480,520.00	4.313416	82	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	56505.63	3.78685	58,511.00	3.78685	97	50 - 150	0.0000	+/-0.50	
MPFBA	324000.7	1.066783	415,125.00	1.058467	78	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	148797	2.8393	173,313.00	2.8393	86	50 - 150	0.0000	+/-0.50	
M6PFDA	516593.8	3.787383	659,331.00	3.787383	78	50 - 150	0.0000	+/-0.50	
M3PFBS	172402.1	1.90325	198,372.00	1.894967	87	50 - 150	0.0083	+/-0.50	
M7PFUnA	409864.1	3.938033	560,946.00	3.938033	73	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	34498.65	3.4293	38,169.00	3.4293	90	50 - 150	0.0000	+/-0.50	
M5PFPeA	345330.7	1.7231	418,578.00	1.7231	83	50 - 150	0.0000	+/-0.50	
M5PFHxA	598965.9	2.596983	697,827.00	2.596983	86	50 - 150	0.0000	+/-0.50	
M3PFHxS	89501.87	3.201883	107,774.00	3.201883	83	50 - 150	0.0000	+/-0.50	
M4PFHpA	559637.9	3.170783	656,777.00	3.170783	85	50 - 150	0.0000	+/-0.50	
M8PFOA	614478.4	3.437833	693,830.00	3.445833	89	50 - 150	-0.0080	+/-0.50	
M8PFOS	80001.98	3.6282	112,919.00	3.6282	71	50 - 150	0.0000	+/-0.50	
M9PFNA	498771.6	3.629233	636,673.00	3.629233	78	50 - 150	0.0000	+/-0.50	
MPFDoA	339542.4	4.07265	474,020.00	4.072667	72	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	103390	3.945517	154,296.00	3.945517	67	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	120514.3	3.865617	169,060.00	3.865617	71	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS Dup (B348570-BSD1) Lab File ID: B348570-BSD1.d Analyzed: 08/11/23 09:55									
M8FOSA	183317.6	3.972583	287,815.00	3.972583	64	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	48059.06	2.51325	56,342.00	2.51325	85	50 - 150	0.0000	+/-0.50	
M2PFTA	240248.5	4.313416	480,520.00	4.313416	50	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	46754.64	3.78685	58,511.00	3.78685	80	50 - 150	0.0000	+/-0.50	
MPFBA	295598.3	1.066783	415,125.00	1.058467	71	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	147255.5	2.8393	173,313.00	2.8393	85	50 - 150	0.0000	+/-0.50	
M6PFDA	484021.7	3.787383	659,331.00	3.787383	73	50 - 150	0.0000	+/-0.50	
M3PFBS	157423.8	1.90325	198,372.00	1.894967	79	50 - 150	0.0083	+/-0.50	
M7PFUnA	390492.5	3.93005	560,946.00	3.938033	70	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	34677.39	3.4293	38,169.00	3.4293	91	50 - 150	0.0000	+/-0.50	
M5PFPeA	313318.3	1.7231	418,578.00	1.7231	75	50 - 150	0.0000	+/-0.50	
M5PFHxA	544027.6	2.596983	697,827.00	2.596983	78	50 - 150	0.0000	+/-0.50	
M3PFHxS	82174.81	3.201883	107,774.00	3.201883	76	50 - 150	0.0000	+/-0.50	
M4PFHpA	520069	3.170783	656,777.00	3.170783	79	50 - 150	0.0000	+/-0.50	
M8PFOA	526017.6	3.437833	693,830.00	3.445833	76	50 - 150	-0.0080	+/-0.50	
M8PFOS	77094.91	3.6282	112,919.00	3.6282	68	50 - 150	0.0000	+/-0.50	
M9PFNA	494919.1	3.629233	636,673.00	3.629233	78	50 - 150	0.0000	+/-0.50	
MPFDoA	360725.3	4.072667	474,020.00	4.072667	76	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	102673.8	3.945517	154,296.00	3.945517	67	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	112949.9	3.865617	169,060.00	3.865617	67	50 - 150	0.0000	+/-0.50	

CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
<i>SOP-454 PFAS in Water</i>	
Perfluorobutanoic acid (PFBA)	NH-P,PA
Perfluorobutanesulfonic acid (PFBS)	NH-P,PA
Perfluoropentanoic acid (PFPeA)	NH-P,PA
Perfluorohexanoic acid (PFHxA)	NH-P,PA
11Cl-PF3OUdS (F53B Major)	NH-P,PA
9Cl-PF3ONS (F53B Minor)	NH-P,PA
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P,PA
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P,PA
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P,PA
Perfluorodecanoic acid (PFDA)	NH-P,PA
Perfluorododecanoic acid (PFDoA)	NH-P,PA
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	NH-P,PA
Perfluoroheptanesulfonic acid (PFHpS)	NH-P,PA
N-EtFOSAA (NEtFOSAA)	NH-P,PA
N-MeFOSAA (NMeFOSAA)	NH-P,PA
Perfluorotetradecanoic acid (PFTA)	NH-P,PA
Perfluorotridecanoic acid (PFTrDA)	NH-P,PA
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P,PA
Perfluorodecanesulfonic acid (PFDS)	NH-P,PA
Perfluorooctanesulfonamide (FOSA)	NH-P,PA
Perfluorononanesulfonic acid (PFNS)	NH-P,PA
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P,PA
Perfluoro-1-butanedisulfonamide (FBSA)	NH-P,PA
Perfluorohexanesulfonic acid (PFHxS)	NH-P,PA
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P,PA
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P,PA
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P,PA
Perfluoropentanesulfonic acid (PFPeS)	NH-P,PA
Perfluoroundecanoic acid (PFUnA)	NH-P,PA
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P,PA
Perfluoroheptanoic acid (PFHpA)	NH-P,PA
Perfluorooctanoic acid (PFOA)	NH-P,PA
Perfluorooctanesulfonic acid (PFOS)	NH-P,PA
Perfluorononanoic acid (PFNA)	NH-P,PA

Con-Test, a Pace Environmental Laboratory, operates under the following certifications and accreditations:

Code	Description	Number	Expires
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2023
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2024

11

Phone: 612-607-6400
Fax: 612-607-6344

<https://www.pacelabs.com/>

Doc # 381 Rev 4_01/08/2020

1800 Elm Street SE
Minneapolis, MN 55414

Page 1 of 3

Contact: https://www.pacelabs.com/contact-us/contact-environmental-sciences/ Company Name: Barnstable County Address: 3195 Main St. PO Box 427 Phone: Project Name: BFTA Project Location: Barnstable, MA 6206 Project Manager: Roger Thibault		ANALYSIS REQUESTED	
Pace Analytical Quote Name/Number: SWildanger @ Bet-Inc-CA Invoice Recipient: Piggalle Ellis - piggalle@bet-inc-ca.org Sampled By: Chris Olen, Laura Bouley, Amanda Ray		Requested Turnaround Time: 7-Day ☐ PFAS 10-Day (std) ☒ Due Date: Rush-Approval Required 1-Day ☐ 3-Day ☐ 2-Day ☐ 4-Day ☐	
Pace Analytical Work Order# 1 PC-16D ✓✓ 2 MW-401S ✓✓ 3 MW-401D ✓✓ 4 MW-403S ✓✓ 5 MW-403D ✓✓ 6 MW-402S ✓✓ 7 MW-402D ✓✓ 8 PC-39 ✓✓ 9 PC-39D ✓✓ 10 EB-7125 ✓✓		Dissolved Metals Samples ☐ Field Filtered ☐ Lab to Filter Orthophosphate Samples ☐ Field Filtered ☐ Lab to Filter	
Client Sample ID / Description Beginning Date/Time Ending Date/Time COMP / GRAB Matrix Code Conc Code		PCB ONLY SOXHLET NON SOXHLET	
VIALS GLASS PLASTIC BACTERIA ENCORE		Glassware in the fridge? Y / N Glassware in freezer? Y / N Prepackaged Cooler? Y / N *Pace Analytical is not responsible for missing samples from prepacked coolers	
¹ Matrix Codes: GW = Ground Water WW = Waste Water DW = Drinking Water A = Air S = Soil SL = Sludge SOL = Solid O = Other (please define)		² Preservation Codes: I = Iced H = HCL M = Methanol N = Nitric Acid S = Sulfuric Acid B = Sodium Bisulfate X = Sodium Hydroxide T = Sodium Thiosulfate O = Other (please define)	
Relinquished by: (signature) Received by: (signature) Relinquished by: (signature) Received by: (signature)		Special Requirements MA MCP Required MCP Certification Form Required CT RCP Required RCP Certification Form Required MA State DW Required PWSD # Other:	
Date/Time: 7-26-23 16:00 Date/Time: 7/28/23 13:10 Date/Time: 7/28/23 20:30 Date/Time:		Please use the following codes to indicate possible sample concentration within the Conc Code column above: H - High; M - Medium; L - Low; C - Clean; U - Unknown	
Relinquished by: (signature) Received by: (signature)		Detection Limit Requirements MA GW-1 CT Other:	
Relinquished by: (signature) Received by: (signature)		Project Entity Government ☐ Municipality ☐ WRTA ☐ Federal ☐ 21 J ☐ School ☐ MBTA ☐ City ☐ Brownfield ☐ Other ☐	
Lab Comments:		NELAC and AIHA-LAP, LLC Accredited	

Disclaimer: Pace Analytical is not responsible for any omitted information on the Chain of Custody. The Chain of Custody is a legal document that must be complete and accurate and is used to determine what analyses the laboratory will perform. Any missing information is not the laboratory's responsibility. Pace Analytical values your partnership on each project and will try to assist with missing information, but will not be held accountable.

ENV-FRM-ELON-0001 V05__Sample Receiving Checklist

Sample	Soils Jars (Circle Amb/Clear)				Ambers				Plastics							VOA Vials						Other / Fill in					
	16oz Amb/Clear	8oz Amb/Clear	4oz Amb/Clear	2oz Amb/Clear	Unpreserved	HCL	Sulfuric	Sulfuric	250mL	100mL	1 Liter	500mL	250mL				Unpreserved	HCl	MeOH	D.I. Water	Bisulfate	Col/Bact					
1																											
2																											
3																											
4																											
5																											
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December 4, 2023

Roger Thibault
Beta Group, Inc. - RI
701 George Washington Highway
Lincoln, RI 02865

Project Location: Barnstable, MA
Client Job Number:
Project Number: 6206.04
Laboratory Work Order Number: 23K1079

Enclosed are results of analyses for samples as received by the laboratory on November 8, 2023. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kaitlyn A. Feliciano
Project Manager

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Beta Group, Inc. - RI
701 George Washington Highway
Lincoln, RI 02865
ATTN: Roger Thibault

REPORT DATE: 12/4/2023

PURCHASE ORDER NUMBER: 23000936

PROJECT NUMBER: 6206.04

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 23K1079

The results of analyses performed on the following samples submitted to CON-TEST, a Pace Analytical Laboratory, are found in this report.

PROJECT LOCATION: Barnstable, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
HSW-6	23K1079-01	Ground Water		SOP-454 PFAS	
PFW-1	23K1079-02	Ground Water		SOP-454 PFAS	
PFW-5	23K1079-03	Ground Water		SOP-454 PFAS	
MW-311	23K1079-04	Ground Water		SOP-454 PFAS	
MW-35	23K1079-05	Ground Water		SOP-454 PFAS	
PC-6A	23K1079-07	Ground Water		SOP-454 PFAS	
PC-11	23K1079-08	Ground Water		SOP-454 PFAS	
PC-345	23K1079-09	Ground Water		SOP-454 PFAS	
DUP-1	23K1079-10	Water		SOP-454 PFAS	
PC-16D	23K1079-11	Ground Water		SOP-454 PFAS	
PC-29	23K1079-12	Ground Water		SOP-454 PFAS	
EB-11.1.23	23K1079-13	Equipment Blank Water		SOP-454 PFAS	
PC-30	23K1079-14	Ground Water		SOP-454 PFAS	
PC-14	23K1079-15	Ground Water		SOP-454 PFAS	
MW-125	23K1079-16	Ground Water		SOP-454 PFAS	
MW-22	23K1079-17	Ground Water		SOP-454 PFAS	
MW-35I	23K1079-18	Ground Water		SOP-454 PFAS	
EB.11.2.23	23K1079-19	Equipment Blank Water		SOP-454 PFAS	
PC-38	23K1079-20	Ground Water		SOP-454 PFAS	
Equip-Blank-11.3.23	23K1079-21	Equipment Blank Water		SOP-454 PFAS	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SOP-454 PFAS

Qualifications:

D-01

Sample extracted/prepared at a dilution due to sample matrix.

Analyte & Samples(s) Qualified:

23K1079-02[PFW-1], 23K1079-03[PFW-5], 23K1079-07[PC-6A], 23K1079-11[PC-16D], 23K1079-14[PC-30], 23K1079-16[MW-125]

E

Reported result is estimated. Value reported over verified calibration range.

Analyte & Samples(s) Qualified:

6:2 Fluorotelomersulfonic acid (6:2FTS A)

B357679-MS1, B357679-MSD1

MS-07A

Matrix spike and spike duplicate recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery.

Possibility of matrix effects that lead to low bias or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Perfluorodecanesulfonic acid (PFDS)

23K1079-08[PC-11], B357679-MS1, B357679-MSD1

Perfluoroheptanesulfonic acid (PFHpS)

23K1079-08[PC-11], B357679-MSD1

Perfluorononanesulfonic acid (PFNS)

23K1079-08[PC-11], B357679-MS1, B357679-MSD1

MS-09

Matrix spike recovery and/or matrix spike duplicate recovery outside of control limits. Possibility of sample matrix effects that lead to a low

bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

Analyte & Samples(s) Qualified:

Perfluorooctanesulfonamide (FOSA)

23K1079-08[PC-11], B357679-MS1, B357679-MSD1

MS-12

Matrix spike recovery and matrix spike duplicate recovery outside of control limits. Possibility of sample matrix effects that lead to a high

bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

Analyte & Samples(s) Qualified:

Perfluoroheptanesulfonic acid (PFHpS)

23K1079-08[PC-11], B357679-MS1

MS-19

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or

meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

6:2 Fluorotelomersulfonic acid (6:2FTS A)

23K1079-08RE1[PC-11], B357679-MS1, B357679-MSD1

8:2 Fluorotelomersulfonic acid (8:2FTS A)

23K1079-08RE1[PC-11], B357679-MS1, B357679-MSD1

Perfluoro-1-hexanesulfonamide (FHxSA)

23K1079-08RE1[PC-11], B357679-MS1, B357679-MSD1

Perfluorohexanesulfonic acid (PFHxS)

23K1079-08RE1[PC-11], B357679-MS1, B357679-MSD1

Perfluorohexanoic acid (PFHxA)

23K1079-08RE1[PC-11], B357679-MSD1

Perfluorooctanesulfonic acid (PFOS)

23K1079-08RE1[PC-11], B357679-MS1, B357679-MSD1

Perfluorooctanoic acid (PFOA)

23K1079-08[PC-11], B357679-MSD1

Perfluoropentanoic acid (PFPeA)

23K1079-08RE1[PC-11], B357679-MS1, B357679-MSD1

Perfluoroundecanoic acid (PFUnA)

23K1079-08RE1[PC-11], B357679-MS1, B357679-MSD1

MS-22

Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is within method specified criteria.

Analyte & Samples(s) Qualified:**N-EtFOSAA (NEtFOSAA)**

B357679-MS1

N-MeFOSAA (NMeFOSAA)

B357679-MSD1

Perfluorobutanesulfonic acid (PFBS)

23K1079-08[PC-11], B357679-MSD1

Perfluorobutanoic acid (PFBA)

23K1079-08[PC-11], B357679-MSD1

Perfluoroheptanoic acid (PFHpA)

23K1079-08[PC-11], B357679-MS1

Perfluoropentanesulfonic acid (PFPeS)23K1079-08[PC-11], B357679-MSD1

MS-23

Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is outside of the method specified criteria. Reduced precision anticipated for any reported result for this compound.

Analyte & Samples(s) Qualified:**Perfluoro-1-butanesulfonamide (FBSA)**

23K1079-08[PC-11], B357679-MSD1

Perfluorononanoic acid (PFNA)23K1079-08[PC-11], B357679-MSD1

PF-17

Extracted Internal Standard recovery is outside of control limits. Data is not significantly affected since associated analyte is not detected and bias is on the high side.

Analyte & Samples(s) Qualified:**M2-4:2FTS**23K1079-05[MW-35]

PF-18

Re-analysis confirmed Extracted Internal Standard failure due to matrix effects.

Analyte & Samples(s) Qualified:**M2-6:2FTS**

23K1079-08[PC-11], B357679-MS1, B357679-MSD1

M2-8:2FTS

23K1079-08[PC-11], B357679-MS1, B357679-MSD1

M2PF7A

23K1079-08[PC-11], B357679-MSD1

PF-19

Sample re-analyzed at a dilution that was re-fortified with internal standard.

Analyte & Samples(s) Qualified:**6:2 Fluorotelomersulfonic acid (6:2FTS A)**

23K1079-01RE1[HSW-6], 23K1079-02RE1[PFW-1], 23K1079-04RE1[MW-311], 23K1079-05RE1[MW-35], 23K1079-08RE1[PC-11]

8:2 Fluorotelomersulfonic acid (8:2FTS A)

23K1079-01RE1[HSW-6], 23K1079-02RE1[PFW-1], 23K1079-04RE1[MW-311], 23K1079-08RE1[PC-11]

Perfluoro-1-butanesulfonamide (FBSA)

23K1079-04RE1[MW-311]

Perfluoro-1-hexanesulfonamide (FHxSA)

23K1079-01RE1[HSW-6], 23K1079-02RE1[PFW-1], 23K1079-04RE1[MW-311], 23K1079-05RE1[MW-35], 23K1079-08RE1[PC-11]

Perfluorobutanoic acid (PFBA)

23K1079-04RE1[MW-311]

Perfluoroheptanesulfonic acid (PFHpS)

23K1079-04RE1[MW-311]

Perfluoroheptanoic acid (PFHpA)

23K1079-01RE1[HSW-6], 23K1079-04RE1[MW-311], 23K1079-05RE1[MW-35]

Perfluorohexanesulfonic acid (PFHxS)

23K1079-01RE1[HSW-6], 23K1079-02RE1[PFW-1], 23K1079-04RE1[MW-311], 23K1079-05RE1[MW-35], 23K1079-08RE1[PC-11], 23K1079-16RE1[MW-125]

Perfluorohexanoic acid (PFHxA)

23K1079-01RE1[HSW-6], 23K1079-04RE1[MW-311], 23K1079-05RE1[MW-35], 23K1079-08RE1[PC-11]

Perfluorononanesulfonic acid (PFNS)

23K1079-04RE4[MW-311]

Perfluorooctanesulfonic acid (PFOS)

23K1079-01RE2[HSW-6], 23K1079-02RE2[PFW-1], 23K1079-03RE1[PFW-5], 23K1079-04RE2[MW-311], 23K1079-05RE2[MW-35], 23K1079-07RE1[PC-6A], 23K1079-08RE1[PC-11], 23K1079-09RE1[PC-345], 23K1079-15RE1[PC-14], 23K1079-16RE1[MW-125], 23K1079-17RE1[MW-22]

Perfluorooctanoic acid (PFOA)

23K1079-01RE1[HSW-6], 23K1079-04RE1[MW-311], 23K1079-05RE1[MW-35]

Perfluoropentanesulfonic acid (PFPeS)

23K1079-04RE1[MW-311]

Perfluoropentanoic acid (PFPeA)

23K1079-01RE1[HSW-6], 23K1079-04RE1[MW-311], 23K1079-05RE1[MW-35], 23K1079-08RE1[PC-11]

Perfluoroundecanoic acid (PFUnA)

23K1079-08RE1[PC-11]

PF-23

Qualifier ion ratio <50% of associated calibration. Detection is suspect.

Analyte & Samples(s) Qualified:**N-McFOSAA (NMcFOSAA)**

23K1079-05[MW-35]

Perfluorodecanesulfonic acid (PFDS)

23K1079-01[HSW-6], 23K1079-02[PFW-1], 23K1079-04[MW-311], 23K1079-05[MW-35], 23K1079-08[PC-11]

Perfluorononanesulfonic acid (PFNS)

23K1079-05[MW-35]

R-05

Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound.

Analyte & Samples(s) Qualified:**Perfluorodecanesulfonic acid (PFDS)**

23K1079-08[PC-11], B357679-MSD1

Perfluoroheptanesulfonic acid (PFHpS)

23K1079-08[PC-11], B357679-MSD1

Perfluorononanesulfonic acid (PFNS)

23K1079-08[PC-11], B357679-MSD1

S-29

Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:

M2-4:2FTS

S097248-CCV2

M2-6:2FTS

23K1079-05RE1[MW-35], 23K1079-08RE1[PC-11], 23K1079-09[PC-345]

M2-8:2FTS

23K1079-05[MW-35], 23K1079-08RE1[PC-11], 23K1079-09[PC-345], 23K1079-10[DUP-1], 23K1079-12[PC-29]

M2PFTA

23K1079-09[PC-345], 23K1079-15[PC-14]

M8FOSA

23K1079-09[PC-345], 23K1079-15[PC-14], B357679-MS1

M8PFOS

23K1079-01[HSW-6], 23K1079-02[PFW-1], 23K1079-04[MW-311], 23K1079-05[MW-35], 23K1079-05RE2[MW-35]

M9PFNA

23K1079-01[HSW-6], 23K1079-02[PFW-1], 23K1079-04[MW-311], 23K1079-05[MW-35]

MPFBA

23K1079-01[HSW-6], 23K1079-05[MW-35], 23K1079-09[PC-345]

MPFDoA

23K1079-15[PC-14]

Z-01

Extracted internal standard outside of control limits due. No remaining volume for re-extraction.

Analyte & Samples(s) Qualified:**D3-NMeFOSAA**

23K1079-21[Equip-Blank-11.3.23]

D5-NEtFOSAA

23K1079-21[Equip-Blank-11.3.23]

M2-4:2FTS

23K1079-21[Equip-Blank-11.3.23]

M2-6:2FTS

23K1079-21[Equip-Blank-11.3.23]

M2-8:2FTS

23K1079-21[Equip-Blank-11.3.23]

M2PFTA

23K1079-21[Equip-Blank-11.3.23]

M3HFPO-DA

23K1079-21[Equip-Blank-11.3.23]

M3PFBS

23K1079-21[Equip-Blank-11.3.23]

M3PFHxS

23K1079-21[Equip-Blank-11.3.23]

M4PFHpA

23K1079-21[Equip-Blank-11.3.23]

M5PFHxA

23K1079-21[Equip-Blank-11.3.23]

M5PFPeA

23K1079-21[Equip-Blank-11.3.23]

M6PFDA

23K1079-21[Equip-Blank-11.3.23]

M7PFUnA

23K1079-21[Equip-Blank-11.3.23]

M8FOSA

23K1079-21[Equip-Blank-11.3.23]

M8PFOA

23K1079-21[Equip-Blank-11.3.23]

M8PFOS

23K1079-21[Equip-Blank-11.3.23]

M9PFNA

23K1079-21[Equip-Blank-11.3.23]

MPFBA

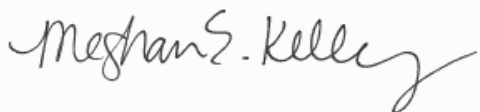
23K1079-21[Equip-Blank-11.3.23]

MPFDoA

23K1079-21[Equip-Blank-11.3.23]

The results of analyses reported only relate to samples submitted to Con-Test, a Pace Analytical Laboratory, for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Meghan E. Kelley
Reporting Specialist

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Field Sample #: HSW-6

Sampled: 11/2/2023 09:15

Sample ID: 23K1079-01

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	120	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
Perfluorobutanesulfonic acid (PFBS)	45	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
Perfluoropentanoic acid (PFPeA)	500	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:02	RRB
Perfluorohexanoic acid (PFHxA)	480	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:02	RRB
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	390	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:02	RRB
Perfluorodecanoic acid (PFDA)	34	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
Perfluorododecanoic acid (PFDoA)	3.0	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
Perfluoroheptanesulfonic acid (PFHpS)	56	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
Perfluorotridecanoic acid (PFTrDA)	6.8	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	7.1	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
Perfluorodecanesulfonic acid (PFDS)	18	1.9	ng/L	1	PF-23	SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
Perfluorooctanesulfonamide (FOSA)	4.8	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
Perfluorononanesulfonic acid (PFNS)	78	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	260	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:02	RRB
Perfluoro-1-butanefulfonamide (FBFA)	93	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
Perfluorohexanesulfonic acid (PFHxS)	430	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:02	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	750	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:02	RRB
Perfluoropentanesulfonic acid (PFPeS)	80	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
Perfluoroundecanoic acid (PFUnA)	120	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB
Perfluoroheptanoic acid (PFHpA)	190	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:02	RRB
Perfluorooctanoic acid (PFOA)	160	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:02	RRB
Perfluorooctanesulfonic acid (PFOS)	3200	380	ng/L	200	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:09	RRB
Perfluorononanoic acid (PFNA)	170	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 21:43	RRB

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Field Sample #: PFW-1

Sampled: 11/2/2023 10:00

Sample ID: 23K1079-02

Sample Matrix: Ground Water

Sample Flags: D-01

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	140	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Perfluorobutanesulfonic acid (PFBS)	63	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Perfluoropentanoic acid (PFPeA)	470	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Perfluorohexanoic acid (PFHxA)	470	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
11Cl-PF3OUdS (F53B Major)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
9Cl-PF3ONS (F53B Minor)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	2400	210	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:16	RRB
Perfluorodecanoic acid (PFDA)	95	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Perfluorododecanoic acid (PFDoA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Perfluoroheptanesulfonic acid (PFHpS)	290	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
N-EtFOSAA (NEtFOSAA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
N-MeFOSAA (NMeFOSAA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Perfluorotetradecanoic acid (PFTA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Perfluorodecanesulfonic acid (PFDS)	17	11	ng/L	1	PF-23	SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Perfluorooctanesulfonamide (FOSA)	11	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Perfluorononanesulfonic acid (PFNS)	260	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	1700	210	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:16	RRB
Perfluoro-1-butanefulfonamide (FBFA)	190	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Perfluorohexanesulfonic acid (PFHxS)	1000	210	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:16	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	1200	210	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:16	RRB
Perfluoropentanesulfonic acid (PFPeS)	130	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Perfluoroundecanoic acid (PFUnA)	140	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Nonfluoro-3,6-dioxahexanoic acid (NFDHA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Perfluoroheptanoic acid (PFHpA)	230	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Perfluorooctanoic acid (PFOA)	370	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB
Perfluorooctanesulfonic acid (PFOS)	20000	2100	ng/L	200	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:23	RRB
Perfluorononanoic acid (PFNA)	260	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:05	RRB

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Field Sample #: PFW-5

Sampled: 11/3/2023 10:05

Sample ID: 23K1079-03

Sample Matrix: Ground Water

Sample Flags: D-01

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	29	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluorobutanesulfonic acid (PFBS)	26	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluoropentanoic acid (PFPeA)	75	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluorohexanoic acid (PFHxA)	89	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
11Cl-PF3OUdS (F53B Major)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
9Cl-PF3ONS (F53B Minor)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	250	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluorodecanoic acid (PFDA)	5.5	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluorododecanoic acid (PFDoA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluoroheptanesulfonic acid (PFHpS)	21	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
N-EtFOSAA (NEtFOSAA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
N-MeFOSAA (NMeFOSAA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluorotetradecanoic acid (PFTA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluorooctanesulfonamide (FOSA)	27	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluorononanesulfonic acid (PFNS)	7.6	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	120	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluoro-1-butanefulfonamide (FBFA)	16	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluorohexanesulfonic acid (PFHxS)	370	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	9.7	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluoropentanesulfonic acid (PFPeS)	38	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluoroundecanoic acid (PFUnA)	22	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluoroheptanoic acid (PFHpA)	67	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluorooctanoic acid (PFOA)	64	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB
Perfluorooctanesulfonic acid (PFOS)	940	84	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:31	RRB
Perfluorononanoic acid (PFNA)	52	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:12	RRB

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Sampled: 11/2/2023 13:15

Field Sample #: MW-311

Sample ID: 23K1079-04

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	150	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:53	RRB
Perfluorobutanesulfonic acid (PFBS)	100	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
Perfluoropentanoic acid (PFPeA)	560	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:53	RRB
Perfluorohexanoic acid (PFHxA)	500	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:53	RRB
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	1100	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:53	RRB
Perfluorodecanoic acid (PFDA)	67	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
Perfluoroheptanesulfonic acid (PFHpS)	350	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:53	RRB
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	4.3	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
Perfluorodecanesulfonic acid (PFDS)	14	1.9	ng/L	1	PF-23	SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
Perfluorooctanesulfonamide (FOSA)	18	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
Perfluorononanesulfonic acid (PFNS)	80	3.8	ng/L	2	PF-19	SOP-454 PFAS	11/28/23	12/4/23 12:03	JR2
Perfluoro-1-hexanesulfonamide (FHxSA)	890	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:53	RRB
Perfluoro-1-butanefulfonamide (FBFA)	140	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:53	RRB
Perfluorohexanesulfonic acid (PFHxS)	1600	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:53	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	1200	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:53	RRB
Perfluoropentanesulfonic acid (PFPeS)	120	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:53	RRB
Perfluoroundecanoic acid (PFUnA)	100	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB
Perfluoroheptanoic acid (PFHpA)	300	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:53	RRB
Perfluorooctanoic acid (PFOA)	470	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 1:53	RRB
Perfluorooctanesulfonic acid (PFOS)	5900	380	ng/L	200	PF-19	SOP-454 PFAS	11/28/23	12/1/23 2:00	RRB
Perfluorononanoic acid (PFNA)	190	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:19	RRB

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Field Sample #: MW-35

Sampled: 11/2/2023 13:50

Sample ID: 23K1079-05

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	110	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
Perfluorobutanesulfonic acid (PFBS)	41	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
Perfluoropentanoic acid (PFPeA)	430	36	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 2:07	RRB
Perfluorohexanoic acid (PFHxA)	280	36	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 2:07	RRB
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	11	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
Perfluorodecanoic acid (PFDA)	8.0	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
Perfluoroheptanesulfonic acid (PFHpS)	86	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
N-MeFOSAA (NMeFOSAA)	2.2	1.8	ng/L	1	PF-23	SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
Perfluorodecanesulfonic acid (PFDS)	2.3	1.8	ng/L	1	PF-23	SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
Perfluorooctanesulfonamide (FOSA)	36	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
Perfluorononanesulfonic acid (PFNS)	20	1.8	ng/L	1	PF-23	SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	230	36	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 2:07	RRB
Perfluoro-1-butanefulfonamide (FBFA)	20	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
Perfluorohexanesulfonic acid (PFHxS)	890	36	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 2:07	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	220	36	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 2:07	RRB
Perfluoropentanesulfonic acid (PFPeS)	70	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
Perfluoroundecanoic acid (PFUnA)	19	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB
Perfluoroheptanoic acid (PFHpA)	210	36	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 2:07	RRB
Perfluorooctanoic acid (PFOA)	280	36	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 2:07	RRB
Perfluorooctanesulfonic acid (PFOS)	2800	360	ng/L	200	PF-19	SOP-454 PFAS	11/28/23	12/1/23 2:14	RRB
Perfluorononanoic acid (PFNA)	97	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:27	RRB

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Field Sample #: PC-6A

Sampled: 11/3/2023 09:30

Sample ID: 23K1079-07

Sample Matrix: Ground Water

Sample Flags: D-01

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	6.3	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluoropentanoic acid (PFPeA)	9.7	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluorohexanoic acid (PFHxA)	12	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
11Cl-PF3OUdS (F53B Major)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
9Cl-PF3ONS (F53B Minor)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluorodecanoic acid (PFDA)	8.7	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluorododecanoic acid (PFDoA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
N-EtFOSAA (NEtFOSAA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
N-MeFOSAA (NMeFOSAA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluorotetradecanoic acid (PFTA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluorooctanesulfonamide (FOSA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluorononanesulfonic acid (PFNS)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	13	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluoro-1-butanefulfonamide (FBFA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluorohexanesulfonic acid (PFHxS)	61	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluoropentanesulfonic acid (PFPeS)	4.9	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluoroundecanoic acid (PFUnA)	47	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Nonafluoro-3,6-dioxahexanoic acid (NFDHA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluoroheptanoic acid (PFHpA)	11	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluorooctanoic acid (PFOA)	11	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB
Perfluorooctanesulfonic acid (PFOS)	360	42	ng/L	10	PF-19	SOP-454 PFAS	11/28/23	12/1/23 11:04	RRB
Perfluorononanoic acid (PFNA)	24	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:34	RRB

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Field Sample #: PC-11

Sampled: 11/1/2023 14:00

Sample ID: 23K1079-08

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	67	1.9	ng/L	1	MS-22	SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
Perfluorobutanesulfonic acid (PFBS)	20	1.9	ng/L	1	MS-22	SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
Perfluoropentanoic acid (PFPeA)	150	38	ng/L	20	MS-19, PF-19	SOP-454 PFAS	11/28/23	12/1/23 2:29	RRB
Perfluorohexanoic acid (PFHxA)	160	38	ng/L	20	MS-19, PF-19	SOP-454 PFAS	11/28/23	12/1/23 2:29	RRB
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	120	38	ng/L	20	MS-19, PF-19	SOP-454 PFAS	11/28/23	12/1/23 2:29	RRB
Perfluorodecanoic acid (PFDA)	9.2	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
Perfluoroheptanesulfonic acid (PFHpS)	19	1.9	ng/L	1	MS-07A, MS-12, R-05	SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	2.4	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
Perfluorodecanesulfonic acid (PFDS)	35	1.9	ng/L	1	MS-07A, PF-23, R-05	SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
Perfluorooctanesulfonamide (FOSA)	13	1.9	ng/L	1	MS-09	SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
Perfluorononanesulfonic acid (PFNS)	39	1.9	ng/L	1	MS-07A, R-05	SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	180	38	ng/L	20	MS-19, PF-19	SOP-454 PFAS	11/28/23	12/1/23 2:29	RRB
Perfluoro-1-butanefulfonamide (FBSA)	54	1.9	ng/L	1	MS-23	SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
Perfluorohexanesulfonic acid (PFHxS)	200	38	ng/L	20	MS-19, PF-19	SOP-454 PFAS	11/28/23	12/1/23 2:29	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	250	38	ng/L	20	MS-19, PF-19	SOP-454 PFAS	11/28/23	12/1/23 2:29	RRB
Perfluoropentanesulfonic acid (PFPeS)	35	1.9	ng/L	1	MS-22	SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
Perfluoroundecanoic acid (PFUnA)	150	38	ng/L	20	MS-19, PF-19	SOP-454 PFAS	11/28/23	12/1/23 2:29	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
Perfluoroheptanoic acid (PFHpA)	99	1.9	ng/L	1	MS-22	SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
Perfluorooctanoic acid (PFOA)	80	1.9	ng/L	1	MS-19	SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB
Perfluorooctanesulfonic acid (PFOS)	830	38	ng/L	20	MS-19, PF-19	SOP-454 PFAS	11/28/23	12/1/23 2:29	RRB
Perfluorononanoic acid (PFNA)	74	1.9	ng/L	1	MS-23	SOP-454 PFAS	11/28/23	11/29/23 22:41	RRB

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Sampled: 11/2/2023 10:40

Field Sample #: PC-345

Sample ID: 23K1079-09

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	49	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluorobutanesulfonic acid (PFBS)	22	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluoropentanoic acid (PFPeA)	130	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluorohexanoic acid (PFHxA)	170	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
11Cl-PF3OUdS (F53B Major)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
9Cl-PF3ONS (F53B Minor)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	9.8	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluorodecanoic acid (PFDA)	13	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluoroheptanesulfonic acid (PFHpS)	22	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
N-EtFOSAA (NEtFOSAA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
N-MeFOSAA (NMeFOSAA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluorooctanesulfonamide (FOSA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluorononanesulfonic acid (PFNS)	4.5	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	30	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluoro-1-butanefulfonamide (FBFA)	17	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluorohexanesulfonic acid (PFHxS)	130	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	86	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluoropentanesulfonic acid (PFPeS)	20	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluoroundecanoic acid (PFUnA)	8.3	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluoroheptanoic acid (PFHpA)	97	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluorooctanoic acid (PFOA)	73	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB
Perfluorooctanesulfonic acid (PFOS)	800	40	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 2:43	RRB
Perfluorononanoic acid (PFNA)	120	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:48	RRB

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Sampled: 11/3/2023 08:40

Field Sample #: DUP-1

Sample ID: 23K1079-10

Sample Matrix: Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluoropentanoic acid (PFPeA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluorohexanoic acid (PFHxA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluorohexanesulfonic acid (PFHxS)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Nonafluoro-3,6-dioxahexanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluoroheptanoic acid (PFHpA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluorooctanoic acid (PFOA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluorooctanesulfonic acid (PFOS)	4.1	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB
Perfluorononanoic acid (PFNA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 22:55	RRB

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Field Sample #: PC-16D

Sampled: 11/2/2023 12:00

Sample ID: 23K1079-11

Sample Matrix: Ground Water

Sample Flags: D-01

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	20	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluoropentanoic acid (PFPeA)	57	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluorohexanoic acid (PFHxA)	52	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
11Cl-PF3OUdS (F53B Major)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
9Cl-PF3ONS (F53B Minor)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluorodecanoic acid (PFDA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluorododecanoic acid (PFDoA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
N-EtFOSAA (NEtFOSAA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
N-MeFOSAA (NMeFOSAA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluorotetradecanoic acid (PFTA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluorooctanesulfonamide (FOSA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluorononanesulfonic acid (PFNS)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	11	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluoro-1-butanefulfonamide (FBFA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluorohexanesulfonic acid (PFHxS)	54	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	11	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluoropentanesulfonic acid (PFPeS)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluoroundecanoic acid (PFUnA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluoroheptanoic acid (PFHpA)	22	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluorooctanoic acid (PFOA)	11	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluorooctanesulfonic acid (PFOS)	200	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB
Perfluorononanoic acid (PFNA)	ND	11	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:03	RRB

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Sampled: 11/1/2023 11:10

Field Sample #: PC-29

Sample ID: 23K1079-12

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluorohexanesulfonic acid (PFHxS)	2.1	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:10	RRB

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Sampled: 11/1/2023 14:30

Field Sample #: EB-11.1.23

Sample ID: 23K1079-13

Sample Matrix: Equipment Blank Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluoropentanoic acid (PFPeA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluorohexanoic acid (PFHxA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
11Cl-PF3OUdS (F53B Major)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
9Cl-PF3ONS (F53B Minor)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
N-EtFOSAA (NEtFOSAA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
N-MeFOSAA (NMeFOSAA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluorodecanesulfonic acid (PFDS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluorooctanesulfonamide (FOSA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluorononanesulfonic acid (PFNS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluoro-1-butanesulfonamide (FBSA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluoropentanesulfonic acid (PFPeS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/29/23 23:53	AMS

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Field Sample #: PC-30

Sampled: 11/2/2023 11:00

Sample ID: 23K1079-14

Sample Matrix: Ground Water

Sample Flags: D-01

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	21	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluorobutanesulfonic acid (PFBS)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluoropentanoic acid (PFPeA)	51	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluorohexanoic acid (PFHxA)	66	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluorodecanoic acid (PFDA)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluoroheptanesulfonic acid (PFHpS)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluorotridecanoic acid (PFTrDA)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluoro-1-hexanesulfonamide (FHxSA)	29	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluoro-1-butanefulfonamide (FBFA)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluorohexanesulfonic acid (PFHxS)	98	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
6:2 Fluorotelomersulfonic acid (6:2FTS A)	26	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluoropentanesulfonic acid (PFPeS)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluoroundecanoic acid (PFUnA)	16	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluoroheptanoic acid (PFHpA)	45	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluorooctanoic acid (PFOA)	37	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluorooctanesulfonic acid (PFOS)	870	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS
Perfluorononanoic acid (PFNA)	69	10	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:00	AMS

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Sampled: 11/1/2023 12:30

Field Sample #: PC-14

Sample ID: 23K1079-15

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	15	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluorobutanesulfonic acid (PFBS)	6.5	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluoropentanoic acid (PFPeA)	42	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluorohexanoic acid (PFHxA)	42	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
8:2 Fluorotelomersulfonic acid (8:2FTS A)	6.5	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluorodecanoic acid (PFDA)	6.4	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluoroheptanesulfonic acid (PFHpS)	6.2	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluorotridecanoic acid (PFTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluorooctanesulfonamide (FOSA)	18	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluorononanesulfonic acid (PFNS)	2.3	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluoro-1-hexanesulfonamide (FHxSA)	7.8	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluoro-1-butanefulfonamide (FBFA)	7.6	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluorohexanesulfonic acid (PFHxS)	77	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
6:2 Fluorotelomersulfonic acid (6:2FTS A)	21	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluoropentanesulfonic acid (PFPeS)	8.7	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluoroundecanoic acid (PFUnA)	16	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluoroheptanoic acid (PFHpA)	34	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluorooctanoic acid (PFOA)	18	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS
Perfluorooctanesulfonic acid (PFOS)	380	38	ng/L	20	PF-19	SOP-454 PFAS	11/28/23	12/1/23 3:05	RRB
Perfluorononanoic acid (PFNA)	34	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:07	AMS

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Field Sample #: MW-125

Sampled: 11/1/2023 13:30

Sample ID: 23K1079-16

Sample Matrix: Ground Water

Sample Flags: D-01

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	84	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluorobutanesulfonic acid (PFBS)	23	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluoropentanoic acid (PFPeA)	330	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluorohexanoic acid (PFHxA)	250	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
11Cl-PF3OUdS (F53B Major)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
9Cl-PF3ONS (F53B Minor)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluorodecanoic acid (PFDA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluorododecanoic acid (PFDoA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluoroheptanesulfonic acid (PFHpS)	15	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
N-EtFOSAA (NEtFOSAA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
N-MeFOSAA (NMeFOSAA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluorotetradecanoic acid (PFTA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluorotridecanoic acid (PFTrDA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluorodecanesulfonic acid (PFDS)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluorooctanesulfonamide (FOSA)	360	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluorononanesulfonic acid (PFNS)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluoro-1-hexanesulfonamide (FHxSA)	55	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluoro-1-butanefulfonamide (FBFA)	14	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluorohexanesulfonic acid (PFHxS)	470	42	ng/L	10	PF-19	SOP-454 PFAS	11/28/23	12/1/23 3:12	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
6:2 Fluorotelomersulfonic acid (6:2FTS A)	95	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluoropentanesulfonic acid (PFPeS)	35	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluoroundecanoic acid (PFUnA)	13	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluoroheptanoic acid (PFHpA)	140	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluorooctanoic acid (PFOA)	150	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS
Perfluorooctanesulfonic acid (PFOS)	660	42	ng/L	10	PF-19	SOP-454 PFAS	11/28/23	12/1/23 3:12	RRB
Perfluorononanoic acid (PFNA)	24	4.2	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:15	AMS

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Field Sample #: MW-22

Sampled: 11/1/2023 12:30

Sample ID: 23K1079-17

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluoropentanoic acid (PFPeA)	3.1	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluorohexanoic acid (PFHxA)	4.2	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluoroheptanesulfonic acid (PFHpS)	2.6	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluoro-1-hexanesulfonamide (FHxSA)	2.2	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluorohexanesulfonic acid (PFHxS)	71	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluoropentanesulfonic acid (PFPeS)	3.1	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluoroheptanoic acid (PFHpA)	2.8	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluorooctanoic acid (PFOA)	14	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS
Perfluorooctanesulfonic acid (PFOS)	160	18	ng/L	10	PF-19	SOP-454 PFAS	11/28/23	12/1/23 3:19	RRB
Perfluorononanoic acid (PFNA)	1.9	1.8	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:22	AMS

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Field Sample #: MW-351

Sampled: 11/1/2023 11:30

Sample ID: 23K1079-18

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluoropentanoic acid (PFPeA)	2.7	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluorohexanoic acid (PFHxA)	3.4	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
11Cl-PF3OUdS (F53B Major)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
9Cl-PF3ONS (F53B Minor)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
N-EtFOSAA (NEtFOSAA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
N-MeFOSAA (NMeFOSAA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluorodecanesulfonic acid (PFDS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluorooctanesulfonamide (FOSA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluorononanesulfonic acid (PFNS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluoro-1-butanefulfonamide (FBFA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluorohexanesulfonic acid (PFHxS)	13	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluoropentanesulfonic acid (PFPeS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluorooctanesulfonic acid (PFOS)	21	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:29	AMS

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Sampled: 11/2/2023 14:30

Field Sample #: EB.11.2.23

Sample ID: 23K1079-19

Sample Matrix: Equipment Blank Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluoropentanoic acid (PFPeA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluorohexanoic acid (PFHxA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluorotridecanoic acid (PFTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluorohexanesulfonic acid (PFHxS)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluoroheptanoic acid (PFHpA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluorooctanoic acid (PFOA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluorooctanesulfonic acid (PFOS)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS
Perfluorononanoic acid (PFNA)	ND	1.9	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:36	AMS

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Sampled: 11/3/2023 08:30

Field Sample #: PC-38

Sample ID: 23K1079-20

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluoropentanoic acid (PFPeA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluorohexanoic acid (PFHxA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
11Cl-PF3OUdS (F53B Major)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
9Cl-PF3ONS (F53B Minor)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
N-EtFOSAA (NEtFOSAA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
N-MeFOSAA (NMeFOSAA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluorodecanesulfonic acid (PFDS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluorooctanesulfonamide (FOSA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluorononanesulfonic acid (PFNS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluoro-1-butanefulfonamide (FBFA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluoropentanesulfonic acid (PFPeS)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluorooctanesulfonic acid (PFOS)	3.5	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:43	AMS

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K1079

Date Received: 11/8/2023

Field Sample #: Equip-Blank-11.3.23

Sampled: 11/3/2023 11:20

Sample ID: 23K1079-21

Sample Matrix: Equipment Blank Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluorobutanesulfonic acid (PFBS)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluoropentanoic acid (PFPeA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluorohexanoic acid (PFHxA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
11Cl-PF3OUdS (F53B Major)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
9Cl-PF3ONS (F53B Minor)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluorodecanoic acid (PFDA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluorododecanoic acid (PFDoA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
N-EtFOSAA (NEtFOSAA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
N-MeFOSAA (NMeFOSAA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluorotetradecanoic acid (PFTA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluorotridecanoic acid (PFTrDA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluorodecanesulfonic acid (PFDS)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluorooctanesulfonamide (FOSA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluorononanesulfonic acid (PFNS)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluorohexanesulfonic acid (PFHxS)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluoropentanesulfonic acid (PFPeS)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluoroundecanoic acid (PFUnA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluoroheptanoic acid (PFHpA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluorooctanoic acid (PFOA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluorooctanesulfonic acid (PFOS)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS
Perfluorononanoic acid (PFNA)	ND	1.7	ng/L	1		SOP-454 PFAS	11/28/23	11/30/23 0:51	AMS

Sample Extraction Data

Prep Method:SOP 454-PFAAS Analytical Method:SOP-454 PFAS

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23K1079-01 [HSW-6]	B357679	266	1.00	11/28/23
23K1079-01RE1 [HSW-6]	B357679	266	1.00	11/28/23
23K1079-01RE2 [HSW-6]	B357679	266	1.00	11/28/23
23K1079-02 [PFW-1]	B357679	47.1	1.00	11/28/23
23K1079-02RE1 [PFW-1]	B357679	47.1	1.00	11/28/23
23K1079-02RE2 [PFW-1]	B357679	47.1	1.00	11/28/23
23K1079-03 [PFW-5]	B357679	119	1.00	11/28/23
23K1079-03RE1 [PFW-5]	B357679	119	1.00	11/28/23
23K1079-04 [MW-311]	B357679	261	1.00	11/28/23
23K1079-04RE1 [MW-311]	B357679	261	1.00	11/28/23
23K1079-04RE2 [MW-311]	B357679	261	1.00	11/28/23
23K1079-04RE4 [MW-311]	B357679	261	1.00	11/28/23
23K1079-05 [MW-35]	B357679	274	1.00	11/28/23
23K1079-05RE1 [MW-35]	B357679	274	1.00	11/28/23
23K1079-05RE2 [MW-35]	B357679	274	1.00	11/28/23
23K1079-07 [PC-6A]	B357679	119	1.00	11/28/23
23K1079-07RE1 [PC-6A]	B357679	119	1.00	11/28/23
23K1079-08 [PC-11]	B357679	266	1.00	11/28/23
23K1079-08RE1 [PC-11]	B357679	266	1.00	11/28/23
23K1079-09 [PC-345]	B357679	253	1.00	11/28/23
23K1079-09RE1 [PC-345]	B357679	253	1.00	11/28/23
23K1079-10 [DUP-1]	B357679	260	1.00	11/28/23
23K1079-11 [PC-16D]	B357679	47.6	1.00	11/28/23
23K1079-12 [PC-29]	B357679	284	1.00	11/28/23

Prep Method:SOP 454-PFAAS Analytical Method:SOP-454 PFAS

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23K1079-13 [EB-11.1.23]	B358210	256	1.00	11/28/23
23K1079-14 [PC-30]	B358210	48.1	1.00	11/28/23
23K1079-15 [PC-14]	B358210	263	1.00	11/28/23
23K1079-15RE1 [PC-14]	B358210	263	1.00	11/28/23
23K1079-16 [MW-125]	B358210	119	1.00	11/28/23
23K1079-16RE1 [MW-125]	B358210	119	1.00	11/28/23
23K1079-17 [MW-22]	B358210	273	1.00	11/28/23
23K1079-17RE1 [MW-22]	B358210	273	1.00	11/28/23
23K1079-18 [MW-35I]	B358210	254	1.00	11/28/23
23K1079-19 [EB.11.2.23]	B358210	267	1.00	11/28/23
23K1079-20 [PC-38]	B358210	251	1.00	11/28/23
23K1079-21 [Equip-Blank-11.3.23]	B358210	289	1.00	11/28/23

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B357679 - SOP 454-PFAAS
Blank (B357679-BLK1)

Prepared: 11/28/23 Analyzed: 11/29/23

Perfluorobutanoic acid (PFBA)	ND	1.9	ng/L
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L
Perfluoropentanoic acid (PFPeA)	ND	1.9	ng/L
Perfluorohexanoic acid (PFHxA)	ND	1.9	ng/L
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.9	ng/L
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L
Perfluorotridecanoic acid (PFTrDA)	ND	1.9	ng/L
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.9	ng/L
Perfluorohexanesulfonic acid (PFHxS)	ND	1.9	ng/L
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.9	ng/L
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L
Perfluoroheptanoic acid (PFHpA)	ND	1.9	ng/L
Perfluorooctanoic acid (PFOA)	ND	1.9	ng/L
Perfluorooctanesulfonic acid (PFOS)	ND	1.9	ng/L
Perfluorononanoic acid (PFNA)	ND	1.9	ng/L

LCS (B357679-BS1)

Prepared: 11/28/23 Analyzed: 11/29/23

Perfluorobutanoic acid (PFBA)	10.1	1.9	ng/L	9.44	107	73-129
Perfluorobutanesulfonic acid (PFBS)	8.83	1.9	ng/L	8.35	106	72-130
Perfluoropentanoic acid (PFPeA)	9.98	1.9	ng/L	9.44	106	72-129
Perfluorohexanoic acid (PFHxA)	10.4	1.9	ng/L	9.44	110	72-129
11Cl-PF3OUdS (F53B Major)	6.97	1.9	ng/L	8.89	78.4	43.3-138
9Cl-PF3ONS (F53B Minor)	7.53	1.9	ng/L	8.80	85.6	52-140
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	7.22	1.9	ng/L	8.89	81.2	53.7-152
Hexafluoropropylene oxide dimer acid (HFPO-DA)	7.27	1.9	ng/L	9.44	77.1	42.1-145
8:2 Fluorotelomersulfonic acid (8:2FTS A)	9.23	1.9	ng/L	9.06	102	67-138
Perfluorodecanoic acid (PFDA)	10.3	1.9	ng/L	9.44	109	71-129
Perfluorododecanoic acid (PFDoA)	11.7	1.9	ng/L	9.44	124	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	7.12	1.9	ng/L	8.40	84.7	52.7-147

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B357679 - SOP 454-PFAAS
LCS (B357679-BS1)

Prepared: 11/28/23 Analyzed: 11/29/23

Perfluoroheptanesulfonic acid (PFHpS)	10.7	1.9	ng/L	9.01		118	69-134			
N-EtFOSAA (NEtFOSAA)	12.2	1.9	ng/L	9.44		130	61-135			
N-MeFOSAA (NMeFOSAA)	11.4	1.9	ng/L	9.44		121	65-136			
Perfluorotetradecanoic acid (PFTA)	10.2	1.9	ng/L	9.44		108	71-132			
Perfluorotridecanoic acid (PFTTrDA)	9.62	1.9	ng/L	9.44		102	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	9.82	1.9	ng/L	8.83		111	63-143			
Perfluorodecanesulfonic acid (PFDS)	8.57	1.9	ng/L	9.11		94.1	53-142			
Perfluorooctanesulfonamide (FOSA)	10.9	1.9	ng/L	9.44		116	67-137			
Perfluorononanesulfonic acid (PFNS)	9.50	1.9	ng/L	9.06		105	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	6.59	1.9	ng/L	9.44		69.8	50-150			
Perfluoro-1-butanefulfonamide (FBSA)	7.01	1.9	ng/L	9.44		74.3	50-150			
Perfluorohexanesulfonic acid (PFHxS)	10.0	1.9	ng/L	8.64		116	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	8.73	1.9	ng/L	9.44		92.5	53.8-150			
Perfluoro-5-oxahexanoic acid (PFMBA)	8.59	1.9	ng/L	9.44		91.0	54.5-152			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	9.93	1.9	ng/L	8.97		111	64-140			
Perfluoropentanesulfonic acid (PFPeS)	10.4	1.9	ng/L	8.87		117	71-127			
Perfluoroundecanoic acid (PFUnA)	9.96	1.9	ng/L	9.44		106	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	8.61	1.9	ng/L	9.44		91.2	50.5-159			
Perfluoroheptanoic acid (PFHpA)	9.84	1.9	ng/L	9.44		104	72-130			
Perfluorooctanoic acid (PFOA)	11.3	1.9	ng/L	9.44		120	71-133			
Perfluorooctanesulfonic acid (PFOS)	9.52	1.9	ng/L	8.73		109	65-140			
Perfluorononanoic acid (PFNA)	9.32	1.9	ng/L	9.44		98.7	69-130			

Matrix Spike (B357679-MS1)
Source: 23K1079-08

Prepared: 11/28/23 Analyzed: 11/29/23

Perfluorobutanoic acid (PFBA)	75.6	1.9	ng/L	9.48	66.8	93.3	73-129			
Perfluorobutanesulfonic acid (PFBS)	28.6	1.9	ng/L	8.39	20.3	98.6	72-130			
Perfluoropentanoic acid (PFPeA)	225	1.9	ng/L	9.48	209	171 *	72-129			MS-19
Perfluorohexanoic acid (PFHxA)	224	1.9	ng/L	9.48	215	99.7	72-129			
11Cl-PF3OUdS (F53B Major)	7.50	1.9	ng/L	8.93	ND	84.0	50-150			
9Cl-PF3ONS (F53B Minor)	9.70	1.9	ng/L	8.83	ND	110	50-150			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	7.60	1.9	ng/L	8.93	ND	85.2	51.4-161			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.67	1.9	ng/L	9.48	ND	91.5	40.3-148			
8:2 Fluorotelomersulfonic acid (8:2FTS A)	217	1.9	ng/L	9.10	216	17.2 *	67-138			MS-19
Perfluorodecanoic acid (PFDA)	19.9	1.9	ng/L	9.48	9.19	113	71-129			
Perfluorododecanoic acid (PFDoA)	11.8	1.9	ng/L	9.48	ND	124	72-134			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	7.30	1.9	ng/L	8.44	ND	86.5	57.2-150			
Perfluoroheptanesulfonic acid (PFHpS)	32.6	1.9	ng/L	9.05	19.5	145 *	69-134			MS-12
N-EtFOSAA (NEtFOSAA)	14.1	1.9	ng/L	9.48	1.15	137 *	61-135			MS-22
N-MeFOSAA (NMeFOSAA)	12.9	1.9	ng/L	9.48	ND	136	65-136			
Perfluorotetradecanoic acid (PFTA)	10.4	1.9	ng/L	9.48	ND	110	71-132			
Perfluorotridecanoic acid (PFTTrDA)	9.85	1.9	ng/L	9.48	ND	104	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	13.6	1.9	ng/L	8.86	2.39	126	63-143			
Perfluorodecanesulfonic acid (PFDS)	30.8	1.9	ng/L	9.15	34.7	-43.3 *	53-142			MS-07A
Perfluorooctanesulfonamide (FOSA)	15.9	1.9	ng/L	9.48	13.4	26.2 *	67-137			MS-09
Perfluorononanesulfonic acid (PFNS)	38.0	1.9	ng/L	9.10	38.7	-7.60 *	69-127			MS-07A
Perfluoro-1-hexanesulfonamide (FHxSA)	195	1.9	ng/L	9.48	196	-9.25 *	50-150			MS-19
Perfluoro-1-butanefulfonamide (FBSA)	62.0	1.9	ng/L	9.48	54.3	80.9	49.5-154			
Perfluorohexanesulfonic acid (PFHxS)	269	1.9	ng/L	8.67	273	-46.2 *	68-131			MS-19
Perfluoro-4-oxapentanoic acid (PFMPA)	12.4	1.9	ng/L	9.48	ND	131	50-150			

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B357679 - SOP 454-PFAAS

Matrix Spike (B357679-MS1)		Source: 23K1079-08			Prepared: 11/28/23 Analyzed: 11/29/23					
Perfluoro-5-oxahexanoic acid (PFMBA)	9.96	1.9	ng/L	9.48	ND	105	58.1-164			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.9	ng/L	9.00	ND	*	64-140			E, MS-19
Perfluoropentanesulfonic acid (PFPeS)	45.1	1.9	ng/L	8.91	34.6	118	71-127			
Perfluoroundecanoic acid (PFUnA)	231	1.9	ng/L	9.48	232	-4.73	* 69-133			MS-19
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	9.60	1.9	ng/L	9.48	ND	101	54.6-170			
Perfluoroheptanoic acid (PFHpA)	105	1.9	ng/L	9.48	99.0	67.1	* 72-130			MS-22
Perfluorooctanoic acid (PFOA)	90.7	1.9	ng/L	9.48	80.2	110	71-133			
Perfluorooctanesulfonic acid (PFOS)	885	1.9	ng/L	8.77	978	-1060	* 65-140			MS-19
Perfluorononanoic acid (PFNA)	80.8	1.9	ng/L	9.48	73.6	76.0	69-130			

Matrix Spike Dup (B357679-MSD1)		Source: 23K1079-08			Prepared: 11/28/23 Analyzed: 11/29/23					
Perfluorobutanoic acid (PFBA)	55.9	1.8	ng/L	8.93	66.8	-122	* 73-129	30.0	30	MS-22
Perfluorobutanesulfonic acid (PFBS)	22.4	1.8	ng/L	7.90	20.3	26.9	* 72-130	24.1	30	MS-22
Perfluoropentanoic acid (PFPeA)	142	1.8	ng/L	8.93	209	-753	* 72-129	45.4	* 30	MS-19
Perfluorohexanoic acid (PFHxA)	115	1.8	ng/L	8.93	215	-1120	* 72-129	64.6	* 30	MS-19
11Cl-PF3OUdS (F53B Major)	6.97	1.8	ng/L	8.41	ND	82.8	50-150	7.30	30	
9Cl-PF3ONS (F53B Minor)	8.92	1.8	ng/L	8.32	ND	107	50-150	8.33	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	7.59	1.8	ng/L	8.41	ND	90.2	51.4-161	0.195	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	7.66	1.8	ng/L	8.93	ND	85.8	40.3-148	12.4	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	89.9	1.8	ng/L	8.57	216	-1470	* 67-138	82.9	* 30	MS-19
Perfluorodecanoic acid (PFDA)	16.2	1.8	ng/L	8.93	9.19	78.8	71-129	20.4	30	
Perfluorododecanoic acid (PFDoA)	11.5	1.8	ng/L	8.93	ND	129	72-134	2.01	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	7.17	1.8	ng/L	7.95	ND	90.2	57.2-150	1.76	30	
Perfluoroheptanesulfonic acid (PFHpS)	20.9	1.8	ng/L	8.53	19.5	16.7	* 69-134	43.8	* 30	MS-07A, R-05
N-EtFOSAA (NEtFOSAA)	13.1	1.8	ng/L	8.93	1.15	133	61-135	7.85	30	
N-MeFOSAA (NMeFOSAA)	12.3	1.8	ng/L	8.93	ND	138	* 65-136	4.53	30	MS-22
Perfluorotetradecanoic acid (PFTA)	10.1	1.8	ng/L	8.93	ND	113	71-132	2.97	30	
Perfluorotridecanoic acid (PFTrDA)	11.5	1.8	ng/L	8.93	ND	129	65-144	15.4	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.6	1.8	ng/L	8.35	2.39	98.5	63-143	24.4	30	
Perfluorodecanesulfonic acid (PFDS)	10.0	1.8	ng/L	8.62	34.7	-286	* 53-142	102	* 30	MS-07A, R-05
Perfluorooctanesulfonamide (FOSA)	15.9	1.8	ng/L	8.93	13.4	27.5	* 67-137	0.196	30	MS-09
Perfluorononanesulfonic acid (PFNS)	14.7	1.8	ng/L	8.57	38.7	-280	* 69-127	88.5	* 30	MS-07A, R-05
Perfluoro-1-hexanesulfonamide (FHxSA)	40.8	1.8	ng/L	8.93	196	-1740	* 50-150	131	* 30	MS-19
Perfluoro-1-butanesulfonamide (FBSA)	18.8	1.8	ng/L	8.93	54.3	-398	* 49.5-154	107	* 30	MS-23
Perfluorohexanesulfonic acid (PFHxS)	220	1.8	ng/L	8.17	273	-649	* 68-131	20.1	30	MS-19
Perfluoro-4-oxapentanoic acid (PFMPA)	12.1	1.8	ng/L	8.93	ND	135	50-150	2.70	30	
Perfluoro-5-oxahexanoic acid (PFMBA)	9.45	1.8	ng/L	8.93	ND	106	58.1-164	5.23	30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	176	1.8	ng/L	8.48	ND	2070	* 64-140		30	E, MS-19
Perfluoropentanesulfonic acid (PFPeS)	34.3	1.8	ng/L	8.39	34.6	-2.99	* 71-127	27.1	30	MS-22
Perfluoroundecanoic acid (PFUnA)	55.5	1.8	ng/L	8.93	232	-1970	* 69-133	123	* 30	MS-19
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	9.05	1.8	ng/L	8.93	ND	101	54.6-170	5.91	30	
Perfluoroheptanoic acid (PFHpA)	107	1.8	ng/L	8.93	99.0	91.8	72-130	1.73	30	
Perfluorooctanoic acid (PFOA)	67.5	1.8	ng/L	8.93	80.2	-143	* 71-133	29.3	30	MS-19
Perfluorooctanesulfonic acid (PFOS)	302	1.8	ng/L	8.26	978	-8180	* 65-140	98.3	* 30	MS-19
Perfluorononanoic acid (PFNA)	30.4	1.8	ng/L	8.93	73.6	-484	* 69-130	90.6	* 30	MS-23

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B358210 - SOP 454-PFAAS
Blank (B358210-BLK1)

Prepared: 11/15/23 Analyzed: 11/29/23

Perfluorobutanoic acid (PFBA)	ND	1.8	ng/L
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.8	ng/L
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L

LCS (B358210-BS1)

Prepared: 11/15/23 Analyzed: 11/29/23

Perfluorobutanoic acid (PFBA)	8.37	1.9	ng/L	9.62	87.0	73-129
Perfluorobutanesulfonic acid (PFBS)	7.49	1.9	ng/L	8.51	87.9	72-130
Perfluoropentanoic acid (PFPeA)	8.32	1.9	ng/L	9.62	86.5	72-129
Perfluorohexanoic acid (PFHxA)	8.05	1.9	ng/L	9.62	83.7	72-129
11Cl-PF3OUdS (F53B Major)	6.10	1.9	ng/L	9.06	67.3	43.3-138
9Cl-PF3ONS (F53B Minor)	6.50	1.9	ng/L	8.97	72.4	52-140
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	6.19	1.9	ng/L	9.06	68.3	53.7-152
Hexafluoropropylene oxide dimer acid (HFPO-DA)	6.07	1.9	ng/L	9.62	63.0	42.1-145
8:2 Fluorotelomersulfonic acid (8:2FTS A)	8.76	1.9	ng/L	9.24	94.8	67-138
Perfluorodecanoic acid (PFDA)	8.34	1.9	ng/L	9.62	86.7	71-129
Perfluorododecanoic acid (PFDoA)	9.96	1.9	ng/L	9.62	104	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	5.65	1.9	ng/L	8.56	65.9	52.7-147

QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B358210 - SOP 454-PFAAS

LCS (B358210-BS1)

Prepared: 11/15/23 Analyzed: 11/29/23

Perfluoroheptanesulfonic acid (PFHpS)	9.15	1.9	ng/L	9.19		99.5	69-134			
N-EtFOSAA (NEtFOSAA)	10.1	1.9	ng/L	9.62		105	61-135			
N-MeFOSAA (NMeFOSAA)	9.40	1.9	ng/L	9.62		97.7	65-136			
Perfluorotetradecanoic acid (PFTA)	8.83	1.9	ng/L	9.62		91.8	71-132			
Perfluorotridecanoic acid (PFTTrDA)	8.36	1.9	ng/L	9.62		86.9	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	8.45	1.9	ng/L	9.00		93.9	63-143			
Perfluorodecanesulfonic acid (PFDS)	6.63	1.9	ng/L	9.28		71.4	53-142			
Perfluorooctanesulfonamide (FOSA)	9.64	1.9	ng/L	9.62		100	67-137			
Perfluorononanesulfonic acid (PFNS)	9.38	1.9	ng/L	9.24		102	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	5.79	1.9	ng/L	9.62		60.1	50-150			
Perfluoro-1-butanefulfonamide (FBSA)	6.58	1.9	ng/L	9.62		68.4	50-150			
Perfluorohexanesulfonic acid (PFHxS)	8.15	1.9	ng/L	8.80		92.5	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	7.28	1.9	ng/L	9.62		75.7	53.8-150			
Perfluoro-5-oxahexanoic acid (PFMBA)	7.30	1.9	ng/L	9.62		75.9	54.5-152			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	8.65	1.9	ng/L	9.14		94.6	64-140			
Perfluoropentanesulfonic acid (PFPeS)	8.15	1.9	ng/L	9.04		90.1	71-127			
Perfluoroundecanoic acid (PFUnA)	8.73	1.9	ng/L	9.62		90.7	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	7.58	1.9	ng/L	9.62		78.8	50.5-159			
Perfluoroheptanoic acid (PFHpA)	8.27	1.9	ng/L	9.62		86.0	72-130			
Perfluorooctanoic acid (PFOA)	9.10	1.9	ng/L	9.62		94.6	71-133			
Perfluorooctanesulfonic acid (PFOS)	8.36	1.9	ng/L	8.90		94.0	65-140			
Perfluorononanoic acid (PFNA)	7.66	1.9	ng/L	9.62		79.6	69-130			

LCS Dup (B358210-BSD1)

Prepared: 11/15/23 Analyzed: 11/29/23

Perfluorobutanoic acid (PFBA)	7.39	1.8	ng/L	8.92		82.8	73-129	12.4	30	
Perfluorobutanesulfonic acid (PFBS)	6.41	1.8	ng/L	7.89		81.2	72-130	15.5	30	
Perfluoropentanoic acid (PFPeA)	7.12	1.8	ng/L	8.92		79.8	72-129	15.6	30	
Perfluorohexanoic acid (PFHxA)	7.17	1.8	ng/L	8.92		80.5	72-129	11.5	30	
11Cl-PF3OUdS (F53B Major)	5.17	1.8	ng/L	8.40		61.6	43.3-138	16.4	30	
9Cl-PF3ONS (F53B Minor)	5.14	1.8	ng/L	8.31		61.9	52-140	23.3	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	5.81	1.8	ng/L	8.40		69.1	53.7-152	6.41	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	4.94	1.8	ng/L	8.92		55.4	42.1-145	20.5	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	8.06	1.8	ng/L	8.56		94.2	67-138	8.25	30	
Perfluorodecanoic acid (PFDA)	7.82	1.8	ng/L	8.92		87.7	71-129	6.47	30	
Perfluorododecanoic acid (PFDoA)	8.42	1.8	ng/L	8.92		94.5	72-134	16.7	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	4.96	1.8	ng/L	7.94		62.5	52.7-147	13.0	30	
Perfluoroheptanesulfonic acid (PFHpS)	8.02	1.8	ng/L	8.52		94.2	69-134	13.1	30	
N-EtFOSAA (NEtFOSAA)	8.87	1.8	ng/L	8.92		99.5	61-135	13.0	30	
N-MeFOSAA (NMeFOSAA)	8.33	1.8	ng/L	8.92		93.4	65-136	12.1	30	
Perfluorotetradecanoic acid (PFTA)	7.48	1.8	ng/L	8.92		83.9	71-132	16.6	30	
Perfluorotridecanoic acid (PFTTrDA)	6.93	1.8	ng/L	8.92		77.7	65-144	18.7	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	7.14	1.8	ng/L	8.34		85.6	63-143	16.8	30	
Perfluorodecanesulfonic acid (PFDS)	5.67	1.8	ng/L	8.61		65.9	53-142	15.5	30	
Perfluorooctanesulfonamide (FOSA)	8.51	1.8	ng/L	8.92		95.5	67-137	12.4	30	
Perfluorononanesulfonic acid (PFNS)	7.88	1.8	ng/L	8.56		92.1	69-127	17.3	30	
Perfluoro-1-hexanesulfonamide (FHxSA)	4.95	1.8	ng/L	8.92		55.5	50-150	15.6	30	
Perfluoro-1-butanefulfonamide (FBSA)	5.73	1.8	ng/L	8.92		64.2	50-150	13.9	30	
Perfluorohexanesulfonic acid (PFHxS)	7.21	1.8	ng/L	8.16		88.4	68-131	12.2	30	
Perfluoro-4-oxapentanoic acid (PFMPA)	6.29	1.8	ng/L	8.92		70.5	53.8-150	14.7	30	
Perfluoro-5-oxahexanoic acid (PFMBA)	6.31	1.8	ng/L	8.92		70.7	54.5-152	14.6	30	

QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B358210 - SOP 454-PFAAS
LCS Dup (B358210-BSD1)

Prepared: 11/15/23 Analyzed: 11/29/23

6:2 Fluorotelomersulfonic acid (6:2FTS A)	7.84	1.8	ng/L	8.47		92.5	64-140	9.83	30	
Perfluoropentanesulfonic acid (PFPeS)	7.42	1.8	ng/L	8.38		88.5	71-127	9.47	30	
Perfluoroundecanoic acid (PFUnA)	7.43	1.8	ng/L	8.92		83.4	69-133	16.0	30	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	6.72	1.8	ng/L	8.92		75.4	50.5-159	12.0	30	
Perfluoroheptanoic acid (PFHpA)	7.35	1.8	ng/L	8.92		82.5	72-130	11.8	30	
Perfluorooctanoic acid (PFOA)	7.41	1.8	ng/L	8.92		83.1	71-133	20.5	30	
Perfluorooctanesulfonic acid (PFOS)	6.91	1.8	ng/L	8.25		83.8	65-140	19.0	30	
Perfluorononanoic acid (PFNA)	6.55	1.8	ng/L	8.92		73.4	69-130	15.7	30	

FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
D-01	Sample extracted/prepared at a dilution due to sample matrix.
E	Reported result is estimated. Value reported over verified calibration range.
MS-07A	Matrix spike and spike duplicate recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possibility of matrix effects that lead to low bias or non-homogeneous sample aliquot cannot be eliminated.
MS-09	Matrix spike recovery and/or matrix spike duplicate recovery outside of control limits. Possibility of sample matrix effects that lead to a low bias for reported result or non-homogeneous sample aliquots cannot be eliminated.
MS-12	Matrix spike recovery and matrix spike duplicate recovery outside of control limits. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
MS-22	Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is within method specified criteria.
MS-23	Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is outside of the method specified criteria. Reduced precision anticipated for any reported result for this compound.
PF-17	Extracted Internal Standard recovery is outside of control limits. Data is not significantly affected since associated analyte is not detected and bias is on the high side.
PF-18	Re-analysis confirmed Extracted Internal Standard failure due to matrix effects.
PF-19	Sample re-analyzed at a dilution that was re-fortified with internal standard.
PF-23	Qualifier ion ratio <50% of associated calibration. Detection is suspect.
R-05	Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound.
S-29	Extracted Internal Standard is outside of control limits.
Z-01	Extracted internal standard outside of control limits due. No remaining volume for re-extraction.

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
HSW-6 (23K1079-01) Lab File ID: 23K1079-01.d Analyzed: 11/29/23 21:43									
M8FOSA	480432.4	3.996583	668,109.00	3.9966	72	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	284578.6	2.628233	230,805.00	2.644867	123	50 - 150	-0.0166	+/-0.50	
M2PFTA	996109.9	4.3622	1,372,008.00	4.370333	73	50 - 150	-0.0081	+/-0.50	
MPFBA	332522.4	1.0917	747,715.00	1.100017	44	50 - 150	-0.0083	+/-0.50	*
M3HFPO-DA	173338.4	2.929733	217,420.00	2.93785	80	50 - 150	-0.0081	+/-0.50	
M6PFDA	1122992	3.827567	1,363,136.00	3.835533	82	50 - 150	-0.0080	+/-0.50	
M3PFBS	268973.4	1.9945	285,464.00	2.011067	94	50 - 150	-0.0166	+/-0.50	
M7PFUnA	1146763	3.978017	1,369,349.00	3.986033	84	50 - 150	-0.0080	+/-0.50	
M5PFPeA	499214.4	1.80795	708,804.00	1.824517	70	50 - 150	-0.0166	+/-0.50	
M5PFHxA	902800.6	2.7145	1,169,882.00	2.730867	77	50 - 150	-0.0164	+/-0.50	
M3PFHxS	174091.4	3.250667	209,914.00	3.250683	83	50 - 150	0.0000	+/-0.50	
M4PFHpA	947479.3	3.21955	1,182,052.00	3.227633	80	50 - 150	-0.0081	+/-0.50	
M8PFOA	1122442	3.4859	1,412,221.00	3.4859	79	50 - 150	0.0000	+/-0.50	
M8PFOS	91527.92	3.668133	234,102.00	3.66815	39	50 - 150	0.0000	+/-0.50	*
M9PFNA	499576.5	3.677167	1,581,628.00	3.669183	32	50 - 150	0.0080	+/-0.50	*
MPFDoA	942762.4	4.120783	1,242,329.00	4.128833	76	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	219614.5	3.9855	297,341.00	3.9935	74	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	243975.3	3.905917	295,321.00	3.913933	83	50 - 150	-0.0080	+/-0.50	
HSW-6 (23K1079-01RE1) Lab File ID: 23K1079-01RE1.d Analyzed: 12/01/23 01:02									
M2-8:2FTS	227656.6	3.818733	232,714.00	3.818767	98	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	194207	3.461417	208,918.00	3.461433	93	50 - 150	0.0000	+/-0.50	
M5PFPeA	855178.7	1.7826	706,168.00	1.7826	121	50 - 150	0.0000	+/-0.50	
M5PFHxA	1362096	2.68055	1,153,660.00	2.68055	118	50 - 150	0.0000	+/-0.50	
M3PFHxS	264502.1	3.2345	204,620.00	3.234517	129	50 - 150	0.0000	+/-0.50	
M4PFHpA	1376216	3.21145	1,186,878.00	3.211467	116	50 - 150	0.0000	+/-0.50	
M8PFOA	1741525	3.469933	1,468,289.00	3.46995	119	50 - 150	0.0000	+/-0.50	
HSW-6 (23K1079-01RE2) Lab File ID: 23K1079-01RE2.d Analyzed: 12/01/23 01:09									
M8PFOS	307709.4	3.660133	232,302.00	3.660167	132	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PFW-1 (23K1079-02) Lab File ID: 23K1079-02.d Analyzed: 11/29/23 22:05									
M8FOSA	541622.8	3.996567	668,109.00	3.996567	81	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	148018.6	2.628233	230,805.00	2.628217	64	50 - 150	0.0000	+/-0.50	
M2PFTA	1114558	4.3622	1,372,008.00	4.362184	81	50 - 150	0.0000	+/-0.50	
MPFBA	609459.9	1.091717	747,715.00	1.0917	82	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	247736.1	2.929733	217,420.00	2.929733	114	50 - 150	0.0000	+/-0.50	
M6PFDA	1125672	3.827567	1,363,136.00	3.827567	83	50 - 150	0.0000	+/-0.50	
M3PFBS	283732.3	1.9945	285,464.00	2.002783	99	50 - 150	-0.0083	+/-0.50	
M7PFUnA	1156081	3.978017	1,369,349.00	3.978017	84	50 - 150	0.0000	+/-0.50	
M5PFPeA	631866.9	1.816233	708,804.00	1.816233	89	50 - 150	0.0000	+/-0.50	
M5PFHxA	1034073	2.7145	1,169,882.00	2.722683	88	50 - 150	-0.0082	+/-0.50	
M3PFHxS	186728.9	3.250667	209,914.00	3.250667	89	50 - 150	0.0000	+/-0.50	
M4PFHpA	1085295	3.21955	1,182,052.00	3.219533	92	50 - 150	0.0000	+/-0.50	
M8PFOA	1341176	3.4859	1,412,221.00	3.4859	95	50 - 150	0.0000	+/-0.50	
M8PFOS	85221.11	3.668133	234,102.00	3.668133	36	50 - 150	0.0000	+/-0.50	*
M9PFNA	519699.6	3.677167	1,581,628.00	3.669167	33	50 - 150	0.0080	+/-0.50	*
MPFDoA	993343.5	4.120783	1,242,329.00	4.120783	80	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	235244.1	3.9855	297,341.00	3.985483	79	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	241719.9	3.905917	295,321.00	3.905917	82	50 - 150	0.0000	+/-0.50	
PFW-1 (23K1079-02RE1) Lab File ID: 23K1079-02RE1.d Analyzed: 12/01/23 01:16									
M2-8:2FTS	256155.9	3.818733	232,714.00	3.818767	110	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	227988.2	3.461417	208,918.00	3.461433	109	50 - 150	0.0000	+/-0.50	
M3PFHxS	279747	3.2345	204,620.00	3.234517	137	50 - 150	0.0000	+/-0.50	
M8PFOA	1893787	3.469917	1,468,289.00	3.46995	129	50 - 150	0.0000	+/-0.50	
PFW-1 (23K1079-02RE2) Lab File ID: 23K1079-02RE2.d Analyzed: 12/01/23 01:23									
M8PFOS	294997.7	3.66015	232,302.00	3.660167	127	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PFW-5 (23K1079-03) Lab File ID: 23K1079-03.d Analyzed: 11/29/23 22:12									
M8FOSA	485674.3	3.996567	668,109.00	3.996567	73	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	145423.4	2.628217	230,805.00	2.628217	63	50 - 150	0.0000	+/-0.50	
M2PFTA	1090484	4.3622	1,372,008.00	4.362184	79	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	197802.8	3.827067	224,508.00	3.835033	88	50 - 150	-0.0080	+/-0.50	
MPFBA	524944.4	1.0917	747,715.00	1.0917	70	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	211842.1	2.929717	217,420.00	2.929733	97	50 - 150	0.0000	+/-0.50	
M6PFDA	1187867	3.82755	1,363,136.00	3.827567	87	50 - 150	0.0000	+/-0.50	
M3PFBS	265670.3	1.9945	285,464.00	2.002783	93	50 - 150	-0.0083	+/-0.50	
M7PFUnA	1199060	3.978017	1,369,349.00	3.978017	88	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	160643.8	3.4694	192,908.00	3.4694	83	50 - 150	0.0000	+/-0.50	
M5PFPeA	595710.1	1.80795	708,804.00	1.816233	84	50 - 150	-0.0083	+/-0.50	
M5PFHxA	1003770	2.7145	1,169,882.00	2.722683	86	50 - 150	-0.0082	+/-0.50	
M3PFHxS	187702.3	3.250667	209,914.00	3.250667	89	50 - 150	0.0000	+/-0.50	
M4PFHpA	1032608	3.219533	1,182,052.00	3.219533	87	50 - 150	0.0000	+/-0.50	
M8PFOA	1239914	3.4859	1,412,221.00	3.4859	88	50 - 150	0.0000	+/-0.50	
M8PFOS	199431.9	3.668133	234,102.00	3.668133	85	50 - 150	0.0000	+/-0.50	
M9PFNA	1229963	3.669167	1,581,628.00	3.669167	78	50 - 150	0.0000	+/-0.50	
MPFDoA	1066690	4.120783	1,242,329.00	4.120783	86	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	224106.2	3.985483	297,341.00	3.985483	75	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	236420.4	3.905917	295,321.00	3.905917	80	50 - 150	0.0000	+/-0.50	
PFW-5 (23K1079-03RE1) Lab File ID: 23K1079-03RE1.d Analyzed: 12/01/23 01:31									
M8PFOS	288790.3	3.66015	232,302.00	3.660167	124	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
MW-311 (23K1079-04) Lab File ID: 23K1079-04.d Analyzed: 11/29/23 22:19									
M8FOSA	465517.3	3.996567	668,109.00	3.996567	70	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	176258.4	2.628217	230,805.00	2.628217	76	50 - 150	0.0000	+/-0.50	
M2PFTA	1034488	4.3622	1,372,008.00	4.362184	75	50 - 150	0.0000	+/-0.50	
MPFBA	453467.5	1.0917	747,715.00	1.0917	61	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	217980.3	2.929717	217,420.00	2.929733	100	50 - 150	0.0000	+/-0.50	
M6PFDA	941557.2	3.827567	1,363,136.00	3.827567	69	50 - 150	0.0000	+/-0.50	
M3PFBS	257148	1.9945	285,464.00	2.002783	90	50 - 150	-0.0083	+/-0.50	
M7PFUnA	1050878	3.978017	1,369,349.00	3.978017	77	50 - 150	0.0000	+/-0.50	
M5PFPeA	503906	1.80795	708,804.00	1.816233	71	50 - 150	-0.0083	+/-0.50	
M5PFHxA	844827.4	2.7145	1,169,882.00	2.722683	72	50 - 150	-0.0082	+/-0.50	
M3PFHxS	106430.2	3.250667	209,914.00	3.250667	51	50 - 150	0.0000	+/-0.50	
M4PFHpA	792194.7	3.219533	1,182,052.00	3.219533	67	50 - 150	0.0000	+/-0.50	
M8PFOA	835098.9	3.4859	1,412,221.00	3.4859	59	50 - 150	0.0000	+/-0.50	
M8PFOS	62036.07	3.668133	234,102.00	3.668133	26	50 - 150	0.0000	+/-0.50	*
M9PFNA	384334.9	3.67715	1,581,628.00	3.669167	24	50 - 150	0.0080	+/-0.50	*
MPFDoA	925549.4	4.120783	1,242,329.00	4.120783	75	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	193171.5	3.9855	297,341.00	3.985483	65	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	210377.8	3.905917	295,321.00	3.905917	71	50 - 150	0.0000	+/-0.50	
MW-311 (23K1079-04RE1) Lab File ID: 23K1079-04RE1.d Analyzed: 12/01/23 01:53									
M2-8:2FTS	282623.1	3.81875	232,714.00	3.81875	121	50 - 150	0.0000	+/-0.50	
MPFBA	957684.8	1.0834	744,723.00	1.0834	129	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	249016.3	3.461417	208,918.00	3.461417	119	50 - 150	0.0000	+/-0.50	
M5PFPeA	926558.9	1.7826	706,168.00	1.7826	131	50 - 150	0.0000	+/-0.50	
M5PFHxA	1490640	2.680533	1,153,660.00	2.672333	129	50 - 150	0.0082	+/-0.50	
M3PFHxS	276166.6	3.2345	204,620.00	3.2345	135	50 - 150	0.0000	+/-0.50	
M4PFHpA	1547109	3.2031	1,186,878.00	3.2031	130	50 - 150	0.0000	+/-0.50	
M8PFOA	1935324	3.469933	1,468,289.00	3.469933	132	50 - 150	0.0000	+/-0.50	
M8PFOS	279461.2	3.66015	232,302.00	3.660167	120	50 - 150	0.0000	+/-0.50	
MW-311 (23K1079-04RE2) Lab File ID: 23K1079-04RE2.d Analyzed: 12/01/23 02:00									
M8PFOS	337579.7	3.660167	232,302.00	3.660167	145	50 - 150	0.0000	+/-0.50	
MW-311 (23K1079-04RE4) Lab File ID: 23K1079-04RE5.d Analyzed: 12/04/23 12:03									
M8PFOS	130710.4	3.668133	234,224.00	3.668133	56	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
MW-35 (23K1079-05) Lab File ID: 23K1079-05.d Analyzed: 11/29/23 22:27									
M8FOSA	370726.9	3.996583	668,109.00	3.996567	55	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	460975.5	2.562517	230,805.00	2.628217	200	50 - 150	-0.0657	+/-0.50	*
M2PFTA	782688.6	4.362184	1,372,008.00	4.362184	57	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	525453.1	3.827083	224,508.00	3.835033	234	50 - 150	-0.0080	+/-0.50	*
MPFBA	257804.8	1.075083	747,715.00	1.0917	34	50 - 150	-0.0166	+/-0.50	*
M3HFPO-DA	134165.5	2.880217	217,420.00	2.929733	62	50 - 150	-0.0495	+/-0.50	
M6PFDA	1104588	3.827567	1,363,136.00	3.827567	81	50 - 150	0.0000	+/-0.50	
M3PFBS	230582	1.95315	285,464.00	2.002783	81	50 - 150	-0.0496	+/-0.50	
M7PFUnA	1151894	3.978033	1,369,349.00	3.978017	84	50 - 150	0.0000	+/-0.50	
M5PFPeA	461237.6	1.7743	708,804.00	1.816233	65	50 - 150	-0.0419	+/-0.50	
M5PFHxA	879379.1	2.638533	1,169,882.00	2.722683	75	50 - 150	-0.0842	+/-0.50	
M3PFHxS	136215.4	3.21835	209,914.00	3.250667	65	50 - 150	-0.0323	+/-0.50	
M4PFHpA	758493.8	3.18695	1,182,052.00	3.219533	64	50 - 150	-0.0326	+/-0.50	
M8PFOA	828147.6	3.469933	1,412,221.00	3.4859	59	50 - 150	-0.0160	+/-0.50	
M8PFOS	100324.7	3.66015	234,102.00	3.668133	43	50 - 150	-0.0080	+/-0.50	*
M9PFNA	503208.9	3.669183	1,581,628.00	3.669167	32	50 - 150	0.0000	+/-0.50	*
MPFDaA	932865.8	4.120783	1,242,329.00	4.120783	75	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	256044.1	3.9855	297,341.00	3.985483	86	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	264449.9	3.905917	295,321.00	3.905917	90	50 - 150	0.0000	+/-0.50	
MW-35 (23K1079-05RE1) Lab File ID: 23K1079-05RE1.d Analyzed: 12/01/23 02:07									
M2-6:2FTS	510729.8	3.461417	208,918.00	3.461417	244	50 - 150	0.0000	+/-0.50	*
M5PFPeA	924147.4	1.7826	706,168.00	1.7826	131	50 - 150	0.0000	+/-0.50	
M5PFHxA	1527275	2.672333	1,153,660.00	2.672333	132	50 - 150	0.0000	+/-0.50	
M3PFHxS	282957.5	3.2345	204,620.00	3.2345	138	50 - 150	0.0000	+/-0.50	
M4PFHpA	1648350	3.2031	1,186,878.00	3.2031	139	50 - 150	0.0000	+/-0.50	
M8PFOA	2144060	3.469933	1,468,289.00	3.469933	146	50 - 150	0.0000	+/-0.50	
MW-35 (23K1079-05RE2) Lab File ID: 23K1079-05RE2.d Analyzed: 12/01/23 02:14									
M8PFOS	351275.3	3.66015	232,302.00	3.660167	151	50 - 150	0.0000	+/-0.50	*

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PC-6A (23K1079-07) Lab File ID: 23K1079-07.d Analyzed: 11/29/23 22:34									
M8FOSA	476101	3.9966	668,109.00	3.996567	71	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	141444.7	2.620033	230,805.00	2.628217	61	50 - 150	-0.0082	+/-0.50	
M2PFTA	1035968	4.362216	1,372,008.00	4.362184	76	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	134328.8	3.8271	224,508.00	3.835033	60	50 - 150	-0.0079	+/-0.50	
MPFBA	518704	1.091717	747,715.00	1.0917	69	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	225017.7	2.92115	217,420.00	2.929733	103	50 - 150	-0.0086	+/-0.50	
M6PFDA	1079988	3.8276	1,363,136.00	3.827567	79	50 - 150	0.0000	+/-0.50	
M3PFBS	262015.8	1.986217	285,464.00	2.002783	92	50 - 150	-0.0166	+/-0.50	
M7PFUnA	1069249	3.97805	1,369,349.00	3.978017	78	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	155196.5	3.469433	192,908.00	3.4694	80	50 - 150	0.0000	+/-0.50	
M5PFPeA	573684.1	1.80795	708,804.00	1.816233	81	50 - 150	-0.0083	+/-0.50	
M5PFHxA	956068.3	2.706333	1,169,882.00	2.722683	82	50 - 150	-0.0164	+/-0.50	
M3PFHxS	193227.9	3.242617	209,914.00	3.250667	92	50 - 150	-0.0080	+/-0.50	
M4PFHpA	998124.8	3.219567	1,182,052.00	3.219533	84	50 - 150	0.0000	+/-0.50	
M8PFOA	1269244	3.47795	1,412,221.00	3.4859	90	50 - 150	-0.0080	+/-0.50	
M8PFOS	193029.7	3.668167	234,102.00	3.668133	82	50 - 150	0.0000	+/-0.50	
M9PFNA	1295426	3.6692	1,581,628.00	3.669167	82	50 - 150	0.0000	+/-0.50	
MPFDoA	927012.4	4.120817	1,242,329.00	4.120783	75	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	236849	3.985517	297,341.00	3.985483	80	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	223243	3.90595	295,321.00	3.905917	76	50 - 150	0.0000	+/-0.50	
PC-6A (23K1079-07RE1) Lab File ID: 23K1079-07RE1.d Analyzed: 12/01/23 11:04									
M8PFOS	213194.5	3.668133	239,870.00	3.668133	89	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PC-11 (23K1079-08) Lab File ID: 23K1079-08.d Analyzed: 11/29/23 22:41									
M8FOSA	355616.3	3.996567	668,109.00	3.996567	53	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	194852.2	2.620017	230,805.00	2.628217	84	50 - 150	-0.0082	+/-0.50	
M2PFTA	579462.9	4.362184	1,372,008.00	4.362184	42	50 - 150	0.0000	+/-0.50	*
M2-8:2FTS	711926.4	3.827067	224,508.00	3.835033	317	50 - 150	-0.0080	+/-0.50	*
MPFBA	411439.2	1.0917	747,715.00	1.0917	55	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	215004.4	2.921133	217,420.00	2.929733	99	50 - 150	-0.0086	+/-0.50	
M6PFDA	1160321	3.82755	1,363,136.00	3.827567	85	50 - 150	0.0000	+/-0.50	
M3PFBS	255306.6	1.986217	285,464.00	2.002783	89	50 - 150	-0.0166	+/-0.50	
M7PFUnA	1077984	3.978017	1,369,349.00	3.978017	79	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	981330	3.4694	192,908.00	3.4694	509	50 - 150	0.0000	+/-0.50	*
M5PFPeA	555335.1	1.799667	708,804.00	1.816233	78	50 - 150	-0.0166	+/-0.50	
M5PFHxA	930606.8	2.706317	1,169,882.00	2.722683	80	50 - 150	-0.0164	+/-0.50	
M3PFHxS	171248.9	3.242583	209,914.00	3.250667	82	50 - 150	-0.0081	+/-0.50	
M4PFHpA	1034470	3.219533	1,182,052.00	3.219533	88	50 - 150	0.0000	+/-0.50	
M8PFOA	1202037	3.4779	1,412,221.00	3.4859	85	50 - 150	-0.0080	+/-0.50	
M8PFOS	137489.3	3.66015	234,102.00	3.668133	59	50 - 150	-0.0080	+/-0.50	
M9PFNA	927821.8	3.669167	1,581,628.00	3.669167	59	50 - 150	0.0000	+/-0.50	
MPFDoA	909718.9	4.120783	1,242,329.00	4.120783	73	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	244507.4	3.985483	297,341.00	3.985483	82	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	261219.5	3.9059	295,321.00	3.905917	88	50 - 150	0.0000	+/-0.50	
PC-11 (23K1079-08RE1) Lab File ID: 23K1079-08RE1.d Analyzed: 12/01/23 02:29									
M2-8:2FTS	355478.3	3.81875	232,714.00	3.81875	153	50 - 150	0.0000	+/-0.50	*
M7PFUnA	1742827	3.970033	1,393,340.00	3.970033	125	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	495748	3.461417	208,918.00	3.461417	237	50 - 150	0.0000	+/-0.50	*
M5PFPeA	907112.9	1.7826	706,168.00	1.7826	128	50 - 150	0.0000	+/-0.50	
M5PFHxA	1459677	2.672333	1,153,660.00	2.672333	127	50 - 150	0.0000	+/-0.50	
M3PFHxS	278472.9	3.234517	204,620.00	3.2345	136	50 - 150	0.0000	+/-0.50	
M8PFOA	2084667	3.469933	1,468,289.00	3.469933	142	50 - 150	0.0000	+/-0.50	
M8PFOS	305250.3	3.66015	232,302.00	3.660167	131	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PC-345 (23K1079-09) Lab File ID: 23K1079-09.d Analyzed: 11/29/23 22:48									
M8FOSA	267564.5	3.996567	668,109.00	3.996567	40	50 - 150	0.0000	+/-0.50	*
M2-4:2FTS	277942	2.6118	230,805.00	2.628217	120	50 - 150	-0.0164	+/-0.50	
M2PFTA	638083.4	4.362184	1,372,008.00	4.362184	47	50 - 150	0.0000	+/-0.50	*
M2-8:2FTS	503802.4	3.827067	224,508.00	3.835033	224	50 - 150	-0.0080	+/-0.50	*
MPFBA	357561.8	1.0834	747,715.00	1.0917	48	50 - 150	-0.0083	+/-0.50	*
M3HFPO-DA	221985.5	2.91295	217,420.00	2.929733	102	50 - 150	-0.0168	+/-0.50	
M6PFDA	1068598	3.827567	1,363,136.00	3.827567	78	50 - 150	0.0000	+/-0.50	
M3PFBS	265097.9	1.986217	285,464.00	2.002783	93	50 - 150	-0.0166	+/-0.50	
M7PFUnA	973604.2	3.978017	1,369,349.00	3.978017	71	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	627539.2	3.4694	192,908.00	3.4694	325	50 - 150	0.0000	+/-0.50	*
M5PFPeA	578325.6	1.799667	708,804.00	1.816233	82	50 - 150	-0.0166	+/-0.50	
M5PFHxA	989237.8	2.696967	1,169,882.00	2.722683	85	50 - 150	-0.0257	+/-0.50	
M3PFHxS	192707.2	3.242583	209,914.00	3.250667	92	50 - 150	-0.0081	+/-0.50	
M4PFHpA	1052710	3.21145	1,182,052.00	3.219533	89	50 - 150	-0.0081	+/-0.50	
M8PFOA	1269975	3.477917	1,412,221.00	3.4859	90	50 - 150	-0.0080	+/-0.50	
M8PFOS	143682.8	3.66015	234,102.00	3.668133	61	50 - 150	-0.0080	+/-0.50	
M9PFNA	974348.5	3.661183	1,581,628.00	3.669167	62	50 - 150	-0.0080	+/-0.50	
MPFDoA	711111.8	4.120783	1,242,329.00	4.120783	57	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	269060.6	3.9855	297,341.00	3.985483	90	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	252730.9	3.905917	295,321.00	3.905917	86	50 - 150	0.0000	+/-0.50	
PC-345 (23K1079-09RE1) Lab File ID: 23K1079-09RE1.d Analyzed: 12/01/23 02:43									
M8PFOS	306714.8	3.660167	232,302.00	3.660167	132	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
DUP-1 (23K1079-10)		Lab File ID: 23K1079-10.d				Analyzed: 11/29/23 22:55			
M8FOSA	365866.8	4.004583	668,109.00	3.996567	55	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	120578	2.611817	230,805.00	2.628217	52	50 - 150	-0.0164	+/-0.50	
M2PFTA	848334.3	4.3622	1,372,008.00	4.362184	62	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	110465.9	3.827083	224,508.00	3.835033	49	50 - 150	-0.0080	+/-0.50	*
MPFBA	542200.7	1.0834	747,715.00	1.0917	73	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	210362	2.912967	217,420.00	2.929733	97	50 - 150	-0.0168	+/-0.50	
M6PFDA	835476.1	3.827583	1,363,136.00	3.827567	61	50 - 150	0.0000	+/-0.50	
M3PFBS	256543.5	1.986217	285,464.00	2.002783	90	50 - 150	-0.0166	+/-0.50	
M7PFUnA	849555.3	3.978033	1,369,349.00	3.978017	62	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	132842.1	3.469417	192,908.00	3.4694	69	50 - 150	0.0000	+/-0.50	
M5PFPeA	555052.6	1.799667	708,804.00	1.816233	78	50 - 150	-0.0166	+/-0.50	
M5PFHxA	899591.5	2.706333	1,169,882.00	2.722683	77	50 - 150	-0.0164	+/-0.50	
M3PFHxS	183712.2	3.2426	209,914.00	3.250667	88	50 - 150	-0.0081	+/-0.50	
M4PFHpA	939843.8	3.21955	1,182,052.00	3.219533	80	50 - 150	0.0000	+/-0.50	
M8PFOA	1186056	3.477933	1,412,221.00	3.4859	84	50 - 150	-0.0080	+/-0.50	
M8PFOS	171128.6	3.660167	234,102.00	3.668133	73	50 - 150	-0.0080	+/-0.50	
M9PFNA	1165819	3.669183	1,581,628.00	3.669167	74	50 - 150	0.0000	+/-0.50	
MPFDoA	756640.4	4.1208	1,242,329.00	4.120783	61	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	158697.2	3.9855	297,341.00	3.985483	53	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	166243.3	3.905933	295,321.00	3.905917	56	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PC-16D (23K1079-11)		Lab File ID: 23K1079-11.d				Analyzed: 11/29/23 23:03			
M8FOSA	462042.3	4.004583	668,109.00	3.996567	69	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	126450.7	2.6118	230,805.00	2.628217	55	50 - 150	-0.0164	+/-0.50	
M2PFTA	985800.3	4.3622	1,372,008.00	4.362184	72	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	139428.4	3.827083	224,508.00	3.835033	62	50 - 150	-0.0080	+/-0.50	
MPFBA	570709.5	1.0834	747,715.00	1.0917	76	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	208529.4	2.912967	217,420.00	2.929733	96	50 - 150	-0.0168	+/-0.50	
M6PFDA	1079474	3.827583	1,363,136.00	3.827567	79	50 - 150	0.0000	+/-0.50	
M3PFBS	262157	1.986217	285,464.00	2.002783	92	50 - 150	-0.0166	+/-0.50	
M7PFUnA	1087054	3.978033	1,369,349.00	3.978017	79	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	166145.8	3.461433	192,908.00	3.4694	86	50 - 150	-0.0080	+/-0.50	
M5PFPeA	579324.3	1.799667	708,804.00	1.816233	82	50 - 150	-0.0166	+/-0.50	
M5PFHxA	949268.8	2.696967	1,169,882.00	2.722683	81	50 - 150	-0.0257	+/-0.50	
M3PFHxS	191345.6	3.2426	209,914.00	3.250667	91	50 - 150	-0.0081	+/-0.50	
M4PFHpA	993256.3	3.211467	1,182,052.00	3.219533	84	50 - 150	-0.0081	+/-0.50	
M8PFOA	1266746	3.477933	1,412,221.00	3.4859	90	50 - 150	-0.0080	+/-0.50	
M8PFOS	194185	3.660167	234,102.00	3.668133	83	50 - 150	-0.0080	+/-0.50	
M9PFNA	1306586	3.6612	1,581,628.00	3.669167	83	50 - 150	-0.0080	+/-0.50	
MPFDoA	1011078	4.1208	1,242,329.00	4.120783	81	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	217177.3	3.985517	297,341.00	3.985483	73	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	224837.4	3.905933	295,321.00	3.905917	76	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PC-29 (23K1079-12)		Lab File ID: 23K1079-12.d				Analyzed: 11/29/23 23:10			
M8FOSA	462754.9	4.004567	668,109.00	3.996567	69	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	144557.4	2.6118	230,805.00	2.628217	63	50 - 150	-0.0164	+/-0.50	
M2PFTA	958877.3	4.362184	1,372,008.00	4.362184	70	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	111795.8	3.827067	224,508.00	3.835033	50	50 - 150	-0.0080	+/-0.50	
MPFBA	526280.9	1.0834	747,715.00	1.0917	70	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	254077	2.912967	217,420.00	2.929733	117	50 - 150	-0.0168	+/-0.50	
M6PFDA	983417.8	3.827567	1,363,136.00	3.827567	72	50 - 150	0.0000	+/-0.50	
M3PFBS	278029.2	1.986217	285,464.00	2.002783	97	50 - 150	-0.0166	+/-0.50	
M7PFUnA	986233.9	3.978033	1,369,349.00	3.978017	72	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	163241.4	3.4694	192,908.00	3.4694	85	50 - 150	0.0000	+/-0.50	
M5PFPeA	604169.9	1.799667	708,804.00	1.816233	85	50 - 150	-0.0166	+/-0.50	
M5PFHxA	999425.6	2.696967	1,169,882.00	2.722683	85	50 - 150	-0.0257	+/-0.50	
M3PFHxS	192354.3	3.2426	209,914.00	3.250667	92	50 - 150	-0.0081	+/-0.50	
M4PFHpA	1015582	3.211467	1,182,052.00	3.219533	86	50 - 150	-0.0081	+/-0.50	
M8PFOA	1276568	3.477917	1,412,221.00	3.4859	90	50 - 150	-0.0080	+/-0.50	
M8PFOS	186147.5	3.66015	234,102.00	3.668133	80	50 - 150	-0.0080	+/-0.50	
M9PFNA	1274822	3.6612	1,581,628.00	3.669167	81	50 - 150	-0.0080	+/-0.50	
MPFDoA	837758.9	4.120783	1,242,329.00	4.120783	67	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	179846.5	3.9855	297,341.00	3.985483	60	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	200297.1	3.905917	295,321.00	3.905917	68	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
EB-11.1.23 (23K1079-13)		Lab File ID: 23K1079-13.d				Analyzed: 11/29/23 23:53			
M8FOSA	499188.3	4.004567	668,109.00	3.996583	75	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	170095.5	2.6118	230,805.00	2.6118	74	50 - 150	0.0000	+/-0.50	
M2PFTA	1132814	4.362184	1,372,008.00	4.3622	83	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	181612.2	3.827083	224,508.00	3.827083	81	50 - 150	0.0000	+/-0.50	
MPFBA	772255.1	1.0834	747,715.00	1.0834	103	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	277635.1	2.91295	217,420.00	2.91295	128	50 - 150	0.0000	+/-0.50	
M6PFDA	1231500	3.827567	1,363,136.00	3.827567	90	50 - 150	0.0000	+/-0.50	
M3PFBS	294707.1	1.986217	285,464.00	1.978033	103	50 - 150	0.0082	+/-0.50	
M7PFUnA	1259629	3.978033	1,369,349.00	3.978033	92	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	279412.8	3.461417	192,908.00	3.4694	145	50 - 150	-0.0080	+/-0.50	
M5PFPeA	679296.3	1.799667	708,804.00	1.799667	96	50 - 150	0.0000	+/-0.50	
M5PFHxA	1080295	2.706317	1,169,882.00	2.696967	92	50 - 150	0.0093	+/-0.50	
M3PFHxS	213957	3.242583	209,914.00	3.242583	102	50 - 150	0.0000	+/-0.50	
M4PFHpA	1147254	3.219533	1,182,052.00	3.211467	97	50 - 150	0.0081	+/-0.50	
M8PFOA	1516021	3.477917	1,412,221.00	3.477917	107	50 - 150	0.0000	+/-0.50	
M8PFOS	230418.3	3.660167	234,102.00	3.660167	98	50 - 150	0.0000	+/-0.50	
M9PFNA	1585031	3.6612	1,581,628.00	3.6612	100	50 - 150	0.0000	+/-0.50	
MPFDoA	1088308	4.11265	1,242,329.00	4.11265	88	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	251255.8	3.9855	297,341.00	3.9855	85	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	267692	3.905917	295,321.00	3.905917	91	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PC-30 (23K1079-14)		Lab File ID: 23K1079-14.d				Analyzed: 11/30/23 00:00			
M8FOSA	519885.2	4.004567	668,109.00	3.996583	78	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	145746.7	2.6118	230,805.00	2.6118	63	50 - 150	0.0000	+/-0.50	
M2PFTA	1074032	4.362184	1,372,008.00	4.3622	78	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	147939.2	3.827067	224,508.00	3.827083	66	50 - 150	0.0000	+/-0.50	
MPFBA	625467.9	1.0834	747,715.00	1.0834	84	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	297062.5	2.91295	217,420.00	2.91295	137	50 - 150	0.0000	+/-0.50	
M6PFDA	1143188	3.82755	1,363,136.00	3.827567	84	50 - 150	0.0000	+/-0.50	
M3PFBS	290707.4	1.986217	285,464.00	1.978033	102	50 - 150	0.0082	+/-0.50	
M7PFUnA	1108556	3.978017	1,369,349.00	3.978033	81	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	193775.3	3.461417	192,908.00	3.4694	100	50 - 150	-0.0080	+/-0.50	
M5PFPeA	657416.4	1.799667	708,804.00	1.799667	93	50 - 150	0.0000	+/-0.50	
M5PFHxA	1064094	2.696967	1,169,882.00	2.696967	91	50 - 150	0.0000	+/-0.50	
M3PFHxS	210508.9	3.242583	209,914.00	3.242583	100	50 - 150	0.0000	+/-0.50	
M4PFHpA	1076160	3.21145	1,182,052.00	3.211467	91	50 - 150	0.0000	+/-0.50	
M8PFOA	1387255	3.477917	1,412,221.00	3.477917	98	50 - 150	0.0000	+/-0.50	
M8PFOS	205408	3.66015	234,102.00	3.660167	88	50 - 150	0.0000	+/-0.50	
M9PFNA	1430050	3.661183	1,581,628.00	3.6612	90	50 - 150	0.0000	+/-0.50	
MPFDoA	961212.3	4.120783	1,242,329.00	4.11265	77	50 - 150	0.0081	+/-0.50	
D5-NEtFOSAA	229837.8	3.985483	297,341.00	3.9855	77	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	247814	3.905917	295,321.00	3.905917	84	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PC-14 (23K1079-15) Lab File ID: 23K1079-15.d Analyzed: 11/30/23 00:07									
M8FOSA	135703.6	4.004583	668,109.00	3.996583	20	50 - 150	0.0080	+/-0.50	*
M2-4:2FTS	168429.9	2.6118	230,805.00	2.6118	73	50 - 150	0.0000	+/-0.50	
M2PFTA	259044	4.3622	1,372,008.00	4.3622	19	50 - 150	0.0000	+/-0.50	*
M2-8:2FTS	146345.1	3.827067	224,508.00	3.827083	65	50 - 150	0.0000	+/-0.50	
MPFBA	479088.1	1.0917	747,715.00	1.0834	64	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	276970.2	2.91295	217,420.00	2.91295	127	50 - 150	0.0000	+/-0.50	
M6PFDA	974979.9	3.827567	1,363,136.00	3.827567	72	50 - 150	0.0000	+/-0.50	
M3PFBS	272855.3	1.986217	285,464.00	1.978033	96	50 - 150	0.0082	+/-0.50	
M7PFUnA	840058.1	3.978033	1,369,349.00	3.978033	61	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	246506	3.461417	192,908.00	3.4694	128	50 - 150	-0.0080	+/-0.50	
M5PFPeA	604391.4	1.799667	708,804.00	1.799667	85	50 - 150	0.0000	+/-0.50	
M5PFHxA	987043.9	2.696967	1,169,882.00	2.696967	84	50 - 150	0.0000	+/-0.50	
M3PFHxS	190029.9	3.242583	209,914.00	3.242583	91	50 - 150	0.0000	+/-0.50	
M4PFHpA	1015980	3.21145	1,182,052.00	3.211467	86	50 - 150	0.0000	+/-0.50	
M8PFOA	1247337	3.477917	1,412,221.00	3.477917	88	50 - 150	0.0000	+/-0.50	
M8PFOS	176828.6	3.66015	234,102.00	3.660167	76	50 - 150	0.0000	+/-0.50	
M9PFNA	1133784	3.661183	1,581,628.00	3.6612	72	50 - 150	0.0000	+/-0.50	
MPFDoA	584293.6	4.11265	1,242,329.00	4.11265	47	50 - 150	0.0000	+/-0.50	*
D5-NEtFOSAA	178442.7	3.9855	297,341.00	3.9855	60	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	216942.4	3.897733	295,321.00	3.905917	73	50 - 150	-0.0082	+/-0.50	
PC-14 (23K1079-15RE1) Lab File ID: 23K1079-15RE1.d Analyzed: 12/01/23 03:05									
M8PFOS	241788.3	3.66015	232,302.00	3.66015	104	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
MW-125 (23K1079-16) Lab File ID: 23K1079-16.d Analyzed: 11/30/23 00:15									
M8FOSA	495642.4	4.004567	668,109.00	3.996583	74	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	256755.8	2.603583	230,805.00	2.6118	111	50 - 150	-0.0082	+/-0.50	
M2PFTA	1077468	4.362184	1,372,008.00	4.3622	79	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	229619.7	3.827067	224,508.00	3.827083	102	50 - 150	0.0000	+/-0.50	
MPFBA	435650.3	1.0834	747,715.00	1.0834	58	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	240031.9	2.91295	217,420.00	2.91295	110	50 - 150	0.0000	+/-0.50	
M6PFDA	1229803	3.82755	1,363,136.00	3.827567	90	50 - 150	0.0000	+/-0.50	
M3PFBS	293732.9	1.978033	285,464.00	1.978033	103	50 - 150	0.0000	+/-0.50	
M7PFUnA	1180948	3.978017	1,369,349.00	3.978033	86	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	290213	3.461417	192,908.00	3.4694	150	50 - 150	-0.0080	+/-0.50	
M5PFPeA	633064.1	1.791367	708,804.00	1.799667	89	50 - 150	-0.0083	+/-0.50	
M5PFHxA	1087917	2.68875	1,169,882.00	2.696967	93	50 - 150	-0.0082	+/-0.50	
M3PFHxS	198472.6	3.242583	209,914.00	3.242583	95	50 - 150	0.0000	+/-0.50	
M4PFHpA	1124465	3.21145	1,182,052.00	3.211467	95	50 - 150	0.0000	+/-0.50	
M8PFOA	1408953	3.477917	1,412,221.00	3.477917	100	50 - 150	0.0000	+/-0.50	
M8PFOS	212555.1	3.66015	234,102.00	3.660167	91	50 - 150	0.0000	+/-0.50	
M9PFNA	1327774	3.661183	1,581,628.00	3.6612	84	50 - 150	0.0000	+/-0.50	
MPFDoA	1027472	4.112633	1,242,329.00	4.11265	83	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	252559.2	3.9775	297,341.00	3.9855	85	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	273588.5	3.897733	295,321.00	3.905917	93	50 - 150	-0.0082	+/-0.50	
MW-125 (23K1079-16RE1) Lab File ID: 23K1079-16RE1.d Analyzed: 12/01/23 03:12									
M3PFHxS	245976.4	3.2345	204,620.00	3.2345	120	50 - 150	0.0000	+/-0.50	
M8PFOS	243559.7	3.66015	232,302.00	3.66015	105	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
MW-22 (23K1079-17) Lab File ID: 23K1079-17.d Analyzed: 11/30/23 00:22									
M8FOSA	432700.2	4.004583	668,109.00	3.996583	65	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	140396.8	2.6118	230,805.00	2.6118	61	50 - 150	0.0000	+/-0.50	
M2PFTA	961426.8	4.3622	1,372,008.00	4.3622	70	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	125296.6	3.827083	224,508.00	3.827083	56	50 - 150	0.0000	+/-0.50	
MPFBA	525356.5	1.0834	747,715.00	1.0834	70	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	234817.8	2.912967	217,420.00	2.91295	108	50 - 150	0.0000	+/-0.50	
M6PFDA	958096.5	3.827583	1,363,136.00	3.827567	70	50 - 150	0.0000	+/-0.50	
M3PFBS	272385.8	1.986217	285,464.00	1.978033	95	50 - 150	0.0082	+/-0.50	
M7PFUnA	927561.8	3.978033	1,369,349.00	3.978033	68	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	164673.6	3.461433	192,908.00	3.4694	85	50 - 150	-0.0080	+/-0.50	
M5PFPeA	598193	1.799667	708,804.00	1.799667	84	50 - 150	0.0000	+/-0.50	
M5PFHxA	995969.7	2.696967	1,169,882.00	2.696967	85	50 - 150	0.0000	+/-0.50	
M3PFHxS	191624.9	3.2426	209,914.00	3.242583	91	50 - 150	0.0000	+/-0.50	
M4PFHpA	1013984	3.211467	1,182,052.00	3.211467	86	50 - 150	0.0000	+/-0.50	
M8PFOA	1264245	3.477933	1,412,221.00	3.477917	90	50 - 150	0.0000	+/-0.50	
M8PFOS	172726.2	3.660167	234,102.00	3.660167	74	50 - 150	0.0000	+/-0.50	
M9PFNA	1201450	3.6612	1,581,628.00	3.6612	76	50 - 150	0.0000	+/-0.50	
MPFDoA	808465.3	4.1208	1,242,329.00	4.11265	65	50 - 150	0.0081	+/-0.50	
D5-NEtFOSAA	181579.9	3.9855	297,341.00	3.9855	61	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	196268	3.905933	295,321.00	3.905917	66	50 - 150	0.0000	+/-0.50	
MW-22 (23K1079-17RE1) Lab File ID: 23K1079-17RE1.d Analyzed: 12/01/23 03:19									
M8PFOS	256168.7	3.66015	232,302.00	3.66015	110	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
MW-351 (23K1079-18) Lab File ID: 23K1079-18.d Analyzed: 11/30/23 00:29									
M8FOSA	501948	4.004567	668,109.00	3.996583	75	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	134543.8	2.6118	230,805.00	2.6118	58	50 - 150	0.0000	+/-0.50	
M2PFTA	1045459	4.362184	1,372,008.00	4.3622	76	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	142097.8	3.827067	224,508.00	3.827083	63	50 - 150	0.0000	+/-0.50	
MPFBA	667771.6	1.0834	747,715.00	1.0834	89	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	293607.8	2.91295	217,420.00	2.91295	135	50 - 150	0.0000	+/-0.50	
M6PFDA	1145483	3.827567	1,363,136.00	3.827567	84	50 - 150	0.0000	+/-0.50	
M3PFBS	296946.6	1.986217	285,464.00	1.978033	104	50 - 150	0.0082	+/-0.50	
M7PFUnA	1068153	3.978033	1,369,349.00	3.978033	78	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	198581.5	3.4694	192,908.00	3.4694	103	50 - 150	0.0000	+/-0.50	
M5PFPeA	664622.9	1.799667	708,804.00	1.799667	94	50 - 150	0.0000	+/-0.50	
M5PFHxA	1107909	2.706317	1,169,882.00	2.696967	95	50 - 150	0.0093	+/-0.50	
M3PFHxS	211608.2	3.2426	209,914.00	3.242583	101	50 - 150	0.0000	+/-0.50	
M4PFHpA	1143192	3.21955	1,182,052.00	3.211467	97	50 - 150	0.0081	+/-0.50	
M8PFOA	1378254	3.477917	1,412,221.00	3.477917	98	50 - 150	0.0000	+/-0.50	
M8PFOS	216129.4	3.66015	234,102.00	3.660167	92	50 - 150	0.0000	+/-0.50	
M9PFNA	1482683	3.661183	1,581,628.00	3.6612	94	50 - 150	0.0000	+/-0.50	
MPFDaA	978942.2	4.11265	1,242,329.00	4.11265	79	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	219345.6	3.9855	297,341.00	3.9855	74	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	241747.9	3.905917	295,321.00	3.905917	82	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
EB.11.2.23 (23K1079-19) Lab File ID: 23K1079-19.d Analyzed: 11/30/23 00:36									
M8FOSA	504183.9	4.004567	668,109.00	3.996583	75	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	143403.8	2.6118	230,805.00	2.6118	62	50 - 150	0.0000	+/-0.50	
M2PFTA	1096289	4.362184	1,372,008.00	4.3622	80	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	163458.8	3.827067	224,508.00	3.827083	73	50 - 150	0.0000	+/-0.50	
MPFBA	712717.4	1.0834	747,715.00	1.0834	95	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	286631.2	2.91295	217,420.00	2.91295	132	50 - 150	0.0000	+/-0.50	
M6PFDA	1167530	3.82755	1,363,136.00	3.827567	86	50 - 150	0.0000	+/-0.50	
M3PFBS	274695.9	1.986217	285,464.00	1.978033	96	50 - 150	0.0082	+/-0.50	
M7PFUnA	1182696	3.978017	1,369,349.00	3.978033	86	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	173882	3.4614	192,908.00	3.4694	90	50 - 150	-0.0080	+/-0.50	
M5PFPeA	619805.6	1.799667	708,804.00	1.799667	87	50 - 150	0.0000	+/-0.50	
M5PFHxA	1010866	2.696967	1,169,882.00	2.696967	86	50 - 150	0.0000	+/-0.50	
M3PFHxS	190537.4	3.242583	209,914.00	3.242583	91	50 - 150	0.0000	+/-0.50	
M4PFHpA	1056404	3.21145	1,182,052.00	3.211467	89	50 - 150	0.0000	+/-0.50	
M8PFOA	1310937	3.4779	1,412,221.00	3.477917	93	50 - 150	0.0000	+/-0.50	
M8PFOS	219257.9	3.660133	234,102.00	3.660167	94	50 - 150	0.0000	+/-0.50	
M9PFNA	1390826	3.661183	1,581,628.00	3.6612	88	50 - 150	0.0000	+/-0.50	
MPFDoA	1019419	4.112633	1,242,329.00	4.11265	82	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	234855.8	3.977483	297,341.00	3.9855	79	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	251930.5	3.897717	295,321.00	3.905917	85	50 - 150	-0.0082	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PC-38 (23K1079-20) Lab File ID: 23K1079-20.d Analyzed: 11/30/23 00:43									
M8FOSA	535728.9	4.004567	668,109.00	3.996583	80	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	168096.6	2.6118	230,805.00	2.6118	73	50 - 150	0.0000	+/-0.50	
M2PFTA	1194190	4.362184	1,372,008.00	4.3622	87	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	139456.8	3.827067	224,508.00	3.827083	62	50 - 150	0.0000	+/-0.50	
MPFBA	701869.6	1.0834	747,715.00	1.0834	94	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	295482.5	2.91295	217,420.00	2.91295	136	50 - 150	0.0000	+/-0.50	
M6PFDA	1208161	3.827567	1,363,136.00	3.827567	89	50 - 150	0.0000	+/-0.50	
M3PFBS	333836.6	1.986217	285,464.00	1.978033	117	50 - 150	0.0082	+/-0.50	
M7PFUnA	1147896	3.978017	1,369,349.00	3.978033	84	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	208073.5	3.4694	192,908.00	3.4694	108	50 - 150	0.0000	+/-0.50	
M5PFPeA	733073.4	1.799667	708,804.00	1.799667	103	50 - 150	0.0000	+/-0.50	
M5PFHxA	1188505	2.696967	1,169,882.00	2.696967	102	50 - 150	0.0000	+/-0.50	
M3PFHxS	229895.3	3.242583	209,914.00	3.242583	110	50 - 150	0.0000	+/-0.50	
M4PFHpA	1261431	3.21955	1,182,052.00	3.211467	107	50 - 150	0.0081	+/-0.50	
M8PFOA	1509420	3.477917	1,412,221.00	3.477917	107	50 - 150	0.0000	+/-0.50	
M8PFOS	235144.2	3.66015	234,102.00	3.660167	100	50 - 150	0.0000	+/-0.50	
M9PFNA	1560855	3.661183	1,581,628.00	3.6612	99	50 - 150	0.0000	+/-0.50	
MPFDoA	1083266	4.112633	1,242,329.00	4.11265	87	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	211807.3	3.985483	297,341.00	3.9855	71	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	231533.8	3.905917	295,321.00	3.905917	78	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Equip-Blank-11.3.23 (23K1079-21)		Lab File ID: 23K1079-21.d				Analyzed: 11/30/23 00:51			
M8FOSA	81085.86	4.004567	668,109.00	3.996583	12	50 - 150	0.0080	+/-0.50	*
M2-4:2FTS	8508.219	2.6118	230,805.00	2.6118	04	50 - 150	0.0000	+/-0.50	*
M2PFTA	279830.6	4.362184	1,372,008.00	4.3622	20	50 - 150	0.0000	+/-0.50	*
M2-8:2FTS	11597.34	3.827067	224,508.00	3.827083	05	50 - 150	0.0000	+/-0.50	*
MPFBA	46482.79	1.0834	747,715.00	1.0834	06	50 - 150	0.0000	+/-0.50	*
M3HFPO-DA	14837.13	2.91295	217,420.00	2.91295	07	50 - 150	0.0000	+/-0.50	*
M6PFDA	72777.22	3.819267	1,363,136.00	3.827567	05	50 - 150	-0.0083	+/-0.50	*
M3PFBS	28103.99	1.986217	285,464.00	1.978033	10	50 - 150	0.0082	+/-0.50	*
M7PFUnA	88233.9	3.970017	1,369,349.00	3.978033	06	50 - 150	-0.0080	+/-0.50	*
M2-6:2FTS	9053.924	3.461417	192,908.00	3.4694	05	50 - 150	-0.0080	+/-0.50	*
M5PFPeA	38383.58	1.79965	708,804.00	1.799667	05	50 - 150	0.0000	+/-0.50	*
M5PFHxA	60286.16	2.696967	1,169,882.00	2.696967	05	50 - 150	0.0000	+/-0.50	*
M3PFHxS	17274.21	3.242583	209,914.00	3.242583	08	50 - 150	0.0000	+/-0.50	*
M4PFHpA	60863.71	3.21145	1,182,052.00	3.211467	05	50 - 150	0.0000	+/-0.50	*
M8PFOA	73028.98	3.4779	1,412,221.00	3.477917	05	50 - 150	0.0000	+/-0.50	*
M8PFOS	17366.67	3.660133	234,102.00	3.660167	07	50 - 150	0.0000	+/-0.50	*
M9PFNA	88101.05	3.661183	1,581,628.00	3.6612	06	50 - 150	0.0000	+/-0.50	*
MPFDoA	126059.9	4.112633	1,242,329.00	4.11265	10	50 - 150	0.0000	+/-0.50	*
D5-NEtFOSAA	26139.32	3.9775	297,341.00	3.9855	09	50 - 150	-0.0080	+/-0.50	*
D3-NMeFOSAA	19358.14	3.897733	295,321.00	3.905917	07	50 - 150	-0.0082	+/-0.50	*

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Blank (B357679-BLK1)			Lab File ID: B357679-BLK1.d			Analyzed: 11/29/23 20:17			
M8FOSA	613048.6	3.996567	668,109.00	3.9966	92	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	214203.5	2.636633	230,805.00	2.644867	93	50 - 150	-0.0082	+/-0.50	
M2PFTA	1364218	4.3703	1,372,008.00	4.370333	99	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	226639.9	3.835017	224,508.00	3.835033	101	50 - 150	0.0000	+/-0.50	
MPFBA	764754.8	1.0917	747,715.00	1.100017	102	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	238262.9	2.93785	217,420.00	2.93785	110	50 - 150	0.0000	+/-0.50	
M6PFDA	1416191	3.82755	1,363,136.00	3.835533	104	50 - 150	-0.0080	+/-0.50	
M3PFBS	326400.3	2.002783	285,464.00	2.011067	114	50 - 150	-0.0083	+/-0.50	
M7PFUnA	1388198	3.986	1,369,349.00	3.986033	101	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	230872.1	3.477383	192,908.00	3.4774	120	50 - 150	0.0000	+/-0.50	
M5PFPeA	751130.6	1.816233	708,804.00	1.824517	106	50 - 150	-0.0083	+/-0.50	
M5PFHxA	1259548	2.722683	1,169,882.00	2.730867	108	50 - 150	-0.0082	+/-0.50	
M3PFHxS	238349.7	3.250667	209,914.00	3.250683	114	50 - 150	0.0000	+/-0.50	
M4PFHpA	1320902	3.227617	1,182,052.00	3.227633	112	50 - 150	0.0000	+/-0.50	
M8PFOA	1632481	3.485883	1,412,221.00	3.4859	116	50 - 150	0.0000	+/-0.50	
M8PFOS	254433.2	3.668133	234,102.00	3.66815	109	50 - 150	0.0000	+/-0.50	
M9PFNA	1858389	3.669167	1,581,628.00	3.669183	117	50 - 150	0.0000	+/-0.50	
MPFDoA	1206904	4.120767	1,242,329.00	4.128833	97	50 - 150	-0.0081	+/-0.50	
D5-NEtFOSAA	307228.2	3.993467	297,341.00	3.9935	103	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	296382.1	3.9139	295,321.00	3.913933	100	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (B357679-BS1)			Lab File ID: B357679-BS1.d			Analyzed: 11/29/23 20:09			
M8FOSA	565658.1	3.996583	668,109.00	3.9966	85	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	211569.6	2.636633	230,805.00	2.644867	92	50 - 150	-0.0082	+/-0.50	
M2PFTA	1303011	4.370317	1,372,008.00	4.370333	95	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	232320.8	3.835033	224,508.00	3.835033	103	50 - 150	0.0000	+/-0.50	
MPFBA	708556.1	1.0917	747,715.00	1.100017	95	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	225180	2.929717	217,420.00	2.93785	104	50 - 150	-0.0081	+/-0.50	
M6PFDA	1300310	3.835517	1,363,136.00	3.835533	95	50 - 150	0.0000	+/-0.50	
M3PFBS	310779.8	2.002783	285,464.00	2.011067	109	50 - 150	-0.0083	+/-0.50	
M7PFUnA	1350868	3.986017	1,369,349.00	3.986033	99	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	209148.4	3.477383	192,908.00	3.4774	108	50 - 150	0.0000	+/-0.50	
M5PFPeA	696736.4	1.816233	708,804.00	1.824517	98	50 - 150	-0.0083	+/-0.50	
M5PFHxA	1162807	2.722683	1,169,882.00	2.730867	99	50 - 150	-0.0082	+/-0.50	
M3PFHxS	218138.1	3.250683	209,914.00	3.250683	104	50 - 150	0.0000	+/-0.50	
M4PFHpA	1250912	3.227633	1,182,052.00	3.227633	106	50 - 150	0.0000	+/-0.50	
M8PFOA	1521252	3.4859	1,412,221.00	3.4859	108	50 - 150	0.0000	+/-0.50	
M8PFOS	242556.3	3.668133	234,102.00	3.66815	104	50 - 150	0.0000	+/-0.50	
M9PFNA	1798645	3.669167	1,581,628.00	3.669183	114	50 - 150	0.0000	+/-0.50	
MPFDoA	1144580	4.120783	1,242,329.00	4.128833	92	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	278130.9	3.993483	297,341.00	3.9935	94	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	284712.6	3.913917	295,321.00	3.913933	96	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike (B357679-MS1) Lab File ID: B357679-MS1.d Analyzed: 11/29/23 20:24									
M8FOSA	304052.3	3.996583	668,109.00	3.9966	46	50 - 150	0.0000	+/-0.50	*
M2-4:2FTS	234521.3	2.636633	230,805.00	2.644867	102	50 - 150	-0.0082	+/-0.50	
M2PFTA	850906.9	4.370317	1,372,008.00	4.370333	62	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	790530.4	3.835033	224,508.00	3.835033	352	50 - 150	0.0000	+/-0.50	*
MPFBA	465787.8	1.100017	747,715.00	1.100017	62	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	205955.3	2.929733	217,420.00	2.93785	95	50 - 150	-0.0081	+/-0.50	
M6PFDA	1146962	3.827567	1,363,136.00	3.835533	84	50 - 150	-0.0080	+/-0.50	
M3PFBS	282948.2	2.002783	285,464.00	2.011067	99	50 - 150	-0.0083	+/-0.50	
M7PFUnA	1024246	3.986017	1,369,349.00	3.986033	75	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	1086210	3.477383	192,908.00	3.4774	563	50 - 150	0.0000	+/-0.50	*
M5PFPeA	641276.1	1.816233	708,804.00	1.824517	90	50 - 150	-0.0083	+/-0.50	
M5PFHxA	1091791	2.722683	1,169,882.00	2.730867	93	50 - 150	-0.0082	+/-0.50	
M3PFHxS	186702.7	3.250667	209,914.00	3.250683	89	50 - 150	0.0000	+/-0.50	
M4PFHpA	1159576	3.227617	1,182,052.00	3.227633	98	50 - 150	0.0000	+/-0.50	
M8PFOA	1354074	3.4859	1,412,221.00	3.4859	96	50 - 150	0.0000	+/-0.50	
M8PFOS	146612.8	3.668133	234,102.00	3.66815	63	50 - 150	0.0000	+/-0.50	
M9PFNA	1040059	3.669167	1,581,628.00	3.669183	66	50 - 150	0.0000	+/-0.50	
MPFDoA	830486.4	4.120783	1,242,329.00	4.128833	67	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	249191.3	3.993483	297,341.00	3.9935	84	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	261552.8	3.905917	295,321.00	3.913933	89	50 - 150	-0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike Dup (B357679-MSD1)			Lab File ID: B357679-MSD1.d			Analyzed: 11/29/23 20:31			
M8FOSA	357880.1	3.996567	668,109.00	3.9966	54	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	188477.2	2.636633	230,805.00	2.644867	82	50 - 150	-0.0082	+/-0.50	
M2PFTA	574864.5	4.3703	1,372,008.00	4.370333	42	50 - 150	0.0000	+/-0.50	*
M2-8:2FTS	610019.3	3.835017	224,508.00	3.835033	272	50 - 150	0.0000	+/-0.50	*
MPFBA	428565.1	1.0917	747,715.00	1.100017	57	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	185133.8	2.929717	217,420.00	2.93785	85	50 - 150	-0.0081	+/-0.50	
M6PFDA	1218401	3.82755	1,363,136.00	3.835533	89	50 - 150	-0.0080	+/-0.50	
M3PFBS	243524	2.002783	285,464.00	2.011067	85	50 - 150	-0.0083	+/-0.50	
M7PFUnA	1154264	3.986	1,369,349.00	3.986033	84	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	760435.2	3.477383	192,908.00	3.4774	394	50 - 150	0.0000	+/-0.50	*
M5PFPeA	582240.3	1.816233	708,804.00	1.824517	82	50 - 150	-0.0083	+/-0.50	
M5PFHxA	1007974	2.722683	1,169,882.00	2.730867	86	50 - 150	-0.0082	+/-0.50	
M3PFHxS	171520.5	3.250667	209,914.00	3.250683	82	50 - 150	0.0000	+/-0.50	
M4PFHpA	1027866	3.227617	1,182,052.00	3.227633	87	50 - 150	0.0000	+/-0.50	
M8PFOA	1305422	3.485883	1,412,221.00	3.4859	92	50 - 150	0.0000	+/-0.50	
M8PFOS	159912.2	3.668133	234,102.00	3.66815	68	50 - 150	0.0000	+/-0.50	
M9PFNA	1153305	3.669167	1,581,628.00	3.669183	73	50 - 150	0.0000	+/-0.50	
MPFDoA	882150.9	4.120783	1,242,329.00	4.128833	71	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	228133.3	3.993483	297,341.00	3.9935	77	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	261904.8	3.9059	295,321.00	3.913933	89	50 - 150	-0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Blank (B358210-BLK1)			Lab File ID: B358210-BLK1.d			Analyzed: 11/29/23 23:46			
M8FOSA	564498.8	4.004567	668,109.00	3.996583	84	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	182890.4	2.6118	230,805.00	2.6118	79	50 - 150	0.0000	+/-0.50	
M2PFTA	1137918	4.3622	1,372,008.00	4.3622	83	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	176301	3.827067	224,508.00	3.827083	79	50 - 150	0.0000	+/-0.50	
MPFBA	715771.4	1.0834	747,715.00	1.0834	96	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	306313.2	2.91295	217,420.00	2.91295	141	50 - 150	0.0000	+/-0.50	
M6PFDA	1181378	3.827567	1,363,136.00	3.827567	87	50 - 150	0.0000	+/-0.50	
M3PFBS	294466.2	1.986217	285,464.00	1.978033	103	50 - 150	0.0082	+/-0.50	
M7PFUnA	1138964	3.978033	1,369,349.00	3.978033	83	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	211481.6	3.461417	192,908.00	3.4694	110	50 - 150	-0.0080	+/-0.50	
M5PFPeA	681065.7	1.799667	708,804.00	1.799667	96	50 - 150	0.0000	+/-0.50	
M5PFHxA	1109066	2.696967	1,169,882.00	2.696967	95	50 - 150	0.0000	+/-0.50	
M3PFHxS	211604	3.2426	209,914.00	3.242583	101	50 - 150	0.0000	+/-0.50	
M4PFHpA	1164307	3.211467	1,182,052.00	3.211467	98	50 - 150	0.0000	+/-0.50	
M8PFOA	1435701	3.477917	1,412,221.00	3.477917	102	50 - 150	0.0000	+/-0.50	
M8PFOS	221277.4	3.66015	234,102.00	3.660167	95	50 - 150	0.0000	+/-0.50	
M9PFNA	1575203	3.661183	1,581,628.00	3.6612	100	50 - 150	0.0000	+/-0.50	
MPFDoA	997375.7	4.1208	1,242,329.00	4.11265	80	50 - 150	0.0081	+/-0.50	
D5-NEtFOSAA	236946	3.9855	297,341.00	3.9855	80	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	257710.7	3.905917	295,321.00	3.905917	87	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (B358210-BS1)			Lab File ID: B358210-BS1.d			Analyzed: 11/29/23 23:31			
M8FOSA	590833.8	3.996583	668,109.00	3.996583	88	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	189606.5	2.6118	230,805.00	2.6118	82	50 - 150	0.0000	+/-0.50	
M2PFTA	1202934	4.3622	1,372,008.00	4.3622	88	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	185548.8	3.827083	224,508.00	3.827083	83	50 - 150	0.0000	+/-0.50	
MPFBA	787032.3	1.0834	747,715.00	1.0834	105	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	305685.7	2.91295	217,420.00	2.91295	141	50 - 150	0.0000	+/-0.50	
M6PFDA	1258978	3.827567	1,363,136.00	3.827567	92	50 - 150	0.0000	+/-0.50	
M3PFBS	325342.3	1.986217	285,464.00	1.978033	114	50 - 150	0.0082	+/-0.50	
M7PFUnA	1199145	3.978033	1,369,349.00	3.978033	88	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	216546.2	3.461433	192,908.00	3.4694	112	50 - 150	-0.0080	+/-0.50	
M5PFPeA	731183.3	1.799667	708,804.00	1.799667	103	50 - 150	0.0000	+/-0.50	
M5PFHxA	1204165	2.706317	1,169,882.00	2.696967	103	50 - 150	0.0093	+/-0.50	
M3PFHxS	229400.9	3.2426	209,914.00	3.242583	109	50 - 150	0.0000	+/-0.50	
M4PFHpA	1274076	3.211467	1,182,052.00	3.211467	108	50 - 150	0.0000	+/-0.50	
M8PFOA	1609419	3.477917	1,412,221.00	3.477917	114	50 - 150	0.0000	+/-0.50	
M8PFOS	225195.8	3.66015	234,102.00	3.660167	96	50 - 150	0.0000	+/-0.50	
M9PFNA	1610726	3.6612	1,581,628.00	3.6612	102	50 - 150	0.0000	+/-0.50	
MPFDoA	1092711	4.120783	1,242,329.00	4.11265	88	50 - 150	0.0081	+/-0.50	
D5-NEtFOSAA	246628.8	3.9855	297,341.00	3.9855	83	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	270336.5	3.905917	295,321.00	3.905917	92	50 - 150	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

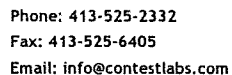
Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS Dup (B358210-BSD1) Lab File ID: B358210-BSD1.d Analyzed: 11/29/23 23:39									
M8FOSA	529267.1	3.996567	668,109.00	3.996583	79	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	172797.5	2.6118	230,805.00	2.6118	75	50 - 150	0.0000	+/-0.50	
M2PFTA	1110697	4.362167	1,372,008.00	4.3622	81	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	152325.9	3.827067	224,508.00	3.827083	68	50 - 150	0.0000	+/-0.50	
MPFBA	673605.8	1.0834	747,715.00	1.0834	90	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	260526.5	2.91295	217,420.00	2.91295	120	50 - 150	0.0000	+/-0.50	
M6PFDA	1074373	3.82755	1,363,136.00	3.827567	79	50 - 150	0.0000	+/-0.50	
M3PFBS	285791.6	1.986217	285,464.00	1.978033	100	50 - 150	0.0082	+/-0.50	
M7PFUnA	1066361	3.978017	1,369,349.00	3.978033	78	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	201116	3.461417	192,908.00	3.4694	104	50 - 150	-0.0080	+/-0.50	
M5PFPeA	639457.9	1.799667	708,804.00	1.799667	90	50 - 150	0.0000	+/-0.50	
M5PFHxA	1035531	2.696967	1,169,882.00	2.696967	89	50 - 150	0.0000	+/-0.50	
M3PFHxS	198744.1	3.242583	209,914.00	3.242583	95	50 - 150	0.0000	+/-0.50	
M4PFHpA	1088915	3.21145	1,182,052.00	3.211467	92	50 - 150	0.0000	+/-0.50	
M8PFOA	1380083	3.4779	1,412,221.00	3.477917	98	50 - 150	0.0000	+/-0.50	
M8PFOS	212307.2	3.660133	234,102.00	3.660167	91	50 - 150	0.0000	+/-0.50	
M9PFNA	1499784	3.661183	1,581,628.00	3.6612	95	50 - 150	0.0000	+/-0.50	
MPFDoA	977065.6	4.120767	1,242,329.00	4.11265	79	50 - 150	0.0081	+/-0.50	
D5-NEtFOSAA	214227.9	3.985483	297,341.00	3.9855	72	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	238517	3.9059	295,321.00	3.905917	81	50 - 150	0.0000	+/-0.50	

CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
<i>SOP-454 PFAS in Water</i>	
Perfluorobutanoic acid (PFBA)	NH-P,PA,NY
Perfluorobutanesulfonic acid (PFBS)	NH-P,PA,NY
Perfluoropentanoic acid (PFPeA)	NH-P,PA,NY
Perfluorohexanoic acid (PFHxA)	NH-P,PA,NY
11Cl-PF3OUdS (F53B Major)	NH-P,PA,NY
9Cl-PF3ONS (F53B Minor)	NH-P,PA
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P,PA,NY
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P,PA,NY
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P,PA
Perfluorodecanoic acid (PFDA)	NH-P,PA,NY
Perfluorododecanoic acid (PFDoA)	NH-P,PA,NY
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	NH-P,PA,NY
Perfluoroheptanesulfonic acid (PFHpS)	NH-P,PA,NY
N-EtFOSAA (NEtFOSAA)	NH-P,PA,NY
N-MeFOSAA (NMeFOSAA)	NH-P,PA,NY
Perfluorotetradecanoic acid (PFTA)	NH-P,PA,NY
Perfluorotridecanoic acid (PFTrDA)	NH-P,PA,NY
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P,PA,NY
Perfluorodecanesulfonic acid (PFDS)	NH-P,PA
Perfluorooctanesulfonamide (FOSA)	NH-P,PA
Perfluorononanesulfonic acid (PFNS)	NH-P,PA
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P,PA
Perfluoro-1-butanedisulfonamide (FBSA)	NH-P,PA
Perfluorohexanesulfonic acid (PFHxS)	NH-P,PA,NY
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P,PA,NY
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P,PA,NY
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P,PA,NY
Perfluoropentanesulfonic acid (PFPeS)	NH-P,PA,NY
Perfluoroundecanoic acid (PFUnA)	NH-P,PA,NY
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P,PA
Perfluoroheptanoic acid (PFHpA)	NH-P,PA,NY
Perfluorooctanoic acid (PFOA)	NH-P,PA,NY
Perfluorooctanesulfonic acid (PFOS)	NH-P,PA,NY
Perfluorononanoic acid (PFNA)	NH-P,PA,NY

Con-Test, a Pace Environmental Laboratory, operates under the following certifications and accreditations:

Code	Description	Number	Expires
NY	New York State Department of Health	10899 NELAP	04/1/2024
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2024
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2024



CHAIN OF CUSTODY RECORD

39 Spruce Street
East Longmeadow, MA 01028

Doc # 381 Rev 2 06262019

Page 1 of 3

Company Name:	BETA Group Inc.
Address:	701 George Washington Hwy, Lincoln, RI
Phone:	
Project Name:	BFTA
Project Location:	Barnstable, MA
Project Number:	6206.04
Project Manager:	Roger Thibault
Con-Test Quote Name/Number:	
Invoice Recipient:	**Stacy Wildanger - AP@BETA-Inc.com
Sampled By:	Laura Bouley

Requested Turnaround Time		Discussed Metals Samples	
7-Day ☐	10-Day ☐	☐ Field Filtered	
PFAS 15-Day (std) ☒	Due Date:	☐ Lab to Filter	
Rush-Approval Required		Orthophosphate Samples	
1-Day ☐	3-Day ☐	☐ Field Filtered	
2-Day ☐	4-Day ☐	☐ Lab to Filter	
Data Delivery			
Format: PDF ☒	EXCEL ☒	PCB ONLY	
Other:		SOXHLET	☐
CLP Like Data Pkg Required: ☐		NON SOXHLET	☐
Email To: Rithibatali@BETA-Inc.com , Louclay@BETA-Inc.com			
Fax To #:			

ANALYSIS REQUESTED										2 Preservation Code	
O	N	H								Courier Use Only	
										<u>Total Number Of:</u> VIALS _____ GLASS _____ PLASTIC _____ BACTERIA _____ ENCORE _____	

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	COMP/GRAB	'Matrix Code	Conc Code	VIALS	GLASS	PLASTIC	BACTERIA	ENCORE	PFAS
1	HSW-6	11-2-23	9:15	GRAB	GW	H			1/2	(C)		X
2	PFW-1	11-2-23	10:00	GRAB	GW	H			1/2	(C)		X
3	PFW-5	11-3-23	10:05	GRAB	GW	H			1/2	(C)		X
4	MW-311	11-2-23	13:15	GRAB	GW	H			1/2	(C)		X
5	MW-35	11-2-23	13:50	GRAB	GW	H			1/2	(C)		X
6	PC-1	11-3-23	11:15	GRAB	GW	H			2			X
7	PC-6A	11-3-23	9:30	GRAB	GW	H			2			X
8	PC-11	11-1-23	14:00	GRAB	GW	H			2			X
9	PC-345	11-2-23	10:40	GRAB	GW	H			1/2	(C)		X
10	DUP-1	11-3-23	8:40	Grab	GW L-M				2			X

2 Preservation Code

Courier Use Only

Total Number Of:

VIALS _____

GLASS _____

PLASTIC _____

BACTERIA _____

ENCORE _____

Relinquished by: (signature) <i>[Signature]</i>	Date/Time: 11-3-23 15:00	Client Comments: *Lab requested MS/MSD. Sample confirmation and report to Rthibault@BETA-Inc.com & Lbouley@BETA-Inc.com only 1 sample bottle available for H30-6, PFW-1, PFW-5, MW-311, MW-35, PC-345, PC-29, MW-125, MW-22, and Equip-1 Blank-11.3.23.			
Received by: (signature) <i>Lincoln Frige</i>	Date/Time: 11-3-23 15:00				
Relinquished by: (signature) <i>P. B. Moore</i>	Date/Time: 11/8/23 9:58	Detection Limit Requirements		Special Requirements	
Received by: (signature) <i>[Signature]</i>	Date/Time: 11/8/23 16:18	MA	GW-1	☒	MA MCP Required
Relinquished by: (signature) <i>[Signature]</i>	Date/Time:			☐	MCP Certification Form Required
Received by: (signature) <i>[Signature]</i>	Date/Time:			☐	CT RCP Required
Relinquished by: (signature) <i>[Signature]</i>	Date/Time:	CT			RCP Certification Form Required
Received by: (signature) <i>[Signature]</i>	Date/Time: 11/5/23 16:15			☐	MA State DW Required
Relinquished by: (signature) <i>[Signature]</i>	Date/Time:	Other:	PWSID #	NELAC and AIHA-LAP, LLC Accredited	
Received by: (signature)	Date/Time:	Project Entity			
		Government ☐	Municipality ☐	MWRA ☐	WRTA ☐
		Federal ☐	21 J ☐	School ☐	
		City ☐	Brownfield ☐	MBTA ☐	
		Other ☐ Chromatogram ☐ AIHA-LAP, LLC			

Glassware in the fridge? Y / N

Glassware in freezer? Y / N

Prepackaged Cooler? Y / N

*Contest is not responsible for missing samples from prepacked coolers

1 Matrix Codes:
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

2 Preservation Codes:
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define) ___Non-preserved

Lab Comments:

Sample -06 not received 1/17/23 KF

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Phone: 413-525-2332

Fax: 413-525-6405

Email: info@con-testlabs.com

BETA Group Inc.

Address: 701 George Washington Hwy, Lincoln, RI

Phone: BETA

Project Location: Barnstable, MA

Project Number: 6206.04

Project Manager: Roger Thibault

Con-Test Quote Name/Number: **Stacy Wildanger - AP@BETA-Inc.com

Invoice Recipient: Laura Bouley

Sampled By: Laura Bouley

39 Spruce Street

East Longmeadow, MA 01028

CHAIN OF CUSTODY RECORD

Requested Turnaround Time

Dispersed Matrix Samples

7-Day ☐ 10-Day ☐

PFAS 15-Day (std) ☒ Due Date:

Rush Approval Required

1-Day ☐ 3-Day ☐

2-Day ☐ 4-Day ☐

Orthophosphate Samples

Field Filtered

Lab to Filter

Format: PDF ☒ EXCEL ☒

Other: ☐

CLP Like Data Pkg Required: ☐

Email To: Rthibault@BETA-Inc.com, Lbouley@BETA-Inc.com

Fax To #: NON SOXHLET

ANALYSIS REQUESTED

O N H

2 Preservation Code

Courier Use Only

Total Number Of:

VIALS

GLASS

PLASTIC

BACTERIA

ENCORE

Glassware in the fridge? Y / N

Glassware in freezer? Y / N

Prepackaged Cooler? Y / N

*Contest is not responsible for missing samples from prepacked coolers

1 Matrix Codes:

GW = Ground Water

WW = Waste Water

DW = Drinking Water

A = Air

S = Soil

SL = Sludge

SOL = Solid

O = Other (please define)

2 Preservation Codes:

I = Iced

H = HCL

M = Methanol

N = Nitric Acid

S = Sulfuric Acid

B = Sodium Bisulfate

X = Sodium Hydroxide

T = Sodium Thiosulfate

O = Other (please define) ___ Non-preserved

Client Comments: *Lab requested MS/MSD. Sample confirmation and report to Rthibault@BETA-Inc.com & Lbouley@BETA-Inc.com

Relinquished by: (signature)

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Disclaimers: Con-Test Labs is not responsible for any omitted information on the Chain of Custody. The Chain of Custody is a legal document that must be complete and accurate and is used to determine what analyses the laboratory will perform. Any missing information is not the laboratory's responsibility. Con-Test values your partnership on each project and will try to assist with missing information, but will not be held accountable.



Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
BETA Group Inc.

Address: 701 George Washington Hwy, Lincoln, RI

Project Name: BFTA

Project Location: Barnstable, MA

Project Number: 6206.04

Project Manager: Roger Thibault

Con-Test Quote Name/Number:

Invoice Recipient: **Stacy Wildanger - AP@BETA-Inc.com

Sampled By: Laura Bouley

http://www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East Longmeadow, MA 01028

Doc # 381 Rev 2_06262019

Page 3 of 3

ANALYSIS REQUESTED

Requested Turnaround Time: 7-Day ☐ 10-Day ☐ PFAS 15-Day (std) ☒ Due Date: ☐ Rush Approval Required: 1-Day ☐ 3-Day ☐ 2-Day ☐ 4-Day ☐ Field Filtered: ☐ Lab to Filter: ☐ Orthophosphate Samples: ☐ Field Filtered: ☐ Lab to Filter: ☐

Format: PDF ☒ EXCEL ☒ Other: ☐

CLP Like Data Pkg Required: ☐ SOXHLET ☐

Email To: ☐ NON SOXHLET ☐

Fax To #: ☐

Ending Date/Time: 11-23 14:00

Beginning Date/Time: 11-23 11:20

Client Sample ID / Description: PC-11 MS/MSD

Con-Test Work Order#: 21 Equip Blank-11323

Matrix Code: GW

Conc Code: H

COMP/GRAB: GRAB

VIALS: 2

GLASS: 12

PLASTIC: 12

BACTERIA: 12

ENCORE: 12

PFAS: X

Glassware in the fridge? Y/N

Glassware in freezer? Y/N

Prepackaged Cooler? Y/N

*Contest is not responsible for missing samples from prepackaged coolers

1 Matrix Codes: GW = Ground Water WW = Waste Water DW = Drinking Water A = Air S = Soil SL = Sludge SOL = Solid O = Other (please define)

2 Preservation Codes: I = Iced H = HCL M = Methanol N = Nitric Acid S = Sulfuric Acid B = Sodium Bisulfate X = Sodium Hydroxide T = Sodium Thiosulfate O = Other (please define) - Non-preserved

Please use the following codes to indicate possible sample concentration within the Conc Code column above: H - High; M - Medium; L - Low; C - Clean; U - Unknown

MA MCP Required ☒ MA State DW Required ☐

MCP Certification Form Required ☐ RCP Certification Form Required ☐

CT RCP Required ☐

MA State DW Required ☐

PWSID #

Project Entity

Government ☐ Federal ☐ City ☐

Municipality ☐ 21 J ☐ Brownfield ☐

MWRA ☐ School ☐ MBTA ☐

WRTA ☐ Other ☐

Chromatogram ☐ AIHA-LAP, LLC ☐

NEIAC and AIHA-LAP, LLC Accredited

Disclaimers: Con-Test Labs is not responsible for any omitted information on the Chain of Custody. The Chain of Custody is a legal document that must be complete and accurate and is used to determine what analyses the laboratory will perform. Any missing information is not the laboratory's responsibility. Con-Test values your partnership on each project and will try to assist with missing information, but will not be held accountable.

Retinquired by: (signature) Date/Time: 11-23 15:00

Received By: (signature) Date/Time: 11-23 15:00

Retinquired by: (signature) Date/Time: 11-23 16:18

Received By: (signature) Date/Time: 11-23 16:18

Retinquired by: (signature) Date/Time: 11-23 16:18

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Received By: (signature) Date/Time: 11-23 16:18

Retinquired by: (signature) Date/Time: 11-23 16:18

Received By: (signature) Date/Time: 11-23 16:18

December 22, 2023

Roger Thibault
Beta Group, Inc. - RI
701 George Washington Highway
Lincoln, RI 02865

Project Location: Barnstable, MA
Client Job Number:
Project Number: 6206.02
Laboratory Work Order Number: 23K2978

Enclosed are results of analyses for samples as received by the laboratory on November 22, 2023. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kaitlyn A. Feliciano
Project Manager

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332Beta Group, Inc. - RI
701 George Washington Highway
Lincoln, RI 02865
ATTN: Roger Thibault

REPORT DATE: 12/22/2023

PURCHASE ORDER NUMBER: 23000936

PROJECT NUMBER: 6206.02

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 23K2978

The results of analyses performed on the following samples submitted to CON-TEST, a Pace Analytical Laboratory, are found in this report.

PROJECT LOCATION: Barnstable, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
PC-1	23K2978-01	Ground Water		SOP-454 PFAS	
HW-25	23K2978-02	Ground Water		SOP-454 PFAS	
HW-2D	23K2978-03	Ground Water		SOP-454 PFAS	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

Revised Report 12/21/23: Removal of duplicated result for result of PFHxS and PFOS for sample -01.

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

SOP-454 PFAS**Qualifications:****L-01**

Laboratory fortified blank/laboratory control sample recovery outside of control limits. Data validation is not affected since all results are "not detected" for all samples in this batch for this compound and bias is on the high side.

Analyte & Samples(s) Qualified:**N-EtFOSAA (NEtFOSAA)**

23K2978-01[PC-1], 23K2978-02[HW-25], 23K2978-03[HW-2D]

Perfluorodecanoic acid (PFDA)

23K2978-02[HW-25], 23K2978-03[HW-2D]

Perfluorotetradecanoic acid (PFTA)

23K2978-01[PC-1], 23K2978-02[HW-25], 23K2978-03[HW-2D]

L-02

Laboratory fortified blank/laboratory control sample recovery and duplicate recoveries outside of control limits. Data validation is not affected since all results are "not detected" for associated samples in this batch and bias is on the high side.

Analyte & Samples(s) Qualified:**6:2 Fluorotelomersulfonic acid (6:2FTS A)**

23K2978-02[HW-25], 23K2978-03[HW-2D]

N-EtFOSAA (NEtFOSAA)

B360698-BS1, B360698-BSD1

N-MeFOSAA (NMeFOSAA)

23K2978-01[PC-1], 23K2978-02[HW-25], 23K2978-03[HW-2D], B359274-BS1, B359274-BSD1

L-06

Laboratory fortified blank/laboratory control sample recovery and/or duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the high side.

Analyte & Samples(s) Qualified:**6:2 Fluorotelomersulfonic acid (6:2FTS A)**

23K2978-01[PC-1], B359274-BS1, B359274-BSD1

L-07

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:**N-EtFOSAA (NEtFOSAA)**

B359274-BS1

Perfluorodecanoic acid (PFDA)

23K2978-01[PC-1], B359274-BS1

Perfluorododecanoic acid (PFDoA)

B360698-BSD1

Perfluorononanoic acid (PFNA)

23K2978-01[PC-1], 23K2978-02[HW-25], 23K2978-03[HW-2D], B359274-BS1

Perfluorotetradecanoic acid (PFTA)

B359274-BS1

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

PF-18

Re-analysis confirmed Extracted Internal Standard failure due to matrix effects.

Analyte & Samples(s) Qualified:**D3-NMeFOSAA**

23K2978-03[HW-2D]

D5-NEtFOSAA

23K2978-01[PC-1], 23K2978-03[HW-2D]

M2-4:2FTS

23K2978-01[PC-1], 23K2978-03[HW-2D]

M2PFTA

23K2978-01[PC-1], 23K2978-03[HW-2D]

M7PFUnA

23K2978-03[HW-2D]

M8FOSA

23K2978-03[HW-2D]

MPFBA

23K2978-01[PC-1]

MPFDoA

23K2978-01[PC-1], 23K2978-03[HW-2D]

PF-19

Sample re-analyzed at a dilution that was re-fortified with internal standard.

Analyte & Samples(s) Qualified:**Perfluorohexanesulfonic acid (PFHxS)**

23K2978-01RE1[PC-1]

Perfluorooctanesulfonic acid (PFOS)

23K2978-01RE1[PC-1], 23K2978-02RE1[HW-25], 23K2978-03RE1[HW-2D]

S-29

Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:**M2-8:2FTS**

S097696-CCV4

M2PFTA

23K2978-02[HW-25]

M8FOSA

23K2978-02[HW-25]

MPFBA

23K2978-02[HW-25]

V-20

Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:**9Cl-PF3ONS (F53B Minor)**

S097984-CCV3

The results of analyses reported only relate to samples submitted to Con-Test, a Pace Analytical Laboratory, for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Lisa A. Worthington
Technical Representative

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K2978

Date Received: 11/22/2023

Field Sample #: PC-1

Sampled: 11/21/2023 13:00

Sample ID: 23K2978-01

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	48	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluorobutanesulfonic acid (PFBS)	17	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluoropentanoic acid (PFPeA)	140	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluorohexanoic acid (PFHxA)	110	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	74	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluorodecanoic acid (PFDA)	7.1	1.9	ng/L	1	L-07	SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluoroheptanesulfonic acid (PFHpS)	9.3	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1	L-01	SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1	L-02	SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1	L-01	SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluorooctanesulfonamide (FOSA)	4.0	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluorononanesulfonic acid (PFNS)	2.3	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	40	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluoro-1-butanefulfonamide (FBFA)	14	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluorohexanesulfonic acid (PFHxS)	220	19	ng/L	10	PF-19	SOP-454 PFAS	12/12/23	12/13/23 12:12	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	51	1.9	ng/L	1	L-06	SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluoropentanesulfonic acid (PFPeS)	25	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluoroundecanoic acid (PFUnA)	40	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluoroheptanoic acid (PFHpA)	100	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluorooctanoic acid (PFOA)	57	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW
Perfluorooctanesulfonic acid (PFOS)	230	19	ng/L	10	PF-19	SOP-454 PFAS	12/12/23	12/13/23 12:12	QNW
Perfluorononanoic acid (PFNA)	25	1.9	ng/L	1	L-07	SOP-454 PFAS	12/12/23	12/12/23 17:26	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K2978

Date Received: 11/22/2023

Field Sample #: HW-25

Sampled: 11/21/2023 13:30

Sample ID: 23K2978-02

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	2.6	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluoropentanoic acid (PFPeA)	3.6	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluorohexanoic acid (PFHxA)	4.2	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L	1	L-01	SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1	L-01	SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1	L-02	SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1	L-01	SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluorohexanesulfonic acid (PFHxS)	14	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.9	ng/L	1	L-02	SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluoroheptanoic acid (PFHpA)	3.6	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluorooctanoic acid (PFOA)	3.0	1.9	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW
Perfluorooctanesulfonic acid (PFOS)	150	19	ng/L	10	PF-19	SOP-454 PFAS	12/12/23	12/13/23 12:19	QNW
Perfluorononanoic acid (PFNA)	22	1.9	ng/L	1	L-07	SOP-454 PFAS	12/12/23	12/12/23 17:33	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Barnstable, MA

Sample Description:

Work Order: 23K2978

Date Received: 11/22/2023

Field Sample #: HW-2D

Sampled: 11/21/2023 12:00

Sample ID: 23K2978-03

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	8.8	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluoropentanoic acid (PFPeA)	26	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluorohexanoic acid (PFHxA)	23	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
11Cl-PF3OUdS (F53B Major)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
9Cl-PF3ONS (F53B Minor)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluorodecanoic acid (PFDA)	ND	2.1	ng/L	1	L-01	SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluorododecanoic acid (PFDoA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluoroheptanesulfonic acid (PFHpS)	2.9	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
N-EtFOSAA (NEtFOSAA)	ND	2.1	ng/L	1	L-01	SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
N-MeFOSAA (NMeFOSAA)	ND	2.1	ng/L	1	L-02	SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluorotetradecanoic acid (PFTA)	ND	2.1	ng/L	1	L-01	SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluorooctanesulfonamide (FOSA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluorononanesulfonic acid (PFNS)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluorohexanesulfonic acid (PFHxS)	61	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	2.1	ng/L	1	L-02	SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluoropentanesulfonic acid (PFPeS)	2.5	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluoroundecanoic acid (PFUnA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluoroheptanoic acid (PFHpA)	11	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluorooctanoic acid (PFOA)	23	2.1	ng/L	1		SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW
Perfluorooctanesulfonic acid (PFOS)	170	21	ng/L	10	PF-19	SOP-454 PFAS	12/12/23	12/13/23 12:26	QNW
Perfluorononanoic acid (PFNA)	3.2	2.1	ng/L	1	L-07	SOP-454 PFAS	12/12/23	12/12/23 17:40	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332**Sample Extraction Data****Prep Method:**SOP 454-PFAAS **Analytical Method:**SOP-454 PFAS

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23K2978-01 [PC-1]	B359274	267	1.00	12/12/23
23K2978-01RE1 [PC-1]	B359274	267	1.00	12/12/23
23K2978-02 [HW-25]	B359274	261	1.00	12/12/23
23K2978-02RE1 [HW-25]	B359274	261	1.00	12/12/23
23K2978-03 [HW-2D]	B359274	237	1.00	12/12/23
23K2978-03RE1 [HW-2D]	B359274	237	1.00	12/12/23

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B359274 - SOP 454-PFAAS

Blank (B359274-BLK1)

Prepared & Analyzed: 12/12/23

Perfluorobutanoic acid (PFBA)	ND	1.8	ng/L
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.8	ng/L
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L
Perfluoro-1-butanesulfonamide (FBSA)	ND	1.8	ng/L
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L
Nonfluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L

LCS (B359274-BS1)

Prepared & Analyzed: 12/12/23

Perfluorobutanoic acid (PFBA)	11.6	1.9	ng/L	9.36	124	73-129
Perfluorobutanesulfonic acid (PFBS)	10.0	1.9	ng/L	8.29	121	72-130
Perfluoropentanoic acid (PFPeA)	11.4	1.9	ng/L	9.36	122	72-129
Perfluorohexanoic acid (PFHxA)	11.8	1.9	ng/L	9.36	126	72-129
11Cl-PF3OUdS (F53B Major)	8.22	1.9	ng/L	8.82	93.2	43.3-138
9Cl-PF3ONS (F53B Minor)	8.72	1.9	ng/L	8.73	99.9	52-140
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	9.25	1.9	ng/L	8.82	105	53.7-152
Hexafluoropropylene oxide dimer acid (HFPO-DA)	11.3	1.9	ng/L	9.36	121	42.1-145
8:2 Fluorotelomersulfonic acid (8:2FTS A)	12.1	1.9	ng/L	8.99	135	67-138
Perfluorodecanoic acid (PFDA)	12.2	1.9	ng/L	9.36	130 *	71-129
Perfluorododecanoic acid (PFDoA)	12.1	1.9	ng/L	9.36	129	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	10.1	1.9	ng/L	8.33	121	52.7-147

L-07

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B359274 - SOP 454-PFAAS										
LCS (B359274-BS1)										
Prepared & Analyzed: 12/12/23										
Perfluoroheptanesulfonic acid (PFHpS)	11.6	1.9	ng/L	8.94		130	69-134			
N-EtFOSAA (NEtFOSAA)	13.9	1.9	ng/L	9.36		149 *	61-135			L-07
N-MeFOSAA (NMeFOSAA)	14.1	1.9	ng/L	9.36		151 *	65-136			L-02
Perfluorotetradecanoic acid (PFTA)	13.3	1.9	ng/L	9.36		142 *	71-132			L-07
Perfluorotridecanoic acid (PFTTrDA)	12.8	1.9	ng/L	9.36		136	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.7	1.9	ng/L	8.75		122	63-143			
Perfluorodecanesulfonic acid (PFDS)	10.4	1.9	ng/L	9.03		115	53-142			
Perfluorooctanesulfonamide (FOSA)	11.7	1.9	ng/L	9.36		125	67-137			
Perfluorononanesulfonic acid (PFNS)	10.0	1.9	ng/L	8.99		111	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	8.31	1.9	ng/L	9.36		88.8	50-150			
Perfluoro-1-butanefulfonamide (FBSA)	9.00	1.9	ng/L	9.36		96.2	50-150			
Perfluorohexanesulfonic acid (PFHxS)	10.1	1.9	ng/L	8.57		118	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	11.5	1.9	ng/L	9.36		123	53.8-150			
Perfluoro-5-oxahexanoic acid (PFMBA)	11.1	1.9	ng/L	9.36		118	54.5-152			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	12.5	1.9	ng/L	8.89		141 *	64-140			L-06
Perfluoropentanesulfonic acid (PFPeS)	10.3	1.9	ng/L	8.80		118	71-127			
Perfluoroundecanoic acid (PFUnA)	11.6	1.9	ng/L	9.36		124	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	12.5	1.9	ng/L	9.36		134	50.5-159			
Perfluoroheptanoic acid (PFHpA)	11.5	1.9	ng/L	9.36		123	72-130			
Perfluorooctanoic acid (PFOA)	11.6	1.9	ng/L	9.36		123	71-133			
Perfluorooctanesulfonic acid (PFOS)	10.6	1.9	ng/L	8.66		123	65-140			
Perfluorononanoic acid (PFNA)	12.5	1.9	ng/L	9.36		133 *	69-130			L-07
LCS Dup (B359274-BS1)										
Prepared & Analyzed: 12/12/23										
Perfluorobutanoic acid (PFBA)	10.1	1.8	ng/L	8.76		115	73-129	14.6	30	
Perfluorobutanesulfonic acid (PFBS)	8.54	1.8	ng/L	7.76		110	72-130	16.1	30	
Perfluoropentanoic acid (PFPeA)	9.79	1.8	ng/L	8.76		112	72-129	15.1	30	
Perfluorohexanoic acid (PFHxA)	10.2	1.8	ng/L	8.76		116	72-129	14.8	30	
11Cl-PF3OUdS (F53B Major)	7.45	1.8	ng/L	8.26		90.2	43.3-138	9.82	30	
9Cl-PF3ONS (F53B Minor)	7.83	1.8	ng/L	8.17		95.9	52-140	10.7	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	7.60	1.8	ng/L	8.26		92.0	53.7-152	19.6	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	9.05	1.8	ng/L	8.76		103	42.1-145	22.1	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	10.5	1.8	ng/L	8.41		125	67-138	14.4	30	
Perfluorodecanoic acid (PFDA)	10.7	1.8	ng/L	8.76		123	71-129	12.7	30	
Perfluorododecanoic acid (PFDoA)	11.0	1.8	ng/L	8.76		125	72-134	9.45	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	8.59	1.8	ng/L	7.80		110	52.7-147	15.7	30	
Perfluoroheptanesulfonic acid (PFHpS)	10.3	1.8	ng/L	8.37		124	69-134	11.4	30	
N-EtFOSAA (NEtFOSAA)	10.8	1.8	ng/L	8.76		123	61-135	25.4	30	
N-MeFOSAA (NMeFOSAA)	13.1	1.8	ng/L	8.76		149 *	65-136	7.73	30	L-02
Perfluorotetradecanoic acid (PFTA)	10.6	1.8	ng/L	8.76		121	71-132	22.6	30	
Perfluorotridecanoic acid (PFTTrDA)	10.2	1.8	ng/L	8.76		117	65-144	22.2	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	9.45	1.8	ng/L	8.19		115	63-143	12.6	30	
Perfluorodecanesulfonic acid (PFDS)	8.62	1.8	ng/L	8.46		102	53-142	18.6	30	
Perfluorooctanesulfonamide (FOSA)	9.81	1.8	ng/L	8.76		112	67-137	17.6	30	
Perfluorononanesulfonic acid (PFNS)	8.53	1.8	ng/L	8.41		101	69-127	16.0	30	
Perfluoro-1-hexanesulfonamide (FHxSA)	7.01	1.8	ng/L	8.76		79.9	50-150	17.0	30	
Perfluoro-1-butanefulfonamide (FBSA)	7.96	1.8	ng/L	8.76		90.9	50-150	12.2	30	
Perfluorohexanesulfonic acid (PFHxS)	8.72	1.8	ng/L	8.02		109	68-131	14.4	30	
Perfluoro-4-oxapentanoic acid (PFMPA)	10.1	1.8	ng/L	8.76		115	53.8-150	13.4	30	

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QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B359274 - SOP 454-PFAAS
LCS Dup (B359274-BSD1)

Prepared & Analyzed: 12/12/23

Perfluoro-5-oxahexanoic acid (PFMBA)	9.47	1.8	ng/L	8.76		108	54.5-152	15.6	30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	12.4	1.8	ng/L	8.33		149	* 64-140	1.09	30	L-06
Perfluoropentanesulfonic acid (PFPeS)	8.73	1.8	ng/L	8.24		106	71-127	16.9	30	
Perfluoroundecanoic acid (PFUnA)	9.32	1.8	ng/L	8.76		106	69-133	21.6	30	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	10.4	1.8	ng/L	8.76		119	50.5-159	18.7	30	
Perfluoroheptanoic acid (PFHpA)	9.88	1.8	ng/L	8.76		113	72-130	15.2	30	
Perfluorooctanoic acid (PFOA)	9.51	1.8	ng/L	8.76		109	71-133	19.4	30	
Perfluorooctanesulfonic acid (PFOS)	9.68	1.8	ng/L	8.11		119	65-140	9.41	30	
Perfluorononanoic acid (PFNA)	10.4	1.8	ng/L	8.76		118	69-130	18.5	30	

Batch B360698 - SOP 454-PFAAS
Blank (B360698-BLK1)

Prepared: 12/15/23 Analyzed: 12/18/23

Perfluorobutanoic acid (PFBA)	ND	1.8	ng/L
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.8	ng/L
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L
Perfluoro-1-butanesulfonamide (FBSA)	ND	1.8	ng/L
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B360698 - SOP 454-PFAAS

LCS (B360698-BS1)

Prepared: 12/15/23 Analyzed: 12/19/23

Perfluorobutanoic acid (PFBA)	10.5	1.8	ng/L	8.78		119	73-129			
Perfluorobutanesulfonic acid (PFBS)	9.37	1.8	ng/L	7.77		121	72-130			
Perfluoropentanoic acid (PFPeA)	10.2	1.8	ng/L	8.78		116	72-129			
Perfluorohexanoic acid (PFHxA)	10.3	1.8	ng/L	8.78		117	72-129			
11Cl-PF3OUdS (F53B Major)	8.84	1.8	ng/L	8.27		107	43.3-138			
9Cl-PF3ONS (F53B Minor)	9.29	1.8	ng/L	8.19		113	52-140			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.32	1.8	ng/L	8.27		101	53.7-152			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.46	1.8	ng/L	8.78		96.3	42.1-145			
8:2 Fluorotelomersulfonic acid (8:2FTS A)	10.5	1.8	ng/L	8.43		124	67-138			
Perfluorodecanoic acid (PFDA)	10.9	1.8	ng/L	8.78		124	71-129			
Perfluorododecanoic acid (PFDoA)	11.4	1.8	ng/L	8.78		129	72-134			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	10.4	1.8	ng/L	7.82		133	52.7-147			
Perfluoroheptanesulfonic acid (PFHpS)	9.48	1.8	ng/L	8.39		113	69-134			
N-EtFOSAA (NEtFOSAA)	12.2	1.8	ng/L	8.78		139	* 61-135			L-02
N-MeFOSAA (NMeFOSAA)	11.9	1.8	ng/L	8.78		135	65-136			
Perfluorotetradecanoic acid (PFTA)	11.5	1.8	ng/L	8.78		131	71-132			
Perfluorotridecanoic acid (PFTrDA)	11.8	1.8	ng/L	8.78		135	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.2	1.8	ng/L	8.21		125	63-143			
Perfluorodecanesulfonic acid (PFDS)	9.24	1.8	ng/L	8.48		109	53-142			
Perfluorooctanesulfonamide (FOSA)	10.3	1.8	ng/L	8.78		117	67-137			
Perfluorononanesulfonic acid (PFNS)	8.51	1.8	ng/L	8.43		101	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	6.80	1.8	ng/L	8.78		77.4	50-150			
Perfluoro-1-butanessulfonamide (FBSA)	6.98	1.8	ng/L	8.78		79.5	50-150			
Perfluorohexanesulfonic acid (PFHxS)	10.1	1.8	ng/L	8.04		126	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	9.91	1.8	ng/L	8.78		113	53.8-150			
Perfluoro-5-oxahexanoic acid (PFMBA)	9.10	1.8	ng/L	8.78		104	54.5-152			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	11.0	1.8	ng/L	8.34		131	64-140			
Perfluoropentanesulfonic acid (PFPeS)	9.41	1.8	ng/L	8.26		114	71-127			
Perfluoroundecanoic acid (PFUnA)	11.7	1.8	ng/L	8.78		133	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	9.27	1.8	ng/L	8.78		106	50.5-159			
Perfluoroheptanoic acid (PFHpA)	10.6	1.8	ng/L	8.78		120	72-130			
Perfluorooctanoic acid (PFOA)	10.6	1.8	ng/L	8.78		120	71-133			
Perfluorooctanesulfonic acid (PFOS)	9.70	1.8	ng/L	8.13		119	65-140			
Perfluorononanoic acid (PFNA)	10.7	1.8	ng/L	8.78		122	69-130			

LCS Dup (B360698-BS1)

Prepared: 12/15/23 Analyzed: 12/19/23

Perfluorobutanoic acid (PFBA)	10.8	1.8	ng/L	9.07		119	73-129	3.08	30	
Perfluorobutanesulfonic acid (PFBS)	9.42	1.8	ng/L	8.03		117	72-130	0.502	30	
Perfluoropentanoic acid (PFPeA)	10.5	1.8	ng/L	9.07		116	72-129	3.12	30	
Perfluorohexanoic acid (PFHxA)	10.5	1.8	ng/L	9.07		116	72-129	2.20	30	
11Cl-PF3OUdS (F53B Major)	8.66	1.8	ng/L	8.54		101	43.3-138	2.07	30	
9Cl-PF3ONS (F53B Minor)	9.05	1.8	ng/L	8.45		107	52-140	2.60	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.60	1.8	ng/L	8.54		101	53.7-152	3.34	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	10.5	1.8	ng/L	9.07		116	42.1-145	21.9	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	10.9	1.8	ng/L	8.71		125	67-138	3.58	30	
Perfluorodecanoic acid (PFDA)	11.7	1.8	ng/L	9.07		129	71-129	6.96	30	
Perfluorododecanoic acid (PFDoA)	12.3	1.8	ng/L	9.07		136	* 72-134	8.04	30	L-07
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	10.6	1.8	ng/L	8.07		132	52.7-147	2.10	30	

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QUALITY CONTROL
Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B360698 - SOP 454-PFAAS										
LCS Dup (B360698-BSD1)										
Prepared: 12/15/23 Analyzed: 12/19/23										
Perfluoroheptanesulfonic acid (PFHpS)	9.89	1.8	ng/L	8.66		114	69-134	4.27	30	
N-EtFOSAA (NEtFOSAA)	13.0	1.8	ng/L	9.07		143	* 61-135	5.81	30	L-02
N-MeFOSAA (NMeFOSAA)	11.9	1.8	ng/L	9.07		131	65-136	0.307	30	
Perfluorotetradecanoic acid (PFTA)	11.5	1.8	ng/L	9.07		127	71-132	0.299	30	
Perfluorotridecanoic acid (PFTrDA)	12.3	1.8	ng/L	9.07		136	65-144	4.39	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.1	1.8	ng/L	8.48		120	63-143	1.07	30	
Perfluorodecanesulfonic acid (PFDS)	9.33	1.8	ng/L	8.75		107	53-142	1.03	30	
Perfluorooctanesulfonamide (FOSA)	11.2	1.8	ng/L	9.07		124	67-137	8.35	30	
Perfluorononanesulfonic acid (PFNS)	9.72	1.8	ng/L	8.71		112	69-127	13.3	30	
Perfluoro-1-hexanesulfonamide (FHxSA)	7.12	1.8	ng/L	9.07		78.5	50-150	4.49	30	
Perfluoro-1-butanefulfonamide (FBSA)	7.33	1.8	ng/L	9.07		80.8	50-150	4.84	30	
Perfluorohexanesulfonic acid (PFHxS)	9.53	1.8	ng/L	8.30		115	68-131	6.25	30	
Perfluoro-4-oxapentanoic acid (PFMPA)	10.1	1.8	ng/L	9.07		111	53.8-150	1.85	30	
Perfluoro-5-oxahexanoic acid (PFMBA)	9.27	1.8	ng/L	9.07		102	54.5-152	1.85	30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	11.2	1.8	ng/L	8.62		130	64-140	2.13	30	
Perfluoropentanesulfonic acid (PFPeS)	9.83	1.8	ng/L	8.52		115	71-127	4.35	30	
Perfluoroundecanoic acid (PFUnA)	11.6	1.8	ng/L	9.07		128	69-133	0.759	30	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	9.53	1.8	ng/L	9.07		105	50.5-159	2.77	30	
Perfluoroheptanoic acid (PFHpA)	10.5	1.8	ng/L	9.07		116	72-130	0.293	30	
Perfluorooctanoic acid (PFOA)	10.7	1.8	ng/L	9.07		118	71-133	1.63	30	
Perfluorooctanesulfonic acid (PFOS)	9.13	1.8	ng/L	8.39		109	65-140	6.02	30	
Perfluorononanoic acid (PFNA)	11.4	1.8	ng/L	9.07		126	69-130	6.59	30	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
L-01	Laboratory fortified blank/laboratory control sample recovery outside of control limits. Data validation is not affected since all results are "not detected" for all samples in this batch for this compound and bias is on the high side.
L-02	Laboratory fortified blank/laboratory control sample recovery and duplicate recoveries outside of control limits. Data validation is not affected since all results are "not detected" for associated samples in this batch and bias is on the high side.
L-06	Laboratory fortified blank/laboratory control sample recovery and/or duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the high side.
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
PF-18	Re-analysis confirmed Extracted Internal Standard failure due to matrix effects.
PF-19	Sample re-analyzed at a dilution that was re-fortified with internal standard.
S-29	Extracted Internal Standard is outside of control limits.
V-20	Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

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INTERNAL STANDARD AREA AND RT SUMMARY

SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
PC-1 (23K2978-01) Lab File ID: 23K2978-01.d Analyzed: 12/12/23 17:26									
M8FOSA	360455.3	3.9486	707,119.00	3.948617	51	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	55894.59	2.463967	117,614.00	2.472183	48	50 - 150	-0.0082	+/-0.50	*
M2PFTA	515093.6	4.30535	1,087,831.00	4.31345	47	50 - 150	-0.0081	+/-0.50	*
M2-8:2FTS	166996.9	3.770917	165,683.00	3.7789	101	50 - 150	-0.0080	+/-0.50	
MPFBA	345179.3	1.058467	801,955.00	1.050167	43	50 - 150	0.0083	+/-0.50	*
M3HFPO-DA	141551.8	2.798383	230,692.00	2.806583	61	50 - 150	-0.0082	+/-0.50	
M6PFDA	896754.6	3.77145	1,409,304.00	3.77145	64	50 - 150	0.0000	+/-0.50	
M3PFBS	206270.6	1.861817	305,252.00	1.861817	68	50 - 150	0.0000	+/-0.50	
M7PFUnA	649132.6	3.92205	1,281,109.00	3.922067	51	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	72689.84	3.41245	73,080.00	3.412467	99	50 - 150	0.0000	+/-0.50	
M5PFPeA	476067.3	1.698283	726,231.00	1.698283	66	50 - 150	0.0000	+/-0.50	
M5PFHxA	756876.4	2.5477	1,130,870.00	2.547717	67	50 - 150	0.0000	+/-0.50	
M3PFHxS	134596.9	3.177667	215,682.00	3.177667	62	50 - 150	0.0000	+/-0.50	
M4PFHpA	729828.3	3.138483	1,101,580.00	3.146567	66	50 - 150	-0.0081	+/-0.50	
M8PFOA	871270.5	3.421183	1,201,948.00	3.421183	72	50 - 150	0.0000	+/-0.50	
M8PFOS	135130.2	3.620217	233,924.00	3.620233	58	50 - 150	0.0000	+/-0.50	
M9PFNA	699439.8	3.62125	1,205,846.00	3.621267	58	50 - 150	0.0000	+/-0.50	
MPFDoA	532128.9	4.064667	1,115,887.00	4.064683	48	50 - 150	0.0000	+/-0.50	*
D5-NEtFOSAA	76334.55	3.929517	162,242.00	3.929533	47	50 - 150	0.0000	+/-0.50	*
D3-NMeFOSAA	80378.21	3.8497	158,055.00	3.849717	51	50 - 150	0.0000	+/-0.50	
PC-1 (23K2978-01RE1) Lab File ID: 23K2978-01RE1.d Analyzed: 12/13/23 12:12									
M3PFHxS	214264.3	3.185733	212,179.00	3.193817	101	50 - 150	-0.0081	+/-0.50	
M8PFOS	243947.5	3.6282	245,160.00	3.628217	100	50 - 150	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
HW-25 (23K2978-02) Lab File ID: 23K2978-02.d Analyzed: 12/12/23 17:33									
M8FOSA	318529.7	3.9486	707,119.00	3.948617	45	50 - 150	0.0000	+/-0.50	*
M2-4:2FTS	63605.5	2.45575	117,614.00	2.472183	54	50 - 150	-0.0164	+/-0.50	
M2PFTA	391668.5	4.30535	1,087,831.00	4.31345	36	50 - 150	-0.0081	+/-0.50	*
M2-8:2FTS	152383.5	3.770933	165,683.00	3.7789	92	50 - 150	-0.0080	+/-0.50	
MPFBA	399438.3	1.058467	801,955.00	1.050167	50	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	147420.2	2.798383	230,692.00	2.806583	64	50 - 150	-0.0082	+/-0.50	
M6PFDA	1005612	3.77145	1,409,304.00	3.77145	71	50 - 150	0.0000	+/-0.50	
M3PFBS	220210.9	1.861817	305,252.00	1.861817	72	50 - 150	0.0000	+/-0.50	
M7PFUnA	801127.2	3.922067	1,281,109.00	3.922067	63	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	71002.74	3.41245	73,080.00	3.412467	97	50 - 150	0.0000	+/-0.50	
M5PFPeA	528073.6	1.698283	726,231.00	1.698283	73	50 - 150	0.0000	+/-0.50	
M5PFHxA	833022.9	2.539483	1,130,870.00	2.547717	74	50 - 150	-0.0082	+/-0.50	
M3PFHxS	152769.6	3.177667	215,682.00	3.177667	71	50 - 150	0.0000	+/-0.50	
M4PFHpA	826261.6	3.138483	1,101,580.00	3.146567	75	50 - 150	-0.0081	+/-0.50	
M8PFOA	951274.6	3.421167	1,201,948.00	3.421183	79	50 - 150	0.0000	+/-0.50	
M8PFOS	152496.1	3.620217	233,924.00	3.620233	65	50 - 150	0.0000	+/-0.50	
M9PFNA	798486.4	3.613267	1,205,846.00	3.621267	66	50 - 150	-0.0080	+/-0.50	
MPFDoA	625743.9	4.064667	1,115,887.00	4.064683	56	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	96888.86	3.929533	162,242.00	3.929533	60	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	101139.3	3.8497	158,055.00	3.849717	64	50 - 150	0.0000	+/-0.50	
HW-25 (23K2978-02RE1) Lab File ID: 23K2978-02RE1.d Analyzed: 12/13/23 12:19									
M8PFOS	239106.4	3.620233	245,160.00	3.628217	98	50 - 150	-0.0080	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY

SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
HW-2D (23K2978-03) Lab File ID: 23K2978-03.d Analyzed: 12/12/23 17:40									
M8FOSA	126912.5	3.948617	707,119.00	3.948617	18	50 - 150	0.0000	+/-0.50	*
M2-4:2FTS	37169.82	2.463967	117,614.00	2.472183	32	50 - 150	-0.0082	+/-0.50	*
M2PFTA	98457.45	4.30535	1,087,831.00	4.31345	09	50 - 150	-0.0081	+/-0.50	*
M2-8:2FTS	108550.4	3.770933	165,683.00	3.7789	66	50 - 150	-0.0080	+/-0.50	
MPFBA	510963.2	1.058467	801,955.00	1.050167	64	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	141150.5	2.798383	230,692.00	2.806583	61	50 - 150	-0.0082	+/-0.50	
M6PFDA	828444.1	3.77145	1,409,304.00	3.77145	59	50 - 150	0.0000	+/-0.50	
M3PFBS	201974.5	1.861817	305,252.00	1.861817	66	50 - 150	0.0000	+/-0.50	
M7PFUnA	536128.9	3.922067	1,281,109.00	3.922067	42	50 - 150	0.0000	+/-0.50	*
M2-6:2FTS	45818.18	3.41245	73,080.00	3.412467	63	50 - 150	0.0000	+/-0.50	
M5PFPeA	507197.6	1.698283	726,231.00	1.698283	70	50 - 150	0.0000	+/-0.50	
M5PFHxA	774956.8	2.5477	1,130,870.00	2.547717	69	50 - 150	0.0000	+/-0.50	
M3PFHxS	142957.4	3.177667	215,682.00	3.177667	66	50 - 150	0.0000	+/-0.50	
M4PFHpA	745383.7	3.14655	1,101,580.00	3.146567	68	50 - 150	0.0000	+/-0.50	
M8PFOA	885678.8	3.421183	1,201,948.00	3.421183	74	50 - 150	0.0000	+/-0.50	
M8PFOS	141427.5	3.620217	233,924.00	3.620233	60	50 - 150	0.0000	+/-0.50	
M9PFNA	710710.8	3.621267	1,205,846.00	3.621267	59	50 - 150	0.0000	+/-0.50	
MPFDoA	370702.8	4.064683	1,115,887.00	4.064683	33	50 - 150	0.0000	+/-0.50	*
D5-NEtFOSAA	62190	3.929533	162,242.00	3.929533	38	50 - 150	0.0000	+/-0.50	*
D3-NMeFOSAA	78474.98	3.849717	158,055.00	3.849717	50	50 - 150	0.0000	+/-0.50	
HW-2D (23K2978-03RE1) Lab File ID: 23K2978-03RE1.d Analyzed: 12/13/23 12:26									
M8PFOS	250372.1	3.620217	245,160.00	3.628217	102	50 - 150	-0.0080	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY

SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Blank (B359274-BLK1)			Lab File ID: B359274-BLK1.d			Analyzed: 12/12/23 15:09			
M8FOSA	533133.8	3.9486	707,119.00	3.956617	75	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	97740.15	2.4886	117,614.00	2.488617	83	50 - 150	0.0000	+/-0.50	
M2PFTA	782428	4.31345	1,087,831.00	4.313433	72	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	132006.4	3.7789	165,683.00	3.7789	80	50 - 150	0.0000	+/-0.50	
MPFBA	645401.6	1.058467	801,955.00	1.058467	80	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	151390.3	2.822933	230,692.00	2.81475	66	50 - 150	0.0082	+/-0.50	
M6PFDA	1102131	3.779417	1,409,304.00	3.779433	78	50 - 150	0.0000	+/-0.50	
M3PFBS	254040.4	1.886667	305,252.00	1.878383	83	50 - 150	0.0083	+/-0.50	
M7PFUnA	976215.1	3.93005	1,281,109.00	3.930067	76	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	76637.4	3.4205	73,080.00	3.420517	105	50 - 150	0.0000	+/-0.50	
M5PFPeA	616155.8	1.714833	726,231.00	1.714833	85	50 - 150	0.0000	+/-0.50	
M5PFHxA	957204.6	2.572333	1,130,870.00	2.57235	85	50 - 150	0.0000	+/-0.50	
M3PFHxS	172614	3.185733	215,682.00	3.18575	80	50 - 150	0.0000	+/-0.50	
M4PFHpA	955898.1	3.154633	1,101,580.00	3.15465	87	50 - 150	0.0000	+/-0.50	
M8PFOA	1087647	3.42985	1,201,948.00	3.429867	90	50 - 150	0.0000	+/-0.50	
M8PFOS	191119.9	3.620217	233,924.00	3.620233	82	50 - 150	0.0000	+/-0.50	
M9PFNA	1031575	3.621267	1,205,846.00	3.621267	86	50 - 150	0.0000	+/-0.50	
MPFDoA	788992.7	4.072667	1,115,887.00	4.072683	71	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	124915.1	3.937517	162,242.00	3.937533	77	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	120957.7	3.857667	158,055.00	3.857683	77	50 - 150	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (B359274-BS1) Lab File ID: B359274-BS1.d Analyzed: 12/12/23 14:54									
M8FOSA	470092.3	3.948617	707,119.00	3.956617	66	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	90437.59	2.496817	117,614.00	2.488617	77	50 - 150	0.0082	+/-0.50	
M2PFTA	732676.2	4.313433	1,087,831.00	4.313433	67	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	116620.7	3.786867	165,683.00	3.7789	70	50 - 150	0.0080	+/-0.50	
MPFBA	596422.4	1.066783	801,955.00	1.058467	74	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	133353	2.831117	230,692.00	2.81475	58	50 - 150	0.0164	+/-0.50	
M6PFDA	986463.6	3.779433	1,409,304.00	3.779433	70	50 - 150	0.0000	+/-0.50	
M3PFBS	226033.3	1.894967	305,252.00	1.878383	74	50 - 150	0.0166	+/-0.50	
M7PFUnA	861109.9	3.930067	1,281,109.00	3.930067	67	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	82379.9	3.4205	73,080.00	3.420517	113	50 - 150	0.0000	+/-0.50	
M5PFPeA	558811.5	1.7231	726,231.00	1.714833	77	50 - 150	0.0083	+/-0.50	
M5PFHxA	879492.9	2.58055	1,130,870.00	2.57235	78	50 - 150	0.0082	+/-0.50	
M3PFHxS	154641.3	3.185733	215,682.00	3.18575	72	50 - 150	0.0000	+/-0.50	
M4PFHpA	830689.3	3.154633	1,101,580.00	3.15465	75	50 - 150	0.0000	+/-0.50	
M8PFOA	1000500	3.42985	1,201,948.00	3.429867	83	50 - 150	0.0000	+/-0.50	
M8PFOS	178385.6	3.620217	233,924.00	3.620233	76	50 - 150	0.0000	+/-0.50	
M9PFNA	924280.1	3.62125	1,205,846.00	3.621267	77	50 - 150	0.0000	+/-0.50	
MPFDoA	745462.4	4.072683	1,115,887.00	4.072683	67	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	101226.9	3.937533	162,242.00	3.937533	62	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	114061.2	3.857667	158,055.00	3.857683	72	50 - 150	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS Dup (B359274-BSD1) Lab File ID: B359274-BSD1.d Analyzed: 12/12/23 15:02									
M8FOSA	513966.4	3.948617	707,119.00	3.956617	73	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	94907.81	2.488617	117,614.00	2.488617	81	50 - 150	0.0000	+/-0.50	
M2PFTA	752696.1	4.313433	1,087,831.00	4.313433	69	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	119074.9	3.7789	165,683.00	3.7789	72	50 - 150	0.0000	+/-0.50	
MPFBA	627670.9	1.058467	801,955.00	1.058467	78	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	162260.6	2.82295	230,692.00	2.81475	70	50 - 150	0.0082	+/-0.50	
M6PFDA	1054641	3.779417	1,409,304.00	3.779433	75	50 - 150	0.0000	+/-0.50	
M3PFBS	240375.4	1.886683	305,252.00	1.878383	79	50 - 150	0.0083	+/-0.50	
M7PFUnA	899127.6	3.930067	1,281,109.00	3.930067	70	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	73516.53	3.420517	73,080.00	3.420517	101	50 - 150	0.0000	+/-0.50	
M5PFPeA	591541.8	1.714833	726,231.00	1.714833	81	50 - 150	0.0000	+/-0.50	
M5PFHxA	923094.2	2.57235	1,130,870.00	2.57235	82	50 - 150	0.0000	+/-0.50	
M3PFHxS	169604.1	3.18575	215,682.00	3.18575	79	50 - 150	0.0000	+/-0.50	
M4PFHpA	895369.4	3.15465	1,101,580.00	3.15465	81	50 - 150	0.0000	+/-0.50	
M8PFOA	1058221	3.429867	1,201,948.00	3.429867	88	50 - 150	0.0000	+/-0.50	
M8PFOS	177264.5	3.620233	233,924.00	3.620233	76	50 - 150	0.0000	+/-0.50	
M9PFNA	990372.1	3.621267	1,205,846.00	3.621267	82	50 - 150	0.0000	+/-0.50	
MPFDoA	727170.3	4.072683	1,115,887.00	4.072683	65	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	120943.9	3.937533	162,242.00	3.937533	75	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	115210.8	3.857667	158,055.00	3.857683	73	50 - 150	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY

SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Blank (B360698-BLK1)			Lab File ID: B360698-BLK1.d			Analyzed: 12/18/23 17:04			
M8FOSA	553063.7	3.9646	785,370.00	3.972583	70	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	166287.2	2.537883	253,797.00	2.5543	66	50 - 150	-0.0164	+/-0.50	
M2PFTA	1182525	4.3297	2,191,245.00	4.337817	54	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	212657.9	3.8028	290,438.00	3.8028	73	50 - 150	0.0000	+/-0.50	
MPFBA	614589.9	1.0834	851,124.00	1.0834	72	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	215058.2	2.86385	228,269.00	2.872033	94	50 - 150	-0.0082	+/-0.50	
M6PFDA	1191323	3.79535	1,765,419.00	3.803317	67	50 - 150	-0.0080	+/-0.50	
M3PFBS	235123	1.928117	314,234.00	1.944683	75	50 - 150	-0.0166	+/-0.50	
M7PFUnA	1045248	3.94605	1,675,624.00	3.954033	62	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	148329.1	3.4373	183,944.00	3.445283	81	50 - 150	-0.0080	+/-0.50	
M5PFPeA	592654.3	1.757717	784,382.00	1.766017	76	50 - 150	-0.0083	+/-0.50	
M5PFHxA	1005876	2.629833	1,328,451.00	2.646767	76	50 - 150	-0.0169	+/-0.50	
M3PFHxS	144130.8	3.21025	192,255.00	3.218333	75	50 - 150	-0.0081	+/-0.50	
M4PFHpA	975806.4	3.178867	1,301,472.00	3.186933	75	50 - 150	-0.0081	+/-0.50	
M8PFOA	1156591	3.453817	1,492,035.00	3.46195	78	50 - 150	-0.0081	+/-0.50	
M8PFOS	158197	3.644183	210,426.00	3.644167	75	50 - 150	0.0000	+/-0.50	
M9PFNA	1087174	3.645217	1,446,382.00	3.645217	75	50 - 150	0.0000	+/-0.50	
MPFDoA	853963.4	4.088666	1,449,550.00	4.09665	59	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	220644.5	3.953517	304,370.00	3.9615	72	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	242926.7	3.873783	396,602.00	3.881767	61	50 - 150	-0.0080	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY
SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (B360698-BS1) Lab File ID: B360698-BS1.d Analyzed: 12/19/23 11:13									
M8FOSA	577920.9	3.9566	770,047.00	3.9566	75	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	175475.7	2.52145	221,149.00	2.52145	79	50 - 150	0.0000	+/-0.50	
M2PFTA	1347624	4.329683	2,053,088.00	4.329683	66	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	387931.3	3.794833	456,451.00	3.794833	85	50 - 150	0.0000	+/-0.50	
MPFBA	659758.1	1.0834	839,274.00	1.075083	79	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	204706.1	2.847483	204,484.00	2.847483	100	50 - 150	0.0000	+/-0.50	
M6PFDA	1411861	3.79535	1,710,765.00	3.79535	83	50 - 150	0.0000	+/-0.50	
M3PFBS	248521.4	1.911533	304,809.00	1.90325	82	50 - 150	0.0083	+/-0.50	
M7PFUnA	1181177	3.946033	1,671,274.00	3.946033	71	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	144940.6	3.4373	167,667.00	3.4373	86	50 - 150	0.0000	+/-0.50	
M5PFPeA	630882.9	1.741117	760,379.00	1.741117	83	50 - 150	0.0000	+/-0.50	
M5PFHxA	1060639	2.605183	1,276,662.00	2.605183	83	50 - 150	0.0000	+/-0.50	
M3PFHxS	149274.2	3.201883	182,978.00	3.201883	82	50 - 150	0.0000	+/-0.50	
M4PFHpA	1053276	3.170783	1,247,426.00	3.170783	84	50 - 150	0.0000	+/-0.50	
M8PFOA	1194369	3.445833	1,428,397.00	3.445833	84	50 - 150	0.0000	+/-0.50	
M8PFOS	174387.1	3.644167	214,587.00	3.636183	81	50 - 150	0.0080	+/-0.50	
M9PFNA	1152054	3.6452	1,399,645.00	3.6452	82	50 - 150	0.0000	+/-0.50	
MPFDoA	967001.6	4.08865	1,387,742.00	4.08865	70	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	226872.1	3.9535	331,684.00	3.9535	68	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	312701.1	3.873767	431,045.00	3.873767	73	50 - 150	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY

SOP-454 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS Dup (B360698-BSD1) Lab File ID: B360698-BSD1.d Analyzed: 12/19/23 11:20									
M8FOSA	553248.8	3.9566	770,047.00	3.9566	72	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	169126.7	2.51325	221,149.00	2.52145	76	50 - 150	-0.0082	+/-0.50	
M2PFTA	1239702	4.329683	2,053,088.00	4.329683	60	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	370743.3	3.794833	456,451.00	3.794833	81	50 - 150	0.0000	+/-0.50	
MPFBA	642613.1	1.0834	839,274.00	1.075083	77	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	173415.6	2.8393	204,484.00	2.847483	85	50 - 150	-0.0082	+/-0.50	
M6PFDA	1317725	3.79535	1,710,765.00	3.79535	77	50 - 150	0.0000	+/-0.50	
M3PFBS	240894.7	1.90325	304,809.00	1.90325	79	50 - 150	0.0000	+/-0.50	
M7PFUnA	1115192	3.946033	1,671,274.00	3.946033	67	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	150327.6	3.4373	167,667.00	3.4373	90	50 - 150	0.0000	+/-0.50	
M5PFPeA	611886.2	1.741117	760,379.00	1.741117	80	50 - 150	0.0000	+/-0.50	
M5PFHxA	1029337	2.596983	1,276,662.00	2.605183	81	50 - 150	-0.0082	+/-0.50	
M3PFHxS	145857.2	3.201883	182,978.00	3.201883	80	50 - 150	0.0000	+/-0.50	
M4PFHpA	1003883	3.170783	1,247,426.00	3.170783	80	50 - 150	0.0000	+/-0.50	
M8PFOA	1170772	3.445833	1,428,397.00	3.445833	82	50 - 150	0.0000	+/-0.50	
M8PFOS	168350.6	3.636183	214,587.00	3.636183	78	50 - 150	0.0000	+/-0.50	
M9PFNA	1114675	3.637217	1,399,645.00	3.6452	80	50 - 150	-0.0080	+/-0.50	
MPFDoA	912851.6	4.08865	1,387,742.00	4.08865	66	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	208605.9	3.9535	331,684.00	3.9535	63	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	288492.4	3.873767	431,045.00	3.873767	67	50 - 150	0.0000	+/-0.50	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
SOP-454 PFAS in Water	
Perfluorobutanoic acid (PFBA)	NH-P,PA,NY
Perfluorobutanesulfonic acid (PFBS)	NH-P,PA,NY
Perfluoropentanoic acid (PFPeA)	NH-P,PA,NY
Perfluorohexanoic acid (PFHxA)	NH-P,PA,NY
11Cl-PF3OUdS (F53B Major)	NH-P,PA,NY
9Cl-PF3ONS (F53B Minor)	NH-P,PA
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P,PA,NY
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P,PA,NY
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P,PA
Perfluorodecanoic acid (PFDA)	NH-P,PA,NY
Perfluorododecanoic acid (PFDoA)	NH-P,PA,NY
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	NH-P,PA,NY
Perfluoroheptanesulfonic acid (PFHpS)	NH-P,PA,NY
N-EtFOSAA (NEtFOSAA)	NH-P,PA,NY
N-MeFOSAA (NMeFOSAA)	NH-P,PA,NY
Perfluorotetradecanoic acid (PFTA)	NH-P,PA,NY
Perfluorotridecanoic acid (PFTrDA)	NH-P,PA,NY
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P,PA,NY
Perfluorodecanesulfonic acid (PFDS)	NH-P,PA
Perfluorooctanesulfonamide (FOSA)	NH-P,PA
Perfluorononanesulfonic acid (PFNS)	NH-P,PA
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P,PA
Perfluoro-1-butanefulfonamide (FBSA)	NH-P,PA
Perfluorohexanesulfonic acid (PFHxS)	NH-P,PA,NY
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P,PA,NY
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P,PA,NY
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P,PA,NY
Perfluoropentanesulfonic acid (PFPeS)	NH-P,PA,NY
Perfluoroundecanoic acid (PFUnA)	NH-P,PA,NY
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P,PA
Perfluoroheptanoic acid (PFHpA)	NH-P,PA,NY
Perfluorooctanoic acid (PFOA)	NH-P,PA,NY
Perfluorooctanesulfonic acid (PFOS)	NH-P,PA,NY
Perfluorononanoic acid (PFNA)	NH-P,PA,NY

Con-Test, a Pace Environmental Laboratory, operates under the following certifications and accreditations:

Code	Description	Number	Expires
NY	New York State Department of Health	10899 NELAP	04/1/2024
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2024
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2024

Page 28 of 30



DC#_ Title: ENV-FRM-ELON-0001 v07_Sample Receiving Checklist

Effective Date: 07/13/2023

Log In Back-Sheet

Client BETA Group

Project Barnstable Fire Training Academy

MCP/RCP Required MA-MCP

Deliverable Package Requirement GW-1

Location Barnstable, MA

PW/SID# (When Applicable) n/a

Arrival Method:

Courier ☒ Fed Ex ☐ Walk In ☐ Other ☐

Received By / Date / Time Men 11/22/23 1715

Back-Sheet By / Date / Time Men 11/24/23 0850

Temperature Method Gun # 5

Temp < 6° C Actual Temperature 49

Rush Samples: Yes / No Notify No

Short Hold: Yes / No Notify No

Notes regarding Samples/COC outside of SOP:

Log In Sample Receipt Checklist – (Rejection Criteria Listing
– Using Acceptance Policy) Any False statement will be
brought to the attention of the Client – True or False

	True	False
Received on Ice	☒	☐
Received in Cooler	☒	☐
Custody Seal: DATE TIME	☐	☒
COC Relinquished	☒	☐
COC/Samples Labels Agree	☒	☐
All Samples in Good Condition	☒	☐
Samples Received within Holding Time	☒	☐
Is there enough Volume	☒	☐
Proper Media/Container Used	☒	☐
Splitting Samples Required	☐	☒
MS/MSD	☐	☒
Trip Blanks	☐	☒
Lab to Filters	☐	☒
COC Legible	☒	☐
COC Included: (Check all included)		
Client ☒ Analysis ☒		☒
Project ☒ IDs ☒	Sampler Name	☒
	Collection Date/Time	☐
All Samples Proper pH:	☐	☐

N/A

Additional Container Notes

Note: West Virginia requires all samples to have their
temperature taken. Note any outliers.

[illegible]

APPENDIX E

PUBLIC NOTIFICATIONS



February 9, 2024

Mark S. Ells, Town Manager
Town of Barnstable
200 Main Street
Hyannis, MA 02601

RE: Immediate Response Action Status and Remedial Monitoring Report #66
The Former Barnstable County Fire Training Academy
155 South Flint Rock Road
Barnstable, Massachusetts
DEP Release Tracking No. 4-26179
Project File #6206

Dear Mr. Ells,

As required by the Massachusetts Contingency Plan (MCP) 310 CMR 40.1403(3)(e) and 40.1403(6), BETA Group, Inc.(BETA) is notifying you on behalf of our client, Barnstable County, that Immediate Response Action (IRA) Status and Remedial Monitoring Report (RMR) No. 66 is being submitted to the Massachusetts Department of Environmental Protection – Bureau of Waste Site Cleanup (MassDEP – BWSC) for the release Site referenced as the former Barnstable County Fire Training Academy (FTA) located at 155 South Flint Rock Road in Barnstable, Massachusetts (the Disposal Site or Site). This Report summarizes the IRA activities that occurred during the July 2023 to December 2023 six-month reporting period.

A release of poly- and perfluoroalkyl substances (PFAS) attributable to historic training with aqueous film-forming foams (AFFF) has been documented at the Site. In August 2016, MassDEP Southeast Regional Office issued a Notice of Responsibility (NOR) to Barnstable County, as the owner and operator of the Barnstable County Fire and Rescue Training Academy (BCFRTA) at that time, that the detection of elevated concentrations of PFAS in groundwater at the Site constituted a release under the MCP. MassDEP issued Release Tracking Number (RTN) 4-26179 to this release. As summarized in the NOR, based on the detected PFAS concentrations in soil and groundwater at the BCFRTA and the inferred groundwater flow, MassDEP determined that the releases of PFAS from the use of aqueous film-forming foam (AFFF) at the BCFRTA is a source of PFAS detected in the Mary Dunn public water supply wells.

During the July 2023 to December 2023 reporting period, two treatment systems, GWTS #1 and GWTS#2, were in operation for all, or portions of the 6-month period. The primary treatment system (GWTS #1) and secondary system (GWTS #2) were in operation for approximately 179 days. The overall (average) system flow rate and gallons of groundwater treated, based on the available Effluent flow totalizer readings for both systems, were approximately 10.32 million gallons.

The IRA Status and RMR document is available electronically via the searchable sites database of the MassGOV / MassDEP website via the following link:

<https://eeonline.eea.state.ma.us/portal#!/wastesite/4-0026179>

BETA Group Inc.
701 George Washington Highway, Lincoln, RI 02865
P : 401.333.2832 | F: 401.333.9225 | W: beta-inc.com

At this time, IRA activities are ongoing. Continuing IRA activities will include operation and monitoring of the on-Site Groundwater Pump and Treatment Systems (GWPTS), including performance sampling of GWTS #1 and #2, review and evaluation of the on-Site GWPTS operation and maintenance activities as they affect groundwater treatment, and quarterly groundwater monitoring. Additional information regarding the continuing IRA activities is included in the IRA Status and RMR No. 66 report document.

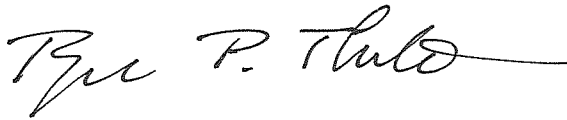
Change in Procedure for Filing Status Reports

In December 2021, it was established with MassDEP that a six-month submittal schedule for IRA Status and RMR reports would be acceptable. The referenced IRA Status and RMR No. 66 document is the forth submittal under that schedule.

Approximately quarterly, updates regarding clean up and remediation activities of the PFAS release at the Site will be provided to the public, more specifically those listed on the Public Involvement mailing list. These updates will be in the form of written notices and/or public meetings.

If you have any questions or comments, please do not hesitate to contact our office.

Sincerely,
BETA Group, Inc.



Roger P. Thibault, P.E., LSP
Senior Associate

Copies: Mass Department of Environmental Protection
Southeast Regional Office
20 Riverside Drive
Lakeville, MA 02347

Thomas Mckean, Director
Town of Barnstable Health Division
200 Main Street
Hyannis, MA 02601

Hans Keijser, Supervisor
Town of Barnstable Water Supply Division
47 Old Yarmouth Road
Hyannis, MA 02601

APPENDIX F

WASTE MANIFESTS

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

EST 2306537993.002

BUCK 40230

NON-HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. NONEREQUIRED		Manifest Document No. 012182023 BHR		2. Page 1 of 1	
3. Generator's Name and Mailing Address Barnstable County 155 South Flint Rock Road P.O. Box 427 Barnstable MA 02601				Site Address : 155 South Flint Rock Road Barnstable, MA 02601			
4. Generator's Phone ()		6. US EPA ID Number MAD039322250		A. State Transporter's ID			
5. Transporter 1 Company Name Clean Harbors Environmental Services, Inc		8. US EPA ID Number		B. Transporter 1 Phone (781) 792-5000			
7. Transporter 2 Company Name		10. US EPA ID Number MAD053452637		C. State Transporter's ID			
9. Designated Facility Name and Site Address Clean Harbors of Braintree Inc 1 Hill Avenue Braintree, MA 02184				D. Transporter 2 Phone			
				E. State Facility's ID			
				F. Facility's Phone (781) 380-7100			
11. WASTE DESCRIPTION				Containers No. Type		13. Total Quantity	
a. NON DOT REGULATED MATERIAL, (PFAS REMEDIATION WASTEWATER)				001 TT		991	
b.							
c.							
d.							
G. Additional Descriptions for Materials Listed Above 11a.CH2543327B				H. Handling Codes for Wastes Listed Above			
15. Special Handling Instructions and Additional Information				EMERGENCY PHONE #: (800) 483-3718 GENERATOR: Barnstable County			
16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.							
Printed/Typed Name * Ridge M. Ruiz				Signature * Ridge M. Ruiz		Date Month Day Year 12 18 23	
17. Transporter 1 Acknowledgement of Receipt of Materials							
Printed/Typed Name Christopher E Bowen				Signature		Date Month Day Year 12 18 23	
18. Transporter 2 Acknowledgement of Receipt of Materials							
Printed/Typed Name				Signature		Date Month Day Year	
19. Discrepancy Indication Space							
20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.							
Printed/Typed Name				Signature		Date Month Day Year	

NON-HAZARDOUS WASTE

GENERATOR

TRANSPORTER

FACILITY





40406

Generator acknowledges that no material change has occurred either in the characteristics or in the process generating the material.

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

NON-HAZARDOUS WASTE MANIFEST		1. Generator ID Number NONEREQUIRED	2. Page 1 of 1	3. Emergency Response Phone (800) 483-3713	4. Waste Tracking Number 012142023 BAR	
5. Generator's Name and Mailing Address 155 South Flint Rock Road P.O. Box 427 Barnstable, MA 02601			Generator's Site Address (if different than mailing address) 155 South Flint Rock Road Barnstable, MA 02601			
Generator's Phone:			U.S. EPA ID Number MAD082303777			
6. Transporter 1 Company Name Cyn Oil Corporation			U.S. EPA ID Number			
7. Transporter 2 Company Name			U.S. EPA ID Number			
8. Designated Facility Name and Site Address Clean Harbors of Braintree Inc- 1 Hill Avenue Braintree, MA 02184			U.S. EPA ID Number MAD053452637			
Facility's Phone: (781) 380-7100						
9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))		10. Containers No. Type		11. Total Quantity	12. Unit Wt./Vol.
1.	NON DOT REGULATED MATERIAL, (PFAS REMEDIATION WASTEWATER)		001 TT		2600 G	MA99
2.						
3.						
4.						
13. Special Handling Instructions and Additional Information Contract retained by generator confers agency authority on initial transporter to add or substitute additional transporters on generator's behalf for purposes of transportation efficiency, convenience, or safety.						
14. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.						
Generator's/Officer's Printed/Typed Name PAUL RUSALA			Signature <i>[Signature]</i>		Month 10	Day 14
					Year 23	
15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit: Date leaving U.S.:						
16. Transporter Acknowledgment of Receipt of Materials						
Transporter 1 Printed/Typed Name Nathan Camacho			Signature <i>[Signature]</i>		Month 10	Day 14
Transporter 2 Printed/Typed Name			Signature <i>[Signature]</i>		Year 23	
17. Discrepancy						
17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection						
Manifest Reference Number:						
17b. Alternate Facility (or Generator) U.S. EPA ID Number						
Facility's Phone:						
17c. Signature of Alternate Facility (or Generator) Month Day Year						
H141						
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a						
Printed/Typed Name Huyen Hoang			Signature <i>[Signature]</i>		Month 12	Day 15
					Year 23	

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

EST 2306537993-002

NON-HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. NONREQUIRED		Manifest Document No. 012182023 BAR		2. Page 1 of 1	
3. Generator's Name and Mailing Address Barnstable County 155 South Flint Rock Road P.O. Box 427 Barnstable MA 02601				Site Address : 155 South Flint Rock Road Barnstable, MA 02601			
4. Generator's Phone ()		5. Transporter 1 Company Name Clean Harbors Environmental Services, Inc		6. US EPA ID Number MAD039322250		A. State Transporter's ID	
		7. Transporter 2 Company Name		8. US EPA ID Number		B. Transporter 1 Phone (781) 792-5000	
						C. State Transporter's ID	
						D. Transporter 2 Phone	
		9. Designated Facility Name and Site Address Clean Harbors of Braintree Inc 1 Hill Avenue Braintree, MA 02184		10. US EPA ID Number MAD053452637		E. State Facility's ID	
						F. Facility's Phone (781) 380-7100	
11. WASTE DESCRIPTION				Containers No. Type		13. Total Quantity	
a. NON DOT REGULATED MATERIAL, (PFAS REMEDIATION WASTEWATER)				001 TT		991	
b.							
c.							
d.							
G. Additional Descriptions for Materials Listed Above 11a.CH2543327B				H. Handling Codes for Wastes Listed Above			
15. Special Handling Instructions and Additional Information				EMERGENCY PHONE #: (800) 483-3718 GENERATOR: Barnstable County			
16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.							
Printed/Typed Name Paul Rossato		Signature <i>Paul Rossato</i>		Date Month Day Year 12/18/23			
17. Transporter 1 Acknowledgement of Receipt of Materials							
Printed/Typed Name Christopher E. Bowen		Signature <i>Christopher E. Bowen</i>		Date Month Day Year 12/18/23			
18. Transporter 2 Acknowledgement of Receipt of Materials							
Printed/Typed Name		Signature		Date Month Day Year			
19. Discrepancy Indication Space							
20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in Item 19.							
Printed/Typed Name Huyen Hoang		Signature <i>Huyen Hoang</i>		Date Month Day Year 12/18/23			